Centrex Switch Requirements and Administration

3

Overview

This chapter includes general software and hardware requirements for administering Centrex switches for integration with the Lucent™ INTUITY™ system and specifies information the customer must provide to and obtain from the central office (CO). Separate sections are provided for the:

- Lucent 5ESS® switch
- Northern Telecom (Nortel) DMS-100/SL-100 switch

Purpose

This chapter provides high-level guidelines for ensuring that the switch is administered properly for integration with the Lucent INTUITY system.

Lucent 5ESS Switch

This section provides the following information for 5ESS switch integrations:

- Hardware and software requirements
- Switch administration requirements

5ESS Switch Hardware and Software Requirements

The customer must ensure that the CO provides the hardware and software listed below.

5ESS Switch Integration with a 3A Translator

The following are required:

- 5E4(2) generic software load (version 4.2 or later)
- A basic rate interface (BRI) line set up in office-dependent data (ODD) as an applications processor interface (API). This BRI/API link should be a OB+D link (data only) with D-channel packet switching. The CO can provide this service in one of two ways:
  - A BRI/API 4-wire T-interface is used if a 3A translator is located less than 1 km (0.6 miles) from the switch. This interface requires a D8W-87 8-pin modular cord (RJ45 to RJ45) leading to a 4-wire, T-interface jack. The modular jack is usually the demarcation point; the CO is responsible for any equipment beyond this point. A 5ESS switch module can provide an integrated services line unit-T card (ISLU-T) connection if the customer site is located near the CO.
  - A 2-wire BRI/API U-interface is used if a 3A translator is located more than 1 km (0.6 miles) from the switch. The U-interface allows the 3A translator to be located up to about 10 km (6.25 miles) from the switch (if 19-gauge wire is used); a U-interface often uses 25-gauge wire, allowing the connection to extend up to 3.6 km (2.25 miles). However, the 3A translator can connect only to 4-wire T-interface cabling.

    Converting the 2-wire BRI/API U-interface from the switch to the 4-wire T-interface wiring needed by the 3A translator requires a network terminator unit (NT1U-200 or NT1U-220 using AMI protocol or an NT1U-300 using ZB1Q protocol). The CO may provide the unit or the customer may be required to obtain it, depending on the local service provider procedures.

    NOTE:
    Brite cards are required on the switch if the network terminator unit is more than 5 km (3 miles) away from the switch.

- Business and residence custom services (BRCS) feature package I, II, or III
- Integrated services digital network (ISDN) feature package I
- An ISDN SM, optical remote module (ORM), or remote switching module (RSM) to support the BRI/API link
- The ISDN Message Service, also called deluxe MSS
- Up to 64 analog station lines in a multi-line hunt group (MLHG), with one 2-way Centrex line for each voice messaging port. The number of queue slots in the group should be based on traffic.

  NOTE:
  If multiple hunt groups are to be configured, the same requirements apply to each hunt group. The Lucent INTUITY system can support a configuration with up to 64 different MLHGs.

  The number of analog lines must match the number of INTUITY AUDIX® voice ports.
- One 2-way analog station line for reporting INTUITY AUDIX alarms to a remote services site. Remote services personnel or systems will use this line to perform remote maintenance.
- Optional: One 2-way analog station line if the customer will be using remote access for administration

5ESS Switch Integration with a 202T Modem

The following is required:

- A 202T modem (or equivalent) at the switch
- A baud rate setting of 1200

NOTE:
Further requirements are site-specific. Contact your service provider and your remote support center.

5ESS Switch Administration Requirements

The customer and the service provider are responsible for administering the CO to accept the INTUITY system. The local operating company must administer the 5ESS switch before you begin the installation.

This list summarizes the switch administration necessary for all integrations, whether the 3A translator or the 202T modem is used:

- The voice messaging station lines must be assigned to a message service center (MSC) MLHG. The hunt group must use uniform call distribution (UCD) and be associated with a Deluxe MSS group. There may be 2 to 64 lines in the group.

  NOTE:
  The Lucent INTUITY system can support a configuration with up to64 different MLHGs.

  — The voice ports must be configured to allow calls to originate from INTUITY AUDIX® ports. This is required for outcalling functions such as fax and audio interchange interface specification (AMIS).

