DEFINITY®
Enterprise Communications Server
DEFINITY ONE™
Communications System
Avaya IP600 Internet Protocol
Communications Server

What's New for Release 9.5

555-233-418
Issue 1
July 2001

Copyright 2001, Avaya Inc.
All Rights Reserved

Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya Fraud Intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, in the United States and Canada, call the Technical Service Center's Toll Fraud Intervention Hotline at 1-800-643-2353. For additional support telephone numbers, see the Avaya web site:
http://www.avaya.com
Click on Support, click on Escalation Lists US and International. This web site includes phone numbers for escalation within the United States. For escalation phone numbers outside the United States, click on Global Escalation List.

Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based) or asynchronous (character-, message-, or packet-based) equipment or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll-facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Your Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - an Avaya customer's system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- your Avaya-provided telecommunications systems and their interfaces
- your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- any other equipment networked to your Avaya products.

How to get help

For support phone numbers, see the Avaya web site:
http://www.avaya.com
Click on Support, click on Escalation Lists US and International. This web site includes phone numbers for escalation within the United States. For escalation phone numbers outside the United States, click on Global Escalation List.

Standards Compliance

Avaya Inc. is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya Inc. The correction of interference caused by such unauthorized modifications, substitution or attachment will be the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya Inc. could void the user's authority to operate this equipment.
The equipment described in this manual complies with standards of the following organizations and laws, as applicable:

- Australian Communications Agency (ACA)
- American National Standards Institute (ANSI)
- Canadian Standards Association (CSA)
- Committee for European Electrotechnical Standardization (CENELEC) – European Norms (EN's)
- Digital Private Network Signaling System (DPNSS)
- European Computer Manufacturers Association (ECMA)
- European Telecommunications Standards Institute (ETSI)
- FCC Rules Parts 15 and 68
- International Electrotechnical Commission (IEC)
- International Special Committee on Radio Interference (CISPR)
- International Telecommunications Union - Telephony (ITU-T)
- ISDN PBX Network Specification (IPNS)
- National ISDN-1
- National ISDN-2
- Underwriters Laboratories (UL)

Product Safety Standards

This product complies with and conforms to the following international Product Safety standards as applicable:

Safety of Information Technology Equipment, IEC 60950, 3rd Edition including all relevant national deviations as listed in Compliance with IEC for Electrical Equipment (IECEE) CB-96A.

Safety of Laser products, equipment classification and requirements:

- IEC 60825-1, 1.1 Edition
- Safety of Information Technology Equipment, CAN/CSA-C22.2 No. 60950-00 / UL 60950, 3rd Edition
- Safety Requirements for Customer Equipment, ACA Technical Standard (TS) 001 - 1997
- One or more of the following Mexican national standards, as applicable: NOM 001 SCFI 1993, NOM SCFI 016 1993, NOM 019 SCFI 1998

Electromagnetic Compatibility (EMC) Standards

This product complies with and conforms to the following international EMC standards and all relevant national deviations:

Limits and Methods of Measurement of Radio Interference of Information Technology Equipment, CISPR 22:1997 and EN55022:1998.

Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement, CISPR 24:1997 and EN55024:1998, including:

- Electrostatic Discharge (ESD) IEC 61000-4-2
- Radiated Immunity IEC 61000-4-3
- Electrical Fast Transient IEC 61000-4-4
- Lightning Effects IEC 61000-4-5
- Conducted Immunity IEC 61000-4-6
- Mains Frequency Magnetic Field IEC 61000-4-8
- Voltage Dips and Variations IEC 61000-4-11
- Powerline Harmonics IEC 61000-3-2
- Voltage Fluctuations and Flicker IEC 61000-3-3

Federal Communications Commission Statement

Part 15:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 68: Answer-Supervision Signaling. Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- answered by the called station,
- answered by the attendant, or
- routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user.

This equipment returns answer-supervision signals on all direct inward dialed (DID) calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered.
- A busy tone is received.
- A reorder tone is received.

Avaya attests that this registered equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

This equipment complies with Part 68 of the FCC Rules. On the rear of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

REN is not required for some types of analog or digital facilities.

Means of Connection

Connection of this equipment to the telephone network is shown in the following table.

Manufacturer's Port Identifier	FIC Code	SOC/REN/ A.S. Code	Network Jacks
Off/On premises station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
CO trunk	02LS2	0.3A	RJ21X
Tie trunk	TL31M	9.0F	RJ2GX
Basic Rate Interface	02IS5	6.0F, 6.0Y	RJ49C
1.544 digital interface	04DU9-BN, 1KN, 1SN	6.0F	RJ48C, RJ48M
120A2 channel service unit	04DU9-DN	6.0Y	RJ48C

If the terminal equipment (for example, the DEFINITY® System equipment) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact the Technical Service Center at 1-800-242-2121 or contact your local Avaya representative. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

It is recommended that repairs be performed by Avaya certified technicians.
The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.
This equipment, if it uses a telephone receiver, is hearing aid compatible.

Canadian Department of Communications (DOC) Interference Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

DECLARATIONS OF CONFORMITY

United States FCC Part 68 Supplier's Declaration of Conformity (SDoC)

Avaya, Inc. in the United States of America hereby certifies that the equipment described in this document and bearing a TIA TSB-168 label identification number complies with the FCC's Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments (ACTA) adopted technical criteria.
Avaya further asserts that Avaya handset equipped terminal equipment described in this document complies with Paragraph 68.316 of the FCC Rules and Regulations defining Hearing Aid Compatibility and is deemed compatible with hearing aids.
Copies of SDoCs signed by the Responsible Party in the U. S. can be obtained by contacting your local sales representative and are available on the following Web site:
http://support.avaya.com/elmodocs2/DoC/SDoC/index.jhtml/
All DEFINITY® system products are compliant with FCC Part 68, but many have been registered with the FCC before the SDoC process was available. A list of all Avaya registered products may be found at:
http://www.part68.org/
by conducting a search using "Avaya" as manufacturer.

European Union Declarations of Conformity

CE

Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Europeénne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC). This equipment has been certified to meet CTR3 Basic Rate Interface (BRI) and CTR4 Primary Rate Interface (PRI) and subsets thereof in CTR12 and CTR13, as applicable.
Copies of these Declarations of Conformity (DoCs) signed by the Vice President of DEFINITY® systems research and development, Avaya Inc., can be obtained by contacting your local sales representative and are available on the following Web site:
http://support.avaya.com/elmodocs2/DoC/IDoC/index.jhtml/

Japan

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Network Connections

Digital Connections - The equipment described in this document can be connected to the network digital interfaces throughout the European Union.
Analogue Connections - The equipment described in this document can be connected to the network analogue interfaces throughout the following member states:

Belgium	Germany	Greece	Italy	Luxemburg
Netherlands	Spain	United Kingdom		

LASER Product

The equipment described in this document may contain Class 1 LASER Device(s) if single-mode fiber-optic cable is connected to a remote expansion port network (EPN). The LASER devices operate within the following parameters:

- Maximum power output –5 dBm to -8 dBm
- Center Wavelength 1310 nm to 1360 nm
- CLASS 1 LASER PRODUCT IEC 60825-1: 1998

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Contact your Avaya representative for more laser product information.

Trademarks

AUDIX, DEFINITY, and GuestWorks are registered trademarks of Avaya.
Comsphere is a registered trademark of Paradyne Corp.
GuideBuilder and INTUITY are trademarks of Avaya.
InnLine 2020 is a trademark of ComTelco (North America), Inc.
Okidata is a registered trademark of OKI Electric Co., LTD.
UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.
Xiox is a trademark of @Comm Corporation.

To order copies of this and other documents:

Call: Avaya Publications Center
Voice 1.800.457.1235 or +1.410.568.3680
FAX 1.800.457.1764 or +1.410.891.0207
Write: Globalware Solutions
200 Ward Hill Avenue
Haverhill, MA 01835 USA
Attention: Avaya Account Management
Email: totalware@gwsmail.com
Order: Document No. 555-233-418
Issue 1, July 2001

Contents

Contents **v**

Welcome **xi**

- Overview xi
- Purpose xii
- Audience xii
- Contents xii
- Trademarks and service marks xiv
- How to get Avaya books on the web xiv
- How to order more copies xv
- How to get help xv
- Tell us what you think xvi

1 Highlights **1**

- General Enhancements 1
- Hardware Enhancements 5
- Networking Enhancements 6
- ATM Enhancements 8
- EC500 Extension to Cellular R2 8
- IP Solution Enhancements 9
- DEFINITY ONE® Enhancements 11
- AVAYA IP600 Enhancements 11

2 System Capacity Enhancements **13**

- System Capacity Limits 13

3 Hardware **39**

- 302D Console 39
- Remotely Readable Electronic IDs 40
- TN744E/TN2182C Enhancements 42
- TN2302AP Enhancements 42
- TN2305B/TN2306B (new vintage) 42
- TN2501AP (new board) 42

4 General System Enhancements 43

- 2-digit Release String 44
- Announcement Intercept Treatment for Invalid Number 45
- Automatic Answer Intercom Calls 47
- Automatic Customer Telephone Rearrangement (ACTR) 48
- Busy Tone Disconnect 55
- D-channel Backup 57
- Increased BRI trunks to 1440 57
- Interworking between TGU/TGE Trunks and ISDN (Italy) 57
- Mixed Length Dial Access Codes 57
- Multi-Frequency Packet Signaling (Russia) 58
- Personal Station Access (PSA) Enhancements 60
- R2 MFC Enhancements 60
- Skip Two Second Delay Timer on Overlap Digit Sending 62

5 Asynchronous Links 63

- Introduction/overview 63
- Design considerations 67
- Installation and upgrades 68
- Related topics 92

6 ATM 93

- Introduction 93
- Reliability and Performance 94
- Serviceability 100
- Survivability 115

7 Networking 125

- ISDN B-Channel Maintenance 125
- Network Call Redirection Enhancements 126
- QSIG Standalone Path Replacement 129
- QSIG/DCS Voice Messaging 131

8 Voice Announcements over LAN (VAL) 139

- Introduction 139
- Important File Specifications 140
- Installing the TN2501AP Circuit Pack 148
- Announcement Administration 154
- FTP 167
- Troubleshooting 175
- Maintenance Commands 178
- Maintenance Objects 180

9 IP Enhancements 181

- Alternate Gatekeeper 181
- IP Serviceability Enhancements 183
- Switch Support for IP Stations 187
- Quality of Service (QoS) to Endpoints 191
- Quality of Service (QoS) Integration with Cajun Rules 192

10 DEFINTY ONE Enhancements 195

- Introduction 195
- New Capabilities 196
- Procedure to Disable Voice Messaging 201

11 Avaya IP600 Enhancements 211

- Introduction 211
- New Capabilities 212
- Procedure to Disable Voice Messaging 217

12 EC500 Extension to Cellular R2 227

- X-Station Mobility Explicit Number Mapping 227
- X-Station Mobility Extended to External Networks 229
- Activation of Calls to External Numbers 229
- X-Station Mobility Maintenance Plan 230

13 Upgrades 233

- Upgrading from R9.1si to R9.5si 233
- Upgrading from R9.1csi to R9.5csi 248
- Upgrading from R9.1r to R9.5r 260

14 New and Changed Screens 275

- New screens 275
- ATM VPI.VCI Data screen 275
- DCS to QSIG TSC Gateway screen 276
- QSIG to DCS TSC Gateway screen 278
- Changed screens 279
- CDR System Parameters screen 280
- Class of Restriction screen 283
- Dial Plan Record 284
- DS1 Circuit Pack screen 285
- Feature-Related System Parameters screen 288
- Hospitality screen 295
- Hunt Group screen 297
- IP Services screen 298
- Maintenance-Related System Parameters screen 302
- Multifrequency-Signaling-Related System Parameters screen 303
- Route Pattern screen 304
- Signaling Group screen 305
- Station screen 307
- System Parameters Country-Options screen 311
- System Parameters Customer Options screen 312
- System Parameters OCM Call Classification screen 315
- Trunk Group screen 316

15 New and Changed Commands 319

- New commands 319
- Changed commands 327

16 New and Changed Maintenance Objects 355

- New maintenance objects 355
- Changed maintenance objects 355
- VAL-BD (Voice Announcements over LAN Circuit Pack) 356
- VAL-PT (Voice Announcements over LAN Packet/Port) 373
- ATM-DCH (ATM D-Channel Port) 379
- ATM-EI (Expansion Interface Circuit Pack) 382
- ATM-NTWK (ATM Network Error) 427
- ATM-TRK (Circuit Emulation Service Circuit Pack) 438
- ATM-WSP (ATM WAN Spare Processor) 468
- DIG-IP-STN (Digital IP Station) 473
- FW-DWNLD (Firmware Download) 480

IN Index 497

Welcome

Overview

This document describes the new features and enhancements available with Release 9.5 software for DEFINITY® Enterprise Communications Server (ECS), DEFINITY ONE™ Communications System, and Avaya IP600 Internet Protocol Communications Server.

This document contains feature descriptions and instructions for switch administration. It also contains information about what has changed in the system: new and changed screens, new and changed maintenance objects.

Purpose

This document provides an overall reference for DEFINITY ECS Release 9.5 development.

Audience

This document is intended for DEFINITY ECS system administrators and managers, users interested in information about specific features, and Avaya personnel responsible for planning, designing, configuring, selling, and supporting the system.

Contents

The information for each task is usually presented under the following headings:

Highlights

Contains brief descriptions of the changes for R9.5.

System Capacity Enhancements

Contains an update of the System Capacity Table. The information in this section supersedes all previously published versions of this table.

Hardware

Describes hardware changes introduced in R9.5.

General System Enhancements

Describes new telephony features and other system-wide enhancements.

Asynchronous Links

Describes enhancements to asynchronous connectivity over TCP/IP. These enhancements allow you to connect adjunct applications such as PMS and CDR over TCP/IP.

ATM

Describes changes to ATM functionality offered with R9.5.

Networking

Describes changes to ISDN and QSIG.

Voice Announcements over LAN (VAL)

Describes installation, administration, troubleshooting and maintenance for the new VAL circuit pack.

IP Enhancements

Describes changes in IP telephone support and enhancements for improved troubleshooting.

DEFINITY ONE Enhancements

Describes enhancements to DEFINITY ONE Communications System for Release 9.5.

Avaya IP600 Enhancements

Describes enhancements to the Avaya IP600 Internet Protocol Communications Server for Release 9.5.

EC500 Extension to Cellular R2

Describes the Release 2 enhancements to the Avaya EC500 mobile communications product.

Upgrades

Describes how to perform software upgrades from Release 9.1 to Release 9.5.

New and Changed Screens

Provides information about new administration screens, and changes to existing screens.

New and Changed Commands

Provides information about non-administration commands (such as display, list or status commands) that changed for this release.

New and Changed Maintenance Objects

Provides the complete text of any maintenance object that changed for this release.

Trademarks and service marks

The following are trademarks or registered trademarks of Avaya:

AUDIX®	Callvisor®
Callmaster®	CentreVu™
CONVERSANT®	DEFINITY®
Intuity™	DEFINITY ONE™

The following are trademarks or registered trademarks of other companies:

- Adobe® and Acrobat® are trademarks of Adobe Systems, Inc.
- MCI is a registered trademark of MCI WorldCom

How to get Avaya books on the web

If you have internet access, you can view and download the latest version of Avaya documentation products. To view these books, you must have a copy of Adobe® Acrobat® Reader.

For example, to access an electronic version of this book:

1. Access the Avaya Customer Support web site at **http://support.avaya.com**
2. Click on Online Services, then Documentation, then Recent Documents, then look for the latest DEFINITY release.
3. To find a specific book, search for the document number (**555-233-418)** to view the latest version of the book.

How to order more copies

Call: Avaya Publications Center
Voice 1-800-457-1235
Fax 1-800-457-1764
International Voice 317-322-6416
International Fax 317-322-6699

Write: Avaya Publications Center
Attention: Avaya Account Management
200 Ward Hill Avenue
Haverhill, MA 01835 USA

Order: Document No. 555-233-418
Issue 1, July 2001

We can place you on a standing order list so that you automatically receive updated versions of this book. For more information on standing orders, or to be put on a list to receive future issues of this book, please contact the Avaya Publications Center.

How to get help

If you need additional help, the following services are available. You can purchase an extended service agreement to use some of these services. See your Avaya representative for more information.

- DEFINITY Helpline (for help with feature administration and system applications) +1-800-225-7585
- Avaya National Customer Care Center Support Line (for help with maintenance and repair) +1-800-242-2121
- Avaya Toll Fraud Intervention +1-800-643-2353
- Avaya Corporate Security +1-800-822-9009
- Avaya Centers of Excellence
  - Asia/Pacific +65-872-8686
  - Western Europe/Middle East/South Africa +441-252-391-889
  - Central/Eastern Europe +361-270-5160
  - Central/Latin America Caribbean +1-303-538-4666
  - North America +1-800-248-1111

Tell us what you think

Let us know what you like or don't like about this book. Although we can't respond personally to all your feedback, we promise we will read each response we receive. You can use the comment card at the back of the book or send us your feedback in your own format.

Write to us at: Avaya
Product Documentation Group
Room 22-2H15
1200 W. 120th Avenue
Denver, CO 80234 USA

Fax to: 303-538-1741

Send email to: document@avaya.com

Highlights

1

This section presents highlights of features and enhancements added in Release 9.5 software for the DEFINITY Enterprise Communications Server (ECS), the DEFINITY ONE Communications System, and the Avaya IP600 Internet Protocol Communications Server.

General Enhancements

Release 9.5 includes the following general telephony and system-wide enhancements.

2-digit Release Number

The standard DEFINITY software release string has been modified to accommodate 2-digit release numbers that are required for future releases.

Asynchronous Links Enhancements

Client applications with asynchronous links allow you to use TCP/IP to connect adjunct equipment to the switch via the C-LAN board. In the past these applications required an RS232 connection through a serial port with a data module or a data line port with an Asynchronous Data Unit (ADU).

With Release 9.5 these applications can be connected through the local area network (LAN) via a TCP/IP port. These links can operate at a much higher data rate, and allow you to connect adjuncts without the need for data modules.

Call detail recording (CDR) devices, property management systems (PMS) and printers can be connected using asynchronous TCP/IP links. In addition, maintenance parameters can be set to allow the switch to alarm out over a TCP/IP link.

Any device that does not support a direct TCP/IP connection, but that does support an RS232 interface, can connect to the C-LAN board through a terminal server or router.

Announcement Intercept Treatment for Invalid Numbers

This feature allows the user to administer a recorded announcement to play back when the end-user dials an invalid number.

The announcement does not play back for calls that fail due to inter-digit timeout. An invalid number is any called number that cannot be resolved through the dial plan.

The announcement does not play back for calls that fail due to inter-digit timeout. You can only use this feature in single-switch environment (non-DCS, non-QSIG).

Automatic Answer Intercom Calls

Automatic Answer Intercom Calls (Auto Answer ICOM) allows a user to answer an intercom call within the intercom group without pressing the intercom button. Auto Answer ICOM works with digital, BRI, and hybrid phones with built-in speaker, headphones, or adjunct speakerphone.

Automatic Customer Telephone Rearrangement

Automatic Customer Telephone Rearrangement (ACTR) allows a phone to be unplugged from one location and moved to a new location without additional switch administration. The switch automatically associates the extension to the new port. ACTR works with 6400 Serialized phones. The 6400 Serialized phone is stamped with the word Serialized on the faceplate for easy identification. The 6400 Serialized phone memory electronically stores its own part ID (comcode) and serial number. ACTR uses the stored information and associates the phone with new port when the phone is moved.

ACTR is an enhancement to Terminal Translation Initialization (TTI), Personal Station Access (PSA), Customer Telephone Activation (CTA).

ACTR makes it easy to identify and move phones.

Busy Tone Disconnect

In some regions of the world the CO sends a busy tone for the disconnect message. With Busy Tone Disconnect, the switch disconnects analog loop-start Central Office trunks when a busy tone is sent from the CO.

Capacity Changes

Release 9.5 introduces several increased capacity limits, including an increased number of IP telephones made possible by using single extension IP phones in place of dual extension configurations.

The new Voice Announcement over LAN (VAL) feature allows greater announcement recording times, and the number of vectors and vector directory numbers (VDNs) has increased for systems with Offer Category B.

The number of ATM WAN Spare Processors (WSP) allowed has also increased. See ''System Capacity Enhancements'' on page 13 for more information.

D-channel Backup

This feature allows you to use D-channel backup when the country protocol field is set to 19 (Hong Kong) on the DS1 Circuit Pack screen.

Increased BRI Trunks to 1440

This feature increases the maximum number of BRI trunks on the G3r platform from 720 to 1440. This feature allows additional controllers and base stations to be supported by the additional BRI trunks, which allows you to have more administered wireless users.

Interworking between TGU/TGE Trunks and ISDN (Italy)

The feature modifies ISDN messaging operation in systems where TGE/TGU trunking is used for networking satellite switches. Messaging from the DEFINITY ECS has been modified to ensure that the calling party receives ringback or busy tone as appropriate.

Mixed-length Dial Access Codes

Mixed- Length Dial Access Codes (DACs) allows you to use the second digit table to assign Feature Access Codes (FAC) and DACs of different lengths depending on the second digit. This feature existed prior to R9.5, but only for first digits 0-9. In R9.5, the feature works for first digits * and # as well.

Multi-Frequency Packet Signaling (Russia)

Multi-Frequency Packet (MFP) address signaling is provided in Russia on outgoing CO trunks. Calling party number and dialed number information is sent on outgoing links between local and toll switches. Russian MFP is set on each trunk group on the Type field on the trunk screen. Russian MFP does not apply to PCOL trunks.

Personal Station Access (PSA) Enhancements

When a call that goes to coverage from a PSA-disassociated extension, the switch sends a message to the coverage point indicating that the call was not answered. If the coverage point is a display phone, the display shows **da** for don't answer. If the coverage point is a voice messaging system, the VM system receives an indication from the switch that this call was not answered, and treat the call accordingly.

R2 MFC Enhancements

Release 9.5 contains the following enhancements to R2 Multifrequency-Compelled Signaling (MFC):

- The user can choose to include the R2 MFC Calling Party Category in the call detail record (CDR)
- The user can choose to assign the R2 MFC Calling Party Category and Called Party Category on a per-station or per-trunk basis.
- The user can administer a recorded announcement to play when outgoing R2 MFC trunk calls do not complete. This applies when the DEFINITY ECS receives either group A or B signals from the called Central Office or other switch.

Skip 2-Second Delay Timer

Prior to R9.5, the DEFINITY system waited two seconds before sending digits on an ARS/AAR ISDN PRI trunk call. In situations where the difference between the minimum and maximum number of digits dialed is small, this delay is unnecessary.

This enhancement eliminates the two-second delay timer for calls when the difference between the minimum and maximum number of digits is 0 or 1. The timer is set to one second if the difference between the minimum and maximum number of digits is 2 or 3. If the difference is 4 or greater, the original two-second timer is set.

Voice Announcement over LAN

Voice Announcement over LAN (VAL) introduces the TN2501AP, a new integrated announcement circuit pack that

- plays announcements over the TDM bus, similar to the TN750C.
- has up to 1 hour of announcement storage time per circuit pack.
- has 33 ports
- 10/100 Mb ethernet interface, allowing announcement and firmware file portability over a LAN (FTP server functions).
- supports generated .wav announcement files

Hardware Enhancements

302D Console

The 302D console provides the following enhancements to the current 302C console:

- Modular handset/headset connection
- Activate/deactivate push-button
- Two-wire DCP compatibility
- Headset volume control
- Noise expander option
- Support for Eurofont or Katakana character set

Remotely Readable Electronic IDs

Remotely readable electronic identification allows the switch to read a serialized DCP telephone's part number (comcode) and serial number. Avaya can use this information to determine the proper maintenance replacement unit or the date of manufacture for warranty or QPPCN status. The remotely readable electronic identification is currently only available with the 6400 Serialized DCP telephones.

TN744E/TN2182C Enhancements

The TN744E Call Classifier/Detector circuit pack and the TN2182C Tone Clock circuit pack now support Busy Tone Disconnect. See ''Busy Tone Disconnect'' on page 55.

TN2302AP Enhancements

The TN2302AP IP Media Processor board now supports the T.38 standard for fax transmissions.

TN2305B/TN2306B (new vintage)

The TN2305B and TN2306B ATM interface circuit packs support the Release 9.5 ATM enhancements. See ''Redesigned ATM interface circuit packs'' on page 94.

TN2501AP (new board)

The new TN2501AP integrated announcement circuit pack supports Voice Announcement over LAN (VAL). See ''Voice Announcements over LAN (VAL)'' on page 139.

Networking Enhancements

ISDN B-Channel Maintenance

This development allows you to connect their DEFINITY ECS with other switches that use the NI-1998 B-channel maintenance standard. B-Channel Maintenance applies only to ISDN-PRI connections.

Network Call Redirection Enhancements

Changes provided in DEFINITY R9.5 are required for reliable operation with the MCI® WorldCom® Network Call Transfer network service.

NCR 9.5 supports Information Forwarding for AT&T In-band Transfer and Connect network service.

Enabling NCR provides Information Forwarding support for the AT&T Transfer and Connect In-band network service ISDN D-channel data forwarding capability starting with DEFINITY R9.2 load 35. The DEFINITY Information Forwarding feature forwards User-to-User Information (UUI) associated with the call to the transferred to location. When NCR is active in the DEFINITY system, transferring the call using Call Vectoring and AT&T In-band Transfer and Connect, the disconnect vector step includes the codeset UUI IE in the ISDN DISCONNECT message.

QSIG Stand-alone Path Replacement

Path Replacement (PR) is the process of routing an established call over a new, more efficient path, after which the old call is torn down leaving those resources free. Path Replacement offers potential savings by routing calls more efficiently, saving resources and trunk usage.

Prior to R9.5, path replacement only occurred with QSIG Call Transfer. In R9.5, path replacement can exist as a stand-alone feature, or occur in the following additional cases:

- Call Forwarding by Forward Switching supplementary service, including the case where Call Diversion by Rerouting fails, and Call Forwarding is accomplished via forward switching
- Gateway scenarios where DEFINITY ECS, serving as an incoming or outgoing gateway, invokes PR to optimize the path between the gateways
- Calls in queue/vector processing even though no true user is on the call yet
- QSIG Lookahead Interflow call, Best Service Route call, or adjunct route

CAUTION:
Depending on the version of Call Management System (CMS) you are using, some calls can go unrecorded if you administer your system for Path Replacement in queue/vector processing. Please see your Avaya representative for more information.

QSIG/DCS Voice Mail Interworking

QSIG/DCS Voice Mail Interworking is an enhancement to the current QSIG feature. It integrates DCS and QSIG Centralized Voicemail via the new DCS+/QSIG gateway. Switches labeled DCS+/QSIG integrate multi-vendor PBXs into a single voice messaging system.

This is an Offer Category A enhancement and works on G3r, G3si, and G3csi. It provides network flexibility, DCS functionality without a dedicated T1 and vendor independence.

ATM Enhancements

The redesigned TN2305 and TN2306 ATM interface circuit packs have more capabilities and resources, including

- Firmware monitor port on the backplane of the circuit packs
- Spare lead for WAN Spare Processor (WSP) applications
- Processor speed increased to 66 megahertz (MHz.)
- Increased hardware vintage bits
- ATM-network duplication

The increased functionality is available to both ATM-PNC and ATM-CES applications. However, both circuit packs can also function in systems designed and installed earlier than this release.

The ATM WAN Spare Processor (WSP) is a processor port network (PPN) without port circuit packs and is invoked into service when there is a catastrophic failure in the network and links to the main PPN are severed. This ATM development

- Increases the number of WSPs to 15.
- Supports ATM PNC network duplication and critical reliability systems.

EC500 Extension to Cellular R2

The Avaya EC500 Extension to Cellular R2 provides the expansion of mobile services, including one-number availability, increased user capacities, flexibility across facilities and hardware, more control over unauthorized usage, enhanced enable/disable capability, increased serviceability, and support of IP trunk facilities. Avaya EC500 R2 provides flexible mobile communications that save time and increase productivity.

IP Solution Enhancements

Quality of Service (QoS) to Endpoints

You can set operating parameters to optimize the audio performance, or Quality of Service (QoS), on calls made over your IP network. These parameters include the audio codec, network priority through DiffServ capability, and the IEEE 802.1p/Q MAC-layer prioritization and segregation.

Default QoS parameters are downloaded to the IP Telephone R1.5 and the IP Softphone R3 when the values are not provided by the endpoint installer or the user. Certain options can be set locally by the endpoints or via the gatekeeper. The endpoints receive the parameters when the endpoints register, and once they are registered, whenever the administered values of the QoS parameters are modified.

QoS integration with Cajun Rules

Cajun Rules provides a central repository for QoS parameters and allows comprehensive QoS management across routers, switches, and endpoints. QoS parameters and policies are assigned according to network regions on a Network Region and are distributed through Enterprise Directory Gateway to the DEFINITY ECS and to routers and switching devices.

Alternate Gatekeeper and Registration Addresses

When an IP endpoint (including softphones, IP phones, and Avaya R300) registers with the switch, the switch sends back an IP registration address. The switch sends a different IP address for each registration according to a cyclic algorithm.

If registration with the original C-LAN circuit pack IP address is successful, the switch sends back the IP addresses of all the C-LAN circuit packs in one network region, not including interconnected regions. These C-LAN addresses are called gatekeeper addresses. These addresses can also be used if the call signaling on the original C-LAN circuit pack fails.

If the network connection to one C-LAN circuit pack fails, the IP endpoint re-registers with a different C-LAN.

Alternate gatekeeper and registration addresses, and C-LAN circuit pack load sharing, spread IP endpoint registration across more than one C-LAN circuit pack, increasing performance and reliability.

IP Serviceability Enhancements

The feature consists of switch-resident commands that you and service personnel can use as diagnostic/troubleshooting tools for communication problems between IP endpoints within a DEFINITY system.

This feature is a collection of report-generating utilities that use existing TN799 (C-LAN) and the TN2302 (IP Media Processor) circuit packs along with new software and firmware. The following table lists these utilities:

Description	Command	Enhanced/New
Packet Loss / Jitter Size Report	**status station** and **status trunk**	New report added to existing command
Refresh route tables	**refresh route-table**	New
IP Denial Events Log	**display events**	Enhanced

Switch Support for IP Stations

This release contains enhancements to improve support for IP phones. These enhancements include:

- administrable options for which calling number to send to the public safety access point when an emergency call is placed from an IP phone
- single extension connection, which allows you to convert existing dual-extension IP phones to single extensions and free up extension numbers for other uses
- support for Softphone R3
- support for IP Telephone R1.5

DEFINITY ONE® Enhancements

Release 9.5 supports the following DEFINITY ONE® Communications System changes. Refer to ''DEFINTY ONE Enhancements'' on page 195 for more information.

- Improved performance and capacity
- Supports Intuity Audix 5.1
  - — Fax Extended Dialing
  - — Increased Message Storage
  - — Increased Number of IMAPI Sessions
- Allows Disabling/Enabling of Embedded Messaging
- Supports Unified Messaging and Off-Board Messaging
- Adds Analog Interface to Voice Messaging Platforms
- Enhanced Backup/Restore feature

AVAYA IP600 Enhancements

Release 9.5 supports the following Avaya IP600 Internet Protocol Server changes. Refer to ''Avaya IP600 Enhancements'' on page 211 for more information.

- Improved performance and capacity
- Supports Intuity Audix 5.1
  - — Fax Extended Dialing
  - — Increased Message Storage
  - — Increased Number of IMAPI Sessions
- Allows Disabling/Enabling of Embedded Messaging
- Supports Unified Messaging and Off-Board Messaging
- Adds Analog Interface to Voice Messaging Platforms
- Enhanced Backup/Restore feature

1 Highlights
AVAYA IP600 Enhancements *12*

System Capacity Enhancements

2

This section provides information on the overall characteristics and capacities of the DEFINITY Systems.

NOTE:
This section supersedes the System Capacity table that Avaya publishes in with every major software release in the *DEFINITY ECS System Description.* This table has been updated to reflect the increased capacities in Release 9.5.

System Capacity Limits

The maximum parameters for the DEFINITY hardware and software items are listed on the following pages. These parameters apply to Compact Modular Cabinets (CMC), Single-Carrier Cabinets (SCC), and Multi-Carrier Cabinet (MCC) systems. Each parameter specifies the maximums for both category A (ECS and ProLogix Solutions), and category B (DEFINITY BCS and GuestWorks).

Terminal and digital station capacities are reduced by such administered items as: attendant consoles, number of EAS login IDs, and number of ACD agents.

NOTE:
Not all maximum capacities listed in the following table can be reached simultaneously with all versions or all configurations of the system.

NOTE:
In the following table, a single entry denotes that capacities for category A and category B are the same. If the capacities are different, a slash (/) separates the entries (for example, 8/NA). For DEFINITY ONE, which does not have categories A and B, all capacities are single entries.

Table 1. Maximum system parameters (Category A/B)

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Abbreviated Dialing (AD)				
AD lists per system	2400*	2400*	2400	5000
AD list entry size	24	24	24	24
AD entries per system	12,000*	12,000*	12,000	100,000
Auto dialing button[1]				
Entries per system Auto dialing button	Note[1]	Note[1]	Note[1]	Note[1]
Enhanced list (system list)	1	1	1	1
Maximum entries	10,000	10,000	10,000	10,000
Group lists	100	100	100	1000
Maximum entries	100	100	100	100
Group lists per extension	3	3	3	3
System list	1	1	1	1
Maximum entries	100	100	100	100
Personal lists	2400*	2400*	2400	5000
Maximum entries	100	100	100	100
Personal lists per extension	3	3	3	3
Applications Adjuncts				
CallVisor ASAI adjuncts	1	4[2]/NA	8/NA	16[3]/NA
Asynchronous links (RS-232)[4]	NA	5	9	10
CDR output devices	NA[5]	2	2	2
Journal printers	1	1	1	1
System printer	NA	1	1	1
Wake-up log printer	1	1	1	1
Services alarming out	NA	2	2	2
Property management systems	NA	1	1	1
Maximum Links[6]	25	25	25	33
BX.25 physical links[7]	NA	NA	8	16
PPP Links (switch using C-LAN board)[6]	25	25	25	33
C-LAN IP Routes[6]	400	270	400	650

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Voice processing adjuncts	NA			
Traditional AUDIX	NA	NA	1	8
DEFINITY AUDIX	NA	1	1	1
DEFINITY AUDIX DCP emulation	NA	1	1	1
DEFINITY AUDIX control link	NA	NA	1	1
INTUITY AUDIX	NA			
INTUITY AUDIX (Via mode code)	NA	1	1[8]	1[8]
INTUITY AUDIX (Via BX.25)	NA	NA	1	8
INTUITY AUDIX (Via TCP/IP)	NA	1	1	8
INTUITY AUDIX (MAPD)	NA	1	1	1
Mode code voice mail systems	NA	1	1[8]	1[8]
DEFINITY ONE coresident AUDIX	1	NA	NA	NA
Other adjuncts				
CMS X.25 adjunct (PI/PGATE)[9]	NA	1/NA	1/NA	1/NA
CMS C-LAN adjuncts	1[9]	2/NA	2/NA	2/NA
ICM adjuncts (ISDN gateway)	NA	NA	NA	NA
BX.25 Processor channels	NA	NA	64	128
BX.25 Hop channels	NA	NA	64	128
TCP/IP Processor Channels (includes Gateway Channels)	128	128	256	384
Automatic Call Distribution (ACD)				
Announcements per split	2	2	2	2
Announcements per system	128	128	128	1000
Splits	99	99	99	999
ACD members per split	200	200	200	1500
Maximum administered ACD members[10]	1000*	1000*/150	1000/150	10,000/150
Logged-In splits per agent[11]				
No CMS	4	4	4	4
R2 or R3V1 CMS	NA	3/NA	3/NA	3/NA
R3V2 or later CMS[9]	4	4/NA	4/NA	4/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Maximum Logged-in ACD agents when each logs into[12]				
1 split	500*	500/150	500/150	5200/150
2 splits	500*	500/75	500/75	5000/75
3 splits	333*	333/50	333/50	3333/50
4 splits	250*	250/37	250/37	2500/37
Queue slots per group[13]	200	200	200	999
Queue slots per system	1500	1500	1500	25,000
ARS/AAR				
AAR/ARS patterns (shared)	254	254	254	640
ARS/AAR analysis tables	2000	2000	2000	4000
Choices per RHNPA table	12	12	12	12
Digit conversion entries	400	400	400	600
AAR/ARS digit conversion				
Digits deleted for ARS/AAR	28	28	28	28
Digits inserted for ARS/AAR	18	18	18	18
AAR/ARS sub-net trunking				
Digits deleted for ARS/AAR[14]	28	28	28	28
Digits inserted for ARS/AAR	36	36	36	36
Entries in each RHNPA table	1000	1000	1000	1000
FRLs	8	8	8	8
Inserted digit strings[15]	1200	1200	1200	3000
Patterns for measurement				
Shared patterns for measurement	20	20	20	25
RHNPA tables	32	32	32	32
Routing plans	8	8	8	8
ARS toll tables	32	32	32	32
Entries per toll table	800	800	800	800
Trunk groups in ARS/AAR pattern	6	6	6	16
UDP (entries)	10,000	10,000	10,000	50,000
TOD charts	8	8	8	8

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Toll analysis table entries	1000	1000	1000	1000
ATM				
WAN spare processor (WSP)	NA	NA	NA	15/NA
Attendant Service				
Attendant consoles (day:night)[16]	15:1	15:1	15:1	27:1
Attendant console 100s groups per attendant	20	20	20	20
Attendant control restriction groups	96	96	96	96
Centralized attendant service				
Release link trunks at branch	99	99/NA	99/NA	255/NA
Release link trunk groups at branch	1	1/NA	1/NA	1/NA
Release link trunks at main	400	400/NA	400/NA	4000/NA
Release link trunk groups at main[17]	99	99/NA	99/NA	666/NA
Other access queues				
Maximum number of queues	12	12	12	12
Maximum number of queue slots[18]	80	80	80	80
Size range of reserved queue	2-75	2-75	2-75	2-75
Reserved queue default size	5	5	5	5
Queue length	80	80	80	300
Switched loops per console	6	6	6	6
Authorization				
Authorization codes	5000	5000	5000	90,000
Station security code length	7	7	7	7
Classes of restriction	96	96	96	96
Classes of service	16	16	16	16
Length of authorization code	4-13	4-13	4-13	4-13
Length of barrier code	4-7	4-7	4-7	4-7
Length of account codes	1-15	1-15	1-15	1-15
Restricted call list	1	1	1	1
Remote access barrier codes	10	10	10	10
CDR account code list	1	1	1	1

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Toll call list	1	1	1	1
Unrestricted/allowed call lists	10	10	10	10
Total call list entries	1000	1000	1000	1000
Automatic Callback Calls	240	240	240	1500
Automatic Wakeup				
Simultaneous display requests	10	10	10	30
Wakeup requests per system	2400	2400	2400	15,000
Wakeup requests per extension	2	2	2	2
Wakeup requests per 15-minute interval	450	450	450	950
Basic CMS (BCMS)				
Measured agents or Login IDs	25	400/25	400/25	2000/25
Measured agents per split	25	200/25	200/25	999/25
Measured splits	99	99/5	99/5	600/5
Measured trunk groups	32	32	32	32
Measured VDNs	99	99/10	99/10	512/20
Maximum agents displayed by monitor BCMS split command[19]	100	100	100	100
Maximum BCMS terminals	3	3	3	4
Maximum active maintenance commands for the system	1	1	1	5
Maximum simultaneous BCMS terminals in monitor mode[20]	1	1	1	3
Reporting periods				
Intervals	25	25	25	25
Days	7	7	7	7
Cabinets				
Expansion port network (EPN)				
Multicarrier cabinet (medium-capacity MCC)[21]	NA	NA	2	43
Single-carrier cabinet (SCC or CMC)[21]	NA	NA	8	164

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Inter-port network connectivity				
Port networks	1	1	3	44
Maximum number of PNs per cabinet	1	1	1	2
Switch nodes (Simplex)	NA	NA	NA	3
Switch nodes (Duplex)	NA	NA	NA	6
ATM interfaces used for port network (PN) connectivity, per system	NA	NA	NA	88
DS1 converter complex (simplex)	NA	NA	NA	41
DS1 converter complex (duplex)	NA	NA	NA	82
Processor port network (PPN)				
Multicarrier cabinet (MCC)	NA	NA	1	1
Single-carrier cabinet (SCC/ESCC)	NA	NA	4	NA
Compact modular cabinet (CMC)	2[22]	3[22]	NA	NA
Call Appearances				
Bridged images per appearance[23]	64	64	64	64
Call appearances per station[24]	54	54	54	54
Maximum appearances per extension	10	10	10	10
Minimum appearances per extension	0	0	0	0
Total bridged appearances	2400*	2400*	2400	25,000
Maximum simultaneous off-hook per call[25]	5	5	5	5
Call Coverage				
Coverage answer groups (CAG)	200	200	200	750
Coverage paths	999	999	999	9999
Coverage paths including in call coverage report	100	100	100	100
Coverage path per station	2	2	2	2
Coverage points in a path	6	6	6	6
Remote coverage points	999	999	999	999
Maximum users per coverage path[26]	3500*	3500*	3500	36,065
Members per coverage answer group	8	8	8	8
Time of day coverage tables	999	999	999	999
Time of day changes per table	5	5	5	5

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Remote administration Coverage paths	2	2/NA	2/NA	2/NA
Call Detail Recording				
Intra-switch call trackable extensions	1000	1000	1000	5000
Maximum number of CDR records buffered in switch	Note[27]	500	500	9614
Number of records buffered for the primary output device to cause secondary device to be busied out for 2 minutes	NA	200	200	1800
Call Forwarding				
Call forwarded digits (off-net)	16	16	16	16
Call forwarded numbers	2400	2400	2400	25,000
Call Park				
Attendant group common shared extension numbers per system[28]	80	80	80	80
Number of Parked Calls	723	723	723	10,604
Call Pickup Groups				
Call pickup members per group	50	50	50	50
Call pickup members per system	2400*	2400*	2400	25,000
Number of groups	800	800*	800	5000
Call Vectoring				
Maximum skills a call can simultaneously queue to	3	3/NA	3/NA	3/NA
Priority levels	4	4	4	4
Recorded announcements/audio sources for vector delay	128	128	128	1000
Steps per vector	32	32	32	32
Vector directory numbers	512	512/30	512/30	20000[29]/40
CMS measured VDNs[30]	512	512/NA	512/NA	20000[31]/NA
Vectors per system	256	256/15	256/15	999/20
Number of collected digits for call prompting or CINFO	16	16	16	16
Number of dial-ahead digits for call prompting	24	24	24	24

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Vector routing tables	NA	10/NA	10/NA	100/NA
BSR Application Routing Tables Pairs	256/NA	256/NA	256/NA	256/NA
BSR Application-Location Pairs[32]	NA	1000/NA	1000/NA	1000/NA
Holiday tables	10	10	10	10
CallVisor ASAI				
Adjunct control associations per call	1	1/NA	1/NA	1/NA
Active adjunct control associations (simultaneous active call-controlled calls)	300	600[2]/NA	600/NA	5000[33]/NA
Active adjunct route requests system-wide	300	300[2]/NA	300/NA	2000/NA
Active adjunct route requests per link (switch to adjunct associations)	300	300[2]/NA	300/NA	2000/NA
Active notifications per call	3	3/NA	3/NA	6/NA
Active notifications per split domain	3	3/NA	3/NA	6/NA
Active notifications per VDN domain	3	3/NA	3/NA	6/NA
Call controllers per call	1	1[2]/NA	1/NA	1/NA
Call monitors per call	28	28[2]/NA	28/NA	28/NA
CRVs ECS to adjunct	126	500[2]/NA	500/NA	4000/NA
Domain-control associations per call	12	12[2]/NA	12/NA	24/NA
Domain-control station associations (active station control associations)	2,000	2000/NA	2000/NA	6000/NA
Domain-control split/skill associations	300	300[2]/NA	300/NA	2000/NA
Domain-controls per station domain	1	2[2]/NA	2/NA	4/NA
Domain-controls per split/skill domain	1	4/NA	4/NA	8/NA
Notification associations (requests or monitors)	300	300[2]/NA	300/NA	10,000/NA
Maximum calls with send DTMF active	16	16[2]/NA	16/NA	32/NA
Number of CallVisor ASAI links (open & proprietary)	1	8[2]/NA	8/NA	8, 16[3]/NA
Maximum simultaneous calls being classified	80	80[2]/NA	80/NA	600/NA
Monitors per VDN or split	6	6[2]/NA	6/NA	6/NA
Split/skill domain controls system-wide	300	300[2]/NA	300/NA	2000/NA
Simultaneous billing (MultiQuest) requests	100	100[2]/NA	100/NA	1000/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Station controllers per station	4	4[2]/NA	4/NA	4/NA
Simultaneous selected listening disconnected paths	75	75[2]/NA	75/NA	300/NA
ASAI traffic				
Messages/second per ASAI/BRI link	NA	20/NA	30/NA	30/NA
Messages/second per ASAI IP link	30	NA	NA	NA
Messages/second per MAPD LAN-gateway link	NA	NA	Note[34]/NA	180/NA
Messages/second per system	Note[34]	80/NA	Note[34]/NA	240/NA
LAN gateway board max links				
LAN gateway links per multifunction circuit pack	4	NA	4/NA	4/NA
LAN gateway links per MAPD	8	NA	8/NA	8/NA
Conference Parties	6	6	6	6
Simultaneous 3-way conference calls[35]	483	483	483	7084
Simultaneous 6-way conference calls[36]	240	240	240	3520
Data Parameters				
Administered connections	128	128	128	128
Alphanumeric dialing				
Maximum entries	200	200	200	1250
Characters per entry	22	22	22	22
PRI endpoints (PE)	8	8	25	50
Access endpoints (number of trunks)	400	400	400	4000
Multimedia Parameters				
TN787D MMI boards[37]	4	4[2]/NA	4/NA	12/NA
TN788B VC boards[37]	25	25/NA	25/NA	69/NA
MMI and VC boards in multiple PNs	NA	NA	Yes/NA	Yes/NA
Multimedia One Number conferences per system[37]	800*	800*[2]/NA	800/NA	2000/NA
Multimedia Dynamic Conference Records	64	64/NA	64/NA	192/NA
Maximum BRI connections	1000*	84[2]/NA	1000/NA	7000/NA
MASI nodes	15	15/NA	15/NA	15/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
MASI links	15	15/NA	15/NA	15/NA
MASI trunk groups	96	96/NA	96/NA	120/NA
Digital Data Endpoints	800	800	800	7500
Dial Plan				
Direct inward dialing listed directory numbers	8	8	8	20
Extensions (total)[38]	3500*	3500*	3500*	36,065
Station extensions[39]	2416*	2416	2416	25,028
Extension number portability[40]	10,000	10,000	10,000	50,000
Feature dial access codes	77	77	77	77
Number of digits in a feature access code	1-4	1-4	1-4	1-4
Integrated directory entries[41]	2416*	2416*	2416	25,028
Maximum extension size	5	5	5	5
Minimum extension size	1	1	1	1
Miscellaneous extensions[42]	900	900	900	20,317
Names				
Number of names[43]	4215	4215	4215	36,511
Number of characters in a name	27	27	27	27
Non-DID LDNs	50	50	50	666
Prefix extensions	Yes	Yes	Yes	Yes
Trunk dial access codes				
Number of access codes	317*	317*	317	884
Number of digits	1-4	1-4	1-4	1-4
Do Not Disturb (DND)				
Do not disturb requests per system	2400*	2400*	2400	25,000
Simultaneous display requests	10	10	10	30
Expert Agent Selection (EAS)				
Skill groups	99	99/NA	99/NA	999/NA
VDN skill preferences	3	3/NA	3/NA	3/NA
Maximum skills a call can simultaneously queue to	3	3/NA	3/NA	3/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Maximum administered ACD members (login ID-skill pairs)[44]	6000	6000/NA	6000/NA	65,000/NA
Maximum staffed (logged-in) ACD members[45]	1000	1000/NA	1000/NA	10,000/NA
Maximum agent login IDs administered[46]	1500	1500/NA	1500/NA	10,000/NA
Maximum skills per agent				
No CMS	20	20/NA	20/NA	20/NA
R3V2 to R3V4 CMS	4	4/NA	4/NA	4/NA
R3V5 or later CMS	20	20/NA	20/NA	20/NA
Skill levels (preferences) per agent skill	16	16/NA	16/NA	16/NA
Maximum logged-in EAS (per system) when each has:[12]				
1 skill	500	500/NA	500/NA	5200/NA
2 skills	500*	500/NA	500/NA	5000/NA
4 skills	250*	250/NA	250/NA	2500/NA
10 skills	100*	100/NA	100/NA	1000/NA
20 skills	50*	50/NA	50/NA	500/NA
External device alarming	32	32	32	90
Facility busy indicators				
Buttons per tracked resource	100	100	100	500
Number of indicators (station and trunk groups)	3600*	3600*	3600	10,000
Hunt Groups (Non-ACD)[47]				
Announcements per group	2	2	2	2
Announcements per system	128	128	128	1000
Groups	99	99	99	999
Group members per group	200	200	200	1500
Group members per system[47]	1000	1000	1000	10,000
Queue slots per group	200	200	200	999
Queue slots per system	1500	1500	1500	25,000

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Intercom Translation Table (ICOM)				
Auto/manual and Dial				
ICOM groups per system	32	32	32	256
Auto/Manual	32	32	32	256
Dial	32	32	32	256
Members per ICOM group				
Auto	32	32	32	32
Dial	32	32	32	32
Members per system	1024*	1024*	1024	8192
Last Number Dialed				
Entries per system[48]	3216*	3216*	3216	32,528
Number of digits	24	24	24	24
Leave Word Calling (Switch-Based)				
Messages stored	2000*	2000*	2000	6000
Messages per user	125	125	125	125
Remote message waiting indicators				
Per extension	80	80	80	80
Per system	240	240	240	1250
Simultaneous message retrievers	60	60	60	400
System-wide message retrievers	10	10	10	10
Malicious Call Trace				
Maximum simultaneous traces	16	16	16	16
MLDN				
Via direct inward dialing	8	8	8	20
Via direct inward dialing with tenant partition	20	20/NA	20/NA	100/NA
Via Central Office	99	99	99	666
Modem Pool Groups (Mode-2/Analog)				
Group members per system	160	160/NA	160/NA	2016/NA
Number of groups	5	5/NA	5/NA	63/NA
Members per group	32	32/NA	32/NA	32/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Networking				
Centralized attendants service (CAS) nodes	99	99/NA	99/NA	99/NA
Distributed communications system (DCS) nodes[49]				
BX.25 (Private)	NA	NA	20/NA	20/NA
TCP/IP	20	20/NA	20/NA	20/NA
ISDN PRI	20	20/NA	20/NA	20/NA
Hybrid (combination of PRI, BX.25, and & TCP/IP)	NA	20/NA	20/NA	20/NA
EN nodes[50]	999	999/NA	999/NA	999/NA
Paging				
Code calling IDs	125	125	125	125
Loudspeaker zones	9	9	9	9
Partitions				
Attendant groups	15	15/NA	15/NA	27/NA
Extension partition groups	8	8/NA	8/NA	8/NA
Extension partition	8	8/NA	8/NA	8/NA
Tenant partition	20	20/NA	20/NA	100/NA
Multiple music-on-hold sources	20	20/NA	20/NA	100/NA
Personal CO Lines (PCOL)				
PCOL appearances	16	16	16	16
PCOL lines (trunk groups)	200	200	200	200
PCOL trunks per trunk group	1	1	1	1
Port Circuit Pack Slots[51]				
Per Expansion Port Network				
Multi-Carrier Cabinet standard reliability	NA	NA	99	99
Single-Carrier Cabinet standard reliability	NA	NA	71	71
Small cabinet standard reliability (upgrade only)	NA	NA	39	39

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Per Processor Port Network				
Multi-carrier Cabinet standard reliability	NA	NA	89	60, 80
Single-Carrier Cabinet standard reliability	NA	NA	64	NA
Enhanced Single-Carrier Cabinet standard reliability	NA	NA	70	NA
Compact Modular Cabinet	28	28	NA	NA
Recorded Announcements/Audio Sources for Vector Delay				
Announcement audio sources (total recorded announcements)	128	128	128	1000
Analog and auxiliary trunk announcements				
Analog and auxiliary trunk queue slots per announcement	150	150	150	1000
Analog and auxiliary trunk queue slots per system	150	150	150	1000
Trunk calls connected per announcement	150	150	150	1000
Integrated announcements				
Queue slots per system	200	200	200	4000
Calls connected to same announcement	50	50	50	1000
Integrated announcement boards (TN750 & TN2501AP combined)	5[52]	5	5	10
TN750C				
Channels per board (playback ports)	16	16	16	16
Maximum announcements per board	256	256	256	256
Board contents saved	1	1	1	1
Integrated announcement recording time (minutes: seconds) per board				
16 kB recording	8:32	8:32	8:32	8:32
32 kB recording	4:16	4:16	4:16	4:16
64 kB recording	2:08	2:08	2:08	2:08

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
TN2501AP (VAL)				
Channels per board (playback ports)[53]	31	31	31	31
Maximum announcements per board	256	256	256	256
Board contents saved	All active boards	All active boards	All active boards	All active boards
Recording time per board (Min.)				
Standard offer (Max. 1 board)	10	10	10	10
Enhanced offer (5 csi/si or 10 r)	60	60	60	60
Integrated SSP Announcements				
SSP boards	1	NA	NA	NA
Channels per SSP integrated announcement circuit pack	8	NA	NA	NA
Maximum announcements per board	128	NA	NA	NA
Board contents saved	All	NA	NA	NA
Recording time (Min.)				
16 KB recording	240	NA	NA	NA
32 KB recording	120	NA	NA	NA
64 KB recording	60	NA	NA	NA
System Administration				
Number of logins	16	16	16	25
Administrable history file entries	500	500	500	1250
Simultaneous administration commands	1	1	1	5
Simultaneous maintenance commands	1	1	1	5
Simultaneous system maintenance sessions	1	5	5	8
Number of scheduled reports	Note[54]	50	50	50
Access Security Gateway Session History Log Entries	NA	100	100	250
Speech Synthesis Circuit Packs	6	6	6	40
Channels per speech circuit pack	4	4	4	4
Stations[55]				
Associated data modules (such as DTDMs)	800*	800[56]	800	7500

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
BRI stations[57]				
Point-to-Point	1000*	84[2]	1000	7000
Multipoint (passive bus)	1000*	168[2]	1000	7000
Digital stations	2400*	900[56]	2400	25,000
Display stations	2400*	900[56]	2400	10,000
Stations[58]	450*	900[56]	2400	25,000[59]
Station button capacity (K Units)[60]	656.4	656.4	662.4	5260
Station button feature capacity[61]	15,900	15,900	15,900	15,900
Terminating Extension Groups (TEG)				
TEGs	32	32	32	32
Users that can share a TEG	4	4	4	4
Time Slots				
Simultaneous circuit-switched calls[62]	242	242[63]	726	7744
Total time slots	512	512[63]	1536	22,528
Time slots for voice and data[64]	484	484[63]	1452	21,296
Time slots per port network	512	512[63]	512	512
Tone Classifiers				
Tone receivers (general)[65]	200	200	200	840
TTR queue size	4	4	4	4
Prompting TTR queue size	80	80	80	80
Trunks				
DS1 circuit packs	30*	8	30	166
Queue slots for trunks	198	198	198	1332
Measured trunks in system	168*	400*	400	4000
Total PRI interfaces	30	8	30	166
PRI interface via TN799 C-LAN	NA	8	NA	NA
PRI interface via TN794 NetPkt	NA	NA	30	NA
PRI Interfaces via TDM Bus	8	8	NA	NA
Emulated circuits per ATM-CES interface	8	8/NA	8/NA	8/NA
PRI D-channels per ATM-CES interface	8	8/NA	8/NA	8/NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
ATM-CES interfaces used per PN	2	2/NA	2/NA	2/NA
ATM-CES interfaces used for PRI circuit-emulation, per system	2	2/NA	6/NA	88/NA
ATM circuit-emulation and port network-connectivity interfaces, per system	2	2/NA	6/NA	176/NA
BRI trunks[66]				
BRI trunk circuit packs	8	8	8	60
BRI trunks total	168	160	192	1440[67]
ISDN temporary signaling connections (TSCs)				
TSCs in system	656	656/NA	656/NA	4256/NA
Call associated TSCs	400	400/NA	400/NA	4000/NA
Non call associated TSCs	256	256/NA	256/NA	256/NA
Administered TSCs	128	128/NA	128/NA	128/NA
Ringback queue slots	198	198	198	1332
Trunk groups				
Trunk group hourly measurements	25	25	25	75
Trunk groups in the system	99	99	99	666
Trunk members in a trunk group	99	99	99	255
ISDN services				
Incoming call handling treatment (per trunk group)	18	18	18	54
Incoming call handling treatment (per trunk system)	288	288	288	576
User defined services	24	24	24	60
Usage allocation entries (per plan)	15	15	15	15

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
VuStats				
Measured agents or login IDs	400	400/NA	400/NA	2000/NA
Measured splits	99	99/NA	99/NA	600/NA
Measured trunk groups	32	32/NA	32/NA	32/NA
Measured VDNs	99	99/NA	99/NA	512/NA
Reporting periods				
Intervals	25	25/NA	25/NA	25/NA
Days	1	1/NA	1/NA	1/NA
Displays				
Display formats	50	50/NA	50/NA	50/NA
Simultaneous updating displays	100	100/NA	100/NA	500/NA
DEFINITY Wireless Business System Terminals (9601)	400	400	1000	1500
Radio controller circuit packs[68]	50	10	50	150
Wireless fixed bases	100	20	100	300
Cell antenna units (CAU)	400	80	400	1200
Coverage (million square feet)	3	3	3	3
Button capacity for wireless (K units)	18	4.8	18	18
X-Mobile				
Absolute Station Capacity	2400	900	2400	25000
EC500 Absolute Maximum (assumes 2 bridges per principal)	800	300	800	8333
Hard Disk Drive		NA	NA	NA
Total Capacity (Mbytes)	3000	NA	NA	NA
C drive allocation	1500	NA	NA	NA
D drive allocation	1500	NA	NA	NA
Hard Drive Budgets by application (Mbytes) (D drive only)		NA	NA	NA
Station Capacity	408	NA	NA	NA
Windows NT Client Licenses				
Total client licenses in NT workstation	10	NA	NA	NA

Continued on next page

Table 1. Maximum system parameters (Category A/B) — *Continued*

ITEM	DEFINITY ONE/ IP600	R9csi	R9si	R9r
Window NT License Budget				
Intuity Message Manager	5	NA	NA	NA
Audix Networking	2	NA	NA	NA
DSA	1	NA	NA	NA
Services Access	1	NA	NA	NA
Call Accounting Access (CAS)	1	NA	NA	NA
IP Solutions				
Simultaneous Registered IP endpoints (stations and trunks combined)[69,70]	618[71]	390	1500[72]	10000[72]
Simultaneous Registered IP stations - single extension[70]	450 (or 240 with Audix)[73]	390	1500	10000
Simultaneous Registered IP stations - dual extension[70]	225[74]	240	1000	5000
Simultaneous Registered IP trunks	168[74]	390	400	4000
Total Station and Trunk ports (both IP and non-IP)[69,72]	618	900	2800	29000
TN799 circuit packs (C-LAN)	30[71]	30	30	30
TN802B and TN2302AP IP Media Processor	50*[71]	50	50	200
Network regions	80*	80	80	250
Avaya R300 Remote Office Communicators	80	80	80	250
ISDN D-channels, H.323 trunks, and Signaling groups[75] combined	46	110	110	416
IP Telephones (4600 series)[76]	256	900	1000/NA	5000/NA

1. There is no limit on the maximum number of auto dial buttons (other than the system limit on button capacity). See Station Button Capacity for system button limitations.
2. BRI stations are supported on R6.2csi and later only with the TN556C. The TN2198 is not supported on R6.2csi or R6.3csi, but can be used with R7.1csi over C-LAN. ASAI is available on R6.3.2 and later csi models using the TN801B MAPD. The TN2198 cannot be supported over the TDM bus, thus BRI station capacities are less with TN2198 (6 circuit packs instead of 7). ASAI via the LAN Gateway R1 (MFB) is not supported on csi.
3. The capacity for ASAI links is 8 in R6.1 - 6.2. The capacity was increased to 16 links in R6.3 with the MAPD (BRI link capacity is still limited to 8).
4. The G3si has eight (8) NetCon channels plus one (1) direct-connect.

5. DEFINITY ONE/IP600 stores CDR records to a file on the local disk or on any disk on the LAN.
6. Each C-LAN circuit pack has one Ethernet connection and 16 PPP connections. A maximum of 10 C-LAN circuit packs are allowed for each model. The combination of BX.25 links, the new TCP/IP PPP links, and the new TCP/IP Ethernet links have to be less than the maximum number of links.
7. In the case of SCC/ESCC/CSCC, only 4 BX.25 physical links are supported in the configuration.
8. Mode code integration with Intuity AUDIX is only marketed on csi models.
9. ProLogix or DEFINITY ONE/IP600 only connects to R3V6 or later CMS via C-LAN TCP/IP.
10. Number of agent-split combinations supported. Agent-split pairs is the total combination used by ACD agents, Auto-Available Splits (AAS) ports (e.g., VRUs), non-ACD hunt groups (hunting groups w/ or w/o queues, Message Center Service, INTUITY/AUDIX, Remote AUDIX, etc.). Each non-ACD hunt group member, AAS split member and split assigned to an ACD agent is counted when administered.
11. An agent can be assigned more splits during administration but only this number can be simultaneously logged into.
12. The number of agents that can log into the same split/skill is limited by the maximum Members per Group limits. Maximum agent limits are reduced by the number of non-ACD members and AAS ports administered and, with non-EAS, the additional splits assigned to agents that are not logged into.
13. Queue slots are shared across non-ACD, ACD (splits/skills) and AAS hunt groups.
14. Plus up to 7 inter-exchange carrier (IXC) digits.
15. This is the number of available 12 character inserted-digit-strings available for AAR/ARS preferences.
16. The number of attendant consoles listed is per software limitations. 4 consoles are supported per vs and 1 per CMC cabinet without supplemental power.
17. The number of release link trunk groups at the Main is the same as the number of trunk groups in the system.
18. "Maximum number if queue slots" is referred to as "emergency access queue length" in si.
19. The Monitor Split command only shows status for the first 100 agents logged into the split regardless of how many additional agents log into the split.
20. BCMS monitoring, being a maintenance command, is limited by the active maintenance commands limit, reduced by 2 in the "r" system configuration (since 2 active command slots are reserved for the INADS and SMT logins respectively).
21. Only EPNs in r can be DS1-remoted EPNs.
22. G3csi is limited to 3 carriers (28 slots) by the DEFINITY ProLogix Solutions offer. The A (1st) carrier provides 8 slots in addition to 2 slots that are required by the TN798 Processor and TN2182 Tone Clock circuit packs. The B (2nd) and C (3rd) carriers provide 10 slots each.
23. Twenty-six bridged appearances (principal + 25) are supported on all R6 platforms, provided that ASAI is not used. The capacity is 16 with ASAI.
24. The number of call appearances is the sum of primary and bridged appearances; at most 10 can be primary. A maximum of 54 administrable buttons can be supported for the 7434 terminal without display.The 8434 terminal with display and expansion module can support up to 52 call appearances.
25. Does not apply to conferencing.
26. Maximum number of users per coverage path equals to the number of extensions.
27. DEFINITY ONE/IP600 stores CDR records on a disk file. The disk can be either the local “office” disk or a disk on the LAN. The size of the file is disk dependent. DEFINITY, however, can still buffer 500 records in memory should this disk be unavailable.

28. Shared extensions must be shared among all attendant groups in the system including Tenant Partition scenarios.
29. VDNs are counted as part of the miscellaneous extensions capacity. The total of VDNs, hunt groups, announcements, LDNs, TEGs, PCOL groups, access endpoints, administered TSCs and Code Calling IDs extensions and common shared extensions cannot exceed 20,317 for r models. In addition, the total of stations (station extensions including ACD agent physical set extensions, Logical Agent IDs and AWOH) assigned and the VDNs assigned can not exceed 25,000 for r models (share message server space). Also, the total of all extensions assigned for any purpose can not exceed 36,065 for r models. See the Dial Plan section for details.
30. Measured limits depend on the CMS release used.
31. CMS permission checking for VDNs is disabled when more than 2,000 VDNs are to be measured. Also, interval reporting on CMS for large numbers of VDNs is limited due to an Informix 2 GB file size limit.
32. BSR application numbers and location numbers are limited to a range of 1 to 255 (i.e., each is limited to 255).
33. Requires 2 byte CRVs.
34. This information has not yet been determined.
35. Simultaneous 3-way Conference Call= (483 / 3)* number PNs.
36. Simultaneous 6-way Conference Call= (483 / 6)* number PNs.
37. This feature was introduced in the Release 5.4 load and is not available in previous R5 loads.
38. Total extensions is the count of all extension assignments for any use. Included in this count are "station extensions," "miscellaneous extensions," data extension groups (800 for csi/si and 7500 for r), PRI endpoint groups (8 for csi, 25 for si, and 50 for r), and trunk group extensions (99 for csi/si and 666 for r).
39. "Station extensions" consist of attendant extensions (max. 28 for r), station set assignments (including ACD agent physical sets), AWOH (admin. without hardware), and administered Logical Agent IDs extensions.
40. The numbers shown in "Extension Number Portability" are Uniform Dialing Plan (UDP) entries.
41. Integrated Directory Entries = Stations + Attendant Consoles.
42. Miscellaneous extensions consist of VDNs, hunt groups, announcements, LDNs, PCOL groups, common shared extensions, access endpoints, administered TSCs, Code Calling IDs, TEGs and Phantom ACAs.
43. Number of Names = number of stations + attendant consoles + trunk groups + digital data endpoints + miscellaneous extensions.
44. Total of the administered Login ID skill-pair members (for agents and AAS ports).
45. Number of agent-skill combinations supported. Agent-skill pairs is the total combination used by ACD agents, Auto-Available Skills (AAS) ports (e.g., VRUs), non-ACD hunt groups (hunting groups w/ or w/o queues, Message Center Service, INTUITY/AUDIX, Remote AUDIX, etc.). Each non-ACD hunt group member and AAS skill member is counted when administered. Each skill assigned to an EAS agent is counted as an ACD member when the EAS agent logs in, not when administered.

46. This limit can be reached on DEFINITY ECS only if 4 skills or less are assigned per Login ID due to the ACD Members Administered (Login ID-skill pair) limits. The following shows the Login ID limits for different number of skills per Login ID (assumes increased administered Login ID-skill pair capacity provided in R6.3.3):

Max. Login IDs With:	csi/si	r
1 to 4 Skills Each	500	10,000
10 Skills Each	600	6,500
20 Skills Each	300	3,250

47. Hunt group members include non-ACD (hunting, Message Center Service, Intuity/AUDIX, Remote AUDIX, etc.) and ACD uses (splits or skills including Auto-Available Splits/Skills). Each ACD agent-split/skill assignment counts as a hunt group member.
48. Last Number Dialed Entries = Stations + Digital Data Endpoints + Attendant Consoles.
49. The actual limit in the software is 63, but due to performance considerations the recommended number of DCS Nodes is 20.
50. The numbers here are node number addresses.
51. Only port slots are included in this count. For example, there are 100 slots per MCC EPN cabinet with 99 port slots and one slot dedicated for the Tone Clock board. There may be other service circuits required which would further reduce the number of port slots available. In G3r and G3i MCC port carriers, the service slots may be equipped with service boards that do not require tip & ring connections.
52. Any combination of boards. The SSP announcements capability is counted as an integrated board.
53. The TN2501AP has 31 playback ports and 1 dedicated port for telephone recording and playback.
54. Reports are not produced via DEFINITY, but through DSA. There isn't the concept of a limit to this activity in DSA.
55. The following items subtract from the total number of available "Stations" on a given switch:
    Analog Music-On-Hold
    Attendants
    Modem Pool Conversion Resources
    TAAS Port
    Stations (Digital, display, BRI, etc.)
    Analog Announcements
    Analog External Alarm Port
    Agent Login Ids
    ACD Agents

    These items constitute all the valid objects within software that limits the number of available stations on a switch. You should be aware that Attendant Consoles and Stations are not the only objects that detract from the total number of available stations on a switch. Also see the Dial Plan section for more details.
56. Up to 900 stations can be assigned in software (AWOH). The physical number of stations is limited by the hardware capacity of 28 slots (3 CMCs).
57. All BRI stations can be display stations.
58. Including extensions administered without associated hardware. Also see the Dial Plan section for details.
59. The total of stations (station extensions including ACD agent physical set extensions, Logical Agent IDs and AWOH) assigned and the VDNs assigned can not exceed 25,000 for r models (share message server space). Dial plan limits also apply, see the Dial Plan section for details.
60. "Station Button Capacity (units)" replaces "Maximum Button Modules" (from pre-R1V5.1). See Section 5.3 of the R6 Configuration Guidelines (CID 57864) for complete information.

61. The following button features share a common resource in memory:
    Call Forwarding
    Call Forward Busy Don't Answer
    Send Extension Calls (SAC w/extension)
    Station Busy Indicators
    Trunk Group Status
    Hunt Group Status
    Loudspeaker Paging Zone Status
    PCOL Group Status
    Data Module
    Terminating Extension Group Status
    Announcement Status
    Attendant Group Status/DXS
    Remote Trunk Group Select
62. 241 Simultaneous Circuit Switched Calls per port network. DEFINITY r has a total of 7,712 which is limited by the number of call records supported. This is the total number of simultaneous 2-party calls. Multimedia calls tend to be multi-party calls.
63. Supports PRI D-Channels over the TDM bus. Each D-Channel for PRI uses one timeslot pair. An R6csi with 8 PRIs utilizes 8 timeslot pairs, allowing a maximum of 233 simultaneous circuit switched calls.
64. 483 time slots for Voice & Data per port network.
65. G3V4, R5, and R6 use the TN744 Call Classifier/Detector for basic TTR usage as well as call prompting/call classification/MFC. In addition the TN2182 Tone/Clock/Detector is used for multiple tone detection functions. The number of TN748, TN420, or TN744 boards is limited only by the number of available slots. The number of TN2182 boards is limited only as described in DEFINITY Hardware and Traffic "Configuration Guidelines for G3V5, CID 49756. There is a single limit on the total number of tone receiver (classifier) ports for the system. The Configuration Guidelines have been updated for R6 (CID 57864).
    TN748/TN420 have 4 ports for TTR use
    TN748/TN420 have 2 ports for GPTD use
    TN744 has 8 ports for call prompting/call classification/MFC/TTR/GPTD use
    TN2182 has 8 ports for call prompting/call classification/MFC/TTR/GPTD use
66. The TN2185 BRI Trunk circuit pack provides 8 ports. Each port (2B + D) provides 2 BRI trunks.
67. The BRI trunk capacity per system is the total on TN2185 and TN556 tie trunk boards (up to 60 boards). The TN2185 provides 16B and 8D ports per board. The TN556 Tie Trunk provides 24B and 12D ports per board. You can achieve 1440 ports if you use all 24B channels on 60 TN556 boards.
68. For r, TN789 Radio Controller Circuit Packs cannot be used in DS-1 remoted EPNs.
69. In a G3r system, while up to 10,000 single-extension (5000 dual extension) endpoints can register simultaneously, up to 29,000 IP endpoints (25,000 IP stations and 4,000 IP trunks) can potentially register. For a G3si, the potential that can register is 2800, for a G3csi, it is 900.
70. Performance can vary based on your mixture of call types.
71. Capacities for the DEFINITY ONE and IP600 can be limited by the physical constraints of the systems. DEFINITY ONE and IP600 systems only allow 17 port slots, so you may not be able to reach the maximums allowed by the software.
72. Dual-extension Road Warriors and dual-extension IP Telephone require 2 endpoints each.

73. The maximum number of IP single-extension sets allowed on an DEFINITY ONE or IP600 depends on whether the Audix voice mail is enabled in the system. Without Audix, 450 single-extension sets are allowed. With Audix, this number drops to 240.
74. The maximum number of IP ports is 408. The total combined IP trunks and stations cannot exceed the maximum number of IP ports. The recommended limit for IP trunks is 168. The recommended limit for IP stations is 225.
75. The signaling connections are shared by ISDN and ATM trunk signaling.
76. Each IP telephone uses one of the capacities of the H.323 endpoints shown in the IP Solutions section of this table.

* indicates that the software capacity limit cannot be achieved due to hardware capacity limits for the platform.

Hardware

3

This chapter describes the following hardware changes:

- 302D Console
- Remotely Readable Electronic IDs
- TN744E/TN2182C Enhancements
- TN2302AP Enhancements
- TN2305B/TN2306B (new vintage)
- TN2501AP (new board)

302D Console

The new 302D console provides the following enhancements to the 302C console:

- Modular handset/headset connection

  The console accepts a standard RJ11, 4-pin modular handset or headset. This connection replaces the quarter-inch, dual-prong handset/headset connection.

- Activate/deactivate push-button

  You can use the push-button on the left side of the console to activate or deactivate the console. A message appears on the console identifying that the button must be pressed to activate the console.

- Two-wire DCP compatibility

  The console is compatible with two-wire DCP circuit packs only, not four-wire DCP circuit packs.

- Headset volume control

  The console can now control the volume of an attached headset.

- Noise expander option

  The console has circuitry to help reduce background noise during pauses in speech from the console end of a conversation. This option is normally enabled.

- Support for Eurofont or Katakana character set

  The console can show the Eurofont or Katakana character set. Administration of these character sets must be coordinated with the characters sent from the switch.

Remotely Readable Electronic IDs

Remotely readable electronic identification allows the switch to read a serialized DCP telephone's part number (comcode) and serial number. Avaya can use this information to determine the proper maintenance replacement unit or the date of manufacture for warranty or QPPCN status.

The remotely readable electronic identification is currently only available with the 6400 Serialized DCP telephones. The 6400 Serialized phone is stamped with the word "Serialized" on the faceplate for easy identification.

The remotely readable electronic ID allows both you and Avaya service personnel to obtain more accurate information about the phone, thus simplifying the repair process. With this new functionality, the serial numbers for phones can be entered into trouble tickets manually so that Avaya can identify the problem more easily. In addition, this feature enables the switch to read the model number of DCP phone types whose electronic IDs are not remotely readable.

Phones with remotely readable IDs show whatever information is available for phones connected to a DEFINITY Extender, provided that the Extender has an active connection with the switch.

Administration

To determine the serial number of a 6400 Serialized telephone, use the status station command. This command can also show you the model number for other types of telephones whose serial numbers cannot be read remotely.

Finding a phone's part ID and serial number

For 6400 Serialized telephones, you can find part ID and serial number information to help in the repair process.

For example, to find information about a phone at extension 12345:

1. Type **status station 12345** and press RETURN.

   The General Status report appears.

2. Press Page Down to move to Page 2 of the report.

   The Part ID number and Serial number of the phone appear on this page.

```
status station 12345                                          Page 2 of x
                                GENERAL STATUS

 CONNECTED STATION INFORMATION

                Part ID Number: 108576794
                 Serial Number: 01SP29123456
```

Maintenance and troubleshooting

The **status station *xxxxx*** command does not show the same information if the extension is in use by a registered softphone. If this is the case, page 2 of the General Status screen shows Registration Status and IP Signaling information instead of the Part ID and Serial Numbers.

Fixing problems/ troubleshooting strategy

If the General Status (status station) screen shows "errored" in the Serial Number field it is because the serial number received is not in the correct format. There can be several causes for this including:

- the firmware that stores the serial number in the set is damaged
- a random static electric charge changed one bit in the switch processor while the serial number was being decrypted

You can re-insert the set to see if the problem corrects itself.

TN744E/TN2182C Enhancements

The TN744E Call Classifier/Detector circuit pack and the TN2182C Tone Clock circuit pack now support Busy Tone Disconnect. See ''Busy Tone Disconnect'' on page 55.

TN2302AP Enhancements

The TN2302AP IP Media Processor board now supports the T.38 standard for fax transmissions.

TN2305B/TN2306B (new vintage)

The TN2305B and TN2306B ATM interface circuit packs support the Release 9.5 ATM enhancements. See ''Redesigned ATM interface circuit packs'' on page 94.

TN2501AP (new board)

The new TN2501AP integrated announcement circuit pack supports Voice Announcement over LAN (VAL). See ''Voice Announcements over LAN (VAL)'' on page 139.

General System Enhancements

4

This chapter describes the following general system features:

- 2-digit Release String
- Announcement Intercept Treatment for Invalid Number
- Automatic Answer Intercom Calls (Auto Answer ICOM)
- Automatic Customer Telephone Rearrangement (ACTR)
- Busy Tone Disconnect
- D-channel Backup
- Increased BRI trunks to 1440
- Interworking between TGU/TGE Trunks and ISDN (Italy)
- Mixed Length Dial Access Codes
- Multi-Frequency Packet Signaling (Russia)
- Personal Station Access (PSA) Enhancementss
- R2 MFC Enhancements
- Skip Two Second Delay Timer on Overlap Digit Sending

2-digit Release String

The standard DEFINITY software release string has been modified to accommodate 2-digit release numbers that is required for future releases. The release string consists of five components. For example, the string R010r.00.0.018.0 provides the following information.

R010r	Identifies the release number and platform, in this case Release 10 on an r model. The fifth character identifies the processor type: r = mips, i = si/csi, c = DEFINITY One, x = Linux based If the second character is an X (RX10r), the software load contains at least one red feature.
.00	a value other than zero identifies a major incremental issue of the software
.0	a value other than zero identifies a minor incremental issue of the software
.018	identifies the exact software load number
.0	a value other than zero identifies an unscheduled release of the software

Announcement Intercept Treatment for Invalid Number

This feature allows the user to administer a recorded announcement to play back when the end-user dials an invalid number.

The announcement does not play back for calls that fail due to inter-digit timeout. An invalid number is any called number that cannot be resolved through the dial plan, including:

- Extension numbers
- Feature access codes (FACs)
- Numbers associated with routing tables such as
  - — Automatic Alternate Routing (AAR)
  - — Automatic Route Selection (ARS)
  - — Uniform Dial Plan (UDP)
  - — Extension Number Portability

The announcement does not play back for calls that fail due to inter-digit timeout. You can only use this feature in single-switch environment (non-DCS, non-QSIG).

Design considerations

This feature is not available with DEFINITY ONE or Avaya IP600.

Capacities

The announcement you use for intercept treatment counts towards the system limit for Recorded Announcements (see Capacities in Chapter 8, ''Voice Announcements over LAN (VAL)'').

Administration

Adding an intercept announcement for invalid numbers

In this example, we administer an announcement to be played when a caller dials an invalid number.

1. Add an announcement on extension 2040, and name the announcement **Intercept_for_Invalid_Number_Dialed**.

   Refer to *DEFINITY ECS Administrator's Guide* for more information on adding announcements.

   Tip:
   If you record an analog announcement, you must also administer a queue for the announcement.

2. Type **change system-parameters features** and press RETURN.

   The Feature-Related System Parameters screen appears.

3. In the Invalid Number Dialed Intercept field, type **announcement**.

   Another blank field appears.

4. In this blank field, type **2040**.

   This is the extension of the announcement you recorded earlier.

5. Press ENTER to save your changes.

New or changed commands

You can use the **list usage extension xxxx** command to determine where this announcement is used in the system. If you want to remove this announcement at some time, you must first delete the extension from the Invalid Number Dialed Intercept field on the Feature-Related System Parameters screen.

Automatic Answer Intercom Calls

Automatic Answer Intercom Calls (Auto Answer ICOM) allows a user to answer an intercom call within the intercom group without pressing the intercom button. Auto Answer ICOM works with digital, BRI, and hybrid phones with built-in speaker, headphones, or adjunct speakerphone.

SECURITY ALERT:

Press the Do Not Disturb button or the Send All Calls button on your phone when you don't want someone in your intercom group to listen in on a call. Auto Answer ICOM does not work when the Do Not Disturb button or the Send All Calls button is pressed on the phone.

Administration

This section contains an example, with step-by-step instructions, on how to set up Auto Answer ICOM.

In this example, you set up Auto Answer ICOM on station 12345. To do so, complete the following steps:

1. Type **change station 12345**.

   The Station screen for extension 12345 appears.

```
change station 12345                                                Page 2 of X
                                    STATION

FEATURE OPTIONS
           LWC Reception? msa-spe             Auto Select Any Idle Appearance? n
          LWC Activation? y                            Coverage Msg Retrieval? y
  LWC Log External Calls? n                                      Auto Answer: icom
             CDR Privacy? n                                  Data Restriction? n
   Redirect Notification? y                        Idle Appearance Preference? n
 Per Button Ring Control? n
   Bridged Call Alerting? n                            Restrict Last Appearance? y
  Active Station Ringing: single

        H.320 Conversion? n             Per Station CPN - Send Calling Number? _
       Service Link Mode: as-needed   Special Character for Restricted Number? n
         Multimedia Mode: basic
    MWI Served User Type: ______                     Display Client Redirection? n
             AUDIX Name:                            Select Last Used Appearance? n
   Messaging Server Name: ______                      Coverage After Forwarding? _
     Recall Rotary Digit? n                             Multimedia Early Answer? n
                                                  Direct IP-IP Audio Connections? n
                                                             IP Audio Hairpinning? n
```

2. Move to the Auto Answer field and enter **icom**.
3. Press ENTER to save your changes.

Automatic Customer Telephone Rearrangement (ACTR)

Automatic Customer Telephone Rearrangement (ACTR) allows a phone to be unplugged from one location and moved to a new location without additional switch administration. The switch automatically associates the extension to the new port. ACTR works with 6400 Serialized phones. The 6400 Serialized phone is stamped with the word "Serialized" on the faceplate for easy identification. The 6400 Serialized phone memory electronically stores its own part ID (comcode) and serial number. ACTR uses the stored information and associates the phone with new port when the phone is moved.

ACTR is an enhancement to Terminal Translation Initialization (TTI), Personal Station Access (PSA), Customer Telephone Activation (CTA). ACTR makes it easy to identify and move phones.

CAUTION:
When a phone is unplugged and moved to another physical location, the USA Automatic Location Identification data base must be manually updated. If it is not updated, the DID number sent to the Public Safety Network could send emergency response personnel to the wrong location.

Detailed description

On the Feature-Related System Parameters screen, set the Terminal Translation Initialization (TTI) Enabled field to **y** and the TTI State field to **voice**.

NOTE:
When a phone is moved, if there is any local auxiliary power (a power supply plugged into a local AC outlet), the phone must be plugged into an AC outlet at the phone's new location. A phone with remote auxiliary power must be supplied remote auxiliary power at its new location. If you do not supply auxiliary power in either case after a phone is moved, some optional adjuncts (for example, an expansion module) do not operate.

When you enter **always** or **once** in the Automatic Moves field on the station screen, the switch adds the extension to its ACTR Move List database. When the phone is plugged in, the switch asks the phone for its serial number and records the serial number on the ACTR Move List. If you change the entry in the Automatic Moves field from **always** or **once** to **no**, the switch removes the extension from the Move List.

Call processing

When a phone is unplugged while on a call, and a 6400 Serialized phone that is administered for automatic moves is plugged into the port within 60 seconds:

- both extensions are placed in idle state
- active calls on either extension are dropped, unless the call is active on a bridged appearance at some other phone
- held calls remain in a hold state
- any calls ringing on either extension instantly proceed to the next point in coverage or station hunting path, unless the call is ringing on a bridged appearance at some other phone
- user actions that were pending when the new phone was plugged in are aborted

Design considerations

You can use the **list station movable** command to keep track of extensions on the move list. Once you reach the maximum number, the switch does not allow additional extensions.

Capacities

Maximum number of extensions allowed on the Move List:

- 5000 on the DEFINITY ECS r model
- 480 on the DEFINITY ECS si and csi models, DEFINITY ONE, and on the Avaya IP600

NOTE:
DEFINITY ONE has a capacity of 240 total extensions, even though 480 extension are allowed on the move list.

Hardware specifications

ACTR works with 6400 Serialized phones.

Circuit pack ID - usage information

ACTR works with existing 2 wire DCP circuit packs.

Installation and upgrades

According to standard upgrades process, verify that the following fields are set before carrying out the upgrade:

- On the Feature-Related System Parameters screen, set the TTI enabled field to **n**.
- On the Maintenance-Related System Parameters screen, set the Save Translation field to **n**.

After the upgrade is complete:

- On the Feature-Related System Parameters screen, set the TTI enabled field to **y** and the TTI State field to **voice**.

Change save translation to something other than **n** (Daily is suggested).

Testing

If you use the **test station** command on a station that is administered for Automatic Moves, and you unplug the phone and plug it into another jack while the test is running, any remaining tests are aborted.

If test 16 is running when an automatic moves phone is moved, the switch does not report an error and the remaining tests are aborted. If test 17 is running when an automatic moves phone is moved, the switch reports error code 1, 2, 4, 5, or 6, depending on when you plugged the set into the new port. If the switch reports error code 2, the switch also logs error 513 in the error log.

Administration

Before you start

- Be sure the TTI field on the Feature-Related System Parameters screen is set to y.

Tasks

Before you move a phone in your system, set the TTI State field to voice on the Feature-Related System Parameters screen.

Moving phones

You can allow a phone to be unplugged from one location and moved to a new location without additional switch administration.

For example, to allow moves anytime for a phone at extension 1234:

1. Type **change station 1234** and press RETURN.
2. Move to the Automatic Moves field.

```
change station 1014                                                Page 2 of X
                                     STATION

FEATURE OPTIONS
           LWC Reception? msa-spe       Auto Select Any Idle Appearance? n
          LWC Activation? y                           Coverage Msg Retrieval? y
  LWC Log External Calls? n                                     Auto Answer: none
             CDR Privacy? n                                  Data Restriction? n
   Redirect Notification? y                         Idle Appearance Preference? n
 Per Button Ring Control? n
   Bridged Call Alerting? n                           Restrict Last Appearance? y
  Active Station Ringing: single

        H.320 Conversion? n             Per Station CPN - Send Calling Number? _
       Service Link Mode: as-needed   Special Character for Restricted Number? n
         Multimedia Mode: basic
    MWI Served User Type: ______                     Display Client Redirection? n
         Automatic Moves: always
              AUDIX Name:                           Select Last Used Appearance? n
   Messaging Server Name: ______                      Coverage After Forwarding? _
     Recall Rotary Digit? n                             Multimedia Early Answer? n
                                                 Direct IP-IP Audio Connections? n
                                                            IP Audio Hairpinning? n
```

3. Type **always** in the Automatic Moves field.
4. Press ENTER to save your changes.

Maintenance and troubleshooting

If the Automatic Moves field is set to **always** and the phone is unplugged, and a new phone is plugged into the jack before the moved phone is plugged into its new location, the new phone in the old jack takes over as a maintenance replacement. The new phone, viewed as a maintenance replacement by the switch, retains the extension and all the properties of the first phone. The first phone does not work when it is plugged into its new location, because its extension is taken over by the second phone. Avaya recommends that you use **always** for a limited set of users when security is not a concern.

