



# **Avaya Aura™ Communication Manager Reports**

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## Contents

About this document . . . . .	15
Purpose of traffic reports . . . . .	15
Who should read this document . . . . .	15
How this document is organized . . . . .	16
Trademarks. . . . .	17
Document conventions . . . . .	17
How to obtain Avaya books on the Web . . . . .	17
How to order documentation . . . . .	18
How to comment on this book . . . . .	18
How to get help . . . . .	18
Chapter 1: About commands and displaying reports . . . . .	19
Commands and the command line format. . . . .	19
Monitor commands . . . . .	26
List commands. . . . .	26
Display commands . . . . .	26
Change commands . . . . .	26
Clear commands. . . . .	26
Displaying reports . . . . .	27
Screen format . . . . .	27
Chapter 2: System printer and the report scheduler feature . . . . .	29
System printer . . . . .	29
System printer data-link operation and maintenance . . . . .	30
Report scheduler feature . . . . .	31
Print intervals . . . . .	31
Adding a report to the report scheduler . . . . .	32
Printing reports on the system printer . . . . .	34
Listing scheduled reports. . . . .	34
Changing the schedule of a report . . . . .	36
Removing a report from report scheduler . . . . .	38
Chapter 3: Traffic data analysis reports . . . . .	41
How this chapter is organized . . . . .	41
About reports . . . . .	43
Switch name . . . . .	43
Time and date . . . . .	43

## Contents

Measurement hour. . . . .	43
Changing the time . . . . .	44
Measurement Data Updates. . . . .	44
Attendant group reports. . . . .	44
Attendant Group Measurements report . . . . .	44
Command. . . . .	44
Screen . . . . .	45
Attendant Positions Measurements report . . . . .	51
Command. . . . .	51
Screens. . . . .	52
Attendant Speed of Answer report . . . . .	53
Command. . . . .	53
Screens. . . . .	54
Data analysis guidelines for attendant group reports. . . . .	56
Analyzing attendant group data . . . . .	56
Automatic circuit assurance reports . . . . .	64
ACA Parameters report . . . . .	65
Command. . . . .	65
Screen . . . . .	66
Automatic Circuit Assurance Measurements report . . . . .	69
Command. . . . .	69
Screens. . . . .	69
ARS/AAR/UDP route pattern reports . . . . .	72
Route Pattern Measurement Selection screen. . . . .	72
Command. . . . .	72
Screen . . . . .	73
Route Pattern Measurements report . . . . .	74
Command. . . . .	74
Screen . . . . .	74
Data analysis guidelines for route pattern reports . . . . .	78
Analyzing the route pattern data . . . . .	79
Call Type Analysis Route Chosen report. . . . .	80
Command. . . . .	80
Screen . . . . .	80
AAR/ARS Route Chosen reports . . . . .	82
Command. . . . .	82
Screen . . . . .	82
Command. . . . .	83
Screen . . . . .	83
Call Rate Measurements report. . . . .	85

Command. . . . .	85
Screen . . . . .	85
Call Summary Measurements report . . . . .	88
Command. . . . .	88
Screen . . . . .	88
Cell Traffic report . . . . .	91
Command. . . . .	91
Screen . . . . .	91
Call coverage measurements reports . . . . .	93
Terms . . . . .	94
Feature interactions . . . . .	94
Data analysis guidelines for call coverage measurements . . . . .	94
Selecting coverage paths to be measured. . . . .	95
Command. . . . .	95
Screen . . . . .	95
Coverage Path Measurements report . . . . .	96
Command. . . . .	97
Screen . . . . .	97
Selecting principal extensions to be measured . . . . .	100
Command. . . . .	100
Screen . . . . .	100
Principal Measurements report. . . . .	102
Command. . . . .	102
Screen . . . . .	102
DS1 link performance measurements . . . . .	104
DS-1 Link Performance Measurements Summary report . . . . .	106
Command. . . . .	107
Screen . . . . .	107
DS-1 Link Performance Measurements Detailed Log report. . . . .	111
Command. . . . .	111
Screens. . . . .	112
DS1 Converter reports. . . . .	114
Command. . . . .	116
Screens. . . . .	116
Emergency Access Calls report . . . . .	122
Command. . . . .	122
Screen . . . . .	122

## Contents

Hunt group reports . . . . .	124
Hunt Groups report . . . . .	124
Command. . . . .	124
Screen . . . . .	125
Hunt Group Members report . . . . .	126
Command. . . . .	127
Screen . . . . .	127
Hunt Group Measurements report . . . . .	130
Command. . . . .	130
Screen . . . . .	130
Data analysis guidelines for hunt group reports . . . . .	134
Analyzing the hunt group measurement data . . . . .	134
Total usage. . . . .	136
Average holding time . . . . .	136
Hunt Group Performance report . . . . .	137
Command. . . . .	137
Screen . . . . .	137
Hunt Group Status report . . . . .	139
Command. . . . .	139
Screen . . . . .	140
IP Signaling Groups Latency and Loss report. . . . .	141
Commands . . . . .	141
Screen . . . . .	142
IP traffic measurements reports . . . . .	143
IP Codec Resource Hourly report . . . . .	144
Commands . . . . .	144
Screen . . . . .	145
IP Codec Resource Summary report . . . . .	146
Commands . . . . .	146
Screen . . . . .	147
IP Codec Resource Detail report . . . . .	149
Commands . . . . .	149
Screen . . . . .	149
IP DSP Resource Hourly report. . . . .	151
Commands . . . . .	151
Screen . . . . .	151
IP DSP Resource Summary report . . . . .	154
Commands . . . . .	154
Screen . . . . .	155
IP DSP Resource Detail report . . . . .	158

Commands . . . . .	158
Screen . . . . .	159
Port Network level DSP-Resource reports . . . . .	162
PN Summary DSP Resource report . . . . .	163
Command . . . . .	163
Screen . . . . .	163
PN Hourly DSP Resource report . . . . .	167
Command . . . . .	167
Screen . . . . .	167
H.248 GW Level DSP-Resource reports . . . . .	171
GW Summary DSP Resource report . . . . .	171
Command . . . . .	171
Screen . . . . .	172
GW Hourly DSP Resource report . . . . .	175
Command . . . . .	175
Screen . . . . .	176
LAN performance reports . . . . .	180
C-LAN Ethernet Performance Measurements	
Detailed report . . . . .	180
Commands . . . . .	180
Screen . . . . .	181
C-LAN PPP Performance Measurement	
Detailed report . . . . .	182
Commands . . . . .	182
Screen . . . . .	182
CLAN Sockets Hourly report . . . . .	184
Commands . . . . .	184
Screen . . . . .	184
C-LAN Sockets Summary report . . . . .	185
Commands . . . . .	185
Screen . . . . .	186
CLAN Sockets Detail report. . . . .	187
Commands . . . . .	187
Screen . . . . .	187
LAR Measurements for Preferences in Pattern report . . . . .	189
Command. . . . .	189
Screen . . . . .	189
Logins report. . . . .	191
Command. . . . .	191
Screen . . . . .	191