  — Queuing (including optional music or recorded announcements) can be assigned to the hunt group if desired.

  — Optional: Some voice messaging ports can be assigned to a separate hunt group on the switch to support the INTUITY AUDIX automated attendant feature (for example, if heavy automated attendant use is expected). Outside callers can then be directed to the automated attendant MLHG, while INTUITY AUDIX system subscribers can dial directly into the main MLHG.

  — If desired, other voice messaging ports can be set aside on the switch to support the INTUITY AUDIX outcalling feature. By default, outcalling occurs on channel group 2 on the Lucent INTUITY system. Through administration of the Voice Equipment window, outcalling can be made to occur on the highest numbered ports, such as ports 59 to 63, by assigning them to another channel group. These ports can be administered as individual station lines on the switch that are not in the hunt group.

  — For the purpose of evaluating traffic on the system, any ports that are set aside for specific automated attendant or outcalling use are subtracted from the total number of ports available in the main voice messaging hunt group. For example, if a 32-port system has 6 ports in a MLHG for automated attendant calls and 4 station lines set aside for outcalling, 22 ports are available in the main voice messaging MLHG for direct voice mailbox calls and redirected call answer calls.

- The following line assignments are needed for all INTUITY AUDIX station (subscriber telephone) lines, depending on customer requirements:

  — BCID (business customer ID) (shows the message group to which INTUITY AUDIX system subscribers belong). One INTUITY AUDIX system can support more than one company, for example, if each company has a different customer group ID. The business

customer group ID between the 3A translator and the INTUITY AUDIX system must match. If not, the message waiting indicators may not light or calls will get non-intercept answer.

— Call forwarding in ODD, with forwarding to the voice messaging MLHG (called the MSC MLHG on the switch). The 5ESS switch bases internal call forwarding on the terminal group.

— Deluxe MSS feature with the following:

- Attendant coverage (required; set to **yes**).
- Message waiting indicator (MWI), either a lamp, stutter tone, or both.

— The analog lines to the voice messaging system must be assigned to a MSC MLHG with circular hunting on the 5ESS and to a UCD on the DMS-100. The hunt group must be assigned to a Deluxe MSS group (ISDN messaging service).

- An individual analog port is required for reporting INTUITY AUDIX alarms to a remote location.
- To test the INTUITY system, the CO must set up two test telephones to be connected through the switch. These telephones should match the majority of telephones that the customer will use on the system. If the MWI will be a flashing light, the test telephones must also be equipped with a flashing light. If the MWI is a stutter tone, the test telephones must be able to give the stutter notification.

  For the system to be tested and cut to service, the customer must provide the CO with two test subscriber extensions and all subscriber extensions on the system. Once the integration is complete, the CO must perform acceptance tests for the two test subscribers, which includes:

  — Administering the coverage path

  — Administering the test subscriber stations

Nortel DMS-100 and SL-100 Switches

This section provides the following information for DMS-100 and SL-100 switch integrations:

- Hardware
- Software requirements
- Switch administration requirements

DMS-100 and SL-100 Switch Hardware Requirements

The customer must ensure that the CO provides the following hardware for the SMDI link:

- A 202T modem at the switch (if distance requires)
- A 3002 data circuit between the two modems (for example, an 829 channel interface unit, OMNI port, or equivalent). The transmit option must be 0 and the receive option must be 13.
- If an 829 channel interface unit is used, an appropriate cable (such as a B25A) between the unit and the modem in the CO (central office)
- Data communications card:
  - NT1X67FA or higher vintage IOC card for 1200-baud rate link
  - NT1X89AA/AB or high vintage MPC card for 2400 baud rate link (used for direct connection configurations or configurations with a customer-supplied modem)
- An SMDI link cable between the IOC/MPC port on the switch and the 25-pin adapter connected to the Lucent INTUITY serial port cable.

NOTE:
If the NT1X67 IOC card is used at the switch, the connection must be programmed for port 0 on the data communication card and the card must be dedicated for the Lucent INTUITY system.

CAUTION:
The nt1x67bc or the nt1x67bd circuit cards are NOT compatible with the Lucent INTUITY system.