If the Automatic Moves field is set to **once**, a maintenance replacement is not allowed.

Potential failure scenarios and repair actions

ACTR can help you troubleshoot phone problems. For example, you can determine if problems originate with the 6400 Serialized phone.

You can unplug a movable 6400 Serialized phone and plug in a maintenance replacement that does not have move permission. If you are able to place and receive calls from the replacement phone, the problem could be with the original phone.

To troubleshoot phone problems with a 6400 Serialized phone using ACTR, one movable phone and one unassigned phone of the same model:

1. Type **change station *nnnn***, where ***nnnn*** is the extension of the 6400 Serialized phone that is not working and press RETURN.

   The Station screen appears.

2. Set the Automatic Moves field to **always** or **no** and press ENTER.
3. Unplug the phone.
4. In the same jack, plug in a phone that does not have move permission of the same model and series into the same jack.

   The switch treats the new phone as a maintenance replacement and does not change the extension and move list administration.

5. Try to place and receive calls from the new phone.

The first phone is the problem if the replacement phone works properly.

The circuit pack is the problem if the replacement phone works incorrectly and experiences the same problems as the first phone.

If you do not have an unassigned phone:

- Change the Automatic Moves field on the Station screen to **no** for the suspect phone and plug it into a different jack.
- Change the Automatic Moves field on the Station screen to **no** for a different phone, then plug it into the suspect jack.

Remember to change the field back when you are done, and reassociate the phone with Customer Telephone Activation (CTA), TTI, or at the switch. If you try either test without changing the field, the extensions move to the new port.

Interactions

Attendant Console

If the attendant console is unplugged and another DCP phone with move permissions is plugged into the port, the new DCP phone's extension do not move to the port. The port keeps the attendant console's extension.

Backup Console

Queue threshold warning tone signals every 10 seconds to certain stations. If the set is ACTR moved while the extension is receiving warning tone, or if it becomes eligible to receive the tone by the time it is plugged in, the tone sounds within 10 seconds of the phone being plugged into new port.

Distributed Communications Systems, Uniform Dial Plan

ACTR is not transparent across switches in Distributed Communications Systems (DCS) or Uniform Dial Plan (UDP). The extension number is not carried along when a phone is moved from one switch and plugged into a different switch.

Emergency Access to the Attendant

If the emergency access redirection extension phone is unplugged and another DCP phone with move permissions is plugged into the port, the new DCP phone does not have dial tone. The DCP phone's extension does not move to the port. The port keeps the emergency access redirection extension.

Expert Agent Selection (EAS)

If an ACTR move takes place, a logged-in EAS agent is automatically logged off.

Night Service

If the night service phone is unplugged and another DCP phone with move permissions is plugged into the port, the new DCP phone does not have dial tone. The DCP phone's extension does not move to the port.The port keeps night service extension.

Outgoing trunk Queuing (automatic callback, ringback queuing)

If a station ACTR moves before the callback occurs, the callback rings at the new port. If the extension is in x-port (still being moved), the outgoing call attempt is removed from the queue.

Person Station Access (PSA)

If you use PSA to disassociate an extension that is on the move list, the extension stays on the move list, but the serial number for that set is removed the port is X-port.

If you use PSA to associate an extension with a new set, and the extension is on the move list, the serial number on the move list changes to the serial number for the new set.

If you use PSA to associate an extension with a non-ACTR phone the extension is removed from the move list.

Survivable Remote EPN (SREPN)

An ACTR move made under PPN control is recorded in switch translations, but not in the SREPN and vice versa. Do not use ACTR when the switch is running under control of SREPN. SREPN records need to be updated to reflect any ACTR moves made on the PPN.

Terminal Self Administration (TSA)

If a phone in TSA mode is unplugged and another DCP phone with move permissions is plugged into the port, the new DCP phone is idle, not in TSA mode.

Terminal Translation Initialization (TTI)

You can administer an extension, port, or X-port, and add them to the move list, without a port assignment, or a physical phone connected to the port. If a non-serialized 6400 phone is later plugged into the port or associated with that extension, the extension is removed from the move list and the "Automatic Moves" field is set to no. If a 6400 Serialized phone is later associated with that extension that phone's serial number and port are added to the move list for that extension.

Wan Spare Processor (WSP)

An ACTR move made under PPN control is recorded in switch translations, but not in the WSP, and vice versa. Do not use ACTR when the switch is running under control of WSP. WSP records need to be updated to reflect any ACTR moves made on the PPN.

Busy Tone Disconnect

In some regions of the world the CO sends a busy tone for the disconnect message. With Busy Tone Disconnect, the switch disconnects analog loop-start Central Office trunks when a busy tone is sent from the CO.

A call that is originated from or terminated to a phone using a BTD enabled trunk has a Call Classifier port connected to the trunk. The Classifier port connects, then the call is answered and stays connected on the trunk until the station hangs up or a BTD signal is received from the CO. If there is only one BTD trunk on a call when the BTD signal is received, the call is dropped. If it is a conference call, only the trunk is dropped and the rest of the parties stay connected.

Capacities

One BTD-capable circuit pack provides BTD on up to 8 trunks.

CAUTION:
Allocate one call classifier port per loop-start CO trunk for BTD. Call classifier ports remain seized for the entire duration of the call, so the required number of call classifier circuit packs is potentially large. Contact your Avaya Sales Engineer representative to help determine the correct number of required call classifier or tone detector circuit packs necessary for BTD.

Hardware specifications

Busy Tone Disconnect requires the TN744E Call Classifier/Detector circuit pack. Some systems require the TN2182C Tone Clock circuit pack for platforms that do not have the tone clock functionality incorporated into the processor.

The DEFINITY system supports a mixture of call classifier circuit packs, eliminating the need to replace older call classifier circuit packs.

Busy Tone Disconnect requires the TN744E Call Classifier/Detector circuit pack, and the TN2182C Tone Clock circuit pack for platforms that do not have the tone clock functionality incorporated into the processor.

Administration

This section contains an example, with step-by-step instructions, on how to set up Busy Tone Disconnect.

When you set up Busy Tone Disconnect, the switch can disconnect analog loop start Central Office trunks when busy tone is sent from the CO.

Before you start

- Busy Tone Disconnect requires the TN744E Call Classifier/Detector circuit pack. Some systems require the TN2182C Tone Clock circuit pack for platforms that do not have the tone clock functionality incorporated into the processor
- Be sure the Enable Busy Tone Disconnect for Analog loop-start Trunks field on the System Parameter Country Options screen is y.
- Be sure the USA Default Algorithm and USA SIT Algorithm fields are n on the System Parameters OCM Call Classification screen.
- Be sure you define the busy tone and cadence on the System Parameters OCM Call Classification screen. We recommend that you use a minimum of two on and off steps to determine a valid busy tone.

Instructions

Let's add Busy Tone Disconnect to an existing CO trunk group. For our example, we'll use trunk group 20.

To add Busy Tone Disconnect to trunk group 20:

1. Type **change trunk group 20**.

   The Trunk Group screen for trunk group 20 appears.

```
change trunk group 20                                                Page 3 of x
ADMINISTRABLE TIMERS
                Send Incoming/Outgoing Disconnect Timers to TN465 Ports? _
                                          Outgoing Dial Guard(msec): _____
  Incoming Glare Guard(msec): _____          Outgoing Glare Guard msec): _____

                                  Outgoing Rotary Dial Interdigit(msec): ____
       Ringing Monitor(msec): _____              Incoming Seizure(msec): ____
   Outgoing End of Dial(sec): ___        Outgoing Seizure Response(sec): ___
 Programmed Dial Pause(msec): _____        Disconnect Signal Error(sec): ___
          Flash Length(msec): ____
                                                  Busy tone Disconnect? y


END TO END SIGNALING
    Tone (msec): ____    Pause (msec): 150

OUTPULSING INFORMATION
     PPS: 10    Make(msec): 40    Break(msec): 60  PPM? y  Frequency: 50/12k
```

2. Move to the Busy Tone Disconnect field and type **y**.
3. Press ENTER to save your changes.

Potential failure scenarios and repair actions

If all Busy Tone Disconnect capable Call Classifier ports are busy, a subsequent call can go through without Busy Tone Disconnect. The circuit cannot disconnect according to BTD.

Interactions

Answer supervision

If Answer supervision is enabled, set the Answer supervision timeout field to 0 (zero).

D-channel Backup

This feature allows you to use D-channel backup when the country protocol field is set to 19 (Hong Kong) on the DS1 Circuit Pack screen.

Increased BRI trunks to 1440

This feature increases BRI trunks on the G3r platform from 720 to 1440. This feature allows additional controllers and base stations to be supported by the additional BRI trunks, which allows more administered wireless users.

Interworking between TGU/TGE Trunks and ISDN (Italy)

The feature modifies ISDN messaging operation in systems where TGE/TGU trunking is used for networking satellite switches. Messaging from the DEFINITY ECS has been modified to ensure that the calling party receives ringback or busy tone as appropriate.

Mixed Length Dial Access Codes

Mixed- Length Dial Access Codes (DACs) allows you to use the second digit table to assign Feature Access Codes (FAC) and DACs of different lengths depending on the second digit. This feature existed prior to R9.5, but only for first digits 0-9. In R9.5, the feature works for first digits * and # as well.

For more information on the Dial Plan screen changes, refer to "Dial Plan Record'' on page 284.

Multi-Frequency Packet Signaling (Russia)

Multi-Frequency Packet (MFP) address signaling is provided in Russia on outgoing CO trunks. Calling party number and dialed number information is sent on outgoing links between local and toll switches. Russian MFP is set on each trunk group on the Type field on the trunk screen. Russian MFP does not apply to PCOL trunks.

To use MFP Signaling, the R9.5 Capabilities field must be enabled on the System Parameters Customer Options screen.

Hardware specifications

Use TN464/ TN2464 (for Russian incoming ANI), TN2199 (Russian CO trunk circuit packs) and TN744D/TN2182B Version 5 and later circuit packs.

Administration

You can administer Russian MF Packet (Russian MFP) Signaling to provide calling party number and dialed number information on outgoing CO trunks in Russia.

Before you start

Be sure the Country field on the Feature-Related System-Parameters Country Options screen is set to 15 for Russia.

Instructions

Russian MFP Signaling must be set up separately on each CO trunk group on your system. As an example, we'll set up Russian MFP Signaling on trunk group 20, which in our example is already set up as a CO trunk group. Remember, Russian MFP Signaling works on CO trunk groups only.

Tip:
Type list trunk co to identify the co trunks in your system.

To set up Russian MF Packet Signaling:

1. Type **change trunk-group 20**.

   The Trunk Group screen appears.

```
change trunk-group 20                                          Page 1 of x
                                  TRUNK GROUP

 Group Number: 20                    Group Type: co______     CDR Reports: _
   Group Name: ______________________________ COR: __       TN: ___       TAC: ____
    Direction: ________        Outgoing Display? _   Trunk Signaling Type: ____
  Dial Access? _                Busy Threshold: ___        Night Service: _____
 Queue Length: ___                      Country: 15  Incoming Destination: _____
    Comm Type: _____                  Auth Code? _
                                    Trunk Flash? _
          BCC: _                            ITC? ____
 TRUNK PARAMETERS
    Trunk Type (in/out): ____________       Incoming Rotary Timeout(sec): __
     Outgoing Dial Type: r1mf                         Incoming Dial Type: ____
                                           Disconnect Timing(msec): ____
        Digit Treatment: __________                            Digits: ____
                                                   Sig Bit Inversion: none
      Analog Loss Group: ___                         Digital Loss Group: ___
     Incoming Dial Tone? _
               Bit Rate: _____         Synchronization: _____      Duplex: ____
  Disconnect Supervision - In? _  Out? _
  Answer Supervision Timeout: ___             Receive Answer Supervision? _
```

2. Type **r1mf** in the Outgoing Dial Type field.
3. Press ENTER to save your changes.
4. Type **change system-parameters features**.

   The Feature-Related System Parameters screen appears.

```
change system-parameters features                              Page 10 of 10
                         FEATURE-RELATED SYSTEM PARAMETERS

AUTOMATIC EXCLUSION PARAMETERS

                        Automatic Exclusion by COS? y
                  Automatic Exclusion Coverage/Hold? y
             Automatic Exclusion with Whisper Page? y
                              Recall Rotary Digit: 2

                     Password to Change COR by FAC: *
IP PARAMETERS
                   Direct IP-IP Audio Connections? n
                             IP Audio Hairpinning? n

WIRELESS PARAMETERS
  Radio Controllers with Download Server Permission (enter board location)
  1: ___ 2: ___ 3: ___ 4: ___ 5: ___

RUSSIAN MULTI-FREQUENCY PACKET SIGNALING
                                                 Re-try? y
     T2 (Backward Signal) Activation Timer (secs): 20
```

5. Move to the Re-try field and enter **y**.
6. Press ENTER to save your changes.

Personal Station Access (PSA) Enhancements

When a call that goes to coverage from a PSA-disassociated extension, the switch sends a message to the coverage point indicating that the call was not answered. If the coverage point is a display phone, the display shows "da" for "don't answer." If the coverage point is a voice messaging system, the VM system receives an indication from the switch that this call was not answered, and treat the call accordingly.

R2 MFC Enhancements

Release 9.5 contains the following enhancements to R2 Multifrequency-Compelled Signaling (MFC):

- The user can choose to include the R2 MFC Calling Party Category in the call detail record (CDR)
- The user can choose to assign the R2 MFC Calling Party Category and Called Party Category on a per-station or per-trunk basis.
- The user can administer a recorded announcement to play when outgoing R2 MFC trunk calls do not complete. This applies when the DEFINITY ECS receives either group A or B signals from the called Central Office or other switch.

Detailed description

You can send Calling Party Category information to CDR by administering a new field for the customized CDR output format. The field applies to both internal and external calls. If you choose to use this field, you must be sure that your CDR device is capable of receiving and interpreting this information. See your CDR vendor for details.

- For incoming external calls, the value that is output to the CDR record comes from the Group II signal that is received.
- For station-originated outgoing calls and internal calls, the field value comes directly from the Class of Restriction assigned to the originating station.
- For tandem calls, the field value comes from the Group II signal from the originating trunk group's COR.

Administration

You can administer the DEFINITY ECS to allow Calling Party Category to be output to the CDR record, to use the Class of Restriction to determine Calling and Called Party Category, and to provide an announcement as intercept treatment for outgoing calls that cannot be completed.

Before you start

Verify that the Multifrequency Signaling field on the System-Parameters Customer Options field is y.

Adding calling party category to the CDR record

1. Type **change system-parameters multifrequency-signaling** and press RETURN.

   The Multifrequency-Signaling-Related System Parameters screen appears.

2. Type **group-ii-mfc** in the Outgoing Call Type field.
3. Press ENTER to save your changes.
4. Type **change system-parameters cdr** and press RETURN.

   The CDR Parameters screen appears. Move to page 2.

5. Type **clg-pty-cat** in the appropriate line in the record.

NOTE:
The placement of this field in the record must match what your CDR device is programmed to receive. See your CDR vendor for details.

6. Press ENTER to save your changes.

Using COR to determine called and calling party category

Let's administer the system to send calling and called party category based on the class of restriction of the user or trunk. In this example, we establish user type 7 for all phones and trunks with COR1.

1. Type **change system-parameters multifrequency-signaling** and press RETURN.

   The Multifrequency-Signaling-Related System Parameters screen appears.

2. Type **group-ii-mfc** in the Outgoing Call Type field.
3. Type **y** in the Use COR for All Group II Responses field.
4. Press ENTER to save your changes.

5. Type **change cor 1** and press RETURN.

   The Class of Restriction screen appears.

6. Type **7** in the Group II Category For MFC field.

7. Press ENTER to save your changes.

8. If you use more than one COR in your system, repeat steps 5–7 for each COR, entering the appropriate number for the user type you want.

Adding an announcement for R2 MFC intercept

In this example, we want all outgoing R2 MFC calls to hear an announcement if the call cannot be completed.

1. Add an announcement on extension 2040, and name the announcement **Intercept Treatment for R2 MFC Calls**.

   Refer to *DEFINITY ECS Administrator's Guide* for more information on adding announcements.

2. Type **change system-parameters multifrequency-signaling** and press RETURN.

   The Multifrequency-Signaling-Related System Parameters screen appears.

3. In the Outgoing Call Type field, type **group-ii-mfc**.

4. In the MF Signaling Intercept Treatment — Outgoing field, type **announcement**.

   Another blank field appears.

5. In this blank field, type **2040**.

   This is the extension of the announcement you recorded earlier.

6. Press ENTER to save your changes.

Skip Two Second Delay Timer on Overlap Digit Sending

Prior to 9.5, DEFINITY waited two seconds before sending digits on an ARS/AAR ISDN PRI trunk call. In situations where the difference between the minimum and maximum number of digits dialed is small, this delay is unnecessary.

This enhancement eliminates the two-second delay timer for calls when the difference between the minimum and maximum number of digits is 0 or 1. The timer is set to one second if the difference between the minimum and maximum number of digits is 2 or 3. If the difference is 4 or greater, the original two-second timer is set.

Asynchronous Links

5

Introduction/overview

Asynchronous linking over TCP/IP allows you to connect adjunct equipment to the switch via the C-LAN (TN799) board. DEFINITY ECS Release 9.1 allowed system administration applications to be connected in this manner. These are considered Server applications.

With Release 9.5, client applications can be connected through the local area network (LAN) via a TCP/IP port. These links can operate at a much higher data rate, and allow you to connect adjuncts without the need for data modules. In the past these applications required an RS232 connection through a serial port with a data module or a data line port with an Asynchronous Data Unit (ADU).

Call detail recording (CDR) devices, property management systems (PMS) and printers can be connected using asynchronous TCP/IP links. In addition, maintenance parameters can be set to allow the switch to alarm out over a TCP/IP link. These are considered client applications.

Connectivity options

There are several different methods you can use to connect adjuncts over TCP/IP. The option you choose depends on the connection options available with the particular adjunct, and the degree of reliability you require for each connection.

End-to-end TCP/IP

If the adjunct is capable of supporting TCP/IP, you can connect to the adjunct directly over the LAN. Some Call Accounting Systems are capable of LAN connections.

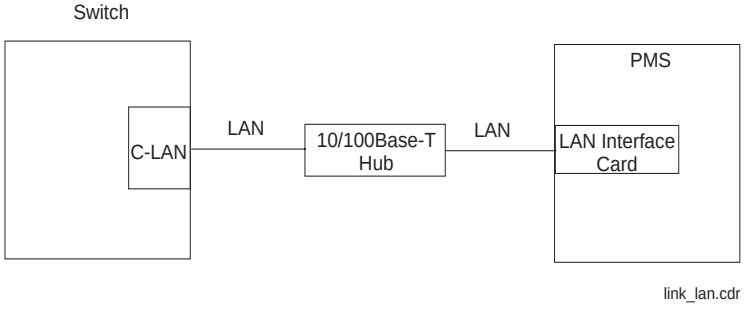


Figure 1. End-to-end TCP/IP adjunct LAN connectivity

Terminal server

Any device that does not support a direct TCP/IP connection, but that does support an RS232 interface, can connect to the C-LAN board through a terminal server. Property Management Systems, printers, and some CDR devices use RS232 connections.

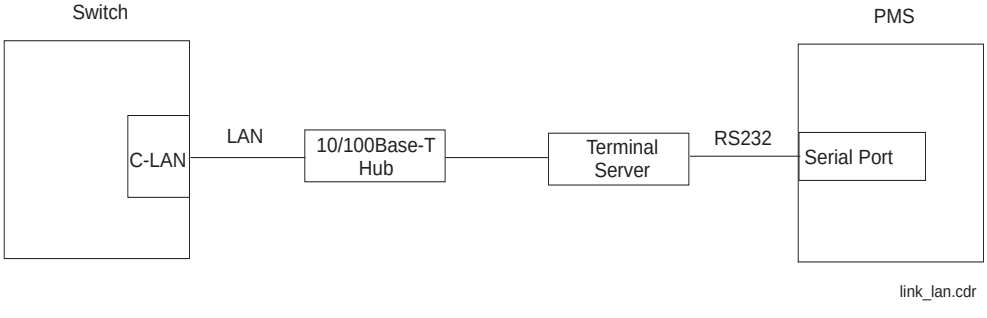


Figure 2. Switch-to-adjunct LAN connectivity via terminal server

Reliable Session-layer Protocol on a PC

You can connect system, journal and log printers over TCP/IP through a terminal server or by connecting the printer to a PC that is running the Reliable Session-layer Protocol. You can use any of the printer types that DEFINITY ECS supports (currently only serial line printers).

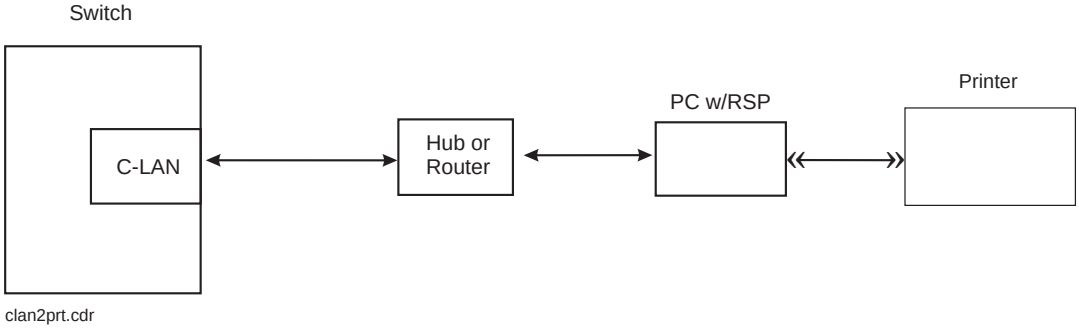


Figure 3. Switch-to-adjunct LAN connectivity via PC with RSP

Reliability options

In order to assure a reliable connection between the switch and an adjunct, the switch must receive periodic notification from the adjunct of its service state. If a router or other element of the network goes down, the switch needs to know to stop sending data to the adjunct. There are several ways to do this, depending on the adjunct and the type of connectivity you choose.

Reliable Session-layer Protocol

The Reliable Session-layer Protocol (RSP) helps to ensure that the switch is always aware of the service state of the end device. Without this protocol, it is possible for an adjunct to be out of service, but for the switch to be unaware of this. This can result in lost data. Once you enable RSP, the switch alarms as soon as a fault is detected, if you have administered the switch to alarm for the particular application.

RSP must be present at both ends of the connection. This requires that adjunct vendors adopt the protocol, and that you obtain equipment that incorporates its use.

Some CDR manufacturers have incorporated RSP, but not all. Check with your Avaya representative to determine which vendors have adopted and tested the protocol. At this time, RSP is not available for system printers.

To ensure a reliable link between the switch and a PMS Log or Journal printer, you must download the Reliable Session-layer Protocol Tool to a PC, and connect the printer to that PC. See "Using the Downloadable Reliable Session-Layer Protocol Tool".

Flow control through the terminal server

If you use a terminal server to connect an adjunct, you can administer Flow Control to help monitor the connection. If the link goes down between the terminal server and the adjunct, the terminal server notifies the switch, and begins to buffer data. Once the terminal server buffer is full, the switch buffers the data until its buffer reaches capacity, at which point the switch raises an alarm.

PMS reliability

Property management systems have a built-in means of ensuring that the connection is active. If the PMS is connected through a terminal server, you need to enable flow-control for both ends of the connection.

Alarming out over IP

You can set up your switch to send alarms over a TCP/IP link. These alarms can be sent to DEFINITY Network Management (DNM) 4.0, DEFINITY Proxy Agent, or DEFINITY Secure Remote Access. For more information, see your Avaya representative.

Security issues

You define the communication path between the switch and the adjunct by administering IP addresses and TCP ports for both ends of the connection. To make this path as secure as possible, you have the ability to define these ports within a wide range. If you require a secure connection, do not administer well-known ports for adjunct links.

This should provide adequate security within a private LAN or intranet. However, the switch does not provide data encryption for transactions to adjunct systems. If you require privacy for your records, you must employ proper encryption techniques, such as using a virtual private network.

Design considerations

In the past, the means of connecting adjuncts included direct connection via the RS232 (EIA) port on some models, asynchronous data units, and data modules. These means are still available at the time of this release, but will be phased out eventually.

If the adjunct does not support a direct TCP/IP connection, you must use a terminal server to convert the RS232 signal to IP. This configuration is less reliable than either a TCP/IP connection with reliable protocol or a traditional RS232 connection. Nonetheless, terminal servers are common LAN devices, and in a well-engineered network the likelihood of data loss is low.

The reduced cost and potentially higher data rates can make this configuration appealing, and it can be the right decision for you. Contact your Avaya representative to help you make an informed decision.

Capacities

Asynchronous TCP/IP connectivity does not change the maximum number of CDR devices, property management systems or printers that can connect concurrently to the switch. It only changes the means by which they connect.

Table 2. System application limits

Service	G3r	G3csi/si	DEFINITY ONE/IP600
System Management	8	5	NA
Call Detail Recording	2	2	1
Property Management System	1	1	1
Journal Printer	1	1	1
Wake-up Log Printer	1	1	1
Services Alarming Out	2	2	NA
System Printer	1	1	NA

The speed of data carried over asynchronous connections depends on the number of applications running over the C-LAN, and also on whether a terminal server is involved. If you use a terminal server, the rate depends on the settings on the terminal server and the adjunct device.

Hardware specifications

The DEFINITY switch must have a TN799B or later Control-LAN (C-LAN) circuit pack and Release 9.5 or later software.

Other hardware

If a terminal server is required, Avaya offers and supports the 4-port Perle Systems IOLAN+ 104 Communication Server for adjunct connections. You can connect up to four adjuncts through one IOLAN+.

Installation and upgrades

This section provides information on connecting adjuncts to the C-LAN and providing the initial administration.

Task list

Whether you use an end-to-end TCP/IP configuration, a terminal server or a PC running RSP, you must complete the following tasks:

- "Administering IP node names"
- "Administering IP services"
- "Administering adjunct parameters"
- If you are using a terminal server, also complete "Installing and administering the terminal server"
- If you are using a PC with the Downloadable RSP Tool, complete "Using the Downloadable Reliable Session-Layer Protocol Tool"

Administering IP node names

You must administer the IP addresses of the C-LAN board, any adjunct that connects directly to the LAN, the terminal server (if appropriate), and the PC running RSP (if appropriate). You use the Node Names screen to do this.

1. Type **change node-names ip** and press RETURN.
2. Enter the name and the IP address of the C-LAN board, as well as any adjunct, terminal server or PC you need to administer.

```
change node-names ip                                          Page 1 of 1

                          NODE NAMES

Name              IP Address    Name              IP Address
 1. switch________      123.456.7  .89   17. _______________     ___.___.___.___
 2. callacctg_____      123.456.9  .00   18. _______________     ___.___.___.___
 3. termserver____      123.456.11 .00   19. _______________     ___.___.___.___
 4. pmslogpc______      123.456.78 .00   20. _______________     ___.___.___.___
 5. _______________     ___.___.___.___  21. _______________     ___.___.___.___
 6. _______________     ___.___.___.___  22. _______________     ___.___.___.___
 7. _______________     ___.___.___.___  23. _______________     ___.___.___.___
 8. _______________     ___.___.___.___  24. _______________     ___.___.___.___
 9. _______________     ___.___.___.___  25. _______________     ___.___.___.___
10. _______________     ___.___.___.___  26. _______________     ___.___.___.___
11. _______________     ___.___.___.___  27. _______________     ___.___.___.___
12. _______________     ___.___.___.___  28. _______________     ___.___.___.___
13. _______________     ___.___.___.___  29. _______________     ___.___.___.___
14. _______________     ___.___.___.___  30. _______________     ___.___.___.___
15. _______________     ___.___.___.___  31. _______________     ___.___.___.___
16. _______________     ___.___.___.___  32. _______________     ___.___.___.___
```

3. Print a copy of this screen, or write down the node names you entered. You need this information for the next administration task.
4. Press ENTER to save your changes.

Administering IP services

For each adjunct that you connect using TCP/IP, you need to administer IP services to establish the IP address/TCP port pairing. The IP address is associated with the node name that you just administered. In this example, we are administering the primary CDR connection as end-to-end TCP/IP, and the PMS connection through a terminal server.

1. Type **change ip-services** and press RETURN to assign the CDR endpoint.
2. In the Service Type field, enter **CDR1** for the call accounting link, and **PMS** for the property management system.

```
change ip-services                                        Page   1 of   3

                                   IP SERVICES
   Service   Enabled   Local          Local   Remote          Remote
    Type               Node           Port    Node            Port
   CDR1                switch         0       callacctg       5101
   PMS                 switch         0       termserver      5103
```

3. In the Local Node field, enter the node name for the switch. In this example, **switch** is the local node.

4. The Local Port field defaults to 0 for all client applications. You cannot make an entry in this field.
5. In the Remote Node field, enter the node name for the adjunct, as administered on the Node Names screen. For the call accounting application, type **callacctg**. Since the PMS application routes through the terminal server, **termserver** is the remote node for this service type.
6. In the Remote Port field, enter the TCP listen port assigned to the adjunct. The recommended value for CDR1 is 5101, and the recommended value for PMS is 5103.

   NOTE:
   This number must match the port administered on the end device. If you are using the Downloadable RSP tool, this must match the port administered in the Server application. If you are using a terminal server, this number must match the Local Port number on the Port Setup menu. Consult the documentation for your Call Accounting system to determine the appropriate port for the CDR device.

7. Move to Page 3. Type **y** in the Reliable Protocol field for the CDR Service Type.

```
change ip-services                                          Page   3 of   3

                                 SESSION LAYER TIMERS
Service   Reliable   Packet Resp    Session Connect    SPDU    Connectivity
 Type     Protocol      Timer         Message Cntr      Cntr       Timer
CDR1         y          3                  1             1          1
```

8. Press ENTER to save your changes.

Administering adjunct parameters

You must administer adjunct parameters to let the system know that the adjunct is connected via TCP/IP.

CDR

1. Type **change system-parameters cdr** and press RETURN.

   The CDR Parameters screen appears.

```
change system-parameters cdr                                      Page   1 of   1
                            CDR SYSTEM PARAMETERS

 Node Number (Local PBX ID):                        CDR Date Format: month/day
      Primary Output Format: printer       Primary Output Endpoint: CDR1
    Secondary Output Format:
           Use ISDN Layouts? n                           EIA Device Bit Rate: 9600
       Use Enhanced Formats? n      Condition Code 'T' for Redirected Calls? n
Modified Circuit ID Display? n                   Remove # From Called Number? n
                  Record Outgoing Calls Only? y            Intra-switch CDR? n
  Suppress CDR for Ineffective Call Attempts? y          CDR Call Splitting? y
      Disconnect Information in Place of FRL? n    Attendant Call Recording? y
                                                     Interworking Feat-flag? n
 Force Entry of Acct Code for Calls Marked on Toll Analysis Form? n
                                    Calls to Hunt Group - Record: member-ext
Record Called Vector Directory Number Instead of Group or Member? n
         Record Called Agent Login ID Instead of Group or Member? n
     Inc Trk Call Splitting? n
  Record Non-Call-Assoc TSC? n
      Record Call-Assoc TSC? n   Digits to Record for Outgoing Calls: dialed
   Privacy - Digits to Hide: 0               CDR Account Code Length: 4
```

2. In the Primary Output Endpoint field, type **CDR1**. If you use a secondary output device, and that device is also connected via TCP/IP, type **CDR2** in the Secondary Output Endpoint field.

3. Press ENTER to save your changes.

PMS, PMS journal and PMS log printers

1. Type **change system-parameters hospitality** and press RETURN.

   The Hospitality screen appears.

2. On this screen, you can administer the PMS Log Endpoint (PMS_LOG), the PMS Journal Endpoint (PMS_JOURNAL), the PMS Endpoint (PMS), for whichever of these is connected via TCP/IP.

3. In the PMS Log Endpoint field, type **CDR1**. If you use a secondary output device, and that device is also connected via TCP/IP, type **CDR2** in the Secondary Output Endpoint field.

4. Press ENTER to save your changes.

System Printer

1. Type **change system-parameters features** and press RETURN.

   The Feature-Related System Parameters screen appears.

2. Move to Page 4.
3. In the System Printer Endpoint field, type **SYS_PRNT**.
4. Press ENTER to save your changes.

Alarming out over IP

1. Type **change system-parameters maintenance** and press RETURN.

   The Maintenance-Related System Parameters screen appears.

2. In the First OSS Endpoint field, type **ALARM1**.

   NOTE:
   In most installations that use TCP/IP alarming, you can set up one endpoint for TCP/IP and the other endpoint for a traditional modem alarming.

3. Press ENTER to save your changes.

Installing and administering the terminal server

Make sure you have all the equipment on site before the installation.You must have the hardware listed in Table 3.

Table 3. Required equipment

Comcode	Description	Number	Supplier
700015084	IOLAN+ 104 communications server	1	Avaya
NA	RJ45-to-DB25 connector for IOLAN+ (supplied with 700015084)	4	Avaya
NA	DB25-to-DB9 connector for PC COM port	1	Avaya
NA	RS232 Null modem (if needed for PC or printer connectivity)	1 or more	Avaya
405369042	Male/female adapter (if necessary)	1 or more	Avaya
846943306 or 104154414	6-inch RJ45 crossover cord, or	1	Avaya
NA	10/100Base-T auto-sensing LAN hub or router	1	Customer
102631413	259A adapter, or	1	Avaya
NA	CAT5 cross connect hardware and connecting blocks		Customer
NA	RJ45 UTP Category 5 modular cords	1–2	Customer
NA	451A in-line RJ45 adapters, as needed to connect modular cords together		

You also need a computer (laptop) with the HyperTerminal software program for the initial administration of the IOLAN+ and to set up the ports.

The general process is to

- Connect the IOLAN+ to the adjunct and the LAN
- Administer the ports on the IOLAN+ using a PC or laptop at the local site
- Test the connectivity back through the DEFINITY switch

Distance limits

The distance limit from the switch to the LAN hub is 328 feet (100 meters). The distance limit from the LAN hub to the terminal server is 328 feet (100 meters). If installed, the limit from the terminal server to the adjunct is 50 feet (15 meters).

Cabling diagram

Figure 4 shows the connection between the terminal server port and a call accounting system.

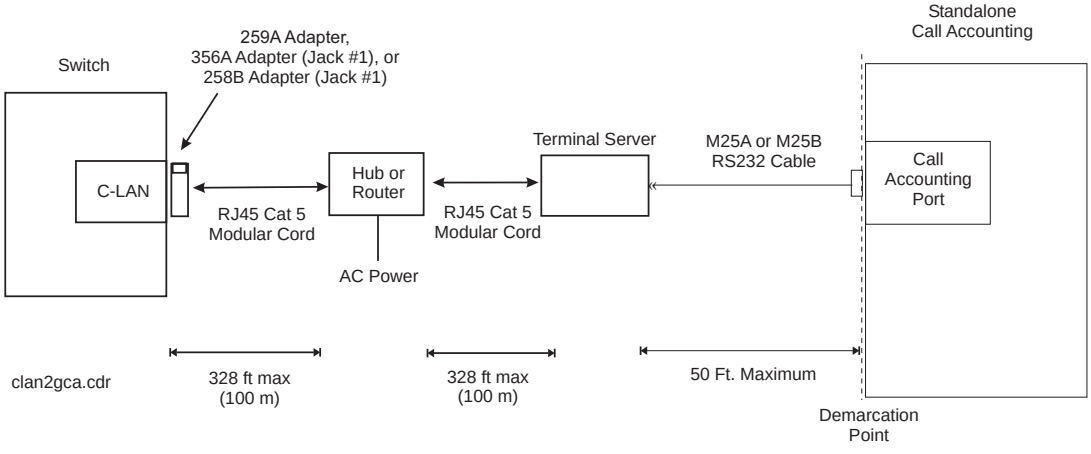


Figure 4. Stand-Alone Call Accounting System Link Using a Terminal Server

Making the connections

Connect the adjunct to the IOLAN+, using the RJ45-to-DB25 cable and the null modem. You can use a male/female adapter. See Figure 5.

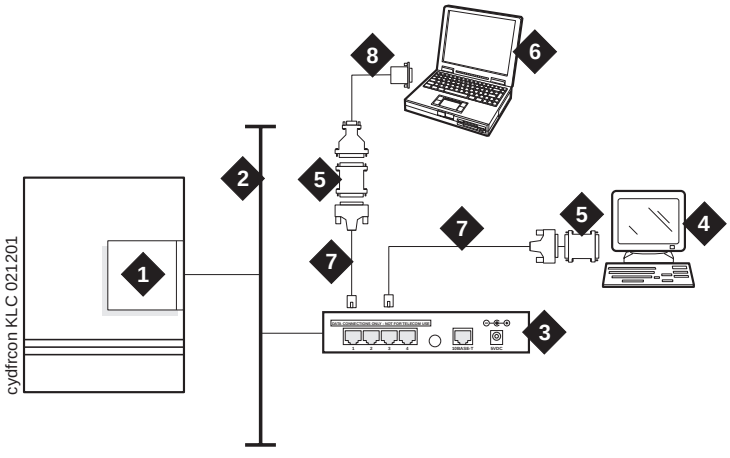


Figure Notes

1. C-LAN circuit pack in DEFINITY switch
2. Local area network (LAN)
3. IOLAN+ 104 terminal server
4. Adjunct (system management terminal, for example)
5. Null modem
6. PC or laptop (for initial administration
7. DB25-to-RJ45 cable
8. DB25-to-DB9 cable

Figure 5. Connecting an adjunct to the IOLAN+

Follow these typical steps:

NOTE:
Depending on the adjunct's connections, you may not need all of these pieces.

1. Connect the null modem adapter to COM1 port on the adjunct.
2. Connect the other end of the null modem adapter to the DB25 to RJ45 cable.
3. Connect the RJ45 end to any port on the IOLAN+.

Administering the IOLAN+

To administer the IOLAN+ the first time, you must connect a PC or laptop to the RS232 Port 1 on the IOLAN+ terminal server. Follow these typical steps:

NOTE:
Depending on the computer's COM port, you may not need all of these pieces.

1. Connect the DB9 end of the DB9-to-DB25 cable to the COM port on the PC or laptop.
2. Connect the DB25 end to the null modem adapter.
3. Connect the other end of the null modem adapter to the DB25 to RJ45 cable.
4. Connect the RJ45 end to Port 1 of the IOLAN+.

Before beginning the initial administration, make sure you have the following information:

- New IP address and subnet mask for IOLAN+
- Host name for IOLAN+
- IP address of C-LAN Ethernet interface
- Port number of C-LAN Ethernet interface where adjunct connects.

Setting up HyperTerminal on the computer

Use the HyperTerminal software program that comes with Windows 95/98/NT/2000 to administer the IOLAN+.

1. Open HyperTerminal.
2. Click on **File > Properties > Connect** tab. In the Connect using: field, select **COM *n***, where ***n*** is the communication port your computer is using.
3. Click on CONFIGURE and set the bits per second field to **9600** and the Flow control field to **Hardware**.
4. Click OK, OK.
5. Press ENTER to get the login prompt.

Navigating the IOLAN+ terminal server

Refer to the IOLAN+ user guide for details. In general,

- Use the arrow keys to move to a menu item
- Use the TAB key to move from field to field horizontally.
- Use the ENTER key to choose an item.

Administering the IOLAN+ the first time

1. At the login prompt type ***any text*** and press ENTER.
2. At the second prompt type **set term ansi** and press ENTER to view the Connections menu.

```
Name: port 2                  CONNECTIONS MENU                    Terminal: 2



                        Connection      Host

                           1            *** FREE ** === Commands ===
                           2            *** FREE ** | Telnet     ^T|
                           3            *** FREE ** | Rlogin     ^R|
                           4            *** FREE ** | Port       ^P|
                                                    | Admin mode ^A|
                                                    | CLI          |
                                                    | Lock         |
                                                    | Logout     ^D|
                                                    ================




IOLAN PLUS v4.02.00 a CDi                                        iolan
```

3. Under Connection select Port 1 (the port to which the adjunct is connected) and press ENTER to access the Commands menu.
4. Select **Admin mode > Password** and press ENTER.

```
Name: port 2                ADMINISTRATION MENU                   Terminal: 2


    gateway     Examine/modify gateway table.
    host        Examine/modify host table.
    line        Terminal configuration organised by line.
    password    Specify password to allow modification of menu items.
    port        Terminal configuration organised by port.
    quit        Return to connections menu.
    server      Examine/modify Server parameters.
    stats       Examine Server statistics.




    Password          [          ]



IOLAN PLUS v4.02.00 a CDi                                       iolan-st
```

5. Type **iolan**, the default password, and press ENTER.

   The Administration Menu changes, offering more options.

6. Select **server** and press ENTER to view the Server Configuration menu.

```
** Administrator **         SERVER CONFIGURATION                    Terminal: 2

  Name               [iolan      ]                 Debug mode      [0     ]
  IP address         [123.45.67.89 ]
  Subnet mask        [222.222.0.0        ]
  Ethernet address   [00:80:d4:03:11:cd]           Ethernet interface [AUTO   ]
  Language           [English  ]
  Identification     [                                  ]
  Lock               [Disabled]
  Password limit     [5     ]
  CR to initiate     [No  ]
  SNAP encoding      [Disabled]
  Boot host          [                   ]  Boot diagnostics [Enabled ]
  Boot file          [                                                ]
  Init file          [                                                ]
  MOTD file          [                                                ]
  Domain name        [                              ]
  Name server        [                   ]           NS Port   [53    ]
  WINS server        [                   ]
 ____________________________________________________________________________

    Name used for prompts and message on bottom right of screen.

IOLAN PLUS v4.02.00 a CDi                                                iolan
```

7. Fill in the following fields with information appropriate to your network. Leave the default settings for the other fields.
   - Name:
   - IP address: (for IOLAN+)
   - Subnet mask:
8. Press ENTER and select **Save & Exit** to effect the changes.

Rebooting the IOLAN+

You must reboot the server any time you change an IP address or Local Port value.

1. Press ENTER to view the Administration Menu.

```
** Administrator **         ADMINISTRATION MENU                    Terminal: 2


    access      Remote System Access (PPP).
    change      Change login and/or admin password.
    gateway     Examine/modify gateway table.
    host        Examine/modify host table.
    kill        Kill TCP connections on serial line.
    line        Terminal configuration organised by line.
    port        Terminal configuration organised by port.
    quit        Return to connections menu.
    reboot      Reboot Server.
    server      Examine/modify Server parameters.
    stats       Examine Server statistics.
    trap        Examine/modify SNMP Trap parameters.


    Port                      [2  ]

_____________________________________________________________________________



IOLAN PLUS v4.02.00 a CDi                                              iolan
```

NOTE:
The following steps re-initialize the IOLAN+ so it knows it's connected to the LAN through its IP address.

2. Select **reboot** and press ENTER.
3. Press the space bar to restart the IOLAN+.

Administering the gateway

NOTE:
If the C-LAN circuit pack and IOLAN+ are in the same subnet, skip this step.

1. Select **Admin mode > Password** and press ENTER.
2. Type **iolan** and press ENTER.
3. Select **gateway** to access the Gateway menu

4. Fill in the following fields for Entry 1:
   - Destination: *C-LAN IP address*
   - Gateway: *Gateway address*
   - Netmask: *Subnet mask*

NOTE:
The following steps re-initialize the IOLAN+ so it knows it's connected to the LAN through your gateway.

5. Select **reboot** and press ENTER.
6. Press the space bar to restart the IOLAN+.

Administering an IOLAN+ port

Use this procedure when connecting an adjunct or serial COM port on a PC directly (locally) to the IOLAN+ (see Figure 5).

1. Select **Admin mode > Password** and press ENTER.
2. Type **iolan** and press ENTER.
3. Select **port** and press ENTER.
4. Type ***port number***, where ***port number*** is the port that the adjunct connects to, and press ENTER to view the Port Setup Menu.

```
** Administrator **          PORT SETUP MENU                        Terminal: 2
   Hardware                   Flow ctrl                   Keys
   Speed          [19200 ]    Flow ctrl    [Hardware]     Hot   [^]]   Intr  [^C]
   Parity           [None]    Input Flow   [Enabled ]     Quit  [^@]   Kill  [^U]
   Bit                 [8]    Output Flow  [Enabled ]     Del   [^@]   Sess  [^@]
   Stop              [1  ]                               Echo  [^@]
   Break        [Disabled]  IP Addresses
   Monitor DSR      [Yes ]    Src   [               ]    Mask  [               ]
   Monitor DCD       [No ]    Dst   [               ]

   User                       Options                     Access
   Name   [port 2        ]    Keepalive        [No  ]     Access        [Local  ]
   Terminal type  [undef ]    Rlogin/Telnet  [Telnet]     Authentication  [None ]
   TERM         [        ]    Debug options    [No  ]     Mode          [Telnet ]
   Video pages         [0]    Map CR to CR LF  [No  ]     Connection  [initiated]
   CLI/Menu          [CLI]    Hex data         [No  ]     Host  [               ]
   Reset Term       [No  ]    Secure           [No  ]     Remote Port     [9001 ]
                              MOTD             [No  ]     Local Port      [10002]

 ____________________________________________________________________________
```

5. Fill in the following fields. Leave the default settings for the other fields.
   - Speed: 19200
   - Monitor DSR: Yes
   - Monitor DCD: No
   - Name: *port number or other descriptive name*
   - Terminal type: undef
   - CLI/Menu: CLI
   - Reset Term: No
   - Flow ctrl: Both

     NOTE:
     This is very important! If the link goes down between the terminal server and the adjunct, the terminal server buffers the data and notifies the switch. Once the terminal server buffer fills up, the switch buffers the data. The switch raises an alarm once the switch buffer is full.

   - IP addresses: *leave blank*
   - Mask: *leave blank*
   - Access: Local
   - Authentication: None
   - Mode: Telnet
   - Connection: Initiated
   - Host: *C-LAN IP Address*
   - Remote Port: *C-LAN Ethernet port where IP adjunct service is offered*
   - Local Port: *must match the value of Remote Port on the DEFINTY IP Services screen*
6. Press ENTER and select **Save & Exit** to effect the changes.
7. Press ENTER again to view the Administration Menu.
8. Select **kill** to disable the port connection.
9. Repeat the steps for each additional port you want to administer.
10. When administration is complete, from the Connections Menu, select **logout** (or press **Ctrl D**).
11. Close HyperTerminal.

    At this point, you have established a connection path from the adjunct through the IOLAN+ to the C-LAN circuit pack.

Testing

1. On the system management terminal, press ENTER to get the login prompt to the DEFINITY switch.

   NOTE:
   If you get garbled text, check the baud rate setting on the Port Setup Menu. You can adjust it up or down.

2. If no login prompt appears, log back into the IOLAN+ through HyperTerminal.
3. Select **Admin mode > stats** and press ENTER twice.
4. Select **users** and press ENTER.
5. Look at the port that the adjunct is connected to and see if there is any traffic. If not, check all your connections and administration fields.

```
** Administrator **          SERVER STATISTICS                      Terminal: 2
 1. port1            Talking to host 172.22.22.67.5111<DSR+CTS+DCD >DTR+RTS
 2. port 2           SERVER STATISTICS               <DSR+DCD >DTR+RTS
 3. port 3           waiting for DSR or DCD           >DTR+RTS
 4. port 4 modem     waiting for DSR or DCD           >DTR+RTS
REM <unknown>        logged out
LOG                  logger not enabled

    Press <RETURN> to see list of options.
IOLAN PLUS v4.02.00 a CDi                                          iolan-st
```

After you have successfully administered and validated the connection between the adjunct and the C-LAN circuit pack through the IOLAN+, you can disconnect the laptop or other PC from the IOLAN+. No further IOLAN+ administration is required.

Potential failure scenarios and repair actions

If a link goes down between the terminal server and the switch, you must reboot the terminal server for the link come back up. If you are performing a software upgrade or if a system reset occurs, you must reboot the terminal server to restore the link. See ''Rebooting the IOLAN+'' on page 79 for instructions.

Testing the switch-to-adjunct link

You can use the test, status, busyout and release commands for to find and correct problems with system printer, PMS log, PMS journal, CDR and PMS links. For more information about these commands, see the Maintenance manual for your switch.

```
status cdr-link
                                CDR LINK STATUS
                Primary                         Secondary

       Link State: up                           extension not administered

 Maintenance Busy? no
```

Figure 6. Example status screen for CDR link

You should also work with the vendor to test the link from the call accounting end. If you are installing the INTUITY Lodging Call Accounting, work with the Homisco technician to test the link.

If a link does not come up immediately, try using the busyout (cdr-link, pms-link, journal-link pms-log and wakeup-log, and sp-link) and release (cdr-link, pms-link, journal-link pms-log and wakeup-log, and sp-link) commands.

NOTE:
Status sp-link can show a system printer link as down, when it is actually properly connected. If no data is being transmitted, the switch may not see this link as active.

Using the Downloadable Reliable Session-Layer Protocol Tool

The intent of the Reliable Session-Layer Protocol (RSP) is to guarantee delivery of data records from the switch to an output device that connects to the switch over an asynchronous TCP/IP link. The Downloadable RSP tool allows you to implement this protocol on a PC that collects data records in a file. The protocol assures that the data records arrive safely at the PC. You can then send the output file to a printer.

Setting up an RSP configuration

To set up an RSP configuration:

- Administer the PC as a client application on the switch.
- Download, install, and administer the RSP for the PC

Setting up the switch

To set up the server application on the switch:

- "Administering IP node names"

  Give the PC a node name. The IP address is the IP address of the PC that is running the RSP tool.

- "Administering IP services"

  The service type = SYS_PRNT, the Remote Node = the node name assigned to the PC. Remote port is the port assigned as the listen port on the PC. You can figure out what this is by starting the RSP Server application, clicking on Start, and checking in the output window to see what port the server is listening on.

Setting up the PC

To set up the client application on the PC:

- Download RSP
- Install RSP
- Administer RSP

Downloading RSP

The RSP is available from the Avaya support web site as a self-extracting executable. To download the RSP:

1. Browse to the Avaya Customer Support web site:

   http://support.avaya.com/sd.jhtml

2. Select the RSP tool from the web site.
3. When queried, save the setup.exe file to a temporary folder on your computer. It is approximately 1.4-MB.

Installing RSP

To install the RSP:

1. Double-click the setup.exe file.

   The Install Shield Wizard steps you through the installation.

2. When prompted to select Client or Server, select both programs.
3. Continue with the installation. Use the default destination folder and program folder.
4. You can view the readme file now or later. The following files are installed on the PC in the folder \\Program Files\Avaya\DEFINITY Data Transport Tool:
   - client.exe (the client tool)
   - server.exe (the server tool)
   - user guide.doc (same as the readme file)
   - spl_design_doc.doc (the RSP design document)
   - splserver.ini
   - ddt_log.txt (installation log file)
   - spl.dll

Administering RSP

See the instructions in the user guide.doc file to administer the Reliable Session-layer Protocol on a PC.

Installing a remote SAT over an asynchronous link

Installation for client and server applications if very similar, if you use the terminal server. It is also possible to install a System Administration device at a remote location, and connect it to the terminal server through modems. This requires a few modifications to the installation process.

NOTE:
Make sure you have all the equipment on site before the installation.

You must have the hardware listed in Table 4.

Table 4. Required Equipment for Remote Connection

Comcode	Description	Number	Supplier
700015084	IOLAN+ 104 communications server	1	Avaya
NA	RJ45 to DB25 cable (included in 700015084) for IOLAN+ to modem	4	Avaya
NA	10/100baseT hub	1	Customer
NA	CAT5 cable	2 or more	Customer
407633999 (33.6K)	U.S. Robotics 33.6K or 56K Fax modem	2 per connection	Avaya

To connect to the IOLAN+ remotely requires modems. You also need a computer with the HyperTerminal software program for initial administration of the IOLAN+ and to set up the ports.

The general process is to

- At the DEFINITY switch site, connect the IOLAN+ to the modem and the LAN.
- At the remote site, connect the modem to the computer and to the PSTN.
- Administer the ports on the IOLAN+ using a PC or laptop at the local site
- Test the connectivity back through the DEFINITY switch

Making the connections

At the DEFINITY switch site:

1. Connect the modem to the IOLAN+, using the RJ45-to-DB25 cable. (see Figure 7).

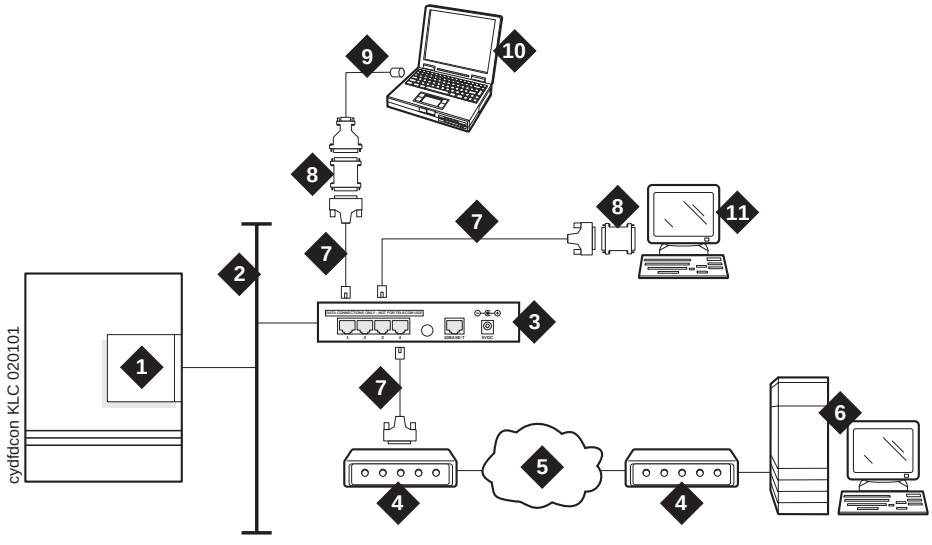


Figure Notes

1. C-LAN circuit pack in DEFINITY switch
2. Local area network (LAN)
3. IOLAN+ 104 terminal server
4. Modem
5. Public Switch Telephone Network (PSTN)
6. Remote administration computer
7. DB25-to-RJ45 cable
8. Null modem
9. DB25-to-DB9 cable
10. PC or laptop (for initial administration)
11. Adjunct (system management terminal, for example)

Figure 7. Connecting to the IOLAN+ for remote administration

2. Set dip switch on the modem to Auto Answer.

At the remote site:

1. Connect the computer to the modem using the null modem.
2. Connect the modem to the PSTN using an analog phone line.

Administering the IOLAN+

See "Administering the IOLAN+" on page 76.

Setting up HyperTerminal on the computer

See "Setting up HyperTerminal on the computer" on page 76.

Administering the IOLAN+ the first time

See "Administering the IOLAN+ the first time" on page 77.

Administering the Gateway

See "Administering the gateway" on page 79.

Administering an IOLAN+ port for remote access

1. Select **Admin mode > Password** and press ENTER.
2. Type **iolan** and press ENTER.
3. Select **access > Remote site devices > *port number***, where *port number* is the port that corresponds to the one that the modem is connected to, and press Enter to view the Remote Site Devices screen.

```
** Administrator **      REMOTE SITE DEVICES SCREEN                    Port: 4

 Type             [modem4  ]

 IP Addresses
   Src Addr       [                ]
   Dst Addr       [                ]

 Modem
   Config         [at&f0s0=1                                                ]
   Dial Comm      [        ]
   Hang Up        [        ]

 PPP Configuration            Dialer Configuration
   Restart timer  [1 ]           Dial Timeout  [40]
   Max Retries    [5 ]           Dial Retries  [2 ]

 Inactivity       [0 ]


    Type of device to use to connect to remote site.

IOLAN PLUS v4.02.00 a CDi                                            iolan-st
```

4. Fill in the following fields. Leave the default settings for the other fields.
   - Type: *a unique descriptive name*
   - Modem Config: **at&f0s0=1**
5. Press ENTER and select **Save & Exit** to effect the changes.
6. Press ENTER again to view the Administration Menu.
7. Select **Admin mode > Password** and press ENTER.
8. Type **iolan** and press ENTER.
9. Select **port** and press ENTER to view the Port Setup Menu.

```
** Administrator **          PORT SETUP MENU                        Terminal: 2
 Hardware                  Flow ctrl                  Keys
   Speed         [19200  ]   Flow ctrl    [Hardware]   Hot   [^]]   Intr  [^C]
   Parity           [None]   Input Flow   [Enabled ]   Quit  [^@]   Kill  [^U]
   Bit                 [8]   Output Flow  [Enabled ]   Del   [^@]   Sess  [^@]
   Stop              [1  ]                             Echo  [^@]
   Break        [Disabled]  IP Addresses
   Monitor DSR       [No ]   Src   [               ]   Mask  [               ]
   Monitor DCD      [Yes ]   Dst   [               ]

 User                      Options                    Access
   Name   [port 2        ]   Keepalive        [No  ]   Access        [Local  ]
   Terminal type  [undef ]   Rlogin/Telnet  [Telnet]   Authentication  [None ]
   TERM         [        ]   Debug options    [No  ]   Mode           [Telnet ]
   Video pages         [0]   Map CR to CR LF  [No  ]   Connection  [initiated]
   CLI/Menu          [CLI]   Hex data         [No  ]   Host  [               ]
   Reset Term       [No  ]   Secure           [No  ]   Remote Port     [9001 ]
                             MOTD             [No  ]   Local Port      [10002]


IOLAN PLUS v4.02.00 a CDi                                                iolan
```

10. Fill in the following fields:
    - speed: 19200
    - Monitor DSR: No
    - Monitor DCD: Yes
    - Name: *port number or other descriptive name*
    - Terminal type: undef
    - CLI/Menu: CLI
    - Reset Term: No
    - Flow ctrl: Both
    - IP addresses: *leave blank*
    - Mask: *leave blank*

- Access: Local
- Authentication: None
- Mode: Telnet
- Connection: Initiated
- Host: *C-LAN IP Address*
- Remote Port: *C-LAN Ethernet port where IP SAT service is offered*
- Local Port: *keep default*

11. Press ENTER and select **Save & Exit** to effect the changes.
12. Press ENTER again to view the Administration Menu.
13. Select **kill** to disable the port connection.
14. When administration is complete, from the Connections Menu, select **logout** (or **Ctrl D**).
15. Close HyperTerminal.

    At this point, you have established a connection path from the adjunct through the IOLAN+ to the C-LAN circuit pack.

Testing

1. On the system management terminal, press ENTER to get the login prompt.

   NOTE:
   If you get garbled text, check the baud rate setting on the Port Setup Menu. You can adjust it up or down.

2. If no login prompt, log back into the IOLAN+ through HyperTerminal
3. Select **Admin mode > stats** and press ENTER twice.
4. Select **users** and press ENTER.
5. Look at the port that the system management terminal is connected to and see if there is any traffic.

```
** Administrator **          SERVER STATISTICS                      Terminal: 2
 1. port 1            Talking to host 172.22.22.67.5111  <DSR+CTS+DCD >DTR+RTS
 2. port 2            SERVER STATISTICS                      <DSR+DCD >DTR+RTS
 3. port 3            waiting for DSR or DCD                 >DTR+RTS
 4. port 4 modem      waiting for DSR or DCD                 >DTR+RTS
REM <unknown>         logged out
LOG                   logger not enabled





    Press <RETURN> to see list of options.
IOLAN PLUS v4.02.00 a CDi                                          iolan-st
```

If not, check all your connections and administration fields.

After you have successfully administered and validated the connection between the adjunct and the C-LAN circuit pack through the IOLAN+, you can disconnect the PC or laptop from the IOLAN+. No further IOLAN+ administration is required. You can now administer the DEFINITY switch through the remote computer.

Using ASA or DNA

If you are using Avaya System Administration (ASA) or DEFINITY Network Administration (DNA) to administer the DEFINITY switch remotely, you must set up the switch with the following settings:

1. Select **File > Add Switch** and press ENTER.
2. As you go through the Add Switch wizard, select the following settings:
   - Select Modem or data module
   - Select US Robotics 56K Fax modem
   - Select the communications port for your computer
   - Set the port speed to match the modem connection speed
   - Select "I want to log in manually each time"

Related topics

See *DEFINITY ECS Administration for Network Connectivity* for more information about asynchronous connectivity over TCP/IP.

ATM

6

Introduction

ATM development complementing the Avaya ATM Solutions offer includes:

- Reliability and Performance
- Serviceability
- Survivability

Table 5 shows the interactions among DEFINITY system software and the circuit pack hardware and firmware.

Table 5. ATM interactions

Development	Description	Hardware	Firmware	Feature	Model
Reliability and Performance	Redesigned firmware monitor connection, increased processor speed.	TN2305B[1] TN2306B[1]	Version 12 or higher	ATM-CES ATM-PNC	r si csi DEFINITY ONE Avaya R600 r (only)
Serviceability	Improved network troubleshooting	TN2305 TN2306	Version 11 or higher.[2]	ATM-CES ATM-PNC	r si csi DEFINITY ONE Avaya R600 r (only)

Continued on next page

Table 5. ATM interactions — *Continued*

Development	Description	Hardware	Firmware	Feature	Model
Survivability	15 WSPs available	TN2305 TN2306		ATM-PNC	r
	ATM WSP supported in ATM network duplication or critical reliability	TN2305B TN2306B	Version 11 or higher in PPN and WSP	ATM-PNC	r
		TN2305B[1] TN2306B[1]	Version 12 or higher in EPNs		

1.The B-suffix circuit pack is backward-compatible with, but does not replace the existing TN2305 or TN2306 circuit packs.
2.QPPCN 1243B covers this firmware upgrade.

Reliability and Performance

Redesigned ATM interface circuit packs

The redesigned TN2305 and TN2306 ATM interface circuit packs have more capabilities and resources:

- Firmware monitor port on the backplane of the circuit packs
- Spare lead for WAN Spare Processor (WSP) applications
- Processor speed increased to 66 megahertz (MHz.)
- Increased hardware vintage bits
- ATM-network duplication

The increased functionality is available to both ATM-PNC and ATM-CES applications (see Table 5). However, both circuit packs can also function in systems designed and installed earlier than this release. (See Design considerations).

Firmware monitor port

Figure 8 shows the location of the firmware monitor port on the backplane of the circuit pack. You can attach a monitor cable to the ATM expansion circuit pack without removing the circuit pack from its carrier.

NOTE:
The circuit pack also has a firmware monitor header located on the circuit pack. This header functions the same as the redesigned backplane connector (Figure 8), but requires busying out and unseating the circuit pack to attach the monitor cable.

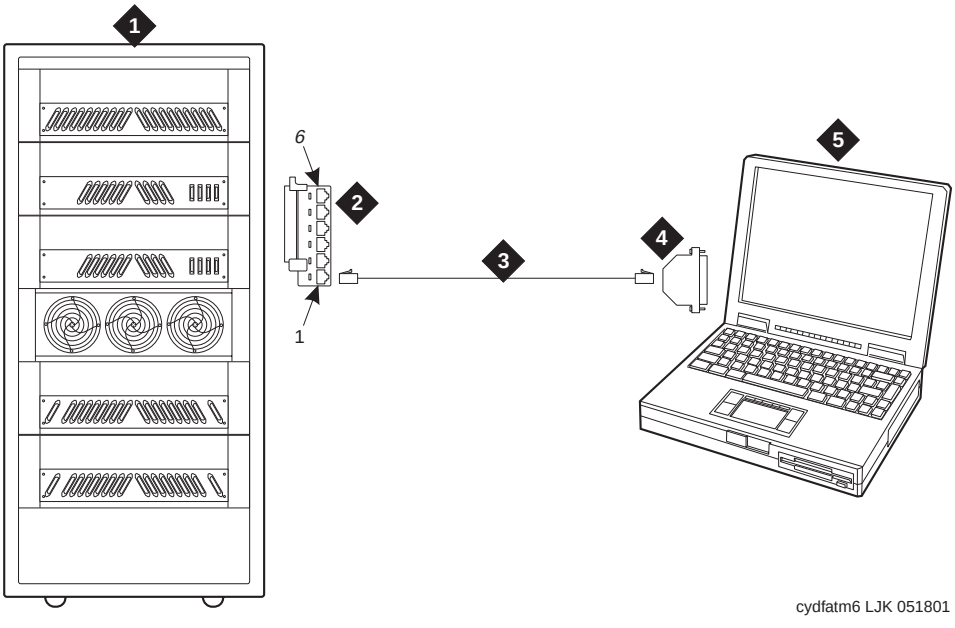


Figure Notes

1. DEFINITY ECS switch
2. 258A 6-port Amphenol to RS-232 adapter (Comcode 102605136)
3. D8W (8-wire) cable
4. 355A RS-232 to 25-pin serial adapter (Comcode 407590785)
5. Laptop computer

Figure 8. TN2305B and TN2306B firmware monitor port

Use Figure 8 and the following procedure to access firmware monitor port *on the TN2305B or TN2306B circuit packs only*:

1. Connect the 258A 6-port Amphenol adapter to the port slot on the backplane corresponding to the TN2305B or TN2306B circuit pack.
2. Connect a D8W cable to port 1 of the 258A adapter.
3. Connect the other end of the D8W cable to the RS-232 side of the 355A adapter.
4. Connect the 25-pin serial connector on the 355A adapter to a serial port on the computer.
5. At the computer set the baud rate for the serial port to 38,400 (38.4K).

Spare lead

The spare lead allows the redesigned ATM circuit packs to function seamlessly in the ATM WAN Spare Processors (WSP) application (see Survivability). It uses pin number 139 (AATOKEN) and is required in

- multicarrier cabinets

  WITH

- r system software

Processor speed increased

The circuit pack processor speed is now 66 megahertz (MHz.)

Increased hardware vintage bits

The range of available hardware vintage bits is now 7, increasing the number of possible vintage values to 127.

ATM-network duplication

This enhancement supports WAN spare processor compatibility with all DEFINITY reliability options for complete ATM-network duplication.

Design considerations

Use Table 5 carefully to determine which configurations can benefit from the redesigned ATM circuit packs:

- The TN2305B and TN2306B circuit packs do not replace the TN2305 and TN2306 circuit packs, respectively. Either circuit pack can be used in all platforms, but the TN2305B is required for critical reliability with WSPs.
- You do not receive the TN2305B and TN2306B ATM interface circuit packs as automatic upgrades.

Hardware specifications

Use Table 5 carefully to determine the proper circuit pack vintage, firmware vintage, and feature use (ATM-PNC vs. ATM-CES).

NOTE:
The B vintage circuit pack is backward compatible but does not replace the existing TN2305 or TN2306 circuit packs.

Circuit pack ID - usage information

TN2305B

The TN2305B circuit pack is an ATM solution for the TN570B/C expansion interface circuit pack. The ATM interface uses OC-3c or STM-1 155-Mbps *multimode* fiber. The TN2305B can facilitate

- port network connectivity (ATM-PNC) through an ATM switch and network.
- trunk connectivity (ATM Circuit Emulation Service -- CES), emulating up to 8 ISDN-PRI trunks on an ATM facility.

The TN2305/B *does not support*

- hybrid port-networks that use both ATM and CES simultaneously. TN2305/B circuit packs must connect all port networks through the ATM switch.
- directly-connected EPNs.

TN2306B

The TN2306B circuit pack has the same features as TN2305B, but supports *single mode* fiber-optic connections.

Other hardware

- Fiber-optic cables:
  - — TN2305B uses *multimode* fiber optic cable.
  - — TN2306B uses *single mode* fiber optic cable.
- Synchronization splitter to distribute a timing signal is necessary in the ATM-PNC application. See the Installing and Testing Network Synchronization section in Chapter 3 of *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for complete procedures.

Fiber-optic cable distances

The fiber-optic cable range is determined by the optical power budget and the fiber bandwidth. shows the TN2305X and TN2306X specifications.

Table 6. TN2305X and TN2306X fiber-optic specifications

Parameter	Fiber mode		Units
	Multimode	Single mode	
Output optical power max	-14	-8	dBm average
Output optical power min (BOL/EOL)	-19/-20	-15	dBm average
Input optical power max	-14	-8	dBm average
Input optical power min	-30	-31/32.5/34	dBm average
Optical power budget	30-19=11	31-15=16	dBm
Typical range	-4	-20	Km
Typical wavelength	1310	1310	nm
Wavelength min/max	1261/1360	1261/1360	nm
Fiber width	62.5/125	62.5/125	um
Connector	Duplex SC	Duplex SC	
Loss per connector	0.2		dB
Fiber cable loss	1	0.5 max (0.33 typical)	dB/Km
Fiber bandwidth	500	10,000	MHz-Km
Reflections		28	dB
IEC 825/CDRH		Class 1 compliant	

Example

A multimode fiber using an optical power budget of 11 dB and a loss of 1 dB/Km with no connectors yields a distance of 11 Km, which is unrealistic. Using a fiber bandwidth of 500MHz-Km and using the ATM OC-3c symbol rate of 77.5 Mb/s (data rate 155 Mb/s_ yields a distance of 6.4Km. In this case the distance is limited by the fiber bandwidth.

Installation and upgrades

Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book, the user guide, and the quick reference guide for information about

- installing the DEFINITY ECS switch.
- installing the ATM switch.

Software administration during installation

Complete the following steps to administer the ATM circuit packs and their fiber-optic connections. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for these administration procedures.

1. Administer the ATM circuit pack as either
   - ATM port network connectivity (ATM-PNC).
   - ATM circuit emulation service (ATM-CES).

   You can administer the circuit packs at the system access terminal (SAT) or on a laptop/PC using DEFINITY Translator ATM WSP Manager (DTA).
2. Administer the fiber-optic connections to and from each ATM circuit pack.

Testing

Because ATM-PNC requires a timing signal through the network, be sure to test the synchronization as part of the installation process. Refer to the Installing and Testing Network Synchronization section in Chapter 3 of *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book.

Other administration

Refer to the *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for further administration.

Maintenance impacts

This ATM development impacts 1 maintenance task:

Maintenance task

Use Figure 8 and the procedure that follows to access firmware monitor port *on the TN2305B or TN2306B circuit packs only.*

Serviceability

This feature improves the ATM Port Network Connectivity (ATM-PNC) application on the TN2305B and TN2306B ATM interface circuit packs. The term hardening refers to circuit-pack firmware changes and modified system software that enables

- you and field technicians can more easily isolate and diagnose ATM network problems.
- new reports, data, and automatic circuit pack reset command to help you and service organizations maintain ATM-network applications.

Detailed description

The Serviceability reports include

- Congestion and Cell-Loss Priority (CLP) bit monitoring
  - — reports the status of the AAL-5 SVCs, the links across an ATM network
  - — generates ATM-NTWK alarms and reports data to the Hardware Error Log.
- SONET-/SDH-layered alarms reported with the detection and clearing time prioritized (reported hierarchically):
  - — Loss of Signal (LOS)
  - — Loss of Pointer (LOP)
  - — Alarm Indication Signal (MS-AIS and HP-AIS)
  - — Remote Defect Identifier (MS-RDI and HP-RDI)
  - — Loss of Frame (LOF)
  - — HP-PSL

- Cell over/underruns and lost cells
  - — are based on your traffic rate.
  - — apply to the bearer channels (SVCs in ATM-PNC, PVCs in ATM-CES).
  - — generate ATM-NTWK warning alarms (viewed with the **display errors** command).
- Internal performance report
  - — shows queue overruns and buffer exhaustion problems.
  - — generates no alarms but logs ATM-EI and ATM-TRK errors in the Hardware Error Log.
  - — indicates whether the system is properly engineered.
- Automatic circuit pack reset after 30 minutes when
  - — it is not an archangel.
  - — it is not scanned by an archangel.
- Control link report (**status sys-link**)
  - — requires craft (and higher) command permissions.
  - — shows originating and terminating VPI.VCI links through an EPN.
  - — shows the time that the link came up or went down.
- System up time report (**status atm-board**)
  - — requires craft (and higher) command permissions.
  - — shows the elapsed time since the last circuit pack insertion and boot.
  - — compares the administered ATM address with the network address for mismatches.
  - — shows last time UNI and ILMI went up and down.
- VPI.VCI data appears on the **status station** screen for
  - — ATM-PNC configurations. The system parameters customer-options screen must have ATM-PNC enabled.
  - — the originating station.
  - — up to 10 connected ports.
  - — the active PNC only (duplicated systems).

- Enhancements to the **list trace station** or **list trace tac** (trunk access code) command show
  - — terminating VCI for setup connections between port networks.
  - — End System Identifier (ESI) portion of the ATM address for successful setups.
  - — a cause code for failed setups.
  - — 8 new messages to describe the setup status (setup, fail, rele, add, rej, drop, save, and reuse).

Design considerations

- The TN2305B and TN2306B circuit packs do not replace the TN2305 and TN2306 circuit packs, respectively. Either circuit pack can be used in all platforms, but the TN2305B is required for critical reliability with WSPs.
- Try to reuse TN2305 and TN2306 circuit packs where the modified TN2305B and TN2306B circuit packs are not required (see Table 5).

Hardware specifications

Use Table 5 carefully to determine the proper circuit pack vintage, firmware vintage, and feature use (ATM-PNC vs. ATM-CES).

NOTE:
The B vintage does not replace the existing TN2305 or TN2306 circuit packs and is backward compatible.

Circuit pack ID - usage information

The TN2305B circuit pack is an ATM solution for the TN570B/C expansion interface circuit pack. The ATM interface uses SONET OC-3c or STM-1 155-Mbps multimode fiber. The TN2305B can facilitate

- port network connectivity (ATM-PNC) through an ATM switch and network.
- trunk connectivity (ATM Circuit Emulation Service -- CES), emulating up to 8 ISDN-PRI trunks on an ATM facility.

The TN2305/B also provides echo cancellation.

The TN2305/B does not support:

- hybrid port-networks that use both ATM and CSS simultaneously. TN2305/B circuit packs must connect all port networks through the ATM switch.
- directly-connected EPNs.

The TN2306B circuit pack has the same features as TN2305B, but supports single-mode fiber.

Other hardware

- These circuit packs use the following fiber-optic cables:
  - — TN2305B uses multimode fiber optic cable.
  - — TN2306B uses single mode fiber optic cable.
- A synchronization splitter is necessary when using the ATM-PNC application. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for installation procedures.

Installation and upgrades

Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book and the user guide and quick reference guide for information about

- installing the DEFINITY ECS switch.
- installing the ATM switch.

Administration

For instructions on administering the TN2305B or TN2306B circuit pack in either ATM-PNC or ATM-CES mode, refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration*.

Maintenance and troubleshooting

Serviceability enhancements in this development make it easier for you and field technicians to isolate and diagnose problems. Table 7 lists the enhancements, the associated command, and when to use the information.

Table 7. ATM serviceability enhancements

Enhancement	Command	Use this to
Report congestion and CLP bit	None (ATM-NTWK warning alarms)	Assess the ATM network's performance.
Report SONET/SDH layer alarms	None	Isolate defects in the media transmission layer through alarm indication signals (AIS).
Report cell underruns and overruns	None (ATM-NTWK warning alarms)	Compare the ATM network's performance with the your required quality of service.
Report lost cells	None (ATM-NTWK warning alarms)	Assess the ATM network's performance.
Report internal performance problems	**display errors** (ATM-EI and ATM-TRK errors, not reported as alarms)	Determine whether these conditions exist: ■ queue overruns ■ buffers or resources exhausted
Report control link details	**status sys link**	Show status data for a specified system link.
Circuit pack automatically resets	None	Automatically reset an ATM circuit pack after 30 minutes in specific conditions.
Report system up time	**status atm board**	Determine when the circuit pack was last inserted or when a link went up or down.
Alarm reporting modified	None (ATM-EI and ATM-TRK alarms remapped as ATM-NTWK)	Assess the ATM network's performance.
Display VPI.VCI data	**status station**	Diagnose network problems without onsite personnel.
VPI.VCI assignments	**list trace**	Track successful and failed call setups.

Report congestion and CLP bit

Each ATM Interface tracks the number of received cells having the congestion indicator or the Cell-Loss Priority (CLP) bit set (marked). The total number of both types of cells either

- generates ATM-NTWK warning alarms when the number of marked cells received by the circuit pack (totaled across all SVCs) exceeds 100.
- retires ATM-NTWK warning alarms when the circuit pack receives less than 90 marked cells within the previous 15 minutes.

NOTE:
Only AAL-5 SVCs are monitored for CLP or congestion markings.

Report SONET/SDH layer alarms

SONET/SDH layer alarms are reported with priority (hierarchically). These include

- Loss of Signal (LOS)
- Loss of Pointer (LOP)
- Alarm Indication Signal (MS-AIS and HP-AIS)
- Remote Defect Identifier (MS-RDI and HP-RDI)
- Loss of Frame (LOF)
- HP-PSL

The switch masks downstream defects within one transmission network layer. For example, if a defect is detected within the media transmission network layer, the downstream notification occurs through AIS in that layer and does not occur in a client layer also (for example, the path network layer).

Each reported alarm shows the time it was detected and the time it was cleared. Only the highest level alarm reports, as defined in the hierarchy (Table 8), where a

- + indicates that the defect contributes as an AND to the Boolean expression for the failure
- – indicates that the defect contributes as an AND NOT (NAND).
- no entry means that the defect is not considered when evaluating that failure.

Table 8. Synchronous Transmission Fault Condition: Contributing Synchronous Defects

	Defect							
	LOS	**LOF**	**MJS-AIS**	**MS-RDI**	**HP-AIS**	**LOP**	**HP-PSL**	**HP-RDI**
LOS	+							
LOF	–	+						
MJS-AIS	–	–	+					
MS-RDI	–	–	–	+				
HP-AIS	–	–	–		+			
LOP	–					+		
HP-PSL		–	–		–	–	+	
HP-RDI		–	–		–	–	–	+

Report cell underruns and overruns

The system monitors each bearer channel (SVCs in ATM-PNC, PVCs in ATM-CES) for cell underruns and overruns. These errors are aggregated and appear as ATM-NTWK warning alarms.

In general, SVCs are set up for a certain traffic rate. For example, constant bit rate (CBR) for voice is about 173 cells/second.

- If traffic is less than this rate, cell underruns are possible.
- If traffic is higher than this rate, cell overruns are possible.

If the network and traffic parameters are well-engineered/designed, you should not experience cell underruns or overruns. In case of either, use Table 9 to help troubleshoot the cause(s).

Table 9. Troubleshooting ATM cell underruns/overruns

Condition	Likely cause	Description	Action
Underrun	Network/switch jitter	In periods of high jitter, the network delays cell delivery.	Determine the cause of the network/switch jitter. You could have to contact your ATM service provider.
Overrun	Network/switch jitter resolved	When the jitter stops, delayed cells are delivered quickly.	Determine the cause of the network/switch jitter or the source of the extra network traffic.

Report lost cells

The system monitors each bearer channel (SVCs in ATM-PNC, PVCs in ATM-CES) for lost cells, which are totalled in 15-minute intervals and reported as ATM-NTWK warning alarms.

Report internal performance problems

The circuit pack reports internal performance problems including

- queue overruns
- exhausted buffers or other resources

Using an Error Type and Aux Data value to indicate the resource that experienced a performance problem, these ATM-EI (ATM-PNC applications) and ATM-TRK (ATM-CES applications) errors are reported in the Hardware Error Log but do not alarm. This helps service personnel or administrators understand when the DEFINITY system has been engineered properly for the ATM Solution

To interpret the Error Type and Aux Data fields in the Hardware Error Log, look up the use of these maintenance objects:

- ATM-EI (Expansion Interface Circuit Pack)
- ATM-TRK (Circuit Emulation Service Circuit Pack)

Report control link details

The **status sys link** command shows ATM-link data for each link that goes to an EPN and thereby traverses through an ATM switch, including the

- time that link last came up and last went down.
- originating and the terminating VPI.VCI data.

Screen 1 shows that the link encountered a fault and recovered by switching to a different inter-switch-node fiber.

```
status sys-link 2a0101                                  Page   1 of   2   SPE A

      Location: 02A0101        Type/Chan: EAL          Alarms: none
  Current Path: present            State: up          Time Up: 03/12/2001 10:48
  Faulted Path: present                             Last Fault: 03/12/2001 10:50

                                Faulted Hardware Path

             Maintenance                            Maintenance
  Location    Name       Alarms            Location    Name       Alarms

  01A1        PKT-INT    none
  PN 01       PKT-BUS    none
  01C01       ATM-EI     none
  0.32        VPI.VCI    none
  AT01A       ATM-NTWK   none
  AT02A       ATM-NTWK   none
  0.32        VPI.VCI    none
  AT02A       ATM-NTWK   none
```

Screen 1. Status sys-link screen, page 1

Both the originating and terminating VPI.VCI links are 0.32.

Scroll to the next page of the report, and you see the old VPI.VCI path for the faulted link (Screen 2).

```
status sys-link 2a0101                                  Page   2 of   2   SPE A

      Location: 02A0101        Type/Chan: EAL          Alarms: none
  Current Path: present            State: up          Time Up: 03/12/2001 10:48
  Faulted Path: present                             Last Fault: 03/12/2001 10:50

                                Faulted Hardware Path

             Maintenance                            Maintenance
  Location   Name       Alarms            Location   Name       Alarms

  01A1       PKT-INT    none
  PN 01      PKT-BUS    none
  01C01      ATM-EI     none
  0.35       VPI.VCI    none
  AT01A      ATM-NTWK   none
  AT02A      ATM-NTWK   none
  0.32       VPI.VCI    none
  AT02A      ATM-NTWK   none
```

Screen 2. Status sys-link screen, page 2

Use these information resources to interpret the **status sys-link** report:

- Screen 1 and Screen 2
- Figure 9

The ATM network encountered a fault at 10:48 and recovered 2 minutes later using a different VPI.VCI link (Figure 9).

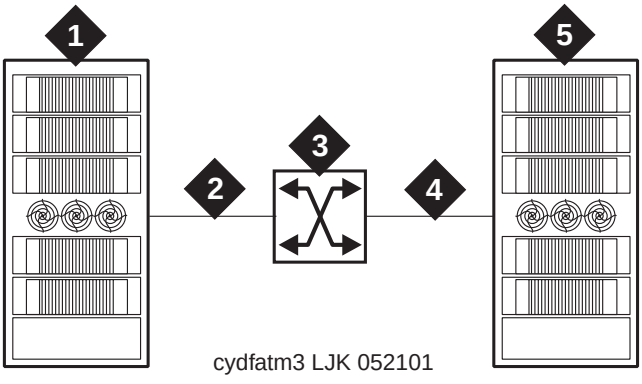


Figure Notes

1. DEFINITY ECS PPN
2. VPI.VCI = 0.35
3. ATM network
4. VPI.VCI = 0.32
5. DEFINITY ECS EPN2

Figure 9. Troubleshooting schematic (status sys-link)

Additionally, use the following information when interpreting this report:

- If the VPI.VCI information is not available for an ATM segment of the link, n/a appears.
- If an SVC is down at the point that you enter the **status sys-link** command, the VPI.VCI data indicates when the SVC was up.
- A -d (down) follows the VPI.VCI value (for example, 0.1234-d).

Circuit pack automatically resets

The circuit pack automatically resets after 30 minutes if

- it is not an archangel.
- it is not scanned by an archangel.

Report system up time

By using the **status atm board** command technicians can get a report listing the time elapsed since the

- circuit pack was last inserted.
- UNI link and ILMI link last went up and down.
- value of the sysUpTime variable for both the circuit pack and the corresponding network end of the ILMI link.

The following screen shows the command output.

```
status atm board 02A01                      Page 1 of 1     SPE A

    Location: 02A01    Personality: ATM-EI


ATM Address: 12345678901234567890123456789012345678 90 Mismatch: No
Last Board Insertion: mm/dd/yyyy hh:mm
Board sysUpTime: 1234567890    Network sysUpTime: 1234567890
UNI   State: up Last Down: mm/dd/yyyy hh:mm Last Up: mm/dd/yyyy hh:mm
ILMI  State: up Last Down: mm/dd/yyyy hh:mm Last Up: mm/dd/yyyy hh:mm
```

Screen 3. Status atm board screen

NOTE:
Only circuit packs administered as ATM-EI or ATM-TRK personalities appear the Location, Last Board Insertion date and time, and Board sysUpTime fields. All other fields are turned off.

Alarm reporting modified

The ATM-related maintenance objects report conditions

- on the ATM circuit pack
- in the ATM network

and do not always reflect hardware conditions within your DEFINITY switch. In order to fairly assess the ATM network's performance, we recommend that you examine the

- Hardware Error Log (**display errors**) for ATM-NTWK errors, indicating ATM network faults (See the ATM-NTWK (ATM Network Error) maintenance object.)

  and the

- red LED on the TN2305A/B or TN2306A/B circuit pack's faceplate, visually indicating network faults.

The following table shows the Cause Code (Error Types) that are now reported against the ATM-NTWK maintenance object:

Table 10. Network errors reported by ATM-NTWK

Cause Code/ Error Type	Aux Data	Description
769		AAL5 or LAPD excessive
770		ATM UCH
771		VPI.VCI unknown
1281	16	Loss of Signal (LOS)
1281	17	Loss of Frame (LOF)
1281	18	Alarm Indication Signal (MS-AIS)
1281	19	Remote Defect Identifier (MS-RDI)
1281	20	Loss of Pointer (LOP)
1281	21	HP-PSL
1281	22	Alarm Indication Signal (HP-AIS)

NOTE:
These alarms still contribute to the parameters that determine PNC interchanges.

Display VPI.VCI data

For ATM-PNC configurations, an additional page to the **status station** screen appears

- the VPI.VCI for the originating station.
- up to 10 connected port(s).
- the VPI.VCI associated with the connected port(s).