## Contents

Modem Pool Measurements report . . . . .	193
Command. . . . .	193
Screen . . . . .	193
Multimedia reports. . . . .	195
ESM Hourly and ESM Summary reports . . . . .	196
Command. . . . .	196
Screens. . . . .	196
MMI Hourly and MMI Summary reports . . . . .	199
Commands . . . . .	199
Screens. . . . .	199
Voice Conditioners report. . . . .	202
Command. . . . .	202
Screens. . . . .	202
Performance Summary report . . . . .	205
Command. . . . .	205
Screens. . . . .	205
Port network load balance study reports . . . . .	209
Command. . . . .	210
Port Network Load Balance Study - Total report . . . . .	210
Screen . . . . .	210
Port Network Load Balance Study - Intercom report . . . . .	213
Screen . . . . .	213
Port Network Load Balance Study - Incoming report. . . . .	214
Screen . . . . .	214
Port Network Load Balance Study - Outgoing report. . . . .	216
Screen . . . . .	216
Port Network Load Balance Study - Tandem report . . . . .	217
Screen . . . . .	217
Blockage study reports . . . . .	218
Command. . . . .	220
Blockage Study - Port Network report . . . . .	220
Blockage Study - Switch Node report . . . . .	222
Attendant and Maintenance Status report . . . . .	224
Command. . . . .	224
Screens. . . . .	224
Tone receiver reports . . . . .	228
Tone Receiver Summary Measurements report . . . . .	228



Command. . . . .	228
Screen . . . . .	228
Tone Receiver Detail report . . . . .	231
Command. . . . .	232
Screens . . . . .	232
Abbreviated Dialing report . . . . .	234
Command. . . . .	234
Screens . . . . .	234
Traffic Summary report . . . . .	235
Command. . . . .	236
Screens . . . . .	236
Trunk group reports . . . . .	242
Trunk Group Summary report . . . . .	242
Command. . . . .	242
Screen . . . . .	242
Trunk Group Hourly report . . . . .	248
Command. . . . .	248
Screen . . . . .	248
Specifying trunks to monitor for	
Trunk Group Hourly report . . . . .	251
Command. . . . .	251
Screen . . . . .	251
Highest Hourly Trunk Group Blocking	
Performance report. . . . .	252
Command. . . . .	252
Screen . . . . .	253
Trunk Out of Service report . . . . .	256
Command. . . . .	256
Screen . . . . .	256
Trunk Group Status report . . . . .	258
Command. . . . .	259
Screen . . . . .	259
Data analysis guidelines for trunk group reports . . . . .	260
Analyzing trunk group data . . . . .	261
CBC Trunk Group Measurements report. . . . .	267
Command. . . . .	267
Screen . . . . .	268
Background information . . . . .	275
Trunk Lightly Used report . . . . .	276
Command. . . . .	277

## Contents

Screen . . . . .	277
Voice Announcement Measurements report . . . . .	279
Command. . . . .	279
Applicable fields . . . . .	280
Voice/Network Statistics reports . . . . .	282
Voice/Net Stats Field on System-Parameters IP-Options Form . . . . .	283
Command . . . . .	283
Screen . . . . .	283
Thresholds Fields on IP-Interface Form . . . . .	284
Command . . . . .	285
Screen . . . . .	285
Status Station report . . . . .	286
Command . . . . .	286
Screen . . . . .	287
Hourly Voice/Network Statistics reports . . . . .	289
Hourly Jitter Network Region report . . . . .	289
Command . . . . .	289
Screen . . . . .	290
Hourly Delay Network Region report . . . . .	291
Command . . . . .	291
Screen . . . . .	292
Hourly Packet Loss Network Region report . . . . .	293
Command . . . . .	293
Screen . . . . .	293
Hourly Data Network Region report . . . . .	295
Command . . . . .	295
Screen . . . . .	295
Hourly Jitter Media Processor report. . . . .	297
Command . . . . .	297
Screen . . . . .	297
Hourly Delay Media Processor report . . . . .	299
Command . . . . .	299
Screen . . . . .	299
Hourly Packet Loss Media Processor report . . . . .	301
Command . . . . .	301
Screen . . . . .	301
Hourly Data Media Processor report . . . . .	303
Command . . . . .	303
Screen . . . . .	303
Summary Voice/Network Statistics reports . . . . .	305

Summary Jitter report . . . . .	305
Command . . . . .	306
Screen . . . . .	306
Summary Round Trip Delay report . . . . .	307
Command . . . . .	308
Screen . . . . .	308
Summary Packet Loss report . . . . .	309
Command . . . . .	309
Screen . . . . .	310
Summary Data report . . . . .	311
Command . . . . .	311
Screen . . . . .	311
Change measurement selection forms. . . . .	313
Command. . . . .	313
Screen . . . . .	314
Wideband trunk groups reports . . . . .	316
Wideband Trunk Group	
Summary report . . . . .	316
Command. . . . .	316
Screen . . . . .	316
Wideband Trunk Group	
Hourly report . . . . .	320
Command. . . . .	320
Screen . . . . .	320
Wideband Trunk Group Measurement Selection . . . . .	322
Command. . . . .	323
Screen . . . . .	323
Data analysis guidelines for trunk groups . . . . .	324
Summary report . . . . .	324
Hourly report . . . . .	325
Performance considerations . . . . .	325
Chapter 4: Processor occupancy reports . . . . .	327
About processor occupancy reports . . . . .	327
The summary command. . . . .	329
When to use the summary command . . . . .	329
Occupancy Summary Measurements report. . . . .	329
Command. . . . .	329
Screen . . . . .	329
The last-hour command. . . . .	335