The hardware interface to the IOC/MPC port varies with different switch models. For direct connection (without a modem) or for connection through a customer-supplied modem (not a 202T modem), see the DTE serial port adapter pin configuration in Chapter 8, "Hardware Installation for Integration with Direct Connection or Customer- Supplied Modem". Use an RS-232 mini-tester (or breakout box) to determine the correct connection. An integration does not

require the installation of a 202T modem if the distance between the Lucent INTUITY system and the switch is less than or equal to 15.3 m (50 ft), which is an RS-232 standard. If the distance is greater than 15.3 m (50 ft), a modem is required.

In addition, a loop start (not a ground start) interface for the voice connection (UCD) agents is required.

DMS-100/SL-100 Switch Software Requirements

The customer must ensure that the CO provides the following software:

- BCS24 through BCS28 and BCS32 or later software releases are required on the DMS-100/SL-100 switch to support the Lucent INTUITY system SMSI data link.

  NOTE:
  Nortel calls this link the simplified message desk interface (SMDI) link.

- The following SMSI feature packages are required:
  - NTX100: Meridian Digital Centrex - Basic (IBN)
  - NTX101: Meridian Digital Centrex - enhanced business services (IBN)
  - NTX119: Message Service
  - NTX730: ASCII Driver
  - NTX732: Simplified Message Desk Interface (SMDI)

  NOTE:
  NTX100 and NTX101 contain the uniform call distribution (UCD) features required for basic message-desk operation. NTX119 allows the Lucent INTUITY system to request message waiting updates. NTX730 and NTX732 enable the DMS-100/SL-100 to send call setup information to the Lucent INTUITY system.

- Plain Old Telephone Service (POTS) — For customers to use the message desk, either NTX220 (Vertical Services I) or NTX806 (Enhanced Call Forwarding - POTS) packaging must be available in addition to the packages listed previously.

Serial Port Settings

For the serial port settings on the switch, see Nortel NTP 297-3501-316.

DMS-100 and SL-100 Switch Administration Requirements

The customer and the local operating company are responsible for administering the CO to accept integration with the Lucent INTUITY system. The local operating company must administer the DMS-100 or SL-100 switch before you begin the integration.The information provided here is for reference only.

The following high-level procedures are needed on the switch:

- Define the UCD (uniform call distribution) agent for each voice port that connects to the Lucent INTUITY system.

  NOTE:
  The Lucent INTUITY system requires a loop start (not a ground start) interface for the voice ports.

- Define the UCD group.
- Configure the SMDI link.
- Activate the SMDI link.

See information on service order procedure 0081 in Nortel NTP 297-3401-311 for the SMDI link configuration on the DMS-100 and SL-100 switches. See Nortel NTP297-2001-104 for information on how to administer the switch tables.

In addition, MWI must be enabled on the switch, and two telephones must be set up for testing.

Configuring the SMDI Link

The following procedures are required to assign parameters to configure the SMDI link. Ensure that the switch administrator has made these assignments.

1. Parameters for the terminal devices must be set in the appropriate tables, as described in Steps a and b below:

   a. The TERMDEV table is required for the NT1X67FA circuit card. Table 3-1 lists the fields in the TERMDEV table.

   b. The MPC table and MPCLINK table are required for the NT1X89 circuit card. Table 3-2 lists the fields for the MPC table, and Table 3-3 lists the fields for the MPCLINK table.

2. Parameters for the datalink characteristics must be set in the SLLNKDEV table. Table 3-4 lists the fields for the SLLNKDEV table.

3. In addition, ensure that the proper buffer allocation is made for SMDI records such as call information and MWI traffic in the OFCENG table per the requirements defined in Nortel NTP 1001-455.