Use this command to get a snapshot of the VPI.VCI data for a specific station. These data enable you to diagnose their network(s) without onsite service personnel or Avaya technical support.

Command interactions

Also consider the following interactions when issuing or interpreting the **status station** command.

- For connected ports that are located in the same port network as the originating station, the VPI.VCI value of n/a appears.
- If VPI.VCI value has -d (down) added at the end (for example, 0.1234-d), this means that the SVC is down.
- This page appears only if ATM-PNC is enabled on the **system parameters customer-options** screen.
- For PNC Duplication, only the active VPI.VCI is shown.
- VPI.VCI data are not shown for:
  - **status trunk**
  - **status access-endpoint**
  - **status attendant**
  - **status bri-port**
  - **status data-module**

VPI.VCI assignments

The **list trace** command includes the terminating VCI number for setup connections between port networks. The command syntax for the qualifiers to this command are:

- **list trace station *xxxxx*/a** where ***xxxxx*** is the station number, and **/a** means that you are requesting ATM-specific data.
- **list trace tac *xxx*/a** where ***xxx*** is the trunk access code number, and **/a** means that you are requesting ATM-specific data.

Example

The following screen shows VPI.VCI data for a successful 2-party call setup.

```
list trace station 52501/a                    Page 1 of 1   SPE B

                              LIST TRACE


   time         data

15:12:07      Calling party station    57405 cid 0x20
15:12:09      dial 52501
15:12:09      ring station 52501 cid 0x20
15:12:09      ATM setup PN01-0081 to PN03-0045
15:12:09      ATM setup PN03-0046 to PN01-0082
15:12:11      active station 52501 cid 0x20
15:12:22      idle station 57405 cid 0x20
```

Screen 4. List trace screen (list trace station)

- If the setup is successful, the assigned VPI.VCI appears along with the End System Identifier (ESI) portion of the ATM address.
- If the setup fails, the cause code associated with the failure appears.

These events are not included in the **list trace** command:

- Parties dropped from the SVC by the network after a successful add party are neither detected nor reported.
- SVCs released or saved in the cache after the phone call is terminated are not traced. This applies to SVCs in existence when a call is hung up, and to SVCs that belonged to a discarded call when it is merged into another call.
- Events on SVCs not actually assigned to the call. This primarily includes SVCs supporting announcements, music and automatic wake-up. These SVCs are considered system resources and do not belong to any one call.
- Many events are not traced unless new firmware exists on both the originating and terminating ATM-EI boards. Some events only require new firmware on the originating or terminating board.
- Only events on the active PNC are reported. Events on the standby PNC, if any, are ignored.

Survivability

Introduction

The ATM WAN Spare Processor (WSP) is a processor port network (PPN) without port circuit packs and is invoked into service when there is a catastrophic failure in the network and links to the main PPN are severed. Even though existing calls are lost when this failure occurs, a WSP quickly acts as the main PPN, allowing a system recovery with minimal down time.

This ATM development

- increases the number of WSPs to 15.
- supports ATM PNC network duplication and critical reliability systems.

Detailed description

This development

- increases the number of WSPs to 15
- supports both ATM network duplication and critical reliability systems.

WSP background information

Several important aspects about WAN spare processors are included in this document and listed below.

- Function
- Links
- Translations
- Priority administration
- Configurations
- Maintenance

Refer to *ATM Installation, Upgrades, and Administration* for a complete discussion of any of these topics.

Function

The following figure shows the main connections in a typical ATM-WSP application.

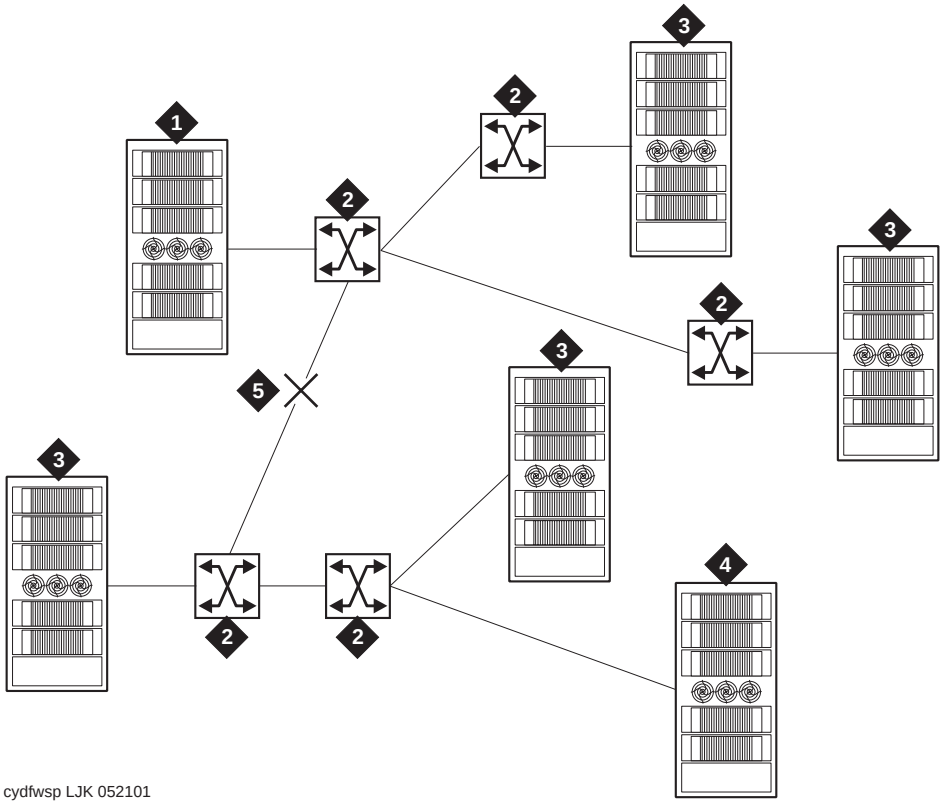


Figure Notes

1. Processor port network (PPN)
2. ATM switch
3. Expansion port network (EPN)
4. ATM WAN spare processor
5. ATM network fault

Figure 10. WAN Spare Processor (WSP) configuration

WSPs continually monitor the administered connection(s) and to the main PPN to determine if the PPN is actively communicating with EPNs. An ATM-network failure breaks the connection between the EPNs and the PPN and signals the WAN spare processor to take over call processing control.

ATM-network failures also include faults/problems:

- in the ATM switch.
- in the main PPN.
- within a link.
- in the ATM network's fiber-optic cables and connections.

When WSPs are initially administered, their state is standby (the normal state). When there is a break in the ATM network, a WSP goes from standby to active. If there is a failure in DEFINITY system, the ATM network, and/or any link in between, the main PPN alarms and each WSP that becomes active alarms.

Which WSP takes over the PPN functions depends upon where the failure in the ATM network occurs.

- If there is more than one WSP, the WSP that is administered with highest priority takes over the responsibilities of the main PPN before other, lower-priority WSPs. See Priority administration.
- A WSP becomes active and takes control of the EPNs when the connection with the main PPN is lost for the administered time period (5-99 minutes; the default is 5 minutes). The WSP then boots up (about 5 minutes) and takes control. All calls are lost during these times.

Links

- A WSP becomes active by establishing Expansion Archangel Link (EAL) connectivity to the EPNs on a first come, first serve basis. A WSP does not disrupt existing EALs to EPNs.
- Standby condition for a WSP requires the establishment of links from each WSP to each other and to the main PPN.
- Every WSP could potentially take over the entire system if there are administered system links between the main PPN and each WSP and from every WSP to every other WSP. The WSPs and the main PPN monitor these links so that each processor can observe and report its status.

Translations

- The WSP and main PPN translations are the same, except for the WSP number.
- WSP databases can be updated manually while in the standby mode or automatically using DEFINITY Translator ATM WSP Manager (DTA)
- The DEFINITY system does not copy new translations from the PPN to the WSPs. You must do this manually for each processor (PPN or WSP) individually.

Priority administration

- Each WSP is assigned a priority from 1 (the first PN to take over) to 15 (last PN to take over.)
- Ensure the integrity of the priority administration, because the system does not prevent 2 WSPs from having the same priority.
- A WSP can also have no priority, called a *blank* priority. A WSP that is administered with a *blank* priority plays dead, that is, it does not monitor any other WSPs and never become active. A *blank* priority facilitates interchanging the priority of two WSPs without having to remove them. A WSP with a priority of *blank* is treated by call processing and by maintenance software as if it does not exist.

Configurations

The ATM-WSP now supports ATM-network duplication and Critical Reliability systems. The duplicated ATM-EIs link to

- 2 distinct ports on an ATM switch
- ports on separate ATM switches
- 2 distinct access points on an ATM WAN.

This way links and associated ATM equipment or WAN elements are duplicated, but not the DEFINITY SPE.

Other ATM configurations guidelines:

- DEFINITY hardware or software does not recognize a WSP as a port network when inactive. The number of port networks in an r configuration is not limited by the number of WSPs used. For example, the number of WSPs used is not subtracted from the total number of PNs to determine the number of PNs that the system can support.
- A WSP in the standby mode is not intended to be a Distributed Communications System (DCS) node. Although DCS could potentially be an effective backup or reroute strategy, DCS connections are not supported between parts of a failed switch. A WSP in *active* mode can have the DCS functionalities of the PPN.
- A WSP always has a simplex SPE, although it supports Standard, High, or and Critical Reliability, as well as ATM-network duplication.
- See Design considerations and Table 5 for more ATM-related design and configuration details.

Maintenance

- Maintenance functions are performed by the resident processor complex. That is, the main PPN performs its own maintenance, and the WSP performs maintenance on itself. The ATM-NTWK maintenance object monitors point-to-point WAN connectivity.
- Each WSP has alarming and remote administration capabilities similar to those of a main PPN.
- WSPs require an INADS connection.
- Once the main PPN becomes functional, you can restore a WSP to the standby mode. See Returning the WSP to standby mode.

Design considerations

When installing the WSP, verify that the WSP configuration matches the main PPN configuration.

- If the main PPN is Standard Reliability or ATM-network duplication (simplex SPE), the port carrier in the WSP is located in Carrier B to match the PPN.
- If the main PPN is High or Critical Reliability (duplicated SPE), the port carrier in the WSP is located in Carrier C to match the PPN.
- The TN2305/B or TN2306/B ATM-EI circuit packs must be in the same carriers (B-E) and slots in both the main PPN and the WSP(s).
- If using DEFINITY Translator ATM WSP Manager (DTA) the TN799B/C C-LAN circuit packs must be in the same carriers and slots in the main PPN and WSPs.
- When registering the WSPs with INADS, give them the Installation Location (IL) number for the *main* PPN and the number of the WSP (1-15).

NOTE:
This is the administered WSP number, *not* the priority number.

Capacities

The maximum number of WSPs has changed from 7 to 15.

Hardware specifications

- DEFINITY ECS G3r in multicarrier cabinets
- Installed and administered ATM switch

Refer to Design considerations and Table 5 for required hardware in ATM-WSP applications.

Circuit pack ID - usage information

TN2305B

The TN2305B circuit pack is an ATM solution for the TN570B/C expansion interface circuit pack. The ATM interface uses OC-3c or STM-1 155-Mbps *multimode* fiber. The TN2305B can facilitate

- port network connectivity (ATM-PNC) through an ATM switch and network.
- trunk connectivity (ATM Circuit Emulation Service -- CES), emulating up to 8 ISDN-PRI trunks on an ATM facility.

The TN2305B does not support

- hybrid port-networks that use both ATM and CES simultaneously. TN2305B circuit packs must connect all port networks through the ATM switch.
- directly-connected EPNs.

TN2306B

The TN2306B circuit pack has the same features as TN2305B, but supports *single mode* fiber-optic connections.

Dependencies

- WSPs are available only when ATM-PNC enabled.
- ATM WSP is not compatible with Survivable Remote EPNs.

Other hardware

If you are using DEFINITY Translator ATM WSP Manager (DTA) to copy translations, you must install a TN799B or later Control LAN (C-LAN) circuit pack in the main PPN and each WSP.

Complete installation and administration procedures are in Chapter 3, Installing a DEFINITY ECS ATM- PNC, of *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration*, in the Installing and Administering C-Lan Circuit Pack section.

Installation and upgrades

Refer to these sources for complete installation procedures for both the DEFINITY ECS switch and the ATM switch:

- *Installation for Multicarrier Cabinets* on the *DEFINITY Release 9 Documentation Library, DEFINITY Made Easy* for instructions on installing a DEFINITY ECS PPN and WSP
- *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration*, Chapter 3 Installing a DEFINITY ECS ATM- PNC, for instructions on installing ATM-PNC.

The essential process for installing and administering WSPs and their translations is:

1. Install/upgrade and administer the main PPN, enabling ATM-PNC
2. Install and administer WSPs
3. Administer the WSPs on the main PPN
4. If you are using DEFINITY Translator ATM WSP Manager (DTA), install and administer TN799 C-LAN circuit packs in the main PPN and each WSP. See Other hardware.

Administration

This section contains information about

- Administration interactions.
- DEFINITY Translator ATM WSP Manager (DTA).

Points to consider when administering WSPs

- Your network can span multiple time zones, including some states (or areas of states) that do not observe Daylight Savings Time.
  - — Set the system time on all WSPs the same as the time on the main PPN to avoid system time offsets in the event of a major failure.
- If you change the value of the Enable Operation of PNC Duplication field on the System-Parameters Duplication screen from **n** to **y** on the WSP, the system checks that
  - — the PPN's A-PNC and B-PNC as well as the WSP's A-PNC and B-PNC are all administered.
  - — both the A-PNC and B-PNC circuit packs are administered for the local WSP on the Maintenance-Related System Parameters screen.

Administration interactions

The system shares information on the ATM PNC and the WAN Spare Processor forms. These interactions include:

- A-PNC and B-PNC addresses last default values are shared with and updated by the WSP forms.
- The A-PNC and B-PNC circuit pack locations must be different. If the value in the WAN Processor Role field is **spare** and the Enable Operation of PNC Duplication field on the System-Parameters Duplication screen is set to **y,** the B-PNC Board Location field cannot be blank.
- PNC Duplication cannot be enabled on a spare switch if the main WSP has 2 A-PNC addresses administered.
  1. Remove the B-PNC address from all WSPs (1-15).
  2. Disable PNC Duplication.
- PNC Duplication is not enabled if the main PPN has 2 A-PNCs administered.

DEFINITY Translator ATM WSP Manager (DTA)

The DEFINITY Translator ATM WSP Manager (DTA) tool makes administering ATM WSP translations more accurate and efficient compared to manually entering data at the SAT. (See Survivability.)

NOTE:
DTA requires DEFINITY Network Administration (DNA), Release 3.0 software and the TN799C (C-LAN) circuit pack.

Troubleshooting

Refer to the existing DEFINITY ECS documentation for maintenance and troubleshooting information for a DEFINITY ECS R9r.

- *DEFINITY ECS Release 9 Maintenance for Release 9r*
- *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration*, Chapter 6, Troubleshooting

For information on troubleshooting the DEFINITY Translator ATM WSP Manager (DTA) software, refer to the

- DEFINITY Translator for ATM Release 3.0 Installation and Configuration book that is packaged with the DTA manager software CD.
- DTA online help.

Alarming strategy

The alarm strategy rules for the ATM WSPs are as follows:

- If there is a failure in the DEFINITY system, the ATM network, and/or any link in between, the main PPN alarms and each WSP that becomes active alarms.
- When a WSP is active, it performs exactly like the main PPN, generating its own alarms, for example, when it loses communication with an EPN.
- When a WSP is in standby mode, and it is unable to take over PPN functionality, it generates a minor alarm to the PPN.

Returning the WSP to standby mode

Returning to normal operating mode, in which the main PPN controls the system, is a manual procedure. We recommend you perform this procedure when it is least disruptive. WSPs are returned to normal mode of operation typically after the main PPN has been restored. It is possible restore the WSP through a remote login.

NOTE:
A main PPN that has been inactive and an attempt has been made to return it to the active state requires manual intervention to prevent an active WSP from taking over for the main PPN. For example, when performing upgrades on simplex systems with WSPs, we recommend that you increase the WSP timer on the highest priority WSP so the WSP does not attempt to become active. If an active WSP discovers that a higher priority WSP is confirmed up and the active WSP has no EALs up, it automatically reverts to standby.

After the problem that caused a WSP to take over is fixed, you must return the switches to normal operation. The main PPN takes over automatically once it is restored to service. However, the WSP must be manually restored.

On the main PPN:

1. Type **status atm wsp** and press Enter to make sure the ATM network is up and running.

On the WSP:

1. Type **reset system 2** and press Enter to return the WSP to standby mode.

Maintenance objects

Modified maintenance objects affected by this development include

- ATM-DCH (ATM D-Channel Port)
- ATM-EI (Expansion Interface Circuit Pack)
- ATM-NTWK (ATM Network Error)
- ATM-TRK (Circuit Emulation Service Circuit Pack)
- ATM-WSP (ATM WAN Spare Processor)

You can find all of these ATM-related maintenance objects in Chapter 16, ''New and Changed Maintenance Objects''.

Networking

7

This chapter describes the following networking enhancements:

- ISDN B-Channel Maintenance
- Network Call Redirection Enhancements
- QSIG Standalone Path Replacement
- QSIG/DCS Voice Messaging

ISDN B-Channel Maintenance

This development allows you to connect their DEFINITY ECS with other switches that use the NI-1998 B-channel maintenance standard. This applies only to ISDN-PRI connections.

The main reason for doing this is to comply with open standards used by other switch manufacturers (including Lucent Technologies).

Installation

No additional hardware installation is necessary. This assumes there have been no changes in the existing installation procedures for ISDN-PRI trunks.

Software administration during installation

The DS1 and Signaling Group screens were changed to allow you to enter a value of **d** in the Protocol Version field.

Maintenance and troubleshooting

If you use the status trunk command for a trunk that uses a 1d interface, this command reports whether the trunk is in a maintenance state on the near end. However, there is no way for the near end to inform the far end when the near end enters a maintenance state. Therefore, if you use the status trunk command on the far end of the same trunk, the command does not show the trunk to be in a maintenance state.

For a complete description of the status trunk command and other trunk tests, see the Maintenance documentation for your switch.

Network Call Redirection Enhancements

Changes provided in Release 9.5 for DEFINITY systems are required for reliable operation with the MCI® WorldCom® Network Call Transfer (NCT) service.

NCR 9.5 supports Information Forwarding for AT&T In-band Transfer and Connect network service.

Enabling Network Call Redirection (NCR) provides Information Forwarding support for the AT&T Transfer and Connect In-band network service ISDN D-channel data forwarding capability starting with DEFINITY R9.2 load 35. The DEFINITY Information Forwarding feature forwards User-to-User Information (UUI) associated with the call to the "transferred to" location. When NCR is active in the DEFINITY system, transferring the call using Call Vectoring and AT&T In-band Transfer and Connect, the disconnect vector step includes the codeset UUI IE in the ISDN DISCONNECT message.

Detailed description

MCI WorldCom

If Network Call Transfer (NCT) is used, a second call is set up by the redirecting DEFINITY system to redirect the call using the public network. Starting with DEFINITY R9.5, that call must be answered (sends a CONNECT ISDN message) by the redirected-to location before the call is requested from the PSTN. This is necessary for reliable NCT operation with MCI's network switches.

AT&T In-band Transfer and Connect Information Forwarding

NCR supports Information Forwarding for the AT&T Network In-band (IB) Transfer and Connect service. The Transfer and Connect service is a method that the AT&T network uses to transfer a call within the network and drop the original trunk to the first destination by using in-band DTMF (touch tone) dialing. The Transfer and Connect Courtesy Transfer IB trigger feature allows the redirecting party to forward user data with the transferred call using out of band data forwarding in the ISDN PRI DISCONNECT message via message-associated UUI signaling over the D-channel. The data is forwarded with the network transferred call if the Customer Premises Equipment (CPE) PBX includes a codeset 0 (or 7) UUI IE in an ISDN DISCONNECT message sent by the CPE within three seconds of the DTMF transfer request digits. See AT&T TR 50075 for details. With NCR, the DEFINITY Information Forwarding feature forwards either the ASAI user data (with the Service Provider setting) or the full call center data set (with the Shared setting) when a call is redirected to another location.

UUI forwarding

With the changes added to the DEFINITY R9.2 load 35 or later, activating NCR allows user data to be included in the ISDN DISCONNECT message when a vectoring **disconnect** step is processed. The user data is included in a codeset 0 UUI IE, which is then forwarded to the transferred-to remote location. The user data can then be handled by the remote DEFINITY in the same manner as an LAI/BSR interflowed call. The inclusion of the UUI IE only occurs when the **disconnect** step does not have an announcement specified. This data forwarding capability can be used with applications that invoke Courtesy Transfer using an announcement step in vectors followed by a **disconnect** step. The announcement has the in-band DTMF transfer trigger (*8) and the transfer to direct dial phone number digits recorded.

Scenario

A typical Transfer and Connect Courtesy Transfer application uses BSR. In this scenario, local Interflow VDN numbers would be assigned in the BSR Application screen, allowing Transfer and Connect to have the AT&T network redirect the call to the remote location. For each location to which the call is sent, the local VDN is assigned to a vector that contains an **announcement** step with the DTMF Courtesy Transfer sequence recorded (using a telephone) to request transfer to the location. This is immediately followed by a **disconnect** step with the announcement field set to **none**. When a call is to be interflowed to a particular location by the **queue-to** vector step, the Transfer and Connect network transfer is requested for the call by routing the call to the appropriate local VDN. The user data is forwarded with the call to the remote location.

Administration

Before you start

DEFINITY R9.5 is required for operation with MCI® WorldCom and for AT&T In-band Network Call Transfer and Connect Information Forwarding.

AT&T In-band Transfer and Connect Information Forwarding

For transfer and connect data forwarding support, the ISDN NCR Customer Options must be active. Only some of the trunk administration for NCR should be assigned, as compared with NCT or NCD. Complete the following fields on the DEFINITY screens:

Field	Set to	Reason
Signaling Group		
NCR	Y	
Trunk Group		
NCR	none	
Supplementary Services Protocol	a	This is the National Public Network - AT&T
DS1 country protocol	1a	
UUI IE Treatment	service provider	if only the ASAI user data (without the shared OP code-length header) is to be included in the IE
UUI IE Treatment	shared	if all of the Information Forwarding user data associated with the incoming call is to be included with shared headers
Send UCID	Y (with UCID active for the system)	if UCID data is to be included in the shared UUI IE
CBC Usage Allocation	not required	the trunk group does not have to be two-way as a second call is not generated by the DEFINITY system with Transfer and Connect (as it is with NCT)

QSIG Standalone Path Replacement

Path Replacement (PR) is the process of routing an established call over a new, more efficient path, after which the old call is torn down leaving those resources free. Path Replacement offers you potential savings by routing calls more efficiently, saving resources and trunk usage.

Prior to R9.5, path replacement only occurred with QSIG Call Transfer. In R9.5, path replacement can exist as a stand-alone feature, or occur in the following additional cases:

- Call Forwarding by Forward Switching supplementary service, including the case where Call Diversion by Rerouting fails, and Call Forwarding is accomplished via forward switching
- Gateway scenarios where DEFINITY ECS, serving as an incoming or outgoing gateway, invokes PR to optimize the path between the gateways
- Calls in queue/vector processing even though no true user is on the call yet
- QSIG Lookahead Interflow call, Best Service Route call, or adjunct route

Alerts

Depending on the version of Call Management System (CMS) you are using, some calls can go unrecorded if you administer your system for Path Replacement in queue/vector processing. Please see your Avaya representative for more information.

CMS R3V9 and earlier versions cannot track a measured ACD call after path replacement has taken place. Beginning with R3V9.1, load r3v9ah, CMS does keep the record of the measured ACD call intact after path replacement takes place.

Detailed description

There are four enhancements to Path Replacement, some of which you administer on a switch-wide basis.

Path Replacement Stand-Alone

Release R9.5 creates a platform to allow other features to invoke Path Replacement removing the current dependence on call transfer only to invoke PR. This involves a new Manufacturer-Specific Information (MSI) value to invoke path replacement.

Path Replacement after QSIG Call Forwarding by Forward Switching

In Release 9.5, QSIG Call Forward by Forward Switching can invoke Path Replacement when the call is answered. For example, if a user places a call from switch A to switch B, and the call is forwarded from switch B to switch C, when the call is answered at switch C, path replacement can take place. Switch A and switch C can now negotiate the most efficient path.

Path Replacement involving gateways

Release 9.5 allows the gateway switch to requesting path replacement. The gateway can send a Path Replacement Propose when there is call diversion via forward switching in addition to call transfer. For this to happen, you must administer a Path Replacement Extension to serve as the local user extension sent in the PR Propose. See Administration for more information.

Path Replacement while in queue/vector processing

Path Replacement can also occur when a call is in queue/vector processing, but only if the call is transferred into a vector or there is call forwarding by forward switching into an answering vector. This also requires the Path Replacement Extension.

For Path Replacement to take place in vector processing, you must have a step in the vector that causes a CONNECT message to be sent. This could be a wait step with music, and announcement, or any step that causes this message to be sent.

Administration

In order to use gateways for Path Replacement, or to allow Path Replacement in queue/vector processing, you must administer certain system-wide parameters.

Before you start

Verify that the QSIG Supplementary Service with Rerouting and R9.5 Capabilities fields are enabled on the System-Parameters Customer-Options screen.

Find an unused extension in your system to use in the following procedure.

Procedure

In this example, we enable Path Replacement in queue/vector processing, and establish extension 2076 as the Path Replacement extension.

1. Type **change system-parameters features** and press RETURN.

   The Feature-Related System Parameters screen appears.

2. Move to the ISDN Parameters page.
3. Type **2076** in the QSIG Path Replacement Extension field.
4. Type **y** in the Path Replacement While in Queue/Vectoring field.
5. Press ENTER to save your changes.

QSIG/DCS Voice Messaging

QSIG/DCS Voice Mail Interworking allows you to have one voice mail server for a mixed DCS+ and QSIG network. With this enhancement, users see the same voice mail functionality (for example, greetings, message waiting indicators, and calling party information are available) on either QSIG or DCS+ network.

This capability is possible through the use of a DCS+/QSIG gateway switch.

Benefits

QSIG/DCS Voice Mail Interworking provides the following benefits:

— Network flexibility (voice mail integration of multi-vendor switches)

— DCS functionality without dedicated T1 (potentially lower cost)

— Vendor independence

— Feature transparency for served-user switches

Requirements

If using a new ISDN connection to implement this enhancement:

- ISDN-PRI trunk connectivity requires a DS1, C-LAN, or ATM board
- ISDN-BRI trunk connectivity requires BRI network or user board.

Administration that routes out over DCS+ must use UDP. It is not necessary to use UDP routing over QSIG trunks, but the administration setup at the interworking nodes must convert to UDP.

You can have a mixture of DCS, DCS+ and QSIG in the network. However, to achieve the interworking described here, you must use DCS+.

Detailed description

In Release 9.5, the gateway switch must be the demarcation point between the DCS+ and QSIG portions of the network.

R9.5 AUDIX enhancements

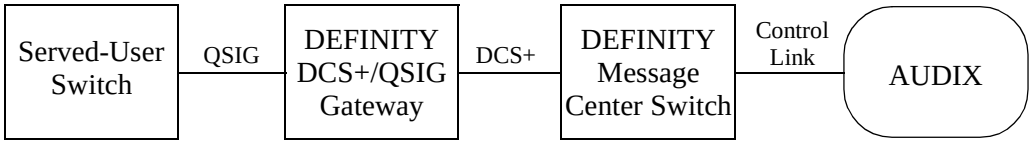


Figure 11. Interworking QSIG into DCS Centralized AUDIX

The interworking of DCS and QSIG Centralized AUDIX uses either TCP/IP link or BX.25 for the control link.

Each served-user node requires individual DCS AUDIX Non-Call Associated Temporary Signaling Connections (NCA-TSC) or QSIG NCA-TSCs from the gateway node to the message center.

The maximum number of nodes supported for QSIG voice messaging is 20, but a single node can provide multiple functionality. A node cannot be a message center for 20 nodes and a QSIG/DCS+ gateway for twenty nodes. The actual combined total cannot exceed 19.

R9.5 Serenade enhancements

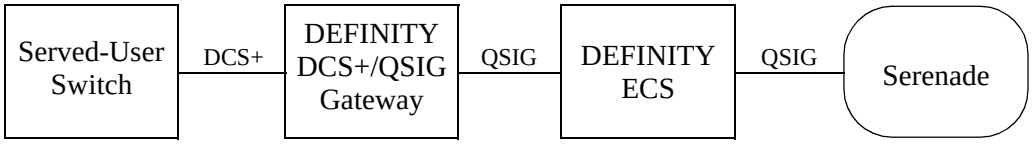


Figure 12. Interworking DCS+ and QSIG with Serenade

Administration

This section discusses the administration required to successfully interwork DCS+ and QSIG voice mail. It does not detail all the administration necessary to implement QSIG voice mail or DCS Centralized voice mail.

Before you start

Verify that Interworking with DCS is enabled on the System-Parameters Customer Options screen.

NOTE:
Even if the QSIG/DCS gateway switch is not a served-user switch, you must make a local entry in the MWI-Prefixes screen to form a complete party number for routing to the gateway.

Interworking QSIG Messages and DCS MWI Messages

There are two scenarios for interworking QSIG and DCS:

- DCS (served-user)<-->DCS/QSIG gateway<-->QSIG (message center)
- QSIG (served-user)<-->DCS/QSIG gateway<-->DCS (message center)

NOTE:
Since Message Waiting Indication is signaled in both directions, you must administer *both* of the following new screens for each scenario.

Using centralized voice mail in a mixed network

Centralized voice mail and message waiting indication for activation, deactivation and interrogation is interworked between DCS and QSIG. This section only details modifications to existing DCS and QSIG administration to achieve the desired interworking.

Enabling centralized voice mail

When calls cover to voice mail between DCS and QSIG nodes, you can administer centralized voice mail functionality (calling and called user information) by activating DCS/QSIG Interworking on the route patterns you use for these calls.

For example, to enable DCS/QSIG Interworking for route pattern 30, complete the following steps:

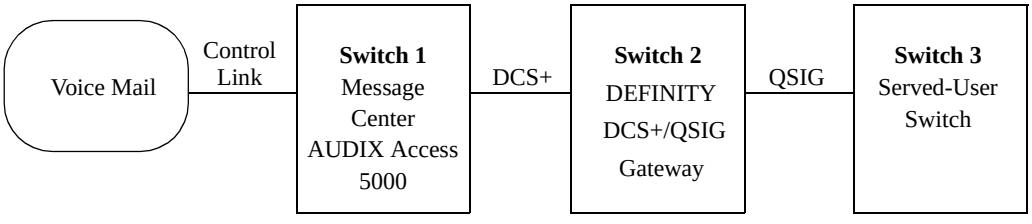
1. Type **change route pattern 30** and press RETURN.

   The route screen appears.

2. In the DCS/QSIG Intw field, type **y**.
3. Press ENTER to save your changes.

Message Waiting Indication - QSIG Message Center

The administration in this section applies to the following scenario:



In this scenario, QSIG MWI activation/deactivation messages (originated from the message center node) are converted from QSIG to DCS messages and transported over an administered NCA-TSC link to the served-user switch. The DCS audit messages (originated from the served-user switch) are converted to QSIG interrogations and transported on the QSIG TSC link to the message center node.

Administration at the message center node

You must make an entry on the Message Waiting Indication Subscriber Number Prefixes screen so that switch 3 can route voice mail messages for switch 3 through the gateway node. If the message center also serves switch 2, you need another entry for switch 2 to route voice mail messages for switch 2 to the gateway (in this case, the gateway node is also a served-user node).

1. Type **change isdn mwi-prefixes** and press RETURN.
2. In the fields on line 3 (Mach ID 3), enter the appropriate Inserted Digits and Routing Digits.
3. In the AUDIX Mach ID field, enter the number of the AUDIX system that serves Switch 3.

   This must match the number assigned to this machine in AUDIX administration.

4. Repeat steps 2 and 3 for Switch 2, if necessary.
5. Press ENTER to save your changes.

Administration at the gateway node

When administering the Signaling Group screen for the AUDIX NCA-TSC link to switch 3 at the gateway, you must enter **qsig-mwi** in the application field. There are no changes required for the administered DCS NCA-TSC connection to switch 3.

The MWI Prefixes screen must have an entry for switch 2 so that complete QSIG party numbers can be formed for the DCS subscribers that send audit messages from the DCS served-user (switch 3).

You must perform the following steps on the DCS to QSIG TSC Gateway screen for switch 3:

1. Type **change isdn dcs-qsig-tsc-gateway** and press RETURN.
2. In the Mach ID field, type **3**.
3. In the Sig Grp field, type the Signaling group assigned to the administered AUDIX NCA-TSC connection to the served-user (switch 3).
4. In the TSC Index field, type the NCA-TSC index for the AUDIX NCA-TSC connection to switch 3.
5. In the Voice Mail Number field, type the complete number for the gateway to route to the AUDIX access number at the message center (5000).

   This is required to establish a link to the message center switch for DCS subscriber audits/interrogations.
6. In the AAR/ARS Access Code field, type the routing access code to route the administered Voice Mail Number.
7. Press ENTER to save your changes.

Next, you must enter all the subscribers' numbers at the DCS served-user (switch 3) on the QSIG to DCS TSC Gateway screen.

For example, if all DCS subscribers on the served-user (switch 3) have 4 digit extensions beginning with 3 and the message center uses a 7digit number such as 300 3xxx to route through the gateway to switch 3, you need to perform the following steps:

1. Type **change isdn qsig-dcs-tsc-gateway** and press RETURN.
2. In the Subscriber Number field, type **3xx3xxx**.
3. In the Sig Grp field, type the signaling group number of the administered AUDIX NCA-TSC to switch 3.

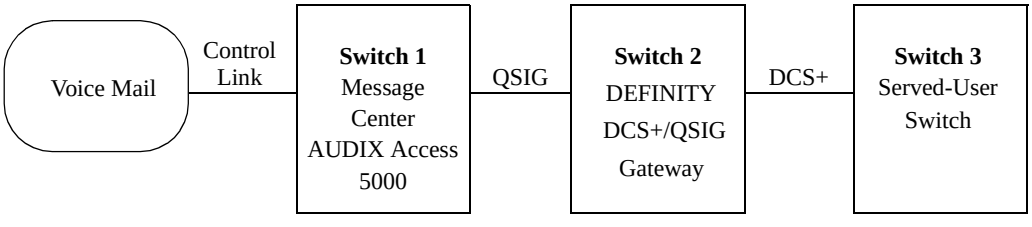
4. In the TSC Index field, type the NCA-TSC index in the signaling group for the AUDIX NCA-TSC to switch 3.
5. Press ENTER to save your changes.
6. Type **change system-parameters features** and press RETURN.
7. In the MWI - Number of Digits Per Voice Mail Subscriber field, type the appropriate number supported by AUDIX.
8. Press ENTER to save your changes.

Administration at the served-user node

The AUDIX and DCS administered NCA-TSCs must terminate to extensions on the gateway node. DEFINITY ECS interworks messages received on DCS AUDIX-administered NCA-TSCs and QSIG NCA-TSCs, *not* the actual TSC connections.

Message Waiting Indication - DCS Message Center

The administration in this section applies to the following scenario:



In this scenario, AUDIX status update messages (originated from the message center node and received on an administered DCS AUDIX NCA-TSC link) are converted from AUDIX to QSIG MWI messages and transported over a QSIG NCA-TSC link to the served-user switch. The QSIG interrogation messages (originated from the served-user node) are converted to DCS AUDIX audit messages and transported on the AUDIX NCA-TSC to the message center node.

Administration at the message center node

The AUDIX and DCS administered NCA-TSCs must terminate to extensions on the gateway node. We interwork messages received on DCS AUDIX NCA-TSCs and QSIG NCA-TSCs. We do not interwork the actual TSC connections.

Administration at the gateway node

The administered AUDIX NCA-TSC link to switch 1 (signaling group screen) at the gateway must be administered with application qsig-mwi. There are no changes required for the administered DCS NCA-TSC connection to switch 1.

The isdn mwi-prefixes screen must have an entry for switch 3 for routing AUDIX messages for switch 3 to the served-user node.

The DCS to QSIG TSC Gateway screen must have a subset of fields administered for switch 3:

1. Type **change isdn dcs-qsig-tsc-gateway** and press RETURN.
2. In the Mach ID field, type **3**.
3. In the Sig Grp field, type the Signaling group assigned to the administered AUDIX NCA-TSC connection to the served-user (switch 1).
4. In the TSC Index field, type the NCA-TSC index for the AUDIX NCA-TSC connection to switch 1.
5. Press ENTER to save your changes.

The QSIG to DCS TSC Gateway screen must have an entry for all subscribers' numbers at the QSIG served-user (switch 3) that is interrogating. For example, if all QSIG subscribers on the served-user (switch 3) have 4 digit extensions beginning with 3 and the served-user uses a 7digit number such as 300 3xxx to route through switch 2, you need to perform the following steps:

1. Type **change isdn qsig-dcs-tsc-gateway** and press RETURN.
2. In the Subscriber number field, type **3xx3xxx**.
3. In the Sig Grp field, type the signaling group number of the administered AUDIX NCA-TSC to switch 1.
4. In the TSC Index field, type the NCA-TSC index in the signaling group for the AUDIX NCA-TSC to switch 1.
5. Press ENTER to save your changes.
6. Type **change system-parameters features** and press RETURN.
7. In the MWI - Number of Digits per Voice Mail Subscriber field, type the appropriate number supported by AUDIX.
8. Press ENTER to save your changes.

Administration at the served-user node

The MWI-Prefixes screen must have an entry for switch 3 to create complete party numbers for interrogations. The qsig-mwi hunt group must have the routing digits and AUDIX access number administered such that the QSIG NCA-TSC routes through the gateway node.

Related topics

For more information about DCS+, QSIG, and QSIG Centralized Voice Mail, see *DEFINITY ECS Administration for Network Connectivity*.

Voice Announcements over LAN (VAL)

8

Introduction

VAL introduces the TN2501AP, a new integrated announcement circuit pack that

- offers up to 1 hour of announcement storage capacity.
- requires shorter backup and restore times.
- is firmware downloadable.
- plays announcements over the TDM bus, similar to the TN750C.
- has 33 ports, including
  - — 1 dedicated telephone port for recording and playing back announcements (port number 1).
  - — 1 ethernet port (port number 33).
  - — 31 playback ports (ports 2–32).
- 10/100 Mb ethernet interface, allowing announcement and firmware file portability over your LAN (FTP server functions).
- supports .wav announcement files (see ''Recording announcements'' on page 159).
- works in r, si, csi, DEFINITY ONE, and Avaya IP600 models.

Important File Specifications

Voice Announcement over LAN (VAL) requires that announcement files are in the following .wav formats:

- CCITT A-Law or CCITT µ-Law companding format (do not use PCM)
- 8kHz sample rate
- 8-bit resolution (bits per sample)
- Mono (channels = 1)

You must convert other wave (.wav) file formats to those listed above. Telephone access creates the correct file formats.

Caveats

Remember the following points when using the TN2501AP integrated announcement circuit pack for the first time or when replacing the TN750C circuit pack:

- Despite the feature name, announcements are not played over the LAN but can be transferred to and from the TN2501AP circuit pack over the LAN.
- You cannot save or restore announcements to a TN2501AP circuit pack to/from
  - — a TN750C circuit pack.
  - — flash cards.
  - — tape.
  - — magneto optical disks.

  See ''Recording announcements'' on page 159 for information about converting a professionally-recorded announcement to a VAL-compatible file format.

Detailed description

The following list details some of the VAL features and functionality:

- Customer option screen defines the purchased Right-to-Use (RTU) storage capacity and the maximum number of VAL circuit packs per system.
  - — **y** = Enhanced offer, or 60 minutes (full) storage capacity, multiple integrated announcement circuit packs in the system, and the announcement capacities in Table 11.
  - — **n** = Standard offer, or 10 minutes storage capacity, only 1 circuit pack in the system, and the announcement capacities in Table 11.

- Available with
  - — Category A (ECS and ProLogix Solutions)
  - — Category B (BCS and GuestWorks)
- Firmware update files download directly over the LAN through the TN2501AP's 10/100Mb ethernet interface, not through the TN799 C-LAN circuit pack.
- 10/100MB ethernet LAN connection through the Backplane Adapter.
- Up to 31 ports, with a dedicated port for recording/playing back announcements through a system telephone.
- A separate announcement management tool, VAL Manager, provides user interface (add, change, delete, save, and restore) from a PC.

Capacities

The following table shows the capacities of the TN2501AP integrated announcement circuit pack. Release 9.5 software provides Voice Announcements Measurements that generate detailed reports about the announcement usage for all integrated and non-integrated announcements.

Table 11. TN2501AP and platform capacities

	Models	
Capacity	**r**	**si, csi DEFINITY ONE Avaya IP 600**
Maximum number of announcement circuit packs (see note below)	1-10 (Enhanced)	1-5 (Enhanced)
	1 (Standard)	1 (Standard)
Maximum number of integrated announcement circuit packs (see note below)	10	5
Number of announcements per system	1,000	128
Number of announcements per circuit pack	256	128
Recording time	60 min. (Enhanced) 10 min. (Standard)	60 min. (Enhanced) 10 min. (Standard)

Continued on next page

Table 11. TN2501AP and platform capacities — *Continued*

Capacity	Models	
	r	si, csi DEFINITY ONE Avaya IP 600
Playback ports	31	31
Telephone access port (record and playback)	1	1
Ethernet port	1	1

NOTE:
You can use a combination of TN2501AP (VAL) or TN750B or C integrated announcement circuit packs:

- only 1 TN750B circuit pack
- multiple TN750C circuit packs
- multiple TN2501AP (VAL) circuit packs

up to the system limit. TN750B or C circuit packs are not counted as VAL circuit packs, but are counted in the total number of integrated announcement circuit packs allowed in each platform.

The Maximum VAL boards field (see "System Parameters Customer Options screen (page 4)" on page 314) defines the maximum number of VAL circuit packs allowed in the system (0-5). If TN750B or C announcement circuit packs are also installed, these boards are counted first against the system limit.

Example
If the Maximum VAL boards? limit is 3, and 3 TN750Cs are already active in a system with a platform limit of 5 integrated announcement circuit packs, only 2 VAL circuit packs become active.

Configurations

The following figure shows the configuration options for the TN2501AP (VAL) circuit pack within a system.

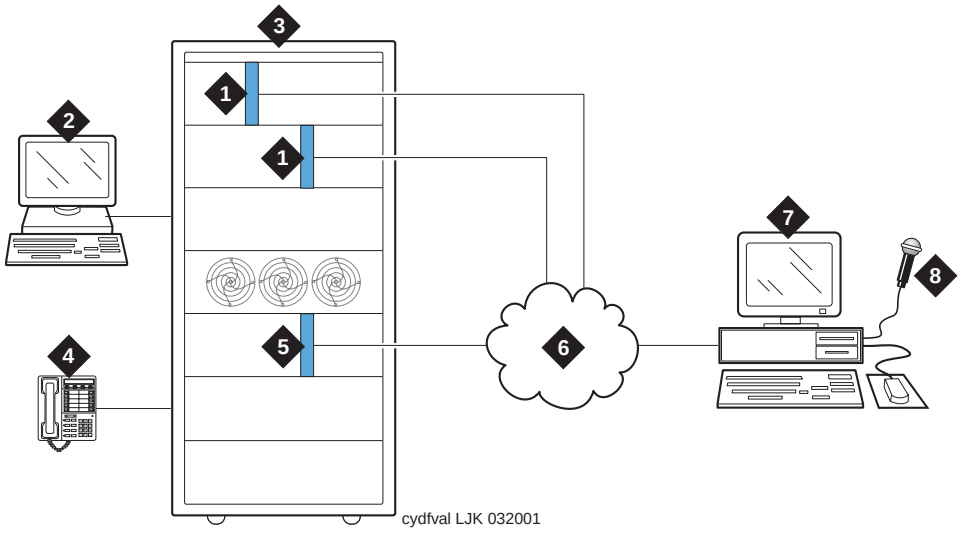


Figure Notes

1. TN2501AP VAL announcement circuit pack
2. System access terminal (SAT)
3. Switch
4. Phone for recording announcements
5. TN799C (C-LAN) is required when using IP SAT or VAL Manager.
6. Your LAN (See LAN cable)
7. computer or remote recording studio for
   - recording and storing announcements (see Recording announcements)
   - FTP client application
   - VAL Manager application (PC only)
8. Microphone

Figure 13. VAL configuration options

Hardware specifications

The following table contains a list of the required VAL hardware.

Part	Number	Comcode
TN2501AP	1	108772583
Backplane Adapter (Label reads IP Media Processor)	1	848525887

Circuit pack ID - usage information

TN2501AP

Announcement circuit pack records and stores announcements that can be played back on demand as part of a calling feature. Depending on the purchased Right-to-Use (RTU) settings, each circuit pack provides a total capacity of 60 minutes (enhanced) or 10 minutes (standard), 1 10/100MB ethernet port, 1 dedicated telephone access port, and 31 playback ports. The TN2501AP is compatible with .wav files, uses filenames for announcements, and improves management of integrated announcements over your LAN.

Faceplate LEDs

The following figure shows the 9 LEDs on the TN2051AP faceplate. Descriptions of each LED are in Table 12.

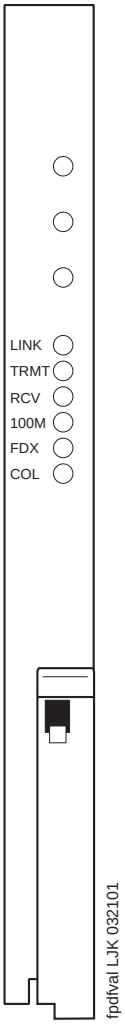


Figure 14. TN2501AP faceplate LEDs

The following table lists the TN2501AP faceplate LEDs, the type of behavior (on, off, flashing, or intermittent), and a description of the condition.

Table 12. TN2501AP LEDs

LED	Behavior	Description
Red	On solid	Circuit pack failure or a major or minor on-board alarm
Green	On solid	Firmware is self-downloading to the circuit pack or testing in progress.
Amber	On solid	Firmware is self-downloading to the circuit pack. **CAUTION:** *You can lose the resident firmware image file if you reset the circuit pack during firmware download. If this happens, FTP a new firmware image file to the VAL circuit pack and perform the Firmware download procedure again.*
Amber	Fast flash (100ms on/ 100ms off)	Occurs during circuit pack insertion or circuit pack reset which the announcement files are being copied from FLASH to RAM. If you reset the circuit pack during this time, your announcement files remain intact.
Amber	Slow flash (200ms on/ 200ms off)	Flashes during autosave while copying announcement files from RAM to FLASH. **CAUTION:** *You can lose the announcements on the circuit pack if you reset it during an autosave.*
LINK	On/off	Active ethernet link
TRMT	Intermittent	Transmit
RCV	Intermittent	Receive
100M	On/off	Off = 10MB ethernet connection
		On = 100MB ethernet connection
FDX	On/off	Off = half-duplex connection
		On = full duplex connection
COL	On/off	Off = no collision detected
		On = collisions detected

Other hardware

To establish LAN connections the TN2501AP circuit pack requires a

- Backplane Adapter that attaches to the Amphenol connector on the back of the cabinet, corresponding to the TN2501AP integrated announcement circuit pack slot.
- LAN cable that attaches to the Backplane Adapter.

Backplane Adapter

The following figure shows the Backplane Adapter (label reads IP Media Processor).

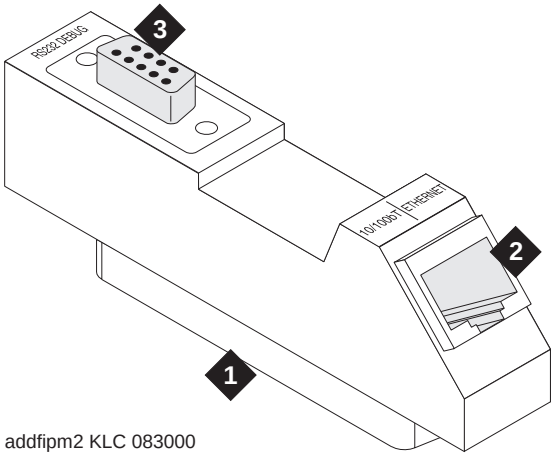


Figure Notes

1. Amphenol connector attaches to the back of the switch cabinet, corresponding to the TN2501AP circuit pack slot.
2. RJ-45 LAN cable connection
   - 10 Mbps uses Category 3 cable.
   - 100 Mbps uses Category 5 cable.
3. This connector is not used for VAL.

Figure 15. Backplane Adapter (Comcode 848525887)

LAN cable

The TN2501AP circuit pack does not include cables to connect the circuit pack to your LAN. The following table lists the cable category and connection port.

Ethernet connection speed	Cable	Connection description
10 Mbps	Category 3	Connects through the RJ45 jack (note #2 in Figure 15),
100 Mbps	Category 5	Connects through the RJ45 jack (note #2 in Figure 15),

Installing the TN2501AP Circuit Pack

Before you start

Ensure that you have the required hardware (see ''Hardware specifications'').

Switch administration before hardware installation

Before inserting the circuit pack into a carrier, an Avaya representative must administer the VAL customer options. Before installing the hardware, check your system for the following administration:

1. At the SAT, type **display system-parameters customer-options** and press RETURN.

   The System Parameters Customer Options screen appears.

2. Verify that the G3 Version field is set to **V9**.
3. Verify that Maximum VAL Boards field is set to 1 or greater, up to the maximum number allowed in the system.

   NOTE:
   Any value greater than the default (1) means that you have the Enhanced offer.

4. Move to page 4.
5. Verify that the R9.5 Capabilities field is set to **y**.

6. Verify that the VAL Full 1-Hour Capacity? field is set for the offer that you purchased:
   - **n** for Standard offer (10 minutes storage time) and only 1 circuit pack.
   - **y** for Enhanced offer (1 hour storage time) and multiple circuit packs.

Hardware installation

WARNING:
To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.

1. Remove connector (if any) from the back of the switch cabinet corresponding to the TN2501AP circuit pack slot.
2. Insert the circuit pack into any port slot and close the latch securely.

   At first, both the red and green LEDs are on steady, then the green LED flashes. If there are announcements on the circuit pack, the amber LED flashes while the announcements are copied from FLASH to RAM. After approximately 3-5 minutes, all of the top 3 LEDs go out, although this time is longer if there are announcements already recorded on the circuit pack.

   NOTE:
   If the TN2501AP or TN750 circuit packs are at the system limit and you insert a VAL circuit pack, the red LED on that circuit pack stays on, indicating that the system does not accept it.

3. Connect the Backplane Adapter (Figure 15) to the Amphenol connector on the back of the switch cabinet, corresponding to the TN2501AP circuit pack slot.
4. Connect the LAN cable to the RJ-45 connector on the Backplane Adapter.

Switch administration after hardware installation

After you have installed the hardware, to support an FTP session you must

- Administer the IP connections.
- Test the IP connections.

Administer the IP connections

Use the following SAT commands to ensure that the system recognizes the TN2501AP circuit pack and to administer its IP connections:

- list configuration board
- change node-names ip
- change ip-interfaces
- add data-module
- add ip-route (optional, depending on network)

list configuration board

Use this command to ensure that the switch recognizes the TN2501AP circuit pack after it is latched in the carrier slot.

1. At the SAT, type **list configuration board *board-location*** and press RETURN.

   The System Configuration report appears.

```
list configuration board 1c08                                          SPE A

                              SYSTEM CONFIGURATION

Board                                                       Assigned Ports
Number    Board Type              Code     Vintage    u=unassigned t=tti p=psa

01C08     VAL-ANNOUNCEMENT        TN2501AP HW00 FW001 01 02 03 04 05 06 07 08
                                                      09 10 11 12 13 14 15 16
                                                      17 18 19 20 21 22 23 24
                                                      25 26 27 28 29 30 31 32
                                                      U



Command successfully completed
```

Screen 5. System Configuration screen (list configuration board)

2. Verify the following field values:
   - Board Type shows **VAL-ANNOUNCEMENT**
   - Code is **TN2501AP**

change node-names ip

Use this command to administer the circuit pack's node name.

1. At the SAT, type **change node-names ip** and press RETURN.

   The IP Node Names screen appears.

```
change node-names ip                                        Page   1 of   1   SPE A
                                   IP NODE NAMES
    Name                IP Address            Name                IP Address
Tiki                172.22 .22 .79                                .   .   .
cdr_1               192.168.22 .63                                .   .   .
default             0  .0  .0  .0                                 .   .   .
iolan               172.22 .22 .68                                .   .   .
lulu_cl1            172.22 .22 .71                                .   .   .
lulu_cl2            172.22 .22 .77                                .   .   .
riki                172.22 .22 .20                                .   .   .
rsat4               172.31 .5  .49                                .   .   .
rsat5               172.23 .23 .40                                .   .   .
st10clan#1          192.168.22 .21                                .   .   .
st12clan            172.22 .22 .67                                .   .   .
st12prowler#1       172.22 .22 .75                                .   .   .
VAL#1               172.22 .22 .120                               .   .   .
                       .   .   .                                  .   .   .
                       .   .   .                                  .   .   .
                       .   .   .                                  .   .   .
( 12 of 12  administered node-names are displayed)
Use 'list node-names' command to see all the administered node-names
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name
```

Screen 6. IP Node Names screen (change node-names ip)

2. Type a unique name in the Name field.

   NOTE:
   This name is recognized only within the switch, and does not need to match the node name on your network.

3. Enter the IP Address.

   You can get this information from the network manager.

4. Press ENTER to save the changes.

change ip-interfaces

Use this command to administer an IP interface, which associates the circuit pack with an IP address.

1. At the SAT, type **change ip-interfaces** and press RETURN.

   The IP Interfaces screen appears.

```
change ip-interfaces                                        Page   1 of   6   SPE A

                                    IP INTERFACES

Enable                                                                          Net
Eth Pt Type   Slot  Code Sfx Node Name       Subnet Mask     Gateway Address Rgn
   y   C-LAN  01C16 TN799  C st12clan        255.255.0  .0   172.22 .22 .254 1
   y   MEDPRO 01E04 TN2302   st12prowler#1   255.255.0  .0   172.22 .22 .254 1
   y   VAL    01C08 TN2501   VAL#1           255.255.0  .0   172.22 .22 .254
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
   n                                        255.255.255.0      .   .   .
```

Screen 7. IP Interfaces screen (change ip-interfaces)

2. Set the Enable Eth Pt field to **y**.
3. Set the Type field to **VAL**.
4. Type the circuit pack location in the Slot field (UUCSS). In the example above the slot is 01C08, meaning Cabinet 1, carrier C, slot 8.

   If a TN2501AP circuit pack is not at this location when you submit the screen, the system prompts you to enter a VAL circuit pack location.
5. The Node Name field is the same as the one previously administered. (See *change node-names ip*)

   Tip:
   If you press Help, a list of administered node names appears (including the name you administered with the change node-names ip command), and you can select from the list.

6. Set the Subnet Mask field according to your network requirements.

7. Gateway Address is usually the same as the TN2501AP circuit pack's IP address, usually with the fourth octet changed. Be sure to set this address according to your network requirements.
8. Leave the Net Rgn (Network Region) field at its default value. This field is not used for VAL.
9. Press ENTER to save the changes.

add data-module

Use this command to administer the data module that is associated with the TN2501AP ethernet port.

1. At the SAT, type **add data-module *extension/next*** and press RETURN.

   The Data Module screen appears.

```
add data-module 30006                                   Page   1 of   1   SPE A
                                DATA MODULE

  Data Extension: 30006           Name: VAL#2 Data Module
            Type: ethernet
            Port: 1b0333
            Link: 5




Network uses 1's for Broadcast Addresses? y
```

Screen 8. Data Module screen (add data-module *extension*)

2. Set the Type field to **ethernet**.
3. Set the Port field to correspond to the circuit pack location.

   In the example above, 1b0333 means Cabinet 1, Carrier B, Slot 3, Port 33.

   NOTE:
   The port number (final two digits) is always **33** for the TN2501AP circuit pack.

4. Set the Link field to an unassigned or next-available link number.
5. Set the Network uses 1's for Broadcast Address? field according to the your network requirements.
6. Type a unique name in the Name field.
7. Press ENTER to save your changes.
8. If your system uses IP routing, continue with the add ip-route section.

   Otherwise, go to the Test the IP connections section.

add ip-route

Use this command to administer IP routes to the TN2501AP circuit pack. This administration is optional.

Test the IP connections

Use the **ping** and **status link** commands to test the new IP connections that you have administered.

Backing out of an upgrade

In the event that problems occur during an upgrade, use the procedure below to restore the system to its previous functionality.

1. Save translations before the upgrade.
2. Ensure that you have the current software load on its original media.
3. If problems occur during the upgrade, back out and return to the your pre-upgrade software load.

Announcement Administration

Introduction/Overview

You can administer VAL announcements through

- a PC running the VAL Manager application.
- Avaya Site Administration
- the System Access Terminal (SAT).

You can record VAL announcements

- from a system phone.
- on a computer or any device that supports recording .wav files in a VAL-compatible format (CCITT µ-Law or A-Law, 8hHz, 8-bit mono).
- at a professional recording studio.

  See ''Professional or computer recordings'' on page 160 for more information about setting the recording parameters.

VAL administration options

The following table shows the VAL administration tasks and which section of this document discusses each task.

NOTE:
Full VAL functionality means that you can use a variety of administration methods listed in the following table's columns. VAL Manager was designed for efficiency and ease of use. The TN2501AP circuit pack was also designed to support other methods of administration. Use VAL Manager as the standard means of administration, and FTP and SAT as backup methods.

Table 13. VAL administration tasks

	Methods		
Tasks	**VAL Manager**	**System Access Terminal (SAT)**	**FTP**
Administering an announcement	X	X	
Deleting an announcement	X	X	X
Saving or backing up an announcement	X		X
Restoring an announcement	X		X
Moving announcement files or administration	X	X	X
Recording announcements		Professional or computer recordings or system phone	

VAL Manager

VAL Manager is a standalone application that allows you to copy announcement files and DEFINITY announcement information to and from a DEFINITY system over a LAN connection.

VAL Manager offers the following basic features:

- Simplified administration to add, change, and remove DEFINITY announcement information.
- The ability to back up and restore announcement files and information to and from a DEFINITY system.
- The ability to view the status of announcement on the VAL circuit pack in any DEFINITY system.

For system requirements see VAL Manager Release 1.0 *Installation and Configuration* (555-233-223).

System Access Terminal (SAT)

These are the tasks that you can perform from a System Access Terminal (SAT):

- Administering an announcement using the SAT
- Recording announcements (with an option to use a system phone)
- Deleting announcements (with an option to use a system phone)

Administering an announcement using the SAT

You must administer the announcement(s) on the TN2501AP circuit pack before you can record the announcement.

1. Type **change announcements** and press RETURN.

   The Announcements/Audio Sources screen appears.

```
change announcements
                          ANNOUNCEMENTS/AUDIO SOURCES

Ann.
No.  Ext.  Type       COR TN  Name                          Q QLen Pro Rate Port

1    1111  integrated 1   1   Welcome                       n N/A  n   64   01A11
2    1112  integrated 1   1   All_busy                      n N/A  n   64   01A12
3    1234  integ-rep  1   1   Closed                        n N/A  n   64   01A11
4                     1   1                                 n
5                     1   1                                 n
6                     1   1                                 n
7                     1   1                                 n
8                     1   1                                 n
9                     1   1                                 n
10                    1   1                                 n
11                    1   1                                 n
12                    1   1                                 n
13                    1   1                                 n
14                    1   1                                 n
15                    1   1                                 n
16                    1   1                                 n
```

Screen 9. Announcements/Audio Sources screen (change announcements)

NOTE:
This screen shows all integrated announcements. Be careful to note the circuit pack location in the Port field of each announcement.

2. Type the extension number in the Ext. field.
3. Set the Type field to either
   - **integrated** for announcements that are stored on the integrated announcement circuit packs. This type is recommended for ACD/vectoring and VDN of Origin announcements.
   - **integ-rep** for repeating automatic wakeup announcements (used with the **multi-integ** hospitality announcement type setting).

   Refer to Appendix A, Recorded Announcements, in *DEFINITY ECS Release 9.5 Guide to ACD Call Centers* (555-233-503) for more information about these options.
4. Set the COR field to the appropriate value.
5. Set the TN field to the appropriate value.
6. Type a unique, alphanumeric name (maximum 27 characters) in the Name field *with no unacceptable characters or blank spaces*:

NOTE:
Do not use '.', '/', ':', '*', '?', '<', '>', '\', '.wav' or spaces in the filename. The system adds the .wav file extension automatically. You do not see the .wav file extension on switch announcement screens.

7. Set the Q field

   - **b** (barge-in) means that callers are connected to an announcement anytime after it has begun playing.
   - **n** means that the announcement does not queue and callers are connected at the beginning of the announcement.
   - **y** means that the announcement queues to wait for an available port when all are ports are busy. Callers are connected at the beginning of the announcement. Call Centers should always use this option.

   NOTE:
   The same non-barge-in announcement can be played through more than one port (or all ports) of an integrated circuit pack. The initial request to play an announcement selects an available port on the board that the announcement resides. If there are additional requests to play the announcement while it is playing on another port(s), another port is selected. If all ports are busy, new requests to play announcements go to the integrated announcement system queue (Q field must be **y**, otherwise, the request to play is denied and processing continues without the caller hearing the announcement). When a port becomes available, all queued calls (up to the platform calls connected limit) are connected at the same time to hear the announcement play from the beginning.

   A barge-in announcement starts playing when first requested and continues playing through a port, repeating until there are no more requests. Call processing simultaneously connects calls to the playing barge-in announcement. Each call remains connected until the requesting feature operation removes the call (for example, wait step times out). Barge-in type announcements never select another port to play the same announcement once it is playing on a specific port.

   Refer to *DEFINITY ECS Release 9 Administrator's Guide* (555-233-506) for more information about these options.

8. The QLen field is display-only and is not used for integrated announcements.

9. Set the Pro (file protection) field to **n** (no file protection) for now.

   Later, when there is an actual announcement file on the circuit pack, you can change this field to **y (**file cannot be overwritten or modified).

10. Set the Rate for all VAL circuit packs to **64** (Kbps).

    NOTE:
    This field automatically administers as 64K when you set the Type field to **integrated**.

11. Type the location of the VAL circuit pack in the Port field (UUCSS). In our example the slot is 01A11, meaning Cabinet 1, carrier A, slot 11.
12. Repeat Steps 2-11 for each announcement that you want to record.
13. Press ENTER to save the changes.

NOTE:
The previous steps have only created the administered name for the announcement file. You fill the file space when you record an announcement or transfer an announcement file to the circuit pack through an FTP session.

To check that the announcement administration is correct:

1. At the SAT, type **list integrated-annc-boards** and press RETURN.

Recording announcements

You can record an announcement for callers to hear when they dial a specific extension or as part of call vectoring. You can use the same steps to change an existing announcement.

Before you start

- Ensure that the announcement administration is complete before proceeding (see "Administering an announcement using the SAT" on page 156).
- If you are replacing a TN750C announcement circuit pack with the new TN2501AP,
  - — get a list and description of the announcements stored on the TN750C circuit pack.
  - — re-record the announcements on a computer or at a professional recording studio as .wav files (CCITT µ-Law or A-Law, 8kHz, 8-bit mono), so that they are ready to transfer to the new announcement circuit pack after it is installed and administered.

CAUTION:
Before you remove a TN750A or B circuit pack from its carrier, ensure that you have backed up the announcements that are stored on it. Once you remove the circuit pack from the carrier, power is lost along with the announcements.

Replacing old announcement circuit packs with the new TN2501AP circuit pack requires that you

— remove previous announcement administration

— record new announcements for the TN2501AP

— re-record any announcements currently resident *on the TN750 circuit packs that you are replacing*. You cannot transfer or restore TN750 announcements from flash card, tape, or optical disk to the TN2501AP.

Instructions

You can record or convert announcements in many ways:

- Professional or computer recordings
- Announcement file conversions
- Recording new announcements at a computer
- Recording announcements at a system phone

Professional or computer recordings

In order to be compatible with the TN2501AP circuit pack and the DEFINITY system, announcement recordings must have the following parameters:

- CCITT A-Law or CCITT µ-Law companding format (do not use PCM)
- 8kHz sample rate
- 8-bit resolution (bits per sample)
- Mono (channels = 1)

Announcements that are recorded in this format occupy 8K Bytes per second of file space. For example, a 10-second announcement creates an 80KB wave file.

NOTE:
The µ-Law (also referred to as Mu-Law) companding is used in the United States, while A-Law is used internationally. Ensure that you use the companding format specified on the System Parameters Country Options screen.

Announcement file conversions

- If you need to convert an announcement file to the required format, you can do so in a sound recording utility application.
- If you are sharing recordings in an enterprise (multi-site) environment with DEFINITY ECS and DEFINITY ONE systems, you must convert announcement files for use on either system.
- If your original announcement file was recorded at CD-quality level (44.1 kHz, 16 bits/sample), converting the file to the VAL formats may degrade the voice quality. We suggest that you re-record the announcement with the required VAL formats.

To convert a previously-recorded or a DEFINITY ONE-compatible announcement file to DEFINITY ECS-compatible formats:

1. Open the sound recording application on your computer (for example, Microsoft Windows Sound Recorder).
2. Open the file you want to convert.
3. Check the file properties to see if you need to change the parameters.
4. If you need to change the recording parameters, look for a conversion tool (some have a Convert Now option, others use Save As).
5. Change the file parameters to those listed above.

NOTE:
In some applications, assigning the format (for example, CCITT μ-Law) sets the remainder of the default parameters. Check each parameter carefully, perhaps changing default settings to match the parameters listed above. CCITT μ-Law or A-Law can be referred to as ITU G.711 μ-Law or ITU G.711 A-Law, respectively.

DEFINITY ONE has a recording conversion utility that supports file formats that are similar to those required by VAL. However, the conversion utility can only read PCM-format announcement files.

If you are converting an announcement file for use on DEFINITY ONE systems:

1. If the file's companding format is already PCM, go to Step 5.

   If you are not sure what the file format is, proceed with Step 2.
2. At a computer, open the sound recording application (for example, Microsoft Windows Sound Recorder).
3. Open the file that you want to convert.

4. Save (Convert Now or Save As) the announcement with these formats:
   - Format: PCM
   - Bits/Sample: 8
   - Sample Rate: 8kHz
   - Mono (channels = 1)

   NOTE:
   The DEFINITY ONE recording conversion utility requires that announcement files are in PCM format.

5. Open the file in DEFINITY ONE's recording conversion utility.
6. Convert the file to SSP format.

Recording new announcements at a computer

To record an announcement at a computer:

1. At the computer, open the application that you use to record .wav files.
2. Set the recording parameters.
3. Record the announcement by speaking into a microphone connected to the computer.
4. Play the announcement back at the computer before transferring the file to the VAL circuit pack.

Recording announcements at a system phone

Before you start

- You must set up the initial announcement administration before you can record it (see "Administering an announcement using the SAT" on page 156).
- Look up the feature access code (FAC) for recording announcements.
  1. At the SAT, type **display feature-access-codes** and press RETURN.

     The Feature Access Codes screen appears.
  2. Find the Announcement Access Code field and note the code.

Instructions

To record the announcement named Closed (announcement #3 in Screen 9) to extension 1234 (or change the announcement already recorded there), you must use a phone with console permissions. In this example, the announcement feature access code is *05.

To record or change the announcement from a system phone:

1. Dial ***05** from a phone or console.

   You hear dial tone.

2. Dial the announcement extension **1234**.

   You hear dial tone indicating that your announcement session has started.

   or

   You hear a fast busy signal (reorder tone) indicating that

   - another announcement session is in progress.
   - a **save** or **restore** command is in progress.

   If the telephone session port is in use, then the you hear a reorder tone followed by silence. This indicates that the port is reserved for an announcement session. Redial the FAC and extension every 45 seconds to gain access to the port.

3. Dial **1** to begin recording.

   - If you hear a **beep**, begin speaking to record the announcement.
   - If you hear a **stutter dial tone**, this means that the circuit pack memory is more than 90% full or an existing announcement is playing. Even if you hear stutter dial tone, begin speaking to record the announcement. If the circuit pack memory becomes full during recording,

     — you hear a **fast busy signal** (reorder tone).

     — the system drops the announcement access session.

     — the system does not retain the announcement.

   - If you hear intercept tone (French siren), then an existing message is administered as read-only (Pro field is **y** on the Announcements screen).

4. If you are using a digital phone, press **#** to end the recording. Do not hang up.

   Pressing **#** returns dial tone, after which you can

   - playback the announcement (go to Step 5).
   - delete or re-record the announcement (see Step 7).

   If you are using an analog phone, hang up. If your analog phone is not connected through lineside DS1, the system records an electrical click at the end of the recording.

5. To listen to the announcement that you just recorded, do not hang up. Press **2**.

   The recording plays back through the handset.

6. If you are satisfied with the announcement, hang up.
7. If you are not satisfied with the announcement,
   - press **1** to re-record the announcement.
   - press **3** to delete the announcement and end the recording session.
8. If you want to listen to the announcement after you have hung up, dial the extension from any phone or console. In this example, dial **1234**.

   The announcement plays through the handset.

   NOTE:
   You have to wait 15 seconds after you record the announcement before you can dial the extension to hear your announcement. During this 15-second window

   - you cannot record a new announcement.
   - no one can play this announcement.
   - you can re-record this announcement. Dial the feature access code, dial the extension, and press **2** before the 15-second timer expires.

Deleting announcements

Before you start

Look up the announcement information:

1. At the SAT, type **list directory board** and press RETURN.
2. Determine which announcement(s) that you want to delete, either by extension or filename.
3. Decide whether you are
   - Deleting individual announcement files using the SAT.
   - Deleting all announcements on a circuit pack using the SAT.
   - Deleting announcements at a system phone

NOTE:
The system denies any attempt to delete an announcement while it is playing, being transferred, or backed up to FLASH (amber LED flashes), regardless of whether the attempt is from a system phone, the SAT, or through an FTP session.

Deleting individual announcement files using the SAT

To delete the announcement named Closed (announcement #3 on Screen 9):

1. At the SAT, type **remove file board *board-location* /annc/*filename.wav*** and press RETURN.

   For example, to delete announcement #3 in Screen 9, type:

   remove file board 01A11 /annc/Closed.wav

   NOTE:
   Filenames are case-sensitive and require the .wav file extension.

   The */annc* portion of the command directs the system to the announcement subdirectory on the VAL circuit pack, and */Closed.wav* indicates to delete the filename Closed.wav.

Deleting all announcements on a circuit pack using the SAT

To delete all of the announcement files on the VAL circuit pack:

1. At the SAT, type **busyout board *board-location*** and press RETURN.

   Ensure that the command is successful.

   NOTE:
   When the VAL board is busied out,

   - both the RSCL and ethernet ports are busied out.
   - firmware takes down the ethernet link.
   - FTP is disabled because the ethernet link is down.
   - announcements on that circuit pack cannot play.

2. At the SAT, type **erase announcements board *board-location*** and press RETURN.

   CAUTION:
   This command deletes the specified announcement file in both RAM and FLASH memory. The board firmware ignores the protect flag (Pro field) when erasing the announcement files.

3. At the SAT, type **list directory board** and press RETURN.
4. Verify that there are no files listed.

   NOTE:
   The announcement directory on the TN2501AP is **/annc**.

5. Type **list integrated-annc-boards** and press RETURN.

   Check the list to see that the announcement was deleted. The Length in Seconds field should show 0.

Deleting announcements at a system phone

This section contains information about how to delete a previously-recorded announcement from a system phone.

NOTE:
The system denies any attempt to delete an announcement while it is playing, being transferred, or backed up to FLASH (amber LED flashes), regardless of whether the attempt is from a system phone, the SAT, or through an FTP session.

Deleting an announcement removes the announcement file contents from the circuit pack but does not remove the announcement administration (**change announcements**).

Before you start

- Look up the announcement extension, which is mapped to a specific TN2501AP circuit pack by location.
  1. At the SAT, type **list integrated-annc-boards** and press RETURN.
  2. Determine the extension(s) for the announcement(s) that you want to delete.
- Record the feature access code (FAC) for an announcement session.

Instructions

To delete the announcement named Closed (announcement #3 on Screen 9) from a system telephone with a Class of Service (COS) administered with console permissions:

1. Dial ***05** (the Feature Access Code).

   You hear dial tone.

2. Enter the extension number.

   In the example above, press **1234**.

3. Press **3** to delete the announcement.

   You hear a confirmation tone.

   If the announcement is protected or is playing at the time of the command, you hear a fast busy signal (reorder tone) and the system does not delete the announcement.

4. Hang up.

   NOTE:
   The announcement file is only removed from volatile RAM memory. During automatic backup, the file is deleted from RAM, then approximately 5 minutes later is removed from nonvolatile ROM flash memory.

5. To ensure that an announcement was deleted, dial the extension of the announcement that you deleted. In the last example, press **1234** at a system phone.

   No announcement plays, and you hear a busy signal.

6. Repeat Steps 1-5 for each announcement that you want to delete.

   You can delete only one announcement at a time from a system phone.

FTP

This section includes information on setting up and terminating a file transfer protocol (FTP) session and outlines tasks that you can do in an FTP session.

There are 3 basic components to an FTP session:

- Setting up an FTP session
- Performing tasks in an FTP session
- Ending an FTP session

SECURITY ALERT:
Be sure to read and observe all of the Security Alerts regarding enabling and disabling the TN2501AP filesystem and FTP sessions into it.

Setting up an FTP session

Setting up a file transfer protocol (FTP) session into the VAL circuit pack involves:

1. Preparing the VAL circuit pack for the FTP session, which
   - allows an FTP session on an individual VAL circuit pack.
   - creates an ftp-login and ftp-password for that session.
2. Starting an FTP session from a computer or network management terminal. Before you can start the FTP session, you need to know
   - the VAL circuit pack's IP address from Step 1.
   - the VAL circuit pack's ftp-login and ftp-password from Step 1.

Preparing the VAL circuit pack for the FTP session

To prepare the VAL circuit pack for the FTP session, including setting the username and password:

1. At the SAT, type **enable filesystem board *board-location* login *ftp-username [3-6 characters] ftp-password [4-11 characters]*** and press RETURN.

   For example, the command:

   enable filesystem board *01A11* login *romeo shakespeare*

   enables an FTP session into the VAL circuit pack in Cabinet 1, carrier A, slot 11. The ***ftp-username*** (3-6 characters) for this session is romeo, and the ***ftp-password*** (4-11 characters) is shakespeare.

   When the FTP session on the circuit pack is enabled, the announcement and firmware files are available to anyone who knows the VAL circuit pack's IP address, the ftp-username, and the ftp-password.

SECURITY ALERT:
We recommend using a unique ftp-login and ftp-password for each FTP session.

Starting an FTP session

If you are unfamiliar with FTP client application software, contact your network administrator for information about access to an FTP session.

The following points apply to FTP sessions into the VAL circuit pack:

- In FTP sessions, filenames are case-sensitive and require the .wav" file extension.
- Only one FTP session can be active at a time. If an FTP session is already active for a particular VAL circuit pack, the system denies a second attempt to establish an FTP session from some other remote host.
- The VAL circuit pack has two user-accessible directories:
  - /annc for playable announcements
  - / (root) for temporary storage of embedded software updates. Use this directory only for software updates.
- FTP sessions time out after 10 minutes of inactivity.

Instructions

1. At the FTP client, type **ftp *val-ip-address*** and press ENTER. The IP address must match the switch-administered IP address (see **change node-names ip**).
2. At the username prompt, type **romeo** and press RETURN.
3. At the password prompt, type **shakespeare** and press RETURN.

   The system responds with User logged in.

   NOTE:
   Once you are logged in you are in the announcements directory (/annc).

4. If you are moving files to or from the VAL circuit pack, you must set the system to binary mode. At the FTP client, type **bin** and press RETURN.

   The system responds with Types set to I, binary mode.

   CAUTION:
   If you do not transfer announcement files in binary mode, they can be corrupted and the FTP session can fail.

Performing tasks in an FTP session

You are now ready to perform any of these tasks in the FTP session

- Moving announcements from the VAL circuit pack
- Deleting announcements
- Moving announcements to a VAL circuit pack or to another LAN device
- Combining tasks

Moving announcements from the VAL circuit pack

When you move a file from the VAL circuit pack, you are either

- backing up (archiving) an announcement file.
- copying an announcement to another VAL circuit pack (restoring).

Moving a file in an FTP session means copying the file from the VAL circuit pack to the FTP client's default directory. If you want to move the file to another circuit pack or LAN device, see ''Moving announcements to a VAL circuit pack or to another LAN device''.

Before you start

- Ensure that the steps in "Setting up an FTP session" are complete.
- Know the IP address and location of the TN2501AP circuit pack as well as the filename (**list directory board**) for the announcement that you want to move.

NOTE:
The announcement directory on the TN2501AP circuit pack is **/annc**.

Instructions

To backup or save an announcement from the VAL board to the client computer through an FTP session:

1. Ensure that the steps in "Setting up an FTP session" are complete.
2. At the FTP client, type **get *filename.wav*** and press RETURN.

   Example: **get Closed.wav**

   The announcement file is written to the directory from which you initiated the FTP session.

   NOTE:
   FTP upload or download of announcement files does not preserve the created timestamp. The file receives the current date and time when it is written to the circuit pack or on the computer.

3. List the FTP client directory contents and ensure that the announcement file is among those listed.
4. Terminate the FTP session (see "Ending an FTP session").

Deleting announcements

You can delete an announcement from a TN2501AP circuit pack or from a LAN device.

NOTE:
The system denies any attempt to delete an announcement while it is playing, being transferred, or backed up to FLASH (amber LED flashes), regardless of whether the attempt is from a system phone, the SAT, or through an FTP session.

Before you start

- Know the IP address, the announcement filename that you are deleting, and the VAL circuit pack location (**list directory board**).

Instructions

To delete an announcement on a TN2501AP circuit pack through an FTP session:

1. Ensure that the steps in ''Setting up an FTP session'' are complete.
2. At the computer client, type **delete *filename.wav*** and press RETURN.

   Example: **delete Closed.wav**

   NOTE:
   The announcement file is only removed from volatile RAM memory. Approximately 5 minutes later, the file is removed from nonvolatile ROM flash memory.

3. List the contents of the announcement directory and ensure that the file is not listed.

   NOTE:
   The .wav file extension on the announcement files are visible when you view the announcement directory from the FTP client.

4. Terminate the FTP session (see ''Ending an FTP session'').
5. At the SAT, type **change announcements** and press RETURN.

   The Announcements/Audio Sources screen appears.

6. Remove the announcement administration by deleting the entire line associated with the announcement.
7. Press ENTER to save your changes.

Moving announcements to a VAL circuit pack or to another LAN device

You can copy an announcement file to the VAL circuit pack to another LAN device.

Before you start

- Know the announcement filename and its location on the client computer.
- Know the destination IP address, the filename, and circuit pack location of the announcement and VAL circuit pack to which you are moving the announcement (**list directory board**).

- Ensure that you *have not just* administered the announcement on the Announcements/Audio Sources screen. If announcement administration precedes the file transfer, then
  - — the announcement appears with a zero (0) length on the **list integrated-annc-boards** screen.
  - — The Time Remaining fields on both the **list integrated-annc-boards** and **display integrated-annc-boards** screens do not refresh to reflect the presence of the new announcement file on the circuit pack.

  Use this procedure to ensure that the announcement length is accurate:

  1. Administer the announcement at the switch (**change announcements**), using the identical filename in the Name field *without spaces or the .wav file extension* (see "Announcement Administration").
  2. Attempt to play the announcement that was administered first and transferred second.

     The switch returns a busy signal at the first play attempt.
  3. Attempt to play the announcement that was administered first and transferred second in a telephone access session.

     The switch returns a busy signal at the first play attempt.
  4. Re-record this announcement with the same filename at a phone (see "Recording announcements at a system phone").

Instructions

To copy an announcement to a VAL circuit pack or to another LAN device:

1. Ensure that the steps in "Setting up an FTP session" are complete.
2. At the FTP client, type **put *filename.wav*** and press RETURN.

   Example: **put Closed.wav**
3. List the contents of the VAL announcement directory or LAN device and look for the announcement file among those listed.

   NOTE:
   FTP upload or download of announcement files does not preserve its timestamp. The file receives the current date and time when it is written to the circuit pack or to a computer.
4. After you are sure that the announcement is on the VAL circuit pack, administer the announcement at the switch (**change announcements**), using the identical filename in the Name field *without spaces or the .wav file extension* (see "Announcement Administration").
5. Terminate the FTP session (see "Ending an FTP session").

Combining tasks

When you combine copying (the **get** command) and moving (the **put** command) announcement files, you can rearrange VAL announcements.

Before you start

- Know the IP address, the filename, and location of the destination VAL circuit pack to which you are moving an announcement (**list directory board**).

Instructions

To move an announcement to a VAL circuit pack from another VAL circuit pack in an FTP session:

1. Ensure that the steps in "Setting up an FTP session" are complete.

   NOTE:
   You must first establish an FTP session into the circuit pack *from which you are restoring an announcement*.

2. List the directory contents and ensure that the announcement file is among those listed.
3. At the FTP client, type **get *filename.wav*** and press RETURN.

   Example: **get Closed.wav**

   A copy of the file is written to the directory from which you initiated the FTP session.

4. List the FTP client directory contents to ensure that the announcement is among those listed.
5. Terminate the FTP session (see "Ending an FTP session") to the circuit pack *from which you copied the announcement file*.
6. Set up a new FTP session into the destination VAL circuit pack (see "Setting up an FTP session").
7. At the FTP client, type **put *filename.wav*** and press RETURN.

   Example: **put Closed.wav**

8. List the VAL announcement directory contents to ensure that the announcement is among those listed.
9. Terminate the FTP session to the circuit pack *to which you copied the announcement file*.

Ending an FTP session

FTP sessions to a VAL circuit pack originate at the FTP client end. You terminate an FTP session by

- logging out from the FTP client (type **bye** or **quit** and press ENTER)

  and

- typing **disable filesystem board *board-location*** at the SAT and press RETURN. (This clears the ftp-username and ftp-password.)

  or

- you can effectively terminate the session from the DEFINITY ECS end by letting the system time out (10 minutes of inactivity).

SECURITY ALERT:
Both logging out of the FTP session and disabling the VAL circuit pack filesystem provide a higher degree of security.

NOTE:
If you only disable the circuit pack filesystem, you can continue your FTP session. However, new FTP session logins are not allowed.

Troubleshooting

Use the following sections for troubleshooting information about the situations described.

Playing an announcement that has been deleted

If a working announcement file is deleted via FTP, the next attempt to play the announcement fails, and the system adds a software event to the Denial Events Log.

Instructions

To view the Denial Events Log:

1. At the SAT, type **display events** and press RETURN.

   The Events Report screen appears. This input screen helps you focus the report on events of a certain type or from a certain time period.

```
display events                                Page  1 of  1   SPE B

                          EVENT REPORT

  The following options control which events will be displayed.

        EVENT CATEGORY

           Category: denial

        REPORT PERIOD

           Interval: ___    From: __/__/__:__ To: __/__/__:__


        SEARCH OPTIONS

                           Vector Number: ___
                              Event Type: _____
```

Screen 10. Event Report screen (display events)

2. In the Category field, select or type **denial**.

3. You can further limit the report by setting the Interval field to one of the following selections (select from the help list or type the first letter):
   - **all**
   - **month**
   - **day**
   - **hour**
   - **minute**
4. Press ENTER.

   The Events Report screen appears.

```
display events                                                    Page   1  of  1

                                 EVENTS REPORT

Event Event                      Event     Event      First       Last     Evnt
Type  Description                Data 1    Data 2     Occur       Occur     Cnt

2028  Annc file has bad format  8C0009    0        05/14/11:55 05/14/12:04  2
2027  Annc not found on board   8C0007    0        05/14/12:09 05/14/12:09  1
```

Screen 11. Events report screen (display events)

5. Look at the 2027 entry in the Event Type field.
   - The Event Description field explains that the announcement is not on the circuit pack.
   - The Event Data 1 field contains the announcement number (hexadecimal in the lower three digits).

NOTE:
This denial event only appears once in the Denial Events Log.

Playing announcements with bad file formats

If you played an announcement files back in another environment and it sounded great, but when you play it back in the DEFINITY environment the sound quality is poor, ensure that the file formats are compatible. A good announcement file format must be

- 8Kbps sample rate
- 8-bit resolution (bits per sample)
- A-law or Mu-law companding format
- Mono (channels = 1)

You must also have the same companding mode administered on page 1 of the Country Options screen (**change system-parameters country-options**).

The system records a software denial event in the Denial Events Log each time it plays an announcement with a bad file format. Refer back to the Events Report screen Screen 11) and find the 2028 entry in the Event Type field:

- The Event Description field explains that the announcement has a bad file format.
- The Event Data 1 field contains the announcement number (hexadecimal in the lower three digits).

Maintenance Commands

The following table lists several VAL-related maintenance commands and how to use the command for troubleshooting.

Table 14. VAL maintenance commands

Command	Use this command to
test board	Test both circuit pack- and port-level maintenance.
test port	Test any of the ports on the VAL circuit pack
test mo	Test either of the 2 maintenance objects on the VAL circuit pack
busyout board	Curtail activity on the circuit pack before resetting it (reset board).
release board	Resume activity on the circuit pack after busying out the VAL circuit pack or ports on it (busyout board or busyout port).
busyout port	Isolate a specific port usually during troubleshooting.
release port	Resume activity after busying out a port on the VAL circuit pack (busyout port).
reset board	Re-initialize the circuit pack in the system and upload announcement file information.
reset val	Reset the circuit pack if it is in the insane state and to override querying the board to determine if an announcement autosave is in process.
status data-module	Obtain general information about the data-module connection to port 33 on the VAL circuit pack
status firmware download	Obtain information about a demand or scheduled firmware download.
list sys-link	Generate a list of administered links and the general status of each.
status sys-link	Generate a detailed status report for a specific administered system link.
status link	Generate a status report about a specific administered ethernet link. (For VAL this means the administered ethernet link.)