## Contents

Occupancy Last-Hour Measurements report . . . . .	335
Command. . . . .	335
Screen . . . . .	335
Using the last-hour report to resolve problems . . . . .	336
The busiest-interval command . . . . .	337
When to use the busiest-interval command . . . . .	337
Occupancy Busiest 3-Minute-Intervals Measurements report . . . . .	337
Command. . . . .	337
Screen . . . . .	338
Using the busiest-interval report to resolve problems . . . . .	338
The communications links command . . . . .	339
When to use the communications links command . . . . .	339
Communication Link Measurements report . . . . .	340
Command. . . . .	340
Screen . . . . .	340
Mapping links to applications. . . . .	342
Command. . . . .	342
Screen . . . . .	342
Data analysis guidelines . . . . .	344
Analyzing the data . . . . .	344
Chapter 5: Security violations reports . . . . .	349
Security Violations Summary report . . . . .	349
Commands . . . . .	349
Screen . . . . .	349
Security violations status reports . . . . .	352
Security Violations Status - Remote Access Barrier Code Violations report. . . . .	352
Security Violations Status - Authorization Code Violations report . . . . .	353
Security Violations Status - Station Security Code Violations report . . . . .	355
Chapter 6: History reports . . . . .	357
Data commands . . . . .	357
History report . . . . .	358
Parsing capabilities for the History report. . . . .	358
Command . . . . .	359
Screen . . . . .	359

Malicious Call Trace History report. . . . .	362
Command . . . . .	362
Screen . . . . .	362
Chapter 7: Blank worksheets . . . . .	365
Worksheet 1 . . . . .	366
Worksheet 2 . . . . .	367
Worksheet 3 . . . . .	368
Worksheet 4 . . . . .	369
Worksheet 5 . . . . .	370
Worksheet 6 . . . . .	371
Index . . . . .	373



# About this document

This document provides a description of the performance reports that are available with Avaya Aura™ Communication Manager.

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## Purpose of traffic reports

The traffic measurements and their associated reports are designed to monitor and collect traffic data (also called usage data) for trunk groups, hunt groups, the attendant group, and so on. The system accumulates and stores the traffic data. You can display and/or print traffic data as an organized report by issuing the appropriate command from the SAT (System Access Terminal), the Communication Manager interface for administrative and maintenance tasks.

Use the system reports and the supporting information in this document to:

- monitor and evaluate system performance
- monitor security violations data, which identifies illegal attempts to access the system
- observe usage trends and recommend possible corrective actions
- determine the source of performance degradations (for example, processor overload)
- determine possible trunk problems (for example, blocking level too high)
- recommend system updates and upgrades

---

## Who should read this document

This document is intended for:

- system administrators
- communications system managers
- technicians who resolve certain usage-related customer complaints
- technicians who plan system expansions and upgrades
- personnel involved in traffic engineering

**Note:**

You do not need a thorough knowledge of traffic theory to use the information in this document. However, such knowledge is helpful if you want to perform in-depth analysis of the traffic data presented in the various reports.

---

## How this document is organized

This document contains the following sections:

- [Chapter 1: About commands and displaying reports](#) lists each traffic command, describes the different types of commands, and describes how to enter a command to display and/or print a report.
- [Chapter 2: System printer and the report scheduler feature](#) describes the Report Scheduler software and how to schedule and print reports on the system printer.
- [Chapter 3: Traffic data analysis reports](#) provides detailed descriptions of the traffic measurement reports, excluding processor occupancy and security violations reports.
- [Chapter 4: Processor occupancy reports](#) describes the purpose of these reports, when to use each report, and how to interpret each report's data. It also lists suggested actions that may be taken if a particular field shows data that indicates an abnormal condition.
- [Chapter 5: Security violations reports](#) describes the reports that contain data on possible security violations.
- [Chapter 6: History reports](#) describes the History and Malicious Call Trace History reports.
- [Chapter 7: Blank worksheets](#) contains blank report analysis worksheets for your use.
  - Attendant Group Data Worksheet — used for historical purposes to record the Attendant Group daily measurements for the selected days.
  - Routing Pattern Data Worksheet — used for historical purposes to record the Routing Pattern daily measurements for the selected pattern number and days.
  - Hunt Group Data Worksheet — used for historical purposes to record the Hunt Group daily measurements for the selected hunt group and days.
  - Trunk Group Data Worksheet — used for historical purposes to record the Trunk Group daily measurements for the selected trunk group and days.
  - Wideband Trunk Group Worksheet — used for historical purposes to record the Wideband Trunk Group daily measurements for the selected trunk groups and days.
  - Processor Occupancy Data Worksheets — used for historical purposes to record the Processor Occupancy daily measurements for the selected days.
  - General Traffic, **ACD**, and CallVisor. ASAI/OCM Applications —used to calculate the **BHCC** for complex traffic applications.



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## Document conventions

This manual uses the following conventions:

- Anything that you type at the command prompt appears in the following typeface:

```
list measurements blockage pn
```

- Any required fields for commands appear enclosed by <>, for example:

```
list measurements blockage pn <yesterday-peak/today-peak/last-hour>
```

- Any optional fields appear enclosed by [ ], for example:

```
list measurements blockage pn <yesterday-peak/today-peak/last-hour>  
[print/schedule]
```

- Keyboard keys are shown as follows: **Enter**

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2. Click **Product Documentation**.
3. To find a specific book, type the document number (for example, 03-300509 for this book) in the **Search Support** text box, and then click **GO**.
4. In the resulting list, locate the latest version of the document, and then click the document title to view the latest version of the book.

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Go to the Avaya Web site at <http://www.avaya.com/support>:

- If you are within the United States, click the **Escalation Management** link. Then click the appropriate link for the type of support you need.

If you are outside the United States, click the **Escalation Management** link. Then click **International Services**, which includes telephone numbers for the international Centers of Excellence. Or contact your local Avaya authorized dealer for any additional help and questions.

# Chapter 1: About commands and displaying reports

---

## Commands and the command line format

The Communication Manager System Administration Terminal, or SAT, is the primary interface for issuing commands to the system. Following a successful login procedure, the screen displays the prompt:

Command:

If you know it, enter the complete command. You can also use **Help** to obtain the list of permissible commands.

The command line consists of three parts:

- The **action** to be taken
- The **object** for the specified action
- The **qualifier** for the specified object

[Table 1](#) lists all of the commands associated with traffic measurements. For a complete list of all commands, refer to *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers*, 03-300431.