Table 3-1. TERMDEV Table Definitions (for the NT1X67 Circuit Card)

Field	Description	Values
TERMDES	The SMDI link device name.	1-8 characters.
IOCNO	The I/O (input/output) controller number.	
CKTNO	The I/O controller number to which the link is assigned as outgoing and incoming dateline.	
TERMTYPE	Terminal type.	SMDI
BAUDRT	Baud rate of the terminal device.	Set the appropriate baud rate: ■ 1200 ■ 2400 (for direct connection configurations only or configurations with a customer-supplied modem).
GUARINTYP	Interface type.	If a modem is used, set this value to EIA.
EQPEC	Product engineering code of the circuit card.	Example: 1X67FA
PRTY	Parity of the terminal device.	■ e (even) ■ o (odd) ■ n (none) Normally this value is set to **n** (none).
MODEM	Type of modem.	NONE
COMCLASS	Command classes for the link.	ALL

Table 3-2. MPC Table Definitions for the NT1X89 Circuit Card

Field	Description	Values
MPCNO	The MPC number used for the SMDI link.	Range 0-255. The value used here must also be used in the MPCNO field in the MPCLINK table.
MPCIOC	The shelf number of the MPC I/O controller (SMDI link).	Range 0-12.
IOCCCT	The IOC circuit number.	To derive this value, multiply the slot position on the IOC shelf by 4. 0, 4, 8, 12, 16, 20, 24, 28, or 32.
EQ	The product engineering code for the MPC circuit card.	1X89AA or 1X89BA.
DLDFILE	The download file name for SMDI.	8 characters in the format MPCAxxyy.

Table 3-3. MPCLINK Table Definitions for the MPC Circuit Card

Field	Description	Values
LINKKEY	Key composed of the MPCNO and LINKNO subfields.	See the fields below.
MPCNO	The MPC number used in the SMDI link.	Enter the same value as in the MPCNO field in the MPC table.
LINKNO	The MPC link for SMDI application with ASYNC protocol.	2 or 3.
PROTOCOL	This value must be consistent with the download file specified in the MPC table (see the DLDFILE field in Table 3-2 above).	ASYNC
LINKNABL	The amount of time a link is enabled before it is busied.	The number of minutes in multiples of 5.
APLDEFN	Application definition.	SMDI

Table 3-4. SLLNKDEV Table Definitions for Datalink Characteristics

Field	Description	Values
DEVNAME	Device name entered in the TERMDEV table.	Use the device name entered in the TERMDEV table.
DEVTYPE	Device type.	■ For BCS29 and earlier releases, use RS232. ■ For BCS30 and later releases, use HS1X67 (for the 1X67F circuit card).
XLATION	Translations used for incoming and outgoing calls.	Usually set to NONE.
PROTOCOL	Protocol used for the datalink.	Set to NONE for the serial link.
DIRECTION	Specifies the direction that data travels through the link.	Set the direction as INOUTLK (for two-way).
XFERS	Report type currently allowed on the datalink.	Set to SMDIDATA.

Activating the SMDI Link

The SMDI link must be assigned to the voice ports. This is done by using the service order (SERVORD) procedure to assign the SMDI option for each voice port by setting SMDI_AUTOLOG to **y** for all voice ports.

Defining the UCD Agent for Each Voice Port that Connects to the Lucent INTUITY System

The UCD group setup requires defining settings for each UCD agent (analog line) using the service ordering (SERVORD) table. Each voice port (Tip/Ring line) coming into the Lucent INTUITY system must be defined as a UCD agent. The directory numbers assigned to each voice port (UCD agent) must also be assigned in the Voice Equipment window on the Lucent INTUITY system.

Each voice port connecting to the Lucent INTUITY system must be configured as a loop-start interface. The status must be set to WORKING in the Line Circuit Inventory (LNINV) table. There must be a sufficient number of DS-30A links between the LCGs (Line Group Controllers) and the LCMs (Line Concentrator Modules) to support traffic to the Lucent INTUITY system. See Nortel NTP-297-1001-103 for more information. The following parameters should be set for each line connected to the Lucent INTUITY system:

- DN — directory number
- LCC — line class code of service (usually set to IBN)
- GROUP — name of the IBN customer group to which the line belongs

- SUBGRP — subgroup number
- NCOS — network class of service
- SNPA — Service numbering plan area
- LATANAME — local area transport access name (set to NILLATA)
- LEN_OR_LTID — line equipment number (also known as line terminal ID)
- OPTION — The following options must be enabled on the line:
  - COD (CUTOFF_ON_DISC) must be enabled and the setting verified as greater than 200 ms. (The default setting on the Nortel switches is usually 80 ms.
  - UCD must be specified to associate the line with a UCD.
  - SMDI must be specified to associated the line with a particular SMDI link.
  - 3WC (for 3-way calling) should be set on the line. More options may be required.
  - T (for transfer enabled) must be set.