Continued on next page

Table 14. VAL maintenance commands — *Continued*

Command	Use this command to
status val-ip	Generate an IP-related, MIB data status report.
netstat ip-route	Generate a report showing the status of the VAL IP routes on the VAL circuit pack.
list directory board	See the file contents of a VAL circuit pack by location.
remove file	Delete an announcement or firmware image file on a VAL circuit pack.
enable filesystem	Begin an FTP session into a specific TN2501AP circuit pack.
disable filesystem	End an FTP session into a specific TN2501AP circuit pack.
set ethernet-options	Manually or automatically set the ethernet connection parameters.
get ethernet options	Generate a report about a specific ethernet connection.
set boot-image	Direct the system to use 1 of 2 possible firmware image files on the TN2501AP circuit pack.
get boot-image	View the two firmware image parameters on the VAL circuit pack.

Maintenance Objects

There are 2 new and 1 changed maintenance objects that the VAL circuit pack uses for routine and demand tests. All of these maintenance objects are in ''New and Changed Maintenance Objects'' on page 355.

New

- VAL-BD (Voice Announcements over the LAN Circuit Pack)
- VAL-PT (Voice Announcements over LAN Packet/Port)

Changed

- FW-DWNLD (Firmware Download)

IP Enhancements

9

This chapter includes information about IP capacity changes, Quality of Service, Alternate Gatekeeper, IP Serviceability, and Switch support for IP stations.

Alternate Gatekeeper

When an IP endpoint (including softphones, IP phones, and Avaya R300) registers with the switch, the switch sends back an IP registration address. The switch sends a different IP address for each registration according to a cyclic algorithm.

If registration with the original C-LAN circuit pack IP address is successful, the switch sends back the IP addresses of all the C-LAN circuit packs in one network region, not including interconnected regions. These C-LAN addresses are called gatekeeper addresses. These addresses can also be used if the call signaling on the original C-LAN circuit pack fails.

If the network connection to one C-LAN circuit pack fails, the IP endpoint re-registers with a different C-LAN.

Alternate gatekeeper and registration addresses, and C-LAN circuit pack load sharing, spread IP endpoint registration across more than one C-LAN circuit pack, increasing performance and reliability.

Detailed description

C-LAN load balancing and alternate gatekeeper addresses require IP stations that accept multiple IP addresses: IP telephone R1.5, IP softphone R3, CentreVu IP Agent R3 or Avaya R300 R1.1.

IP addresses associated with each C-LAN circuit pack in a region are entered on the DEFINITY. The end user can manually enter a gatekeeper address on the IP telephone. If the end user does not enter the gatekeeper address, the IP telephone accepts gatekeeper addresses in the message from the Dynamic Host Configuration Protocol (DHCP) server. If the phone cannot contact the first gatekeeper address, it uses an alternate address. The number of gatekeeper addresses the phone accepts depends on the length of the addresses administered into the DCHP server.

IP softphone and CentreVu IP agents accept gatekeeper addresses from manual administration only, or from manual administration and the message from the C-LAN, depending on the version of the IP softphone and CentreVu IP agent. The IP Softphone R2 and CentreVu IP Agent R2 provide a pull-down menu so the user can select an alternate gatekeeper address if attempts to contact the primary address fail. Later versions of IP softphone and CentreVu IP agents automatically use an alternate addresses received in the message from the C-LAN.

Avaya R300 accepts 2 gatekeeper addresses via manual administration, and uses the alternate address if attempts to contact the first address fails. See the Avaya R300 documentation for more information.

Security issues

DHCP servers send a list of alternate gatekeeper and C-LAN addresses to the IP Telephone R2 endpoint. A hacker could obtain the IP addresses of up to 8 C-LANs by sending requests to a DHCP server.

Hardware specifications

Must use C-LAN circuit packs.

Must use IP stations that accept multiple IP addresses: IP Telephone R1.5 or later, IP Softphone R3 or later, CentreVu IP Agent R3, Avaya R300 R1.1

Installation and upgrades

When a new C-LAN is placed into service, many endpoint registrations and unregistrations could occur before the load is shared equally among C-LAN boards.

Providing alternate gatekeeper addresses

When you provide alternate gatekeeper and registration addresses, your switch spreads IP endpoint registration across more than one C-LAN circuit pack and increases performance and reliability.

See the DEFINITY ECS Administration for Network Connectivity for information on how to:

- set up IP on your switch
- record the IP addresses for each C-LAN circuit pack in each network region
- administer endpoints on the DHCP server

You also need phone types that accept multiple IP addresses. These include IP Telephones R1.5 or later, IP Softphones R3 or later, CentreVu IP Agents R3, or Avaya R300 R1.1.

Fixing problems / troubleshooting strategy

If an endpoint is administered to use a certain codec and the endpoint registers with a C-LAN in a region with a codec that doesn't match, the endpoint does not have dial tone.

IP Serviceability Enhancements

The feature consists of switch-resident commands that are diagnostic/troubleshooting tools for communication problems between IP endpoints within a DEFINITY system.

Prior to R9.5, DEFINITY systems and IP600 systems had limited commands to assess the health of IP links. Local network analyzers or "sniffers" often were required to monitor the performance of the link in question requiring expensive equipment and on-site personnel.

With the new set of switch-resident tools, local and remote service personnel can troubleshoot, diagnose, and repair IP network-related problems without additional troubleshooting equipment.

This feature is a collection of report-generating utilities that use existing TN799 (C-LAN) and the TN2302 (Prowler) circuit packs along with new software and firmware. Table 15 lists these utilities.

Table 15. IP Serviceability commands

Description	Command	Enhanced/ New
Packet Loss / Jitter Size Report	**status station** **status trunk**	New report added to existing command
IP Denial Events Log	**display events**	Enhanced

This feature requires existing circuit packs (more details in Table 16):

- C-LAN
  - — TN799A (V27 or higher)
  - — TN799B (all versions)
  - — TN799C
- TN2302 (Prowler) with V23 or higher firmware

Feature interactions can include

- Conference
- Hold

Performance impact

The IP Serviceability Enhancements have a very low impact on overall switch performance because

- you cannot issue any other SAT commands while the message-intensive refresh route-table is running.
- switch call processing is not adversely affected by running either of these commands.

Hardware specifications

Table 16 lists the required hardware and software for the various DEFINITY models:

Table 16. Required hardware and software

Model	IP service	C-LAN circuit pack
r	Enable IP Services on Customer Options screen	TN799A (V27 or higher) TN799B (all versions) TN799C TN2302 (Prowler) with V23 firmware or higher
si	Enable IP Services on Customer Options screen	
csi	Enable IP Services on Customer Options screen	
DEFINITY ONE	Requires Windows 95/98 TCP/IP connectivity	TN799C
Avaya IP600	Requires Windows 95/98 TCP/IP connectivity	TN799C

Maintenance and troubleshooting

This feature set provides system-based diagnostic and troubleshooting tools for communication problems between IP endpoints.

Fixing problems / troubleshooting strategy

Table 17 lists some of the most common IP problems.

Table 17. IP troubleshooting guide

Problem	Possible cause	Solution
Noisy connection that eventually breaks up, creating gaps in the conversation and making speech unintelligible.	Packet loss Jitter	Depending on which "side" of the switch, use: ■ **status station** ■ **status trunk**
IP service not responsive or cannot make connection	IP connection problem	Use the **display events** command to look for denied IP events.

Diagnostic and troubleshooting commands

Table 18 lists the new and enhanced commands and their use.

Table 18. Diagnostic/troubleshooting commands and their use

Command	Description	Use
display events	This command creates a list of each time an IP event is denied, rejected, or some service is not provided. Each log entry consists of ■ a 25-character string that describes the problem ■ an identification number that uniquely implicates a specific piece of code ■ another numeric string describing the denial	Accumulates data to track denied or rejected IP service.
status station	This command generates a report detailing ■ the number of packets that are either lost or corrupted ■ amount of jitter[1] on the connection	Diagnose for station-side IP problems, including the IP phone.
status trunk		Diagnose for trunk-side IP problem.

1.Jitter in this instance is the variability in the amount of time (in milliseconds) that packets are received over the network. When jitter increases, the user experiences a noisy connection, delays, and a general loss of quality, making speech unintelligible.

Related topics

Refer to *DEFINITY ECS Administration for Network Connectivity* for basic IP administration.

Switch Support for IP Stations

The release contains enhancements to switch support for IP phones. These enhancements include:

- administrable options for which "calling number" to send to the public safety access point when an emergency call is placed from an IP phone
- single extension connection, which allows you to convert existing dual-extension IP phones to single extensions and free up extension numbers for other uses
- support for Softphone R3
- support for IP Telephone R1.5

CAUTION:
An Avaya IP endpoint can dial emergency calls (for example, 911 calls in the U.S.). It only reaches the local emergency service in the Public Safety Answering Point area where the telephone system is located. Please be advised that an Avaya IP endpoint cannot dial to and connect with local emergency service when dialing from remote locations. You should not use an Avaya IP endpoint to dial emergency numbers for emergency services when dialing from remote locations. Avaya Inc. is not responsible or liable for any damages resulting from misplaced emergency calls made from an Avaya endpoint. Your use of this product indicates that you have read this advisory and agree to use an alternative telephone to dial all emergency calls from remote locations.

Capacities

You can only use one IP Softphone on a single PC.

Hardware specifications

To use IP Softphone or IP Telephone, you need the TN799B or later C-LAN circuit pack and the TN2302 IP Media Processor circuit pack.

Software administration during installation

When you upgrade from dual-extension IP phones to single-extension IP phones, you can delete the unnecessary H.323 audio extensions on the switch.

Changing from dual-connect to single-connect IP phones

When you have a dual extension phone and you upgrade to a single extension phone, you can remove the connection that is no longer used for that phone.

To remove the H.323 connection that is no longer needed, first record the media complex extension number:

1. Type **change station *nnnn***, where nnnn is the extension number of the original dual-connect phone that you are replacing with a single-connect phone.

   The Station screen appears.

2. Move to the Media Complex Extension field.
3. Write down the number in the Media Complex field, then delete the number from the field.
4. Press ENTER to save your changes.

Now remove the extension you recorded. Before you remove an H.323 extension from your system, check the status, remove it from any group or usage lists, and then delete it from the system's memory.

For example, if you wrote down extension 1234 before you removed it from the Media Complex field on the Station screen, then remove extension 1234 using these steps:

1. Type status station 1234 and press RETURN.

   The General Status screen appears.

2. Make sure that the extension:
   - is idle (not making or receiving calls)
   - has no messages waiting
   - has no active buttons (such as Send All Calls or Call Forwarding)
3. Type **list groups-of-extension 1234** and press RETURN.

   The Extension Group Membership screen shows whether the extension is a member of any groups on the system.

4. Press CANCEL.
5. If the extension belongs to a group, access the group screen and delete the extension from that group.

   For example, if extension 1234 belongs to pickup group 2, type **change pickup group 2** and delete the extension from the list.

6. Type **list usage extension 1234** and press RETURN.

   The Usage screen shows whether the extension is used in any vectors, has any bridged appearances, used as media complex or used as a controller.

7. Press CANCEL.

8. If the extension appears on the Usage screen, access the appropriate feature screen and delete the extension.

   For example, if extension 1234 belongs to hunt group 2, type **change hunt group 2** and delete the extension from the list.

9. Type **change station 1234** and press RETURN.

10. Delete any bridged appearances or personal abbreviated dialing entries and press ENTER.

11. Type **remove station 1234** and press RETURN.

    The system shows the station screen for this phone so you can verify that you are removing the correct phone.

12. If this is the correct phone, press ENTER.

    The system responds with **command successfully completed**.

    If the system responds with an error message, the phone is busy or still belongs to a group. Press CANCEL to stop the request, correct the problem, and enter **remove station 1234** again.

13. Remove the extension from voice mail service if the extension has a voice mailbox.

14. Type **save translations** and press RETURN to save your changes.

Note that you do not need to delete the extension from coverage paths. The system automatically adjusts coverage paths to eliminate the extension.

Once you successfully remove the extension, it is permanently erased from system memory. If you want to reactivate the extension, you have to add it again as though it were new.

Tasks

Setting up emergency calls on IP phones

Set up which "calling number" to send to the public safety access point when an emergency call is placed from an IP phone.

Before you start

Be sure the G3 version field on the System Parameters Customer Options is set to V9 or newer and the R9.5 Capabilities field is set to y.

Instructions

You use the Station screen to set up emergency call handling options for IP phones. As an example, we'll administer the option that prevents emergency calls from an IP phone.

To prevent an emergency call from an IP phone:

1. Type **change station *nnnn*** and press enter, where ***nnnn*** is the extension of the phone you want to modify.

   The station screen appears.

```
change station 1014                                          Page 1 of X
                              STATION

Extension: 1014               Lock Messages? n                     BCC:
     Type:                    Security Code:                        TN:1
     Port:                  Coverage Path 1:                       COR: 1
     Name:                  Coverage Path 2:


STATION OPTIONS
              Loss Group: 2                Personalized Ringing Pattern: 3
            Data Module? n                           Message Lamp Ext: 1014
           Speakerphone: 2-way                     Mute button enabled? y
       Display Language? English                     Media Complex Ext:
                                                          IP Softphone? y
                                                 Remote Office Station? n
                                                    IP Emergency calls: block
```

2. Type **block** in the IP Emergency calls field and press RETURN to save your changes.

Fixing problems

Problem	Possible causes	Solutions
Audio levels can not be adjusted.	The TN802B Medpro circuit pack is being used.	Use TN799B or later C-LAN circuit pack and the TN2302 IP Media Processor
Display characters on the phone can not be recognized.	Microsoft Windows is not set to use Eurofont characters.	Set the Microsoft Windows operating system to use Eurofont.

Quality of Service (QoS) to Endpoints

You can set operating parameters to optimize the audio performance, or Quality of Service (QoS), on calls made over your IP network. These parameters include the audio codec, network priority through Differentiated Services (DiffServ) capability, and the IEEE 802.1p/Q MAC-layer prioritization and segregation.

Default QoS parameters are downloaded to the IP Telephone R1.5 and the IP Softphone R3 when the values are not provided by the endpoint installer or the user. Certain options can be set locally by the endpoints or via the gatekeeper. The endpoints receive the parameters upon registration, and once they are registered, whenever the administered values of the QoS parameters are modified.

Detailed Description

QoS parameters affect your system's audio reproduction quality, audio path delay (latency), audio loss, and network resource consumption. The DEFINITY system maintains a balance through audio codec selection and network prioritization through the DiffServ capability, and through the IEEE 802.1p/Q MAC-layer prioritization and segregation.

DiffServ and 802.1p priorities apply to either or both ends of a connection. Configure QoS values for the switch interfaces and the endpoints to correspond to the network to which they are connected. In many cases, the endpoints are "local" and the values for the endpoints and the networks are the same. In other cases, the endpoints and the network have different QoS values. The switch can download default values to the endpoint when values are not provided by the endpoint installer or the user.

Where to find more information

The Avaya IP Voice Quality Network Requirements white paper provides detailed descriptions of the Differentiated Services Code Point (DSCP) and IEEE 802.1p/Q prioritization schemes. It also discusses numerous other network parameters that can be adjusted to improve voice quality on an IP network.

To obtain this document, go to
http://support.avaya.com/comsys/definity/dolan/ta
and search for Network Requirements for IP Solutions.

Quality of Service (QoS) Integration with Cajun Rules

Release 9.5 allows you to have more control over the Quality of Service (QoS) in your IP voice network by using Cajun Rules to establish Quality of Service parameters, and to ensure that those parameters are consistently applied to both the data network and the voice network.

Cajun Rules provides a central repository for QoS parameters and allows comprehensive QoS management across routers, switches, and endpoints. QoS parameters and policies are assigned according to network regions and are distributed through Enterprise Directory Gateway to the DEFINITY ECS and to routers and switching devices.

Cajun Rules is a policy management system that allows network managers to define network utilization policies. These policies are targeted on elements in an enterprise directory, such as users, groups, and applications, as well as other factors such as time of day, and can therefore express a rich variety of business rules. These policies can be uniformly and consistently applied throughout the network. Cajun Rules is driven by a directory and can communicate its policy based rules to various data switches and routers (including Cajun and Cisco).

Cajun Rules Release 2.1 includes support for the management of QoS parameters introduced in DEFINITY Release 9. Cajun Rules is able to communicate these QoS policy-based rules to DEFINITY via the Enterprise Directory Gateway. The Enterprise Directory Gateway contains LDAP schema for DEFINITY ECS administration data and communicates with DEFINITY via the proprietary OSSI protocol. The LDAP schema in the Enterprise Directory Gateway is extended to include the QoS parameters described above.

Cajun Rules is able to populate the DEFINITY-specific QoS LDAP schema in the Enterprise Directory Gateway. The Enterprise Directory Gateway then sends the updated QoS parameters to DEFINITY via the OSSI protocol. Cajun Rules also communicates these same QoS policy rules to the various data switches and routers in the network, so that there can be consistent quality of service across the network for the voice packets.

The following figure illustrates this architecture:

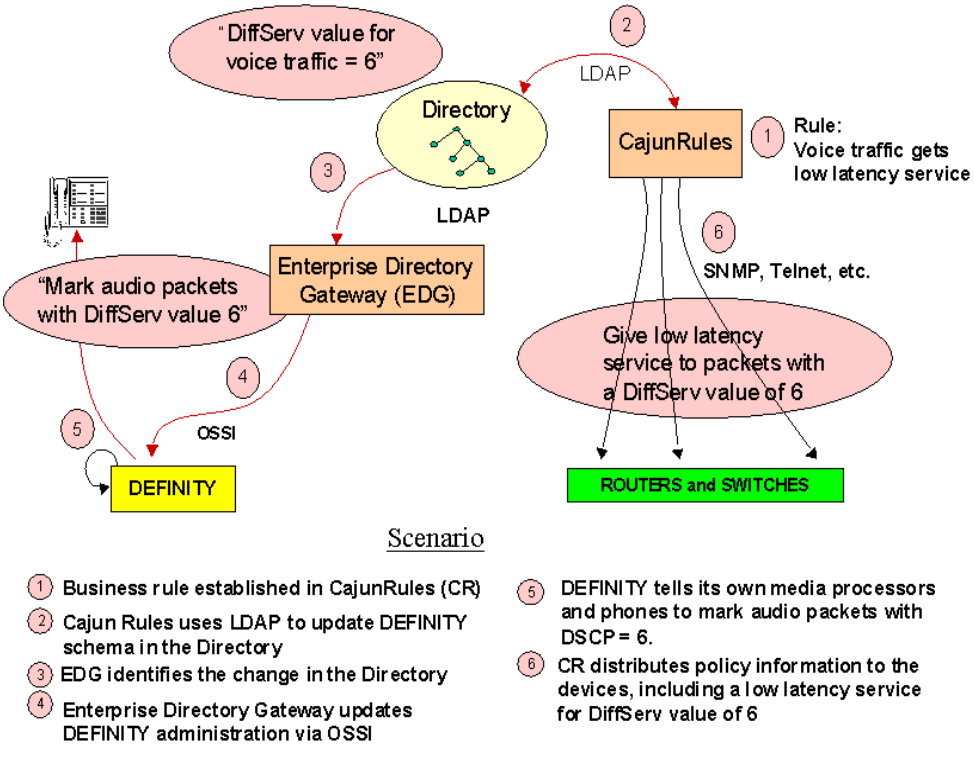


Figure 16. Integration with Cajun Rules

9 IP Enhancements
Quality of Service (QoS) Integration with Cajun Rules *194*

DEFINTY ONE Enhancements

10

Introduction

The purpose of this document is to introduce the reader to the new or changed features in Release 9.5 of DEFINITY ONE. The intended audience includes services personnel and others interested in a more technical presentation than the equivalent material available in the marketing literature.

Although this document is more technically oriented, it should not be considered a substitute for attendance in the appropriate DEFINITY ONE training courses. The reader of this document is expected to learn what is new in this release, but should not necessarily expect to able to install or administer a DEFINITY ONE system based on this material alone.

NOTE:
Screens illustrated in this document were taken from various development machines prior to General Availability (GA) of the product. They are representative of the actual screens in function, but the real screens may be slightly different when the product becomes available. This is necessary to produce this document prior to the completion of the product.

Scope

This document contains a high-level description of the new features in DEFINITY ONE Release 9.5. The focus is on the new or changed features; the reader is assumed to be familiar with DEFINITY ONE Release 9.0 and with the differences between DEFINITY Release 7.1, 8.2, and 9.1.

New Capabilities

The following section contains information about new capabilities and features for DEFINITY ONE Release 9.5. Please refer to the DEFINITY ONE documentation for more detailed information about these features and capabilities.

Documentation CD-ROMS

The xxx symbol in the document numbers for the regions listed below indicates references to the following languages:

- DE = German
- FR = French
- IT = Italian
- SPL = Latin Spanish
- PTB = Brazilian Portuguese
- JA = Japanese
- KO = Korean
- CHS = Simplified Chinese

English Language

- DEFINITY Systems R9 and IP 600 Library, CD 555-233-416
- What's New for R9.5, 555-233-418
- Installation and Upgrades for DEFINITY ONE and IP 600, 555-233-109, Issue 5
    - This is updated for R9.5, English only

EMEA and CALA Regions

- DEFINITY Systems R9 and IP 600 Library CD, 555-233-416
- What's New for R9.5, 555-233-418
- EMEA and CALA Languages CD, 555-600-800EMEACALA
- Installation and Upgrades for DEFINTY ONE and IP 600, 555-233-109xxx
- This is updated for R9.5, English only

APAC Region

- DEFINITY System R9 and IP 600 Library CD, 555-233-416
- What's New for R9.5, 555-233-418
- APAC Languages CD, 555-600-800APAC
- Installation and Upgrades for DEFINITY ONE and IP 600, 555-233-109xxx
    - This is updated for R9.5, English only DEFINITY ONE

Performance and Capacity

DEFINITY ONE Release 9.5 supports an increased capacity to a total of 450 stations (phones), providing Intuity AUDIX is disabled (see Disable/Enable Embedded Messaging). With Intuity AUDIX enabled, DEFINITY ONE has a capacity of 240 stations. DEFINITY ONE supports up to two cabinets and up to 168 trunks.

DEFINITY ONE supports a call traffic rate of 5000 BHC in non-call center configurations. In Release 2, 9, and 9.5, up to 2000 BHC with CentreVuCT and CMS or BCMS Vu are connected and active with up to 50 agents.

In order for 50 agents to generate a call rate of 2000 BHC, the call service time must be less than 86 seconds. This 86 seconds is an extremely short service time for nearly all call center applications, except for credit card authentication. In this case, the call service time is in the range of 5-7 seconds.

DEFINITY software base

DEFINITY software for DEFINITY ONE Release 9.5 corresponds to DEFINITY Release 9.5.

The following features are new to Release 9.5 but are not supported in DEFINITY ONE.

- Alarming via TCP/IP. DEFINITY ONE supports SNMP traps.
- Internet Terminal Server
- DEFINITY Telnet Service. DEFINITY ONE supports telnet, but not via the C-LAN.
- ATM WAN Spare Processors. DEFINITY ONE supports only one port network.
- Reserve DID number for GUEST Works. DEFINITY ONE does not support GUEST Works.
- DEFINITY Remote Max in multiple time zones. DEFINITY ONE supports Remote Max, but is limited to a single time zone.

Intuity Audix Software Base

The Intuity AUDIX application for Release 9.5 is Intuity 5.1.

The software for CornerStone for Release 9.5 is the same as for Release 9.

Fax Extended Dialing

FAX messaging in Release 9.5 now has extended capabilities. In former legacy products, fax destinations were limited to 10-digit addresses to send faxes to domestic locations. This extended dialing increases the digit address to 23 digits. This extension benefits those with subscriber communities who deliver faxes to international locations. In addition, this feature provides strong administrative controls to regulate the delivery of faxes to domestic and international destinations.

Increased Message Storage

The Intuity AUDIX recorded message storage time for Release 9.5 has been increased from 50 hours to 100 hours.

Increased Number of IMAPI Sessions

The number of IMAPI sessions for Release 9.5 has been increased from 6 sessions to 32 sessions.

Disable/Enable Embedded Messaging

Release 9.5 supports the capability to disable and enable the embedded Intuity AUDIX messaging system. A disable/enable link is configured from the administration web pages and allows the user to toggle between active/inactive on-board messaging capability. When the embedded message is active, a 'disable messaging' link is present. When the embedded messaging in inactive, the 'enable messaging' link is present, and all web page references to Intuity AUDIX messaging are removed. In the active messaging state, the appropriate backup-restore pages display the various Intuity AUDIX backup options, whereas in the inactive messaging state, the web pages are modified to not display the message-related backup options.

Impact on Maintenance

When Intuity AUDIX is disabled on the system, the ports on the CWY1 board become unavailable. As a result, maintenance is disabled for the CWY1 board. To counteract this and enable maintenance for the CWY1 board, at least one port on the board must be administered. Perform the following steps to enable maintenance for the CWY1 board when Intuity AUDIX is disabled:

1. Add station next
2. Enter "1A1201" in the Port field
3. Enter "2500" in the Type field
4. Enter "CWY1 Test Port" in the Name field
5. Submit the form
6. Perform a "test port 1A1201" and verify that the test passes

Unified Messaging

The Unified Messenger server software runs on the Windows operating system. The Unified Messenger server itself connects the telephone network to the Exchange, and performs the following functions:

- Plays and records voice messages
- Provides telephone answering service for individual subscribers
- Compresses audio messages in real-time for storage on the Exchange server
- Retrieves audio messages from the Exchange server, then decompresses and plays them
- Interprets DTMF for mailbox manipulation and control
- Performs text-to-speech conversion for audio playback of email messages
- Transports messages to and from subscribers on existing Octel® message servers
- Forwards inbound fax calls to an Exchange-compatible fax server
- Forwards faxes and email messages to a fax server for printing on a fax machine

In addition, Unified Messenger supports third-party Exchange-compatible fax servers. This enables individuals to receive faxes in their unified mailbox, view or send fax messages from their desktops, and direct faxes in their inbox to be printed at any fax machine worldwide.

Support Off-Board Messaging

With the ability to turn off embedded messaging in Release 9.5, the DEFINITY ONE development team has verified the capacity to support a variety of external messaging adjuncts, such as Off-board Messaging. Intuity AUDIX, Unified Messaging, Octel® and Serenade are supported for external messaging in Release 9.5.

Add Analog Interface to Voice Messaging Platforms

An analog interface with external VMS platforms is available in Release 9.5. This interface supports Aria and Serenade, Octel® 200, 250, 300, 350, and Unified Messaging. The analog interface should be used with the mode code.

Backup/Restore Enhancements

The backup/restore feature for Release 9.5 has been enhanced for greater reliability. When a new backup is created, it is placed in a 'parallel' directory to the existing backup, whether to the PCMCIA or to a destination disk over the LAN. In this way, two backups are alternated, wherein the oldest backup is the one overwritten by the current backup. The current backup is validated prior to overwriting the existing backup. A non-affirmative validation procedure results in the generation of a system alarm. The restore procedure remains unchanged.

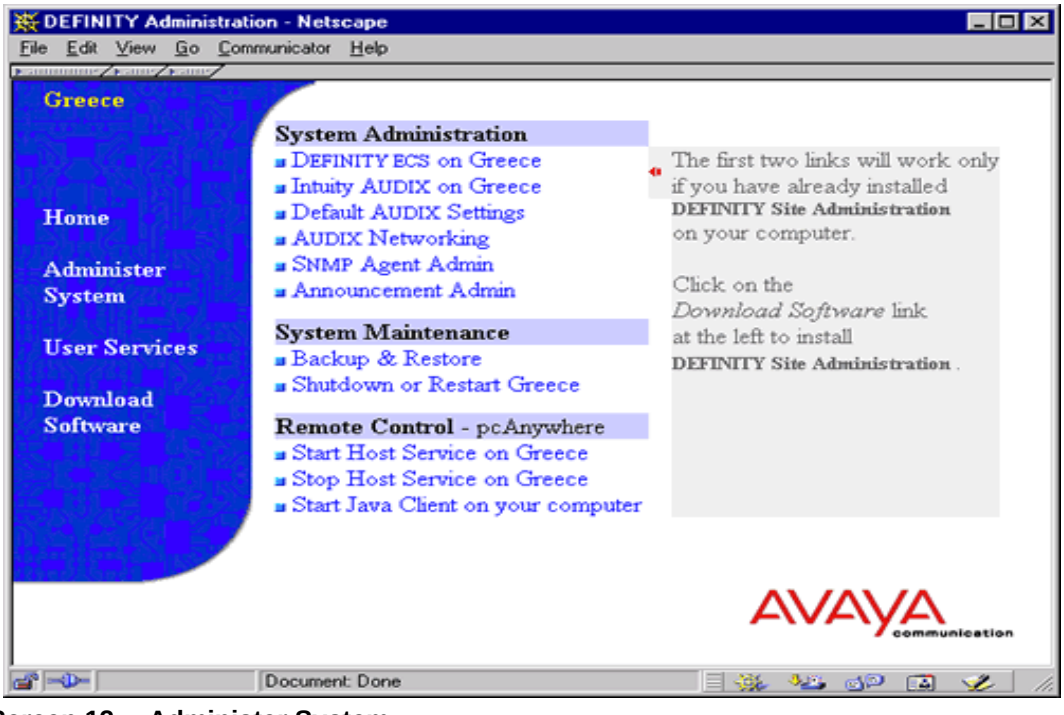
The SAT screens and web pages for the backup/restore operation are not affected by these considerations.

Procedure to Disable Voice Messaging

The following sequence of screens represents the procedure to disable voice messaging.

DEFINITY Administration screen/web page

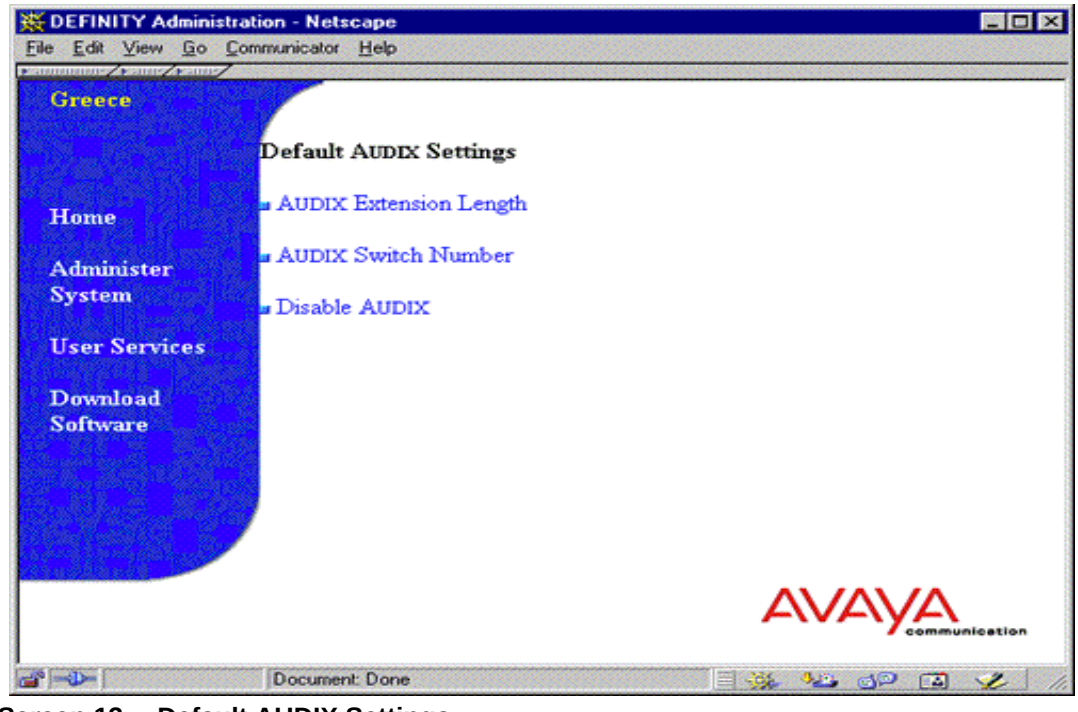
Screen 12 shows the main Administer System web page.



Screen 12. Administer System

Default AUDIX Settings screen

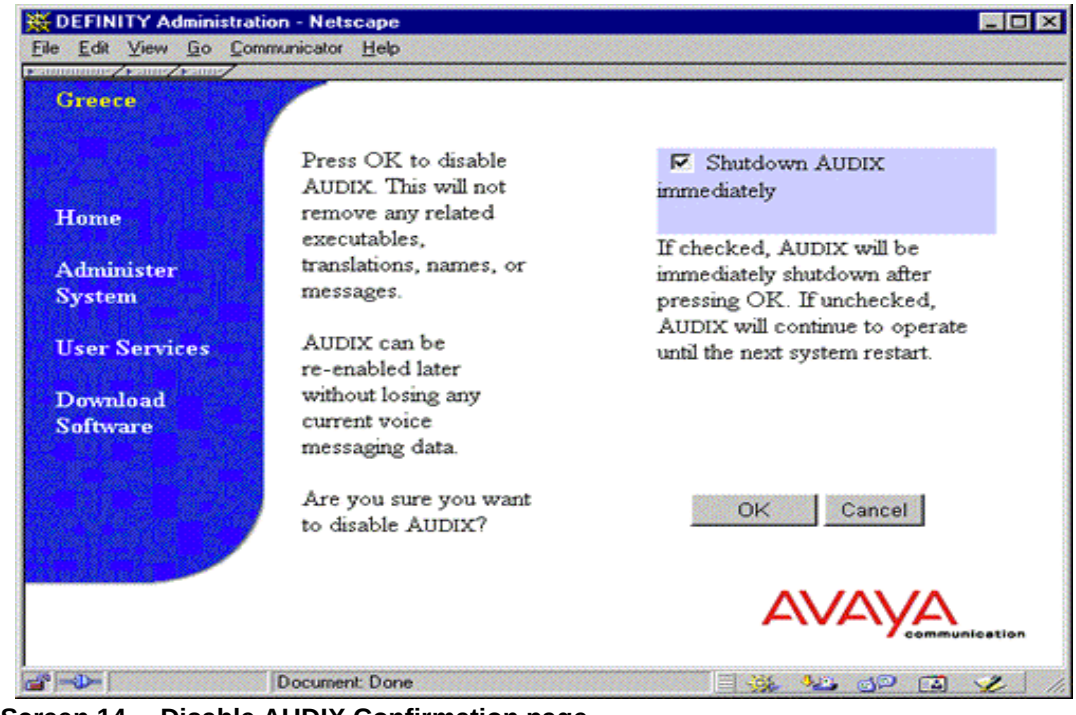
Screen 13 shows the Default AUDIX Settings page that contains the new feature to Disable AUDIX.



Screen 13. Default AUDIX Settings

Disable AUDIX Configuration page

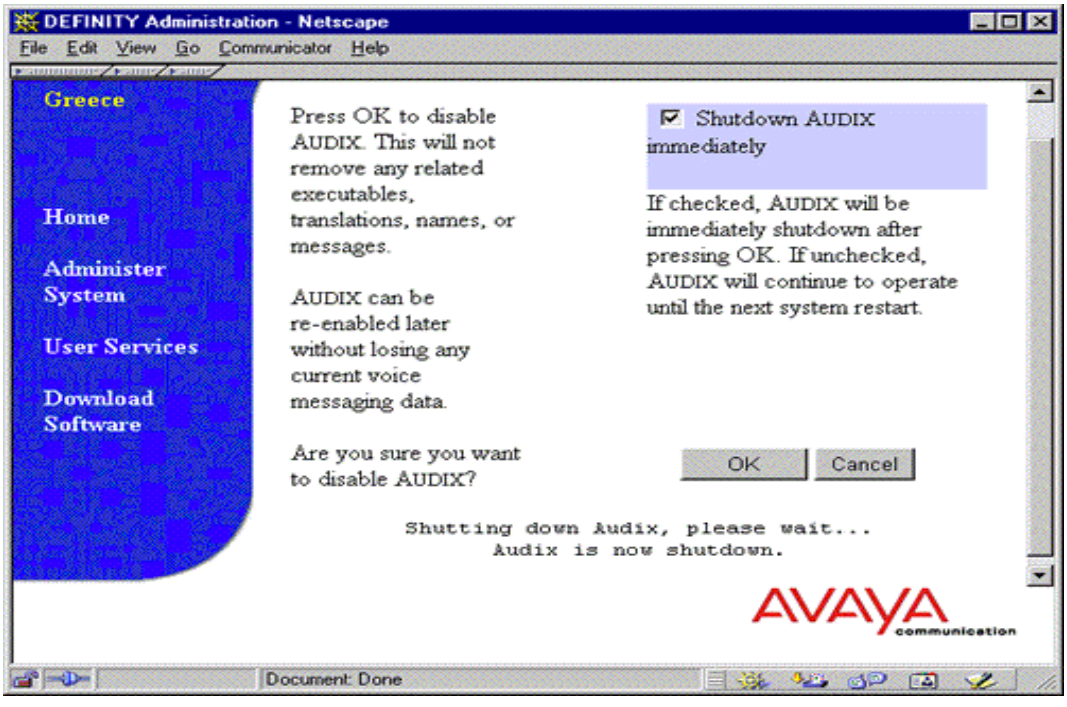
Screen 14 shows the confirmation page when Disable AUDIX is requested. The user has the option to disable AUDIX immediately, or to have AUDIX disabled after the next system restart.



Screen 14. Disable AUDIX Confirmation page

Shutdown Message screen

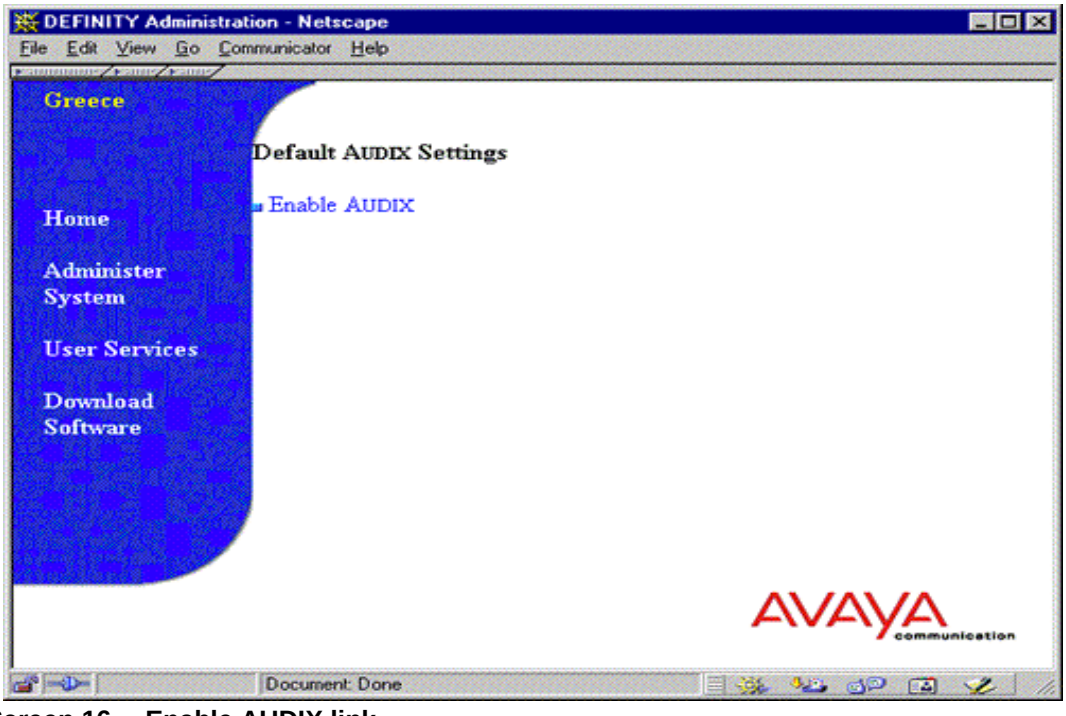
Screen 15 shows the status message if AUDIX is immediately shut down.



Screen 15. Shutdown Message is Displayed

Enable AUDIX Link Message screen

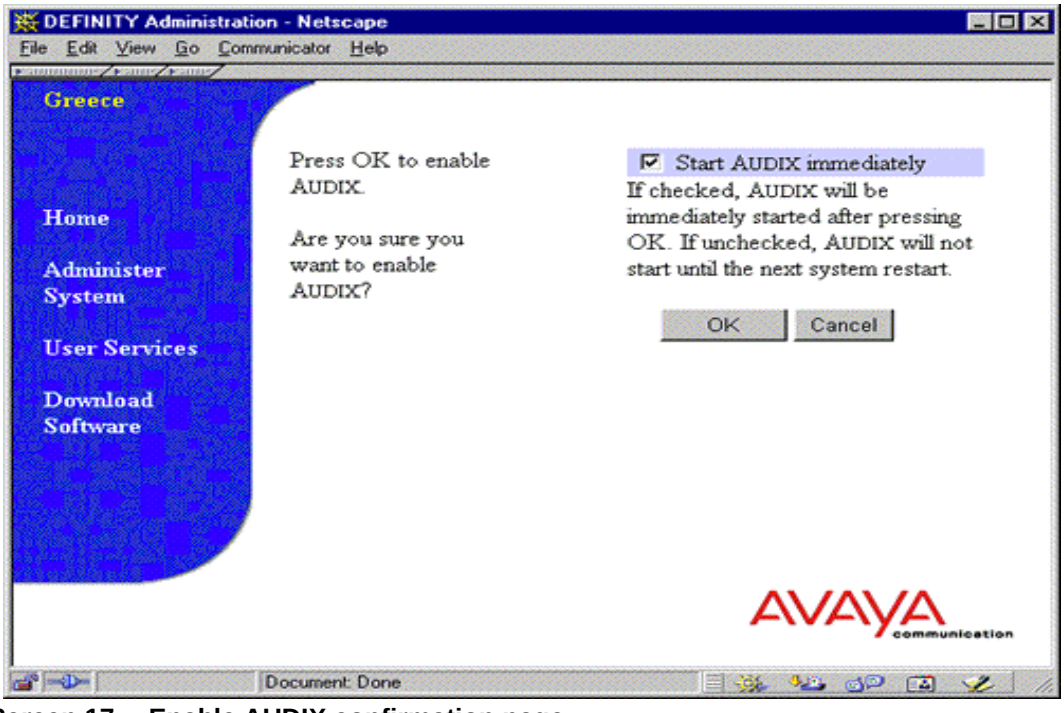
Screen 16 shows AUDIX disabled. When AUDIX is disabled, a link to Enable AUDIX is displayed on the Default AUDIX Settings page.



Screen 16. Enable AUDIX link

Enable AUDIX confirmation page

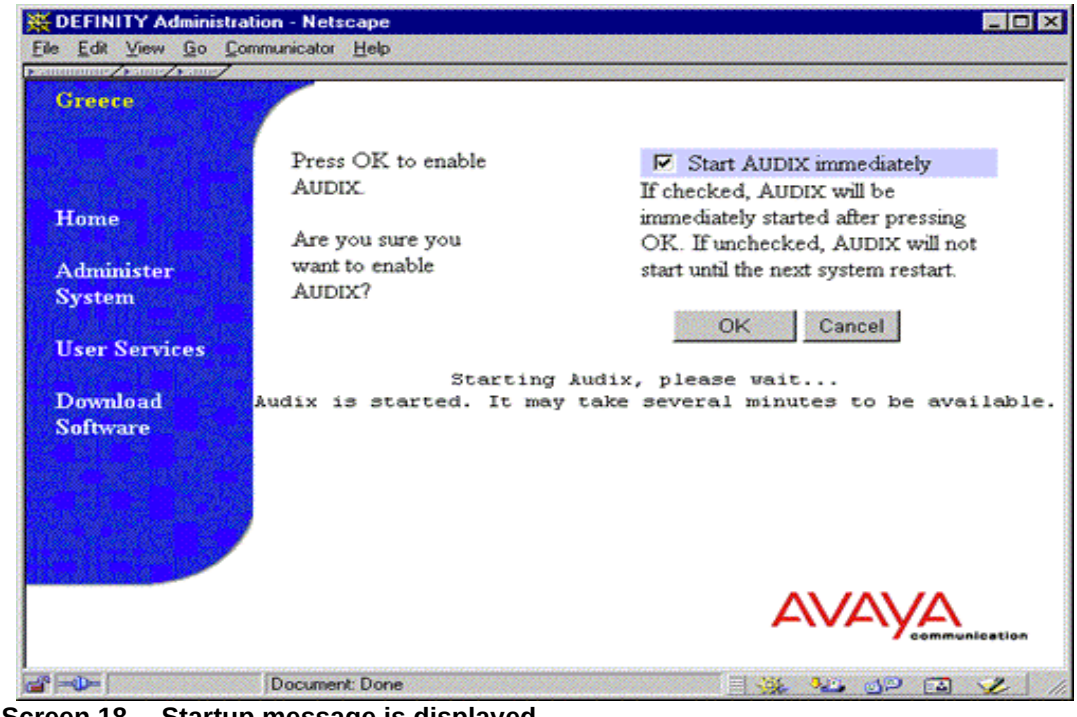
Screen 17 shows the confirmation page when Enable AUDIX is requested. The user has the option to enable AUDIX immediately, or to have AUDIX enabled after the next system restart.



Screen 17. Enable AUDIX confirmation page

Startup DEFINITY ONE message page

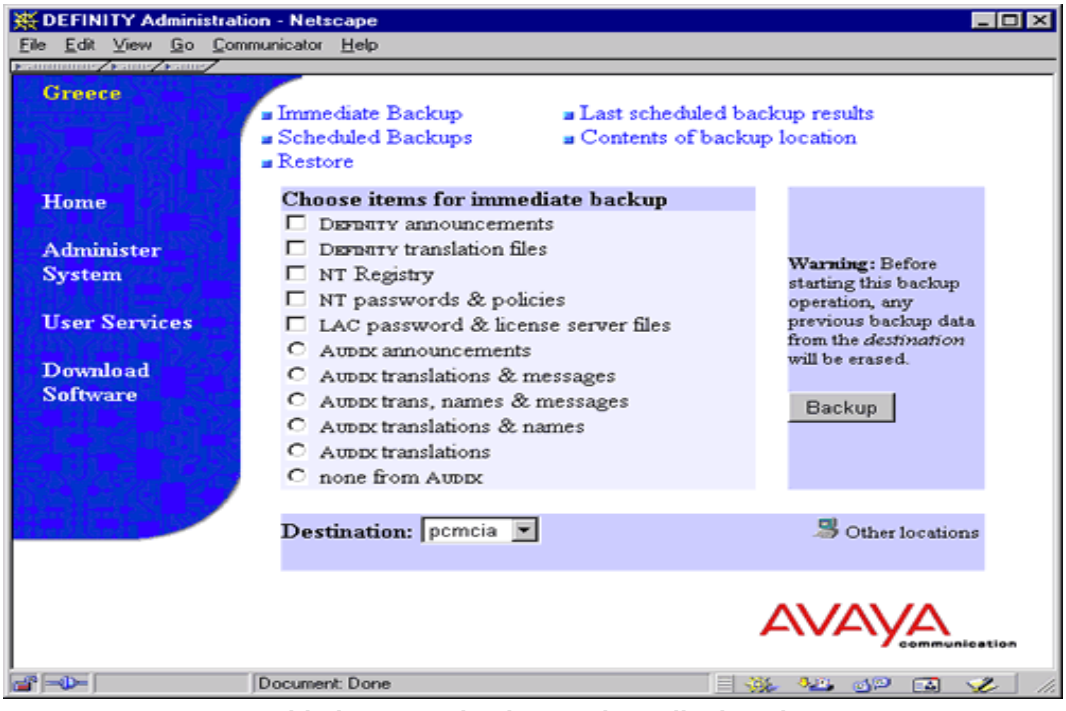
Screen 18 shows the page if an immediate AUDIX startup is requested. The status message displayed is the same as in Screen 4.



Screen 18. Startup message is displayed

AUDIX enabled with AUDIX backup options displayed

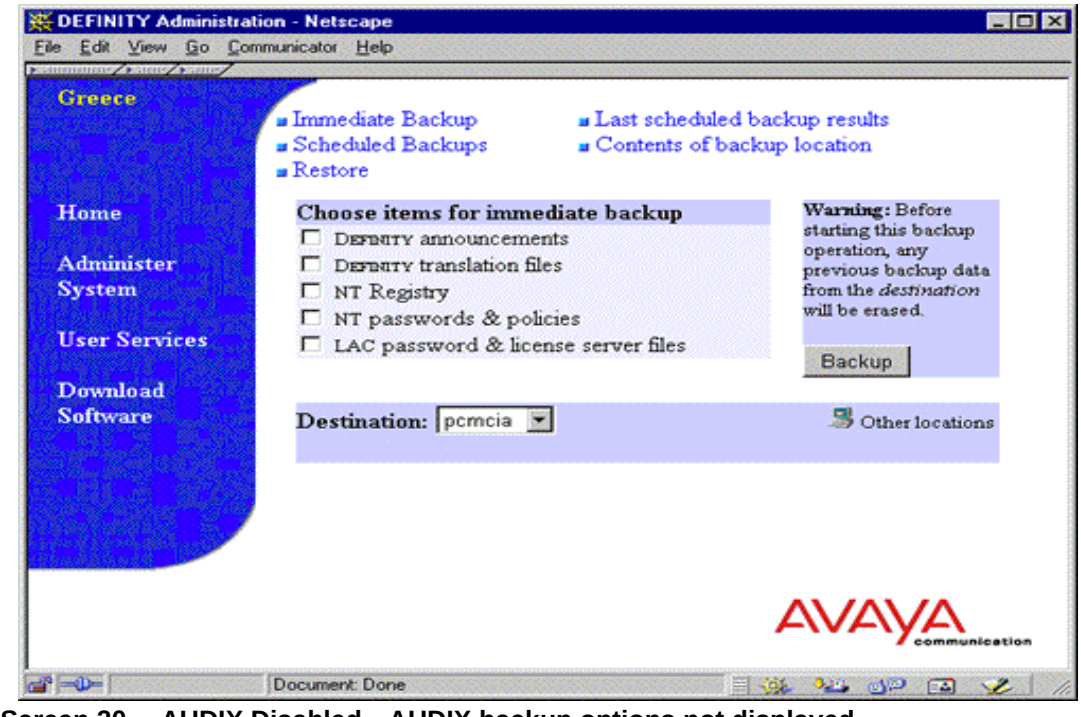
Screen 19 shows the page if AUDIX is enabled. When AUDIX is enabled, all AUDIX backup options are displayed. These Backup/Restore web pages are modified to reflect the on/off status of AUDIX.



Screen 19. AUDIX Enabled—AUDIX backup options displayed

AUDIX disabled with AUDIX backup options not displayed

Screen 20 shows the page when AUDIX is disabled. The AUDIX related backup options are not displayed.



Screen 20. AUDIX Disabled—AUDIX backup options not displayed

Avaya IP600 Enhancements

11

Introduction

The purpose of this document is to introduce the reader to the new or changed features in Release 9.5 of IP 600. The intended audience includes services personnel and others interested in a more technical presentation than the equivalent material available in the marketing literature.

Although this document is more technically oriented, it should not be considered a substitute for attendance in the appropriate IP 600 training courses. The reader of this document is expected to learn what is new in this release, but should not necessarily expect to able to install or administer an IP 600 system based on this material alone.

NOTE:
Screens illustrated in this document were taken from various development machines prior to General Availability (GA) of the product. They are representative of the actual screens in function, but the real screens may be slightly different when the product becomes available. This is necessary to produce this document prior to the completion of the product.

Scope

This document contains a high-level description of the new features in IP 600 Release 9.5. The focus is on the new or changed features; the reader is assumed to be familiar with IP 600 Release 2.0 and with the differences between DEFINITY Release 7.1, 8.2, and 9.1.

New Capabilities

The following section contains information about new capabilities and features for IP 600 Release 9.5. Please refer to the IP 600 documentation for more detailed information about these features and capabilities.

Documentation CD-ROMS

The xxx symbol in the document numbers for the regions listed below indicates references to the following languages:

DE = German

FR = French

IT = Italian

SPL = Latin Spanish

PTB = Brazilian Portuguese

JA = Japanese

KO = Korean

CHS = Simplified Chinese

English Language

- DEFINITY Systems R9 and IP 600 Library, CD 555-233-416
- What's New for R9.5, 555-233-418
- Installation and Upgrades for DEFINITY ONE and IP 600, 555-233-109, Issue 5
    - This is updated for R9.5, English only

EMEA and CALA Regions

- DEFINITY Systems R9 and IP 600 Library CD, 555-233-416
- What's New for R9.5, 555-233-418
- EMEA and CALA Languages CD, 555-600-800EMEACALA
- Installation and Upgrades for DEFINTY ONE and IP 600, 555-233-109xxx
    - This is updated for R9.5, English only

APAC Region

- DEFINITY System R9 and IP 600 Library CD, 555-233-416
- What's New for R9.5, 555-233-418
- APAC Languages CD, 555-600-800APAC
- Installation and Upgrades for DEFINITY ONE and IP 600, 555-233-109xxx
    - This is updated for R9.5, English only DEFINITY ONE

Performance and Capacity

IP 600 Release 9.5 supports an increased capacity to a total of 450 stations (phones), providing Intuity AUDIX is disabled (see the section below on Disabling/Enabling Embedded Messaging). With Intuity AUDIX enabled, IP 600 has a capacity of 240 stations. IP 600 supports up to two cabinets and up to 168 trunks.

IP 600 supports a call traffic rate of 5000 BHC in non-call center configurations. In Release 2, 9, and 9.5, up to 2000 BHC with CentreVuCT and CMS or BCMS Vu are connected and active with up to 50 agents.

In order for 50 agents to generate a call rate of 2000 BHC, the call service time must be less than 86 seconds. This 86 seconds is an extremely short service time for nearly all call center applications, except for credit card authentication. In this case, the call service time is in the range of 5-7 seconds.

DEFINITY Software Base

DEFINITY software for IP 600 Release 9.5 corresponds to DEFINITY Release 9.5.

The following features are new to Release 9.5 but are not supported in IP 600.

- Alarming via TCP/IP. IP 600 supports SNMP traps.
- Internet Terminal Server
- DEFINITY Telnet Service. IP 600 supports telnet, but not via the CLAN.
- ATM WAN Spare Processors. IP 600 supports only one port network.
- Reserve DID number for GUEST Works. IP 600 does not support GUEST Works.
- DEFINITY Remote Max in multiple time zones. IP 600 supports Remote Max, but is limited to a single time zone.

Intuity Audix Software Base

The Intuity AUDIX application for Release 9.5 is Intuity 5.1.

The software for CornerStone for Release 9.5 is the same as for Release 9.

Fax Extended Dialing

FAX messaging in Release 9.5 now has extended capabilities. In former legacy products, fax destinations were limited to 10-digit addresses to send faxes to domestic locations. This extended dialing increases the digit address to 23 digits. This extension benefits customers with subscriber communities who deliver faxes to international locations. In addition, this feature provides strong administrative controls to regulate the delivery of faxes to domestic and international destinations.

Increased Message Storage

The Intuity AUDIX recorded message storage time for Release 9.5 has been increased from 50 hours to 100 hours.

Increased Number of IMAPI Sessions

The number of IMAPI sessions for Release 9.5 has been increased from 6 sessions to 32 sessions.

Disable/Enable Embedded Messaging

Release 9.5 supports the capability to disable and enable the embedded Intuity AUDIX messaging system. A disable/enable link is configured from the administration web pages and allows the user to toggle between active/inactive on-board messaging capability. When the embedded message is active, a 'disable messaging' link is present. When the embedded messaging in inactive, the 'enable messaging' link is present, and all web page references to Intuity AUDIX messaging are removed. In the active messaging state, the appropriate backup-restore pages display the various Intuity AUDIX backup options, whereas in the inactive messaging state, the web pages are modified to not display the message-related backup options.

Impact on Maintenance

When Intuity AUDIX is disabled on the system, the ports on the CWY1 board become unavailable. As a result, maintenance is disabled for the CWY1 board. To counteract this and enable maintenance for the CWY1 board, at least one port on the board must be administered. Perform the following steps to enable maintenance for the CWY1 board when Intuity AUDIX is disabled:

1. Add station next
2. Enter "1A1201" in the Port field
3. Enter "2500" in the Type field
4. Enter "CWY1 Test Port" in the Name field
5. Submit the form
6. Perform a "test port 1A1201" and verify that the test passes

Unified Messaging

The Unified Messenger server software runs on the Windows operating system. The Unified Messenger server itself connects the telephone network to the Exchange, and performs the following functions:

- Plays and records voice messages
- Provides telephone answering service for individual subscribers
- Compresses audio messages in real-time for storage on the Exchange server
- Retrieves audio messages from the Exchange server, then decompresses and plays them
- Interprets DTMF for mailbox manipulation and control
- Performs text-to-speech conversion for audio playback of email messages

- Transports messages to and from subscribers on existing Octel® message servers
- Forwards inbound fax calls to an Exchange-compatible fax server
- Forwards faxes and email messages to a fax server for printing on a fax machine

In addition, Unified Messenger supports third-party Exchange-compatible fax servers. This enables individuals to receive faxes in their unified mailbox, view or send fax messages from their desktops, and direct faxes in their inbox to be printed at any fax machine worldwide.

Support Off-Board Messaging

With the ability to turn off embedded messaging in Release 9.5, the IP 600 development team has verified the capacity to support a variety of external messaging adjuncts, such as Off-board Messaging. Intuity AUDIX, Unified Messaging, Octel® and Serenade are supported for external messaging in Release 9.5.

Add Analog Interface to Voice Messaging Platforms

An analog interface with external VMS platforms is available in Release 9.5. This interface supports Aria and Serenade, Octel® 200, 250, 300, 350, and Unified Messaging. The analog interface should be used with the mode code.

Backup/Restore Enhancements

The backup/restore feature for Release 9.5 has been enhanced for greater reliability. When a new backup is created, it is placed in a 'parallel' directory to the existing backup, whether to the PCMCIA or to a destination disk over the LAN. In this way, two backups are alternated, wherein the oldest backup is the one overwritten by the current backup. The current backup is validated prior to overwriting the existing backup. A non-affirmative validation procedure results in the generation of a system alarm. The restore procedure remains unchanged.

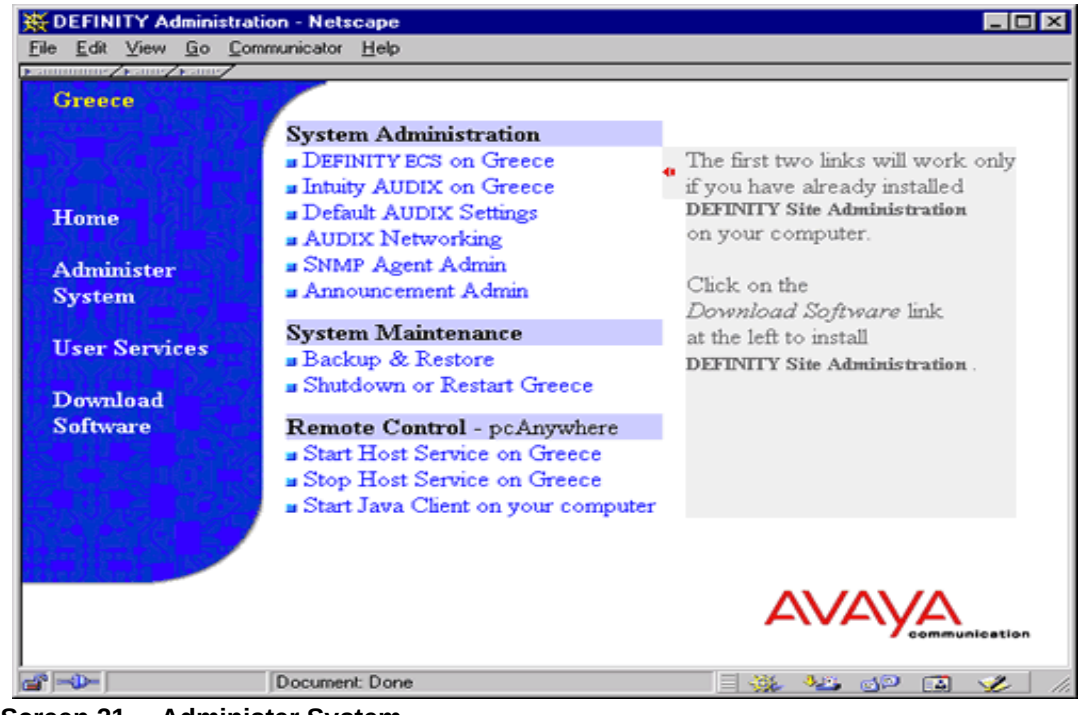
The SAT screens and web pages for the backup/restore operation are not affected by these considerations.

Procedure to Disable Voice Messaging

The following sequence of screens represents the procedure to disable voice messaging.

DEFINITY Administration screen/web page

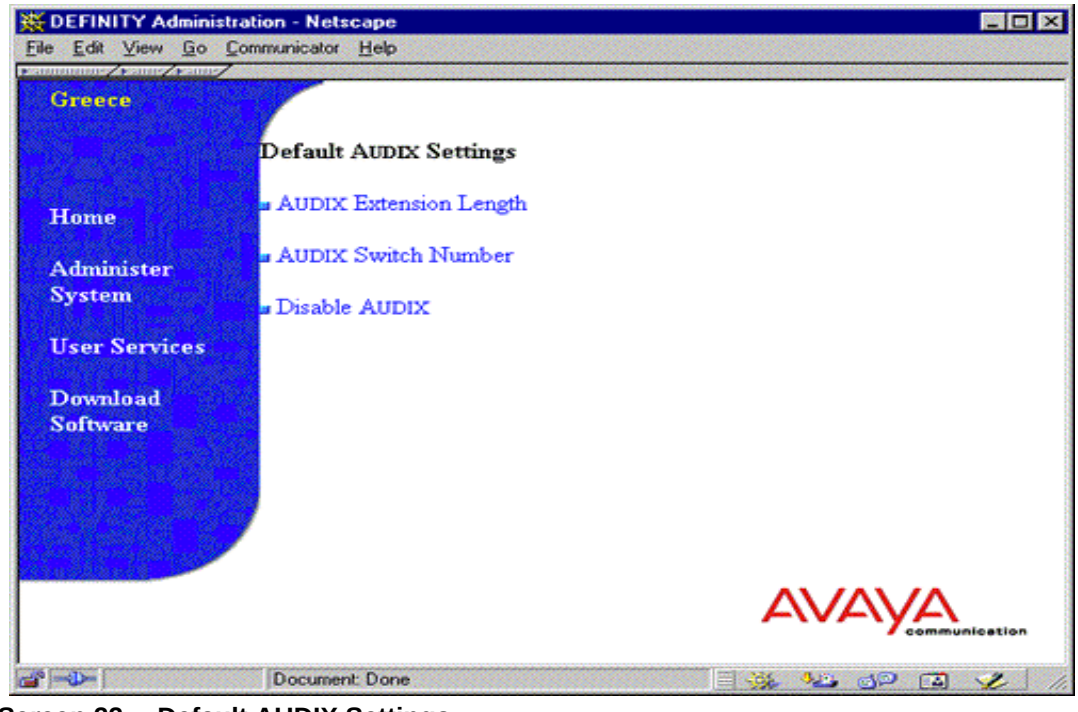
Screen 21 shows the main Administer System web page.



Screen 21. Administer System

Default AUDIX Settings screen

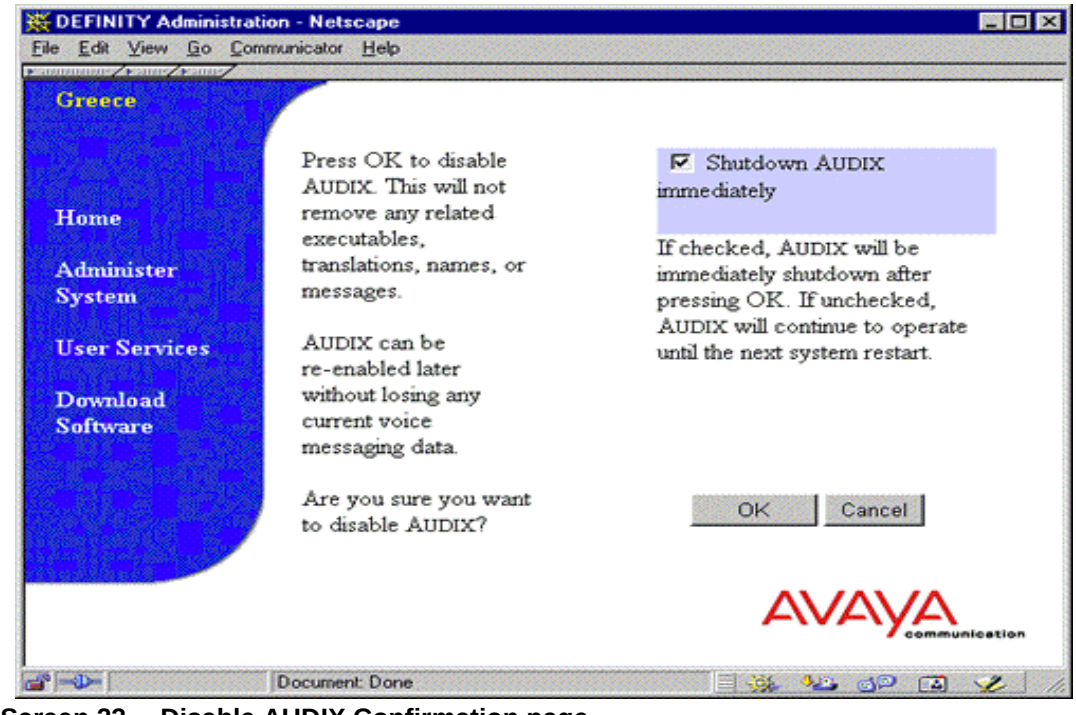
Screen 22 shows the Default AUDIX Settings page that contains the new feature to Disable AUDIX.



Screen 22. Default AUDIX Settings

Disable AUDIX Configuration page

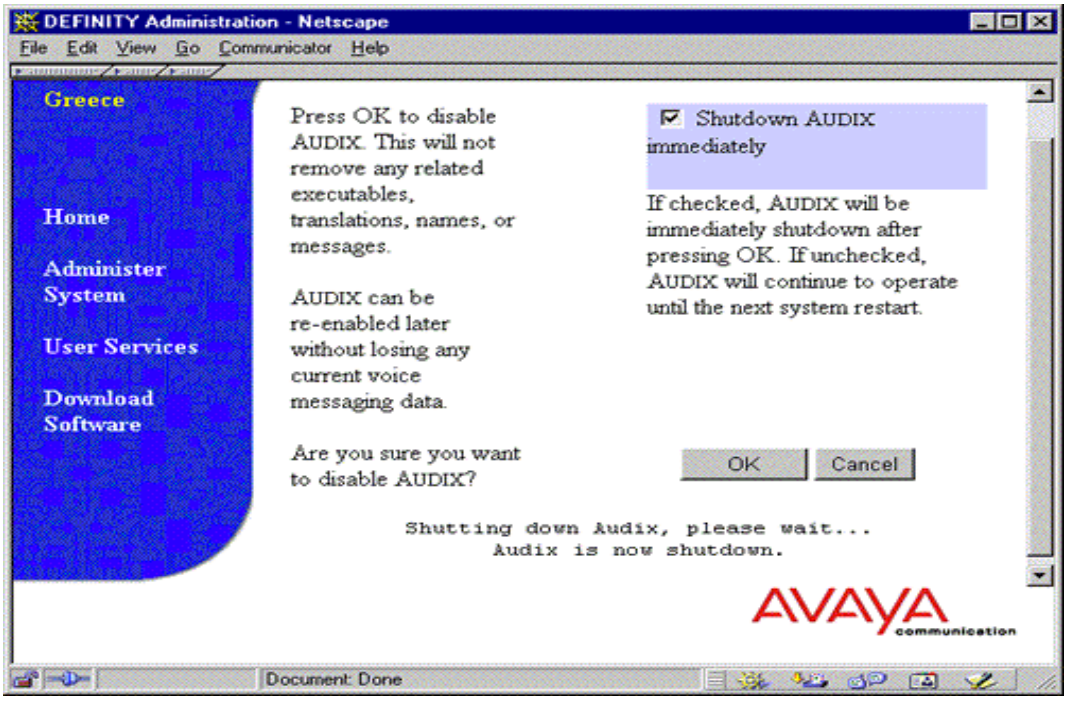
Screen 23 shows the confirmation page when Disable AUDIX is requested. The user has the option to disable AUDIX immediately, or to have AUDIX disabled after the next system restart.



Screen 23. Disable AUDIX Confirmation page

Shutdown Message screen

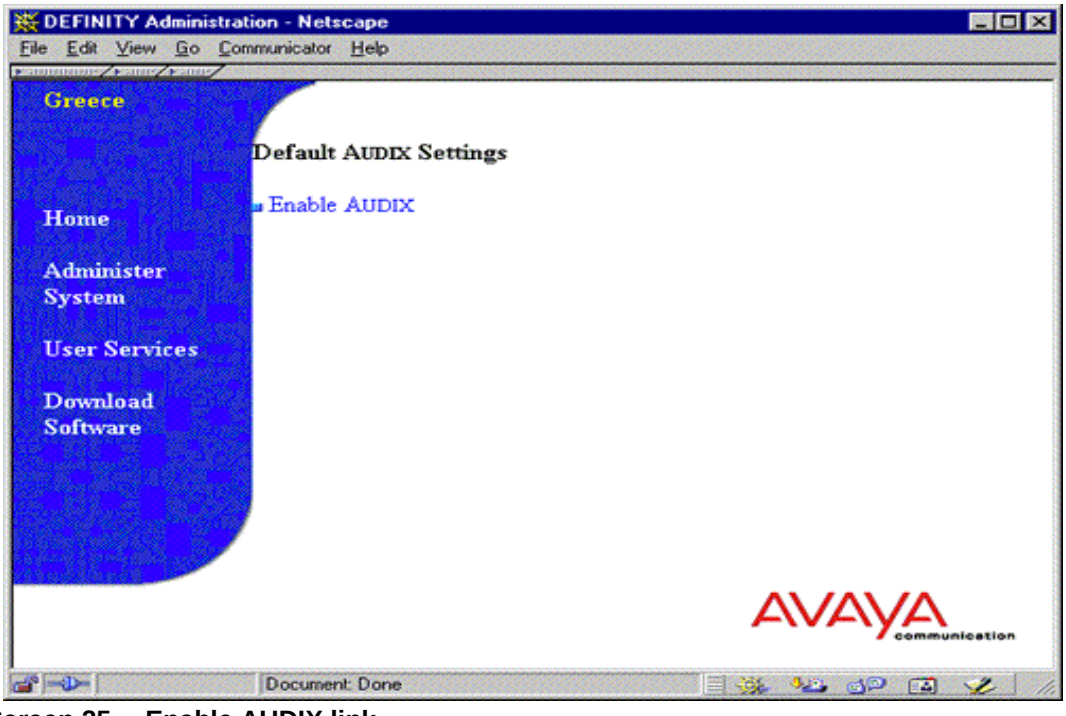
Screen 24 shows the status message if AUDIX is immediately shut down.



Screen 24. Shutdown Message is Displayed

Enable AUDIX Link Message screen

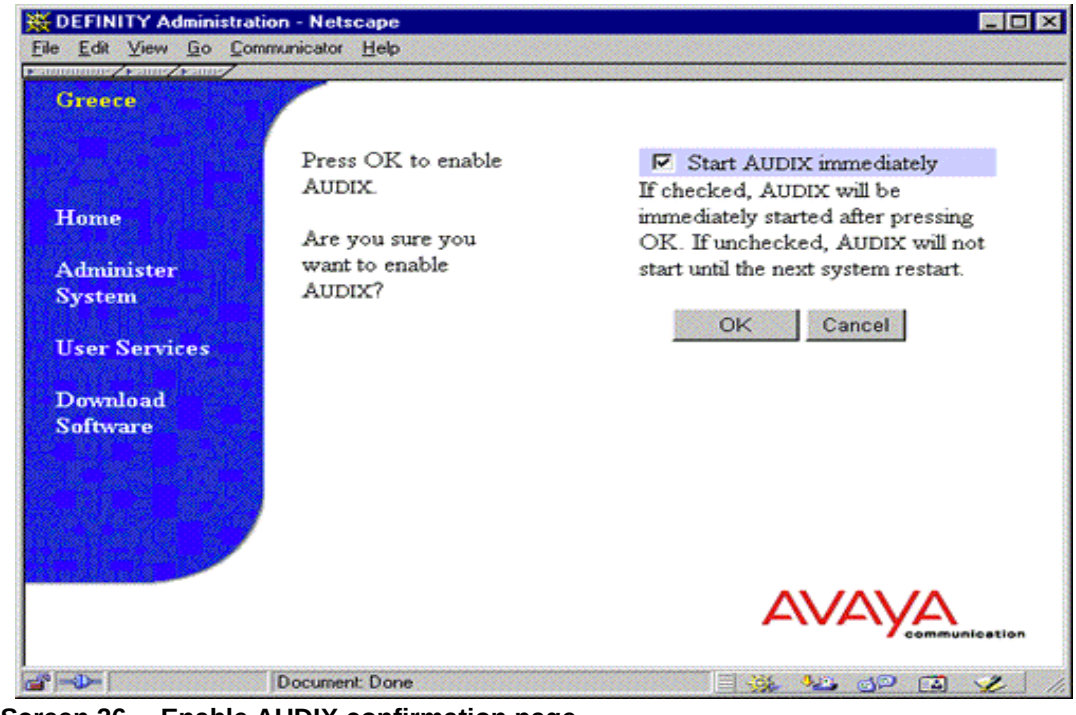
Screen 25 shows AUDIX disabled. When AUDIX is disabled, a link to Enable AUDIX is displayed on the Default AUDIX Settings page.



Screen 25. Enable AUDIX link

Enable AUDIX confirmation page

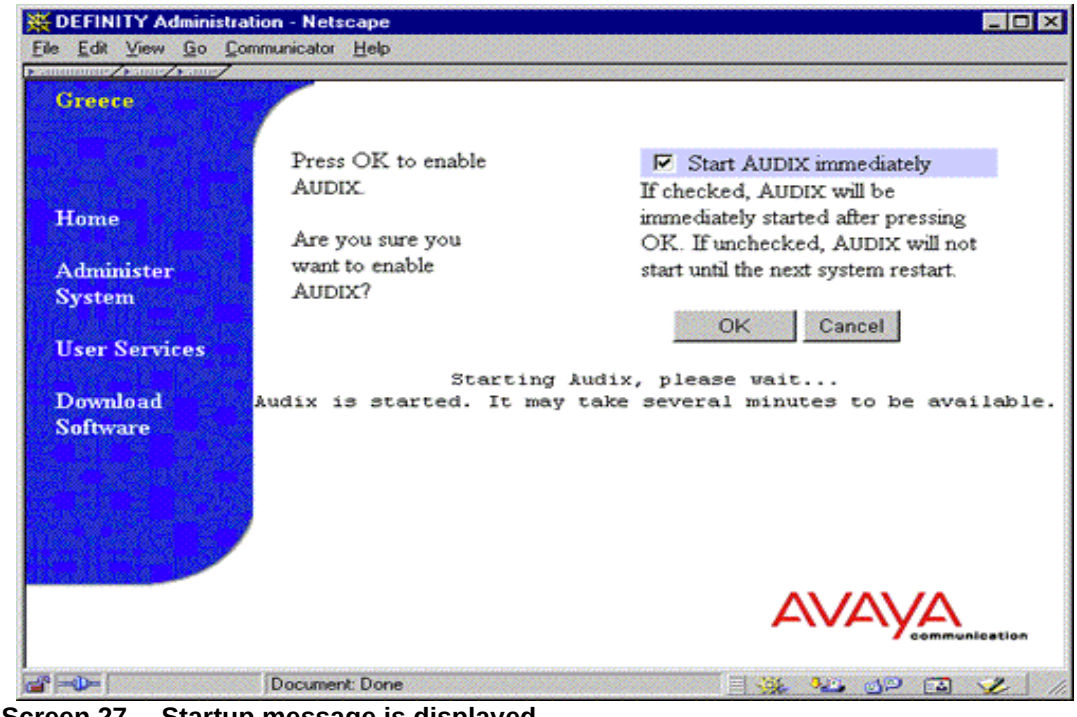
Screen 26 shows the confirmation page when Enable AUDIX is requested. The user has the option to enable AUDIX immediately, or to have AUDIX enabled after the next system restart.



Screen 26. Enable AUDIX confirmation page

Startup IP 600 message page

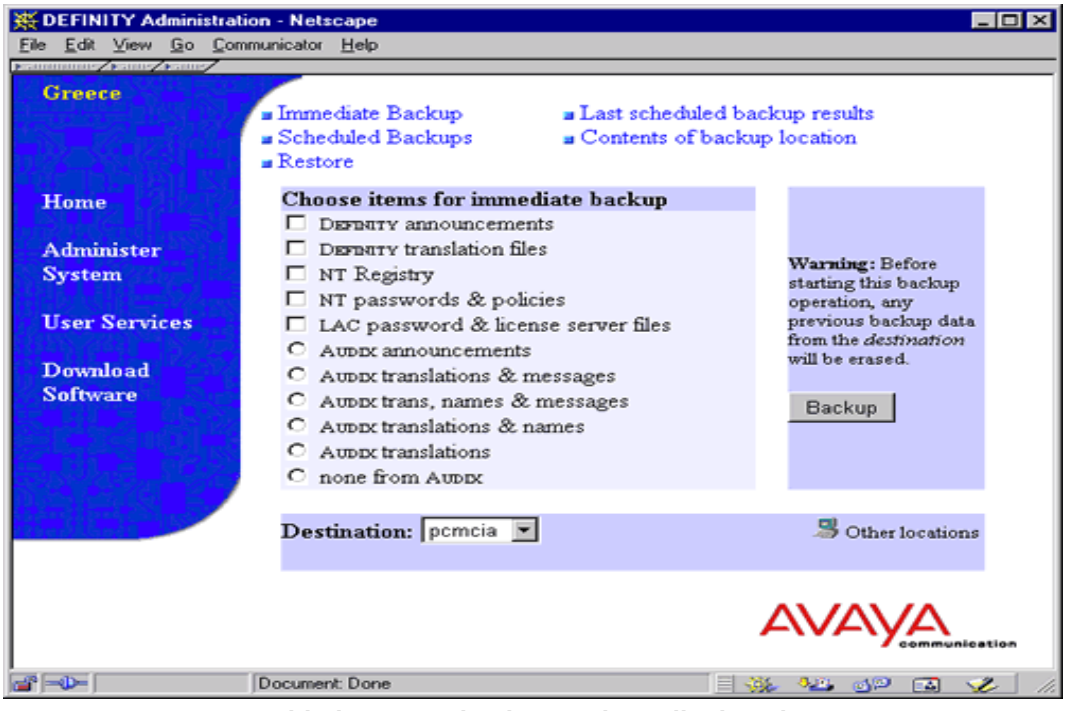
Screen 27 shows the page if an immediate AUDIX startup is requested. The status message displayed is the same as in Screen 4.



Screen 27. Startup message is displayed

AUDIX enabled with AUDIX backup options displayed

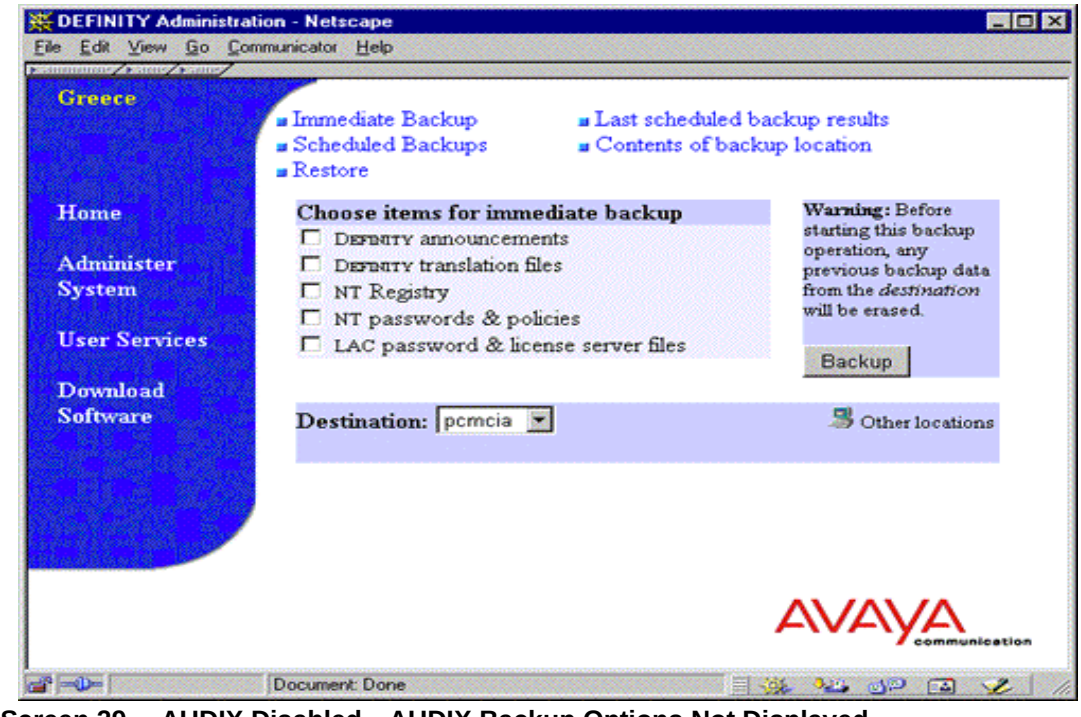
Screen 28 shows the page if AUDIX is enabled. When AUDIX is enabled, all AUDIX backup options are displayed. These Backup/Restore web pages are modified to reflect the on/off status of AUDIX.



Screen 28. AUDIX Enabled—AUDIX backup options displayed

AUDIX disabled with AUDIX backup options not displayed

Screen 29 shows the page when AUDIX is disabled. The AUDIX related backup options are not displayed.



Screen 29. AUDIX Disabled—AUDIX Backup Options Not Displayed

11 Avaya IP600 Enhancements
Procedure to Disable Voice Messaging *226*

EC500 Extension to Cellular R2

12

The Avaya EC500 Extension to Cellular R2 provides the expansion of mobile services, including one-number availability, increased user capacities, flexibility across facilities and hardware, more control over unauthorized usage, enhanced enable/disable capability, increased serviceability, and support of IP trunk facilities. Avaya EC500 R2 provides flexible mobile communications that save time and increase productivity.

X-Station Mobility Explicit Number Mapping

The user can use a cell phone in a public network, or another phone not directly connected to a DEFINITY system or IP600, as if it were an extension on the switch. The wireless user receives the same features and capabilities for incoming calls as a caller-id enabled analog telephone that is directly connected to the system. Any wireless phone from any service provider can connect to the Avaya system, and a user does not have to get a new digital cell phone or change service providers.

Capacities

Explicit Number Mapping increased the EC500 capacities. User capacity is no longer affected by the number of ARS conversion entries that are administered on the system. For capacity information, see ''System Capacity Limits'' on page 13.

Changed screens

There are new fields on the Station screen for X-Mobile stations.

Dial Prefix

Valid entries	Usage
4 digit string, 0-9 and #	Enter the digits or characters added at the beginning of the published cell phone number before dialing. For example, add 1 for long distance numbers, and 011 for international numbers.

Cell Phone Number

Valid entries	Usage
15 digit string, 0-9	Enter the cell phone's published external number.

Mapping Code

Enter the type of operation for the cell phone when it is mapped to this X-Mobile station extension.

Valid entries	Usage
origination	Enter **origination** to allow the cell phone to only originate calls from its associated internal X-Mobile extension.
termination	Enter **termination** to allow the cell phone to only terminate calls from its associated internal X-Mobile extension.
both	Enter **both** to allow the cell phone to originate and terminate calls from its associated internal X-Mobile extension.
none	Enter **none** to prohibit the cell phone from originating or terminating calls from its internal X-Mobile extension. Use none as a security measure if a cell phone is lost or stolen.

X-Station Mobility Extended to External Networks

The user can use a cell phone, or another phone not directly connected to a DEFINITY system or IP600, as if it were an extension on the system. This extension can be used in any configuration that a local extension can be used, including hunt groups, coverage paths, and bridging arrangements, with access to all the features supported by both the system and the cellular phone.

Activation of Calls to External Numbers

Calls to an extension on the switch can be forwarded to an external cell phone number for an EC500 specific X-Mobile station. The user activates or deactivates the Avaya Extension to Cellular (EC500) by dialing a feature access code from any telephone with touch-tone R capability that can access the DEFINITY system or the IP600, including the cell phone. The user also dials the applicable primary extension and security code.

There are two new fields on the Feature Access Codes screen, added in alphabetical order. If one field is administered, the other must also be administered.

Enhanced EC500 Activate

Valid entries	Usage
1-4 digits, including * and # as first digit	Enter a dial access code to forward calls to an extension (the principal) on the switch or IP600 to a cell phone (the bridges or xmappings).

Enhanced EC500 Deactivate

Valid entries	Usage
1-4 digits, including * and # as first digit	Enter a dial access code to stop forwarding incoming calls to an extension (the principal) on the switch or IP600, to a cell phone (the bridges or xmappings).

X-Station Mobility Maintenance Plan

MO_XMOB service states are not saved for system restart levels 3, 4, and 5, and the service state for all administered MO_XMOBs is reset to the In-Service state after the switch is successfully rebooted. The current service state for an MO_XMOB is not reset to the In-Service state for system resets at levels 1 and 2.

Maintenance Object MO_XMOB

Use this MO to maintain the resources that are used to place calls to and from the mobile handsets of X-mobility users. This MO supports the maintenance operations of administered X-Mobile stations.

There is no hardware associated with X-mobile stations when they are not active on a call. Therefore:

- No test actions are needed for this MO.
- Failures are not detected on X-mobile stations because no maintenance testing is performed and no in-line errors are generated for AWOH stations.
- Error counters and error counter thresholds are not defined because no maintenance testing is performed. The error log shows error 18 against XMOB-STA. A warning alarm is logged against an XMOB-STA when an MO_XMOB is busied out
- The test and alarm strategy is not needed for this MO since error counters are not defined and no alarms are triggered.
- Initialization testing of X-mobile stations is not needed.
- Periodic, fixed interval, or scheduled testing is not needed.