**Note:**

Not all commands and reports are available with every configuration or software version. To see which commands you can use with your configuration, type the list, monitor or display command, then press **Help**.

**Table 1: Traffic measurement commands 1 of 7**

**Commands**

Action	Object	Qualifier
change	meas-selection coverage	[schedule]
change	meas-selection principal	[schedule]
change	meas-selection route-pattern	[schedule]
change	meas-selection trunk-group	[schedule]

**1 of 7**

**Table 1: Traffic measurement commands 2 of 7**

**Commands**

Action	Object	Qualifier
change	meas-selection wideband-trunk-group	[schedule]
change	meas-selection network-region	[schedule]
change	meas-selection media-processor	[schedule]
change	report-scheduler	<report number>
clear	measurements ds1	<CabCarSSF> [options]
clear	measurements ds1-facility	<CabCarSSF> [options] [schedule]
clear	measurements occupancy	busiest-intervals
clear	measurements security-violations	[schedule]
display	communications-interface links	[schedule]
display	meas-selection coverage	[schedule]
display	meas-selection principal	[schedule]
display	meas-selection route-pattern	[schedule]
display	meas-selection trunk-group	[schedule]
display	meas-selection wideband-trunk-group	[schedule]
list	aca-parameters	[options] [schedule]
list	emergency	[schedule]
list	hunt group	[option] [schedule]
list	logins	[schedule]
list	measurements aca	[schedule]
list	measurements attendant group	[schedule]
list	measurements attendant positions	[schedule]

**2 of 7**

**Table 1: Traffic measurement commands 3 of 7****Commands**

<b>Action</b>	<b>Object</b>	<b>Qualifier</b>
list	measurements blockage pn	<required field> [schedule]
list	measurements blockage sn	[option] [schedule]
list	measurements call-rate	<required field> [schedule]
list	measurements call-summary	[schedule]
list	measurements cbc-trunk-group	<ISDN CBC tgn> last-hour [schedule]
list	measurements cell-traffic cell-addr	<CabCarSSF> [options] [schedule]
list	measurements cell-traffic summary	[option] [schedule]
list	measurements clan ethernet	<CabCarSSF> [schedule]
list	measurements clan ppp	<CabCarSSF> [schedule]
list	measurements clan sockets hourly	<CabCarSSF> [schedule]
list	measurements clan sockets summary	[options] [schedule]
list	measurements clan sockets detail	<CabCarSSF> [options] [schedule]
list	measurements communications-links	<xx-yy> [schedule]
list	measurements coverage-path	<required field> [options] [schedule]
list	measurements ds1 summary	<CabCarSSF> [options] [schedule]
list	measurements ds1 log	<CabCarSSF> [options] [schedule]
list	measurements ds1-facility summary	<CabCarSSF> [options] [schedule]
list	measurements ds1-facility log	<CabCarSSF> [options] [schedule]

**3 of 7**

**Table 1: Traffic measurement commands 4 of 7**

**Commands**

Action	Object	Qualifier
list	measurements expansion-services-mod hourly	[schedule]
list	measurements expansion-services-mod summary	[options] [schedule]
list	measurements hunt-group	<required field> [schedule]
list	measurements ip codec hourly	[options] [schedule]
list	measurements ip codec summary	<required field> [schedule]
list	measurements ip codec detail	<required field> [options] [schedule]
list	measurements ip dsp-resource hourly	<required field> [schedule]
list	measurements ip dsp-resource summary	[options] [schedule]
list	measurements ip dsp-resource detail	<required field> [options] [schedule]
list	measurements ip signaling group	[options] [schedule]
list	measurements lar-route-pattern	<required fields> [option] [schedule]
list	measurements lightly-used-trunk	<required field> [schedule]
list	measurements load-balance incoming	<required field> [schedule]
list	measurements load-balance intercom	<required field> [schedule]
list	measurements load-balance outgoing	<required field> [schedule]
list	measurements load-balance tandem	<required field> [schedule]

**4 of 7**

**Table 1: Traffic measurement commands 5 of 7****Commands**

<b>Action</b>	<b>Object</b>	<b>Qualifier</b>
list	measurements load-balance total	<required field> [schedule]
list	measurements modem-pool	<required field> [schedule]
list	measurements multimedia-interface hourly	[schedule]
list	measurements multimedia-interface summary	[options] [schedule]
list	measurements occupancy busiest-intervals	[schedule]
list	measurements occupancy last-hour	[schedule]
list	measurements occupancy summary	[schedule]
list	measurements outage-trunk	<required field> [schedule]
list	measurements principal	<required field>[options] [schedule]
list	measurements route-pattern	<pat_no><required field>[schedule]
list	measurements security-violations summary	[schedule]
list	measurements summary	[schedule]
list	measurements tone-receiver detail	<required field>[schedule]
list	measurements tone-receiver summary	<required field>[schedule]
list	measurements trunk-group hourly	<tgn> [schedule]
list	measurements trunk-group summary	<required field>[schedule]
list	measurements voice-conditioners hourly	[schedule]

**5 of 7**

**Table 1: Traffic measurement commands 6 of 7**

**Commands**

Action	Object	Qualifier
list	measurements voice-conditioners summary	[options] [schedule]
list	measurements ip voice-stats hourly jitter	<network region number> [schedule]
list	measurements ip voice-stats hourly rtdelay	<network region number> [schedule]
list	measurements ip voice-stats hourly pktloss	<network region number> [schedule]
list	measurements ip voice-stats hourly data	<network region number> [schedule]
list	measurements ip voice-stats hourly jitter	<media processor board location> [schedule]
list	measurements ip voice-stats hourly rtdelay	<media processor board location> [schedule]
list	measurements ip voice-stats hourly pktloss	<media processor board location> [schedule]
list	measurements ip voice-stats hourly data	<media processor board location> [schedule]
list	measurements ip voice-stats summary jitter today	[schedule]
list	measurements ip voice-stats summary rtdelay today	[schedule]
list	measurements ip voice-stats summary pktloss today	[schedule]
list	measurements ip voice-stats summary data today	[schedule]
list	measurements wideband-trunk-group hourly	<tgn>[schedule]
list	measurements wideband-trunk-group summary	<required field>[schedule]
list	performance attendant	<required field>[schedule]

**6 of 7**



**Table 1: Traffic measurement commands 7 of 7****Commands**

<b>Action</b>	<b>Object</b>	<b>Qualifier</b>
list	performance hunt-group	<required field>[schedule]
list	performance summary	<required field>[schedule]
list	performance trunk-group	<required field>[schedule]
list	report-scheduler	[schedule]
monitor	system	<conn>, <scr>, <view1>, <view2>
monitor	traffic hunt-groups	<hgn> starting group number
monitor	traffic trunk-groups	<tgn> starting group number
monitor	trunk	<tgn>[member #]
remove	report-scheduler	<report number>

**7 of 7**

---

## Monitor commands

Use the **monitor** command to display real-time status reports. When a status report is displayed on the SAT, it is automatically updated every 30 seconds. Press **CANCEL** to abort the **monitor** command.