Make sure that the cutoff-on-disconnect-time is set to 1 second in the OFCVAR table.

Defining the UCD Group

The UCDGRP (uniform call distribution group) table defines the MDN (message desk number) for the Lucent INTUITY system. The MDN is needed for the Lucent INTUITY system only if more than one hunt group (UCD group) is used in voice connection. Each voice channel has a corresponding UCD agent that is a member of the message desk. The UCDGRP (UCD group) table (Table 3-5) is used for these definitions.

A primary directory number must also be assigned for the UCD group:

- DNROUTE table is used in BCS 33 and higher releases.
- WRND table is used in BCS 32 or lower releases.

See (Table 3-6) for the fields in these tables.

Table 3-5. UCD Group Table (UCDGRP)

Field	Description	Values
UCDNAME	Name assigned to a UCD group.	Range 1-16 characters.
ACDN	Specifies whether automatic call distribution is supported.	n
CUSTGRP	The name of the customer group to which the UCD group belongs	1-16 characters.
UCDRNGTH	The interval after which an answered call to a UCD agent is forwarded to the route specified in the THROUT field.	20
TABNAME	Specifies where overflow and timeouts are to be routed.	■ OFRT ■ IBNRTE
INDEX	The route list number assigned in the OFRT or IBNRTE table.	Range 1-1023.
PRIOPRO	The maximum amount of time a call can wait in the queue.	Digits representing the number of seconds.
MAXPOS	The number of Lucent INTUITY voice ports used.	Range 1-64.
DBG	Specifies when billing begins.	■ N — billing starts when the caller receives a recorded announcement. ■ Y — billing starts when the call is answered by a UCD agent.
DEFPRIO	The default priority treatment for local calls terminating on the primary UCD number.	0 (zero)
RLSCNT	The maximum number of calls that terminate on a UCD station but are not answered.	0 (zero)
MAXCQSIZ	The maximum number of calls that can be in the incoming queue. The queue size should be less than or equal to the maximum number of Lucent INTUITY voice ports.	Range 0-511.
MAXWAIT	The maximum time a call can wait in the incoming call queue before being answered.	Digits representing the number of seconds.
OPTIONS		UCD_SMDI

Continued on next page

Table 3-5. UCD Group Table (UCDGRP) — *Continued*

Field	Description	Values
SMDI_ TERMDEV	The terminal designation defined in the TERMDEV and SLLNKDEV tables.	Use the value assigned in the TERMDEV and SLLNKDEV tables.
SMDI_DSK_ NO	MDN (message desk number).	Range 1-63.

Table 3-6. DNROUTE and WRDN Table Definitions for the UCD Group

Field	Description	Values
DNNM	Specifies the numbering plan.	■ SVGNPA ■ NXX ■ DEFGDIGS
DN_SEL	DN selector FEAT.	FEAT
FEATURE	Feature UCD.	UCD
UCDGRP	The UCD group name.	Use the name set for the UCDNAME field in the UCDGRP table.
DNTYPE	Directory number type.	Set this value to PRIM if the directory number is the primary UCD DN for the UCD group.
TOLLPRIO	The priority of toll calls terminating on the primary UCD directory number.	Normally set to 0 (zero).

Enabling MWI

For the subscriber extensions that will receive voice mail messages on the Lucent INTUITY system, the MWI (message waiting indicators) must be enabled. This is done by enabling either MWT (message waiting tone) or MWL (message waiting lamp). The subscriber extensions must be configured o define the Call Forward Busy number as the lead UCD number, and the Call Forward No-Answer number to the UCD.

Setting Up Test Telephones

Two telephones must be set up for testing the Lucent INTUITY system. These telephones must be connected through the switch and should match the majority of telephones that the customer will use on the system. If the MWI will be a flashing light, the test telephones must also be equipped with a flashing light. If the MWI is a stutter tone, the test telephones must be able to give stutter notification.

For the system to be tested and cut to service, the customer must provide the CO with two test subscriber extensions and all subscriber extensions on the system. Once the integration is complete, the CO must perform acceptance tests for the two test subscribers. The following two tasks must be performed:

- Administer the coverage path.
- Administer the test user stations.