Commands

To resolve the problem of an unusable mobile handset at the ISDN-PRI interface, check to see if there are entries for the ISDN-PRI MO in the error and alarm logs. If not, start by busying out and releasing the X-station extension associated with the handset.

busyout station [x-station extension]

The **busyout** command puts the X-mobile station into an out of service state, making the mobile handset unavailable for receiving or placing calls. When the service state of an MO_XMOB changes from In-service to Out-of-Service, error type 18 is logged against the X-mobile station. A warning alarm is raised and logged in the alarm log. Once busied out, all subsequent requests to busy out the X-mobile station are ignored.

release station [x-station extension]

The **release** command puts the X-mobile station into an in-service state, clears all switch resources used by the X-mobile station, and makes the X-mobile station available for receiving or placing calls. The warning alarm for the previous busied-out station is cleared. When the service state of an MO_XMOB changes from Out-of-Service to In-Service, error type 18 is removed from the error log and the warning alarm is removed from the alarm log.

Fixing problems

If an X-mobile WT (a physical wireless station that is remotely controlled by DEFINITY ECS) hangs in an error state that cannot be cleared by ending the call with the End Call button on the handset, issue the **busyout station [X-mobile extension]** command, followed by **release station [X-mobile extension]**. This resets and clears all switch resources for the WT and drops the connection between the switch and the handset.

Upgrades

13

This section explains how to perform a software-only upgrade from Release 9.1 to Release 9.5 for a DEFINITY si, csi, or r system.

- Upgrading from R9.1si to R9.5si
- Upgrading from R9.1csi to R9.5csi
- Upgrading from R9.1r to R9.5r

For instructions for performing upgrades from previous releases, refer to the Release 9 upgrade documentation.

Upgrading from R9.1si to R9.5si

This section provides the information necessary to upgrade a DEFINITY R9.1si system with a single carrier or multicarrier PPN to a DEFINITY R9.5si system using the on-site upgrade method.

The *DEFINITY ECS System Description* lists release features and functions. The *DEFINITY ECS Administrator's Guide* provides the commands and procedures required to initialize and administer the ECS. These documents are included in the DEFINITY Enterprise Communications Server Documentation Library published in CD-ROM (555-233-416).

Before you begin the upgrade

Review the Preparation and process steps carefully. These tables describe the tasks that must be completed before the upgrade visit and who is responsible for them.

To prevent the most common upgrade problems, be sure that you have checked for software upgrade compatibility and identified any patches that need to be re-applied

Provide the required tools

This upgrade can require the following tools and other items:

- Authorized wrist grounding strap
- Documentation (book or PDF file) for the current release:
  - *DEFINITY Enterprise Communications Server Maintenance*
  - *DEFINITY Enterprise Communications Server Administrator's Guide*

Task List: R9.1si to R9.5si

Use this task list to upgrade from simplex or duplex R9.1si systems to an R9.5si PPN.

Perform these tasks *during* the upgrade visit:

1. Verify the software version to identify any software patches.
2. Verify system status to check the health of the SPE. Record any customer-placed busy-outs.
3. Disable scheduled maintenance and alarm origination
4. Check link status
5. Record all links
6. Check IP Softphones
7. Disable TTI if it is enabled. *Do not skip this step!*

   Translations can be corrupted if TTI is enabled. Confirm that TTI is completely disabled before you save translation!
8. Save translations
9. Save announcements
10. For systems so equipped: Shut down DEFINITY LAN Gateway

11. For systems so equipped: Shut down DEFINITY AUDIX system
12. For a high or critical reliability system, Determine active SPE

    Make sure the active tone clock is in the active SPE before continuing.
13. Upgrade software

    Make sure the active tone clock is in the active SPE before continuing.
14. Set date, time, and daylight savings rule
15. Verify the upgrade
16. Verify software version
17. Power up DEFINITY LAN Gateway system
18. Power up DEFINITY AUDIX system
19. If you changed scheduled maintenance parameters, restore the original values. Re-enable scheduled maintenance and alarm notification
20. Enable customer options and alarm origination Check IP softphones here.
21. Administer customer options (This requires an init login)
22. Check link status
23. Resolve alarms

    Restore any customer-placed busy-outs before you run the acceptance tests!

    If the system contains adjuncts such as DEFINITY AUDIX, reseat them as required before you run the acceptance tests.
24. Readminister TTI and alarm notification
25. Restore announcements or Rerecord announcements as necessary
26. Check SPE
27. Save announcements and translation
28. Register the upgraded switch

Verify the software version

1. Type **list configuration software-version** and press RETURN.
2. Check the **UPDATE FILE** column and make a record of any patches that have been applied.

   If the system has to be restored to the old software, you need to download the patches onto the system.

Verify system status

1. Type **status system 1** and press RETURN to verify that system status is normal.
2. If status is not normal, take the needed corrective actions.
3. Type **display alarms** and press RETURN to verify that the system is alarm-free.
4. If the system is not alarm-free, take the needed corrective actions.
5. Type **display errors** and press RETURN to identify and record customer-placed busy-outs.
6. Examine the error log and record the error 18s that identify the busy-outs placed by the customer.

   NOTE:
   You can restore the customer-placed busy-outs after you have upgraded the system.

7. For a system that has existing BX.25 links that are being retained after the upgrade, type **display communication-interface links** and press RETURN.
8. Identify and record the links.
9. Execute the following commands and verify that the information is correct:
   - **list station**
   - **list trunk-group**
   - **list hunt-group**
   - **list data-module**
10. If any command does not complete successfully, escalate the problem immediately.

Disable scheduled maintenance and alarm origination

Use this procedure to prevent scheduled daily maintenance from interfering with the update or upgrade. This prevents the system from generating alarms and unnecessary trouble tickets.

NOTE:
Record any changes that you make; you must restore the original time after the upgrade.

1. Type **change system-parameters maintenance** and press RETURN.
2. Make any required changes to prevent scheduled maintenance during the upgrade.

   If scheduled maintenance

   — has begun: change the Stop Time field to 1 minute later than the current time.

   — has not begun: change the Start Time field to a time after the upgrade will be completed.

3. Type **neither** in the Alarm Origination to OSS Numbers field.
4. For some software releases, disable the Cleared Alarm Notification and Restart Notification fields.
5. Press ENTER to save your changes.

Check link status

This optional step is to make sure the links are in service before and after the upgrade.

1. Type **display communication-interface links** and press RETURN. Write down all enabled links.
2. Type **status link *number*** and press RETURN for each enabled link.
3. Write down which links are enabled and in service.

   NOTE:
   If any links are enabled and out of service, resolve the problem before continuing the upgrade.

Record all links

For R7 and later, ISDN links move to the Net Packet circuit pack. They are not retranslated.

NOTE:
Any BX.25 adjunct links to adjuncts (for example, CMS, AUDIX, INTUITY, or others) that are to be retained will still reside on the existing TN765 processor interface (P/I) in the designated P/I slot. Remove the TN765 P/I only if the sales team has specified that all adjunct connectivity is being migrated to a TN799 Control LAN (C-LAN) circuit pack.

Check IP Softphones

If the customer has IP softphones, the maximum number of registered IP softphones can default to 1 after an upgrade.

1. Type **display system-parameters customer-options** and press RETURN.
2. Go to the Maximum IP Registrations by Product ID screen (last screen) and write down the number listed in the IP_Soft field.

   The number must be verified at the end of the upgrade.

Disable TTI

CAUTION:
If you do not disable the TTI, the translations can be corrupted.

1. Type **change system-parameters features** and press RETURN.
2. On page 2 of the screen, set the TTI Enable? field to **n** to de-activate the TTI feature.
3. Type **status tti** and press RETURN. Confirm that the TTI is *completely* disabled before you proceed with the upgrade.

   TTI is completely disabled when the Percent Complete field shows **100**. You may need to repeat the command several times before the field shows 100.

Save translations

NOTE:
To save translations on duplicated systems, the systems must be in sync or the command will fail.

For duplicated systems only, execute **status system 1** before you save translations.

Verify that conditions are normal (this can take as long as 5 to 10 minutes). If the system refuses to go into a normal condition, refer to the maintenance procedures; if that fails, escalate the problem.

1. Type **save translation** and press RETURN.

   This takes about 10 minutes.

   NOTE:
   Do not press any keyboard key until after the terminal shows the success message. For example, if you press RETURN more than once after typing the command, the second RETURN erases the screen and you never see the success message.

2. If the **save translation** command fails, do not continue. Record the error code that appears on the screen and escalate the problem immediately.

   Keep the translation media in a safe and secure place. In case of failure, you use this translation to restore the system.

Save announcements

NOTE:
You do not need to save announcements for systems equipped with the TN750C announcement circuit pack (which contains on-board nonvolatile memory).

Use this procedure for systems equipped with the TN750B announcement circuit pack. Saving announcements takes about 40 minutes.

1. To determine whether the system has recorded announcements, type **display announcements** and press RETURN.

   If no recorded announcements are listed, you do not have to save announcements.

   NOTE:
   If the customer can verify that no announcements have been changed since the announcements were last saved, you do not have to save announcements. (But if there is any doubt, save announcements!)

2. Type **save announcements <port network> <carrier> <slot>** and press RETURN.

Shut down DEFINITY LAN Gateway

WARNING:
Neglecting to shut down the LAN Gateway assembly before powering down the system cabinet can damage the LAN Gateway disk.

1. Log onto the DEFINITY LAN Gateway.
2. From the main menu, click **Maintenance** > **Reset System** > **Shutdown**.

Shut down DEFINITY AUDIX system

A yellow caution sticker on the system's power unit notifies you to shut down the AUDIX before powering down the system.

WARNING:
Neglecting to shut down an AUDIX assembly before powering down the system cabinet where it resides can damage the AUDIX disk.

1. Log into the AUDIX as **craft**.
2. Type **reset system shutdown** and press RETURN.
3. Press RETURN again to start the shutdown.

   The **SHUTDOWN Completed** message appears when the AUDIX is successfully shutdown. This takes about 2 minutes.

   CAUTION:
   If leaving AUDIX System in the carrier, back it out about 2 in. (5 cm) to eliminate the possibility of damage due to power surges.

Determine active SPE

1. Type **status system 1** and press RETURN to determine the active SPE.
2. Lock the SPE switches on the DUPINT circuit packs to the active SPE.

   NOTE:
   Make sure the active tone clock is in the active SPE before continuing.

Upgrade software

1. Insert the Release 9.5 generic program card (orange card) into the TN2404 processor circuit pack.
2. Type **upgrade software** and press RETURN to upgrade the software to Release 9.5.
3. Install the original translation card when the system prompts (beeps)

   You have 2 minutes to replace the software card with the translation card.
4. For high or critical reliability systems, repeat steps 1 through 3.

Set date, time, and daylight savings rule

NOTE:
To prevent unnecessary trouble tickets, do not enable the system alarms (Alarm Origination feature) until all installation and administration procedures are completed.

1. Type **set time** and press RETURN.

```
display time
                              DATE AND TIME
         DATE
             Day of the Week: Monday      Month: July
            Day of the Month: 2            Year: 2001

         TIME
             Hour: 20  Minute: 30   Second: 55  Type: standard
                        Daylight Savings Rule: 1

WARNING: Changing the date or time impacts BCMS, CDR and MEASUREMENTS
```

2. In the Type field, type **standard** or **daylight savings**, depending on whether you are currently on standard or daylight savings time.

   NOTE:
   The default daylight savings rule is **0**, no daylight savings.

3. In the Daylight Savings Rule field, set the rule value. If your area uses daylight savings time, set the value to **1**; otherwise, use the default setting of **0**.
4. Press ENTER to set the time.

Verify the upgrade

1. Execute **status system 1** and press RETURN to verify that the system is in a normal state.
2. Type **display alarms** and press RETURN.

   If the system is not alarm-free, take the needed corrective actions.
3. Type **list configuration software-version** (simplex) or **list configuration software-version long** (duplex) and press ENTER. Check the Memory Resident field to verify that it shows the correct Release 9 software load.
4. Type **display communication-interface links** and press RETURN.

   Status each of the links.

   NOTE:
   ISDN-PRI D-channel links no longer appear on this screen. (ISDN-PRI resides on the network packet circuit pack.) The only way to determine if an ISDN-PRI D-Channel is up is to use the **status signaling group** command.

5. Type **list signaling-group** press RETURN. For each signaling group, type **status signal <*number*>** and press RETURN.

   Validate that all the signal groups that should be operational are in service.
6. Execute the following commands and verify that the information is correct:
   - **list station**
   - **list trunk-group**
   - **list hunt-group**
   - **list data-module**

   For upgrades from systems later than G1, **list ars analysis**

   For a system with Expert Agent later than G3V3, **list agent**
7. For duplicated systems only, execute **status system 1**

Verify software version

For standard reliability

1. Type **list configuration software-version** and press RETURN to verify the system software version (see the Memory Resident field).

For high/critical reliability

1. Type **list configuration software-version long** and press RETURN to verify the system software version (see the Memory Resident field).

Power up DEFINITY LAN Gateway system

1. Log onto the DEFINITY LAN Gateway.
2. From the main menu, click **Maintenance** > **Reset System** > **Reboot System**.

Power up DEFINITY AUDIX system

If the AUDIX was removed from the cabinet:

1. Re-install the AUDIX and allow it to boot up automatically.
2. Check for AUDIX System errors.

   If the AUDIX remained in the cabinet but the cabinet was powered down:

3. Reseat the AUDIX
4. Power up the cabinet. The AUDIX reboots automatically.
5. Check for AUDIX System errors.

   If the AUDIX remained in the cabinet and the cabinet was *not* powered down:

6. At the AUDIX console, hold the CTRL key and type **cc**.
7. Type **5** at the prompt.

   In about 2 minutes, the AUDIX boots up.

8. When the system initialization is complete, log in as **craft**.
9. Check for AUDIX System errors.

Re-enable scheduled maintenance and alarm notification

1. Type **change system-parameters maintenance** and press ENTER.
2. Enable the scheduled daily maintenance.
3. If you changed the Start Time or Stop Time field, change it back to the original time.
4. Re-enable alarm notification.

Enable customer options and alarm origination

1. Get the DOSS order number of the upgrade from the project manager and ask the regional Customer Software Administration to administer customer options. For telephone numbers, go to Avaya Support Centre and select ONLINE SERVICES, then select Contact Us.

   NOTE:
   As part of the system registration process, the INADS Database Administrator enables Alarm Origination.

2. When notified that the administration is completed, log in as **craft**.

Administer customer options

NOTE:
This procedure requires an **init** login.

If the upgrade is after hours, coordinate with the regional CSA to have the features turned on.

1. Log in to the switch and respond to the Access Security Gateway (ASG) challenge.
2. *For duplicated systems*, verify that the switches are in **Auto**:, type **status system 1** and press RETURN.

   Verify that conditions are normal (this can take as long as 5 to 10 minutes). If the system refuses to go onto a normal condition, refer to the maintenance procedures; if that fails, escalate the problem.
3. If it is necessary to change the offer, type **change system-parameters offer-options** and press RETURN.
4. If changing offers and the Activate Offer field is **n**, set it to **y** and press TAB. A warning message lets you know whether you need to save translations and reboot to make the change permanent.
5. Press ENTER to save the changes or CANCEL if there were no changes.
6. Type **change system-parameters customer-options** and press RETURN to set the customer options that were purchased. Verify that the G3 version field is set to **V9**.

   Use these screens to verify the customer options are set correctly.
7. Go to screen 4 and set the R9.5 Capabilities? field to **y**.
8. If the customer was using Supplementary Services Protocol b or d on an ISDN-PRI trunk group before the upgrade, set the Basic Call Setup field on the QSIG Optional Features page to **y**.

9. For customers having IP softphones, go to the Maximum IP Registrations by Product ID screen (last screen) and verify that the number listed in the IP_Soft field did not default to **1**. If it did, get the number from field technician and type it in.
10. Press ENTER to save the changes.
11. Call the INADS database administrator at the TSC to verify that the system is part of the existing INADS database.
12. Verify that INADS can dial into the system and that the system can dial out to INADS.
13. Log off as init and notify field technician.

Reference

The INADS database administrator enables alarm origination and customer options as part of system registration.

Check link status

This optional step is to make sure the links are in service before and after the upgrade.

1. Type **display communication-interface links** and press RETURN. Write down all enabled links.
2. Type **status link *number*** and press RETURN for each enabled link.
3. Write down which links are enabled and in service.

NOTE:
If any links are enabled and out of service, resolve the problem before continuing the upgrade.

Resolve alarms

1. See your record of customer busy-outs and recreate the pre-upgrade busy-out states.
2. Type **display alarms** and press RETURN.
3. Examine the alarm log.
4. Resolve any alarms using the appropriate DEFINITY Enterprise Communications Server Maintenance book.

Readminister TTI and alarm notification

Perform this step only if you disabled TTI for the upgrade!

1. Type **change system-parameters features** and press RETURN.
2. Change the TTI field on page 2 of the screen back to **y** if necessary.
3. Type **status tti** and press RETURN to verify that TTI is 100% enabled.

Restore announcements

1. Insert the white flash card with the saved announcements.
2. Type **restore announcements** and press RETURN.

   This command takes about 45 minutes to execute.

Rerecord announcements

If you have not saved and restored announcements during the upgrade, the customer must re-record all announcements now.

If the customer changed any announcements after the they provided the source tape for the blowback flash card, the customer must re-record the new announcements.

Check SPE

1. Type **status system 1** and press RETURN.

Save announcements and translation

CAUTION:
Make sure you replace the original translation card(s) with the new ATA flashcard(s). Failure to do so causes an alarm.

1. Remove the original translation card(s) from the TN2401 NetPkt circuit pack(s). These cards are read-only in the new TN2401.
2. Insert the new translation card(s) into the TN2401 NetPkt circuit pack(s).
3. Type **save announcements** and press RETURN.

   This takes about 45 minutes.

4. Type **save translation** and press RETURN.

   This takes about 20 minutes.

   NOTE:
   Do not press any keyboard key until after the screen shows the success message. For example, if you press ENTER more than once after typing the command, the second ENTER erases the screen and you never see the success message.

   NOTE:
   If the **save translation** command fails, do not continue. Record the error code that appears on the screen and escalate the problem immediately.

   Keep the translation media in a safe and secure place.

Register the upgraded switch

You register the system from a laptop or via a technical work bench such as INADS.

1. Get the serial number of the upgraded PPN.
2. Call the INADS database administrator at the TSC (1-800-248-1111) to register the upgraded system.

Upgrading from R9.1csi to R9.5csi

This section provides the information on upgrading from a DEFINITY ECS Release 9.1csi to a Release 9.5csi.

DEFINITY Enterprise Communications Server Release 9 Administrator's Guide lists DEFINITY ECS Release 9.5 features and functions and provides the commands, procedures, and screens to initialize and administer the system.

Read This First

Service Interruption

The upgrade process requires a service interruption of about 10 minutes and must be closely coordinated with the customer and the local account team.

Contact Network Technicians

Contact the technician for each public and private network before the update or upgrade begins. Otherwise, it is possible that network access trunk facilities will be busied out at the far end.

Software Compatibility

Before starting the upgrade, always check the *Software Release Letter* (Compas ID 75029) that accompanies the system removable media. Translation corruption will occur if incompatible software is loaded. The letter also includes the Minimum Vintage Table. For the most current minimum vintage information, check Compas ID 42751 before starting the upgrade.

Usable Circuit Packs

Every circuit pack used in the Release 9.5 system must conform to the minimum usable vintage requirements for that system. At a presale site inspection, the remediation process checks the vintages of existing circuit packs to be reused in the Release 9.5 system. Replace all unusable vintage circuit packs with current vintages.

Refer to *Technical Quarterly, Reference Guide for Circuit Pack Vintages, Change Notices,* and to the *Software Release Letter* for information about usable circuit pack vintages. For information about usable vintages of non-U.S. circuit packs, refer to the ITAC Tech Alert from your regional distributor.

Antistatic Protection

CAUTION:
When handling circuit packs or any components of a DEFINITY ECS, always wear an antistatic wrist ground strap. Connect the strap to an approved ground such as ground jack on the DEFINITY ECS.

Required Tools

This upgrade can require the following tools and other items:

- Wrist ground strap
- One copy of each of the following books:
  - *DEFINITY Enterprise Communications Server Maintenance for R9csi*
  - *DEFINITY Enterprise Communications Server Release 9 Administrator's Guide*

Task Table

Table 19 provides the high-level tasks to perform the upgrades in this section. Refer to the appropriate page for instructions for each step.

Table 19. 74s to Upgrade to Release 9.5csi

✓	Task Description	Page
	Check SPE	250
	Verify Software Version	250
	Verify System Status	251
	Disable Scheduled Maintenance and Alarm Origination to INADS	251
	Check Link Status	252
	Check IP Softphones	265
	Disable TTI (Do not skip this section!)	252
	Check TTI Status	252
	Save Translations	253
	Save Announcements (if necessary)	253

Continued on next page

Table 19. 74s to Upgrade to Release 9.5csi — *Continued*

✓	Task Description	Page
	Upgrade Software	253
	Set Daylight Savings Rules	254
	Set Date and Time	254
	Verify the Upgrade	256
	Enable TTI	257
	Enable Scheduled Maintenance	257
	Enable Alarm Origination to INADS	257
	Administer Customer Options	272
	Check Link Status	258
	Resolve Alarms	258
	Restore Announcements (if necessary)	258
	Check SPE	258
	Save Translations (post-upgrade)	258
	Save Announcements (if necessary— post-upgrade)	258
	Return Equipment	258

Check SPE

1. Type **status system 1** and press RETURN to check the health of the system.

Verify Software Version

1. Type **list configuration software-version** and press RETURN.
2. Under the **UPDATE FILE** column, note whether a patch has been applied.

NOTE:
If the system must be restored to the old software, this patch must be downloaded onto the system.

Verify System Status

1. Type **display alarms** and press RETURN.
2. If the system is not alarm-free, take the needed corrective actions.
3. Type **display errors** and press RETURN.
4. Examine the error log and record the error 18s that identify the busy-outs placed by the customer.
5. Restore the customer-placed busy-outs after you have upgraded the system.
6. Execute the following commands and verify that the information is correct:
   - **list station**
   - **list trunk-group**
   - **list hunt-group**
   - **list data-module**
   - **list announcements**

If any command does not complete successfully, escalate the problem immediately.

Disable Scheduled Maintenance and Alarm Origination to INADS

1. Type **change system-parameters maintenance** and press RETURN.
2. If scheduled maintenance has begun, set the Stop Time field to 1 minute after the current time.

   or

   If scheduled maintenance has **not** begun, set the Start Time field to a time after the upgrade will be completed. For example, if you start the upgrade at 8:00 p.m. and the upgrade takes 90 minutes, set the Start Time field to 21:30.

   CAUTION:
   If you do not disable Alarm Origination, the system can generate alarms, resulting in unnecessary trouble tickets.

3. Type **neither** in the Alarm Origination to OSS Numbers field and press ENTER.

NOTE:
Disabling alarm origination prevents the system from generating alarms, thus preventing unnecessary trouble tickets.

For some software loads**,** set the Cleared Alarm Notification and Restart Notification fields to disable before pressing ENTER.

Check Link Status

1. Enter **display communication-interface links** and press RETURN.
2. Write down all enabled links.
3. Type **status link *number*** and press RETURN for each enabled link.
4. Write down which links are in service.

Check IP Softphones

If the customer has IP softphones, the maximum number of registered IP softphones can default to 1 after an upgrade.

1. Type **display system-parameters customer-options** and press RETURN. Go to the Maximum IP Registrations by Product ID screen (last screen) and write down the number listed in the IP_Soft field. The number must be verified at the end of the upgrade.

Disable TTI

NOTE:
Do this step only if the Terminal Translation Initialization (TTI) is enabled.

CAUTION:
If you do not disable the TTI, the translations can be corrupted.

1. Type **change system-parameters features** and press RETURN.
2. On the second screen, set the TTI Enable? field to **n** to de-activate the TTI feature.

Check TTI Status

1. Type **status tti** and press RETURN. Wait until the Percent Complete field shows **100**.

Save Translations

1. Type **save translation** and press RETURN to write all translations from memory to the original translation flashcard, which takes about 10 minutes.

   When the save translations is successful, the error code must be a zero; otherwise, the translations are not copied. If the translations were corrupted, the following error message appears when logging in:

   WARNING:
   Translation corruption detected; call an Avaya distributor immediately.

   NOTE:
   The **save translation** command cannot function if translations are corrupt.

Save Announcements (if necessary)

NOTE:
The TN750C Announcement circuit pack stores announcements in nonvolatile memory; saving the announcements to a flashcard is optional.

1. If the PPN contains a TN750/B Announcement circuit pack, type **display announcements** and press RETURN.
2. If administered recorded announcements are listed, type **save announcements *UUCSS*** and press RETURN. For example, **01D03**.

   This takes about 30 minutes.

   NOTE:
   For some software loads, type **save announcements from *UUCSS***. Type **help** and press RETURN for complete command syntax.

Upgrade Software

1. Insert the Release 9.5 generic program card (orange card) into the TN2402 processor circuit pack.
2. Type **upgrade software** and press RETURN to upgrade the software to Release 9.5.
3. Install the original translation card when the system prompts (beeps)

   You have 2 minutes to replace the software card with the translation card.

Set Daylight Savings Rules

You can set up to 15 customized daylight savings time rules. If you have switches in several different time zones, you can set up rules for each. A daylight savings time rule specifies the exact time when you want to transition to and from daylight savings time. It also specifies the increment at which to transition.

NOTE:
The default daylight savings rule is **0**, no daylight savings.

1. Type **change daylight-savings-rules** and press RETURN.

```
                        DAYLIGHT SAVINGS RULES
Rule          Change Day              Month  Date   Time   Increment

0: No Daylight Savings
1: Start: first Sunday___ on or after April    1  at _2:00  01:00
    Stop: first Sunday___ on or after October  25 at _2:00
2: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
3: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
4: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
5: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
```

2. Type the appropriate start and stop information in the Change Day, Month, Date, Time, and Increment (for example, **1:00** equals one hour) fields for each rule.

   NOTE:
   You can change any rule except rule 0 (zero). You cannot delete a daylight savings rule if it is in use on either the Locations or Date and Time screens.

3. Press ENTER.

Set Date and Time

1. Type **set time** and press RETURN.
2. Verify that the Date and Time screen appears.

   The cursor is positioned on the Day of the Week: field.

```
display time
                              DATE AND TIME
         DATE
             Day of the Week: Monday      Month: July
            Day of the Month: 2            Year: 2001

         TIME
             Hour: 20  Minute: 30   Second: 55  Type: standard
                        Daylight Savings Rule: 1

WARNING: Changing the date or time impacts BCMS, CDR and MEASUREMENTS
```

3. Type the day of the week in English (Sunday through Saturday). Use the following table for English day of the week names.

Day Number	Day Name
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

4. The cursor is positioned on the Month: field. Type the current month in English (January through December). Use the following table for English month names. After the month is entered, press TAB to move to next field

Number	Name	Number	Name
1	January	7	July
2	February	8	August
3	March	9	September
4	April	10	October
5	May	11	November
6	June	12	December

5. The cursor is positioned on the Day of the Month field. Type the day of month (1 through 31) and press TAB to move to the next field.
6. The cursor is positioned on the Year field. Type the current year and press TAB to move to the next field.

7. The cursor is positioned on the Hour field. Type the current hour for a 24-hour clock. Press TAB to move to the next field.
8. The cursor is positioned on the Minute field. Type current minute (0 through 59). Seconds cannot be set.
9. Type **standard** or **daylight savings** in the Type field.
10. Type the rule (number) in the Daylight Savings Rule field.
11. Press ENTER when the information is correct.
12. Type **display time** and press RETURN to verify date/time data.

Verify the Upgrade

1. Type **status system 1** and verify that the system is in a normal state.
2. Type **display alarms** and press RETURN.

   If the system is not alarm-free, take the needed corrective actions.
3. Type **list configuration software-version** and press RETURN. Verify the software configuration.
4. Type **display communication links** and press RETURN.

   Status each of the links.

   NOTE:
   For Release 7 and later, the only way to determine if an ISDN-PRI D-Channel is up is to type **status signaling group** and press RETURN.

5. Type **list signaling-group** press RETURN. For each signaling group, type **status signal *number*** and press RETURN.

   NOTE:
   Check the ISDN-PRI D-channel links here.

6. Execute the following commands and verify that the information is correct:
   - **list station**
   - **list trunk-group**
   - **list hunt-group**
   - **list data-module**

Enable TTI

NOTE:
Do this step only if the TTI is disabled and you want it enabled.

1. Type **change system-parameters features** and press RETURN to change the TTI field back to its value before the upgrade.

Enable Scheduled Maintenance

1. Type **change system-parameters maintenance** and press RETURN.
2. Check the Start Time and Stop Time fields.

Enable Alarm Origination to INADS

1. Get the DOSS order number of the upgrade from the project manager and ask the regional Customer Software Administration to complete the "Administer Customer Options" steps.

   NOTE:
   As part of the system registration process, the INADS Database Administrator enables Alarm Origination and customer options.

Administer Customer Options

NOTE:
This procedure requires an init login.

1. Type **change system-parameters customer-options** and press RETURN to set the customer options that were purchased. Verify that the G3 version: field is set to **V9**.
2. Go to screen 4 and set the R9 capability? field to **y**.
3. If the customer was using Supplementary Services Protocol b or d on an ISDN-PRI trunk group before the upgrade, go to screen 7, QSIG Optional Features, and set the Basic Call Setup field to **y**.
4. For customers having IP softphones, go to the Maximum IP Registrations by Product ID screen (last screen) and verify that the number listed in the IP_Soft field did not default to **1**. If it did, get the number from field technician and type it in.
5. Press ENTER to save the changes.
6. Type **change system-parameters offer-options** and press RETURN.

7. If changing offers and the Activate Offer field is **n**, set it to **y** and press TAB. A warning message lets you know whether you need to save translations and reboot to make the change permanent.
8. Press ENTER to save the changes or CANCEL if there were no changes.
9. Contact the requester when done.

Check Link Status

1. Type **display communication-interface links** and press RETURN.
2. Type **status link *number*** and press RETURN. Repeat this step for each link.
3. Check that DS1 trunks and BRI phones are functioning normally.
4. Refer to *DEFINITY Enterprise Communications Server Maintenance for R9csi* to test or restore the out-of-service links.

Resolve Alarms

1. Type **display alarms** and press RETURN to examine the alarm log. Resolve any alarms using *DEFINITY Enterprise Communications Server Maintenance for R9csi*.

Restore Announcements (if necessary)

1. Type **restore announcements** and press RETURN to copy announcements from the upgraded translation flashcard to memory, which takes about 40 minutes.

Check SPE

1. Type **status system 1** and press RETURN.

Save Translations (post-upgrade)

1. Type **save translations** and press ENTER to copy upgraded translations to the new flashcard, which takes about 20 minutes.

Save Announcements (if necessary—post-upgrade)

1. Type **save announcements** and press ENTER to copy announcements to the new flashcard.

Return Equipment

1. Call INADS to have them update the customer database.
2. Return replaced equipment to Avaya according to the requirements outlined in:

   BCS/Material Logistics, MSL/Attended Stocking Locations

   Methods and Procedures for Basic Material Returns
3. Retain the old translation card for up to 10 business days to verify that the customer is satisfied and that there is no need to reverse the upgrade.
4. Return the old translation card to Avaya.

Upgrading from R9.1r to R9.5r

This section provides the information necessary to upgrade the software from a DEFINITY ECS Release 9.1r system to a Release 9.5r system. Release 9.5r requires that the following hardware already be installed in the system:

- TN1657 disk drive, Vintage 9 or later
- TN2211 optical drive, V1 or later
- UN332C MSSNET circuit pack, any vintage
- UN330B Duplication Interface circuit packs, Vintage 3 or later
- TN1650B memory circuit packs, any vintage, for a total of 4 per control carrier.

The procedures for the software upgrade can be done on a standard, high, or critical reliability system.

For more help refer to the following books:

— *DEFINITY Enterprise Communications Server Release 9 Maintenance for R9r*, particularly Chapter 4, "Initialization and Recovery."

— *DEFINITY Enterprise Communications Server Release 9 Administrator's Guide*

Read This First

Service Interruption

The upgrade process requires a non–call-preserving service interruption in a standard reliability system and no non–call-preserving service interruption for high or critical reliability systems. The service interruption must be closely coordinated with the customer and the local account team. The service outage for standard reliability is 2 to 15 minutes, depending on the size of the installation.

Call Management System (CMS)

The CMS link is dropped and restarted during the upgrade. This causes CMS data to be lost. This data loss can be minimized if the upgrade is performed just after the last CMS measurement interval.

All measurement data is lost during the upgrade (including BCMS). If needed, the reports can be printed before the upgrade begins.

CMS could abort the processing of a call if a measured trunk that was part of the conference dropped off the call before the end of the call. Customers experiencing this symptom and who are running R3V4 CMS should update to r3v4ao.e or higher.

Software Compatibility

Before starting the upgrade, always check the *Software Release Letter* (Compas ID 75029) that accompanies the system removable media. Translation corruption will occur if incompatible software is loaded. The letter also includes the Minimum Vintage Table. For the most current minimum vintage information, check Compas ID 42751 before starting the upgrade.

Usable Circuit Packs

Every circuit pack used in the Release 9.5 system must conform to the minimum usable vintage requirements for that system. At a presale site inspection, the remediation process checks the vintages of existing circuit packs to be reused in the Release 9.5 system. Replace all unusable vintage circuit packs with current vintages.

Refer to *Technical Quarterly, Reference Guide for Circuit Pack Vintages, Change Notices,* and to the *Software Release Letter* for information about usable circuit pack vintages. For information about usable vintages of non-U.S. circuit packs, refer to the ITAC Tech Alert from your regional distributor.

Survivable Remote EPNs

Check if Survivable Remote EPNs are installed and accessible. The upgrade outage can place the SREPNs into survive mode. After the upgrade, you need to switch them back to normal mode. Refer to *DEFINITY ECS Release 9 Installation and Maintenance for Survivable Remote EPN*.

Wireless Systems

If the system uses Wireless Business System, you need to re-enable the radio controllers after the upgrade. Refer to Chapter 1, "UTAM Disablement" in the *DEFINITY Wireless Business System Maintenance* book. Refer also to Chapter 2, "Switch Administration" in *DEFINITY Wireless Business System Installation and Test.*

This activity can only be performed with the init login.

Customer Requirements

If the DEFINITY ECS has a TN750B or earlier announcement circuit pack, customers are required to back up the announcements *before* the upgrade. The Avaya field technician will not do this step.

G3r only allows the contents of one integrated announcement board to be saved to G3r storage media. Backing up multiple announcement boards requires multiple removable media. Integrated announcement boards require administered data modules to successfully save announcements to storage media.

Troubleshooting R9.5r Upgrade

Status SPE results in no handshake

1. Verify that the light is flashing on the standby UN331B/C processor board.

If the YELLOW LED is not lit and/or the RED alarm LED is lit on the standby processor:

2. Move the management terminal connection to the STANDBY SPE terminal connector on the back of the PPN cabinet.
3. Reboot the standby SPE by toggling the SPE-SELECT switches to the auto position one at a time. This will automatically reboot the standby SPE.
4. Watch the progress of the hardware tests on the system administration terminal.

If the tests fail, refer to the *DEFINITY Enterprise Communications Server Release 9 Maintenance for R9r* Volume 1, Chapter 4 "Initialization and Recovery."

With the management terminal connected to the STANDBY SPE terminal connector on the back of the cabinet and you see:

********** **SPE DOWN MODE** **********

One of the following prompts will appear, indicating which SPE is locked to standby and whether the SPE is down.

SPE_A_LOCKED>
SPE_B_LOCKED>
SPE_A_DOWN_LOCKED>
SPE_B_DOWN_LOCKED>

Refer to *DEFINITY Enterprise Communications Server, Release 9 Maintenance for R9r,*Volume 1, Chapter 4 "Initialization and Recovery," in the section entitled SPE DOWN Interface.

1. Type **d** and press ENTER to display alarms. Run the specified test to determine the cause of the SPE-DOWN condition.

Status SPE results in no shadowing

1. Verify that the YELLOW LED is flashing on the standby processor.
2. Toggle the DUPINT switches from active to auto one at a time.
3. Move the management terminal connector from active to standby.
4. Type **list configuration software memory** and press RETURN on each processor separately to verify that the software versions and translations match on both SPEs.
5. Verify that the memory resident translations dates match. Both must match!

If they don't match:

1. Lock the active SPE.
2. Unseat the TN1657 disk drive from the standby carrier.
3. Take the removable media (optical disk) from the active SPE and insert it in the standby SEE's optical drive.
4. Type **power down reset** to reboot the standby SPE from the optical disk.
5. Wait for the flashing YELLOW LED on the standby SPE.
6. Unlock the DUPINT switches.
7. Type **status spe** and press RETURN to verify that Shadowing is up.

If the Software Version and Translation dates match then follow the troubleshooting procedures in *DEFINITY Enterprise Communications Server, Release 9 Maintenance for R9r,* Volume 1, Chapter 4 "Initialization and Recovery."

No translations after upgrade

You most likely did not save translations to the removable media (optical disk) during the upgrade procedure. You must recover the translations from the disk drive.

Another cause of no translations after upgrade is software corruption.

1. Log into the DEFINITY ECS and check for WARNING: translation corruption detected.
2. If there is a warning, call the Avaya distributor immediately. This warning requires an escalation to Tier 3.

Task Table

Table 20 lists the high-level tasks to perform the upgrades. Refer to the appropriate page for instructions for each step.

The upgrade procedure is similar for both the standard and high or critical reliability system with a few exceptions. These exceptions are noted as you go through the steps.

Table 20. Tasks to upgrade the software

✓	Task Description	Page
	Display Alarms	265
	Check IP Softphones	265
	Record all Busyouts	266
	Check Clock Synchronization	266
	Check for Translation Corruption	266
	Check SPE	266
	Disable TTI	266
	Save Translations to Disk Drive (pre-upgrade)	267
	Save Translations to Removable Media (pre-upgrade)	267
	Verify Software Versions and Translation Timestamp	267
	Disable Scheduled Maintenance and Alarm Origination	267
	Busyout MMI Circuit Packs (High/Critical reliability only—if necessary)	268
	Upgrade the Software	268
	Set Daylight Savings Rules (if necessary)	269
	Verify Date and Time	270
	Set Locations (if necessary)	270
	Enable TTI	271
	Release MMI (High/Critical reliability only)	271
	Check for Translation Corruption	271
	Check Link Status	271
	Check ISDN Signaling Group States	271

Continued on next page

Table 20. Tasks to upgrade the software — *Continued*

✓	Task Description	Page
	Enable Scheduled Maintenance	271
	Save Translations Removable-Media (post-upgrade)	272
	Save Announcements Removable-Media (if necessary—post-upgrade)	272
	Enable Alarm Origination to INADS	272
	Administer Customer Options	272
	Save Translations (post-upgrade)	273
	Back Up Disk	273
	Busy Out Trunks	273
	Resolve Alarms	273
	Set Core Dump Vector	273
	Verify Survivable Remote EPNs	273
	Affix position label(s)	274
	Return Replaced Equipment	274

Display Alarms

1. Type **display alarms** and press RETURN.
1. Note any SPE or sync errors and which ISDN signaling groups and adjunct links are out of service.
2. Resolve all SPE-related alarms where possible before proceeding.

Check IP Softphones

If the customer has IP softphones, the maximum number of registered IP softphones can default to 1 after an upgrade.

1. Type **display system-parameters customer-options** and press RETURN. Go to the Maximum IP Registrations by Product ID screen and write down the number listed in the IP_Soft field. The number must be verified at the end of the upgrade.

Record all Busyouts

1. Type **display errors** and press ENTER. Look for type 18 errors and record any trunks that can be busied out. You need to busy them out again after the upgrade.

Check Clock Synchronization

1. Type **status sync** and press RETURN to verify that the clock synchronization is good. If not, contact the network to resolve.

Check for Translation Corruption

1. Type **newterm** and press RETURN.
2. If you do not get a login prompt and see the following message:

   Warning: Translation corruption detected

   follow the normal escalation procedure for translation corruption before continuing the upgrade.

Check SPE

1. Type **status spe** and press RETURN to check the health of the SPE.

   For high or critical reliability systems:

   - The Standby Refreshed field shows **yes**
   - The Standby Shadowing field shows **on**
   - The Standby Handshake field shows **up**

   If the fields show something other than the above, see Chapter 4, "Initialization and Recovery" in the maintenance book. Do not continue with the upgrade until all errors are resolved.

Disable TTI

NOTE:
Do this step only if Terminal Translation Initialization (TTI) is enabled.

CAUTION:
If you do not disable the TTI, the translations can be corrupted.

1. Type **change system-parameters features** and press RETURN.
2. On the second screen, set the TTI Enabled? field to **n** to de-activate the TTI feature. If it is already set to **n**, cancel the command and skip step 3.

3. Type **status tti** and press RETURN. Wait until the Percent Complete field shows 100%.

Save Translations to Disk Drive (pre-upgrade)

1. Type **save translation** and press RETURN to write all translation information from memory to the disk drive, which takes about 2 minutes.

Save Translations to Removable Media (pre-upgrade)

1. Type **save translation *removable-media*** and press RETURN to write all translation information from the disk drive to the removable media, which takes about 1 minute.

Verify Software Versions and Translation Timestamp

If standard reliability:

1. Type **list configuration software-version** and press RETURN and verify that the memory, removable media, and disk software loads and translations are current. Note any patches.

If high or critical reliability:

1. Type **list configuration software-version long** and press RETURN and verify that the memory, removable media, and disk software loads and translations match.

Disable Scheduled Maintenance and Alarm Origination

1. To prevent scheduled daily maintenance from interfering with the update or upgrade, type **change system-parameters maintenance** and press RETURN.
2. If scheduled maintenance has begun, set the Stop Time field to 1 minute after the current time.

   or

   If scheduled maintenance has **not** begun, set the Start Time field to at least 8 hours after the upgrade starts. For example, if you start the upgrade at 8:00 p.m., set the Start Time field to 04:00.

CAUTION:
If you do not disable Alarm Origination, the system can generate alarms, resulting in unnecessary trouble tickets.

3. Type **neither** in the Alarm Origination to OSS Numbers field

NOTE:
For some software loads, set the Alarm Origination Activated field to **n** and set the Cleared Alarm Notification and Restart Notification fields to **disable** or **n** before pressing ENTER.

4. Press ENTER.

Busyout MMI Circuit Packs (High/Critical reliability only—if necessary)

CAUTION:
Multimedia-to-voice station calls are not preserved on an upgrade. Failure to busy-out the TN787 Multimedia Interface (MMI) circuit packs results in unusable TN787 and TN787 Multimedia Voice Conditioner ports.

1. Type **display system-parameters customer-options** and press RETURN. On screen 2 or 3 under the Multimedia Call Handling (MMCH) options, check the Basic and Enhanced fields.
2. If either the Basic or Enhanced field is **y**, type **list configuration all** and press RETURN to locate all MMI (TN787) circuit packs.
3. If there are MMI circuit packs, type **busyout board** ***cabinet carrier slot***

Upgrade the Software

In the optical drive, replace the original removable media with the one with the new software load.

If standard reliability:

1. Type **list configuration software-version** and press RETURN to verify the correct software release.
2. Type **restore disk install** and press RETURN to install the software on the switch.

If high or critical reliability:

1. Type **list configuration software-version long** and press RETURN to verify the correct software release.
2. Type **restore disk install both** and press RETURN to install the software on the switch.

For all reliabilities:

1. Type **upgrade software *software release string*** and press RETURN to upgrade the switch to the new software.

Set Daylight Savings Rules (if necessary)

You can set up to 15 customized daylight savings time rules. If you have cabinets in several different time zones, you can set up rules for each on a location basis. A daylight savings time rule specifies the exact time when you want to transition to and from daylight savings time. It also specifies the increment at which to transition.

1. Type **change daylight-savings-rules** and press RETURN.

```
                        DAYLIGHT SAVINGS RULES
Rule          Change Day                Month  Date   Time   Increment

0: No Daylight Savings
1: Start: first Sunday___ on or after April    1  at _2:00  01:00
    Stop: first Sunday___ on or after October  25 at _2:00
2: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
3: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
4: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
5: Start: first _________ on or after ________ __ at __:__
    Stop: first _________ on or after ________ __ at __:__
```

2. Type the appropriate start and stop information in the Change Day, Month, Date, Time, and Increment fields for each rule. (for example, **1:00** equals one hour increment)

   NOTE:
   You can change any rule except rule 0 (zero). You cannot delete a daylight savings rule if it is in use on either the Locations or Date and Time screens.

3. When done, press ENTER.

Verify Date and Time

1. Type **display time** and press RETURN to bring up the Date and Time screen.

```
display time
                              DATE AND TIME
         DATE
             Day of the Week: Monday      Month: July
            Day of the Month: 2            Year: 2001

         TIME
             Hour: 20  Minute: 30   Second: 55  Type: standard
                        Daylight Savings Rule: 1

WARNING: Changing the date or time impacts BCMS, CDR and MEASUREMENTS
```

2. Verify that the date and time are correct and the daylight savings rule is set.

Set Locations (if necessary)

After you set the daylight savings rules, you must set the locations for all switches. It is possible to have switches in different time zones.

1. Type **change locations** and press RETURN.

```
                                                                Page 1 of 3
LOCATIONS

ARS Prefix 1 Required for 10-Digit NANP Calls? _

 Number   Name                    Timezone   Daylight-Savings         Number Plan
                                  Offset     Rule                     Area Code

    1     Main_________________   + 00:00    _1                       303
    2     ____________________    _ __:__    __                       ___
    3     ____________________    _ __:__    __                       ___
    4     ____________________    _ __:__    __                       ___
    5     ____________________    _ __:__    __                       ___
    6     ____________________    _ __:__    __                       ___
    7     ____________________    _ __:__    __                       ___
    8     ____________________    _ __:__    __                       ___
    9     ____________________    _ __:__    __                       ___
   10     ____________________    _ __:__    __                       ___
   11     ____________________    _ __:__    __                       ___
   12     ____________________    _ __:__    __                       ___
```

2. Type **y** in the ARS Prefix 1 Required for 10-Digit NANP Calls? field.
3. Type the information in the various fields for each switch.

   NOTE:
   Use the name of the switch or "Local Switch" in the Name field for the first location.

4. Press ENTER to save the changes.

Enable TTI

NOTE:
Do this step only if you disabled the TTI earlier.

1. Type **change system-parameters features** and press RETURN to change the TTI field back to its value before the upgrade.
2. On the second screen, set the TTI Enabled? field to **y** to activate the TTI feature.
3. Type **status tti** and press RETURN. Wait until the Percent Complete field shows 100%.

Release MMI (High/Critical reliability only)

1. Type **release board *cabinet carrier slot*** and press RETURN to release the circuit packs, which were busied out earlier.

Check for Translation Corruption

1. Type **newterm** and press RETURN.
2. If you do not get a login prompt and see the following message:

   Warning: Translation corruption detected

   follow the normal escalation procedure for translation corruption before continuing the upgrade.

Check Link Status

1. Type **display communication-interface links** and press RETURN. Compare it with the earlier status. See "Display Alarms" on page 265.
2. Type **status link *number*** and press RETURN. Repeat this step for each link.

Check ISDN Signaling Group States

1. Type **list signaling-group** and press RETURN.
2. Type **status signaling-group** and press RETURN to determine if ISDN is in service. If it is not, follow normal maintenance procedures.

Enable Scheduled Maintenance

1. Type **change system-parameters maintenance** and press RETURN.
2. Type the appropriate time in the Start field to enable scheduled daily maintenance. Make sure the Save Translation field is set to **daily**.

Save Translations Removable-Media (post-upgrade)

1. Type **save translations removable-media** and press RETURN to copy upgraded translations from the disk drive to the removable media, which takes about 2 minutes.

Save Announcements Removable-Media (if necessary—post-upgrade)

1. If using a TN750/B Announcement circuit pack, type **save announcements removable-media** and press RETURN to copy announcements from the disk drive to the removable media.

Enable Alarm Origination to INADS

1. Get the DOSS order number of the upgrade from the project manager and ask the regional Customer Software Administration to complete the "Administer Customer Options" steps.

NOTE:
As part of the system registration process, the INADS Database Administrator enables Alarm Origination and customer options.

Administer Customer Options

NOTE:
This procedure requires an init login.

1. Log in as **init**.
2. Type **change system-parameters customer-options** and press RETURN to set the customer options that were purchased. Verify the G3 version: field is set to **V9**.
3. Go to screen 4 and set the R9.5 Capabilities? field to **y**.
4. If the customer was using Supplementary Services Protocol b or d on an ISDN-PRI trunk group before the upgrade, go to screen 7, QSIG Optional Features, and set the Basic Call Setup field to **y**.
5. For customers having IP softphones, go to the Maximum IP Registrations by Product ID screen (last screen) and verify that the number listed in the IP_Soft field did not default to **1**. If it did, get the number from field technician and type it in.
6. Type **change system-parameters offer-options** and press RETURN.

7. If changing offers and the Activate Offer field is **n**, set it to **y** and press TAB. A warning message lets you know whether you need to save translations and reboot to make the change permanent.
8. Press ENTER to save the changes or CANCEL if there were no changes.
9. Contact the requester when done.

Save Translations (post-upgrade)

1. Type **save translation** and press RETURN to copy upgraded translations from the removable media to the disk drive, which takes about 2 minutes.

Back Up Disk

1. Type **backup disk** and press RETURN to back up all changed files to the removable media. This takes about 15 minutes.
2. Type **test stored-data** and press RETURN to verify the consistency of the MSS files on the disk and removable media.

If standard reliability:

1. Type **list configuration software-version** and press RETURN to verify all the files one last time.

If high or critical reliability:

1. Type **list configuration software-version long** and press RETURN to verify all the files one last time.

Busy Out Trunks

1. Busy out trunks that were busied out before the upgrade.

Resolve Alarms

1. Type **display alarms** and press RETURN to examine the alarm log. Resolve new alarms since the upgrade using *DEFINITY Enterprise Communications Server Release 9 Maintenance for R9r.*

Set Core Dump Vector

1. Type **set vector f spe-maint** and press RETURN to set the core dump vector to perform a core dump on any system restart.

Verify Survivable Remote EPNs

1. If the system is equipped with Survivable Remote EPNs, make sure the link is still up.

Affix position label(s)

1. Place the new strip label(s) over the old carrier label(s).

Return Replaced Equipment

1. Call INADS to have them update the customer database.
2. Return replaced equipment to Avaya according to the requirements outlined in the following books:
   — *BCS/Material Logistics, MSL/Attended Stocking Locations*
   — *Methods and Procedures for Basic Material Returns*

New and Changed Screens

14

New screens

For Release 9.5, there are new screens:

- ATM VPI.VCI Data screen
- DCS to QSIG TSC Gateway screen
- QSIG to DCS TSC Gateway screen

ATM VPI.VCI Data screen

Use the **status station** command to get a snapshot of the VPI.VCI data for a specific station. These data enable you to diagnose their network(s) without onsite service personnel.

```
status station 1002                                    Page 2 of 2


                         ATM VPI.VCI DATA


  Port         Talk       Connected Port      Listen
03B0508       0.1234        02C0509            0.5678
                            02C0712            0.5678
                            03A1203            n/a
                            04D1312            0.4321
                            03C0609            n/a
```

Screen 30. ATM VPI.VCI Data screen (status station)

Field descriptions

Port	The location of the port assigned to the station.
Talk	If VPI.VCI value has -d (down) added at the end (for example, 0.1234-d), this means that the SVC is down.
Connected Port	Locations of port currently connected to the station.
Listen	If VPI.VCI value has -d (down) added at the end (for example, 0.1234-d), this means that the SVC is down.

DCS to QSIG TSC Gateway screen

Use the DCS to QSIG TSC Gateway screen to determine when and how to convert messages from an administered AUDIX NCA-TSC to a QSIG NCA-TSC. This screen maps the AUDIX NCA-TSC to the appropriate machine ID index to find the QSIG subscriber entry in the QSIG MWI-Prefix screen. It also assigns the voice mail number to be used when a DCS served-user node interrogates a QSIG message center.

This screen only appears if the Interworking with DCS field is enabled on the Customer Options screen.

```
change isdn dcs-qsig-tsc-gateway                                    Page 1 of 1

                                DCS TO QSIG TSC GATEWAY

                                  AAR/                                    AAR/
                                  ARS                                     ARS
Mach  Sig   TSC    Voice Mail    Access    Mach  Sig   TSC    VoiceMail  Access
 ID   Grp  Index     Number       Code      ID   Grp  Index     Number    Code
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
 __   __   ___   ____________    ______    ___   ___  ____   __________  ____
```

Screen 31. DCS to QSIG TSC Gateway screen

Mach ID

You can enter up to 20 machine IDs.

Valid entries	Usage
1 - 20	Enter a unique machine ID. The system does not allow you to specify an ID that you already entered on the Processor Channel screen.

Sig Grp

You must complete the Signaling Group field for each machine ID.

Valid entries	Usage
1 - 110	Enter the assigned signaling group number between 1 and 110 for G3si
1 -416	Enter the assigned signaling group number between 1 and 416 for G3r

TSC Index

You must complete the TSC Index field for each machine ID.

Valid entries	Usage
1 - 64	Enter the assigned signaling group number for **qsig-mwi** application type on the Signaling Group screen.

Voice Mail Number

This field can be left blank.

Valid entries	Usage
0 - 9	Enter the complete Voice Mail Dial Up number up to 17 digits.

AAR/ARS Access Code

This field can be left blank.

Valid entries	Usage
0 - 9, *, #	Enter up to 4-digit access code.

QSIG to DCS TSC Gateway screen

The QSIG to DCS TSC Gateway screen determines when and how to convert messages from a QSIG NCA-TSC to an administered AUDIX NCA-TSC. This screen maps the QSIG subscriber number to the appropriate AUDIX signaling group and TSC index.

This screen only appears if the Interworking with DCS field is enabled on the Customer Options screen.

```
change isdn qsig-dcs-tsc-gateway                                    Page 1 of 1

                              QSIG TO DCS TSC GATEWAY

        Subscriber        Sig   TSC          Subscriber         Sig       TSC
         Number           GRP  Index           Number           GRP      Index
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
     __________________   ___   ___       __________________    ___        ___
```

Screen 32. QSIG to DCS TSC Gateway screen

Subscriber Number

You can enter up to 28 subscriber numbers.

Valid entries	Usage
0 - 9, *, 'x', 'X'	Enter a subscriber number up to 20 characters in length. You can use wildcards 'x' and 'X' to enter subscriber numbers.

Sig Grp

Valid entries	Usage
1 - 110	Enter the assigned signaling group number between 1 and 110 for G3si
1 - 416	Enter the assigned signaling group number between 1 and 416 for G3r

TSC Index

Valid entries	Usage
1 - 64	Enter the assigned signaling group number for **qsig-mwi** application type on the Signaling Group screen.

Changed screens

For Release 9.5, many administration screens and reports changed. This section describes only the new fields or new valid values for each screen that changed for Release 9.5. For a complete screen reference through Release 9.1, refer to the *DEFINITY ECS Administrator's Guid*e.

- CDR System Parameters screen
- Class of Restriction screen
- Dial Plan Record
- DS1 Circuit Pack screen
- Feature-Related System Parameters screen
- Hospitality screen
- Hunt Group screen
- IP Services screen
- Maintenance-Related System Parameters screen
- Multifrequency-Signaling-Related System Parameters screen
- Route Pattern screen
- Signaling Group screen
- Station screen
- System Parameters Country-Options screen
- System Parameters Customer Options screen
- System Parameters OCM Call Classification screen
- Trunk Group screen

CDR System Parameters screen

```
change system-parameters cdr                                      Page   1 of   1
                            CDR SYSTEM PARAMETERS

 Node Number (Local PBX ID):                        CDR Date Format: month/day
      Primary Output Format: printer       Primary Output Endpoint: CDR1
    Secondary Output Format:
           Use ISDN Layouts? n                           EIA Device Bit Rate: 9600
       Use Enhanced Formats? n      Condition Code 'T' for Redirected Calls? n
Modified Circuit ID Display? n                   Remove # From Called Number? n
                  Record Outgoing Calls Only? y            Intra-switch CDR? n
  Suppress CDR for Ineffective Call Attempts? y          CDR Call Splitting? y
      Disconnect Information in Place of FRL? n    Attendant Call Recording? y
                                                     Interworking Feat-flag? n
 Force Entry of Acct Code for Calls Marked on Toll Analysis Form? n
                                    Calls to Hunt Group - Record: member-ext
Record Called Vector Directory Number Instead of Group or Member? n
         Record Called Agent Login ID Instead of Group or Member? n
     Inc Trk Call Splitting? n
  Record Non-Call-Assoc TSC? n
      Record Call-Assoc TSC? n   Digits to Record for Outgoing Calls: dialed
   Privacy - Digits to Hide: 0               CDR Account Code Length: 4
```

Screen 33. CDR System Parameters screen (page 1)

Primary Output Endpoint

This field determines where the switch sends the CDR records, and is required if you specify a Primary Output Format.

Valid entries	Usage
eia	If you use the EIA port to connect the CDR device, enter **eia**. This is not a valid option on G3r systems.
Extension number	This is the extension of the data module (if used) that links the primary output device to the switch.
CDR1, **CDR2**	Use this value if the CDR device is connected over a TCP/IP link, and this link is defined as either CDR1 or CDR2 on the IP Services screen.

Secondary Output Endpoint

Appears when the secondary output format is administered.

Valid entries	Usage
eia	Use this if the secondary output device is connected to the eia port. This is not a valid option on G3r systems.
Extension number	This is the extension of the data module (if used) that links the secondary output device to the switch.
CDR1, **CDR2**	Use this value if the CDR device is connected over a TCP/IP link, and this link is defined as either CDR1 or CDR2 on the IP Services screen.

CDR System Parameters screen (page 2)

Page 2 of the CDR System Parameters screen appears only if Primary Record Format is customized.

```
change system-parameters cdr
                              CDR SYSTEM PARAMETERS                Page 2 of 2
        Data Item - Length          Data Item - Length          Data Item - Length
   1: time_____________ - 4_  17: _________________ - __  33: _________________ - __
   2: space____________ - 1_  18: _________________ - __  34: _________________ - __
   3: duration_________ - 4_  19: _________________ - __  35: _________________ - __
   4: return___________ - 1_  20: _________________ - __  36: _________________ - __
   5: line-feed________ - 1_  21: _________________ - __  37: _________________ - __
   6: _________________ - __  22: _________________ - __  38: _________________ - __
   7: _________________ - __  23: _________________ - __  39: _________________ - __
   8: _________________ - __  24: _________________ - __  40: _________________ - __
   9: _________________ - __  25: _________________ - __  41: _________________ - __
  10: _________________ - __  26: _________________ - __  42: _________________ - __
  11: _________________ - __  27: _________________ - __  43: _________________ - __
  12: _________________ - __  28: _________________ - __  44: _________________ - __
  13: _________________ - __  29: _________________ - __  45: _________________ - __
  14: _________________ - __  30: _________________ - __  46: _________________ - __
  15: _________________ - __  31: _________________ - __  47: _________________ - __
  16: _________________ - __  32: _________________ - __  48: _________________ - __
                                 Record length = 11
```

Screen 34. CDR System Parameters (page 2)

Data Item

Enter the data items in the order they should appear on the customized record. Only use this screen if you have arranged with your vendor to customize your call accounting system to receive these records.

You must include at least one field in order to have a record. See the table below for valid entries. The last two data items in a the record must be **line-feed** and **return**, in that order.

For more information, see Call Detail Recording in the *DEFINITY ECS Administrator's Guide*.

Table 21. Valid Data Item entries

Data Item	Length	Data Item	Length
acct-code	15	ins	3
attd-console	2	isdn-cc	11
auth-code	7	ixc-code	4
bandwidth	2	line-feed	1
bcc	1	ma-uui	1
calling-num	15	node-num	2
clg-pty-cat	2	null	1
clg-num-in-tac	10	out-crt-id	3
code-dial	4	ppm	5
code-used	4	res-flag	1
cond-code	1	return	1
date	6	sec-dur	5
dialed-num	23	space	1
duration	4	time	4
feat-flag	1	tsc_ct	4
frl	1	tsc_flag	1
in-crt-id	3	vdn	5
in-trk-code	4		

Class of Restriction screen

Use this screen to establish classes of restriction (COR). Classes of restriction control call origination and termination. Your system can use only one COR or as many as necessary to control calling privileges. You can assign up to 96 different CORs (0 – 95).

```
change cor 10                                                   Page 1 of 4
                        CLASS OF RESTRICTION

               COR Number: 10
          COR Description: supervisor

                      FRL: 0                                        APLT? y
  Can Be Service Observed? n                  Calling Party Restriction: none
Can Be A Service Observer? y                   Called Party Restriction: none
        Time of Day Chart: 1              Forced Entry of Account Codes? n
         Priority Queuing? n                       Direct Agent Calling? y
     Restriction Override: none              Facility Access Trunk Test? n
     Restricted Call List? n                        Can Change Coverage? n
   Unrestricted Call List? __ __ __ __ __ __ __ __ __ __
            Access to MCT? y                   Fully Restricted Service? n
Group II Category For MFC: 7                   Hear VDN of Origin Annc.? n
         Send ANI for MFE? n_                   Add/Remove Agent Skills? y
            MF ANI Prefix: ______              Automatic Charge Display? n
Hear System Music on Hold? y      PASTE(Display PBX Data on telephone)? n
                              Can Be Picked Up By Directed Call Pickup? n
                                         Can Use Directed Call Pickup? n
                                         Group Controlled Restriction: inactive
```

Screen 35. Class of Restriction

Group II Category For MFC

This field always controls categories for Russian signaling trunks. It can control categories for R2-MFC signaling trunks, depending on the value of the Use COR for Calling Party Category field on the Multifrequency-Signaling-Related System Parameters screen.

The Calling Party Category digit administered in this field is included as part of the ANI information sent to the Central Office on request using R2-MFC signaling.

Valid entries	Usage
1 –10	Enter the value you want the switch to send as the Calling and/or Called Party Category for phones or trunks that use this COR.

Dial Plan Record

The Dial Plan is the system's guide to translating the digits dialed by users. Both the Dial Plan Record and the Second Digit Table screens define your system's dial plan.

For Release 9.5, the Dial Plan Record screen allows new values for **misc**.

```
change dialplan                                                    Page 1 of 1
                                   DIAL PLAN RECORD
                                                      Local Node Number: _
                                                        ETA Node Number: _
          Uniform Dialing Plan: _______             ETA Routing Pattern: _
    UDP Extension Search Order: ____________________
FIRST DIGIT TABLE
  First                                Length
  Digit   -1-         -2-         -3-         -4-         -5-         -6-
    1: __________  __________  __________  __________  __________  __________
    2: __________  __________  __________  __________  __________  __________
    3: __________  __________  __________  __________  __________  __________
    4: __________  __________  __________  __________  __________  __________
    5: __________  __________  __________  __________  __________  __________
    6: __________  __________  __________  __________  __________  __________
    7: __________  __________  __________  __________  __________  __________
    8: __________  __________  __________  __________  __________  __________
    9: __________  __________  __________  __________  __________  __________
    0: __________  __________  __________  __________  __________  __________
    *: misc______  __________  __________  __________  __________  __________
    #: __________  __________  __________  __________  __________  __________
```

Screen 36. Dial Plan Record screen

First Digit Table

This table defines the dialing plan for your system. The rows in the First Digit Table indicate what the system does when the row's first digit is dialed. The columns indicate how long the dialed string is for each type of call.

The First Digit Table can have any of the following codes:

- misc (miscellaneous code) — these codes are used if you want to have more than one kind of code start with the same digit and be the same length. Misc must have a dialed length of 1, and can have a first digit of 0 through 9, *, or #. Using misc requires that you also define a Second Digit Table.

DS1 Circuit Pack screen

Use the DS1 Circuit Pack screen to assign announcements to circuit packs and port locations. For Release 9.5, this screen has one new Protocol Version value.

```
 add ds1 xxxxxx                                                    Page 1 of 2
                                 DS1 CIRCUIT PACK

              Location: _____                            Name: _______________
              Bit Rate: _____                     Line Coding: ____
     Line Compensation: _                        Framing Mode: ___
        Signaling Mode: __________                  D-Channel: __
               Connect: _________                   Interface: ___________
          Interconnect: ___                     Peer Protocol: ________
                                             Country Protocol: ____
                                             Protocol Version: _
I  nterface Companding: _____                            CRC? _
             Idle Code: ________
                                      DCP/Analog Bearer Capability: ________
     MMI Cabling Board: _____  MMI Interface: ESM

 MAINTENANCE PARAMETERS

        Slip Detection? _                   Near-end CSU Type: ________
```

Screen 37. DS1 Circuit Pack

Protocol Version

In countries whose public networks allow multiple layer-3 signaling protocols for ISDN-PRI service, this field selects the protocol that matches your network service provider's protocol. Refer to ''Public network signaling administration for ISDN-PRI Layer 3'' on page 286 to see which countries support which protocols.

This field appears only when:

- The Signaling Mode field is **isdn-pri** and the Connect field is **network.**
- The Signaling Mode field is **isdn-pri,** the Connect field is **pbx**, and the Interface field is **user** or **network.**

Valid entries	Usage
a, b, c, d	The entry in this field must match the protocol used by your network service provider, so work with your vendor to determine the appropriate entry.

WARNING:
The AT&T Switched Network Protocol does not support restricted displays of connected numbers. Therefore, if you administer the 1a country-protocol/protocol-version combination on the DS1 screen, you cannot set the Send Connected Number field to ***r*** *(restricted) on the ISDN-PRI Trunk Group screen, as this causes display problems.*

Public network signaling administration for ISDN-PRI Layer 3

The table below shows DEFINITY ECS public network access connections for ISDN-PRI Layer 3.

Admin value	Country	Protocol supported	B-channel mtce msg
1-a	United States, Canada	AT&T TR 41449/ 41459 (tested with AT&T network, Canadian network, and MCI network)	Service
1-b	United States	Bellcore TR 1268; NIUF.302; ANSI T1.607	Restart
1-c	United States	NORTEL DMS-250 BCS36/IEC01	Service
1-d	United States	Telecordia SR-4287	Service
2-a	Australia	AUSTEL TS014.1; Telecom Australia TPH 1856 National ISDN protocol	Restart
2-b	Australia	ETSI ISDN protocol	Restart
3	Japan	NTT INS-NET	Restart
4	Italy	ETS 300 102	Restart
5	Netherlands	ETS 300 102	Restart
6	Singapore	ETS 300 102	Restart
7	Mexico	ETS 300 102	Restart
8	Belgium	ETS 300 102	Restart
9	Saudi Arabia	ETS 300 102	Restart
10-a	United Kingdom	ETS 300 102 (for connection to DASS II/DPNSS through external converter)	Restart
10-b	United Kingdom, Ireland	ETS 300 102 (Mercury); British Telecom ISDN 30; Telecom Eireann SWD 109	none
11	Spain	Telefonica ISDN Specification	Restart
12-a	France	VN4 (French National PRI)	None
12-b	France	ETS 300 102 modified according to P10-20, called Euronumeris	None
13-a	Germany	FTZ 1 TR 6 (German National PRI)	None

Continued on next page

Admin value	Country	Protocol supported	B-channel mtce msg
13-b	Germany	ETS 300 102	Restart
14	Czech Republic, Slovakia	ETS 300 102	Restart
15	Russia (CIS)	ETS 300 102	Restart
16	Argentina	ETS 300 102	Restart
17	Greece	ETS 300 102	Restart
18	China	ETS 300 102	Restart
19	Hong Kong	ETS 300 102	Restart
20	Thailand	ETS 300 102	Restart
21	Macedonia	ETS 300 102	Restart
22	Poland	ETS 300 102	Restart
23	Brazil	ETS 300 102	Restart
24	Nordic	ETS 300 102	Restart
25	South Africa	ETS 300 102	Restart
ETSI-a	Europe, New Zealand, etc.	ETS 300 102	Restart
ETSI-b		ETS 300 102	None

Feature-Related System Parameters screen

The TTI Enabled field, the TTI State, and the Transactions in History Log field on the on page 2 of the Feature Related System Parameters screen have been updated to include ACTR permissions.

```
change system-parameters features                                  Page 2 of 9
                       FEATURE-RELATED SYSTEM PARAMETERS
LEAVE WORD CALLING PARAMETERS
  Maximum Number of Messages Per Station (when MSA not in service): 10_
               Maximum Number of External Calls Logged Per Station: 0
  Message Waiting Indication for External Calls? n
  Stations with System-wide Retrieval Permission (enter extension)
    1: 34430    3: attd_    5: _____    7: _____    9: _____
    2: 34412    4: _____    6: _____    8: _____   10: _____
WARNING!   SEE USER DOCUMENTATION BEFORE CHANGING TTI STATE
                 Terminal Translation Initialization (TTI) Enabled? _
                         TTI State: voice        TTI Security Code: _______
                                      Telephone Activation Enabled?
                    Record CTA/PSA/TTI Transactions in History Log? _
                                      COR for PSA Dissociated Sets: _
                                 CPN, ANI for PSA Dissociated Sets: _
                    Prohibit Bridging Onto Calls with Data Privacy? _
                         Enhanced Abbreviated Dial Length (3 or 4)? _
                     Record All Submission Failures in History Log? _
                         Record PMS/AD Transactions in History Log? _
             Default Multimedia Outgoing Trunk Parameter Selection: 2x64
```

Screen 38. Feature-Related System Parameters (page 2)

Terminal Translation Initialization (TTI) Enabled

Terminal Translation Initialization (TTI) must be enabled on the System Parameters Customer Options screen before the TTI and Automatic Customer Telephone Rearrangement (ACTR) fields can be administered.

Valid entries	Usage
y	Enter y to start ACTR, TTI, and PSA transactions (extension and phone moves between ports).
n	Enter n to remove existing TTI port translations and make sure no new TTI port translations are generated.

Record CTA/PSA/TTI Transactions in History Log

Use this field to record when extensions and physical phones move between ports without additional administration from the switch administrator.

Valid entries	Usage
y/n	Enter y to start records for ACTR, TTI, and PSA transactions (extension and phone moves between ports) in the history log. You access these transactions via the List History command.

TTI State

The value of this field determines what type of TTI default port translation is generated for unadministered digital ports. This field appears when Terminal Translation Initialization (TTI) Enabled is y.

Valid entries	Usage
data	Used for moving processor data modules, should be turned off after move.
resume	Allows the TTI state to return to what it was before TTI was manually suspended.
suspend	Allows any current generation or removal of TTI port translations to be halted and access to TTI is denied.
voice	Enter voice to allow Personal Station Access and Automatic Customer Telephone Rearrangement.

Feature-Related System Parameters screen (page 4)

```
change system-parameters features                                  Page 4 of 10
                          FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS
              System Printer Endpoint: ____                 Lines Per Page: 60
                  EIA Device Bit Rate: 9600

SYSTEM-WIDE PARAMETERS
                          Switch Name: _______________

MALICIOUS CALL TRACE PARAMETERS
               Apply MCT Warning Tone? n     MCT Voice Recorder Trunk Group: ___

SEND ALL CALLS OPTIONS
           Send All Calls Applies to: station
      Auto Inspect on Send All Calls? n

UNIVERSAL CALL ID
     Create Universal Call ID (UCID)? n                UCID Network Node ID: ___
```

Screen 39. Feature-Related System Parameters screen (page 4)

System Printer Endpoint

NOTE:
The **eia** option is not available for G3r.

Valid entries	Usage
Data module extension	Associated with the System printer
eia	If the DCE jack is used to interface the printer.
SYS_PRNT	Use this value if the system printer is connected over a TCP/IP link, and the link is defined as SYS_PRNT on the IP Services screen.

Feature-Related System Parameters screen (page 5)

```
change system-parameters features                                  Page 5 of 10
                          FEATURE-RELATED SYSTEM PARAMETERS

         Public Network Trunks on Conference Call: 5            Auto Start? n
    Conference Parties with Public Network Trunks: 6             Auto Hold? n
 Conference Parties without Public Network Trunks: 6        Attendant Tone? y
         Night Service Disconnect Timer (seconds): 180       Bridging Tone? n
                 Short Interdigit Timer (seconds): 3       Conference Tone? n
              Unanswered DID Call Timer (seconds): ____     Intrusion Tone? n
              Line Intercept Tone Timer (seconds): 30    Special Dial Tone? n
                 Long Hold Recall Timer (seconds): 160
                      Reset Shift Timer (seconds): 0
     Station Call Transfer Recall Timer (seconds): 0
                               DID Busy Treatment: tone
        Invalid Number Dialed Intercept Treatment: Announcement _____
               Allow AAR/ARS Access from DID/DIOD? _
                 Allow ANI Restriction on AAR/ARS? _  Transfer Upon Hang-Up? n
                    Abort Conference Upon Hang-Up? n         Abort Transfer? n
                  7405ND Numeric Terminal Display? n                 7434ND? n
DISTINCTIVE AUDIBLE ALERTING
             Internal: 1   External: 2   Priority: 3
                           Attendant Originated Calls:_ ________
    DTMF Tone Feedback Signal to VRU - Connection: _    Disconnection: _
```

Screen 40. Feature-Related System Parameters screen (page 5)

Invalid Number Dialed Intercept Treatment

Enter the type of intercept treatment the end-user hears after dialing an invalid number.

Valid entries	Usage
announcement	Provides a recorded announcement when the end-user dials an invalid number. You select and record the message. Enter the extension number for the announcement in the associated field.
tone	Provides intercept tone when the end-user dials an invalid number.

Feature-Related System Parameters screen (page 6)

This screen allows you to establish system-wide parameters for ISDN calls.

```
change system-parameters features                                    Page 6 of 10
                          FEATURE-RELATED SYSTEM PARAMETERS

ISDN PARAMETERS

           Send Non-ISDN Trunk Group Name as Connected Name? n
           Display Connected Name/Number for ISDN DCS Calls? n
                  Send ISDN Trunk Group Name on Tandem Call? n
                       CPN Replacement for Restricted Calls:
                     CPN Replacement for Unavailable Calls:
                                          QSIG TSC Extension:
           MWI - Number of Digits Per Voice Mail Subscriber: 5

                                       National CPN Prefix:
                                 International CPN Prefix:
                                Pass Prefixed CPN to ASAI: n
              Unknown Numbers Considered Internal for AUDIX? n
                       USNI Calling Name for Outgoing Calls? n
                         Path Replacement with Measurements? y
                            QSIG Path Replacement Extension: _____
                     Path Replace While in Queue/Vectoring? n
```

Screen 41. Feature-Related System Parameters screen (page 6)

MWI - Number of Digits Per Voice Mail Subscriber

This field name changed from Number of Digits Per AUDIX subscriber, to acknowledge that DEFINITY ECS can interwork with other voice mail types.

QSIG Path Replacement Extension

Enter the extension for the system to use as part of the complete number sent in the Path Replacement Propose message.

Valid entries	Usage
Extension	Enter an unused extension that conforms to your dial plan.

Path Replace While in Queue/Vectoring

Valid entries	Usage
y/n	Enter y to allow Path Replacement after queue/vector processing has started. Depending on the version of Call Management System (CMS) you are using, some calls can go unrecorded if you enable this capability. Please see your Avaya representative for more information.

Feature-Related System Parameters screen (page 10)

New Re-try field on page 10 of the Feature Related System Parameters screen allows the switch to send the address information after the 10 second T1 timer expires. The Re-try field also allows the switch to resend the address information only once over another trunk port if the switch receives a message that the original information was received incorrectly by the CO.

New T2 (Backward Signal) Activation Timer (secs) field on page 10 of the Feature Related System Parameters screen sets the number of seconds the switch waits for a response after sending the address information.

```
change system-parameters features                                Page 10 of 10
                         FEATURE-RELATED SYSTEM PARAMETERS

AUTOMATIC EXCLUSION PARAMETERS

                       Automatic Exclusion by COS? y
                 Automatic Exclusion Coverage/Hold? y
            Automatic Exclusion with Whisper Page? y
                                Recall Rotary Digit: 2

                     Password to Change COR by FAC: *
IP PARAMETERS
                   Direct IP-IP Audio Connections? n
                             IP Audio Hairpinning? n

RUSSIAN MULTI-FREQUENCY PACKET SIGNALING
                                            Re-try?
     T2 (Backward Signal) Activation Timer (secs):
```

Screen 42. Feature-Related System Parameters (page 10)

Re-try

The Re-try field applies to outgoing Russian MFP trunks. It allows the switch to resend Russian MFP calling party number and dialed number information to the CO. The switch resends the information only once over another outgoing trunk port of the same trunk group if the switch receives a message that the information was received incorrectly by the CO. The switch also sends Russian MFP information over another trunk port if the switch does not receive a timely response for the information.

Valid entries	Usage
y/n	Enter y to resend address information on outgoing Russian MFP trunks.

T2 (Backward Signal) Activation Timer (secs)

The T2 (Backward Signal) Activation Timer (secs) field applies to outgoing Russian MFP trunks. This field sets the number of seconds the switch waits for confirmation after sending calling party number and dialed number information on outgoing Russian MFP trunks

Valid entries	Usage
5 - 20	Enter the number of seconds the system waits to receive confirmation after sending the address information on outgoing Russian MFP trunks.

Hospitality screen

```
change system-parameters hospitality                          Page   1 of   3
                             HOSPITALITY

                      Message Waiting Configuration: act-nopms
               Controlled Restrictions Configuration: act-nopms
               Housekeeper Information Configuration: act-nopms
                     Number of Housekeeper ID Digits: 0
                                   PMS Log Endpoint:
                         Journal/Schedule Endpoint:
            Client Room Coverage Path Configuration: act-nopms
             Default Coverage Path for Client Rooms:
            Forward PMS Messages to Intuity Lodging? n

                             PMS LINK PARAMETERS
                                   PMS Log Endpoint:
                                 PMS Protocol Mode: transparent ASCII mode? n
                Seconds before PMS Link Idle Timeout: 20
Milliseconds before PMS Link Acknowledgment Timeout: 500
                    PMS Link Maximum Retransmissions: 3
            PMS Link Maximum Retransmission Requests: 3
                    Take Down Link for Lost Messages? y
```

Screen 43. Hospitality screen

PMS Log Endpoint

This is a valid data extension number that is assigned to the data module connected to the PMS/Log printer.

Valid entries	Usage
Valid data extension	Cannot be a VDN extension. This extension is dialed by the server to send housekeeping and PMS events to the printer.
PMS_LOG	Use this value if the printer is connected over a TCP/IP link, and this link is defined as PMS_LOG on the IP Services screen.
PMS_JOURNAL	Use this value if the printer is connected over a TCP/IP link, and this link is defined as PMS_JOURNAL on the IP Services screen.

Journal/Schedule Endpoint

This is a valid data extension number that is assigned to the data module connected to the Journal/Schedule printer.

Valid entries	Usage
Valid data extension number	Cannot be a VDN extension. This extension can be the same as the PMS/Log printer and both sets of reports can be printed on the same printer. This extension is dialed by the server to send journal information or schedule reports to the printer.
PMS_LOG	Use this value if the printer is connected over a TCP/IP link, and this link is defined as PMS_LOG on the IP Services screen.
PMS_JOURNAL	Use this value if the printer is connected over a TCP/IP link, and this link is defined as PMS_JOURNAL on the IP Services screen.

PMS Endpoint

Valid entries	Usage
Valid extension	Enter the data extension number the server dials to access PMS. Cannot be a VDN extension.
PMS	Use this value if the PMS is connected over a TCP/IP link, and this link is defined as PMS on the IP Services screen.

Hunt Group screen

The Hunt Group screen has a changed field entry and change field name. The Message Center field allows **rem-vm**, rather than **rem-audix**. The AUDIX Extension field changed to the Voice Mail Extension field.

```
change hunt-group 1                                          Page x of x
                                 HUNT GROUP

                            Message Center: rem-vm
                      Voice Mail Extension: ____
      Calling Party Number to INTUITY AUDIX? n
                             LWC Reception: none
```

Screen 44. Hunt Group screen

Message Center

Enter the type of messaging adjunct for the hunt group. Only one hunt group in the System can be administered as **msa**, one as **audix**, one as **qsig-mwi**, one as **fp-mwi**, and one as **rem-vm**.

Valid entries	Usage
msa	Messaging Server Adjunct
rem-vm	DCS feature allowing voice mail to be located on another switch
audix	For AUDIX located on this switch
qsig-mwi	QSIG network allowing voice mail to be located on another switch
fp-mwi	Public network allowing AUDIX to be located on another switch; administrable only when the ISDN Feature Plus field on the System-Parameters Customer-Options screen is **y**.
none	Indicates the hunt group does not serve as a message hunt group.

Voice Mail Extension

This field only appears if the Message Center field is set to **rem-vm**.

Valid entries	Usage
extension	Enter the UDP extension of the voice mail hunt group on the host switch.

IP Services screen

```
change ip-services                                          Page   1 of   3

                              IP SERVICES
   Service    Enabled   Local          Local   Remote            Remote
    Type                Node           Port    Node              Port
   PMS                 guestworks     0       terminalserver    5103
   CDR1                guestworks     0       terminalserver    5101
```

Screen 45. IP Services screen (page 1)

Service Type

Defines the service provided.

Valid entries	Usage
ASAI	Only available on DEFINITY ONE.
ADJKL	Only available on DEFINITY ONE.
ALARM1, ALARM2	Use this to connect send alarms over a TCP/IP link.
cbc	Enter cbc to reserve the trunk for outgoing use only to enhance Network Call Redirection.
CDR1, CDR2	Use this to connect either the primary or secondary CDR device over a TCP/IP link.
PMS_JOURNAL	Use this to connect the PMS journal printer over a TCP/IP link.
PMS_LOG	Use this to connect the PMS log printer over a TCP/IP link.
SAT	System administration terminal. Not available on DEFINITY ONE.
SYS_PRINT	Use this to connect the system printer over a TCP/IP link.

Enabled

Valid entries	Usage
y/n	Enter y to enable this IP service. Only applies to SAT services.

Local Node

Specify the node name for the port.

Valid entries	Usage
Node names as defined on the Node Names screen.	If the link is administered for services over the C-LAN circuit pack, enter a node name defined on the Node Name screen. See *DEFINITY ECS Administration for Network Connectivity* for information on how to administer node names.
processor	Processor is only available for DEFINITY ONE.

Local Node

Specify the node name for the port.

Valid entries	Usage
Node names as defined on the Node Names screen	If the link is administered for services over the C-LAN circuit pack, enter a node name defined on the Node Name screen. See *DEFINITY ECS Administration for Network Connectivity* for information on how to administer node names.
processor	Processor is only available for DEFINITY ONE.

Local Port

Specify the originating port number.

Valid entries	Usage
5000 to 9999	Use 5111-5117 for SAT applications Use 5678 for ASAI
0	For client applications, this defaults to zero.

Remote Node

Specify the switch at the far end of the link for SAT. The remote node should not be defined as a link on the IP Interface or Data Module screens.

Valid entries	Usage
Node name as defined on the Node Names screen	For SAT, use a node name to provide added security.
any	Use any available node.

Remote Port

Specify the port number of the destination.

Valid entries	Usage
5000 to 64,500	Use if this service is a client application, such as CDR or PMS. This must match the port administered on the adjunct, PC or terminal server that is at the remote end of this connection.
0	Default for System Management applications.

IP Services screen (Session Layer Timers page)

Use this screen to enable reliable protocol for TCP/IP links, and to establish other session-layer parameters. This screen only appears if you enter CDR1, CDR2, PMS_JOURNAL, or PMS_LOG in the Service Type field on page 1 or 2.

```
change ip-services                                          Page   3 of   3

                                SESSION LAYER TIMERS
Service   Reliable   Packet Resp    Session Connect    SPDU    Connectivity
 Type     Protocol      Timer         Message Cntr     Cntr       Timer
CDR1         y          3                   1            1           1
```

Screen 46. IP Services screen (Session Layer Timer page)

Service Type

Identifies the service type for which you are establishing parameters.

Valid entries	Usage
CDR1, CDR2	Use this to connect either the primary or secondary CDR device over a TCP/IP link.
PMS_JOURNAL	Use this to connect the PMS journal printer over a TCP/IP link.
PMS_LOG	Use this to connect the PMS log printer over a TCP/IP link.

Reliable Protocol

Indicates whether you want to use reliable protocol over this link.

Valid entries	Usage
y/n	Use reliable protocol if the adjunct on the far end of the link supports it.

Packet Resp Timer

Valid entries	Usage
1–300	Determines the number of seconds to wait from the time a packet is sent until a response (acknowledgement) is received from the far-end, before trying to resend the packet.

Session Connect Message Cntr

Valid entries	Usage
1–5	The Session Connect Message counter indicates the number of times the switch tries to establish a connection with the far-end adjunct.

SPDU Cntr

Valid entries	Usage
1–5	The Session Protocol Data Unit counter indicates the number of times the switch transmits a unit of protocol data before generating an error.

Connectivity Timer

Valid entries	Usage
1–300	Indicates the amount of time (in seconds) that the link can be idle before the switch sends a connectivity message to ensure the link is still up.

Maintenance-Related System Parameters screen

```
change system-parameters maintenance                                Page   1 of   4
                   MAINTENANCE-RELATED SYSTEM PARAMETERS

OPERATIONS SUPPORT PARAMETERS
            Product Identification: 1000000000
                First OSS Endpoint: ALARM1             Abbrev Alarm Report: y
               Second OSS Endpoint: ALARM2             Abbrev Alarm Report: n
  Alarm Origination to OSS Numbers: both
        Cleared Alarm Notification? n                  Suspension Threshold: 5
              Restart Notification? n
           Test Remote Access Port? n
        CPE Alarm Activation Level: none

     Customer Access to INADS Port? n
       Repeat Dial Interval (mins): 7

SCHEDULED MAINTENANCE
                  Start Time: 01 : 00                   Stop Time: 06 : 00
           Daily Maintenance: daily              Save Translation: daily
                                            Command Time-out (hours): 2
 Control Channel Interchange: no           System Clocks Interchange: no
             SPE Interchange: no                EXP-LINK Interchange: no
```

Screen 47. Maintenance-Related System Parameters screen

First OSS Endpoint

This is the endpoint the switch notifies of alarms first, if Alarm Origination to OSS Numbers is set to any value other than Neither.

Valid entries	Usage
ALARM1, ALARM2, 0–9, ~p (pause)	Enter a valid IP Service type or the first OSS telephone number (for example, INADS or Trouble/Tracker). For a TCP/IP interface, the service type is either ALARM1 or ALARM2 and must be defined on the ip-services screen.