**Note:**

When you cancel some monitor commands, the SAT interface is automatically logged off. This is not administrable.

If the status report consists of more than one page, use **NEXT PAGE (F7)** to display subsequent pages, and **PREV PAGE (F9)** to display previous pages.

If you enter the **monitor** command incorrectly, or if the qualifier is not applicable or cannot be measured, a descriptive error message appears on the message line at the bottom of the screen. Usually the error messages provide enough detail to determine the problem. You may also press **HELP (F5)** when needed.

---

## List commands

Use the **list** command to obtain historical information for a list of all (or a selected range of) attendants, trunk groups, hunt groups, and so on.

---

## Display commands

Use the **display** command to identify the parameters associated with a specific object/qualifier (for example, the parameters being measured).

---

## Change commands

Use the **change** command to alter the group of parameters being measured.

---

## Clear commands

Use the **clear** command to remove the measurement data generated as a result of an alarm or a system irregularity.

## Displaying reports

The commands listed in [Table 1](#) and the resulting reports are described in detail in Chapters 2–6.

Each of the `monitor` and `list` commands depicted in [Table 1](#) produces or displays a different report on the SAT screen.

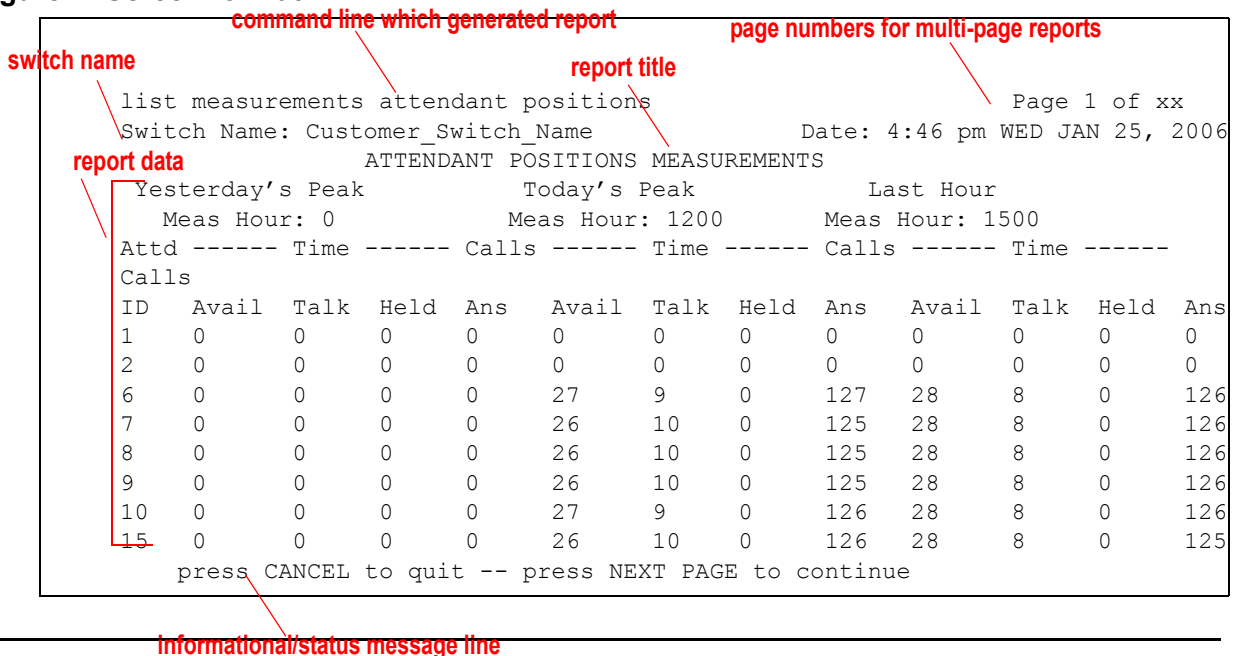
- If the command line qualifier `print` is selected, the report is immediately printed on the slave printer associated with the SAT.
- When the command line qualifier `schedule` is initially executed, the system defaults the report for immediate printing (on the system printer unless a day and time of day is scheduled) and generates a job ID. The job ID is required by the Report Scheduler feature for updating and deleting the schedule of reports.

The Report Scheduler, which is described in [Chapter 2: System printer and the report scheduler feature](#), is used to administer a time/day schedule for each desired report.

## Screen format

The on-screen format for reports is as shown in [Figure 1](#). Red callouts identify standard report content.

**Figure 1: Screen format**



Error messages appear highlighted above the command line, as shown in [Figure 2](#).

---

**Figure 2: Sample error message**

```
This system is restricted to authorized users for legitimate business
purposes.

        Unauthorized access is a criminal violation of the law.
        Copyright 1992 - 2006 Avaya Inc. All Rights Reserved.

Except where expressly stated otherwise, this Product is protected by
copyright and other laws respecting proprietary rights. Certain software
programs or portions thereof included in this Product may contain software
distributed under third party agreements, which may contain terms that
expand or limit rights to use certain portions of the Product. Information
identifying third party components and terms that apply to them are
available on Avaya's web site at: http://support.avaya.com/
ThirdPartyLicense/.

Object command word omitted; please press HELP
Command: list measurements occupancy
```

---

Commands that you type appear as shown in [Figure 3](#).

---

**Figure 3: Sample command line**

```
Command: list measurements occupancy summary
```

---

**Note:**

On large, busy systems, measurement data updates may be delayed at the Top Of The Hour for up to a few minutes due to required processing time for the list measurements reports.

# Chapter 2: System printer and the report scheduler feature

---

## System printer

The system printer, rather than the “slave” printer attached directly to the SAT, is used to schedule reports to be printed. You can also use the system printer to print individual reports.