Second OSS Endpoint

This is the endpoint the switch notifies of alarms, if Alarm Origination to OSS Numbers is set to both or second-as-backup.

Valid entries	Usage
ALARM1, ALARM2, 0–9, ~p (pause)	Enter a valid IP Service type or the second OSS telephone number (for example, INADS or Trouble/Tracker). For a TCP/IP interface, the service type is either ALARM2 or ALARM1 and must be defined on the ip-services screen.

Multifrequency-Signaling-Related System Parameters screen

This screen sets the system parameters associated with multifrequency signaling.

If the new field, Use COR for All Group II Responses, is set to **y**, the Group II Called Party Category and Use COR for Calling Party Category fields do not appear.

```
change system-parameters multifrequency-signaling                Page  1 of  4

             MULTIFREQUENCY-SIGNALING-RELATED SYSTEM PARAMETERS

          Incoming Call Type:                        ANI Prefix:
          Outgoing Call Type:                       ANI for PBX:
       Maintenance Call Type:             NEXT ANI DIGIT
         Test Call Extension:                           Incoming:
      Interdigit Timer (sec):                           Outgoing:
     Maximum Resend Requests: _
   Received Signal Gain (dB): _
Transmitted Signal Gain (dB): -
                            Request Incoming ANI (non-AAR/ARS)?
                      Outgoing Forward Signal Present Timer (sec):
                       Outgoing Forward Signal Absent Timer (sec):
MF Signaling Intercept Treatment - Incoming? _  Outgoing: ____________ _____
                              Collect All Digits Before Seizure?
                   Overlap Sending on Link-to-Link Tandem Calls?
            Private Group II Permissions and Public Interworking?
                              Convert First Digit End-of-ANI To: _
                                 Group II Called Party Category:
                             Use COR for Calling Party Category?
                      Outgoing Shuttle Exchange Cycle Timer (sec):
```

Screen 48. Multifrequency-Signaling-Related System Parameters screen

Multifrequency Signaling Intercept Treatment - Incoming

Valid entries	Usage
y	Send the group B signal for the intercept to the CO and play intercept tone on the trunk.
n	Use normal DID/TIE/ISDN intercept treatment.

Multifrequency Signaling Intercept Treatment - Outgoing

Valid entries	Usage
announcement	Plays a recorded announcement for outgoing calls that cannot be completed as dialed. You select and record the message. Enter the extension number for the announcement in the associated field.
tone	Plays intercept tone for outgoing calls that cannot be completed as dialed.

Use COR for all Group II Responses

This field only appears if the Outgoing Call Type field is set to group-ii-mfc.

Valid entries	Usage
y/n	Y allows the COR administered category to be used for both the calling party and called party categories.

Route Pattern screen

The Route Pattern screen has a new DCS/QSIG Intw field.

```
change route-pattern 1                                          Page 1 of X
                              Pattern Number: 1_

                              No.                                   DCS/
   Grp. FRL NPA Pfx Hop Toll Del   Inserted                        QSIG  IXC
    No.          Mrk Lmt List Dgts  Digits                          Intw
 1: ___   _ ___  _  __   __   __   ______________________________   n   user
 2: ___   _ ___  _  __   __   __   ______________________________   n   user
 3: ___   _ ___  _  __   __   __   ______________________________   n   user
 4: ___   _ ___  _  __   __   __   ______________________________   n   user
 5: ___   _ ___  _  __   __   __   ______________________________   n   user
 6: ___   _ ___  _  __   __   __   ______________________________   n   user

      BCC VALUE  TSC CA-TSC    ITC BCIE Service/Feature BAND  No.   Numbering LAR
     0 1 2 3 4 W     Request                                 Dgts   Format
                                                         Subaddress
  1: y y y y y n  y  none  ___ both ept outwats-bnd____ ____  _    ________  none
  2: y y y y y n  y            rest     ________________       _    ________  next
  3: y y y y y n  y            rest     ________________       _    ________  rehu
  4: y y y y y n  y            rest     ________________       _    ________  none
  5: y y y y y n  y            rest     ________________       _    ________  none
  6: y y y y y n  y            rest     ________________       _    ________  none
```

Screen 49. Route Pattern screen

DCS/QSIG Intw

This field only appears if the Interworking with DCS field on the Customer Options screen is set to y.

Valid entries	Usage
y/n	Enter y to enable DCS/QSIG Interworking.

Signaling Group screen

Use this screen to establish signaling group parameters for ISDN-PRI, H.323 and ATM trunks. Because these trunk types vary in the types of parameters needed, the fields that appear on this screen change depending on the value of the Group Type field.

For R9.5, the Signaling Group screen has one new Protocol Version value.

```
                                                                  Page 1 of 5
                                SIGNALING GROUP

Group Number  ___            Group Type:  atm___
                                                Max Number of NCA TSC: ___
                              D-Channel:         Max number of CA TSC:  ___
                                              Trunk Group for NCA TSC:  ___
     Trunk Group for Channel Selection:  ___
        Supplementary Service Protocol: _      Network Call Transfer? n
CIRCUIT PARAMETERS
     Virtual Path Identifier: 0
  Virtual Channel Identifier: 0

              Signaling Mode: isdn-pri           Circuit Type: T1
                   Idle Code: 11111111                Connect: network
        Interface Companding: mulaw
            Country Protocol: 1
            Protocol Version: d
                                   DCP/Analog Bearer Capability: 3.1kHz
                                           Interworking Message: PROGress
```

Screen 50. Signaling Group screen

Protocol Version

See the DS1 Circuit Pack screen for a description of the Protocol Version field.

Signaling Group screen (page 2)

The Administered NCA-TSC Assignment Page of the Signaling Group screen allows a new entry **qsig-mwi** in the Application (Appl.) field.

```
                                                                  Page 2 of 5
                          ADMINISTERED NCA TSC ASSIGNMENT
Service/Feature: ___________              As-needed Inactivity Time-out (min):_
  TSC    Local                                                  Adj.      Mach.
 Index    Ext.    Enabled  Established   Dest. Digits    Appl.    Name       ID
  1:      _____     __     _________    _____________   _______  _______    __
  2:      _____     __     _________    _____________   _______  _______    __
  3:      _____     __     _________    _____________   _______  _______    __
  4:      _____     __     _________    _____________   _______  _______    __
  5:      _____     __     _________    _____________   _______  _______    __
  6:      _____     __     _________    _____________   _______  _______    __
  7:      _____     __     _________    _____________   _______  _______    __
  8:      _____     __     _________    _____________   _______  _______    __
  9:      _____     __     _________    _____________   _______  _______    __
 10:      _____     __     _________    _____________   _______  _______    __
 11:      _____     __     _________    _____________   _______  _______    __
 12:      _____     __     _________    _____________   _______  _______    __
 13:      _____     __     _________    _____________   _______  _______    __
 14:      _____     __     _________    _____________   _______  _______    __
 15:      _____     __     _________    _____________   _______  _______    __
```

Screen 51. Signaling Group screen (Administered NCA-TSC Assignment Page)

Appl.

Specifies the application for this administered NCA-TSC.

Valid entries	Usage
audix	Use this for ISDN-PRI D-channel DCS Audix feature.
dcs	Use this for the DCS Over ISDN-PRI D-channel feature.
gateway	Use this when the administered NCA-TSC is used as one end in the gateway channel connecting to a BX.25 link. If gateway is entered, then the ISDN TSC Gateway Channel Assignments screen must be completed.
masi	Use this when the NCA-TSC is one end of a multimedia application server interface.
qsig-mwi	Use this to convert messages from an administered AUDIX NCA-TSC to a QSIG CISC. If you use this application type, then you must enter a Machine ID between 1 and 20.

Station screen

```
change station 1014                                          Page 1 of X
                              STATION

Extension: 1014               Lock Messages? n                     BCC:
     Type:                    Security Code:                        TN:1
     Port:                  Coverage Path 1:                       COR: 1
     Name:                  Coverage Path 2:


STATION OPTIONS
              Loss Group: 2                Personalized Ringing Pattern: 3
            Data Module? n                           Message Lamp Ext: 1014
           Speakerphone: 2-way                     Mute button enabled? y
       Display Language? English                     Media Complex Ext:
                                                          IP Softphone? y
                                                 Remote Office Station? n
                                                    IP Emergency calls: extension
```

Screen 52. Station screen (page 1)

IP Emergency calls

Use this field to tell the switch how to handle emergency calls from the IP phone. This field appears when either the IP Softphone field or the Remote Office Station field is set to y on the Station screen.

CAUTION:

An Avaya IP endpoint can dial emergency calls (for example, 911 calls in the U.S.). It reaches solely the local emergency service in the Public Safety Answering Point area where the telephone system is located. Please be advised that an Avaya IP endpoint does not dial to and connect with local emergency service when dialing from remote locations. You should not use an Avaya IP endpoint to dial emergency numbers for emergency services when dialing from remote locations. Avaya Inc. is not be responsible or liable for any damages resulting from misplaced emergency calls made from an Avaya endpoint. Your use of this product indicates that you have read this advisory and agree to use an alternative telephone to dial all emergency calls from remote locations.

Valid entries	Usage
extension	Enter **extension** to send the IP telephone extension, adjusted by CAMA or ISDN screens, to the Public Safety Answering Point (PSAP). Use this entry for IP Telephone users who always call from the same location, in an area covered by the same public safety office as the switch.
block	Enter **block** to prevent the completion of emergency calls. Use this entry for users who move around but always have a circuit-switched phone nearby, and for users who are farther away from the switch than an adjacent area code served by the same 911 Tandem office. When users attempt to dial an emergency call from an IP Telephone and the call is blocked, they can dial 911 from a nearby circuit-switched phone instead.
cesid	Enter **cesid** to allow the switch to send the CESID information supplied by the IP Softphone to the PSAP. The end user enters the emergency information into the IP Softphone. Use this entry for IP Softphones with road warrior service that are near enough to the switch that an emergency call routed over the switch's trunk reaches the PSAP that covers the switch. If the switch uses ISDN trunks for emergency calls, the digit string is the telephone number, provided that the number is a local direct-dial number with the local area code, at the physical location of the IP Softphone. If the switch uses CAMA trunks for emergency calls, the end user enters a specific digit string for each IP Softphone location, based on advice from the local emergency response personnel.
option	Enter **option** to allow the user to select the option (extension, block, or cesid) that the user selected during registration and the IP Softphone reported. Use this entry for extensions that are swapped back and forth between IP Softphones and a phone with a fixed location. The user chooses between **block** and **cesid** on the softphone. A DCP or IP phone in the office automatically selects **extension**.

Station screen (page 2)

A new Automatic Moves field has been added to page 2 of the Station screen for ACTR. There is a new option for the Auto Answer field on page 2 of the Station screen.

```
add station 1014                                                Page 2 of X
                                     STATION

FEATURE OPTIONS
           LWC Reception? msa-spe             Auto Select Any Idle Appearance? n
          LWC Activation? y                            Coverage Msg Retrieval? y
  LWC Log External Calls? n                                      Auto Answer: none
             CDR Privacy? n                                  Data Restriction? n
   Redirect Notification? y                        Idle Appearance Preference? n
 Per Button Ring Control? n
   Bridged Call Alerting? n                          Restrict Last Appearance? y
  Active Station Ringing: single

        H.320 Conversion? n             Per Station CPN - Send Calling Number? _
      Service Link Mode: as-needed   Special Character for Restricted Number? n
        Multimedia Mode: basic
    MWI Served User Type: ______                    Display Client Redirection? n
        Automatic Moves:
             AUDIX Name:                           Select Last Used Appearance? n
   Messaging Server Name: ______                     Coverage After Forwarding? _
     Recall Rotary Digit? n                            Multimedia Early Answer? n
                                                 Direct IP-IP Audio Connections? n
                                                            IP Audio Hairpinning? n
```

Screen 53. Station screen (page 2)

Auto Answer

In EAS environments, the auto answer setting on the Agent LoginID screen can override a station's setting when an agent logs in there.

NOTE:
For analog stations, if Auto Answer is set to acd and the station is off-hook and idle, only the ACD split/skill calls and direct agent calls auto answer; non-ACD calls receive busy treatment. If the station is active on an ACD call and a non-ACD call arrives, the Agent receives call-waiting tone.

Valid entries	Usage
all	Enter all to allow all calls (ACD and non-ACD) terminated to an idle station to be cut through immediately. Does not allow automatic hands-free answer for intercom calls.
acd	Enter acd to allow only ACD split /skill calls and direct agent calls to auto answer. If this field is set to acd, Non-ACD calls terminated to a station ring audibly.
none	Enter none to cause all calls terminated to this station to receive an audible ringing treatment.
icom	Enter icom to allow a phone user to answer an intercom call from the same intercom group without pressing the intercom button.

Automatic Moves

Automatic Moves allows a phone to be unplugged from one location and moved to a new location without additional switch administration. The switch automatically associates the extension to the new port.

CAUTION:
When a phone is unplugged and moved to another physical location, the USA Automatic Location Identification data base must be manually updated. If it is not updated, the DID number sent to the Public Safety Network can send emergency response personnel to the wrong location.

Valid entries	Usage
always	Enter always and the phone can be moved anytime without additional administration by unplugging from one location and plugging into a new location.
once	Enter once and the phone can be unplugged and plugged into a new location once. After a move, the switch sets the field to done the next time routine maintenance runs on the phone. Use once when moving a large number of phones so each extension is removed from the move list. Use once to prevent automatic maintenance replacement.

Valid entries	Usage
no	Enter no to require administration in order to move the phone.
done	Done is a display-only value. The switch sets the field to done after the phone is moved and routine maintenance runs on the phone.
error	Error is a display-only value. The switch sets the field to error, after routine maintenance runs on the phone, when a non-serialized phone is set as a movable phone.

System Parameters Country-Options screen

There is a new Enable Busy Tone Disconnect for Analog loop-start Trunks field on the System Parameter Country Options screen.

```
change system-parameters country-options                        Page 1 of 7

                         SYSTEM PARAMETERS COUNTRY-OPTIONS


              Companding Mode: Mu-Law         Base Tone Generation Set: 1
          440Hz PBX-dial Tone? n             440Hz Secondary-dial Tone? n
       Analog Ringing Cadence: 1    Set Layer 1 timer T1 to 30 seconds? n
     Analog Line Transmission: 1
64/84xx Display Character Set? Roman
       Howler Tone After Busy: y  Disconnect on No Answer by Call Type: y
              Enable Busy Tone Disconnect for Analog Loop-start Trunks?

TONE DETECTION PARAMETERS
        Tone Detection Mode: 5          Dial Tone Validation Timer:
             Interdigit Pause: short
```

Screen 54. System Parameters Country-Options screen

Enable Busy Tone Disconnect for Analog Loop-start Trunks

This field allows the switch to recognize a busy tone from the central office as a disconnect signal.

Valid entries	Usage
y/n	Enter y to allow the switch to disconnect the trunk when a busy tone is received from the central office.

System Parameters Customer Options screen

For Release 9.5, new fields were added to the Customer Options screen.

```
display system-parameters customer-options                          Page 1 of 9
                              OPTIONAL FEATURES
                 G3 Version: V9                     Maximum Ports: 100
                   Location: 1           Maximum XMOBILE Stations: 0
IP PORT CAPACITIES
                                   Maximum Administered IP Trunks: 10
                       Maximum Concurrently Registered IP Stations: 10
                         Maximum Administered Remote Office Trunks: 0
            Maximum Concurrently Registered Remote Office Stations: 0
               Maximum Number of DS1 Boards with Echo Cancellation: 0
                                             Maximum VAL Boards: 1
            (NOTE: You must logoff & login to effect the permission changes.)
```

Screen 55. Customer Options screen (page 1)

Maximum VAL Boards

Valid entries	Usage
0–10 (r only) **0-5** (all others)	This display-only field indicates the maximum number of TN2501AP (Voice Announcement over LAN) boards allowed in this system. See Field interactions.

Field interactions

- For values greater than 1, the Val Full 1-Hour Capacity? field on page 4 of the Customer Options screen (see Screen 57 on page 314) must be set to **y**.
- Entry in this field updates the System Limit field on the System Capacity report (display capacity).
- If TN750B or C announcement circuit packs are also installed, these boards are counted first against the system limit.

  Example:
  If the maximum VAL board limit is 3, and 3 TN750Cs are already active in a system with a platform limit of 5 integrated announcement circuit packs, only 2 VAL circuit packs become active. From that point, the first VAL circuit pack that is inserted becomes active.

Error messages

- If VAL Full 1-Hour Capacity? field (see below) is **n**, and Max VAL Boards is not = 1, then the following error appears:

  Value must be 1 if VAL Full 1-Hour Capacity is 'n'.

System Parameters Customer Options screen (page 3)

```
                                                   Page   3 of   6
                                OPTIONAL FEATURES

                     Hospitality (Basic)? y               PNC Duplication?  n
         Hospitality (G3V3 Enhancements)? n
                            H.323 Trunks? y       Processor and System MSP? n
                             IP Stations? y             Private Networking? y
                        ISDN Feature Plus? n  Restrict Call Forward Off Net? n
                          ISDN-BRI Trunks? n          Secondary Data Module? y
                                 ISDN-PRI? n          Station and Trunk MSP? n
                    Malicious Call Trace? n    Survivable Remote Processor? n
    Mode Code for Centralized Voice Mail? n            Tenant Partitioning? n
                     Mode Code Interface? n    Terminal Trans. Init. (TTI)? n
                Multifrequency Signaling? y            Time of Day Routing? n
Multimedia Appl. Server Interface (MASI)? n           Uniform Dialing Plan? n
        Multimedia Call Handling (Basic)? n  Usage Allocation Enhancements? n
     Multimedia Call Handling (Enhanced)? n
                                                        Wideband Switching? n
           Personal Station Access (PSA)? n                       Wireless? n

        (NOTE: You must logoff & login to effect the permission changes.)
```

Screen 56. System Parameters Customer-Options (page 3)

Terminal Trans. Init. (TTI)

Allows administrators of Terminal Translation Initialization (TTI) to merge an station administered with X in the Port field, to a valid port by dialing a system-wide TTI security code and the extension from a terminal connected to that port. Must beset to y for Automatic Customer Telephone Rearrangement.

System Parameters Customer Options screen (page 4)

```
display system-parameters customer-options                Page   4 of   9   SPE A
                                OPTIONAL FEATURES

                                                       Tenant Partitioning? n
                                                 Terminal Trans. Init. (TTI)? y
           Processor and System MSP? n                   Time of Day Routing? y
                 Private Networking? y                  Uniform Dialing Plan? y
                                                Usage Allocation Enhancements? y
                  R9.5 Capabilities? y               VAL Full 1-Hour Capacity? y
                      Remote Office? n
      Restrict Call Forward Off Net? y                     Wideband Switching? y
              Secondary Data Module? y                                Wireless? n
              Station and Trunk MSP? n
       Station as Virtual Extension? n
        Survivable Remote Processor? n
```

Screen 57. Customer Options screen (page 4)

VAL Full 1-Hour Capacity?

Valid entries	Usage
y	Enhanced offer (60 minutes storage capacity and multiple integrated announcement circuit packs)
n	Standard offer (10 minutes and only 1 integrated announcement circuit pack)

R9.5 Capabilities?

Valid entries	Usage
y	This field must be y before any R9.5 feature is enabled.

Error Messages

- The R9.5 Capabilities field must be **y** before the VAL Full 1-Hour Capacity? field can accept **y**. If not, the following error message appears:

  R9.5 capabilities feature not assigned

System Parameters OCM Call Classification screen

This screen appears when Global Call Classification field on the System Parameters Customer Options screen is set to y, or when the Enable Busy Tone Disconnect for Analog loop-start Trunks field on the System Parameters Country Options screen is set to y. This screen defines the busy tone and cadence and can be administered with up to 4 on and off steps, which is four valid cycles to determine busy tone.

We recommend that you use a minimum of two on and off steps to determine a valid busy tone. If the cadence is administered with one on and off step, any time the classifier hears the cadence it is considered BTD signal.

```
                                                          Page 2 of 9
                    SYSTEM PARAMETERS OCM CALL CLASSIFICATION

Tone Name  Instance      Tone      Cadence   Duration     Duration
                       Continuous  Step      Minimum      Maximum
__________  _____          ___     1.  on     _____        _____
                                   2.  off    _____        _____
                                   3.  on     _____        _____
                                   4.  off    _____        _____
                                   5.  on     _____        _____
                                   6.  off    _____        _____
                                   7.  on     _____        _____
                                   8.  off    _____        _____
```

Screen 58. System Parameters OCM Call Classification screen

Tone Name

This field is required for tone definition outside of the U.S. and Canada.

If the Global Call Classification field on the System Parameters Customer Options screen is n, only busy can be entered into this Tone Name field. If Busy Tone Disconnect is enabled, only busy can be entered into this field.

Valid entries	Usage
busy **information** **intercept** **reorder** **ringback**	Enter the name of the tone that you are adding or modifying. Enter **busy** for Busy Tone Disconnect.

Trunk Group screen

New use for the r1mf entry in the Outgoing Dial Type field on page 1 of the Trunk Group screen.

```
change trunk-group 20                                          Page 1 of x
                                 TRUNK GROUP

 Group Number: 20                   Group Type: co______       CDR Reports: _
   Group Name: ____________________________ COR: __        TN: ___      TAC: ____
    Direction: ________        Outgoing Display? _    Trunk Signaling Type: ____
  Dial Access? _                Busy Threshold: ___          Night Service: _____
 Queue Length: ___                     Country: __   Incoming Destination: _____
    Comm Type: _____                 Auth Code? _
                                   Trunk Flash? _
          BCC: _                           ITC? ____
 TRUNK PARAMETERS
    Trunk Type (in/out): ____________     Incoming Rotary Timeout(sec): __
     Outgoing Dial Type: r1mf                      Incoming Dial Type: ________
                                         Disconnect Timing(msec): ____
        Digit Treatment: __________                         Digits: ____
                                                 Sig Bit Inversion: none
      Analog Loss Group: ___                        Digital Loss Group: ___
     Incoming Dial Tone? _
               Bit Rate: _____         Synchronization: _____    Duplex: ____
  Disconnect Supervision - In? _  Out? _
  Answer Supervision Timeout: ___           Receive Answer Supervision? _
```

Screen 59. Trunk Group screen, page 1

Outgoing Dial Type

This field sets the method used to transmit digits for an outgoing call. Usually, you should match what your central office provides. Refer to Types of address transmission DAG20 for more information. This field appears for Access, APLT, CO, DIOD, DMI-BOS, FX, RLT, and WATS trunk groups. It also appears for Tie trunk groups when the Trunk Signaling Type field is blank, cont, or dis.

Valid entries	Usage
r1mf	Enter r1mf for CAMA trunk groups. Enter r1mf to allow Russian MF Packet Signaling on outgoing trunks. Russian MF Packet Signaling carries calling party number and dialed number information. Group type must be set to co.

Trunk Group screen (administrable timers page)

There is a new field on the administrable timers page of the Trunk Group screen, the Busy tone Disconnect field.

```
add trunk-group next                                                Page 3 of x
ADMINISTRABLE TIMERS
                Send Incoming/Outgoing Disconnect Timers to TN465 Ports? _
                                              Outgoing Dial Guard(msec): _____
  Incoming Glare Guard(msec): _____          Outgoing Glare Guard(msec): _____

                                 Outgoing Rotary Dial Interdigit (msec): ____
       Ringing Monitor(msec): _____               Incoming Seizure(msec): ____
   Outgoing End of Dial(sec): ___        Outgoing Seizure Response(sec): ___
 Programmed Dial Pause(msec): _____        Disconnect Signal Error(sec): ___
          Flash Length(msec): ____
                                                  Busy Tone Disconnect?

END TO END SIGNALING
    Tone (msec): ____    Pause (msec): 150

OUTPULSING INFORMATION
     PPS: 10    Make(msec): 40    Break(msec): 60  PPM? y  Frequency: 50/12k
```

Screen 60. Trunk Group screen (administrable timers page)

CAUTION:
Do not change fields on this page without assistance from Avaya or your network service provider.

Busy Tone Disconnect

The field appears when Enable Busy Tone Disconnect for Analog loop-start Trunks is y on the System Parameters Country-Options screen.

Valid entries	Usage
y/n	Enter y to allow the switch to recognize a busy tone signal as a disconnect on this trunk group.

New and Changed Commands

15

New commands

This following section describes the commands that are new with R9.5, or that have new qualifiers and new output for R9.5.

boot image commands

get boot-image

Use this command to view the two firmware image parameters on the TN2501AP circuit pack.

Table 22. display firmware-image command parameters

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
get boot-image	***location***	The physical location of the circuit pack (UUCSS). Example **get boot-image 1C07**	init inads craft customer		

```
get boot-image 1C07

                            DISPLAY FIRMWARE IMAGE(S)

              Image 1        Image 2

  Board Type: TN2501         TN2501
  FW Vintage: 02             02
HW Signature: 02             02
      Suffix: A              A
        Date: 03/02/02       03/02/01
   Timestamp: 10:30:50       12:42:18
CRC Checksum: Good           Good
Active Image: Yes            No
Reboot Image: Yes            No
```

Screen 61. Display Firmware Image(s) screen

Field descriptions

Board Type	For VAL, this field is TN2501.
FW Vintage	The firmware vintage number
HW Signature	The hardware signature number
Suffix	The circuit pack suffix code letter
Date	The date the firmware file was created or transferred to the circuit pack
Timestamp	The time that the firmware file was created or transferred to the circuit pack
CRC Checksum	Cyclic Redundancy Check (data integrity algorithm)
Active Image	Yes in this field indicates the active firmware image file. No in this field indicates the inactive firmware image file. To change the active image file, use the set boot-image command.
Reboot Image	Yes in this field indicates that this image becomes active after a system reset. No in this field indicates that this image becomes inactive after a system reset.

set boot-image

Use this command to direct the system to use 1 of 2 possible firmware image files on the TN2501AP circuit pack.

Table 23. set boot-image command parameters

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
set boot-image	***location***	The physical location of the circuit pack (UUCSS).	init inads craft customer		
	1	Directs the system to use the Image 1 firmware file			
	2	Directs the system to use the Image 2 firmware file			
		Example **set boot-image board 1B08**			

NOTE:
You must reseat the circuit pack before the firmware file specified in this command becomes the active boot image.

ethernet option commands

get ethernet options

Use this command to generate a report about a specific ethernet connection.

Table 24. set ethernet-options command parameters

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
get ethernet-options	***location***	The physical location of the circuit pack (UUCSS).	init inads craft customer		

```
display ethernet-options 1C07

                    Administered Value         Actual Value

Auto Negotiation: Yes                        Yes
           Speed: N/A                        10Mbps
          Duplex: N/A                        Full
  Link Integrity:                            Active
```

Screen 62. get ethernet-options screen

Field descriptions

Auto Negotiation	Yes means that the system automatically negotiates the highest possible network speed.
	No means that the Speed and Duplex fields are manually assigned.
Speed	10Mbps
	100Mbps
	N/A (not available)
Duplex	Half
	Full
	N/A (not available)
Link Integrity	Active
	Inactive

set ethernet-options

Use this command to manually or automatically set the ethernet connection parameters.

NOTE:
The ethernet port must be both administered and busied out before you can issue this command.

Table 25. set ethernet-options command parameters

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
set ethernet-options	***location***	The physical location of the circuit pack (UUCSS).	init inads craft customer		

```
set ethernet-options 1C07

                              SET ETHERNET OPTIONS

Auto Negotiation: y

           Speed:

          Duplex:
```

Screen 63. Set Ethernet Options screen

Field descriptions

Auto Negotiation

y means that the system automatically negotiates the highest possible network speed.

n means that you must manually assign the Speed and Duplex fields.

NOTE:
If you set the Auto Negotiation field to **n**, the Speed and Duplex fields do not display.

Speed

10Mbps

100Mbps

Duplex

Half

Full

list station

- list station movable - shows extensions that have the Automatic Moves field set to always or once
- list station movable once - shows extensions available to be moved once
- list station movable done - shows extensions that had the Automatic Moves field set to once, and have moved
- list station movable always - shows extensions available for moves anytime
- list station movable error- shows mis-administered non-serialized extensions
- list station movable no - shows extensions not available to be moved

```
list station movable

                                        STATIONS

       Port/     Name/                     Room     Data   Cv1/  COR/     Cable/
Ext    Type      Hunt-to                   Move     Ext    Cv2   COS  TN  Jack

1001   01A0301   Digital a0301                               1    1
       6402D                               always                    1
```

list trace

Use this command to view the VPI.VCI data, adding either of these qualifiers

- list trace station
- list trace tac

Table 26. list trace command parameters

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
list trace	***station***	VPI.VCI data for a specific station	init inads craft customer		
	tac	VPI.VCI data for a specific trunk/member			

list trace station

Use this command to check the VPI.VCI data for a specified station (**list trace station *extension***). The command syntax for ATM-specific trace data is

> **list trace station *xxxxx*/a** where ***xxxxx*** is the station number, and ***/a*** means that you are requesting ATM-specific data.

Screen 64 shows VPI.VCI data for a successful 2-party call setup. Use the Field descriptions (list trace) to interpret this report.

```
list trace station 52501/a                    Page 1 of 1   SPE B

                              LIST TRACE


   Time         Data

15:12:07      Calling party station    57405 cid 0x20
15:12:09      dial 52501
15:12:09      ring station 52501 cid 0x20
15:12:09      ATM setup PN01-0081 to PN03-0045
15:12:09      ATM setup PN03-0046 to PN01-0082
15:12:11      active station 52501 cid 0x20
15:12:22      idle station 57405 cid 0x20
```

Screen 64. List trace screen (list trace station)

list trace tac

Use this command to see the VPI.VCI data for a specified trunk. The command syntax for ATM-specific trace data is **list trace tac *xxx*/a**, where

- ***xxx*** is the trunk access code number.
- ***/a*** means that you are requesting ATM-specific data.

Field descriptions (list trace)

Time	The system time that the event in the data field occurred
Data	A description of the event:
	setup indicates a successful ATM setup.
	fail indicates an unsuccessful ATM setup or the network released an SVC after setup.
	rele(ase) DEFINITY has sent an SVC-release message. This is rare because the call being traced has already ended by the time the SVC-release message is sent.
	add indicates that a party has been added to an SVC.
	rej(ect) indicates a rejected ATM-EI add-party message.
	drop indicates that DEFINITY sent an SVC drop-party message.
	save indicates that an SVC has been saved in the DEFINITY ATM cache.
	reuse indicates that an SVC in the DEFINITY ATM cache has been reused.

reset val

This command performs the functions of the **reset board** command but overrides querying the board to determine if an announcement autosave is in process. This allows resetting the circuit pack if it is in the insane state.

```
reset val 1C07

                                TEST RESULTS

Port        Maintenance Name  Alt. Name Test No. Result            Error Code

01C07       VAL-BD                      53       PASS
```

Screen 65. Reset VAL report

status val-ip

Use this command to generate an IP-related status report about the VAL circuit pack's LAN connection. See status **c-lan-ip** for field descriptions.

```
status val-ip 1C02

                                IP STATUS

Reset Time: mm/dd/hh:mm
Last Hour Start Time: mm/dd/hh:mm       End Time: mm/dd/hh:mm

Incoming Received:      Octets   Datagrams    Discards    Hdr Errors
  Since reset           1        0                        0
  Last Hour             0        327680       0           4294901760
Outgoing Transmitted:   Octets   Datagrams    Discards    No Routes
  Since reset           65535    0            0           0
  Last Hour             0        0            0           0
Datagrams w/o Routes    ICMP Dest Unreachables      ICMP Redirects
  Since Reset           0                           65535
  Last Hour             0                           0
```

Changed commands

add atm wsp

Use this command to add a new WAN spare processor. The commands **add/change/display/remove atm wsp [1-15]** has been changed to reflect the new number of WSPs allowed in a system.

Action/Object	Qualifier	Qualifier Description	Permissions	Defaults	Feature Interactions
add atm wsp	***next***	Next available number	init inads	none	none
	1-15	Number of the selected WSP Examples: **add atm wsp next** **add atm wsp 12**	craft		

Output

Screen 66 is an example of the screen output for the **add atm wsp *next*** command for a system with ATM-network duplication and Critical Reliability.

NOTE:
On Standard or High Reliability systems, only the A-PNC column appears.

```
add atm wsp next                                                  page 1 of 1

                              ATM WAN SPARE PROCESSOR 12

         Name: San Diego 5B
     Priority: 3



                 A-PNC                                B-PNC

  Address Format: E.164 ATM Private    Address Format: E.164 ATM Private
             AFI: 45                              AFI: 45
           E.164: 1234567890123456              E.164: 1234567890123456
          HO-DSP: 12345678                     HO-DSP: 12345678
             ESI: 123456789012                    ESI: 123456789012
             SEL: 12                              SEL: 12
```

Screen 66. ATM WAN Spare Processor screen (add atm wsp)

Field descriptions

ATM WAN Spare Processor #	The WSP number (**1-15**).

display capacity

A new Maximum VAL Boards field has been added indicating the maximum number of TN2501AP (VAL) integrated announcement circuit packs allowed in a system.

```
display capacity                                                Page   6 of  10
                                   SYSTEM CAPACITY

                                                                   System
                                                         Used Available  Limit
                                                        -----------------------

          Recorded Announcement Analog Queue Slots:        0     150      150
                                Maximum VAL Boards:        0       3        3
       TEMPORARY SIGNALING CONNECTIONS (TSC)
                                 Administered TSCs:        0     128      128
                                     NCA-TSC Calls:        0     256      256

                      TRUNKS
                                 DS1 Circuit Packs:        0      30       30
                               ICHT For ISDN Trunks:       0     288      288
               ISDN CBC Service Selection Trunks:        0      10       10
                                       Trunk Groups:       0      99       99
                                        Trunk Ports:       0     400      400
```

Screen 67. System Capacity report

Maximum VAL Boards

Valid display	Usage
Used	The number of VAL circuit packs administered on the circuit packs screen (0-5).
Available	System Limit number minus Used number
System Limit	This display-only field indicates the maximum number of TN2501AP (Voice Announcement over LAN) boards allowed in this system. See the System Parameters Customer Options screen and the Field interactions section for details.

display events

Use this command to generate a report of the denied IP events. This command is available to all login permissions.

Instructions

1. At the switch terminal, type **display events**. Press RETURN.

   The Events Report screen appears (Screen 68). This input screen helps you focus the report on events of a certain type or from a certain time period.

```
display events                                Page  1 of  1   SPE B

                          EVENT REPORT

  The following options control which events will be displayed.

        EVENT CATEGORY

           Category: denial

        REPORT PERIOD

           Interval: ___    From: __/__/__:__ To: __/__/__:__


        SEARCH OPTIONS

                           Vector Number: ___
                              Event Type: _____
```

Screen 68. Event Report screen (display events)

2. In the Category field, select or type **denial** (see bold type in Screen 68).
3. In the Interval field select from the help list or type the first letter of one of the following selections
   - **all**
   - **month**
   - **day**
   - **hour**
   - **minute**

   Press ENTER.

   The Events Report screen (Screen 69) appears.

```
display events                                                    Page   1  of  1

                                 EVENTS REPORT

Event Event                      Event     Event      First       Last     Evnt
Type  Description                Data 1    Data 2     Occur       Occur     Cnt

1012  Destination Unavailable   71        5A       01/09/09:44 01/09/09:54  8
1012  Destination Unavailable   65        22       01/09/09:45 01/09/09:45  1
1012  Destination Unavailable   6E        2D       01/09/09:46 01/09/09:47  3
1012  Destination Unavailable   1EA       4A       01/09/09:47 01/09/09:51  2
1934  IP RRJ - Ext already reg  6c        8709D26D 01/09/09:47 01/09/09:51  1
1012  Destination Unavailable   8E        32       01/09/09:48 01/09/09:48  1
1643  Off-hook dialing time out 46        58       01/09/09:49 01/09/09:53  2
1012  Destination Unavailable   AE        3A       01/09/09:49 01/09/09:49  1
1012  Destination Unavailable   55        41       01/09/09:50 01/09/09:50  2
1012  Destination Unavailable   222       48       01/09/09:51 01/09/09:51  1
1012  Destination Unavailable   1D4       50       01/09/09:52 01/09/09:52  1
1012  Destination Unavailable   46        5E       01/09/09:52 01/09/09:54  2
1012  Destination Unavailable   412       54       01/09/09:52 01/09/09:52  1
1012  Destination Unavailable   72        57       01/09/09:53 01/09/09:53  1

                press CANCEL to quit --  press NEXT PAGE to continue
```

Screen 69. Events report (display events)

Screen 69 shows an example of an IP denial event in bold type. Use the Field descriptions for display events to further interpret this report.

Field descriptions for display events

Event Type	The event identification number that points to a specific piece of software code (see Table 27)
Event Description	A 25-character string describing the problem (see Table 27)
Event Data 1	The station UID that is attempting to register (see Table 27)
Event Data 2	The IP address of the station that is attempting to register (see Table 27)
First Occur	The time and date when this event first occurred
Last Occur	The time and date when this event last occurred
Evnt Cnt	The number of occurrences of the event between the First Occur and Last Occur times

Table 27 lists the Event Type, the text that appears in the Event Description field, a further explanation of the condition, and the kind of data in the Event 1 and Event 2 fields.

Table 27. Denied IP events

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1907	IP RRJ-Invalid RAS addr	Registration Rejected because the RAS address in the RRQ is invalid.	0	IP address that sent the RRQ
1908	IP RRJ-Invld call SigAddr	IP Registration REjection because signalling address in the RRQ is invalid.	0	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1909	IP RRJ-RemoteOfc misadmin	Registration rejected because: 1. Remote Office is enabled on the Signaling Group screen, but the RRQ is not from a supported Remote Office product. 2. The RRQ is from a supported Remote Office product, but Remote Office not enabled on the Signaling Group screen. 3. Remote Office is enabled on the Signaling Group screen, but the Terminal Type in the RRQ is not valid.	0	IP address
1910	IP RRJ-H323 UserObj undef	Registration rejected because there is no H323 User Object.	0	IP address
1911	IP RRJ-Exceed max endpts	Registration rejected because the the capacity for either registered endpoints or Remote Office endpoints is exceeded. Check maximum allowed in the system on page 1 of the System Parameters Customer Options screen.	0	1st part: # of RO stations; 2nd part: # of IP stations, respectively.
1912	IP RRJ-Exceed ProdID/Ver	Registration rejected because the maximum number of registered endpoints of a specific product ID and version is exceeded. Check the limit on the System Parameters Customer Options screen.	T/S: IP Product from the System Parameters Customer Options screen	1st part: registered limit; 2nd part: actual count, respectively.
1913	IP RRJ-Invalid ProdID/Ver	Registration rejected because invalid Product ID / Version. Registering Application's product ID is not administered or no Product ID in RRQ message.	T/S: Product ID of the registering application	Major version number
1914	IP RRJ-ProdID search fail	Registration rejected because the search for registering application's Product ID failed.	T/S: Product ID of the registering application	Major version number

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1915	IP RRJ-Invalid endpt/Ver	Registration rejected because the endpoint version is not compatible with the gatekeeper version.	IP address	Major version number in 2nd byte; minor version number in low byte
1916	IP RRJ-No H323 NonStdData	Registration rejected; non-standard data are missing in the RRQ from authenticating application.	0	IP address
1917	IP RRJ-Invld H323 ObjID	Registration rejected; Object ID in the RRQ is invalid.	Object ID	IP address
1918	IP RRJ-Invld H225 NSData	Registration rejected; cannot decode H225 non-standard data (NSD) message.	0	IP address
1919	IP RRJ-Bad H225 NSDchoice	Registration rejected; unexpected NSD message received from registering application.	NSD choice	IP address
1920	IP RRJ-TTI: new LM fail	Registration rejected; failure in creating new Login Manager. Possible causes ■ No available heap memory to create LoginMgr ■ Cannot start LoginMgr timer ■ Clock not set	UID	IP address
1921	IP RRJ-IP-TTI port fail	Registration rejected; failure when inserting IP TTI port.	UID	IP address
1922	IP RRJ-TTI or RO inactive	Registration for an IP set with TTI service rejected. Possible causes: ■ TTI is not enabled on the System Parameters Customer Options screen. ■ Remote Office is not enabled on the System Parameters Feature Options screen.	0	IP address
1923	IP RRJ-No E164 number	Registration rejected; no valid E.164 phone number available. The extension is not administered.	UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1924	IP RRJ-No GRQ msg rcvd	Registration rejected; did not receive a Gatekeeper Request message	UID	IP address
1925	IP RRJ-RQ: new LM fail	Registration rejected; failure creating a new Login Manager. Possible cause: ■ No available heap memory to create LoginMgr ■ Cannot start LoginMgr timer ■ Clock not set	UID	IP address
1926	IP RRJ-Authentication fail	Registration rejected: authentication failure. The password that the user entered and the administered password on the station screen do not match.	UID	IP address
1927	IP RRJ-Invld station type	Registration rejected: ■ invalid set type ■ no Remote Office or IP Softphone administration on the station screen	UID	Type
1928	IP RRJ-StnTyp/Protocl err	Registration rejected: station type and call signalling protocol are inconsistent. The IP Softphone should be defined as either ■ DCP ext with call control equal to IP Softphone ■ H.323 ext with call control equal to none.	UID	Endpoint type (3rd and 2nd nyble); call signalling protocol (low nyble)
1929	IP RRJ-No idx for MMCmplx	Registration rejected: dual-connected DCP set user record is missing the index for the multimedia complex.	UID	IP address
1930	IP RRJ-No voice path spec	Registration rejected: endpoint has neither an associated multimedia extension nor a specified voice path, hence, no audio path. Either ■ add a Media Complex Extension on the station screen or ■ register as a telecommuter.	UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1931	IP RRJ-H323 ext is MMCmpx	Registration rejected: this H.323 extension is administered as a Media Complex extension on a non-H.323 (for example, a DCP) set.	UID	IP address
1932	IP RRJ-Ext has data modl	Registration rejected: the extension is administered as a data module.	UID	IP address
1933	IP RRJ-IP addr mismatch	Registration rejected: the H.323 application is not at the same IP address as the authenticating application.	UID	IP address of registering endpoint
1934	IP RRJ-Ext already reg	Registration rejected: extension is already registered.	UID	IP address
1935	IP RRJ-Not Remote Ofc ext	Registration rejected: Remote Office is not administered for this extension on the station screen.	UID	IP address
1936	IP RRJ-Invld RO anlg stn	Registration rejected: invalid analog station type.	UID	IP address
1937	IP RRJ-RemOfc not admin	Registration rejected: Remote Office endpoint ■ is not administered or ■ is of unknown station type.	UID	IP address
1938	IP RRJ-Immediate re-reg	Immediate re-registration is rejected when a registration or unregistration is in progress for an extension.	UID	IP address
1939	IP RRJ-Failure moving ext	Registration rejected: failure while trying to force the unregistration of an extension in the process of moving it to another port.	UID	IP address
1940	IP RRJ-Duplicate ext	Registration rejected as a duplicate extension.	UID	IP address
1941	IP KA-from invld endpt ID	Keep Alive registration request rejected: invalid endpoint identifier.	Endpoint UID	IP address
1942	IP KA-from unreg user	Keep Alive registration request rejected: unregistered extension.	Endpoint UID	IP address
1943	IP-KA-from unreg SigGrp	Keep Alive registration request rejected: unregistered signalling group.	Endpoint UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1944	IP RRJ-PSA merge failure	Registration rejected: PSA merge failure (internal software error).	UID	IP address
1945	IP RRJ-New IP user fail	Registration rejected: failure to construct new H.323 or IP Softphone user (internal software error.) First value is NULL. Second value is IP address.	0	IP address
1946	IP RRJ-PSA merge failure	Registration rejected: PSA merge operation failed (internal software error).	0	IP address
1947	IP RRJ-PSA unmerge fail	Registration rejected: PSA unmerge operation failed (internal software error).	UID	IP address
1948	IP RRJ-Complete pend reg	Registration rejected: failure to obtain a station user record (internal software error -- corrupt translation).	UID	IP address
1949	IP RRJ-Build KARCF msg	Registration rejected: failure to build a KeepAlive Registration Confirm (KARCF) message (internal software error).	0	IP address
1950	IP RRJ-Build RCF msg	Registration rejected: failure to build a Registration Confirm (RCF) message (internal software error).	0	IP address
1951	IP GRJ-Invld IP addr/port	Gatekeeper request rejected: invalid destination IP address and port in the GRQ.	0	IP address
1952	IP GRJ-Invld gatekeeperID	Gatekeeper request rejected: message is not for this gatekeeper. First value is gatekeeper ID. Second value is IP address.	Gatekeeper ID	IP address
1953	IP GRJ-Invld auth capblty	Gatekeeper request rejected: the gatekeeper supports a capability that the registering endpoint does not.	0	IP address
1954	IP GRJ-Invld auth algrthm	Gatekeeper request rejected: no compatible authentication algorithm exists between the endpoint and the gatekeeper.	0	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1955	IP GRJ-Bld GCF:Gatewy/MCU	Gatekeeper request rejected: failure to build a GateKeeper Confirm (GCF) message for a GateWay/MCU (internal software error).	0	IP address
1956	IP GRJ-Bld GCF:TTI	Gatekeeper request rejected: failure to build a GateKeeper Confirm (GCF) message for an un-named endpoint registration (internal software error).	0	IP address
1957	IP GRJ-GK will not host	Gatekeeper request rejected: gatekeeper is unwilling to host endpoint because ■ no alias address has been provided. ■ TTI is in incorrect state (for example, TTI is not enabled for voice).	TTI state	IP address
1958	IP GRJ-Invalid extension	Gatekeeper request rejected: extension is not administered.	Either extension number or 0	IP address
1959	IP GRJ-No stn user record	Gatekeeper request rejected: no station user record exists for registering this user (internal software error).	UID	IP address
1960	IP GRJ-GRQ: new LM fail	Gatekeeper request rejected because of failure to create new LoginMgr. Possible causes ■ No available heap memory to create LoginMgr ■ Cannot start LoginMgr timer ■ Clock not set	UID	IP address
1961	IP GRJ-Build GCF msg	Gatekeeper request rejected: failure to build a GateKeeper Confirm (GCF) message (internal software error).	UID	IP address
1962	IP LRJ-No H323 sig group	Location Request rejected: no H.323 signalling group administered.	UID	IP address
1963	IP LRJ-Build LCF msg	Location Request rejected: failure to build a Location Request Confirm (LCF) message Iiternal software error).	UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1964	IP DRJ-Null UserID	Disengage Request rejected: the endpoint ID could not be converted to a UID.	UID	IP address
1965	IP DRJ-Bld DCF:Gatewy/MCU	Disengage Request rejected: failure to build Disengage Request Confirm (DCF) message for a gateway or MCU (internal software error).	UID	IP address
1966	IP DRJ-Endpt not reg	Disengage Request rejected: endpoint is not registered.	UID	IP address
1967	IP DRJ-Build DCF msg	Disengage Request rejected: failure to build a Disengage Request Confirm (DCF) message for a non-gateway or MCU user (internal software error).	UID	IP address
1968	IP BRJ-Null UserID	Bandwidth Request rejected: invalid endpoint ID was received.	0	IP address
1969	IP BRJ-Bld BCF:Gatewy/MCU	Bandwidth Request rejected: failure to build a Bandwidth Request Confirm (BCF) message for a Gateway or MCU (internal software error).	UID	IP address
1970	IP BRJ-Endpt not reg	Bandwidth Request rejected: the endpoint is not registered.	UID	IP address
1971	IP BRJ-Build BCF msg	Bandwidth Request rejected: faiilure to build a Bandwidth Request Confirm (BCF) message for a non-Gateway or MCU user (internal software error).	UID	IP address
1972	IP BRJ-No H323 user	Bandwidth Request rejected: H.323 user object does not exist (internal software error).	UID	IP address
1973	IP BRJ-Call non-existent	Bandwidth Request rejected: request is made for a non-existing call.	UID	IP address
1974	IP BRJ-Bandwdth rqst fail	Bandwidth Request rejected: because of unexpected return code from bandwidth request.	UID	IP address
1975	IP ARJ-Null UserID	Admission Request rejected: received invalid endpoint ID.	NIL UID	IP address
1976	IP ARJ-Endpt not reg	Admission Request rejected: the endpoint is not registered.	UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1977	IP ARJ-No avail B-channel	Admission Request rejected: no B-channel is available for the call.	UID	IP address
1978	IP ARJ-Bld ACF:Gatewy/MCU	Admission Request rejected: because of failure to build a Admission Request Confirm (ACF) message for a Gateway or MCU (internal software error).	UID	IP address
1979	IP ARJ-Not an H323 user	Admission Request rejected: request was received from a non-H.323 user.	UID	IP address
1980	IP ARJ-Stn not in service	Admission Request rejected: station is not in service.	UID	IP address
1981	IP ARJ-Build ACF msg	Admission Request rejected: failure to build an Admission Request Confirm (ACF) message for a non-Gateway or MCU user (internal software error).	UID	IP address
1982	IP ARJ-No H323 user	Admission Request rejected: H.323 user object does not exist (internal software error).	UID	IP address
1983	IP ARJ-CRV already in use	Admission Request rejected: call reference value (CRV) is already in use by another call.	UID	IP address
1984	IP ARJ-CRV does not exist	Admission Request rejected: this call reference value (CRV) does not exist.	UID	IP address
1985	IP ARJ-CRV already in use	Admission Request rejected: call reference value (CRV) is already in use by another call. An ARQ has been received while an earlier one is still pending.	UID	IP address
1986	IP ARJ-Insuff bandwidth	Admission Request rejected: insufficient bandwidth available to support this call.	UID	IP address
1987	IP ARJ-Admissn rqst fail	Admission Request rejected: unexpected return code from Admission Request (internal software error).	UID	IP address
1988	IP URJ-Null UserID	Unregistration Request rejected: received invalid endpoint ID.	0	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
1989	IP URJ-Endpt not reg	Unregistration Request rejected: endpoint is not registered.	UID	IP address
1990	IP URJ-No endpoint ID	Unregistration Request rejected: no endpoint ID provided.	0	IP address
1991	IP URJ-GW/MCU is not reg	Unregistration Request rejected: URQ received from a Gateway or MCU that is not registered.	UID	IP address
1992	IP URJ-No H323 sig group	Unregistration Request rejected: there is no H.323 user for the signalling group (internal software error).	UID	IP address
1993	IP URJ-No non-std data	Unregistration Request rejected: no non-standard data in the URQ.	UID	IP address
1994	IP URJ-NSD has invld OID	Unregistration Request rejected: the non-standard data (NSD) from the registered application has an invalid object ID in the URQ.	UID	IP address
1995	IP URJ-Can't decode NSD	Unregistration Request rejected: failure to decode non-standard data (NSD) in the URQ.	UID	IP address
1996	IP URJ-Unexpected NSD msg	Unregistration Request rejected: unexpected non-standard data (NSD) in the URQ from the registered application endpoint.	UID	IP address
1997	IP URJ-User is on a call	Unregistration Request rejected: the user is on a call.	UID	IP address
1998	IP URJ-PSA unmerge failed	Unregistration Request rejected: PSA unmerge operation failed (internal software error).	UID	IP address
1999	IP URJ-PSA merge failed	Unregistration Request rejected: PSA merge operation failed (internal software error).	UID	IP address
2000	IP URJ-No stn user record	Unregistration Request rejected: no station user record exists for unregistering user (internal software error).	UID	IP address
2001	IP URJ-TTI op failed	Un-registration Request rejected: unexpected TTI return code.	UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
2002	IP URJ-Build UCF msg	Unregistration Request rejected: failure to build an unregistration request confirm (UCF) message (internal software error).	0	IP address
2003	IP URJ-PSA unmerge failed	Unregistration Request rejected: PSA unmerge operation failed (internal software error).	UID	IP address
2004	IP URJ-No stn user record	Unregistration Request rejected: PSA unmerge operation failed (internal software error).	UID	IP address
2005	IP URJ-PSA unmerge failed	Unregistration Request rejected: PSA unmerge operation failed (internal software error).	UID	IP address
2006	IP FURQ-no H.323 ext reg	Force Unregistration Request. Received a KeepAlive RRQ from a dual connect endpoint whose H.323 extension is not registered (cannot make calls). Re-register the endpoint.	UID	IP address
2007	IP FURQ-User, no sig conn	Force Unregistration Request. Unregister user because there is no signalling connection. RAS is alive, but the signalling connection has gone down (user cannot make calls). Re-register the endpoint.	UID	IP address
2008	IP FURQ-H323, no sig conn	Force Unregistration Request. Unregister associated H.323 user because there is no signalling connection. Re-register the endpoint.	UID	IP address
2009	IP FURQ-Move user	Force Unregistration Request. Extension is already registered, but received a force login RRQ. Send a URQ to the existing extension.	UID	IP address
2010	IP FURQ-Restart cleanup	Force Unregistration Request. Instruct the RAS manager to cleanup a UID that had just been registered prior to a system restart.	UID	0
2011	IP FURQ-Aged H323 ext	Force Unregistration Request. Unregister H.323 user that aged out. Endpoint's time to live (TTL) expired without receiving a KeepAlive RRQ.	H.323 UID	IP address

Continued on next page

Table 27. Denied IP events — *Continued*

Event Type	Event Description	Explanation	Event Data1	Event Data 2
2012	IP FURQ-Aged Endpt-no KA	Force Unregistration Request. Unregister endpoint that has aged out. Endpoint's time to live (TTL) expired without receiving a keep alive RRQ.	UID	IP address
2013	IP FURQ-SigGrp removed	Force Unregistration Request. An H.323 Gateway (administered as a signalling group) is registered. Unregister the Gateway before removing the administered signalling group.	Gateway UID	IP address
2014	IP FURQ-Siggrp changed	Force Unregistration Request. Changes have been made to a registered H.323 Gateway (administered as a signalling group). Unregister the Gateway.	Signalling group	IP address
2015	IP FURQ-Ext removed	Force Unregistration Request. Unregister user because the extension has been removed.	IP User-UID	0
2016	IP FURQ-IPusr is sftphone	Force Unregistration Request. A user has PSA'ed an extension that was registered as an IP endpoint.	IP User-UID	0
2017	IP FURQ-Records exhausted	Force Unregistration Request. Unregister the LAN port if there are no station user-records remaining.	IP User-UID	0
2018	IP FURQ-Mtc: H323/Vphone	Force Unregistration Request. Maintenance has unregistered an H.323 or IP Softphone station.	UID	0
2019	IP FURQ-Mtc: Remote Max	Force Unregistration Request. Maintenance has unregistered a Remote Max station.	UID	0
2020	IP FURQ-Mtc:RemOfc TTI	Force Unregistration Request. TTI background maintenance task has requested the removal of Remote Office LAN TTI ports.	UID	0

list extension type

The **list extension type** command shows the extension number and that it is the QSIG Path Replacement endpoint.

list history

List history output has been modified to include history of ACTR moves. You can use this to track moves and help reduce fraud.

```
list history                                                          Page 1
                                        HISTORY
                    Date of Loaded Translation: 10:08pm Wed Feb 14,2001

 Date Time  Port      Login   Actn  Object       Qualifier
 2/15 10:18 01B1203   actr-d  cha   station      2005 EMERGENCY EXT
 2/15 10:18 01B1203   actr-u  cha   station      2004
 2/15 10:17 SYSAM-LCL init    cha   system-param features
 2/15 10:15 01B1203   tti-m   cha   station      2004
 2/15 10:15 01B1202   tti-m   cha   station      2005
 2/15 10:15 01B1203   tti-s   cha   station      2005
 2/15 10:12 01B1203   actr-a  cha   station      2005
 2/15 10:12 01B1203   actr-u  cha   station      2004
 2/15 10:12 01B1202   actr-u  cha   station      2005
 2/15 10:10 01B1203   actr-d  cha   station      2005 NIGHT EXT
 2/15 10:10 01B1203   actr-u  cha   station      2004
 2/15 10:10 01B1203   actr-d  cha   station      2005 FORM CONFLICT
```

The list history command shows:

- date and time of feature use
- port number. Each ACTR move is recorded as two separate records, one against the moved from port, and the other record against the moved to port.
- login shows the errors that occurred. actr-a means associate the phone, actr-u means unassociate the phone, and actr-d means the move was denied.

list measurements announcements

Use the **list measurements announcements** command to generate a detailed report about the announcement usage for all integrated and non-integrated announcements. The measurement report now applies to TN2501AP and TN750B or later boards. The command syntax is

> **list measurements announcements *<all, integ-all, board-loc> <period>***

The type qualifiers are

- **all** lists announcements regardless of type (analog, aux-trunk and integrated).
- **integ-all** lists all active integrated announcement circuit packs in the order they were activated. The report for each circuit pack starts on a new page.
- **board-loc** lists announcements for the specified circuit pack.

The period qualifiers are

- **yesterday-peak** (for yesterday's peak hour)
- **today-peak** (for today's peak hour)
- **last-hour** (for today's previous hour)

Applicable fields

All of the fields on the Voice Announcement Measurements screen (list measurements announcements) apply to *announcements* that are administered with the Type field set to

- **integrated**

  or

- **integ-rep**.

The following fields *do not apply for all other announcement types* (for example, **analog**, **aux-trunk**):

- Mport Plays
- Max Pts
- Max Call

Screen 70 shows an example of a report for all administered announcements with the ***today-peak*** reporting period.

```
list measurements announcements all today-peak                          Page 1

Switch Name: Portsmouth-Main                 Date: 9:23 am  TUE Jan 9, 2001

                    VOICE ANNOUNCEMENTS MEASUREMENTS

Ann                                     Meas Play  Calls      Queue MPort Max Max
No.  Ext     Name (first 24 chars)      Hour Reqts Queued ASP Drops Plays Pts Call
1    3001    Announcement-num-3001      1000 0     0      0   0     0     0   0
2    3002    Announcement-num-3002      1000 0     0      0   0     0     0   0
3    3003    Announcement-num-3003      1000 0     0      0   0     0     0   0
4    3004    Announcement-num-3004      1000 0     0      0   0     0     0   0
5    3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
6    3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
7    3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
8    3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
9    3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
10   3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
11   3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
12   3005    Announcement-num-3005      1000 0     0      0   0     0     0   0
```

Screen 70. Voice Announcements Measurements screen

Screen 71 shows an example of a report for a specific integrated announcement circuit pack with the ***last-hour*** reporting period.

```
list measurements announcements board 01B01 last-hour                   Page 1

Switch Name:                                 Date: 9:23 am  TUE Jan 9, 2001

                    VOICE ANNOUNCEMENTS MEASUREMENTS

Board Location: 01C04                  Play Ports: 31
Max. Callers On Board in Period: 0     All-Ports-Busy in Period: 0

Ann                                     Meas Play  Calls      Queue MPort Max Max
No.  Ext     Name (first 24 chars)      Hour Reqts Queued ASP Drops Plays Pts Call
23   3023    Announcement-num-3001      1000 0     0      0   0     0     0   0
24   3024    Announcement-num-3024      1000 0     0      0   0     0     0   0
25   3025    Announcement-num-3025      1000 0     0      0   0     0     0   0
26   3026    Announcement-num-3026      1000 0     0      0   0     0     0   0
27   3027    Announcement-num-3027      1000 0     0      0   0     0     0   0
28   3028    Announcement-num-3028      1000 0     0      0   0     0     0   0
29   3029    Announcement-num-3029      1000 0     0      0   0     0     0   0
30   3030    Announcement-num-3030      1000 0     0      0   0     0     0   0
31   3031    Announcement-num-3031      1000 0     0      0   0     0     0   0
32   3032    Announcement-num-3032      1000 0     0      0   0     0     0   0
33   3033    Announcement-num-3033      1000 0     0      0   0     0     0   0
34   3034    Announcement-num-3034      1000 0     0      0   0     0     0   0
```

Screen 71. Voice Announcements Measurements screen

Field descriptions

Switch Name	The administered switch name.
Date	The date and time of the report submission.
Board Location	The physical location (UUCSS) of the TN750B or C or TN2501AP circuit packs. This field appears only with the ***integ-all*** and ***board-loc*** qualifiers.
Play Ports	The number of ports available on the circuit pack. This field appears only with the ***integ-all*** and ***board-loc*** qualifiers.
Max Callers on Board in Period	The peak number callers simultaneously connected to a circuit pack (sum of the ports) at the same time. This field appears only with the ***integ-all*** and ***board-loc*** qualifiers.
All-Ports-Busy in Period	A count of how many times the all-ports-busy condition occurred within the reporting period. This field appears only with the ***integ-all*** and ***board-loc*** qualifiers.
Ann No.	The administered announcement number
Ext	Assigned extension
Name	The first 24 characters of the 27-character announcement name as administered on the announcement screen (change announcements).
Calls Queued	The number of announcements that were held in queue while waiting for a port during the period.
ASP	Average speed-to-play from the time the request to play the announcement went into the queue until the time it starts playing. Abandoned calls that are waiting for announcement port are not included in the calculation (s the sum of the queue time divided by the number of calls queued).
Queue Drops	Calls-dropped queue. A count of the individual calls that had to queue but dropped while waiting during the period - this includes calls abandoned by the caller and VOA aborts but excludes calls that were waiting but answered by an agent.
MPort Plays	Multi-port plays; a count of how many times the announcement played through more than one port simultaneously during the period.

Max Pts	The peak number of ports used simultaneously for announcement playback during the period (1-16 for TN750; 1-31 for TN2501AP).
Max Call	The peak number callers simultaneously connected to a port by announcement during the period.

list usage extension

The **list usage extension** command indicates whether or not the specified extension is assigned to the Outgoing Intercept Treatment announcement.

You can use the **list usage extension** command to determine where the Intercept Treatment announcement is used in the system. If you want to remove this announcement at some time, you must first delete the extension from the Invalid Number Dialed Intercept field on the Feature-Related System Parameters screen.

The **list usage extension *xxxx*** command (where *xxxx* is the Path Replacement extension) shows that the extension is administered on the Feature-Related System Parameters screen as the QSIG Path Replacement Extension.

status atm board

Use this command to see the system up time report.

```
status atm board 02A01                                        Page 1 of 1     SPE A
                                      ATM Board

       Location: 02A01                        Personality: ATM-EI

Network Address: 39840f8001bc720000000204000060 1d06319500       Match? Yes
    ATM Address: 39840f8001bc720000000204000060 1d06319500

Board Insertion: 05/24/2001 13:43:16          Board Boot: 11/12/2084 10:58:03

ILMI Board sysUpTime: 0x38120100       ILMI Network sysUpTime: 0x50d06312
 UNI State: up   Last Down:                       Last Up: 05/08/2001 01:26:19
ILMI State: up   Last Down:                       Last Up: 05/08/2001 01:26:19
```

Field descriptions (status sys-link)

Last Board Insertion	Date and time that the circuit pack was last inserted
Board sysUpTime	The value of the MIB variable sysUpTime for the circuit pack end of the ILMI link.
Network sysUpTime	The value of the MIB variable sysUpTime for the network end of the ILMI link.

status station, page 2

The General Status (status station) report screen appears new fields on page 2 to accommodate the remotely readable electronic IDs available with the 6400 serialized phones.

```
status station 1601                                          Page 2 of x
                                   GENERAL STATUS

 CONNECTED STATION INFORMATION

                 Part ID Number: 108576794
                  Serial Number: 01SP29123456
```

Screen 72. General status report screen

Part ID Number

Shows the Part ID Number (comcode) of the telephone. If this field shows unavailable, then the software was unable to determine the Part ID Number.

Serial Number

This is the serial number of the telephone. This field can show unavailable if the software is unable to determine the Serial Number.

This field can also show errored if the serial number received is not in the correct format.

status station, page 4

Use this command to generate a snapshot jitter buffer size (ms) and packet loss report (Screen 73) for a particular station. This command is available to all login permissions.

Definition

In this instance, jitter is the variability in the amount of time (in milliseconds) that packets are received over the network. When jitter increases, the user experiences a noisy connection, delays, and a general loss of quality, making speech unintelligible.

NOTE:
If you issue a **status station** command for a non-IP station or the connection is hairpinned or shuffled, then the packet loss and jitter size information (page 4) does not appear. See also "Shuffling, Hairpinning, Codec and Inter-Network Management Features" in Chapter 3 of *DEFINITY ECS Administration for Network Connectivity.*

```
status station 78020                                          Page 4 of 4
                                   NETWORK STATUS

      Average Jitter (ms)              Packet Loss Per Second
       Last Ten Seconds                  Last Ten Seconds

              5                                 0          Per Call Info
              4                                 0
              3                                 0      Out of Order Counter: 1
              3                                 0      SSRC Change for Call: 0
              3                                 0        Last Rx Sequence #: 0x882A
              3                                 0        Last Tx Sequence #: 0xE900
              1                                 0
              2                                 0
              2                                 0
              1                                 0

 SUMMARY
 Worst Case this Call (ms): 30         Worst Case this Call: 0
    Average this Call (ms): 23            Average this Call: 0
  Current Buffer size (ms): 30
```

Screen 73. Status station

Field descriptions (status station)

Average Jitter (ms) Last Ten Seconds	The ten most recent one-second samples of the jitter buffer size for the requested endpoint
Packet Loss per Second Last Ten Seconds	The ten most recent one-second samples of the lost packet information for the requested endpoint
Out of Order Counter	A count of the number of out-of-order packets detected during the current connection
SSRC Change for Call	The number of SSRC changes occurring during the current connection
Last Rx Sequence No.	Last received data packet sequence number
Last Tx Sequence No.	Last transmitted data packet sequence number
Worst Case this Call	Jitter: the worst-case, 1-second jitter buffer size (ms) experienced during the current connection Packet Loss: the worst-case, 1-second packet loss experienced during the current connection.
Average this Call	Jitter: the average jitter buffer size (ms) for the current connection (the running average of all the one-second intervals during the connection) Packet Loss: the average packet loss number for the current connection (running average of all the one-second intervals experienced during the connection)
Buffer Size	The current jitter buffer size

NOTE:
The information shown on these forms is a snapshot and does not automatically update.

status sys link

Use this command to show status data for a specified system link. The report includes

- the type and operational state of the link.
- the associated processor channel, if any.
- active alarms and path status.
- a list of all hardware components making up the link's path.

If there is a faulted path in addition to the current path, the report lists the components making up the faulted path on page 2.

```
status sys-link 2a0101                                  Page   2 of   2   SPE A

      Location: 02A0101         Type/Chan: EAL        Alarms: none
  Current Path: present             State: up        Time Up: 03/12/2001 10:48
  Faulted Path: present                           Last Fault: 03/12/2001 10:50

                                Current Hardware Path

             Maintenance                            Maintenance
  Location   Name       Alarms            Location   Name       Alarms

  01A1       PKT-INT    none
  PN 01      PKT-BUS    none
  01C01      ATM-EI     none
  0.35       VPI.VCI    none
  AT01A      ATM-NTWK   none
  AT02A      ATM-NTWK   none
  0.32       VPI.VCI    none
  AT02A      ATM-NTWK   none
```

Screen 74. Status sys-link screen

Field descriptions (status sys-link)

Time Up — The date and time that the link came up.

status trunk

Use this command to generate a snapshot jitter buffer size and packet loss report (Screen 75) for a particular trunk group member.

Definition

In this instance, jitter is the variability in the amount of time (in milliseconds) that packets are received over the network. When jitter increases, the user experiences a noisy connection, delays, and a general loss of quality, making speech unintelligible.

NOTE:
If you issue a **status trunk** command for a non-IP station or the connection is hairpinned or shuffled, then the packet loss and jitter size information (page 4) does not appear. See "Shuffling, Hairpinning, Codec and Inter-Network Management Features" in Chapter 3 of *DEFINITY ECS Administration for Network Connectivity* for more information.

```
status trunk 11/3                                        Page   2 of   2   SPE B
                                TRUNK STATUS
NETWORK STATUS

      Average Jitter (ms)         Packet Loss per Second
       Last Ten Seconds              Last Ten Seconds

              0                             0              Per Call Info
              0                             0
              0                             0      Out of Order Counter: 0
              0                             0      SSRC Change for Call: 0
              0                             0        Last Rx Sequence #: 0x1D64
              0                             0        Last Tx Sequence #: 0x1D1B
              0                             0
              0                             0
              0                             0
              0                             0

SUMMARY
Worst Case this Call (ms): 0       Worst Case this Call: 0
   Average this Call (ms): 0          Average this Call: 0
 Current Buffer Size (ms): 30
```

Screen 75. Status trunk

Field descriptions (status trunk)

Average Jitter (ms) Last 10 Samples	The ten most recent one-second samples of the jitter buffer size for the requested endpoint.
Packet Loss per Sec Last 10 Samples	The ten most recent one-second samples of the lost packet information for the requested endpoint.
Out of Order Counter	A count of the number of out of order packets detected during the current connection.
SSRC Change for Call	The number of SSRC changes occurring during the current connection.
Last Rx Sequence No.	Last received data sequence.
Last Tx Sequence No.	Last transmitted data sequence.

Worst Case this call	Jitter: the worst-case, 1-second jitter buffer size (ms) experienced during the current connection Packet Loss: The worst-case, 1-second packet loss experienced during the current connection.
Average this call	Jitter: the average jitter buffer size (ms) for the current connection (the running average of all the one-second intervals during the connection) Packet Loss: the average packet loss number for the current connection (running average of all the one-second intervals experienced during the connection)
Buffer size	The current jitter buffer size.

NOTE:
The information shown on these forms is a snapshot and does not automatically update.

New and Changed Maintenance Objects

16

New maintenance objects

- VAL-BD (Voice Announcements over LAN Circuit Pack)
- VAL-PT (Voice Announcements over LAN Packet/Port)

Changed maintenance objects

- ATM-DCH (ATM D-Channel Port)
- ATM-EI (Expansion Interface Circuit Pack)
- ATM-NTWK (ATM Network Error)
- ATM-TRK (Circuit Emulation Service Circuit Pack)
- ATM-WSP (ATM WAN Spare Processor)
- DIG-IP-STN (Digital IP Station)
- FW-DWNLD (Firmware Download)

VAL-BD (Voice Announcements over LAN Circuit Pack)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
VAL-BD	MINOR	**test board UUCSS long**	Voice Announcements over the LAN Circuit Pack
VAL-BD	WARNING	**test board UUCSS short**	Voice Announcements over the LAN Circuit Pack

1. UU is the universal cabinet number (1 for PPN, 2 - 44 for EPNs). C is the carrier designation (A, B, C, D, or E). SS is the number of the slot in which the circuit pack resides (01 to 21).

Voice Announcements over the LAN Circuit Pack

The Voice Announcements over the LAN (VAL) board (TN2501AP) provides per-pack announcement storage time of up to one hour, up to 31 playback ports, and allows for announcement file portability over a LAN. The VAL circuit pack also allows for LAN backup and restore of announcement files and the use of user-provided (.WAV) files. The circuit pack also provides the ability to download new versions of the firmware to itself. This port circuit pack requires R9.5 software and is not backward compatible with earlier software releases.

VAL congestion controls

The switch activates congestion controls on VAL when it detects buffers exceeding the threshold. The switch releases the congestion controls when the VAL reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval,	Raises MINOR alarm.
Exhausts buffers,	Raises MINOR alarm.
Ceases for 12 minutes,	Retires MINOR alarm.

Error Log Entries and Test to Clear Values

Table 16-1. VAL-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)	0	Sanity	MINOR	ON	
18 (b)	0		WARNING	OFF	release board UUCSS
217 (c)	0	None	WARNING	ON	
257	65535	Control Channel Loop Test (#52)	MINOR	ON	test board UUCSS l r 20
257 (d)					
513 (e)	4352-4357		MINOR	ON	
769 (f)	4358				
1281, 1290 to 1295 (g)	Any		MINOR	ON	reset board UUCSS
1537, 1796(h)	Any		MINOR	ON	
1794(i)			MINOR	ON	
1798 (j)					
2049 (k)		Packet Interface Test (#598)	MINOR	ON	test board UUCSS l r 3
2305 2306 (l)					
2561 to 2668 (m)	Any				
2817 2819 (n)		Congestion Query Test (#600)	MINOR	ON	test board UUCSS s r 3
3073 (o)		Link Status Test (#601)	MINOR	ON	test board UUCSS s
3330 (p)			MINOR	ON	reset board UUCSS
3586 (q)					
3999 (q)	Any	None			
3840 (r)	4096-4102				

Continued on next page

Table 16-1. VAL-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3841, 3843 (s)					
3842 (t)		Receive FIFO Overflow Error Counter Test (#596)			
3844 (u)	Any				
3845 (v)	Any				
3846 (w)	Any				
3848 (x)	Any				
3851 (y)	Any				
3852 (z)	Any				
3853 (aa)	Any				
3854 (ab)	Any				
3855 (ac)	Any				
3856 (ad)	Any				

Notes:

a. **Error Type 1**: Circuit pack stopped functioning or is not physically present.

   1. Verify that the circuit pack is present.
   2. If circuit pack is present, reset the circuit pack (**reset board UUCSS**).
   3. If the error persists, replace the circuit pack.

b. **Error Type 18**: The VAL circuit pack is busied out.

c. **Error Type 217**: applies to 10 circuit packs:

   1. Remove the circuit pack(s) against which the error is logged.

d. **Error Type 257**: Transient communication problem between switch and circuit pack; does not affect service and can be ignored.

   1. Ignore this error, unless the Control Channel Loop Test (#52) fails.
   2. If Test #52 fails, replace the circuit pack.

   Repetitive failures of the Control Channel Loop Test indicate circuit pack hardware failure.

e. **Error Type 513**: Circuit pack detected and reported hardware failure.

   1. Reset the circuit pack (**reset board UUCSS**).

      Aux Data:

      4352 External RAM error

      4353 Internal RAM error

      4355 ROM Checksum error

      4356 Angel Message Corruption error

      4357 Instruction set error

f. **Error Type 769**: Logic error. By itself this error can be ignored, but it can result in other error types being reported.

g. **Error Type 1281,1290-1295**: Critical hardware or firmware error.

If the switch detects:	Then the switch:
1 error,	Resets circuit pack.
3 errors in 15 minutes,	Raises MINOR alarm.

   Error Type descriptions are as follows:

   1290 Global HDLC error

   1291 Main RAM/ROM error

   1292 CPU error

   1293 Insane onboard processor

   1294 Onboard translation RAM error

   1295 (Aux 3) RSCL link down

   (Aux 0) RSCL keep alive failure

   1. Attempt to clear the alarm (**reset board UUCSS**).
   2. If alarm persists, replace circuit pack.

h. **Error Type 1537, 1796**: A hyperactive VAL circuit pack that has exceeded the error threshold has been removed from service.

   1. Attempt to clear the alarm (**reset board UUCSS**).
   2. If the error recurs within 15 minutes, replace the circuit pack.

i. **Error Type 1794**: Packet bus transmit buffers have overflowed.

   1. Attempt to clear the alarm (**reset board UUCSS**).
   2. If the error recurs within 15 minutes, replace the circuit pack.

j. **Error Type 1798**: Unable to write translation RAM.

   1. Attempt to clear alarm (**reset board UUCSS**).
   2. If alarm recurs within 15 minutes, replace the circuit pack.

k. **Error Type 2049**: Packet Interface Test (#598) failed.

   1. Attempt to clear the alarm (**test board UUCSS l r 3**).
   2. If alarm does not clear, reset the circuit pack (**reset board UUCSS**).
   3. If circuit pack resets, execute Packet Interface Test (#598) several times.
   4. If Packet Interface Test (#598) continues to fail, replace the circuit pack.

l. **Error Type 2305-2306**: Error in received frame from packet bus.

Error Type:	Description
2305	Received invalid LAPD frame.
2306	Detected parity error on received frame.

Most likely cause—packet bus problem.
Other cause—circuit pack fault.

Invalid LAPD frame errors occur when the frame

- contains a bad Cyclic Redundancy Check (CRC)
- is greater than the maximum length
- violates the link level protocol

1. Retry the command (**test board UUCSS**) and see if the condition clears.
2. If condition persists, execute PPE/LANBIC Receive Parity Error Counter Test (# 597) and determine if the condition clears.
3. If condition persists, execute Packet Interface Test (# 598) to verify circuit pack integrity.
4. If Packet Interface Test (# 598) fails, consult repair procedure for the packet bus.

m. **Error Type 2561-2668:** System software received an indication that the socket was closed due to an error. Errors are reported as log only. Errors logged here are for the sockets that had *no* processor channels associated with them, for example, sockets to read SNMP data. The counter base is offset by the application type of the application associated with this socket that is down. The Aux Data field of the log entry contains this application's number, for example, a SNMP application would have its application number in the Aux Data field.

NOTE:
2561 - 2668 is a range of reserved numbers for future applications. 2570 currently represents an SNMP socket failure.

n. **Error Type 2817-2819**: Congestion Query Test (#600) failed.

The Error Types correspond to the descriptions:

2817 All buffers exhausted.

2819 Utilized buffers exceed threshold.

If:	Then:
Active buffers exceed threshold,	VAL enters congested state.

1. Refer to Congestion Query Test (# 600) for Abort and Fail 3601s.

o. **Error Type 3073**: Remote Socket Control Link (RSCL) or Link Status Test (#601) failed. This failure can be due to:

- This circuit pack
- The packet bus
- The packet interface circuit pack.

If:	Then:
RSCL disconnects at link level	Link fails
Link cannot be reconnected quickly	Switch raises MINOR alarm

p. **Error Type 3330**: Critical failure in Packet Bus interface.

Below, Error Types correspond to descriptions.

If the switch detects:	Then it:
1 error,	Resets circuit pack.
2 errors in 15 minutes,	Raises MINOR alarm.

1. Attempt to clear the alarm (**reset board UUCSS**).
2. If alarm persists, replace circuit pack.

q. **Error Type 3586 and 3999**: Switch removed hyperactive circuit pack that reported threshold number of errors. One or more of the following symptoms can be present:

- Circuit pack port tests return NO BOARD.
- List configuration command shows circuit pack and ports are installed properly

If Error Type 3999:	And traffic volume is:	Then:
Does not accompany Error Type 3586,	Heavy	Circuit pack is in service, but sent at least half hyperactive threshold. With heavy traffic, this is normal.
Does not accompany Error Type 3586,	Light	Circuit pack is in service, but sent at least half hyperactive threshold. With light traffic, this error indicates a problem with the circuit pack, its links, or the equipment attached to the links.
Accompanies Error Type 3586,	Either Light or Heavy	Switch removed hyperactive circuit pack.

1. Busyout (**busyout board UUCSS**) and release (**release board UUCSS**) the circuit pack.
2. Allow 30 minutes for condition to clear itself.
3. To re-establish circuit pack into service manually, busyout (**busyout board UUCSS**), reset (**reset board UUCSS**), and release (**release board UUCSS**) the circuit pack.

4. If error recurs within 15 minutes, replace the circuit pack.
5. If the same error occurs on a different circuit pack, follow normal escalation procedures.

r. **Error Type 3840**: Circuit pack received bad control channel message from switch.

Aux Data:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link
4102	Bad application identifier

s. **Error Type 3841, 3843**: errors do not affect service.

Below, Error Types correspond to descriptions.

3841	Internal firmware error.
3843	Bad translation RAM. Call uses another translation location.

These errors do not affect service, however, they can cause reports of other errors that do affect service.

If Error Type 3843 begins to affect service, it escalates to Error Type 1294 (See Note g).

t. **Error Type 3842**: Packet interface receive buffers overflowed.

If this error occurs frequently, the overflow can be congesting the circuit pack.

1. Refer to Receive FIFO Overflow Error Counter Test (#596).

u. **Error Type 3844**: LAPD frame contains LAPD Protocol Error.

By themselves, these errors do not affect service.

v. **Error Type 3845**: Angel interprocessor error.

By themselves, these errors do not affect service.

w. **Error Type 3846**: Main interprocessor error.

By themselves, these errors do not affect service.

x. **Error Type 3848**: Main internal channel error.

By themselves, these errors do not affect service.

y. **Error Type 3851**: Unable to write LAN translation RAM error.

By themselves, these errors do not affect service.

z. **Error Type 3852:** LAN external RAM error.

By themselves, these errors do not affect service.

aa. **Error Type 3853**: Interprocessor LAPD frame error.

By themselves, these errors do not affect service.

ab. **Error Type 3854**: Interprocessor LAPD protocol error.

By themselves, these errors do not affect service.

ac. **Error Type 3855**: Memory allocation error.

By themselves, these errors do not affect service.

ad. **Error Type 3856**: High CPU occupancy error.

By themselves, these errors do not affect service.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order they appear in the table below.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around Test #52	X	X	ND
Circuit Pack Restart Test #594			D
Invalid LAPD Frame Error Counter Test #597		X	ND
PPE/LANBIC Receive Parity Error Counter Test #595		X	ND
Receive FIFO Overflow Error Counter Test #596		X	ND
Packet Interface Test #598	X	X	ND
Congestion Query Test #600	X	X	ND
Link Status Test #601	X	X	ND

1. D = Destructive; ND = Nondestructive

Control Channel Loop-Around Test (#52)

This non-destructive test fails if the circuit pack does not return to a sane state after being reset. This test queries the circuit pack for its code and vintage, and verifies its records.

Table 28. TEST #52 Control Channel Loop-Around Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
	FAIL	The circuit pack failed to return the code or vintage. 1. Retry command at 1-minute intervals, up to 5 times. 2. Reset the board (**reset board UUCSS**). 3. If reset aborts with error code 1115, busyout (**busyout board UUCSS**), reset (**reset board UUCSS**), and release board (**release board UUCSS**). 4. If test continues to fail, replace the circuit pack. 5. Escalate the problem if failures continue.
	PASS	Test successful.

Circuit Pack Restart Test (#594)

NOTE:
This test is destructive.

Execute this test (not part of either short or long demand test sequence) to reset the circuit pack only if there are PPCPU errors. This test fails if the circuit pack does not return to a sane state after being reset. The circuit pack resets through the SAKI Sanity Test (#53).

Table 29. Test #594 Circuit Pack Restart Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.

Continued on next page

Table 29. Test #594 Circuit Pack Restart Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack (**busyout board UUCSS**). 2. Retry the command at 1-minute intervals, up to 5 times. 3. If the problem persists, escalate the problem.
1966	ABORT	The board is in the process of running the autosave command to save announcements. 1. Retry the command again later.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
1, 2	FAIL	The circuit pack failed to reset. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, pull out and reseat the circuit pack. 3. If the problem persists, replace the circuit pack.
	PASS	The circuit pack initialized correctly.

PPE/LANBIC Receive Parity Error Counter Test (#595)

This test is non-destructive. When the VAL circuit pack detects a parity error with a received frame, it increments the PPE/LANBIC Receive Parity error counter. This test reads and clears the counter, and can verify repair of the problem.

Errors can indicate a problem with:

- This circuit pack
- A packet bus
- Another circuit pack on the bus

Table 30. TEST #595 PPE/LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
1-10	FAIL	Circuit pack detects parity errors. The Error Code indicates the value of the on-board error counter. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the test continues to fail, execute the Packet Interface Test (#598) (**test board UUCSS**). 3. If Packet Interface Test (#598) fails, see repair procedures for Test (#598).
	PASS	Circuit pack detects no errors.

Receive FIFO Overflow Error Counter Test (#596)

This test is non-destructive. When the VAL circuit pack detects packet bus buffer overflow, it increments the error on the FIFO Overflow error counter. This test reads and clears the counter.

If errors are:	Then they can be due to:
Occasional	Statistical buffer sizing

Table 31. TEST #596 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
1-10	FAIL	Circuit pack detects overflow errors. The error code indicates the value of the on-board error counter. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the test continues to fail, execute the Packet Interface Test (#598) (**test board UUCSS**). 3. If Packet Interface Test (#598) fails, see repair procedures for Test (#598).
	PASS	Circuit pack detects no errors.

Invalid LAPD Frame Error Counter Test (#597)

This test is non-destructive.

The VAL circuit pack detects invalid frames when it receives

- a frame with a CRC error
- an unrecognizable frame
- a recognizable frame in an unexpected state

When the VAL circuit pack detects an invalid LAPD frame, it increments the Invalid LAPD Frame error counter. This test reads and clears the counter, and verifies the repair of the problem.

Errors can indicate a

- circuit pack problem
- packet bus problem
- problem with another circuit pack on the bus

Table 32. TEST #597 Invalid LAPD Frame Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
1-10	FAIL	The circuit pack detects LAPD frame errors. The error code indicates the value of the on-board error counter. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the test continues to fail, execute the Packet Interface Test (#598) (**test board UUCSS long**). 3. If Packet Interface Test (#598) fails, see repair procedures for Test (#598).
	PASS	Circuit pack detects no errors.

Packet Interface Test (#598)

This non-destructive test checks the packet bus interface circuitry on the VAL circuit pack. Test failure indicates faulty circuit pack.

Table 33. TEST #598 Packet Interface Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the problem persists, replace the circuit pack.

Continued on next page

Table 33. TEST #598 Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
	FAIL	Circuit pack has detected a failure of the Packet Interface Test (#598). 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the test continues to fail, replace the circuit pack.
	PASS	The Packet Interface Test (#598) passed.

Congestion Query Test (#600)

This non-destructive test queries the number of used buffers to determine if the VAL circuit pack is congested.

If:	Then:
Used buffers are, or are nearly, exhausted,	The test fails.
The test fails,	The switch alarms, and announcements can fail.

Normal call handling resumes when the VAL circuit pack has recovered from congestion.

Table 34. TEST #600 Congestion Query Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If the problem persists, replace the circuit pack.

Continued on next page

Table 34. TEST #600 Congestion Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
1	FAIL	The buffer level is nearly exhausted.
2	FAIL	The VAL is congested, and no buffers are available. 1. Retry command at 1-minute intervals, up to 5 times. 2. If command continues to fail, examine the VAL port measurements to determine which ports are heavily utilized and the processor occupancy of the circuit pack. *A Low processor occupancy* when VAL is congested indicates circuit pack failure. 1. If the problem persists, reset the circuit pack (**reset board UUCSS**). 2. If congestion recurs, replace the circuit pack. *High processor occupancy* indicates the VAL is congested due to traffic load. 1. To relieve congestion in the short term, selectively busyout ports (**busyout port UUCSSpp**) on the VAL circuit pack. 2. To achieve a more permanent resolution, it could be necessary reassign announcements to other integrated announcement circuit packs. 3. Consider replacing affected VAL ports with new ports.
3	FAIL	The VAL circuit pack is not operating normally and is congested.
	PASS	Hardware setting and attached cable type match VAL circuit pack administration. The circuit pack detects no errors.

Link Status Test (#601)

This non-destructive test determines the state of the call control signaling link for VALs. If the signaling link is physically connected, the test sends a test frame over the link and checks for a response. The test passes only if both the signaling link is connected and the test frame is successfully transmitted.

A failure can indicate a problem with:

- this circuit pack.
- the packet bus.
- the packet interface circuit pack.

Table 35. TEST #601 Link Status Test

Error Code	Test Result	Description/ Recommendation
1125	ABORT	RSCL link or VAL board not in service. 1. Release the board. 2. Repeat the test. 3. Escalate if the problem persists.
2012	ABORT	Could not allocate the necessary system resources to run this test.
2100	ABORT	Internal system error. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, escalate the problem.
2	FAIL	The RSCL control link disconnected. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the test continues to fail, execute the Packet Interface Test (#598) (**test board UUCSS**) to determine if the problem is due to the circuit pack. 3. If the Packet Interface Test (#598) fails, refer to Packet Interface Test repair procedures. 4. If the Packet Interface Test (#598) passes, refer to Packet Control Circuit Pack and Packet Bus repair procedures.
3	FAIL	Received no response to RSCL control link test frame. 1. Retry command at 1-minute intervals, up to 5 times. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**). 3. If test continues to fail, replace the circuit pack.
	PASS	RSCL control link connected.

VAL-PT (Voice Announcements over LAN Packet/Port)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
VAL-PT	MAJOR	**test port UUCSSpp long**	VAL Port Maintenance
VAL-PT	MINOR	**test port UUCSSpp long**	VAL Port Maintenance
VAL-PT	WARNING	**test port UUCSSpp**	VAL Port Maintenance

1. *UU* is the universal cabinet number (1 for PPN, 2 - 44 for EPNs). *C* is the carrier designation (A, B, C, D, or E). *SS* is the number of the slot in which the circuit pack resides (01 to 21). *pp* is the two digit port number (01, 02, ...).

A remote socket control link (RSCL) links the VAL and the SPE to pass call control and other management information. Since one link serves all the ports on the circuit pack, maintenance of the RSCL is part of the VAL circuit pack maintenance.

VAL Congestion Controls

The switch activates congestion controls on VAL when it detects buffers exceeding the threshold. The switch releases the congestion controls when the VAL reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm
Exhausts buffers	Raises MINOR alarm
Ceases for 12 minutes	Retires MINOR alarm

Error Log Entries and Test to Clear Value

Table 36. VAL-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port UUCSSpp l**
1 (a)	0	SCOTCH Sync Looparound Test (#1275)	MINOR	ON	**test port UUCSSpp l r 3**
257 (b)	0		WARNING	OFF	
3585 (c)	0-1	TDM Looparound Test (#1285)	MAJOR	ON	**test port UUCSSpp l r 3**

1. There is no short test sequence for this MO. All tests are available in the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. **Error Type 001**: SCOTCH Synchronous Looparound Test (#1275) failed.

   1. Test the port (**test port UUCSSpp long**).
   2. Refer to SCOTCH Synchronous Looparound Test (#1275) repair procedures.

b. **Error Type 257**: VAL port detected overrun or underrun condition that can indicate a hardware problem.

   1. Test for hardware problem (**test port UUCSSpp long**).
   2. Refer to SCOTCH Synchronous Looparound Test (#1275) repair procedures to verify repair.
   3. Clear the alarm (**test port UUCSSpp long clear**).

c. **Error Type 3585**: TDM Port Looparound Test (#1285) failed.

   1. Test the port (**test port UUCsspp long**).
   2. Refer to TDM Looparound Test (#1285) repair procedure.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order they appear in the table below.

Table 37. System Technician-Demanded Tests: VAL-PT

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TDM Looparound Test (#1285)		X	D
SCOTCH Synchronous Looparound Test (#1275)		X	D

1. D = Destructive, ND = Non-destructive

TDM Test (#1285)

This test is destructive.

This test verifies whether the VAL port can send and receive data on the TDM bus. This test has a tone generator send tones on a timeslot, and it has a tone receiver receive tones on another timeslot. The tones are looped through the record/playback port.

If the received tones:	Then:
Match the tones sent	The test passes.
Do not match the tones sent	The test fails.

Test failure indicates failure of one or more of the following components:

- VAL (TN2501) circuit pack
- TDM Bus
- Tone generator / tone receiver circuit pack

Table 38. TEST #1285 TDM Looparound Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	The port is in use. 1. Retry the command when the port is idle. You can force the port to the idle state with the **busyout port UUCSS** command. 2. Escalate if the problem persists. **NOTE:** This command is destructive, tearing down all calls and links using the port.
1002	ABORT	No TDM bus timeslots available for the test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
1003	ABORT	No more tone receivers idle for use in this test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. If this problem persists, reset the circuit pack (**busyout board UUCSS**, **reset board UUCSS**, and **release board UUCSS**). 2. Repeat the test. 3. If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
	FAIL	Received tones do not match transmitted tones. 1. Retry command at 1-minute intervals, up to 3 times. 2. If the problem persists, refer to TDM-BUS, Tone Generator, and Tone Receiver repair procedures. 3. If the problem persists, reset the board (**busyout board UUCSS**, **reset board UUCSS**, and **release board UUCSS**). Repeat the test. 4. If the problem persists, replace the circuit pack.
	PASS	Port connections across the TDM bus function properly.

SCOTCH Synchronous Looparound Test (#1275)

This test is destructive.

This test verifies the circuit in the data path of a VAL announcement port call. This test fails if the data transmitted on the port does not match the data received in the looparound mode. Failure of this test indicates a port hardware fault on the circuit pack.

This test aborts if calls are using the port, or if the VAL link associated with the port is connected. To avoid this, at the SAT type **busyout port UUCSSpp**, which tears down all calls and links using the port.

Table 39. TEST #1275 SCOTCH Synchronous Looparound Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	The port is in use. 1. Retry the command when the port is idle. You can force the port to the idle state with the **busyout port UUCSS** command. **NOTE:** This command is destructive, tearing down all calls and links using the port.
1002	ABORT	No TDM bus timeslots available for the test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
1963	ABORT	The port is in use. 1. Retry the command when the port is idle. You can force the port to the idle state with the **busyout port UUCSS** command. **NOTE:** This command is destructive, tearing down all calls and links using the port.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. 1. If this problem persists, reset the circuit pack (**busyout board UUCSS**, **reset board UUCSS**, and **release board UUCSS**). 2. If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.

Continued on next page

Table 39. TEST #1275 SCOTCH Synchronous Looparound Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
	FAIL	VAL circuit pack detected test failure. 1. If the problem persists, reset the circuit pack (**busyout board UUCSS**, **reset board UUCSS**, and **release board UUCSS**). 2. If the problem persists, replace the circuit pack.
	PASS	Port circuitry functioning properly.

ATM-DCH (ATM D-Channel Port)

MO Name (in Alarm Log)	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ATM-DCH[2]	MINOR	test port *UUCSSpp* l	ATM D-Channel
ATM-DCH	WARNING	test port *UUCSSpp* sh	ATM D-Channel

1. pp is administered as a port in the range of 9 through 32.
2. For additional related information, see "ATM-TRK (Circuit Emulation Service Circuit Pack)".

NOTE:
TN230x circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

This MO (ATM-DCH) utilizes the existing ISDN-PLK or D-channel maintenance strategy with modifications. The ATM circuit pack can be administered for up to 8 Circuit Emulation Service (CES) or signaling groups, each with its own D-channel, as opposed to one D-channel for an entire DS1 circuit pack.

NOTE:
Due to the dual personalities and the number of D-channels that the ATM board can possess, the in-line errors and signaling port LAN loopback test has been moved to the maintenance object ATM-TRK. When an in-line error is sent due to PACKET BUS errors, the ATM circuit pack maintenance object receives the error, not ATM-DCH.

The D-channel ISDN-PRI interface, which is emulated for ATM-CES, uses out-of-band signaling to transmit control messages between two endpoints. User information or bearer channels (B-channels) carry digitized voice and digital data and are assigned to DS1 ISDN trunks or PRI endpoints. Call control signaling for the B-channels is combined and carried over the separate ISDN-PRI Signaling Link Port D-channel.

Problems with ATM-DCH affects all of the associated B-channels, since call control signaling cannot reach the far-end switch or terminal adapter. Stable calls can remain operational, but no new calls can be made. ATM-DCH in turn depends on the TN230X ATM Trunk circuit pack it resides on and the packet bus which provides the link to the processor.

When working ATM-DCH alarms or errors, also investigate

- "ATM-TRK (Circuit Emulation Service Circuit Pack)"
- PKT-BUS (Packet Bus

Hardware Error Log Entries and Test to Clear Values

Table 40. ATM D-channel Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port UUCSSpp[2]
18 (a)	0	busyout port *UUCSSpp*	WARNING	OFF	release port UUCSSpp
130 (b)		None	WARNING	ON	test port UUCSSpp
1793 (c)		Signaling Link Board Check (#643)			test board UUCSS l

1. Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.
2. pp is for ports 9-32.

Notes:

a. Error Type 18: D-channel busied out; no calls possible over this D-channel.

b. Error Type 130: circuit pack removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. Error Type 1793: ATM Trunk circuit pack failed the Signaling Link Board Check (#643). Resolve any ATM-TRK errors in the Error Log.

System Technician-Demanded Tests: Descriptions and Error Codes

The command to test the ATM-DCH maintenance object is **test port UUCSSpp**, where pp is for ports 9-32.

Table 41. System Technician-Demanded Tests: ATM-DCH

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Board Check (#643)	X	X	ND

1. D = Destructive, ND = Non-destructive

Signaling Link Board Check (#643)

This nondestructive test checks the health of the ATM TN230X Trunk circuit pack hardware. The test runs on a periodic or scheduled basis, during initialization testing, and upon demand.

NOTE:
The board-level maintenance is handled independently of the ATM-CES signaling link maintenance, raising the possibility of inconsistent states.

Table 42. TEST #643 Signaling Link Board Check

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error Retry the command at 1-minute intervals for a maximum of 5 times.
8	FAIL	The TN230X circuit pack is not in-service. Check the Error Log for ATM-TRK errors and resolve any using ''ATM-TRK (Circuit Emulation Service Circuit Pack)''.
	PASS	The ATM TN230X circuit pack is in-service.

ATM-EI (Expansion Interface Circuit Pack)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-EI	MAJOR	test board UUCSS	ATM Expansion Interface Circuit Pack
ATM-EI	MINOR	test board UUCSS	ATM Expansion Interface Circuit Pack
ATM-EI	WARNING	test board UUCSS	ATM Expansion Interface Circuit Pack

1. UU is the universal cabinet number (1 for PPN, 2 - 44 for EPNs). C is the carrier designation (A, B, C, D, or E). SS is the number of the slot in which the circuit pack resides (01 to 21).

This maintenance object covers the ATM circuit pack administered as an ATM-Port Network Connectivity (PNC) Expansion Interface (ATM-EI). The ATM-EI provides PNC between a DEFINTY PPN and all the EPNs through the ATM switch.

The circuit packs listed in Table 43 are ATM-EI boards *if they are administered to serve the ATM Port Network Connectivity (ATM-PNC) for DEFINITY.*

Table 43. ATM-EI circuit packs for R9

Circuit pack	Fiber	Echo cancellation
TN2305	Multi mode	Y
TN2306	Single mode	Y

NOTE:
TN230x circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

NOTE:
ATM switch maintenance is not covered in this section. When DEFINTY ECS maintenance software suspects the ATM switch connections, it raises appropriate DEFINITY alarms.
To clear any ATM switch faults, refer to the particular ATM switch's documentation.

LEDs

The ATM Interface circuit pack has three LEDs:

- Red indicates some alarm condition.
- Green indicates maintenance testing in progress.
- Amber provides useful visual information regarding the operating mode of the ATM-EI and possible error conditions.

The possible LED states are in Table 44.

Table 44. ATM Interface LED codes

LED	LED status	Condition
Red	Steady on	Board is not healthy
	Never on	Normal conditions
Red and Green	Red LED solid on Green LED 200 ms on; 200 ms off	Board is in the processes of booting
Green	Steady on[1]	Maintenance is running tests on the board
	100 ms on - 100 ms off	No links to the board
Yellow	100 ms on -100 ms off	Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC (See Table 48 on page 394)
Yellow	500 ms on; 500 ms off	Signal to the ATM switch is down
Yellow	2 s on; 0.2 s off	ATM-EI is Expansion Archangel (EAA)
Yellow	Steady on	ATM-EI active (PPN)
Yellow	Never on	ATM-EI standby

1. The green LED flashes between tests.

ATM-EI-related commands

The following commands can be helpful in resolving ATM-EI problems:

add atm pnc	list measurements atm
busyout/release atm pnc	remove atm pnc
busyout/release board	reset board
change system-parameters customer-options (atm pnc)	status atm-pnc
change atm pnc (pnc duplication)	status cabinet
display atm pnc	status port-network
list atm oam-statistics	test board
list atm pnc	

Replacing an ATM-EI circuit pack

Standard Reliability

1. Enter **busyout atm-pnc #** (this is service-affecting) at the DEFINITY SAT.
2. Replace the ATM-PNC circuit pack and re-connect the fiber.
3. Enter **release atm-pnc**.
4. Wait 2.5 minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.
6. Enter **test board UUCSS** and verify that all tests pass.

High Reliability

There are 2 ATM-EI circuit packs in the PPN, 1 in the EPN.

1. Enter **busyout atm pnc #** at the DEFINITY SAT.

   NOTE:
   If the ATM-EI is in an EPN, this is service-affecting.

2. Replace the circuit pack.
3. Enter **release atm pnc**.
4. Wait 2.5 minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.
6. Enter **test board UUCSS** and verify that all tests pass.

Critical Reliability

There are 2 ATM-EI circuit packs in the PPN, 2 in the EPN.

1. Enter **status pnc** at the DEFINITY SAT. If the board is on the active side, enter **reset pnc interchange** to switch the active ATM-EI board to the standby side.
2. Enter **busyout pnc-standby**.
3. Enter **busyout atm-pnc #** ***a-pnc*** or ***b-pnc***.
4. Replace the circuit pack.
5. Enter **release atm pnc #**.
6. Enter **release pnc-standby**.
7. Wait 2.5 minutes for board insertion.
8. Enter **test board UUCSS** and verify that all tests pass.

Basic ATM PNC administration

NOTE:
This section contains basic administration information only. Refer to *DEFINITY ECS Installation, Upgrade, and Administration for ATM* for more detailed information.

ATM PNC connections involve administering

- 1 ATM-EI board in each Port Network (Standard Reliability)
- 2 ATM-EI boards in the PPN; 1 in each EPN (High Reliability)
- 2 ATM-EI boards in every Port Network (Critical Reliability)

Adding ATM PNC connections

Standard Reliability

1. If the ATM-EI circuit pack is not present or if the circuit pack is present but is in an EPN, use the **change circuit-pack** command to add circuit pack translation.
2. Enter **add atm pnc** ***n*** (connection number), and administer the circuit pack location and ATM address.

Critical Reliability

1. Enter **change system-parameters duplication** and change the Enable Operation of PNC Duplication field to **n**.
2. If the ATM-EI circuit pack is not present or is present but it is in an EPN that does not yet have PNC connectivity to it, use the **change circuit-pack** command to add circuit pack translation for the missing circuit pack.
3. Enter **add atm pnc *n*** (connection number), and administer the circuit pack location and ATM address.
4. Enter **change system-parameters duplication** and change the Enable Operation of PNC Duplication field to **y**.

Removing ATM PNC connections

Standard Reliability

NOTE:
Standard Reliability systems are *not* equipped with PNC duplication.

1. Enter **busyout atm-pnc *n*** (connection number)
2. Enter **remove atm-pnc *n*** (connection number)

Critical Reliability

1. Enter **status pnc** and ensure that the A-PNC is active. If it is not active, request a PNC interchange using the **reset pnc interchange** command.
2. Enter **busyout pnc-standby**.
3. Enter **change system-parameters duplication** and change the Enable Operation of PNC Duplication field to **n**.
4. Enter **busyout atm-pnc *n*** (port network number).
5. Enter **remove atm pnc *n*** (port network number) to remove both ATM-EI boards, or enter **change atm pnc** to remove the B-side ATM-EI board.
6. Enter **change system-parameters duplication** and change the Enable Operation of PNC Duplication field to **y**.

Changing circuit pack location or ATM address

Standard Reliability

NOTE:
Standard Reliability systems are *not* equipped with PNC duplication.

1. Remove the ATM PNC connection (see "Removing ATM PNC connections" above).
2. Add an ATM PNC connection (see "Adding ATM PNC connections" above).

A-side ATM-EI — Critical Reliability

1. Remove the ATM PNC connection (see "Removing ATM PNC connections" above).
2. Add an ATM PNC connection (see "Adding ATM PNC connections" above).

B-side ATM-EI — Critical Reliability

1. Enter **status pnc** and ensure that the A-PNC is active.

   If it is not active, request a pnc interchange using the **reset pnc interchange** command.
2. Enter **busyout pnc-standby**.
3. Enter **list config carrier** and verify that an ATM circuit pack is administered for the new location. If it is not, add the ATM circuit pack translations.
4. Enter **busyout atm pnc *n*** (connection number) **b-pnc**.
5. Enter **change atm pnc *n*** (connection number) and change circuit pack location for the B side.
6. Enter **release pnc-standby**.

Changing ATM address of a Standby ATM-PNC EI — Critical Reliability

1. Enter **busy pnc-standby**.
2. Enter **change atm pnc *n*** (connection number) and change the ATM address for the standby side.
3. Enter **release pnc-standby**.

Error Log Entries and Test to Clear Values

Table 45. ATM-EI Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board UUCSS
2 (a)		None	MIN	ON	
18 (b)	0	busy out board UUCSS	WRN	OFF	release board UUCSS
23 (c)	0	None	WRN	OFF	
125 (d)		None	MIN	ON	
131 (e)		None	MIN	ON	
257-9 (f)	Any	Expansion Interface Control Channel Test (#316)	MAJ	ON	test board UUCSS r 2
513 (g)	Any	ATM Crosstalk Test (#1298)	MIN	ON	test board long UUCSS
769 (h)	34, 35	ATM Board Error Query Test (#1259)	WRN	OFF	test board UUCSS
770 (h)	31	ATM Board Error Query Test (#1259)	WRN	OFF	test board UUCSS
771 (h)	26	ATM Board Error Query Test (#1259)	WRN	OFF	test board UUCSS
1024 - 1151 (i)	Any	None	WRN/ MIN	ON	test board UUCSS
1153 (j)		None	WRN	ON	test board UUCSS
1281 (k)		ATM Board Error Query Test (#1259)	MAJ	OFF	test board UUCSS r 1
1537 (l)	12	None	MIN	ON	
1538 (m)	0	None	MIN	ON	
1793 (n)	13	None	MIN	ON	
2049 (o)	15	None	MIN	OFF	test board UUCSS r 4
2050 (o)		Expansion Interface Lock Query test (#304)	MIN	OFF	test board UUCSS r 4
2305 (p)		None	MIN	ON	
2309 (p)		Packet interface test (#598)	MIN	ON	test board UUCSS r 2
2561 (q)		Expansion Interface 2-way Transmission test (#241)	MAJ	OFF	test board UUCSS r 3
2817 (r)	Any	ATM Board DSP test (#1293)	MIN	ON	test board UUCSS

Continued on next page

Table 45. ATM-EI Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2818 (r)	Any	None	MIN	ON	test board UUCSS
3329 (s)	3	LANHO critical error	MAJ	OFF	
3585 (t)		ATM Framer Looparound Test (#1260)	MAJ	ON	test board UUCSS l
3586 (t)		ATM Framer Looparound Test (#1260)	MAJ	ON	test board UUCSS l
3841 (u)					
3842 (v)					
3843 (w)		None			
3999 (x)	Any	None			
Any	32767[2]	None			

1. Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.
2. Aux Data 32767 for any error log entry indicates that an alarmed ATM-EI was busied out and then released. When this occurs, existing service-affecting alarms must be preserved. Typically, all alarms are resolved when the ATM-EI is released. Therefore, the Alarm and Error Logs must be repopulated with the alarms present at time of busyout. This Aux Data indicates that existing Error Type and Error Log time stamps are no longer valid because they were lost when the circuit pack was released.

Notes:

a. **Error Type 2** — The on-board DUART chip failed. This results in communication failure between the port network's maintenance board and the ATM-EI board. The Maintenance circuit pack should have a red LED lit, because the link to the ATM-EI is down in this EPN.

   1. Reset the board with the **reset board UUCSS** command.
   2. If the board does not recover, replace the board.

b. **Error Type 18** — The ATM-EI circuit pack has been busied out.

   1. Release the circuit pack (**release board UUCSS**).

c. **Error Type 23** — An ATM-EI circuit pack has been administered with the **add atm-pnc *n*** command, but the circuit pack has not been inserted into the system.

   1. Insert an ATM-EI circuit pack at this location.

d. **Error Type 125** — A wrong circuit pack is located in the slot where the ATM-EI circuit pack is logically administered.

   1. Either remove the wrong circuit pack and insert the ATM-EI circuit pack or remove the ATM-EI administration (see ''Basic ATM PNC administration'').

   2. Remove the ATM-INTF administration and re-administer the slot (**change circuit-pack**) to match the circuit-pack that is physically present in this slot.

e. **Error Type 131** — An ATM-EI circuit pack has been removed from the slot for 5 minutes.

   1. Insert the ATM-EI circuit pack into its administered slot.

   2. Another way to resolve or prevent this alarm is to remove the ATM-EI administration (see ''Basic ATM PNC administration''), then remove the ATM-INTF administration (**change circuit-pack**).

   It is possible that the ATM-EI could be held in reset by the EPN Maintenance board and is not inserted in the system.

   1. Try issuing the **test maint P long** command on the maintenance board in the same port network.

f. **Error Type 257** — Expansion Interface Control Channel Test #316 failed (board cannot communicate on the TDM bus control channel). Follow the suggested test procedures.

   Error Type 258 — The archangel is out of sequence (Aux Data indicates angel number).

   Error type 259 — The expansion archangel link (EAL) to the active ATM-EI board is down. See SYS-LINK.

g. **Error Type 513** — The ATM Crosstalk test failed. The board is either writing to or reading from a TDM time slot that is not allocated to the board.

   1. Test the board (**test board UUCSS**) and follow the test procedures suggested for this test. In random tests of a single DSP during low or high traffic, the same DSP can be tested more than once.

h. **Error Types 769 and 770** — are board-degraded alarm errors that result when the ATM switch is sending corrupted cells or excessive AAL/LAPD retransmissions (off-board ATM cell corruption errors). These errors indicate the detection of a problem in handling ATM cells that are received from the fiber interface.

Aux Data:

Error Type	Aux Data	Description
769	34	AAL5 Excessive: retransmission requests
769	35	LAPD Excessive: retransmission requests
770	25	ATM Uncorrectable cell headers - threshold
771	26	VPI,VCI pair unknown

The problem is most likely *not* on the ATM-EI circuit pack reporting the errors, but it could be due to one or more of the following reasons:

- The fiber is not snugly connected to either the board or the ATM switch.
- The PN packet bus is corrupting the cells. See Packet maintenance objects (Aux Data 35 only).
- The fiber between the ATM switch and the ATM-EI is too long (greater than 2km for multimode fiber). Use loopback to see if the fiber is corrupting the cells.
- Some other ATM-EI board is not receiving the cells properly.
- The intervening ATM switch is dropping the ATM cells due to a shortage of bandwidth, or the DEFINITY is using more than the subscribed bandwidth.

Error Type 771 — The ATM switch is sending cells with unknown VPI and VCI address (wrong connection).

1. Ensure that the ATM-EI board address on the ATM switch matches the ATM-EI (ATM) address on the DEFINITY side.

i. **Error Types 1024-1151** — These errors represent problems detected by the ATM-EI board in response to SETUP and ADDPARTY requests from software.

- The Error Types and descriptions are in Table 46 on page 392.
- Aux Data values represent port network and angel numbers and are in Table 47 on page 393.

Table 46. ATM Error Types 1024 - 1151

Error Type	Description	General problem
1024	Next node unreachable	ATM protocol stack on ATM-EI circuit pack
1056	DTL Transit not my node ID	
1088 or 1104	ATM-EI circuit pack received a request with an invalid connection identifier.	Firmware-detected problems on the ATM-EI circuit pack. Note: Error Types 1088-1103 are reported by the board that is originating the connection. Error Types 1104-1119 are reported by the board that is terminating the connection. In most cases, when the terminating board reports one of these errors, the originating board also reports an ATM-NTWK error for the same event (usually with Error Type 21).
1089 or 1105	ATM-EI circuit pack received a request with a reference to an unknown VC token.	
1090 or 1106	ATM-EI circuit pack did not have enough resources (memory) for the requested operation.	
1091 or 1107	Internal failure in the local protocol stack. This can occur when the connection to the ATM switch failed, perhaps because the: ATM switch rebooted fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1092 or 1108	ATM-EI circuit pack received a request for which the referenced VC was in the wrong call state.	
1093 or 1109	ATM-EI circuit pack received a request for which the VPI/VCI pair was invalid or out of range.	
1094 or 1110	ATM-EI circuit pack received a request to add a party to an existing VC. The add party request failed, and a retry was not possible.	
1095 or 1111	ATM-EI circuit pack in link recovery after the lower ATM layer (Q.SAAL portion of the protocol stack) failed. This can occur when the connection to the ATM switch failed, perhaps because the: ■ ATM switch rebooted ■ fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1096 or 1112	ATM-EI circuit pack received an error from the local protocol stack for which no more detailed cause was specified.	
1102	ATM-EI circuit pack asked to create more connections that it was capable of creating.	
1103	ATM-EI circuit pack detected an illegal message from software. Check the Error Log for CONN-M proc errors for more information.	
1113		Problems detected by the board terminating the connection

1. Test the ATM-EI circuit pack (**test board UUCSS**) and investigate further based on each test's results. If all tests pass, the error was a transient problem.

Aux Data values: For Setup and Add Party connection request failure type, the port network and the angel number of the destination ATM-EI circuit pack are logged Aux Data values in the form XXYYY, where

- port network number = XX
- angel number = YYY

Aux Data values for WSP Setup (XX = WSP number, YYY = location code).

Since you need to know the slot number also, Table 47 converts the Aux Data to slot numbers.

Table 47. Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number

Slot	Carrier														
	A			B			C			D			E		
	Failure type			Failure type			Failure type			Failure type			Failure type		
Slot #	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up
1	28	528	828	66	566	866	98	598	898	34	534	834	02	502	802
2	29	529	829	67	567	867	99	599	899	35	535	835	03	503	803
3	30	530	830	68	568	868	100	600	900	36	536	836	04	504	804
4	31	531	831	69	569	869	101	601	901	37	537	837	05	505	805
5	56	556	856	70	570	870	102	602	902	38	538	838	06	506	606
6	57	557	857	71	571	871	103	603	903	39	539	839	07	507	607
7	58	558	858	72	572	872	104	604	904	40	540	840	08	508	808
8	59	559	859	73	573	873	105	605	905	41	541	841	09	509	809
9	60	560	860	74	574	874	106	606	906	42	542	842	10	510	810
10	61	561	861	75	575	875	107	607	907	43	543	843	11	511	811
11	62	562	862	76	576	876	108	608	908	44	544	844	12	512	812
12	63	563	863	77	577	877	109	609	909	45	545	845	13	513	813
13	88	588	888	78	578	878	110	610	910	46	546	846	14	514	814
14	89	589	889	79	579	879	111	611	911	47	547	847	15	515	815
15	90	590	890	80	580	880	112	612	912	48	548	848	16	516	816
16	91	591	891	81	581	881	113	613	913	49	549	849	17	517	817
17	92	592	892	82	582	882	114	614	914	50	550	850	18	518	818
18	93	593	893	83	583	883	115	615	915	51	551	851	19	519	819

Continued on next page

Table 47. Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number — *Continued*

Slot	Carrier														
	A			B			C			D			E		
	Failure type			Failure type			Failure type			Failure type			Failure type		
Slot #	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up
19	94	594	894	84	584	884	116	616	916	52	552	852	20	520	820
20	95	595	895	85	585	885	117	617	917	53	553	853	21	521	821
21	NA	NA	NA	86	586	886	118	618	918	54	554	854	22	522	822
22	NA	NA	NA	87	587	887	119	619	919	55	555	855	23	523	823

j. **Error type 1153** — The ATM connection audit found some discrepancy in the firmware's VC token numbers and live VCs. The problem is rectified in firmware and no action is needed.

k. **Error Type 1281** — The loss of high-level signal indicating operational problems of equipment located outside of the circuit pack and the fiber connected to the board. Aux Data values are listed in Table 48.

Table 48. Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone Clock problem. Check for TDM-BUS or TONE-BD errors in the Error Log. If no other problems are present, reset the circuit pack (**reset board UUCSS**)

Continued on next page

Table 48. Error type 1281 Aux Data and repair procedures — *Continued*

Aux Data	Alarm Description	Repair procedure
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-EI board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. Run **test board UUCSS** command. If Test #1259 fails, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. If the yellow LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cannot obtain or maintain STM-1/OC-3 framing. Try to move the fiber on the ATM switch side to a different port. This could require administration on the ATM switch. If the problem persists, reset the circuit pack (**reset board UUCSS**).
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. See if the ports at the MUX and/or the ATM switch are connected snugly. Run **test board UUCSS** command If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. If the yellow LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far-end is detecting a major problem with the signal that this board is transmitting. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface Run **test board UUCSS** command. If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. If the yellow LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.

Continued on next page

Table 48. Error type 1281 Aux Data and repair procedures — *Continued*

Aux Data	Alarm Description	Repair procedure
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. Reset the board (**reset board UUCSS**). If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/SONET)	The incoming signal payload is not set up for transmission of ATM data. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface.
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. Run **test board UUCSS**. If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. If the yellow LED continues to flash, replace the circuit pack.
23	High-level path Remote defect Indicator: HP_RDI	The far-end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. Run **test board UUCSS** command; if the Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. If the yellow LED continues to flash, replace the circuit pack.
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. Reset the board (**reset board UUCSS**). If the error persists, replace the board.

Continued on next page

Table 48. Error type 1281 Aux Data and repair procedures — *Continued*

Aux Data	Alarm Description	Repair procedure
27	SIGCON_DOWN ATM switch high level signal.	The board cannot communicate with the ATM switch. Busyout the board (**busyout board UUCSS**). Test the board (**test board long UUCSS**). If Test #1260 fails, replace the board. If Test #1260 passes, make sure the ATM address on both the DEFINITY and the ATM switch sides are the same for this board. If the address is the same, change the port on the ATM switch side. This could require administration on the ATM switch. If the error is resolved, the problem is on the ATM switch port.

l. **Error Type 1537** — LAN bus time out. The circuit pack is transmitting a packet larger than 1,024 bytes. Replace the circuit pack.

m. **Error Type 1538** — A hyperactive ATM-EI circuit pack is generating an abnormal amount of control messages to the processor. When this error is generated, the system automatically resets the ATM-EI.

Duplicated PNC?	Then:
Y	service to the EPN is disrupted
N	the system switches to the standby PNC

1. Enter the **reset board UUCSS** command for this ATM-EI circuit pack.
2. If the same error persists, replace the ATM-EI circuit pack.

n. **Error Type 1793** — LANHO transmit FIFO overflow error (the transmit FIFO RAM buffers on the circuit pack overflowed). This most likely indicates a hardware problem on the circuit pack, because the speed of the LAN/Packet Bus is much higher than the speed of the link connected to the port.

1. Test this ATM-EI circuit pack (**test board UUCSS**).
2. If Test #598 fails again, replace the ATM-EI circuit pack.

o. **Error Types 2049 and 2050** — The ATM-EI is out of lock with the backplane system clock.

1. Test this ATM-EI circuit pack (**test board UUCSS**).
2. If Test #304 fails, follow the repair procedures suggested for this test.

p. **Error Type 2305** — Too many parity errors on data received from the LAN/Packet Bus (could be due to packet bus problems).

1. Test the ATM-EI circuit pack (**test board UUCSS**).
2. If Test #598 fails, follow the repair procedures suggested for this test.
3. If the test passes, look for and resolve any PKT-BUS (Packet Bus) alarms/errors.
4. If there are no PKT-BUS errors and the problem persists, escalate the problem.

Error Type 2309 — The packet interface chip (LANHO) is malfunctioning.

1. Test the ATM-EI circuit pack (**test board UUCSS**).
2. If Test #598 fails, follow the repair procedures suggested for this test.

q. **Error Type 2561** — ATM-EI 2-way Transmission Failure (circuit pack is having problems creating connections to other port networks in the system).

1. Test the ATM-EI circuit pack (**test board UUCSS**).
2. Follow the repair procedures suggested for Test #241.

r. **Error Types 2817 and 2818** — A DSP test failure detected along the circuit path of the ATM-EI circuit pack.

Error Type	Description	Aux Data indicates
2817	DSP test failure	The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs
2818	One or more DSPs failed	DSP number that has failed

1. Test the ATM-EI circuit pack (**test board UUCSS**).
2. Follow the repair procedures suggested for Test #1258.

s. **Error Type 3329** — The on-board LANHO chip is insane, possibly due to a problem in Packet Bus arbitration, the transmission line frame, or the circuit pack itself. The circuit pack cannot talk to the packet bus.

If the packet bus is alarmed:

1. Resolve PKT-BUS errors, if any. The probability of this error being related to Packet bus problem increases with the number of other circuit packs using the Packet bus that are also showing this error.

If the Packet Bus is *not* alarmed:

1. Reset the circuit pack (**reset board UUCSS**).
2. If the problem persists, replace the ATM-EI circuit pack.

If the system has a duplicated PNC, and the in-line error received is from an active ATM-EI, the system switches to the standby PNC.

CAUTION:
If the system does not have duplicated PNC, services to the EPN could be disrupted.

t. **Error Types 3585 and 3586** — (Major board alarm) A failure of critical components involved in the operation of the circuit pack, and the switch can no longer recognize the circuit pack. If the system has a duplicated PNC and the in-line error received is from an active ATM-EI, the system switches to standby PNC.

CAUTION:
If the system does not have duplicated PNC, services to the EPN could be disrupted.

Error Type 3585

Aux Data (Error Type 3585 only):

Aux Data	Description
1	ATM framer failure
2	NCE failed (only from ATM-EIs in EPN)
4	TDM_PLD_FAILED
5	DSP_ALL FAILED
6	Receive Network Processor (RNP) failure
7	Transmit Network Processor (TNP) failure
8	MEMORY read/write failure

1. If the board is in a PPN, or if the system has duplicated PNC:
   a. Test the ATM-EI (**test board UUCSS l**).
   b. If Error 3585 is detected again, or if the board is not recognized anymore, replace the ATM-EI circuit pack.
2. If the system does *not* have duplicated PNC, and the circuit pack is in an EPN:
   a. Replace the ATM-EI circuit pack.

Error Type 3586 — Framer Looparound Test #1260 failed.

Aux Data (Error Code 3586 only):

Aux Data	Description
2	Packet path failed
3	Circuit path failed
4	TDM loop cannot be created
5	Packet loop cannot be created

1. If Error Type 3586 is detected again, replace the circuit pack.

u. **Error Type 3841** — The board received a message from the switch that it does not recognize, and the board responded with an inconsistent down link error message. This error does not affect service, and no action is required.

v. **Error type 3842** — The circuit pack received data from the Packet Bus faster than it could distribute the data to its endpoint. This circuit pack should be able to recover by itself, and no action is necessary.

w. **Error type 3843 —** The firmware on the circuit pack is reporting a resource that is low. This error does not affect service and no action is required.

x. **Error Type 3999** — The circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	Circuit pack is taken out of service
If Error Type 1538 is not present	Circuit pack is *not* taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. This can be normal during heavy traffic. If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in Table 49 when inspecting the errors in the system. By clearing error codes associated with the Expansion Interface Test, for example, you can also clear errors generated from other tests in the testing sequence.

Table 49. System Technician-Demanded Tests: ATM-EI

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Expansion Interface 2way-Transmission Test (#241)	X	X		ND
ATM Board Framer Looparound Test (#1260)		X		D
Expansion Interface Lock Query Test (#304)	X	X		ND
ATM Board Error Query Test (#1259)	X	X		ND
ATM Expansion Interface Reset (#1256)			X	D
ATM board DSP test(#1293) for TN2305 and TN2306 circuit packs.	X	X		ND
ATM Cross Talk test(#1298) for TN2305 and TN2306 circuit packs		X		ND

1. D = Destructive, ND = Non-destructive

NOTE:
To get a better indication of a problem's location, test both ATM-EI circuit packs on the associated fiber link, whether the circuit packs are both ATM-EI circuit packs or not.

Expansion Interface 2-way Transmission Test (#241)

This test is non-destructive and applies to all ATM-EIs, both active and standby. It is run as part of craft short and long testing, periodic, scheduled, initialization, and error analysis testing. The test sets up a connection between a Tone/Clock in one cabinet and a Tone Detector in a separate cabinet and transmits a digital test count between the port networks. The ATM-EIs used to set up this connection are chosen by maintenance, not call processing. After the connection is checked for dial-tone, the connection is torn down and re-established in the opposite direction.

In this test the second ATM-EI can be in any port network outside the port network of the ATM-EI under test. Therefore if the test should fail in any direction, the test is repeated with a different port network, if available, which aids the fault isolation procedure.

The test results indicate if the test failed in one or both directions. The test aborts if the ATM-EIs do not exist on both ends (for example, the EIs are not administered correctly). If the test passes, the TDM and ATM framer interfaces of both ATM-EIs are functioning properly. If the test fails, a series of tests are run on the board. Figure 17 shows a schematic of this test.

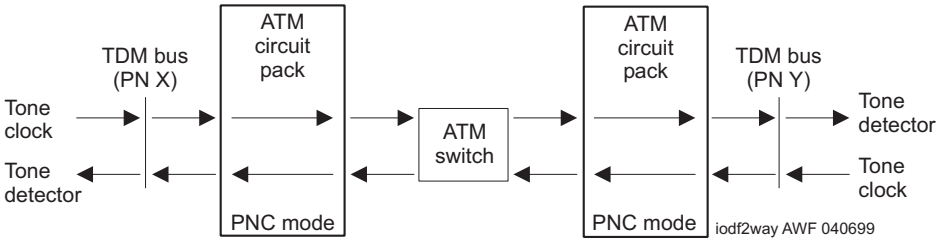


Figure 17. Expansion Interface 2-Way Transmit Test #241
PN X and PN Y represent any of 43 possible port networks.

Table 50. Expansion Interface 2-way Transmission Test (#241)

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it can have time slots out of service due to TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals a maximum of 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system could be oversized for the number of tone detectors present, or some tone detectors can be out of service. 1. Resolve any TTR-LEV errors. Even if there are not TTR-LEV errors, there could be no tone detector available on the network that contains the circuit pack being tested. Verify that there is at least one tone detector on this network. If not, this test always aborts for this ATM-EI circuit pack, but does not harm the system. **NOTE:** DEFINITY Systems require that Tone Clock circuit packs (TN2182) must be of vintage B or newer. If older Tone Detector circuit packs are installed in the system, this test always aborts with this abort code. 2. Resolve any TONE-PT errors. 3. If neither condition exists, retry the command at 1-minute intervals a maximum of 3 times.

Continued on next page

Table 50. Expansion Interface 2-way Transmission Test (#241) — *Continued*

Error Code	Test Result	Description/ Recommendation
1033	ABORT	The test cannot run because either the ATM-EI board is not administered, or there were no other PNs administered that had its ATM-EI board in-service. 1. Ensure that the board is administered as ATM PNC Expansion Interface circuit pack. 2. If the board is administered as ATM-EI circuit pack, then there has been some change in the ability of the ATM-EI circuit pack in the other PNs to communicate with the ATM-EI on the other end of its connection. 3. Using **status port *x*** (the port-network number in which the board is administered), see if both ACL and EAL are up to this board. If they are not, see the service procedure for SYS-LINK. 4. Check the Error Log for Error Type 1281 with Aux Data 27 (board cannot talk to the ATM switch). See Table 48 on page 394 for repair procedures. 5. If present, check both the ATM switch and the DEFINITY administrations for consistent ATM addresses. Reset the board and see if the problem resolves. 6. Repeat Test #241. If it continues to abort with this abort code, replace the board.
1394	ABORT	1. See Table 48 on page 394 (Error Type 1281) with Aux Data 27 (board cannot talk to the ATM switch), and if present, check both the ATM switch and the DEFINITY administrations for consistent ATM addresses. 2. Reset the board and see if the problem resolves. 3. Repeat the test.
1395	ABORT	This test cannot run on an ATM-EI circuit pack if it is part of the B-side PNC and Duplicated PNC is not enabled. 1. If this test needs to run on this ATM-EI circuit pack, enable PNC with the **change system-parameters duplication** command. 2. Prevent the system from doing a PNC interchange by executing the **set PNC lock** command. 3. Repeat this test.
1413	ABORT	This test requires the use of a Tone/Clock circuit pack in each of the port networks (PN) used in this test. This abort code indicates that a Tone/Clock circuit pack is not present in one of the PNs. 1. Make sure that there is a Tone/Clock circuit pack located in the PN in which the ATM PNC Expansion Interface circuit pack under test is located. 2. In ATM PNC configurations, make sure that there is at least one other PN besides the PN where the ATM-EI circuit pack under test resides that contains a Tone/Clock circuit pack.

Continued on next page

Table 50. Expansion Interface 2-way Transmission Test (#241) — *Continued*

Error Code	Test Result	Description/ Recommendation
1414	ABORT	The active Tone/Clock circuit pack in one of the port networks being used for the test has a MAJOR or MINOR alarm logged against it. 1. Enter **display alarms** and resolve any TONE-BD and TONE-PT alarms.
1956	ABORT	ACL to the board is not up. See ACL status with the **list sys-link** command and follow the repair procedures for SYS-LINK.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 3 times.
	FAIL	The test tone was not detected correctly in either direction. 1. Test the active Tone/Clocks on the Port Networks for which the ATM-EI circuit pack under test provides a link. This determines if the dial tone is supplied.
10MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "MM" refer to the distant or far-end port network (PN), and "NN" to the near-end ATM-EI under test. The test tone was detected correctly in forward direction (data sent from the PN in which the circuit pack under test resides and detected correctly in port network MM), but not the opposite direction. 1. Test the active Tone/Clocks on the "MM" PN and the PN in which the ATM-EI under test resides (**test tone-clock UUCSS**). This determines if a dial tone is supplied. 2. Ensure that the ATM address of the ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for the procedure to check the ATM port address on the ATM switch. 3. Run this Test #241 on the active ATM-EI in port network MM. If this test fails with Error Code 10NN or 30NN, go back to Step 2. 4. If the address was the same, replace the active ATM-EI circuit pack on port network MM. 5. If this test fails with Error Code 20NN or 40NN, replace ATM-EI circuit pack that had the initial problem.

Continued on next page

Table 50. Expansion Interface 2-way Transmission Test (#241) — *Continued*

Error Code	Test Result	Description/ Recommendation
20MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "MM" refer to the distant or far-end port network (PN), and "NN" to the near-end ATM-EI under test. 1. The test tone was detected correctly in reverse direction (data sent from the MM port network was detected correctly in the port network in which the circuit pack under test resides, but not the opposite direction). 2. Test the active Tone/Clock on the "MM" PN and the PN in which the ATM-EI under test resides (**test tone-clock UUCSS**). This determines if dial tone is supplied. 3. Ensure that the ATM address of the active ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for the procedure to check the ATM port address on the ATM switch. 4. Run this Test #241 on the active ATM-EI in port network MM. If this test fails with Error Code 20NN or 40NN, go back to Step 2. If the address was the same, replace the active ATM-EI circuit pack on port network MM. If this test fails with Error Code 10NN or 30NN, replace ATM-EI circuit pack with the initial problem.
30MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "MM" refer to the distant or far-end port network (PN), and "NN" to the near-end ATM-EI under test. The test failed for the first connection from the ATM-EI board under test to another EPN, and the test tone was detected correctly in the forward direction (data sent from the port network in which the circuit pack under test resides was detected correctly in port network MM, but not the opposite direction). 1. Test the active Tone/Clock on the "MM" PN and the PN in which the ATM-EI under test resides (**test tone-clock UUCSS**). This determines if dial tone is supplied. 2. Ensure that the ATM address of the ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to for the procedure to check the ATM port address on the ATM switch. 3. Run this Test #241 on the active ATM-EI in port network MM. If this test fails with Error Code 10NN or 30NN, go back to Step 2. If the address was the same, replace the active ATM-EI circuit pack on port network MM. If this test fails with Error Code 20NN or 40NN, replace ATM-EI circuit pack with the initial problem.

Continued on next page

Table 50. Expansion Interface 2-way Transmission Test (#241) — *Continued*

Error Code	Test Result	Description/ Recommendation
40MM	FAIL	Failure code only applies to a system equipped with an ATM Switch. The letters "MM" refer to the distant or far-end port network (PN), and "NN" to the near-end ATM-EI under test. The test failed for the first connection from the ATM-EI board under test to another EPN, and the test tone was detected correctly in the reverse direction (data sent from the MM port network was detected correctly in the port network in which the circuit pack under test resides), but not the opposite direction. 1. Test for the Active Tone-Clocks on the MM PN and the PN in which the ATM-EI under test resides. This determines if dial tone is supplied. 2. Ensure that the ATM address of the active ATM-EI circuit pack in port network MM matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for the procedure to check the ATM port address on the ATM switch. 3. Run this Test #241 on the active ATM-EI in port network MM. If this test fails with Error Code 20NN or 40NN, go back to Step 2. If the address was the same, replace the active ATM-EI circuit pack on port network MM. If this test fails with Error Code 10NN or 30NN, replace ATM-EI circuit pack with the initial problem.
	PASS	Tone successfully transmitted in both directions. Both ATM-EI boards and their lightwave transceivers are functioning properly.
0	NO BOARD	No board was detected by the test. 1. Resolve either wrong board (Error 125) or no board (Error 131) issues. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board could be bad. Replace the board and retest.

Expansion Interface Lock Query Test (#304)

This test is non-destructive and is used to query the ATM and EI circuit packs (both active and standby) for its status concerning lock to the backplane system clock. It is run as part of periodic, scheduled, initialization, and error analysis testing. When an in-line, "out-of-lock" report comes in, this test is run to check the circuit pack's status. The ATM-EI responds with "in lock" or "out of lock." If the response is "in lock," the test passes; if the response is "out of lock," the test fails.

Table 51. TEST #304 Expansion Interface Lock Query Test (#304)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 3 times.
	FAIL	The ATM-EI circuit pack responded incorrectly or if it is the EPN active ATM-EI circuit pack, it could not talk to EPN circuit packs. 1. If the active ATM-EI circuit pack in the EPN is failing and duplicated PNC is enabled, attempt to switch to the standby PNC using the **reset PNC interchange** command. 2. Repeat the short test sequence. 3. If test continues to fail, reset the ATM-EI circuit pack with the **reset board UUCSS** command. 4. If the ATM-EI circuit pack in the EPN is failing, enter **display errors** and **display alarms** and follow the associated repair procedures for TDM-CLK, TONE-BD, or SYNC alarms/errors and repeat the Short Test Sequence. 5. If test continues to fail, replace the circuit pack or transceiver.
	PASS	Communication from software to the ATM-EI circuit pack is functioning correctly.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

Expansion Interface Control Channel Test (#316)

This test is non-destructive. If an ATM-EI circuit pack is an *active* ATM-EI in the EPN (yellow LED on long/off short), the Expansion Interface Control Channel test checks to see if the ATM-EI circuit pack can communicate with other circuit packs in the EPN using the EPN TDM bus.

If the circuit pack is a *standby* ATM-EI (yellow LED off) or if the ATM PNC Expansion Interface is in the PPN (yellow LED on), this test queries the ATM PNC Expansion Interface circuit pack for its circuit pack type and vintage information.

Table 52. Expansion Interface Control Channel Test #316

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 3 times.
	FAIL	The ATM-EI circuit pack responded incorrectly or if it is the EPN active ATM-EI circuit pack, it could not talk to EPN circuit packs. 1. If the active ATM-EI circuit pack in the EPN is failing and duplicated PNC is enabled, attempt to switch to the standby PNC using the **reset PNC interchange** command. 2. Repeat the short test sequence. 3. If test continues to fail, reset the ATM-EI circuit pack with the **reset board UUCSS** command. 4. If the ATM-EI circuit pack in the EPN is failing, enter **display errors** and **display alarms** and resolve any TDM-CLK, TONE-BD, or SYNC alarms/errors and repeat the Short Test Sequence. 5. If test continues to fail, replace the circuit pack or transceiver.
	PASS	The ATM-EI circuit pack did respond correctly to test. Communication from software to the ATM-EI circuit pack is functioning. 1. Refer to other ATM-EI circuit pack tests if the link is not functioning correctly.

Continued on next page

Table 52. Expansion Interface Control Channel Test #316 — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	No board was detected by the test. 1. Resolve any wrong board (Error 125) or no board (Error 131) issues. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

Packet Interface Test (#598)

This test is non-destructive and attempts to send a data packet from the TN1655 Packet Interface circuit pack through any ATM PNC Expansion Interface circuit packs. The path the data packet takes depends on the location of the ATM-PNC Expansion Interface circuit pack being tested and whether the system has duplicate Port Network Connectivity.

The Packet Interface Looparound test checks the Packet Bus interface circuitry on this board. The on-board LANHO chip sends a data stream to the bus, retrieves it back, and checks for its consistency. If the data is consistent, the test passes; otherwise, it fails. The test aborts if the Packet Bus in the specified port network has a minor alarm active, is out of service, or if the Packet Bus in the PPN is out of service. This test runs as a part of initialization, periodic, scheduled, error analysis, and demand test sequences. Figure 18 shows a schematic of the test.

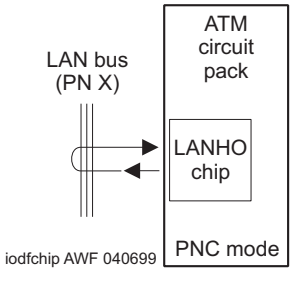


Figure 18. Packet Interface Test (#598)

Table 53. Packet Interface Test (#598)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 3 retries. 2. If the test fails repeatedly, attempt to reset the circuit pack. 3. If the test continues to fail, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
ANY	FAIL	The transmitted data packet was not received correctly by the Packet Interface circuit pack. The failure can be in the ATM-EI under test, the DS1 CONV circuit packs, or the intervening Center Stage components. 1. Retry the command at 1-minute intervals a maximum of five times 2. If the test continues to fail, replace the circuit pack.
	PASS	The Packet Interface Test passed.

ATM Board Error Query Test (#1259)

This test is non-destructive. The ATM circuit pack firmware maintains counters for some of the on-board and off-board errors. The maintenance software queries the board for its health information to do error analysis. These alarms have assigned priority: if a higher priority alarm occurs, the remaining alarms are not reported to the software (through the inline errors), avoiding unnecessary up-link, in-line error message traffic. This is run as a part of a craft demand test sequence periodic testing, initialization, and error analysis.

Table 54. ATM Board Error Query Test (#1259)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 3 times.
XXYY	FAIL	On-board hardware or off-board signalling errors on the board. XX indicates the on-board hardware error, and YY indicates the off-board errors on the as shown in Table 55 on page 412. 1. Resolve any errors in error logs.
	PASS	No service effecting errors or alarms were detected on the circuit pack.
0	NO BOARD	No board was detected by the test. 1. Check the Error Log for wrong board (Error Type 125) or no board (Error Type 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error Type 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

Table 55. XXYY Error Codes for Test #1259 (ATM Board Error Query Test)

XX Aux Data	Description
1	ATM framer chip failed
2	NCE chip failed
3	LANHO critical error
4	TDM Prog. logic device failed
5	All on-board DSPs failed
6	Receive network processor failed
7	Transmit network processor failed
8	Memory read failed

Continued on next page

Table 55. XXYY Error Codes for Test #1259 (ATM Board Error Query Test) — *Continued*

XX Aux Data	Description
9	Dual UART chip failed
10	LANHO receive parity error
11	LANHO FIFO overflow error
12	LAN Bus timeout
13	LANHO Xmit FIFO overflow
14	One or more on-board DSPs failed
YY Aux Data	Description
15	Backplane clock failed
16	Loss of signal
17	Loss of frame
18	Multiplexer Section Alarm indication signal error
19	Multiplexer Section remote defect indicator error
20	Loss of pointer
21	Path signal level mismatch
22	High level path alarm indication signal
23	High level path remote defect indicator
24	Loss of cell delineation
25	Uncorrectable headers sent by the ATM switch
26	Too many cells with invalid Virtual Path Indicator (VPI)/Virtual Circuit Indicator (VCI) combination
27	The signalling link between the board and the ATM switch is down.
28	Board to the ATM switch connection is down
34	AAL5 (ATM signalling protocol) excessive retransmission requests
35	LAPD excessive retransmission requests
37	ATM CLP (Cell Loss Priority) Bit - see MO ATM-NTWK
38	ATM Congestion Indicator - see MO ATM-NTWK
39	ATM Cell Underrun - see MO ATM-NTWK
40	ATM Cell Overrun - see MO ATM-NTWK
41	ATM Lost Cells - see MO ATM-NTWK

ATM Board Framer Looparound Test (#1260)

This test is destructive.

NOTE:
This test can be run on the standby PNC only if the board is busied out.

This test places the ATM circuit pack in ATM framer looparound mode. Once the board receives this message, it creates a dummy virtual circuit that originates and ends on the same board, without leaving the board. This test verifies both the TDM path and the Packet Path. If the TDM test path passes, then the packet path is tested. Definitions of each test path are:

— ***The circuit (TDM) path***: one of the tone generators sends a bit pattern through a TDM bus time slot to the ATM framer. The pattern is converted into ATM cells and looped back to the ATM-EI board, which converts the cell back into the bit pattern and puts it on a pre-determined time slot. A tone detector tests for the bit pattern and reports the test result. This test verifies that a large portion of the ATM-EIs circuit paths are functioning correctly. Figure 19 shows a diagram of the test.

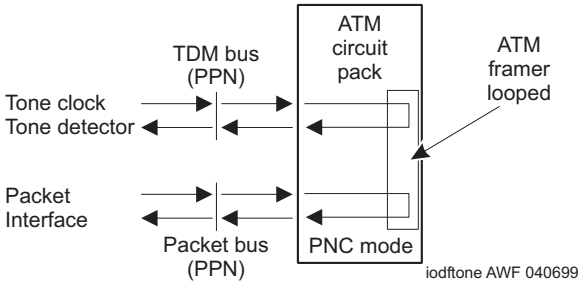


Figure 19. ATM Board Framer Looparound Test (#1260)

— ***Packet path***: the Packet Interface circuit pack sends packet data to the ATM framer interface, where it is mapped into ATM cells and then looped around internally. The cells are converted back to packet data after it has been looped. This portion of the test verifies correct operation of the ATM-EI's Packet bus interface and a large portion of the ATM-EI's packet paths. Figure 20 shows the packet switched signal path for the ATM circuit pack.

— This test verifies the operation of a large portion of the ATM-EI circuit and packet paths, but does not verify the optical portion of the lightwave transceiver. If this test passes, the ATM-EI circuit pack is functioning correctly, but faults can exist in the lightwave transceiver. If the test fails, the fault can be on the board. After the test results are reported, the ATM framer is taken out of loopback.

NOTE:
This test can be run on active or standby ATM-EIs, but it is *not* allowed if an ATM-EI is the Expansion Archangel.

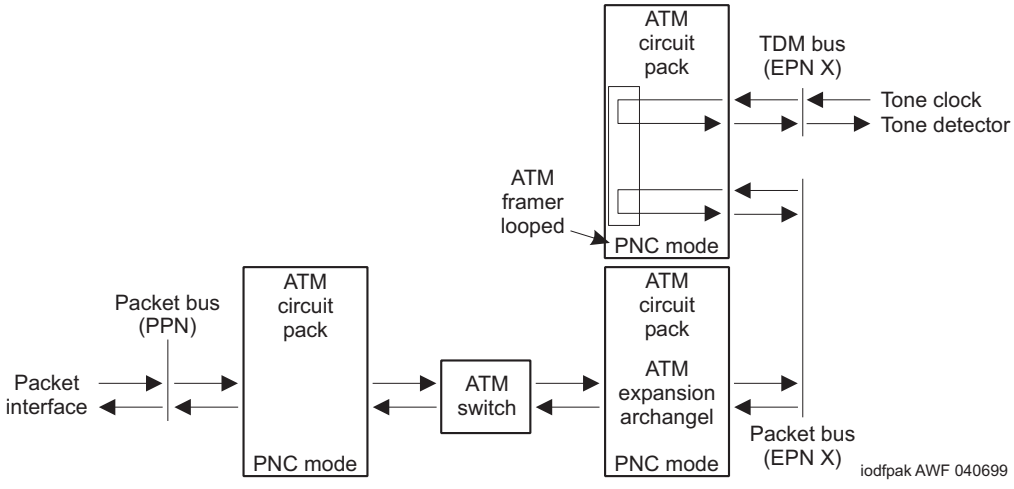


Figure 20. ATM Board Framer Looparound Test (#1260) (non-EAA, Packet Path)

Table 56. ATM Board Framer Looparound Test (#1260)

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system could be under heavy traffic conditions or it could have timeslots out of service due to TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals a maximum of 3 times.

Continued on next page

Table 56. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system could be oversized for the number of Tone Detectors present or some Tone Detectors could be out of service. 1. Resolve any TTR-LEV errors. Even if there are no TTR-LEV errors, there is no Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. If there is not at least one Tone Detector, this test always aborts for this ATM-EI board. This does not harm the system. **NOTE:** DEFINITY Systems require that Tone Clock circuit packs (TN2182) must be of vintage B or newer. If older Tone Detector circuit packs are installed in the system, this test always aborts with this abort code. 2. Resolve any TONE-PT errors. 3. If neither condition exists, retry the command at 1-minute intervals a maximum of 3 times.
1015	ABORT	The ATM-EI circuit pack has not been busied out. 1. Busyout the ATM-Expansion Interface circuit pack, then repeat the **test board UUCSS long** command.
1031	ABORT	If the ATM Expansion Interface circuit pack is in an EPN and is on the active PNC, this test cannot be executed. 1. If PNC Duplication is enabled, attempt to make the standby PNC active with the **reset pnc interchange** command. 2. If the PNC Interchange is successful, rerun the test.
1033	ABORT	The ATM-EI circuit pack is not present. 1. Issue the **list atm-pnc** command to verify that switch recognizes the circuit pack. 2. Retry the command.
1139	ABORT	The packet bus in the EPN where this ATM-EI board is located has a major alarm against it. This test needs to use the alarmed port network's Packet Bus. 1. Resolve any PKT-BUS problems. 2. Retry the command.
1141	ABORT	The Packet Interface circuit pack is out of service. 1. Resolve any PKT-INTF problems.

Continued on next page

Table 56. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
1144	ABORT	The Packet Bus in the PPN has a major alarm against it. This test needs to use the alarmed PPN packet bus. 1. Resolve any PKT-BUS problems. 2. Retry the command.
1394	ABORT	The ATM-EI board is out of service and the test cannot be run. This condition is due to a change in the ATM-EI board's ability to communicate with the ATM switch. 1. Run Test #241. If it does not pass, refer to repair procedures for "Expansion Interface 2-way Transmission Test (#241)".
1395	ABORT	This test cannot be run on an ATM-EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this ATM-EI circuit pack, enable PNC duplication with the **change system-parameters duplication** command. 2. Prevent the system from doing a PNC interchange by executing the **set PNC lock** command. 3. Repeat this test.
1407	ABORT	This test cannot be run on an ATM-EI board that is on the active PNC because it cannot be busied out. This error code indicates that PNC duplication is enabled. 1. Attempt to perform a PNC interchange with the **reset pnc interchange** command. 2. If the PNC interchange is successful, busy out the original ATM-Expansion Interface circuit pack with the **busyout board UUCSS** (address of the original ATM-EI board) command. 3. Retry the command.
2000	ABORT	Response to the test was not received in the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 3 times.
2060	ABORT	The link on the packet bus being used to perform the test has failed. 1. Retry the command at 1-minute intervals a maximum of 3 times. 2. If the test continues to abort, resolve any PKT-INTF errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 3 times.

Continued on next page

Table 56. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The test did not detect the test tone through the looparound connection. **NOTE:** The packet portion of this test was not run since the circuit portion failed. 1. Test the active Tone/Clock (**test tone-clock UUCSS**) on the PN that contains the defective ATM-EI circuit pack to verify that dial tone is being supplied. 2. If the Tone/Clock is healthy, test the ATM-EI circuit pack (**test board UUCSS long**). 3. If this test continues to fail, replace the ATM-EI circuit pack or transceiver. 4. Test the new ATM-EI circuit pack (**test board UUCSS long**).
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the Packet Interface circuit pack. 1. Test the Packet Interface circuit pack to verify that it is functioning properly. If any tests fail, investigate those tests and repair the Packet Interface circuit pack. 2. If the Packet Interface circuit pack is OK, resolve any DS1 CONV-BD alarms or errors (if so equipped). 3. Test the ATM-EI circuit pack (**test board UUCSS long**). 4. If this test continues to fail, replace the ATM-EI board. 5. Test the new ATM-EI circuit pack (**test board UUCSS long**).
3	FAIL	The test tone was transmitted correctly, but the returned tone was distorted. 1. If the Tone/Clock is healthy, test the ATM-EI circuit pack (**test board UUCSS long**). 2. If this test continues to fail, replace the ATM-EI circuit pack. 3. Test the new ATM-EI circuit pack (**test board UUCSS long**).
4	FAIL	Unable to create loop for TDM path for this test. 1. Retry the command at 1-minute intervals a maximum of 3 times. 2. If this test continues to fail, replace the ATM-EI circuit pack. 3. Test the new ATM-EI circuit pack (**test board UUCSS long**).
5	FAIL	Unable to create loop for packet path for this test. 1. Retry the command at 1-minute intervals a maximum of 3 times. 2. If this test continues to fail, replace the ATM-EI circuit pack. 3. Test the new ATM-EI circuit pack (**test board UUCSS long**).

Continued on next page

Table 56. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
6	FAIL	A previously-established looparound was not released. 1. Issue the **reset board UUCSS** command. 2. Retry the command at 1-minute intervals a maximum of 3 times. 3. If this test continues to fail, replace the ATM-EI circuit pack. 4. Test the new ATM-EI circuit pack (**test board UUCSS long**).
	PASS	The ATM-EI board is functioning properly, however this test does not verify that the optical portion of the lightwave transceiver is functioning.
0	NO BOARD	No board was detected by the test. 1. Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

ATM Board Time Of Day Update (#1261)

This test is non-destructive. The ATM circuit pack requires a reference time to do SDH/SONET performance monitoring. This test updates the system time to the board and synchronizes the board with the DEFINITY system clock during initialization, scheduled maintenance, and craft long test.

Table 57. ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description/ Recommendation
2031	FAIL	The attempt to send the message to the ATM-EI circuit pack was not successful.
2500	FAIL	Did not send the time of day information to the board. 1. Retry the command at 1-minute intervals a maximum of 3 times.
	PASS	The ATM-EI circuit pack is successfully updated with system time. 1. If the **status port-network** command still indicates that this link is down, it is possible that one or both of the ATM-EI circuit packs have been busied out. 2. If the link still does not come up, reset one or both ATM-EI circuit packs on the link.
0	NO BOARD	No board detected. 1. Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the NCE chip on the circuit pack could be bad. Replace the pack and retest.

ATM Board Reset (#1256)

This test is destructive. If the ATM-EI board is in the PPN or is a standby in the EPN, the reset is done through the SAKI reset interface. If the ATM-EI is an Expansion Arch Angel (active ATM-EI board in the EPN) a special message is sent to the board over the EAL if the EAL is present.

Table 58. ATM Board Reset (#1256)

Error Code	Test Result	Description/ Recommendation
1386	ABORT	No Active EAL to the board. This error applies only if the board under test is in EPN. Check the error logs for SYS-LINK errors against the port network in which the ATM-EI is residing and take appropriate diagnostic action for the SYS-LINK.
1015	ABORT	This test cannot be run because the ATM-EI circuit pack has not been busied out. 1. Busyout the ATM circuit pack, then repeat the **test board UUCSS long** command.
1407	ABORT	1. Perform a PNC Interchange 2. Try to reset the board again.
None	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort escalate the problem.
2000	ABORT	Did not receive the SANITY response in the given time. 1. Wait for 5 minutes and see if board is visible to the system by using list config all command. 2. If the board is visible, run the test again. If same abort code results, escalate the problem. 3. If the board is not visible to the system with the **list configuration all** command, reseat the board. 4. If the board is still not recognized by the system, replace the board.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2500	ABORT	Internal system error 1. Try to reset the board again.

Continued on next page

Table 58. ATM Board Reset (#1256) — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. 1. Execute command again. 2. If the problem persists, replace the circuit pack.
	PASS	The ATM-EI circuit pack is successfully reset. 1. If the **status port-network** command still indicates that this link is down, it is possible that one or both of the ATM-EI circuit packs are busied out. 2. If the links do not come up after reset, review the error logs and take appropriate diagnostic action.

ATM Cross Talk Test (#1298)

This test is non-destructive. The ATM board Cross Talk test verifies that the selected TDM bus time slot never crosses over to time slots reserved for other connections. The test also checks for cross connections, where the board talks to time slots other than those specified. Since this test uses many system resources (TDM time slots, tone generator, tone detector, and others), it runs as a part of demand test only.

This test fails if either the TDM programmable logic and/or the interface to the DSP is not operating properly. Failure of these components can result in one-way or noisy connections. Refer to Figure 21 for a schematic of this test.

NOTE:
Note: This test takes approximately 12 minutes and applies only to TN2305 and TN2306 circuit packs.

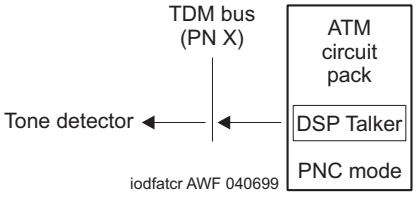


Figure 21. ATM Cross Talk Test #1298 schematic

Table 21-1. ATM Crosstalk Test (#1298)

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it could have time slots out-of-service due to TDM-Bus errors. Refer to TDM-BUS to diagnose these errors. 1. If system has no TDM-Bus errors and is not handling heavy traffic, repeat test at 1-minute intervals for a maximum of 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system could be oversized for the number of tone detectors present or some tone detectors could be out-of-service. 1. Resolve any TTR-LEV errors in the Error Log. 2. Resolve any TONE-PT errors in the Error Log. 3. If neither condition exists, retry the test at 1-minute intervals for a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times.
1962	ABORT	All the TALKER DSPs are busy (an unlikely event). 1. Retry the command at 1-minute intervals a maximum of 3 times.
2302	ABORT	Inconsistent uplink message from the ATM-EI board. This is a very unlikely event. 1. Retry the command at 1-minute intervals a maximum of 3 times.
2752	ABORT	The circuit pack in this location is not a TN230X.
1-8, None	FAIL	The board is writing to unauthorized TDM time slots. The error code indicates the number of faulted TALKER DSPs. 1. Retry the command a maximum of 3 times. 2. If the failure persists, replace the circuit pack.
1-8	PASS	The board is not talking to unauthorized time slots on the TDM Bus. The error code indicates the number of TALKER DSPs that were tested.

ATM Board DSP Test (#1293)

This test is non-destructive and is designed to test the board's interface to the TDM bus and the functions of all 24 on-board DSPs (Digital Signal Processors). There are three functional types of DSPs:

- talkers - put data on the TDM bus
- listeners - take data off the TDM bus
- echo cancelers - as implied

Listener and echo cancelers are tightly coupled because firmware allocates *sets* of DSPs. Since there are a total of 24 DSPs on the board, there can be up to 8 triplets allocated.

If the test fails for all DSPs, a MAJOR alarm is raised against the board. If the test fails for one or more DSPs, a MINOR alarm is raised. If a DSP is busy, the test for that particular DSP is considered passed. The test aborts if the system resources (for example, the TDM time slots, tone generator, and others) are not available.

This test applies to TN2305 and TN2306 ATM-EIs, both active and standby, and is run as part of craft short and long testing, periodic, scheduled, initialization, and error analysis testing. Refer to Figure 22 for a diagram of this looparound test.

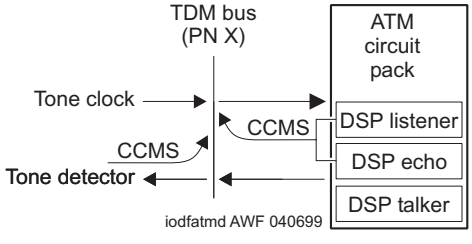


Figure 22. ATM Board DSP Test (#1293)

Table 59. ATM Board DSP Test (#1293)

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it could have time slots out of service due to TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals a maximum of 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system could be oversized for the number of tone detectors present, or some tone detectors could be out of service. 1. Resolve any TTR-LEV errors. Even if there are no TTR-LEV errors, there is no tone detector available on the network that contains the circuit pack being tested. Verify that there is at least one tone detector on the network. If not, this test always aborts for this ATM-EI circuit pack and does not harm the system. 2. Resolve any TONE-PT errors. 3. If neither condition exists, retry the command at 1-minute intervals a maximum of 3 times.
1962	ABORT	All DSPs are busy (an unlikely event). 1. Retry the command at 1-minute intervals a maximum of 3 times.
2000	ABORT	Response to the test was not received within the allowable time period for some of the DSPs. 1. If the board is in standby, reset the board and run the test again. 2. Look into the Error Log for Error Type 1218 (bad DSP). If Error Type 1218 is not logged against this board, run the DSP test again and see if the error persists.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2302	ABORT	Inconsistent uplink message from the ATM-EI board (an unlikely event). 1. Retry the command at 1-minute intervals a maximum of 3 times.
2500	ABORT	Internal system error
2752	ABORT	The circuit pack in this location is not a TN230X.

Continued on next page

Table 59. ATM Board DSP Test (#1293) — *Continued*

Error Code	Test Result	Description/ Recommendation
XYZ	FAIL	A device on the circuit pack is failing. There is at least one bad DSP on the board. Values are as follows: ■ The X value indicates the number of talker DSPs ■ Y indicates the number of listener DSPs ■ Z indicates the number of Echo Canceler DSPs that have failed the test. 1. Run the tests for the active Tone-Clock on the PN that contains the indicted ATM-EI circuit pack to verify that dial-tone is supplied. 2. If the tone-clock is healthy, repeat the short test on the ATM-EI board. 3. If this test continues to fail, replace the ATM-EI circuit pack.
XYZ	PASS	The test passed for some or all DSPs depending on XYZ values. XYZ indicates the number of talker, listener and echo-canceler DSPs for which the test passed, respectively. In the DSPs that passed the test, the test tone was correctly detected by the DSP Listener and by tone-detector for the DSP Talkers on both busses, and the Echo Canceler DSPs are working properly.
0	NO BOARD	No board was detected by the test. 1. Check the Error Log for wrong board (Error Type 125) or no board (Error Type 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error Type 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the circuit pack could be bad. Replace the circuit pack and retest.

ATM-NTWK (ATM Network Error)

MO Name (in Alarm Log)	Physical Name in Error Logs[1]	Alarm Level	Full Name of MO
ATM-NTWK	ATUUP	WARNING	ATM Network Error
ATM-NTWK	UUCSS	WARNING	ATM Network Error

1. *AT* indicates it is an ATM switch related address, *UU* is the connection number. The connection number can be converted into a board location by the command **display atm pnc UU**, which shows the translations for the board that reported the ATM network error. *P* indicates if the ATM-EI board (reporting the ATM network error) is the A side or the B side of the PNC. If the system is simplex, only A is valid.

In the ATM PNC configuration, the proprietary Center Stage Switch (CSS) is replaced by the ATM network. Since the CSS switch nodes are replaced by the ATM network in the ATM PNC configuration, the SNI boards are no longer needed. In place of the SNI boards, the ATM EI or CES boards are connected to an ATM switch port over a fiber optic cable. The port on the ATM switch is under the control of ATM switch maintenance software. Refer to *DEFINITY ECS Release 9 ATM Installation, Upgrades, and Administration* book for more information.

An error against this maintenance object (MO) indicates a problem in the ATM network (including the ATM switch) that is affecting the service quality. These error events are reported by the ATM network to the ATM EI or ATM CES board, or detected by the ATM EI or ATM CES board itself. Since these errors are *not* related to the ATM EI or ATM CES board, they are not reported against the ATM-EI or ATM-TRK Maintenance Object. However, some of these errors invoke alarms that require action by DEFINITY maintenance, while other log-only errors require no action.

Error Codes and Aux Data values

The Cause Code/Error Type information is shown inTable 60 on page 428. These are the possible errors that can be logged against the ATM-NTWK maintenance object.

If the ATM-NTWK Maintenance Object receives more than 6 errors, the most recent are discarded.

Table 60. Error Codes and Aux Data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
NORMAL EVENTS		
0	(a)	Network unreachable
1	(a)	Unallocated (unassigned) number. This cause indicates that the called party cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).
2	(a)	No route to specified transit network. This cause indicates that the equipment sending this cause has received a request to route the call through a particular network which it does not recognize, either because the transit network does not exist or because that particular transit network does not serve the equipment which is sending this cause. This cause is supported on a network-dependent basis.
3	(a)	No route to destination. This cause indicates that the called party cannot be reached because the network through which the call has been routed does not serve the destination desired. This cause is supported on a network-dependent basis.
10	(a)	VPCI/VCI unacceptable. This cause indicates that the virtual channel most recently identified is not acceptable to the sending entity for use in this call.
16	(a)	Normal call clearing. This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared. Under normal situations, the source of this cause is not the network.
17	(a)	User busy. This cause indicates that the called party is unable to accept another call because the user busy condition has been encountered. This cause value can be generated by the called user or by the network.
18	(a)	No user responding. This cause is used when a called party does not respond to a call establishment message with a connect indication within the prescribed period of time allocated.
21	(a)	Call rejected. This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible. **NOTE:** If the call was rejected by the far-end ATM-EI or ATM-CES board, there could also be additional information about this rejection in an ATM-EI error log entry. Look for an ATM-EI or error with an Error Type between 1104 and 1119 inclusive, with approximately the same time stamp as this error.

Continued on next page

Table 60. Error Codes and Aux Data values ATM-NTWK — *Continued*

Cause Code/ Error Type	Aux Data	Cause Codes Description
22	(a)	Number changed. This cause is returned to a calling party when the called party number indicated by the calling user is no longer assigned. The new called party number can optionally be included in the diagnostic field. If a network does not support this capability, cause number 1 "*unassigned (unallocated) number*" is used.
23	(a)	User rejects all calls with calling line identification restriction (CLIR). This cause is returned by the called party when the call is offered without calling party number information and the called party requires this information.
27	(a)	Destination out of order. This cause indicates that the destination indicated by the user cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signalling message was unable to be delivered to the remote user; for example, a physical layer or SAAL failure at the remote user or user equipment off-line.
28	(a)	Invalid number format (address incomplete). This cause indicates that the called user cannot be reached because the called party number is not in a valid format or is not complete.
30	(a)	Response to STATUS ENQUIRY. This cause is included in the STATUS message when the reason for generating the STATUS message was the prior receipt of a STATUS ENQUIRY message.
31	(a)	Normal, unspecified. This cause is used to report a normal event only when no other cause in the normal class applies.
32	(a)	DTL transit not-my-node ID
RESOURCE UNAVAILABLE		
35	(a)	Requested VPCI/VCI not available. This cause indicates that the requested VPCI/VCI is not available. This can be caused by mismatched VCI ranges on different ATM switches.
36	(a)	VPCI/VCI assignment failure
37	(a)	User Cell Rate not available
38	(a)	Network out of order. This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long period of time; for example, immediately re-attempting the call is not likely to be successful.
41	(a)	Temporary failure. This cause indicates that the network is not functioning correctly and that the condition is not likely to last a long period of time. For example, the user can try another call attempt immediately.

Continued on next page

Table 60. Error Codes and Aux Data values ATM-NTWK — *Continued*

Cause Code/ Error Type	Aux Data	Cause Codes Description
43	(a)	Access information discarded. This cause indicates that the network could not deliver access information to the remote user as requested; that is, ATM adaptation layer parameters, Broadband low layer information, Broadband high layer information, or sub-address as indicated in the diagnostic.
45	(a)	No VPCI/VCI available. This cause indicates that there is no appropriate VPCI/VCI presently available to handle the call.
47	(a)	Resource unavailable, unspecified. This cause is used to report a resource unavailable event only when no other cause in the resource unavailable class applies.
SERVICE OR OPTION UNAVAILABLE		
49	(a)	Quality of Service unavailable. This cause is used to report that the requested Quality of Service cannot be provided.
51	(a)	User cell rate not available. This cause is used to report that the requested ATM Traffic Descriptor is unobtainable.
57	(a)	Bearer capability not authorized. This cause indicates that the user has requested a bearer capability which is implemented by the equipment which generated this cause but the user is not authorized to use.
58	(a)	Bearer capability not presently available. This cause indicates that the user requested a bearer capability implemented by the equipment that generated the cause but is not available at this time.
63	(a)	Service or option not available, unspecified. This cause is used to report a service or option not available event only when no other cause in the service or option not available class applies.
65	(a)	Bearer capability not implemented. This cause indicates that the equipment sending this cause does not support the bearer capability requested.
73	(a)	Unsupported combination of traffic parameters. This cause indicates that the combination of traffic parameters contained in the ATM traffic descriptor information element is not supported.
78	(a)	AAL parameters cannot be supported.
INVALID MESSAGES		
81	(a)	Invalid call reference value. This cause indicates that the equipment sending this cause has received a message with a call reference which is not currently in use on the user-network interface.
82	(a)	Identified channel does not exist. This cause indicates that the equipment sending this cause has received a request to use a channel not activated on the interface for a call.

Continued on next page

Table 60. Error Codes and Aux Data values ATM-NTWK — *Continued*

Cause Code/ Error Type	Aux Data	Cause Codes Description
88	(a)	Incompatible destination. This cause indicates that the equipment sending this cause has received a request to establish a call which has Broadband low layer information, Broadband high layer information, or other compatibility attributes which cannot be accommodated.
89	(a)	Invalid endpoint reference value. This cause indicates that the equipment sending this cause has received a message with an endpoint reference that is currently not in use on the user-network interface.
91	(a)	Invalid transit network selection. This cause indicates that a transit network identification was received in an incorrect format.
92	(a)	Too many pending add party requests. This cause indicates a temporary condition when the calling party sends an add party message, but the network is unable to accept another add party message because its queues are full.
93	(a)	AAL parameters cannot be supported. This cause indicates that the equipment sending this cause has received a request to establish a call with ATM adaptation layer parameters that cannot be accommodated.
PROTOCOL ERROR		
96	(a)	Mandatory information element is missing. This cause indicates that the equipment sending this cause has received a message that is missing an information element.
97	(a)	Message type non-existent or not implemented. This cause indicates that the equipment sending this cause has received a message with a message type it does not recognize, either because this is a message not defined, or defined but not implemented by the equipment sending this cause.
99	(a)	Information element non-existent or not implemented. This cause indicates that the equipment sending this cause has received a message that includes information element(s) not recognized, because the information element identifier(s) are not defined, or are defined but not implemented by the equipment sending the cause. This cause indicates that the information element was discarded. However, the information element is not required to be present in the message in order for the equipment sending this cause to process the message.
100	(a)	Invalid information element contents. This cause indicates that the equipment sending this cause has received and implemented an information element. However, one or more of the fields in the information element are coded in such a way that has not been implemented by the equipment sending this cause.
101	(a)	Message not compatible with call state. This cause indicates receipt of a message that is incompatible with the call state.

Continued on next page

Table 60. Error Codes and Aux Data values ATM-NTWK — *Continued*

Cause Code/ Error Type	Aux Data	Cause Codes Description
102	(a)	Recovery on timer expiration. This cause indicates that a procedure has been initiated by the expiration of a timer in association with error handling procedures.
104	(a)	Incorrect message length
111	(a)	Protocol error, unspecified. This cause is used to report a protocol error event only when no other cause in the protocol error class applies.
257 to 300 (b)	(b)	ATM Impaired Paths 1. Examine the error log (**display errors**), atm setup-events log (**list measurements atm svc-setup**), and atm pnc-latency (**list measurements atm latency**) screens to help diagnose the problem -- it is possible the switch is operating normally. In this case, you should consider raising the Activation threshold and/or increasing the Timeout value on the ATM-RELATED System Parameters screen. (**change system atm**). You can use the **list measurements atm svc-setup** command to provide information about errors associated with connection numbers. 2. After entering the above command, note the time stamps shown in the **list measurements atm setup-events** screen. Execute the above command periodically and note the time stamps. If the time stamps have changed for a particular From Conn-To Conn pair, this indicates there are still setup failures/delays for that connection. 3. After verifying that all associated ATM end-points are operating correctly, and if errors are still occurring, contact your local service provider.
301 (c)	ANY	System wide ATM Impaired Paths. See the suggestions listed above to trouble shoot these errors.
769 (d)		ATM CLP (Cell Loss Priority) Bit Errors
1025 (e)		ATM Congestion Bit Errors
1281 (f)		ATM Cell Underrun Errors
1537 (g)		ATM Cell Overrun Errors
1793 (h)		ATM Lost Cells

Notes:

a. Aux Data values for Setup and Add Party (XX = Port Network, YYY = location code).

Aux Data values for WSP Setup (XX = WSP number, YYY = location code).

Table 61 is a list of UNI 3.1 location codes:

Table 61. Location codes from Aux Data values

Setup (Location Code)	Add Party (Location Code)	WSP Setup (location Code)	Location Code Meaning
0	500	800	User
1	501	801	Private network serving the local user
2	502	802	Public network serving the local user
3	503	803	Transit network
4	504	804	Public network serving the remote user
5	505	805	Private network serving the remote user
7	507	807	International network
10	510	810	Network beyond interworking point

b. **Error Types 257 to 300** — These error type numbers are used to determine the destination PNC connection number of an ATM Network connection that is experiencing an impaired path. The connection number is obtained by subtracting 256 from the number that is shown in the Error Type field. See the following example:

ERROR TYPE field =	263
Subtract	-256
PNC destination connection # =	7

The AUX DATA field contains the originating and destination PN number (XXYY). Where XX = the originating PN #, and YY = the destination PN # for example:

1. AUX DATA = 302
   3 = orig
   2 = dest

2. Example AUX DATA = 1510
   15 = orig
   10 = dest

c. **Error Type 301** — indicates that there is a system wide impaired path network problem.

NOTE:
Under certain circumstances network errors can be against the ATM EI board.

d. **Error Type 769** — ATM CLP (Cell Loss Priority) Bit Errors

The ATM cell header has a bit called the cell loss priority (CLP) bit. The bit indicates one of two states: the cell is eligible for discarding, or it is not. In DEFINITY ATM, all cells are transmitted into the ATM network with the CLP bit set to 0 indicating that these cells are NOT eligible for discarding. Should DEFINITY ever receive a cell from the ATM network with the CLP bit set to 1 (discard eligible), an entity in the ATM network modified the bit during transit. Generally, an ATM network switch sets the CLP bit to 1 (discard eligible) only if the cell fails to conform to the cell rate specified in the traffic contract for the VC. However, DEFINITY ATM traffic shapes cell emissions to conform to the VC traffic contract. Therefore, for a cell to no longer conform implies that something else in the ATM network switch is setting the CLP bit in some cells, the ATM switch can also be policing out (discarding) cells which do not conform to the traffic contract. This error can occur together with other errors such as:
"Excessive AAL5 CRC errors" or
"Excessive LAP-D retransmissions".

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Again, this indicates problems with cell transmissions in the ATM network.

If cell discard is happening generically in the ATM network, other symptoms can affect the Constant Bit Rate (CBR) SVCs including audible artifacts in talk paths, failure of modems over voice lines, and "Cell Underruns" - see note (f).

e. **Error Type 1025** — ATM Congestion Bit Errors

The ATM cell header has a bit called the congestion bit. In DEFINITY ATM, all cells are transmitted into the ATM network with the congestion bit set to 0 (congestion not experienced). Should DEFINITY ever receive a cell from the ATM network with the congestion bit set to 1 (congestion experienced), an entity in the ATM network modified the bit during transit. It simply indicates that the ATM network is experiencing heavy traffic.

During periods of congestion, the ATM network can choose to discard cells even though those cells conform to their traffic contracts. Should the ATM network discard cells, errors such as the following can occur:

"Excessive AAL5 CRC errors" or
"Excessive LAP-D retransmissions".

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Symptoms that can affect the Constant Bit Rate (CBR) SVCs include audible artifacts in talk paths, failure of modems over voice lines, and "cell Underruns" - see note (f).

f. **Error Type 1281** — ATM Cell Underruns

DEFINITY ATM monitors for cell underrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES Trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive below that rate, an underrun condition exists. The most likely cause of cell underruns is a problem with cell transmission through the ATM network.

Possible symptoms include audible artifacts in talk paths and failure of modems over voice lines. If cell loss is happening generically in the ATM network, other symptoms like "excessive AAL5 CRC errors" or "excessive LAP-D retransmissions" are possible on SVCs with Variable Bit Rate (VBRnt) traffic contracts. The VBR SVCs transport system links such as EAL, PACL, and PRI links.

Another DEFINITY ATM board at the specified traffic contract rate originally generated the arriving cells. In order to have arrived at a lower rate, these cells were either slowed during transmission or possibly discarded by the ATM network. This indicates problems with cell transmission in the ATM network. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

Cell underruns often happen in conjunction with cell overruns. If both occur, it further indicts the ATM network.

g. **Error Type 1537** — ATM Cell Overruns

DEFINITY ATM monitors for cell overrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES Trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive above that rate, an overrun condition exists. The most likely cause of cell overruns is a problem with cell transmission through the ATM network.

Both cell underruns and overruns are typical symptoms of cell transmission problems like cell jitter or delay. The ATM board attempts to compensate somewhat by buffering cells. However, if the ATM network transmission delays are high, the board could conclude that it has seen a cell overrun because it has exhausted all its buffer space.

If cell underruns or both cell underruns and overruns occur, indict the ATM network. Consult the ATM vendor. Ask about cell delay variation, cell discard, and traffic policing.

Another much less likely cause of cell overruns is that an ATM board is generating cells above the traffic contract rate. Suppose, a board somehow generates cells too quickly. The ATM network likely reacts by at least setting the CLP bit in the cells that exceed the traffic contract (see note (d) for ATM CLP errors). The ATM network can also discard the excess cells.