The Report Scheduler feature uses the system printer as its output device. The hardware parameters for the system printer must have been previously administered on the **Feature-Related System Parameters** screen.

To access this screen, use the `change system-parameters features` command.

[Figure 4](#) shows the Feature-Related System Parameters screen.

[Table 2](#) describes the data fields for this screen.

---

**Figure 4: Feature-Related System Parameters**

change system-parameters features page 4 of xx

FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS

System Printer Endpoint:  Lines Per Page: 60

EIA Device Bit Rate: 9600

SYSTEM-WIDE PARAMETERS

Switch Name:

Emergency Numbers - Internal:  External: 911

No-License Incoming Call Number:

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:

### Note:

The system printer must use either a TCP/IP or Electronic Industries Association (EIA) RS-232 asynchronous serial interface. Depending upon the type/model of serial printer you use, you may have to administer certain hardware option switch settings as part of the installation procedure.

**Table 2: System printer hardware administration field descriptions**

Field	Description
<b>System Printer Endpoint</b>	Enter the extension number if connected to a switched port, SYS_PRNT if the system printer is connected over a TCP/IP link and the link is defined as SYS_PRNT on the IP Services screen, or "eia" (see note below).  <b>Note:</b> If your system is a G3si or G3csi, you may connect the printer to the EIA, unless the EIA is used for Call Detail Record (CDR) collection.
<b>Lines Per Page</b>	The number of lines on the computer screen. The range is from 24 to 132. Generally, 60 will be the appropriate selection.
<b>EIA Device Bit Rate</b>	1200, 2400, 4800, 9600 (This field appears when the System Printer Extension field is set to eia.)

---

## System printer data-link operation and maintenance

Operation and maintenance of the system printer data link is significantly different from the Call Detail Recording (CDR) and journal printer data links. For example, the CDR and journal printer data links are maintained in a constant link up state, while the system printer data link is brought up once every 15 minutes, provided there are reports to be printed, or when an immediate report is scheduled.

The system printer data link has three states that identify its operational condition:

- link up
- link down
- maintenance busy-out

When the communication path (including software processes, hardware cabling, and printer) functions properly and data is exchanged successfully between them, the data link is defined as being in the link up state. The link down state refers to all times except when reports are printed

and when maintenance personnel disable the link. The maintenance busy-out state occurs when you execute the **busyout sp-link** command from the SAT. While in the maintenance busy-out state, the switch software processes and link retry operations are disabled.

Avaya recommends that you monitor the operating status of the system printer and perform routine tasks such as refilling the paper bin, clearing paper jams, and verifying that the printer is plugged in and functioning.

**Note:**

The **Basic Call Management System (BCMS)** login cannot execute the **busyout sp-link** command. This is normally only performed via the maintenance login. Therefore, as necessary, all non-maintenance personnel should simply flip the printer power switch to the OFF position to refill the paper bin and remove jammed paper. Subsequently, the system-printer can be restored on-line by turning the power switch ON.

If the system printer link generates either a warning alarm or a minor alarm, the problem should be referred to the proper maintenance personnel.

---

## Report scheduler feature

The report scheduler can be used with many Communication Manager features. Specifically, virtually all **list**, **display**, or **test** commands can be executed with the **schedule** qualifier. In this way the system administrator login, maintenance login, and other logins can schedule reports.

When a command containing the **schedule** option is executed, it generates a Job Id. A maximum of 50 different Job Ids (50 different reports) can be scheduled for printing. The Report Scheduler feature is used to specify the actual day(s) and time of day each report is printed. For a list of measurement commands that can be scheduled, refer to [Table 1: Traffic measurement commands](#) on page 19.

---

## Print intervals

For purposes of printing reports, three print intervals are available:

- **Immediate** — The report prints immediately.
- **Scheduled** — The report prints each week for the time and days specified. The date, time, and day(s) parameters for the report are set administratively. To change them, re-administration is required.
- **Deferred** — The report generates once for the time and day specified.

# Adding a report to the report scheduler

To add a report to the report scheduler, enter a `list`, `test`, or `display` command followed by the `schedule` option. When a report is initially scheduled, the print interval of **immediate** is automatically assigned as the default. Therefore, if **immediate** is not desired, change the print interval to **deferred** or **scheduled** and add a day and print time to the report scheduler. [Figure 5](#) shows this screen with sample data. [Table 3](#) describes the data fields for this screen.

**Figure 5: Report Scheduler screen — immediate print interval**

```
list measurements attendant-group
REPORT SCHEDULER
Job Id: 1                               Job Status: none
Command: list measurements attendant-group
Print Interval: immediate
```

Page 1

**Table 3: Report Scheduler field descriptions 1 of 2**

Field	Description
Job Id	This is a display-only field. When a command is executed with the qualifier <b>schedule</b> , the system generates a unique Job Id. The Job Id assigned by the system is the lowest number from 1 to 50 not already in use.
Job Status	This is a display-only field. It identifies the print status of the report. Since the job is not yet on the report scheduler, our example shows “none.”
Command	This is a display-only field. It displays the action, object, and qualifier entered when the report was scheduled.
Print Interval	<p>This field has three options: <b>immediate</b>, <b>deferred</b>, and <b>scheduled</b>. The default is <b>immediate</b>. When the <b>Print Interval</b> field is changed from <b>immediate</b> to <b>deferred</b> or <b>scheduled</b>, the screen changes to the format depicted in <a href="#">Figure 6</a> and the administrator is prompted to enter values for the <b>Print Time</b> and the days of the week fields.</p> <p><b>Note:</b> Use <b>deferred</b> when you want to schedule a report for a single printing. Thereafter, the Job Id is automatically removed from the report scheduler. Those reports administered as scheduled print on a week-after-week basis.</p>



**Table 3: Report Scheduler field descriptions 2 of 2**

Field	Description
<b>Print Time</b>	<p>Within a given hour, reports can be scheduled at 15-minute intervals (that is, xx:00, xx:15, xx:30, or xx:45). The system printer requires significant switch processor resources, so it is important that reports be scheduled for off-peak hours. Do not schedule all reports for the same hour and time interval, but stagger them across multiple off-peak time intervals.</p> <p>If, because of printing volume or other problems, a report is not printed within four hours of its scheduled time interval, it is not printed until its next scheduled time interval. This is a four-hour (non-administrable) limit. Immediate and deferred jobs are removed from the report scheduler under this scenario and require reentry to print.</p>
<b>Days of Week</b>	<p>Enter <b>y</b> (yes) for each day of the week the report is to be printed. Enter <b>n</b> (no) for those days when the report should not be printed. Selecting an <b>n</b> for all seven days of the week effectively disables a report from being printed.</p>

**2 of 2****Figure 6: Report Scheduler screen — scheduled print interval**

list measurements attendant groups	Page 1
REPORT SCHEDULER	
Job Id: 1	Job Status: none
Command: list report scheduler	
Print Interval: scheduled	
Print Time: xx:xx	
Sun: n   Mon: n   Tue: n   Wed: n   Thu: n   Fri: n   Sat: n	

Other commands, such as those described in [Chapter 3: Traffic data analysis reports](#), are added to the report scheduler in a similar manner. Add the **schedule** qualifier to the command (for example, **list aca-parameters schedule**). When the first screen appears, change the **Print Interval** field from **immediate** to **scheduled** and subsequently administer the **Print Time** and the days of the week fields.

---

## Printing reports on the system printer

To print a report on the system printer:

1. Execute a command with the **schedule** qualifier.

The Report Scheduler screen appears (see [Figure 5: Report Scheduler screen — immediate print interval](#) on page 32). It indicates the print interval is immediate.

2. Choose one of these options:

- Press **Enter** to print the report immediately on the system printer
- Type **scheduled** or **deferred** in the **Print Interval** field and press **Enter**.

When you change the print interval to **scheduled** or **deferred**, the **Print Time** and the days of the week fields appear (see [Figure 6: Report Scheduler screen — scheduled print interval](#) on page 33).

3. Type in the time at which you want the report to print in the **Print Time** field and press **Enter**.

The cursor is now on the days of the week field.

4. Type **y** for the days that you want to print the report.
5. Press **Enter** to execute the command.

---

## Listing scheduled reports

The **list report-scheduler** command lists all the reports in the report scheduler. The order of the list is according to scheduled print time. Reports are printed according to this list (for example, first report on the list is the first report printed).

To display a list of all reports in the report scheduler:

1. Type **list report-scheduler [print/schedule]** and press **Enter**.

The schedule option is available.

[Figure 7](#) shows the screen for the **list report-scheduler** command.

[Table 4](#) describes the data fields for this screen.

**Figure 7: List Report Scheduler**

list report-scheduler						Page 1 of x
Report Scheduler						
Job Id	Days (smtwtfs)	Time	User	Status	Type	
Command						
4	nynnnnn	18:45	bcms	printing	immediate	
list measurements attendant-group						
2	nynynyn	19:00	bcms	waiting	scheduled	
list measurements call-rate						
7	nnnnnyn	19:15	bcms	waiting	deferred	
list bcms agent 5000						
23	nnynnnn	19:15	bcms	waiting	scheduled	
list bcms agent 4000 day 09/11 09/15						

**Note:**

In instances such as for Job Id 4, if an immediate report is scheduled, the Days field is completed with one **y** for the current day and **n** for all others.

All fields are display-only. Use **change report-scheduler** if you want to change the schedule of reports.

**Table 4: Report Scheduler field descriptions 1 of 2**

Field	Description
<b>Job Id</b>	When a command is executed with the <b>schedule</b> qualifier, the system responds by generating a unique Job Id. The Job Id assigned by the system is the lowest number from 1 to 50 not already in use.
<b>Days (smtwtfs)</b>	On a per-day basis, an <b>n</b> indicates the report is not printed that day; a <b>y</b> indicates the report is printed that day. Specifying <b>n</b> for all seven days of the week effectively disables a report from printing.
<b>Time</b>	The time interval the report is scheduled to print.
<b>User</b>	The user login that scheduled the identified report.

**1 of 2**

Table 4: Report Scheduler field descriptions 2 of 2

Field	Description
Status	<p>The print status of the report. The four possible states are:</p> <ul style="list-style-type: none"> <li>● <b>waiting</b> indicates the report is not scheduled for any activity during the current 15-minute time interval.</li> <li>● <b>print-next</b> indicates the report is scheduled to print within the current 15-minute time interval.</li> <li>● <b>printing</b> indicates the report is currently printing.</li> <li>● <b>printed</b> indicates the report has successfully printed during the current 15-minute time interval.</li> </ul>
Type	The type of print interval scheduled for the report.
Command	Displays the action, object, and qualifier entered when the report was scheduled.

**2 of 2**

## Changing the schedule of a report

Use `change report-scheduler` to change the schedule of a report. To display this screen, use `change report-scheduler nn`, where `nn` corresponds to the Job Id. [Figure 8](#) shows the Change Report Scheduler screen. [Table 5](#) describes the data fields for this screen.

**Figure 8: Change Report Scheduler**

```

change report-scheduler 23
Report Scheduler
Job Id: 23                               Job Status: printed
Command: list bcms agent 4000 time start 08:00 stop 12:00
Print Interval: scheduled
Print Time: 19:15
Sun: n   Mon: y   Tue: n   Wed: y   Thu: n   Fri: y   Sat: n

```

**Table 5: Change Report Scheduler field descriptions 1 of 2**

Field	Description
<b>Job Id</b>	This is a display-only field. It is the unique identifier for the report. The Job Id assigned by the system is the lowest number from 1 to 50, not already in use.
<b>Job Status</b>	<p>This is a display-only field. It identifies the print status of the report. The four possible states are:</p> <ul style="list-style-type: none"> <li>● <b>waiting</b> indicates the report is not scheduled for any activity during the current 15-minute time interval.</li> <li>● <b>print-next</b> indicates the report is scheduled to print within the current 15-minute time interval.</li> <li>● <b>printing</b> indicates the report is currently printing.</li> <li>● <b>printed</b> indicates the report has successfully printed during the current 15-minute time interval.</li> </ul> <p><b>Note:</b> The <b>Print Time</b> and the days of the week fields may be changed and effect a change of the Job Status.</p>
<b>Command</b>	This is a display-only field. It displays the action, object, and qualifier entered when the report was scheduled.
<b>Print Interval</b>	The three possible options are immediate, scheduled, and deferred. If the print time of a report is changed so its scheduled time now falls inside the current 15-minute time interval (that is, the <b>Job Status</b> field changes from <b>waiting</b> to <b>print-next</b> ), the report is printed during the next scheduled time interval. As a contrast, if a report scheduled for a time interval (other than the current 15-minute time interval) has its print interval changed from scheduled to immediate, the report is printed immediately.