If only cell overruns occur, locate the DEFINITY ATM board generating those cells. Execute **test board long**. If the board passes, then the ATM network remains the likely cause of transmission problems. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

h. **Error Type 1793** — ATM lost cells:

The ATM board receiving the CBR cell stream is detecting out-of-sequence AAL1 sequence numbers, above the defined threshold. This normally indicates that the ATM network has lost the missing cells. In this case, "lost" could mean that the cells were, for example, policed out, lost to congestion, or misdirected to another endpoint.

The likely user-visible symptoms of lost cells are missing talk paths or poor voice quality.

The "lost cells" error can help you diagnose cell underrun problems. When cell underruns are accompanied by lost cells errors, the lost cells could have caused the underruns. But if you have cell under runs without lost cells, it could indicate that the underruns were due to network jitter instead. It is also possible that network jitter can cause both cell underruns and lost cells, if the jitter is so severe it causes the cells to violate their traffic contract.

When accompanied by congestion or CLP errors, the congestion or CLP can be causing the lost cells.

When accompanied by cell overrun errors, the cell overruns can be causing the TN2305 to discard cells, which in turn can show up as lost cells.

Lost cells without other errors can indicate that cells are being corrupted, especially the AAL1 sequence number.

In any case, consult your ATM network vendor about possible causes. Look for jitter (cell delay variation), cell discard, and traffic policing.

ATM-TRK (Circuit Emulation Service Circuit Pack)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-TRK	MAJOR	test board UUCSS	ATM TRUNK (ATM Circuit Emulation Service)
ATM-TRK	MINOR	test board UUCSS	ATM TRUNK (ATM Circuit Emulation Service)
ATM-TRK	WARNING	test board UUCSS	ATM TRUNK (ATM Circuit Emulation Service)

1. UU is the universal cabinet number (1 for PPN, 2 - 44 for EPNs). C is the carrier designation (A, B, C, D, or E). SS is the number of the slot in which the circuit pack resides (01 to 21).

This maintenance object explains how you test and repair TN230x ATM Interface circuit packs (TN2305 and TN2306) that have been administered as virtual ISDN-PRI trunks for ATM Circuit Emulation Service (CES). The maintenance instructions for TN230x circuit packs that have been administered as Expansion Interfaces for WAN connectivity are in the ATM-INTF (TN2305/6) maintenance object.

Description

The TN2305 and TN2306 (Table 62 on page 439) are dual-purpose ATM circuit packs that can be administered as either personality:

- "ATM Circuit Emulation Service" or virtual ISDN-PRI signaling trunks.
- Expansion Interfaces (ATM-EI) for Port Network Connectivity (ATM-PNC) between the PPN and the EPNs.

Either circuit pack "personality" requires SONET OC-3 or SDH STM-1 fiber cable connections between the circuit pack and the ATM switch. As a trunk board, it supports direct connection between ATM CES circuit packs without an intervening ATM switch.

Table 62. R7 ATM-TRK circuit packs

Circuit pack	Channel types	Interface	Fiber	Echo cancellation
TN2305	B and D channels	24 or 32 channel	Multi mode	Y
TN2306	B and D channels	24 or 32 channel	Single mode	Y

NOTE:
TN230x circuit packs are not interchangeable.

ATM Circuit Emulation Service

Under ATM Circuit Emulation Service (CES), you simulate ISDN-PRI circuits by assigning ports to *signaling groups*. Each signaling group represents a PRI circuit, and the ports in the group represent the D-channel and B-channels of that circuit. TN230x circuit packs support up to 248 ports per circuit pack.

Virtual D-channels. Non-facility associated signaling is not supported under ATM-CES, so you must reserve one port in each signaling group for use as a D-channel (channel 24 when emulating a T-1 ISDN facility, channel 16 when emulating an E-1 facility). The D-channel can be any physical port from 9 to 32.

Virtual circuits. The TN230x can support a varied number of virtual circuits, depending on the switch and the administration of the circuit pack. Table 63 lists the possibilities for various DEFINITY ECS models.

Table 63. Circuit and channel capacities, for each DEFINITY model

Model	Ports	Emulated circuits (signaling groups)	Channels/circuit	Virtual D-channels	Virtual B-channels
R6csi	248	1 to 8	24 (T1), 31 (E1)	1-8	6-240
R6si	248	1 to 8	24 (T1), 31 (E1)	1-8	6-240
R6r	248	1 to 8	24 (T1), 31 (E1)	1-8	6-240

Virtual trunk groups. You cannot bundle physical DS1 ISDN-PRI circuits and virtual ATM-CES circuits into the same trunk groups. Virtual circuits can only be assigned to all-virtual, all-ATM trunk groups. Table 64 lists the possible trunk-group capacities.

Table 64. ATM CES capacities by DEFINITY model

Model	Ports per trunk group (max)	Trunk groups per switch (max)	Trunks per switch (max)
R6csi	99	99	400
R6si	99	99	400
R6r	255	666	400

Table 65 shows the ATM CES capacities for both T1 and E1 circuits.

Table 65. Ports available for trunking, for each ISDN facility type

Type	Channels per signaling group (trunk)	Max. signaling groups (trunks) per circuit pack	Max. available ports	Reserved ports	Total ports
T1:	24	8	192	ports 1-8	256
E1:	31	8	248	ports 1-8	256

LEDs

The ATM circuit pack LEDs give you a visual indication of the condition of the TN230x circuit pack (Table 66).

Table 66. ATM-TRK LED interpretation

LEDs	Condition	LED status
Red	Error (alarm logged)	On
Red and Green	Booting (LEDs being tested)	Blinking (on 200 ms, off 200 ms)
Green	Test/maintenance in progress	On
Yellow	Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC	Blinking fast (100 ms on, 100 ms off)
Yellow	Signal to ATM switch down	Blinking slowly (500 ms on, 500 ms off)
Yellow	One or more CES signaling groups administered	On
Yellow	CES signaling group not administered or not reporting to firmware	Off

ATM-TRK-related commands

Table 67 lists some commands that can be useful in troubleshooting ATM errors and alarms.

Table 67. ATM CES troubleshooting commands

Command	Description
display circuit-packs *cabinet*	Shows the circuit packs in the cabinet, identifying ATM Trunk as well as ATM-EI boards. "ATM Interface" boards have not been administered as CES or PNC.
display atm ports *UUCSSppp*	Shows the 256 ports on the ATM board with the corresponding signaling and trunk group.
list configuration atm	Lists the ATM boards, identifying equipment location, board code, type, and vintage.
list configuration trunks	Lists boards identifying assigned ports. While the ATM board is listed, the 256 ports are not.

Continued on next page

Table 67. ATM CES troubleshooting commands — *Continued*

Command	Description
busyout/release atm signaling-group	Busyout or release of an ATM signaling group within a trunk group.
status atm signaling-group	Show current status of an ATM signaling group.
status trunk-group	Shows status of the trunk group (ATM signaling groups are part of trunk groups).

Error Log Entries and Test to Clear Values

Table 68. ATM-TRK Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		test board UUCSS
1(a)		None	MIN	ON	
18(b)	0	busy out board UUCSS	MIN	ON	release board UUCSS
23(c)	0	None	MIN	ON	
125(d)		None	MIN	ON	
257(e)	Any	Control Channel Loop Test (#52)	MIN	ON	test board UUCSS r 2
513(f)	Any	ATM Cross talk Test (#1298)	MIN	ON	test board UUCSS l r 1
769(g)	35	ATM Error Query Test #1259	WRN	OFF	test board UUCSS
770(g)	25	ATM Error Query Test #1259	WRN	OFF	test board UUCSS
771(h)	26	ATM Error Query Test #1259	WRN	OFF	test board UUCSS
1281(i)		ATM Board Error Query Test (#1259)	WRN/ MIN	OFF	test board UUCSS r 1
1537(j)	12	None	WRN/ MIN	ON	
1538(k)	0	None	WRN/ MIN	ON	reset board UUCSS
1794(l)	13	None	MIN	ON	

Continued on next page

Table 68. ATM-TRK Error Log entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2049(m)	15	None	WRN	OFF	test board UUCSS
2306(n)		None			
2561(o)		Packet interface test (#598)	MIN	ON	test board UUCSS r 2
2817(p)	1-24	ATM Board DSP test (#1293)	WRN/ MIN	ON	test board UUCSS
2818(p)	1-24		WRN/ MIN	ON	test board UUCSS
3330(q)	3		MIN	OFF	
3585(r)		ATM Board Error Query test (#1259)	WRN/ MIN	ON	test board UUCSS l
3841(s)	Any	None			
3842(t)	11	None			
3843 (u)		None			
3999(v)	Any	None			

Notes:

a. **Error Type 1:** the ATM-TRK circuit pack does not appear to be in its assigned slot.

   1. Make sure that the ATM-TRK circuit pack is installed correctly seated in the slot administered for the ATM trunk.

b. **Error Type 18:** the ATM circuit pack is busied out.

   1. Run **release board UUCSS**.

c. **Error Type 23:** an ATM trunk is administered, but the corresponding ATM-TRK circuit pack does not appear to be physically installed.

   1. Make sure the ATM-TRK circuit pack is installed and correctly seated in the slot.

d. **Error Type 125:** an ATM trunk is administered but a non-ATM-TRK circuit pack is installed in the corresponding slot. You have two options:

   - Replace the incorrect circuit pack with an ATM-TRK circuit pack.
   - Or re-administer the slot for the circuit pack that is physically present, locate the slot where the ATM-TRK circuit pack is actually installed, and re-administer the ATM trunk.

e. **Error Type 257:** Control Channel Loop Test #52 failed. The circuit pack is not properly connected with the control channel on the TDM bus.

   1. Take the corrective action specified by Test #52.

f. **Error Type 513:** ATM Crosstalk Test (#1298) failed. The board is writing to or reading from a TDM time slot that is not allocated to the board, or the Digital Signal Processor (DSP) selected for this test has malfunctioned.

   1. Run **test board UUCSS**.
   2. Take the corrective action specified for Test #1298.

g. **Error Type 769, 770:** the ATM switch is requesting too many LAPD retransmissions (off-board ATM cell corruption errors).

Error Type	Aux Data	Description
769	35	LAPD excessive retransmission requests
770	25	ATM uncorrectable cell headers - threshold

   1. Check the connections between the fiber cable, the ATM-TRK circuit pack, and the ATM switch.
   2. See PKT-BUS (Packet Bus) for test and corrective procedures.
   3. Determine what type of fiber is installed between the ATM-TRK circuit pack and the ATM switch.

If	Then
There is multimode fiber	Check the length of the fiber. If the cable is longer than 2 km, it is probably causing the errors.
There is single-mode fiber or the length of the multimode fiber is less than 2 km	The source of the errors can lie in the ATM facility, the ATM-TRK circuit pack, or the far-end circuit pack.

   4. Perform ATM loopback tests on the near-end ATM-TRK circuit pack and on the far-end circuit pack or ATM switch.

If	Then
The ATM-TRK circuit pack fails the loopback test.	The problem is in the ATM-TRK circuit pack. Replace the circuit pack.
The far-end circuit pack or ATM switch fails the loopback test.	The problem is in the far-end circuit pack or ATM switch. Consult the circuit-pack or ATM switch documentation for advice.
The equipment at each end of the ATM span passes the loopback test	The problem is somewhere in the ATM span. Lack of bandwidth can be forcing an intermediate ATM switch to drop cells.

5. Check capacity and peak bandwidth consumption for the ATM span.

If	Then
The capacity of the span is inadequate or bandwidth consumption is too high.	Reduce traffic on the DEFINITY ECS switch to ensure that it is using no more that its subscribed bandwidth.

h. **Error Type 771:** the ATM switch is sending cells with unknown Virtual Path-Identifier (VPI) and Virtual Channel-Identifier (VCI) addresses.

   1. Make sure that the ATM-TRK circuit-pack address is administered identically on the ATM switch and the DEFINITY ECS.

i. **Error Type 1281:** Board major signals error (loss of high-level signal). The far-end has detected a major problem in transmissions originating from the ATM-TRK circuit pack. The possible Aux Data values for this software counter are listed in Table 69.

Table 69. Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone Clock problem. 1. Check for TDM-BUS or TONE-BD errors in the Error Log. 2. If no other problems are present, reset the circuit pack (**reset board UUCSS**)
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-TRK board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. 1. Run **test board UUCSS** command. 2. If Test #1259 fails with Error Code 16, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. If it does the problem is off-board. 3. If the yellow LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cannot obtain or maintain STM-1/OC-3 framing. 1. Try to more the fiber on the ATM switch side to a different port. 2. If the problem persists, reset the circuit pack (**reset board UUCSS**).

Continued on next page

Table 69. Error type 1281 Aux Data and repair procedures — *Continued*

Aux Data	Alarm Description	Repair procedure
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. 1. See if the ports at the MUX and/or the ATM switch are connected snugly. 2. Run **test board UUCSS** command 3. If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. 4. If it does the problem is off-board. 5. If the yellow LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far-end is detecting a major problem with the signal that this board is transmitting. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface 2. Run **test board UUCSS** command. 3. If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. 4. If it does the problem is off-board. 5. If the yellow LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. 1. Reset the board (**reset board UUCSS**). 2. If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/SONET)	The incoming signal payload is not set up for transmission of ATM data. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface.

Continued on next page

Table 69. Error type 1281 Aux Data and repair procedures — *Continued*

Aux Data	Alarm Description	Repair procedure
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. 2. Run **test board UUCSS**. 3. If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. 4. If it does the problem is off-board. 5. If the yellow LED continues to flash, replace the circuit pack.
23	High-level path Remote defect Indicator: HP_RDI	The far-end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. 2. Run **test board UUCSS** command; if the Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the yellow LED flash goes away. 3. If it does the problem is off-board. 4. If the yellow LED continues to flash, replace the circuit pack.
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. 1. Reset the board (**reset board UUCSS**). 2. If the error persists, replace the board.
27	SIGCON_DOWN ATM switch high level signal.	The board cannot communicate with the ATM switch. 1. Busyout the board (busyout board UUCSS). 2. Test the board (**test board long UUCSS**). 3. If Test #1260 fails, replace the board. 4. If Test #1260 passes, make sure the ATM address on both the DEFINITY and the ATM switch sides are the same for this board. 5. If the address is the same, change the port on the ATM switch side. 6. If the error is resolved, the problem is on the ATM switch port.

j. **Error Type 1537:** LANHO bus timeout. The circuit pack is transmitting too many bytes on the LAN bus for a single frame. This can be due to:

- an on-board fault.
- a faulty data received on one of the circuit pack's external ports.

If the error occurs 3 times in 10 minutes, the board is isolated from the Packet Bus and the board is alarmed. To clear the alarm:

1. Restore this circuit pack to the Packet Bus with this command sequence:

   a. **busyout board UUCSS**

   b. **reset board UUCSS**

   c. **test board UUCSS long**

   d. **release board UUCSS**

2. If the problem persists and there are no PKT-BUS or port alarms, replace the circuit pack.

k. **Error Type 1538:** The ATM-TRK circuit pack is hyperactive (sending an abnormal number of control messages to the processor). Use the following command sequence for this ATM-TRK circuit pack:

1. **busyout board UUCSS**
2. **reset board UUCSS**
3. **test board UUCSS long**
4. **release board UUCSS**
5. If this error persists, replace the circuit pack.

l. Error Type 1794: LANHO transmit FIFO overflow. The circuit pack's transmit buffers have overflowed.

1. Run **test board UUCSS r 5**.

If	Then
Test #598 fails	Replace the circuit pack.

m. **Error Type 2049:** ACL Link Failure (link is down). The ATM Control Link (ACL) has failed, communication has been interrupted between the SPE and the ATM-TRK circuit packs on the system, and signaling-group parameters are not communicated across the packet bus.

1. Check the PKT-BUS (Packet Bus) and SYS-LINK (System Link) maintenance objects, and follow the repair procedures indicated.
2. Run **test board UUCSS** against the ATM-TRK circuit pack.

If	Then
Test 598 fails.	Follow the repair procedures suggested for that test.

n. **Error Type 2306:** too many parity errors in data received from the LAN/packet bus.

1. Run **test board UUCSS**.

If	Then
Test 598 fails.	Follow the repair procedures suggested for that test
Test 598 passes.	See the PKT-BUS (Packet Bus) maintenance object, and perform the specified repair.
There are no errors against the packet bus maintenance object.	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

o. **Error Type 2561:** Packet Interface Loop Around Test (598) Failure. The ATM-TRK circuit pack has failed, the packet bus has a minor alarm active, or the packet bus is out of service.

1. Run **test board UUCSS**.

If	Then
Test 598 fails.	Follow the repair procedures suggested for that test
Test 598 passes.	See the PKT-BUS (Packet Bus) maintenance object, and perform the specified repair.
There are no errors against the packet bus maintenance object.	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

p. **Error Type 2817, 2818:** DSP failure detected along the circuit path.

1. Run **test board UUCSS**.
2. Follow the repair procedures suggested for Test #1293.

Error Type	Description
2818	One or more DSPs failed. The Aux Data field contains the ID number of DSP that failed
2817	DSP test failure. The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs

q. **Error Type 3330:** LANHO critical error. The circuit pack reports that the on-board LANHO chip is insane (possibly due to a problem in Packet Bus arbitration, in the transmission line frame, or in the circuit pack itself). The circuit pack cannot talk to the Packet Bus.

1. Check for PKT-BUS alarms.

If	Then
There is a packet-bus alarm.	There is probably a packet-bus problem, particularly if other circuit packs on the packet bus report the same error. See the PKT-BUS (Packet Bus) maintenance object and the packet-bus fault-isolation and recovery sections of the maintenance manual for repair procedures.
There are no packet-bus alarms.	Run the following command sequence: **1. busyout board UUCSS** **2. reset board UUCSS** **3. test board UUCSS long** **4. release board UUCSS**
The problem persists.	Replace the ATM-TRK circuit pack.

r. **Error Type 3585:** Major board alarm; failure of critical components involved in the operation of the circuit pack. The circuit pack has failed, and the switch can no longer recognize it.

Aux Data	Description
1	ATM framer chip failure
2	NCE failed
4	TDM PLD failed
5	All DSPs on the circuit pack have failed
6	Receive Network Processor (RNP) failed
7	Transmit Network Processor (TNP) failed
8	MEMORY read/write failure
9	DUART failure

1. Run **test board UUCSS long**.

If	Then
Test #1259 fails with Error Code XXYY and XX is an AUX value in the preceding table	Replace the ATM-TRK circuit pack.
The system does not recognize the circuit pack	Replace the ATM-TRK circuit pack.

s. **Error Type 3841:** the ATM-TRK circuit pack received an unrecognized message from the switch and responded with an inconsistent down-link error message.

1. Do nothing. This error does not affect service.

t. **Error Type 3842:** LANHO Receive FIFO Overflow error; the packet bus is delivering data to the ATM-TRK circuit pack faster than the circuit pack can distribute it to the endpoint.

1. Do nothing. The circuit pack can recover by itself.

u. **Error Type 3843:** The firmware on the circuit pack is reporting a resource that is to low. This error does not affect the service and no action is required.

v. **Error Type 3999:** circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	Circuit pack is taken out of service
If Error Type 1538 is not present	Circuit pack is *not* taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. ■ This can be normal during heavy traffic. ■ If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and error codes

Always investigate problems in the order presented. When you clear one of the error codes associated with a given test, you clear errors generated by other tests in the testing sequence. If you clear errors out of order, you can lose important information.

Table 70. System Technician-Demanded Tests: ATM-TRK

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
ATM Board Time Of Day Update (#1261)		X		ND
Connection Audit Test (#50)		X		ND
Control Channel Loop Test (#52)		X		ND
Packet Interface Loop Around Test (#598)	X	X		ND
ATM DSP Test (#1293)	X	X		ND
ATM Board Framer Looparound Test (#1260)		X		D
ATM Board Error Query Test (#1259)	X	X		ND
ATM Cross Talk Test (#1298)		X		ND
ATM Board Reset (#1256)			X	D

1. D = Destructive, ND = Non-destructive

Connection Audit Test (#50)

Non-destructive (in a sane switch environment).

The Connection Audit test updates TDM time slots. It sends network-update Control Channel Message Set (CCMS) messages that tell the ATM-TRK circuit pack to listen to, talk to, or disconnect particular time slots.

The test passes if software successfully sends the downlink network-update messages. It aborts otherwise.

CAUTION:
Though normally non-destructive, this test could unintentionally tear down an active call if the connection-manager software's tables are corrupt.

Table 71. TEST #50 Connection Audit Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. Retry the command up to 5 times at 1-minute intervals.
1019	ABORT	The test aborted because a test was already running on the port. Retry the command up to 5 times at 1-minute intervals.
	FAIL	Internal system error 1. Retry the command up to 5 times at 1-minute intervals.
	PASS	The circuit pack has been updated with its translation.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check the board translations. 2. If the ATM-TRK circuit pack is not administered, run **add atm trunk UUCSS**. 3. If the ATM-TRK circuit pack is administered correctly, check the error log. 4. If ATM-TRK circuit pack is hyperactive, shut down, and reseat the circuit pack to force re-initialization. 5. If the ATM-TRK circuit pack is correctly inserted, run **busyout board**. 6. Run **reset board**. 7. Run **release busy board**. 8. Run **test board long** to re-establish the linkage between the internal ID and the port.

Control Channel Loop Test (#52)

The non-destructive Control Channel Loop Test is part of the maintenance subsystem's Common Port Board Testing feature. The Common Port Board test sends board vintage queries to a port circuit pack and checks the responses. CCMS downlink notifications tell the circuit pack which TDM Bus (A or B) carries the control channel and which carries the touch tones.

The test passes if the port circuit pack responds. The test aborts if the circuit pack does not respond. The test fails otherwise.

Table 72. Control Channel Test #52

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Test request timed out.
2100	ABORT	Could not allocate needed system resources.
2500	ABORT	Internal system error 1. Retry the command up to 3 times at 1-minute intervals.
	FAIL	The ATM circuit pack responded incorrectly. 1. Retry the command up to 3 times at 1-minute intervals. 2. If the test continues to fail, reset the ATM-TRK circuit pack (**reset board UUCSS**). 3. If test continues to fail, replace the circuit pack or transceiver.
	PASS	The ATM-TRK circuit pack is communicating correctly with the software.
0	NO BOARD	Circuit pack not detected. 1. Check the error log for Error 125 (wrong board) or Error 131 (no board), and correct any errors found. 2. Make sure that the ATM-TRK circuit pack is properly translated and inserted. 3. Check for Error 1538 (hyperactivity). If hyperactive, run **reset board UUCSS**. 4. Run the test again. If it fails, replace the ATM-TRK circuit pack, and retest.

Packet Interface Loop Around Test (#598)

This nondestructive test checks the ATM-TRK circuit pack's packet-bus interface. The LANHO chip sends data through the bus and back to itself. Figure 18 on page 410 describes this test, substituting "CES mode" for "PNC mode."

If the data received is consistent with the data sent, the test passes. The test does not run if the packet bus in the specified port network has a minor alarm, or is out of service, or if the packet bus in the PPN is out of service.

Table 73. Packet Interface Loop Around Test (#598)

Error Code	Test Result	Description/ Recommendation
1144	ABORT	The packet bus in the PPN has a major alarm against it. 1. Run **display alarms** and **display errors**. 2. Perform the PKT-BUS repair procedures associated with the alarms. 3. Retry the command.
2000	ABORT	Test request timed out. 1. Retry the command up to 3 times at 1-minute intervals. 2. If the test fails repeatedly, run **reset board UUCSS**. 3. If the test continues to fail, replace the ATM-TRK circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate needed system resources. 1. Retry the command up to 5 times at 1-minute intervals.
ANY	FAIL	Data packet not received correctly by the ATM Interface circuit pack. 1. Retry the command up to 5 times at 1-minute intervals. 2. If the test continues to fail, replace the ATM-TRK circuit pack.
	PASS	The Packet Interface Test passed.

ATM Board Reset (#1256)

This test is destructive.

This test checks the sanity of the angel processor using the Sanity and Control Interface (SAKI) test (Common Port Board test #53). It resets the circuit pack if the SAKI test fails and runs the test again.The ATM Board Reset test passes if SAKI can successfully reset and retest the board.

Before running the SAKI test, you must:

- Move synchronization off the ATM-TRK circuit pack
- Busyout the ATM-TRK circuit pack

The test aborts if the ATM-TRK circuit pack is supplying synchronization.

Table 74. ATM Board Reset (#1256)

Error Code	Test Result	Description/ Recommendation
1005	ABORT	Wrong circuit pack configuration to run this test. The ATM CES Trunk Interface circuit pack provides timing for the system and cannot be reset without major system disruptions. 1. Set synchronization to another ATM CES trunk circuit pack or to the Tone-Clock circuit pack and test again.
1015	ABORT	Test cannot be run because the ATM-TRK circuit pack has not been busied out. 1. Busyout out the circuit pack (**busyout board UUCSS**). 2. Repeat the test (**test board UUCSS long**).
None	ABORT	Could not allocate the required system resources 1. Retry the command up to 5 times at 1-minute intervals. 2. If the test continues to abort escalate the problem.
2000	ABORT	Sanity test timed out. 1. Wait 5 minutes. Then see if ATM-TRK circuit pack is visible to the system by running **list configuration all**. 2. If the ATM-TRK circuit pack is visible (**list configuration all**), run the test again, and escalate if the problem recurs. 3. If the ATM-TRK circuit pack is not visible to the system (**list configuration all**), re-seat the ATM-TRK circuit pack, and retest. 4. If the ATM-TRK circuit pack is still not recognized by the system, replace the board.
2100	ABORT	Could not allocate required system resources 1. Retry the command up to 5 times at 1-minute intervals.

Continued on next page

Table 74. ATM Board Reset (#1256) — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal system error 1. Try to reset the circuit pack (**reset board UUCSS**).
1	FAIL	The circuit pack failed to reset
2	FAIL	The circuit pack failed to restart. 1. Retry command. 2. If the problem persists, replace the ATM-TRK circuit pack.
	PASS	The ATM-TRK circuit pack is successfully reset.
0	NO BOARD	No board detected. 1. Check the error log for Error 125 (wrong board) or Error 131 (no board), and perform the appropriate repair, if needed. 2. Ensure that the board is properly translated and inserted. 3. Check for Error 1538 (hyperactivity). If hyperactive, run **reset board UUCSS**. 4. Run the test again. If it fails, replace the ATM-TRK circuit pack, and retest.

ATM Board Error Query Test (#1259)

This non-destructive ATM Error Query Test retrieves the most severe, active, on- and off-board problem from the ATM-TRK circuit pack's firmware and increments error counts in the Error Log.

The test passes if there are no errors and fails otherwise. A passing test clears the software counters; a failure increments the counter associated with the problem that caused the failure and clears the others.

Table 75. ATM Board Error Query Test (#1259)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Test request timed out.
2031	ABORT	SCD failure. Unable to sent down-link message.

Continued on next page

Table 75. ATM Board Error Query Test (#1259) — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate needed system resources.
2500	ABORT	Internal system error 1. Retry the command up to 3 times at 1-minute intervals.
XXYY	FAIL	On-board error XX (Table 76) and/or off-board error YY (Table 77 on page 459). 1. Examine the error logs and repair any errors found.
	PASS	The ATM circuit pack has passed this test. No service effecting errors/alarms have been detected on board.
0	NO BOARD	ATM-TRK circuit pack not found 1. Check the error log, and correct Error 125 (wrong board) or Error 131 (no board), if found. 2. Make sure that the board is properly translated and inserted. 3. Check for hyperactivity (Error 1538). Run **reset board UUCSS** if hyperactive. 4. Run the test again. If it fails, replace the board, and retest.

Aux Data XX

Table 76. Aux Data XX for ATM Board Error Query Test (#1259)

If XX=	Then
1	ATM framer chip failed
2	NCE chip failed
3	LANHO critical error
4	TDM Programmable Logic Device Failed
5	All on-board DSPs failed
6	Receive Network Processor failed
7	Transmit Network Processor failed
8	Memory read failed
9	Dual UART chip failed
10	LANHO receive parity error

Continued on next page

Table 76. Aux Data XX for ATM Board Error Query Test (#1259) — *Continued*

If XX=	Then
11	LANHO FIFO over flow error
12	LAN bus time out.
13	LANHO Xmit FIFO overflow error
14	One or more on-board DSPs failed

Aux Data YY

Table 77. Aux Data YY for ATM Board Error Query Test (#1259)

If YY=	Then
15	Back plane clock failed
16	Loss of signal
17	Loss of frame
18	MS alarm indication signal error
19	MS remote defect indicator error
20	Loss of Pointer
21	Path Signal Level mismatch
22	High-level Path alarm indication signal
23	High-level Path remote defect indicator
24	Loss of Cell Delineation
25	Uncorrectable headers sent by the ATM switch.
26	Too many cells with invalid VPI/VCI combination.
27	The signalling link between the board and the ATM switch is down.
34	AAL5 Excessive retransmission requests -per VC
35	LAPD Excessive retransmission requests - per VC
37	ATM CLP (Cell Loss Priority) Bit - see MO ATM-NTWK
38	ATM Congestion Indicator - see MO ATM-NTWK

Continued on next page

Table 77. Aux Data YY for ATM Board Error Query Test (#1259) — *Continued*

If YY=	Then
39	ATM Cell Underrun - see MO ATM-NTWK
40	ATM Cell Overrun - see MO ATM-NTWK
41	ATM Lost Cells - see MO ATM-NTWK

ATM Board Framer Looparound Test (#1260)

Destructive

This test verifies the board's circuit (Time Division Multiplexing) and packet paths using an on-board, dummy virtual circuit. Before running the test, you must

- busyout the ATM-TRK circuit pack (**busyout board UUCSS**) and
- switch synchronization (**change synchronization**) from the ATM-TRK circuit pack

If the ATM-TRK circuit pack is supplying synchronization, the test aborts.

The test sends a digital counter from one of the tone generators via one of the TDM bus time slots. The ATM framer interface converts this digital counter to ATM cells and loops them back internally. The ATM-TRK circuit pack converts the cells back to a digital counter and sends it to the tone receiver for verification. If the circuit pack passes the circuit check, the software checks the packet path by sending a packet from the packet-interface circuit pack to the ATM-TRK circuit pack via the ATM protocol stack.

Figure 19 on page 414 and Figure 20 on page 415 show a diagrams of this two-part test, substituting "CES mode" for "PNC mode."

Table 78. ATM Board Framer Looparound Test (#1260)

Error Code	Test Result	Description/ Recommendation
1002	ABORT	Time slots could not be allocated. Traffic could be heavy or time slots could be out-of-service. 1. Run **display errors**, and perform repairs associated with TDM-BUS errors. 2. Retry the command up to 3 times at 1-minute intervals.
1003	ABORT	Tone receiver could not be allocated. 1. Run **display errors**, and perform the repairs associated with TTR-LEV and TONE-PT errors. The test cannot run unless there is at least one Tone Detector available on the network that holds the ATM-TRK circuit pack. 2. Retry the command up to 3 times at 1-minute intervals.
1015	ABORT	ATM-TRK circuit pack not busied out 1. Busyout the ATM circuit pack. 2. Rerun the command.
1033	ABORT	ATM-TRK circuit pack not found 1. See if the switch can see the circuit pack. Run status Trunk Group. 2. Retry the command.
1139	ABORT	Major alarm on the EPN packet bus 1. Run **display alarms**, and perform the repairs associated with PKT-BUS errors. 2. Run **display errors**, and perform the repairs associated with PKT-BUS errors. 3. Retry the command.
1141	ABORT	Packet-interface circuit pack out of service 1. See PKT-INT (Packet Interface Circuit Pack).
1144	ABORT	Major alarm on the PPN packet bus 1. Run **display alarms**, and perform the repairs associated with PKT-BUS. 2. Run **display errors**, and perform the repairs associated with PKT-BUS. 3. Retry the command.
1394	ABORT	ATM-TRK circuit pack out of service 1. Run ATM Board Reset Test #1256.
2000	ABORT	Request timed out. 1. Retry the command up to 3 times at 1-minute intervals.

Continued on next page

Table 78. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
2060	ABORT	Packet-bus link has failed. 1. Retry the command up to 3 times at 1-minute intervals. 2. If the test continues to abort, run **display errors**, and perform the repairs associated with PKT-INT errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error 1. Retry the command up to 3 times at 1-minute intervals.
1	FAIL	Test tone not detected over the looparound; packet-path test aborted. 1. Test the active tone clock on the port network, and verify that a tone is reaching the ATM-TRK circuit pack. If not, correct the condition. 2. Run **test board UUCSS long**. 3. If the test continues to fail, replace the ATM-TRK circuit pack or transceiver. 4. Rerun **test board UUCSS long**.
2	FAIL	TN1655 Packet Interface circuit pack could not detect the correct data packet. 1. Test the TN1655 Packet Interface circuit pack to verify that it is functioning properly. If not, correct the condition. 2. Run **display errors**, and perform the repairs associated with DS1 CONV-BD errors, if applicable. 3. Run **display alarms**, and perform the repairs associated with DS1 CONV-BD alarms, if applicable. 4. Run **test board UUCSS long**. 5. If this test continues to fail, replace the ATM-TRK circuit pack. 6. Run **test board UUCSS long**.
3	FAIL	Distorted tone returned 1. Test the active tone clock on the port network, and verify that a tone is reaching the ATM-TRK circuit pack. If not, correct the condition. 2. Run **test board UUCSS long**. 3. If the test continues to fail, replace the ATM-TRK circuit pack. 4. Run **test board UUCSS long**.
4	FAIL	Unable to create TDM-path loop. 1. Retry the command up to 3 times at 1-minute intervals. 2. If this test continues to fail, replace the ATM-TRK circuit pack. 3. Run **test board UUCSS long**.

Continued on next page

Table 78. ATM Board Framer Looparound Test (#1260) — *Continued*

Error Code	Test Result	Description/ Recommendation
5	FAIL	Unable to create packet-path loop. 1. Retry the command up to 3 times at 1-minute intervals. 2. If this test continues to fail, replace the ATM-TRK circuit pack. 3. Rerun **test board UUCSS long**.
6	FAIL	A previously established looparound was not released. 1. Run **reset board UUCSS**. 2. Retry the command up to 3 times at 1-minute intervals. 3. If this test continues to fail, replace the ATM-TRK circuit pack. 4. Rerun **test board UUCSS long**.
	PASS	The non-optical parts of the ATM-TRK circuit pack are functioning properly.
0	NO BOARD	ATM-TRK circuit pack not found 1. Check the error log for Error 125 (wrong board) or Error 131 (no board), and correct as necessary. 2. Check that the board is properly translated and inserted. 3. Check for Error 1538 (hyperactivity), and run **reset board UUCSS** if necessary. 4. Rerun **test board UUCSS long**. 5. If the test fails, replace the board, and rerun **test board UUCSS long**.

ATM Board Time Of Day Update (#1261)

The non-destructive ATM-TOD-UPD test updates the system time that the ATM-TRK circuit pack uses for SDH/SONET performance monitoring and synchronizes the ATM-TRK circuit pack with the DEFINITY system clock. This test is run during initialization, scheduled maintenance, and craft long test.

Table 79. ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description/ Recommendation
2031	FAIL	The attempt to send the message to the ATM-TRK circuit pack was not successful.
2500	FAIL	Internal system error. Did not send the time of day information to the board. 1. Retry the command up to 3 times at 1-minute intervals. 2. If the test aborts with the same error code, escalate the problem.
	PASS	The ATM-TRK circuit pack is successfully updated with system time. 1. If the **status port-network** command still indicates that this link is down, it is possible that one or both of the ATM-TRK circuit packs have been busied out. 2. If the link still does not come up, reset one or both ATM-TRK circuit packs on the link.
0	NO BOARD	No board detected. 1. Check the error log for wrong board (Error 125) or no board (Error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board UUCSS** command. 1. Run the test again. If it fails, the board could be bad. Replace the board and retest.

ATM Board DSP Test (#1293)

Non-destructive

There are three kinds of digital signal processors (DSPs): talkers, listeners, and echo cancelers.Talkers put data on the TDM bus, listeners take data off the TDM bus, and echo cancelers filter out echoes of the main transmission. Firmware allocates DSPs in sets of three (one of each type), up to a maximum of 8 sets. This has three parts, one for each type of DSP. If the test fails for all DSPs, a MAJOR alarm is raised. If the test fails for one or more DSPs, a MINOR alarm is raised. If a DSP is busy, the test passes for that DSP. The test aborts if system resources are not available. Each part of the test returns the number of DSPs that passed or failed. This test run during initialization, error analysis testing, periodic, scheduled, and craft short and long testing.

Table 80. ATM Board DSP Test (#1293)

Error Code	Test Result	Description/ Recommendation
1002	ABORT	Could not allocate time slots. Traffic could be heavy or time slots could be out-of-service 1. Run **display errors**, and follow associated repair procedures for TDM-BUS. 2. Retry the command up to 3 times at 1-minute intervals.
1003	ABORT	Could not allocate a tone detector. Too few tone detectors present or tone detectors out-of-service. 1. Run **display errors**, and follow the repair procedures associated with any TTR-LEV (TTR Level) errors that appear. 2. Make sure that there is at least one tone detector on the network that holds the ATM-TRK circuit pack. 3. Resolve any TONE-PT (Tone Generator) errors listed in the Error Log. 4. Retry the command up to 3 times at 1-minute intervals.
1962	ABORT	All DSPs are busy. This is a very unlikely event. 1. Retry the command up to 3 times at 1-minute intervals.
2000	ABORT	Test timed out. 1. If the ATM-TRK circuit pack is in standby, reset the board and run the test again after the ATM-TRK circuit pack is inserted. 2. Examine the Error Log for Error 1218 (bad DSP). 3. Run the test again.
2100	ABORT	Could not allocate required system resources.
2302	ABORT	Inconsistent uplink message from the ATM-TRK circuit pack.
2500	ABORT	Internal system error 1. Retry the command up to 5 times at 1-minute intervals.
2752	ABORT	Circuit pack not a TN2305A/2306A.

Continued on next page

Table 80. ATM Board DSP Test (#1293) — *Continued*

Error Code	Test Result	Description/ Recommendation
XYZ	FAIL	There is at least one bad DSP on the board. The ***X*** value indicates the number of bad talker DSPs, ***Y*** indicates the number of bad listener DSPs and ***Z*** indicates the number of bad echo canceler DSPs. 1. Test the Active Tone-Clock on the port network that contains the ATM-TRK circuit pack for dial-tone. Repair as needed. 2. Repeat the short test on the ATM-TRK circuit pack. 3. If the test continues to fail, check for service-affecting MINOR alarms. If a MINOR alarm is raised for Error Type 2817 or 1818, replace the circuit pack. 4. If a WARNING alarm is raised, this is a non-service-affecting error, and the circuit pack can still process calls.
XY8	PASS	The test passed for some or all DSPs. XY8 indicates the number of talker, listener, and echo-canceler DSPs for which the test passed (the rest of the DSPs were skipped). The ***X*** value indicates the number of good talker DSPs, ***Y*** indicates the number of good listener DSPs and ***Z*** indicates the number of good echo canceler DSPs.
0	NO BOARD	No board detected. 1. Check the Error Log for wrong board Error 125 (wrong board) or Error 131 (no board). Replace or insert the circuit pack if necessary. 2. Check that the board is properly translated and inserted. 3. If Error 1538 (hyperactivity) is listed in the Error Log, and run **reset board UUCSS**. 4. Run the test again, and, if it fails, replace the ATM-TRK circuit pack. 5. Retest.

ATM Cross Talk Test (#1298)

This nondestructive ATM Cross Talk test makes sure that TDM time slots are correctly allocated to connections. It is useful for diagnosing one-way or noisy connections. The test fails if the TDM programmable logic and/or the interface to the DSP is not operating properly. The test can take more than 10 minutes.

Figure 21 on page 422 shows a diagram of this test, substituting "CES mode" for "PNC mode."

Table 81. ATM Crosstalk Test (#1298)

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate required system resources. 1. Retry the command up to 5 times at 1-minute intervals.
1002	ABORT	Could not allocate time slots. Traffic could be heavy or time slots could be out-of-service. 1. Identify and correct TDM-bus errors (if any) using the procedures in the TDM-BUS (TDM Bus) maintenance object. 2. Repeat the test up to 5 times at 1-minute intervals.
1003	ABORT	Could not allocate a tone receiver. Too few tone detectors installed or tone detectors out-of-service. 1. Identify and correct any TTR-LEV (TTR Level) errors listed in the Error Log. 2. Resolve any TONE-PT (Tone Generator) errors listed in the Error Log. 3. Retry the test up to 5 times at 1-minute intervals a maximum.
2000	ABORT	Test timed out.
2100	ABORT	Could not allocate required system resources 1. Retry the command 5 times at 1-minute intervals.
1962	ABORT	All TALKER DSPs are busy.
2302	ABORT	Inconsistent uplink message from the ATM-TRK circuit pack. 1. Retry the command up to 3 times at 1-minute intervals.
2752	ABORT	The circuit pack in this location is not a TN2305A/2306A.
1-8, None	FAIL	ATM-TRK circuit pack writing on unauthorized TDM time slots. The error code indicates the number of TALKER DSPs that are at fault. These DSPs cannot be used again until this test of the ATM DSP Test (#1293) tells the circuit pack to use them again. 1. Retry the command up to 3 times at 1-minute intervals. 2. If the failure persists, replace the circuit pack.
1-8	PASS	ATM-TRK circuit pack not talking to un-authorized time slots on the TDM bus. The error code indicates the number of TALKER DSPs tested.

ATM-WSP (ATM WAN Spare Processor)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ATM-WSP	MAJOR	status atm wsp	ATM WAN Spare Processor
ATM-WSP	MINOR	status atm wsp	ATM WAN Spare Processor
ATM-WSP	WARNING	display atm wsp (1-15)	ATM WAN Spare Processor

DEFINITY R9r systems with multiple port networks connected via ATM PNC have the option of installing up to 15 ATM WAN Spare Processor (WSP) units. Each WSP has the ability to function as the R9r SPE, if the main PPN is not functional or is not connected to one or more of the other port networks.

ATM WSP is available in R9r standard loads. A WSP is capable of running the entire R9r system (just as the main PPN can), or whatever EPNs with which it can establish links while the ATM network is impaired. WSPs continually monitor a path to the main PPN to determine if it is on-line. In the event of a main PPN failure, automatic switch-over to WSP control is neither instantaneous nor call-preserving. Restoring the system to normal operation (under control of the main PPN) requires manual intervention, and is neither instantaneous nor call preserving.

Each WSP attempts to establish connections (links) to all other WSPs and to the main PPN. These links are re-established once every minute. If a link cannot be re-established, its status is flagged as "down."

A WSP or main PPN is considered "down" if:

1. For Standard Reliability, links cannot be established on the A-PNC.
2. For High Reliability in the main PPN, and with Standard Reliability on the other WSPs, links cannot be established to both A-PNCs of the main, or if links cannot be established on the A-PNC between other WSPs.
3. For Network Duplication and Critical Reliability, links cannot be established on the A-PNC and on the B-PNC.

A WSP becomes active (initiates a fail-over) when all links to higher priority WSPs and the main PPN have been in a "down" state for an administered amount of time (as specified in the WSP Activation Timer field of the System-Parameters Maintenance screen).

When a WSP becomes active, a major alarm is raised against this maintenance object (ATM-WSP). If it is later determined that the WSP should not be active, or the system is rebooted at a COLD-2 or more severe level, the WSP is returned to a standby state and the alarm retired. This alarm is never activated for the Main PPN.

Operations of the ATM WAN Spare Processors

The WSP has the following operational features:

- The WSP feature is activated/deactivated by changing the value of the ATM WAN Spare Processor field on the system-parameters customer-options screen. The field values are **y** or **n** (default).
- Fail-over occurs when the connections with the main PPN and all WSPs of higher priority are lost (lost for an administrable period of time between 5 and 99 minutes; default=5 minutes). When that administrable threshold is exceeded, the highest priority standby WSP becomes active. Once the standby WSP becomes active it takes over control of one or more EPNs. Restoration to the normal configuration must be manual.
- A WSP in the standby mode is not intended to be a DCS node. Although DCS could potentially play a role in an effective back-up or re-route strategy, no provision has been made to support DCS connections between parts of a failed switch. A WSP in the active mode can have the DCS functionality of the PPN.
- The main PPN makes no attempt to do maintenance on the WSPs.
- A WSP can perform maintenance on itself, and monitor WAN connectivity.
- A WSP is not recognized by DEFINITY hardware or software as a DEFINITY port network when not active, and functions in place of the main PPN when active. The total number of WSPs in a DEFINITY ATM PNC configuration can be up to a maximum of seven. The number of PNs in an r configuration is not limited by the number of WSPs used, e.g. the number of WSPs used is not subtracted from the total number of PNs to determine the number of PNs that can be supported by the system.
- Every WSP could potentially take over the entire R9r system.
- Links are established between the main PPN and each WSP, and from every WSP to every other WSP. These links are monitored by the WSPs, as well as by the main PPN, so that each processor is able to observe and report status.
- Each WSP is assigned a unique priority. WSPs become active if they cannot establish communications both with the main PPN and with a WSP of higher priority.
- An active WSP attempts to establish EAL connectivity to the EPNs.
- Contention for support of EPNs is addressed by prioritization, and also by the fact that the EPNs accept an EAL connection to only the main PPN or one WSP at a time.

NOTE:
Each WSP reports its alarms to INADS as an individual DEFINITY processor. The INADS database correlates WSPs together as part of a large network.

Error Log Entries and Test to Clear Values

Table 82. ATM-WSP Error Log Entries

Error Type	Aux Data	Associated Test[1]	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		
18(a)		MO busied out			release atm wsp
257(b)		Active WSP (#1401)	MAJOR	OFF	reset system 2
513(c)		WSP Link Status (#1400)	MINOR	OFF	
769(d)	WSP #	WSP Priority Error	MINOR	OFF	
1025(e)		WSP Error	WARNING	OFF	

1. There are no System Technician-Demanded Tests associated with this MO. The tests listed in this column are tests run by system software.

Notes:

a. **Error Type 18** — indicates that the ATM WSP has been busied out with the **busyout atm wsp** command. To resolve this error, check for any other errors that would require that the WSP be made maintenance busy. Clear all related alarms. After all related alarms are clear, or if there are no other alarms release the ATM circuit pack using the **release atm wsp** command.

b. **Error Type: 257** — indicates that the WSP has become active. When a WSP takes over, the error becomes active, and causes an alarm condition. This error is not applicable for the main PPN. Follow the procedures listed below to return the system to normal operation:

   1. Run **status atm wsp** on the active WSP to verify that the main PPN, or a higher priority WSP that you want to be in control is "up."
   2. If the main PPN, or the higher priority WSP is "up," then run **reset system 2**. The active WSP should relinquish control.
   3. Wait a few minutes, and on the main PPN or higher priority WSP run **list sys-link** to verify that the EAL and ACL system links are "up."

c. **Error Type: 513** — indicates a down ATM WSP link status from this WSP to the main PPN or a WSP of higher priority. If any of the links are considered down, this alarm is logged. When all links probed by this WSP are "up," the alarm should be cleared.

Remember that more than one link can be down. To get a system-wide view of the status of the network run **status atm wsp**.

Aux Data Values are in the form of XYY where

- X is the PNC: 0 = A-PNC, 1 = B-PNC
- YY is the WSP number

Examples:

- An Aux Data of 15 indicates that the B-PNC link to WSP 5 is down.
- An Aux Data of 3 indicates that the A-PNC link to WSP 3 is down.

d. **Error Type: 769** — indicates that there are inconsistent translations with regard to WSP's priority. Each WSP keeps a list of all other WSP's priority levels. Inconsistent priorities can exist that result in a WSP receiving an unexpected probe. This causes an alarm to be raised.

Follow the procedures listed below to correct any inconsistency in WSP priorities:

1. Obtain a list of WSP priorities from the system administrator.
2. Use the **display error** command to find the WSP number with the incorrect priority (the Aux Data of the error).
3. Use the **status atm wsp** command to determine if any administered priorities are incorrect. Pay close attention to WSP X and the local WSP.
4. If any are incorrect, use the **change atm wsp *n*** command to administer the correct priority, where **n** is the appropriate WSP number. If the priorities for WSP X and the local WSP are both correct, then there is an error in priority administered on WSP X.
5. On WSP X, use the **status atm wsp** command to determine if the priority of WSP X, the local WSP, and the priority of the WSP with the alarm are correct. At least one should be incorrect.
6. Use the **change atm wsp *n*** command to administer the correct WSP priority, where **n** is the appropriate WSP number.

e. **Error Type: 1025** — indicates that there is a WSP error. The Aux Data determine the WSP number and error code.

Aux Data Values are in the form of XXYY where

- XX is the WSP number that probed this WSP
- YY is the error code (Table 83)

Table 83. Error type 1025 - Aux Data error codes for YY

YY	Meaning
1	The probing WSP (XX value in Aux Data) contains an ATM address in its message that does not match the translation for that ATM address on this WSP.

Example: This is WSP 1. An Aux Data of 201 indicates that WSP 2 probed this WSP, and it has a different address in the probe message than WSP 1 has for WSP 2.

1. On WSP X, use the **display atm wsp [X]** command to determine its address.
2. On this WSP, use the **change atm wsp [X]** command to change the address of WSP X, if they do not match.
3. If the addresses do match, then the ATM switch has a different address administered for WSP X, even though each WSP is consistent.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no *System Technician-Demanded Tests* associated with this maintenance object.

DIG-IP-STN (Digital IP Station)

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
DIG-IP-STN	WARNING	test station *extension*	Digital IP Station

The Softphone has some level of existing DCP maintenance in the form of audits, and updates. In addition, it also has error log entries and test to clear values.

In addition this MO covers a new Avaya Voice terminal that communicates to the switch via an IP LAN. This type of terminal, referred to as an IP Phone is made up of the 46XX line of terminals. This terminal emulates DCP signaling carried over TCP.

This station type is not attached to a port board. Insertion of the station is not driven by board insertion, rather it is driven by successful registration of the endpoint. It is maintained via a set of explicit TCP/IP ping requests and errors reported by the User Manger software, which terminates the H.323 signaling portion of each endpoint. The MO follows standard maintenance methodology and supports test, busyout, release and status commands.

Maintenance for Softphone includes Error Log Entries and Test to Clear Values. See table DIG-IP-STN Digital IP Station Error Log Entries.

Table 84. DIG-IP-STN Digital IP Station Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		test station *extension*
1 (a)		Registration Status Inquiry (#1372)	WARNING	OFF	
18 (b)	0	Busyout port or station	WARNING	OFF	*release port (or) station*
257 (c)		Signaling Path PING Test (#1373)	WARNING	OFF	
(d)		Digital Terminal Lamp Update (#16)	WARNING	OFF	
(e)		Digital Terminal Audit Update (#17)	WARNING	OFF	
513 (f)	Any	Station Digital AUDIT Test (#17)	WARNING	OFF	test port or station
1281 (g)	Any	Station Digital AUDIT Test (#17)	WARNING	OFF	test port or station

Continued on next page

Table 84. DIG-IP-STN Digital IP Station Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1537 (h)	40968		WARNING	OFF	test port or station
2305 (i)	Any	None			
2817 (j)		Station Hyperactivity			

Notes:

f. **Error Type 1**: this error reports the registration status of the endpoint. If call processing SW claims the endpoint is registered and receives keep-alive handshakes from the endpoint, the test passes. If keep-alive handshaking has failed, the test fails. If the user has intentionally un-registered from DEFINITY ECS, the station is now basically an AWOH station and is no longer being maintained; no tests run for this station.

g. **Error Type 18**: this error type is logged when the port/station is busied out by maintenance personal. Make sure the port/station is released from busy via the *release port/station* command (IP terminal only).

h. **Error Type 257**: this error tracks failures of the signaling path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with the C-LAN board through which the endpoint is registered. If the PING response packet is received, the test passes. If the PING response packet times out, the test fails.

i. This is a refresh of the lamp states for all lamps on the Virtual DCP station. The update always passes, if it runs successfully. It can abort, but it never fails. This update is the same update used for existing DCP stations. It is test number 16.

j. This is a refresh of the ringer state on the Virtual DCP station and a query of the virtual station's switch-hook state. The audit always passes, if it runs successfully. It can abort, but it never fails. This runs a subset of the complete audit update that runs for standard DCP sets.

k. **Error Type 513**: this error type indicates that the terminal failed to respond to the ID Query request. This implies that there is something wrong with the terminal or the communication path. (IP terminal only).

l. **Error Type 1281**: this error type indicates that the terminal is reporting a bad state of health (IP terminal only).

m. **Error Type 1537**: this error type indicates that the link has gone down between the terminal and its gateway to the switch. This likely means that the terminal has unregistered (IP terminal only).

n. **Error Type 2305**: this error indicates that there was an unsolicited Link Reset even though switch software believed the terminal to be functional and in service. This error can be ignored if no user complaints are received (IP terminal only).

o. **Error Type 2817**: this error tracks failures of the port hyperactivity counter. If a port generates more than 50 uplink CCMS messages within 10 seconds, the port is taken out-of-service for 30 seconds. Even though the Softphone actually signals over a TCP/IP link, DCP CCMS messages received over the TCP link are counted as regular CCMS uplinks and can cause the station to marked as hyperactive.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the Signaling Path PING Test, for example, you can also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Registration Status Inquiry (#1372)	X	X	ND
Signaling Path PING Test (#1373)	X	X	ND
Digital Terminal Lamp Update Test (#16)	X	X	ND
Digital Terminal Audits Test (#17)		X	ND

1. D = Destructive; ND = Nondestructive

Registration Status Inquiry (#1372)

The Registration status inquiry reports the H.323 registration status of the endpoint. An endpoint must be registered and authenticated in order to receive service from the system.

Registration is initiated when the endpoint user attempts to login using the Avaya registration software application running on the endpoint PC. The user must provide a valid extension and security code. The registration messages are sent to the IP address of a C-LAN ethernet port.

A registered extension has a port number or ID that appears as SNNNNN, where N is a digit from 0-9 and S is an indication that the port is virtual and a station.

Table 85. TEST #1372 Registration Status Inquiry

Error Code	Test Result	Description/Recommendation
1,2,3	FAIL	The endpoint is not successfully registered. 1. Verify that the user is entering: ■ the correct extension and security code ■ the C-LAN IP address 2. Verify that the extension has been enabled for IP softphone operation. 3. If many endpoints cannot register, investigate any errors of the C-LAN ethernet port. 4. Examine the ethernet cabling from the endpoint PC to the ethernet hub.
	PASS	The endpoint is successfully registered and continues to respond to registration handshaking.

Signaling Path PING Test (#1373)

This test is nondestructive.

The test determines the local C-LAN through which the signaling originates and the endpoint's IP address. It then requests the local C-LAN to execute a PING on the endpoint's address. If the PING is successful, the test passes, if the PING is not successful, the test fails.

NOTE:
Multiple failures of this test can take the Digital IP Station out of service.

NOTE:
This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection.

NOTE:
This nondestructive test runs due to in-line errors, during periodic and schedule maintenance, and on demand.

Table 86. TEST #1373 Signaling Path PING Test

Error Code	Test Result	Description/Recommendation
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
1003	FAIL	Ping to the destination failed. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Investigate any C-LAN ethernet port errors.
1007	FAIL	The system could not PING the registered endpoint via the C-LAN. 1. Verify that at least one destination reachable through this port. PING this destination (**ping ip-address** ***xxx.xxx.xxx.xxx***). 2. If the PING to any destination is successful through this port, the link is up. 3. If PING to all destinations fail, test the C-LAN port (**test port UUCSSpp short**) and follow repair procedures for Session Status Test (#1286) failures. 4. If only this station cannot be pinged: ■ Make sure the PC is up ■ Make sure the PC has a network connection (ethernet or dialup) ■ Check the ethernet cabling
	PASS	The system can successfully send IP packets to the registered endpoint from the C-LAN.

Digital Terminal Lamp Update (#16)

This test updates internal lamp states that can or cannot be shown on the actual PC graphical user interface. The lamp updates run only if the station is in-service. The status of the station is checked and the lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 87. TEST #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 5 times.
1	ABORT	This port could have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times.
3	ABORT	Station could be in ready-for-service or out-of-service state. 1. Use **status station** command to verify state of station. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times.
1000	ABORT	System resources required to run this test are not available. The port could be busy with a valid call. 1. Use **display port UUCSSpp** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals a maximum of 5 times.
	PASS	The message to light all of the station lamps was sent successfully to the port.

Digital Terminal Audits Test (#17)

This is a series of tests that are classified as audits. The SPE sends messages to the softphone application or IP Phone to perform the following tests. These audits run only if the station is in-service.

- Switchhook Inquiry Test — This is an update of the SPE records according to the softphone switch hook state.
- Ringer Update Test — This updates the softphone ringer state according to the processor records.

- ID Request — A request is made to the station for its status. The terminal sends its configuration information and health information back. The information is checked and a PASS/ABORT result is provided. if the result is ABORT an error is logged in the hardware error log (IP Terminal only).

Table 88. TEST #17 Station (Digital) Audits Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Switchhook audit timed out.
2	ABORT	ID request fails, health bit returned from voice terminal is bad (IP Terminal only). 1. Make sure voice terminal is connected and repeat test. 2. If test fails, replace voice terminal and repeat test.
4	ABORT	Internal system error 1. Resolve any outstanding circuit pack maintenance problems. 2. Retry the command at 1-minute intervals a maximum of 5 times.
5	ABORT	Ringer update aborted due to station being in ready-for-service or out-of-service state.
6	ABORT	This port could have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, the release the port via **release station** 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times.
1000	ABORT	System resources required for this test are not available.
2000	ABORT	Response to the test was not received in the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	PASS	Station Audits passed. 1. If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.

FW-DWNLD (Firmware Download)

MO Name (in Alarm Log)	Alarm Level	Full Name of MO
FW-DWNLD	MINOR[1]	Firmware Download

1. MINOR alarms can be down-graded to a WARNING level per local instructions by using the set options command

The Firmware Download feature provides DEFINITY ECS the ability to download new firmware to one or more circuit boards of the same type residing in its system. The download image is copied onto a source (C-LAN TN799C or later/VAL TN2501) board (see TN2501 VAL board firmware download description listed in this MO), using the File Transfer Protocol (FTP). The image is then copied to the target circuit packs' FLASH memory. For C-LAN this is done over the TDM bus; for VAL the source and target are the same. The transfer of the download image from the source board to the target board is done under switch software control. This process is initiated using the DEFINITY System Access Terminal (SAT) interface.

NOTE:
The announcement directory on the TN2501AP circuit pack is **/annc**.

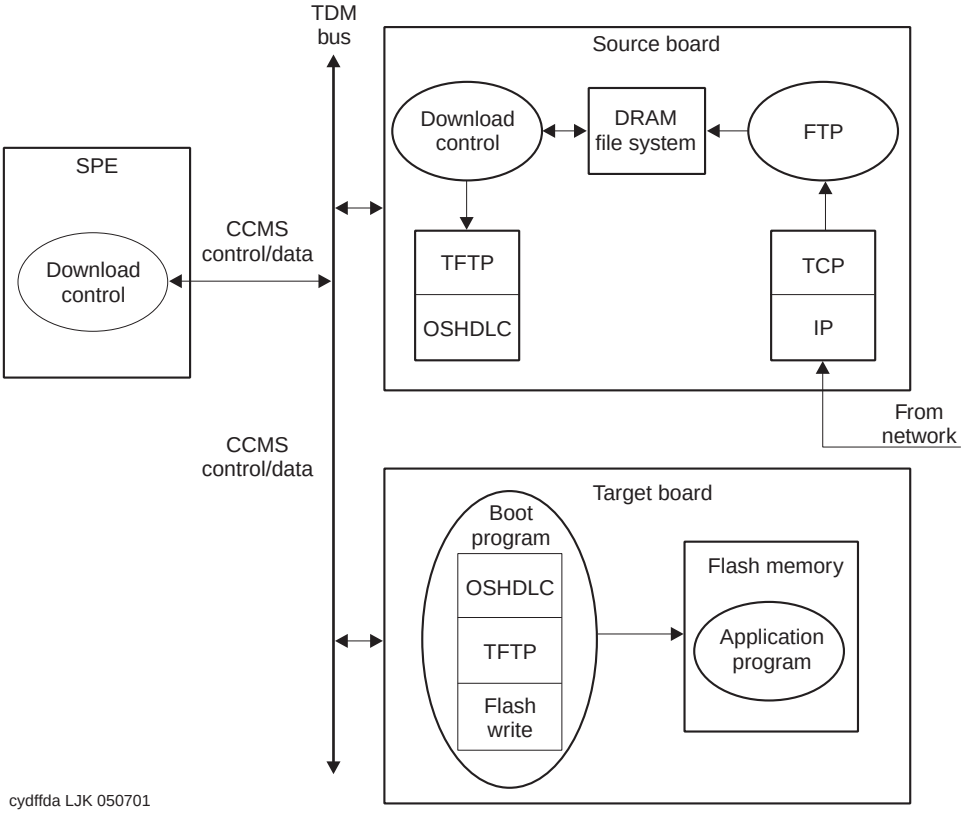


Figure 23. Firmware download schematic

NOTE:
Note the schematic in Figure 23 applies to the TN799 (C-LAN) circuit pack. For VAL, disregard everything in the "Target board" box.

The following is a list of commands for testing the firmware download feature:

- enable filesystem
- disable filesystem
- list directory
- remove file
- change firmware download
- disable firmware download
- display firmware download
- status firmware download

- test firmware download
- display initcauses

TN799C (C-LAN) firmware download

To update the firmware on the TN799C (C-LAN) circuit pack, do the following:

1. Set up a file system on a source board and an FTP login to the system by executing the command **enable filesystem**.
2. FTP the firmware image file onto the source board where the file system was enabled.
3. Execute the **list directory** command. Verify that the image is on the source board.
4. Execute the **change firmware download** command. Set up the download schedule.
5. If a start time has been entered and the schedule is pending, verify the schedule by executing the **test firmware download** command.
6. Execute the **status firmware download [last]** command. This command allows you to view the status of the download. If there are no errors/alarms the status is copied over to the last table.
7. If the system does a reset 1 or 2 and no alarms are present, execute the display init cause command. Clear any errors and retest by executing the **test firmware download** command.
8. If errors/alarms exist they can be resolved/cleared by executing the **test firmware download** command.
9. If there are no errors/alarms and the Remove File option is set to **y** on the **firmware download** screen, the image file is removed from the source board and the file system is disabled. If the Remove File option is set to **n**, the file can be removed by executing the **remove file** command.
10. Execute the **disable file system** command to disable the firmware download file system and FTP login on the source (C-LAN or VAL) board.

TN2501AP (VAL) firmware download

The TN2501AP Voice Announcements over the LAN (VAL) circuit pack provides the ability to download new versions of the firmware to itself. That is, the circuit pack serves as both the source and the target for the firmware image file.

NOTE:
The TN2501 VAL board cannot be used as a source board to download other circuit packs.

Firmware download procedure

Use this procedure to upgrade the firmware image file on the TN2501AP circuit pack.

NOTE:
The commands associated with downloading firmware require that the Administer Features field is **y** on the Command Permissions Categories screen (**change permissions *login***).

Instructions

1. Ensure that the steps in Setting up an FTP session are complete.
2. At the FTP client type **cd /** and press RETURN.

   This command moves you from the announcement directory (default for FTP sessions) to the root directory (/) where firmware and other files are located.
3. FTP the new firmware image file to the TN2501AP circuit pack using the **put** command. The file extension on the firmware image filename is required.
4. Ensure that the file is present by listing the contents of the root directory (/) on the VAL circuit pack.
5. At the SAT type **change firmware download** and press RETURN.

   The Firmware Download screen (Screen 76) appears.

```
change firmware download                                  Page   1 of   1   SPE A
                                FIRMWARE DOWNLOAD

   Source Board Location: 1b03
Firmware Image File Name: /firmware_file
       Target Board Code: TN2501  Suffix: AP  Firmware Vintage:
       Schedule Download? y   Remove Image File After Successful Download? y
   Start Date/Time:   /  /        :      Stop Date/Time:   /  /        :

    Target          Target          Target          Target          Target
   Location        Location        Location        Location        Location
 1. 1b03        11.             21.             31.             41.
 2.             12.             22.             32.             42.
 3.             13.             23.             33.             43.
 4.             14.             24.             34.             44.
 5.             15.             25.             35.             45.
 6.             16.             26.             36.             46.
 7.             17.             27.             37.             47.
 8.             18.             28.             38.             48.
 9.             19.             29.             39.             49.
10.             20.             30.             40.             50.
```

Screen 76. Firmware Download screen

6. Type the location (UUCSS) of the VAL circuit pack in the Source Board Location field. In this example **1B03** indicates Cabinet 1, Carrier B, Slot 3.

   NOTE:
   The Source Board Location field must match the Target Board Code field. That is, the VAL circuit pack is both the source and destination.

   You can only put one entry in the Target Board Code field, meaning that you can download firmware to only one VAL circuit pack at a time.

7. Type ***/*,** then the firmware filename in the Firmware Image File Name field.

   Example: **fwimagexxx.xyz**

   NOTE:
   The initial slash (/) in the Firmware Image File Name field directs the system to the firmware directory on the TN2501AP circuit pack. The file extension (.wav) is required in the Firmware Image File Name field.

8. Type **TN2501**in the Target Board Code field.
9. Type **AP** in the Suffix field.
10. Type **0** in the Firmware Vintage field.
11. If you want to schedule the firmware image download for a later time, type **y** in the Schedule Download? field. Otherwise, type **n** to download the firmware image file now.
12. If you want the firmware image file erased after the download, type **y** in the Remove Image File After Successful Download? field. Otherwise, type **n** to leave the downloaded firmware image intact.

    NOTE:
    You can delete the file later with the **remove file** command.

13. If you answered **y**(es) to the Schedule Download? field (Step 6 above), type the date and time in the Start Date/Time. The Stop Date/Time field is not used for VAL.
14. The Target Location field is identical to the Target Board Code field.

    NOTE:
    Even though there are several Target Locations listed, you can only download VAL firmware one circuit pack at a time. This also means that there can be only one circuit pack listed in the Target Location field.

15. Press ENTER.

    The system copies the firmware image file to the inactive image location.

    Command Successfully Completed appears.

To check the status of a pending firmware download:

1. At the SAT type **test firmware download** and press RETURN.

To check the status of a firmware download:

1. At the SAT type **status firmware download** and press RETURN.

   The Status Firmware Download report (Screen 77) appears. In this example the attempt to download the firmware_file aborted, indicated by the "A" in the St (Status) field.

```
status firmware download                                                SPE A
                            STATUS FIRMWARE DOWNLOAD

   Source Board Location: 01C08
Firmware Image File Name: /firmware_file
       Target Board Code: TN2501  Suffix: AP  Firmware Vintage:
       Schedule Download? n   Remove Image File After Successful Download? y



    Target          Target          Target          Target          Target
   Location St     Location St     Location St     Location St     Location St
 1. 01C08   A   11.             21.             31.             41.
 2.             12.             22.             32.             42.
 3.             13.             23.             33.             43.
 4.             14.             24.             34.             44.
 5.             15.             25.             35.             45.
 6.             16.             26.             36.             46.
 7.             17.             27.             37.             47.
 8.             18.             28.             38.             48.
 9.             19.             29.             39.             49.
10.             20.             30.             40.             50.
Status: Pending(P) Completed(C) Failed(F) Aborted(A)
```

Screen 77. Status Firmware Download screen

If you have problems downloading firmware to the TN2501AP circuit pack:

1. At the SAT type **test firmware download** and press RETURN.

   The Test Results screen (Screen 78) appears.

```
test firmware download                                              SPE A

                                 TEST RESULTS

Port        Maintenance Name  Alt. Name Test No. Result            Error Code

            FW-DWNLD                    1413     PASS
```

Screen 78. Test Results screen

2. The example in Screen 78 shows PASS in the Result field, indicating a successful test of the firmware download circuitry.

If the system does a reset 1 or 2 and no alarms are present:

1. At the SAT type **display initcauses** and press RETURN.
2. Clear any errors
3. At the SAT type **test firmware download** and press RETURN to retest.

So far you have copied the new firmware file to the desired location. Now you set the firmware image, "pointing" the system to the desired firmware image file:

1. At the SAT type **set boot-image board *location image-1/image-2*** and press RETURN.

   Example: **set boot-image board *1C07 2***

   NOTE:
   The new firmware image file resides in image-2 after a successful download. In most cases use ***image-2*** as the new firmware image file.

   The system responds with Command Successfully Completed.

2. Reseat the circuit pack to activate the new firmware image:

   WARNING:
   To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.

   a. Lift the latch handle to free the circuit pack from the carrier.
   b. Pull the circuit pack clear of the backplane.
   c. Re-insert the circuit pack into the carrier.
   d. Close the latch securely.

   Wait until all 3 of the top LEDs (red, green, and amber) are out.

3. At the SAT type **get boot-image *location*** and press RETURN to check the status of the firmware images on the TN2501AP circuit pack.

   The Display Firmware Image(s) report (Screen 79) appears.

```
get boot-image 1C07

                            DISPLAY FIRMWARE IMAGE(S)

               Image 1        Image 2

  Board Type: TN2501         TN2501
  FW Vintage: 02             02
HW Signature: 02             02
      Suffix: A              A
        Date: 03/02/02       03/02/01
   Timestamp: 10:30:50       12:42:18
CRC Checksum: Good           Good
Active Image: Yes            No
Reboot Image: Yes            No
```

Screen 79. Display Firmware Image(s) screen

4. Ensure that both the Active Image and the Reset Image fields are Yes for Image 2.

   NOTE:
   The firmware image filename (the file that you downloaded to the TN2501AP circuit pack) does not appear on this screen. Ensure that you have copied the correct file to the circuit pack and have set the proper firmware image file (**set boot-image**).

Error Log Entries and Test to Clear Values

Table 89. FW-DWNLD Maintenance Error Log Entries

Error Type	Aux Data	Cause Of Error	Alarm Level	On/Off Board	Test to Clear Value
257(a)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
258(b)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
259(c)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
513(d)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
796(e)	See associated note	Firmware download request	MINOR	OFF	test firmware download UUCSS

Notes:

a. **Error Type 257** — a log only error indicating that a certain software resource was not available. Such an error very seldom occurs and usually produces a proc_err. However, in the firmware download feature, the file cannot be downloaded and/or the schedule can also abort/fail. To resolve the error, use the **test firmware download** command. The Aux Data specifies the error that resulted from the resource not being available. See the table below for more details.

Table 90. Error Type 257 Aux Data

Aux Data	Description of Failure
1	Source board query failed - Check for system wide problems, clear all errors and retry the download.
2	Target board query failed - Check for system wide problems, clear all errors and retry the download.
3	Allocating resources failed - Check for system wide problems, clear all errors and retry the download.
4	Firmware Download Information table query failed - Check for system wide problems, clear all errors and retry the download.

Continued on next page

Table 90. Error Type 257 Aux Data

Aux Data	Description of Failure
5	Header message failed - Check for system wide problems, clear all errors and retry the download.
6	Download Map timer expired - Check for system wide problems, clear all errors and retry the download.

b. **Error Type 258** — a log only error indicating that a source board related error occurred. The download schedule can also abort/fail. To resolve the error, use the command **test firmware download**. The Aux Data specifies the error. See the table below for more details.

Table 91. Error Type 258 Aux Data

Aux Data	Description of Failure
1	Download image file specified on the **change firmware download** screen not present on the source board, use the **list dir** command to verify file system contents.
2	The image on the source board has an invalid header, retry then escalate.
3	Bad CRC on image file on source board, retry then escalate.
4	File name too long, rename then try again.
5	Invalid TN code on the **change firmware download** screen does not match TN code of image on the source board. Verify screen, make sure the correct image is being used.
6	Invalid suffix on the **change firmware download** screen does not match suffix of image on the source board. Verify screen, make sure the correct image is being used.
7	Source board not present, verify entry on the **change firmware download** screen, and translations.

Continued on next page

Table 91. Error Type 258 Aux Data

Aux Data	Description of Failure
8	Incorrect source board, verify that the source board is the correct TN code.
9	PPP ports not available, use another source board or reschedule the download for off hours.
10	DL Setup message to source failed. Retry download and if download still fails escalate.

c. **Error Type 259** — a log only error indicating that the target board failed to download. To resolve the error, use the command **test firmware download**. The Aux Data specifies the error. See the table below for more details.

Table 92. Error Type 259 Aux Data

Aux Data	Description of Failure
1	Target board not present / not responding, check board location, translations and retry.
2	Incorrect target board for download schedule, verify board location, and schedule.
3	Target failed to go into DL Mode, retry
4	Target received bad file header
5	Bad image checksum on image on source board, get new image retry.
6	TFTP protocol error - One reason for this type of failure could be that the target board has ami-zcs line coding, and is located in a EPN with ami-zcs line coding between the source and target board. To have a successful firmware download you must have a clear channel between the source and target board. Some examples of the correct type of line coding for this feature are: b8zs, and hdb3.
7	File transfer timer expired, check board location, translations and retry.

Continued on next page

Table 92. Error Type 259 Aux Data

Aux Data	Description of Failure
8	Target failed to reset after transfer, check board location, translations and retry.
10	Download of target failed, check location, translations, and retry.
13	The target board rejected the download image. Check translations, verify image file, retry then escalate.
20	Could not open the requested file - Internal firmware error on target board, retry download if fail then escalate.
21	Problem reading the requested file - Internal firmware error on target board, retry download if fail then escalate
22	The download file has a bad CRC - Internal firmware error on target board, retry download if fail then escalate
24	A download is already in progress - Internal firmware error on target board, retry download if fail then escalate
30	A start download sequence error - Internal firmware error on target board, retry download if fail then escalate
32	The file name is too long - Internal firmware error on target board, retry download if fail then escalate
40	FLASH programming failed on firmware - Internal firmware error on target board, retry download if fail then escalate

d. **Error Type: 513** — indicates that the schedule has failed. Failure of the schedule can result from any of the previously mentioned log only errors (257 - 259), the schedule timer expiring, or the **disable firmware download** command. To resolve the error and clear the alarm, use the command **test firmware download**. The Aux Data specifies the reason why the schedule failed. See the table below for more details.

Table 93. Error Type 513 Aux Data

Aux Data	Description of Failure
1	Software resources not available; see Error Type 257(a)
2	Source board related failure; see Error Type 258(b)
3	A target board failed; see Error Type 259(c). Check image, translations and retry.
4	Two consecutive target boards failed, download schedule aborted. Verify download image, translations, and retry.
5	Schedule timer expired, schedule unfinished target boards and retry.
6	**disable firmware download** command executed

e. **Error Type: 769** — indicates that a downloadable board image is bad and a good image needs to be downloaded. This is not a result of a failed download attempt. The Aux Data specifies the board location in UUCSS format.

System Technician-Demanded Tests: Descriptions and Error Codes

The Firmware Download Maintenance Object (FW-DWNLD) is a non traditional MO. As a result, the associated test, *Test Firmware Download (#1413)* is a non traditional test. This test is not executed in the traditional manner but is executed as a part of scheduling, verifying and running a firmware download schedule.

There are no System Technician demand tests as such for this maintenance object.

Test Firmware Download (#1413)

This is a destructive test.

This test has two functions and can only be executed if there is a download schedule to verify or there are FW-DWNLD errors to be resolve and alarms to clear.

1. This test verifies that the information on the FIRMWARE DOWNLOAD screen is correct. It also verifies that the source board is of the correct type, that the file to be downloaded is present on that source board, and that the file is error free. In addition it verifies that the target board code and suffix are correct. It also retrieves the new firmware vintage for the target board and populates the appropriate field in the firmware download table.
2. If this test is executed after a FIRMWARE DOWNLOAD schedule has run, and there are FW-DWNLD alarms/errors, it resolves the errors, clears the alarms, copies the current download status table to the last table, and clears out the current table.

Table 94. TEST #1413Firmware Download Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2100	ABORT	System resources required for this test are not available. Retry the command at 1-minute intervals a maximum of 5 times.

Continued on next page

Table 94. TEST #1413Firmware Download Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The firmware image file entered on the **change firmware download** screen is not present on the source board specified in the screen: Execute the **list directory** command and verify that a file system is enabled on the board and the file is present. If the file system is not enabled, execute the enable filesystem command and FTP the correct firmware image to the source board. If the correct image file is present, then the name entered on the screen is incorrect. Execute the **change firmware download** command and enter the correct file name.
2	FAIL	The image file header on the source board is invalid. FTP a good firmware image file to the source board
3	FAIL	Firmware image file on the source board has a bad CRC. FTP a good firmware image file to the source board.
4	FAIL	Firmware image file name is too long. Rename the image file to a file name of the correct size. FTP the new image file to the source board. Execute the **change firmware download** command and enter the new file name on the screen.
5	FAIL	The TN code of the firmware image file on the source board does not match the TN code entered on the screen. The firmware file is incorrect for the board type entered on the screen. Execute the **list directory** command and verify that a file system is enabled on the board and the file is present. If the file system is not enabled, execute the **enable filesystem** command and FTP the correct firmware image to the source board. Execute the **change firmware download** command and enter the new file name on the screen.
6	FAIL	The suffix of the firmware image file on the source board does not match the suffix entered on the screen. The firmware image file is incorrect for the board types entered on the screen. Execute the **list directory** command and verify that a file system is enabled on the board and the file is present. If the correct firmware image is not present, FTP the correct firmware image to the source board. Execute the **change firmware download** command and enter the new file name on the screen.

Continued on next page

Table 94. TEST #1413Firmware Download Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	The source board entered on the screen is not present. Execute the **display firmware download** command and verify the source board location. Verify the source boards translations. If the location is incorrect, execute the **change firmware download** command and enter the correct location on the screen
8	FAIL	The source boards entered on the screen are incorrect. The board could have been changed after the schedule was entered. Execute the **list config** command. verify the source board location. Execute the **change firmware download** command and enter the correct location on the screen.
	PASS	Firmware download to this circuit pack is successful.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board re-initializes the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board UUCSS** command. Issue the **reset board UUCSS** command. Issue the **release board UUCSS** command. Issue the **test board UUCSS long** command. This should re-establish the linkage between the internal ID and the port.

Index

Numerics

258A adapter, 95
302D console, 39
355A adapter, 95
6400 Serialized phone
  Automatic Customer Telephone Rearrangement (ACTR), 48
  remotely readable electronic ID, 40

A

Alternate Gatekeeper (Avaya R300), 181, 182
announcements
  administration, 156
  backing up, 169
  bad file formats, 177
  copying, 169
  deleting, 164, 170
  moving to another circuit pack, 171
  recording—at a system phone, 162
  recording—parameters, 160
ARS/AAR
  2-second delay timer, 62
Asynchronous Transfer Mode (ATM)
  attaching firmware monitor cable, 95
  cell underruns/overruns, 106
  Cell-Loss Priority (CLP), 105
  fiber-optic cables, 98
  fiber-optic distances, 98
  jitter, 107
  layer alarms, 105
  link data, 108
  network duplication, 96, 118
  network faults, 117
  synchronization, 98
  troubleshooting aides, 103
  VPI.VCI
    data interactions, 113
    traces between port networks, 113
  WAN spare processor (WSP)—configuration, 116, 119
  WAN spare processor (WSP)—spare lead, 96
  WAN spare processor (WSP)—system limits, 119
AT&T In-band Transfer
  DEFINITY Network Call Redirection (NCR), 126, 127
ATM, *see* Asynchronous Transfer Mode (ATM)
Avaya EC500 R2
  troubleshooting, 231
  XMobile station screen, 228
  X-Station maintenance, 230
Avaya IP600
  backup/restore enhancements, 216
  capacities—AUDIX, 214
  capacities—IMAPI sessions, 214
  documentation—available languages, 212
  extended FAX addresses, 214
  external messaging adjuncts, 216
  interactions with Intuity AUDIX maintenance, 215
Avaya R300
  Alternate Gatekeeper, 181, 182

C

call coverage
  Personal Station Access (PSA), 60
Call Detail Recording (CDR)
  Calling Party Category (MFC), 60
Call Management System (CMS)
  interactions with QSIG path replacement, 129
CE marks, iv
Cell-Loss Priority (CLP), 105
Class of Restriction (COR)
  Multifrequency-Compelled Signaling (MFC), 61

D

daylight savings rules, 254, 269
  location, 270
  upgrade interactions, 269
  upgrades, 241
D-channel Backup (DS1), 57
DEFINITY LAN Gateway
  upgrade interactions, 240
DEFINITY ONE
  backup/restore, 200
  capacities—AUDIX, 198
  capacities—call traffic rate, 197
  capacities—IMAPI sessions, 198
  capacities—stations, 197
  disabling/enabling Intuity AUDIX, 198
  documentation—available languages, 196
  extended FAX addresses, 198
  external messaging adjuncts, 200
  interactions with Intuity AUDIX maintenance, 199
  Unified Messenger software, 199
DEFINITY Translator ATM WSP Manager (DTA)
  troubleshooting, 123

Denied Events Log, 186
announcement failure, 175
Digital IP Station, 473
DS1 Circuit Pack screen
D-channel Backup, 57
DS1 Trunk Service
public network signaling administration, 286

E

electromagnetic compatibility standards, iii

F

fiber-optic cables, 98
File Transfer Protocol (FTP)
backing up announcements, 169
copying announcements, 169
deleting announcements, 170
initiating session, 167
moving announcements, 171
terminating session, 174
FTP, *see* File Transfer Protocol (FTP)

H

help
numbers to call, xv

I

invalid number
announcement administration, 45
IP CentreVu
Alternate Gatekeeper, 182
IP Services
load balancing, 182
IP Softphone
Alternate Gatekeeper, 181, 182
IP trunks, 184, 185, 186
ISDN-PRI
B-channel maintenance, 125

J

jitter
definition, 186
size report, 184, 185, 186

L

location
daylight savings rules, 270
upgrade interactions, 270

M

maintenance objects
ATM-NTWK, 105, 106, 107, 112
Message Waiting Indicator (MWI)
DCS message center, 136
QSIG message center, 134
move list
maximum extensions, 49
Multifrequency-Compelled signaling (MFC)
Call Detail Recording (CDR) and Calling Party Category, 60

N

Network Call Redirection, 298, 300
Network Call Transfer (NCT)
MCI WorldCom and DEFINITY Network Call Redirection (NCR), 126

P

packet loss report, 184, 185, 186
Personal Station Access (PSA)
call coverage, 60
phones
multiple IP addresses, 182, 183
removing, 188
public networks
signaling administration, 286

Q

QSIG
interactions with AUDIX, 132
interactions with Call Management System (CMS), 129
interactions with DCS+ Voice Mail Interworking, 131
interactions with Serenade, 132
Message Waiting Indicator (MWI) activation/deactivation, 134

QSIG, (continued)
Message Waiting Indicator (MWI) administration for DCS message center, 136
path replacement—Call Forward by Forward Switching, 130
path replacement—gateways, 130
path replacement—general, 129
path replacement—stand-alone, 129
path replacement—while in queue or vector processing, 130

R

Recorded Announcements screen, *see* Announcements/Audio Sources screen
removing phones, 188
returning replaced equipment from upgrades, 259, 274

S

software release string explanation, 44
SONET/SDH layer alarms, 105
standards electromagnetic compatibility, iii
Switch-to-Call Accounting Link Testing, 83
synchronization splitter, 98

T

Testing Switch-to-Call Accounting Link, 83
TGE/TGU trunking (Italy), 57
TN2182B (Tone Clock) Multi-Frequency Packet Signaling, 58
TN2182C (Tone Clock) Busy Tone Disconnect, 42, 55
TN2199 (Russian CO) Multi-Frequency Packet Signaling, 58
TN2302AP (IP Media Processor) T.38 fax standards, 42
TN2305B (ATM), 97
ATM-CES application, 102
ATM-PNC application, 102
attaching firmware monitor cable, 95
automatic reset, 110
TN2306B (ATM), 97
ATM-CES application, 102
ATM-PNC application, 102
attaching firmware monitor cable, 95
automatic reset, 110
TN2501AP (integrated announcements) description, 144
faceplate LEDs and interpretation, 149
faceplate LEDs, interpretation, 146
TN464/TN2464 (Russian incoming ANI) Multi-Frequency Packet Signaling, 58
TN744D (Call Classifier/Detector) Multi-Frequency Packet Signaling, 58
TN744E (Call Classifier/Detector) Busy Tone Disconnect, 42, 55
TN765 Processor Interface (PI) system software upgrades, 238
TN787 Multimedia Interface (MMI) upgrade interactions, 268
TN799 (C-LAN) Alternate Gatekeeper, 181, 182
in Voice Announcements over LAN (VAL) application, 143
in WAN spare processor application, 119
Translations CDR Parameters, 71
troubleshooting Automatic Customer Telephone Rearrangement (ACTR), 51
Avaya EC500 R2, 231
Busy Tone Disconnect, 57
DEFINITY Translator ATM WSP Manager (DTA), 123
R9.5r upgrades, 262
remotely readable electronic ID, 41
VAL, 178
TTI enable procedure, 257, 271
upgrade interactions, 238, 246

U

UN331B/C (processor), 262
upgrades BX.25 links (CMS, AUDIX, INTUITY), 238
Call Management System (CMS) interactions, 260
daylight savings rules, 269
DEFINITY LAN Gateway, 240
interaction with TN787 Multimedia Interface (MMI) circuit packs, 268
location interactions, 270
returning replaced equipment, 259, 274
setting date, time and daylight savings rules, 241

upgrades, (continued)
Survivable Remote EPN (SREPN) interactions, 261
TTI interactions, 238, 246
Wireless Business System interactions, 261

V

VAL, *see* Voice Announcements over LAN
Voice Announcements over LAN (VAL)
administration, 156
backplane adapter—Comcode, 144
backplane adapter—installing, 147
equipment configuration, 143
FTP—administering connections, 149
FTP—starting a session, 168
maintenance objects, 356
recording announcements—at a system phone, 162
recording announcements—professional or computer recording parameters, 160
system capacities, 141
troubleshooting commands, 178
VAL Manager, 156

W

WAN spare processor (WSP)
ATM-network duplication, 118
boot-up time, 117
configuration, 116, 119
Expansion Archangel Link (EAL), 117
network monitoring, 119
priority administration, 118
spare lead, 96
system limits, 119

X

XMobile station screen
Avaya EC500 R2, 228