**1 of 2**

Table 5: Change Report Scheduler field descriptions 2 of 2

Field	Description
<b>Print Time</b>	Within a given hour, reports can be scheduled at 15-minute intervals (that is xx:00, xx:15, xx:30, xx:45). This field may be changed as desired. The system printer requires significant switch processor resources; therefore, it is important that the reports be scheduled for off-peak hours. Do not schedule all reports for the same hour and time interval, but stagger them across multiple off-peak time intervals. If, because of printing volume or other problems, a report is not printed within four hours of its scheduled time interval, it is not printed until its next scheduled time interval.
<b>Days of Week</b>	On a per-day basis, an <b>n</b> indicates the report is not to be printed that day; a <b>y</b> indicates the report is to be printed that day. This field can be changed as desired. Specifying <b>n</b> for all seven days of the week effectively disables a scheduled printing of a report.

2 of 2

## Removing a report from report scheduler

The **remove report-scheduler** command is used to remove a report from the report scheduler. Enter **remove report-scheduler nn**, where **nn** corresponds to the Job Id. [Figure 9](#) shows the Remove Report Scheduler screen.

[Table 6](#) describes the data fields for the screen.

Figure 9: Remove Report Scheduler

remove report-scheduler 23							Page 1
Report Scheduler							
Job Id: 23			Job Status: printed				
Command: list bcms agent 7000 time start 08:00 stop 12:00							
Print Interval: scheduled							
Print Time: 19:15							
Sun: n	Mon: y	Tue: n	Wed: y	Thu: n	Fri: y	Sat: n	

**Note:**

All fields are display-only. Once you verify that the identified report is the one to be removed, press **Enter**.

**Table 6: Remove Report Scheduler field descriptions**

Field	Description
<b>Job Id</b>	The unique identifier for the report. The Job Id assigned by the system is the lowest number from 1 to 50 not already in use.
<b>Job Status</b>	Identifies the print status of the report. The four possible states are: <ul style="list-style-type: none"> <li>● <b>waiting</b> indicates the report is not scheduled for any activity during the current 15-minute time interval.</li> <li>● <b>print-next</b> indicates the report is scheduled to print within the current 15-minute time interval.</li> <li>● <b>printing</b> indicates the report is currently printing.</li> <li>● <b>printed</b> indicates the report has successfully printed during the current 15-minute time interval.</li> </ul>
<b>Command</b>	Displays the action, object, and qualifier entered when the report was scheduled.
<b>Print Interval</b>	Displays the print interval ( <b>immediate</b> , <b>scheduled</b> , <b>deferred</b> ) for the report.
<b>Print Time</b>	Within a given hour, reports can be scheduled at 15-minute intervals (for example, xx:00, xx:15, xx:30, xx:45).
<b>Days of Week</b>	On a per-day basis, an <b>n</b> indicates the report is not to be printed that day; a <b>y</b> indicates the report is to be printed that day. Specifying an <b>n</b> for all seven days of the week effectively disables a report from printing.





# Chapter 3: Traffic data analysis reports

---

## How this chapter is organized

This chapter describes traffic measurement reports, excluding history, processor occupancy, and security reports. The reports are presented alphabetical order. Each report description includes the following elements.

- An explanation of the report
- The full command used to call up the report (elements of the command may be abbreviated as long as they are unique), including a description of any required fields and options
- An illustration of a typical report screen
- A table that defines all field labels in the report and, when appropriate, a “suggested actions” list

The following reports are described here.

- **Abbreviated Dialing.** Describes the abbreviated dialing group and personal reports.
- **Attendant.** Describes the traffic measurements and performance reports for attendant groups and attendant positions, and provides an analysis of the data provided in the reports.
- **Automatic Circuit Assurance.** Describes the parameters and measurements reports for the Automatic Circuit Assurance (**ACA**) feature.
- **ARS/AAR/UDP Route Pattern Measurements.** Describes the measurements selection screen and routing pattern measurements report for the Automatic Route Selection (**ARS**), Automatic Alternate Routing (**AAR**), and User Datagram Protocol (**UDP**) features, and provides an analysis of the data provided in the measurements report.
- **AAR/ARS Route Chosen.** Describes the route chosen reports for the Automatic Alternate Routing (**AAR**) and Automatic Route Selection (**ARS**) features.
- **Call Type Analysis Route Chosen.** Describes the analysis of numbers as if they were dialed from a phone's call log.
- **Call Rate.** Describes the call rate measurements and summary reports available with Communication Manager systems.
- **Call Summary.** Lists the number of completed calls for the last 24 hours.
- **Cell Traffic Measurements.** Describes the wireless traffic data reports available with Communication Manager systems.

- **Call Coverage Measurements.** Describes the Principal Coverage and Coverage Path measurement reports available with Communication Manager systems.
- **DS1 Link Performance Measurements.** Describes performance measurements for **DS1** links. The reports available include detailed log and summary reports.
- **DS1 Converter Link Performance Measurements.** Describes performance measurements for **DS1 Converter** links. The reports available include detailed log and summary reports.
- **Emergency Access Calls.** Tracks emergency calls by extension, event, type of call, and time of day. This report prints in the system journal printer with name, time and event code (attendant crisis alert).
- **Hunt Groups.** Lists the hunt groups on your system. Describes the traffic measurements, performance, and status reports for Automatic Call Distribution (**ACD**)/Uniform Call Distribution (**UCD**)/Direct Department Calling (**DDC**) Hunt Groups and provides the analysis of the data provided in the reports.
- **IP Signaling Groups Latency and Loss.** Describes worst-performing signaling groups for the last hour, current hour, today, or yesterday.
- **IP Media Processor Measurements.** Lists the activity on IP media processors for specific regions and time periods.
- **LAN Performance Measurements.** Describes the performance measurements report for traffic over Ethernet, CLAN and PPP LAN connections.
- **LAR Route Pattern Measurements.** Describes the route pattern measurements report for the Look Ahead Routing feature.
- **Logins.** Describes the login ID information for each system user.
- **Modem Pool Groups.** Describes the traffic measurements report for modem pool groups.
- **Multimedia.** Describes the traffic measurement reports used to determine multimedia traffic resources.
- **Performance Summary.** Describes the traffic measurements Performance Summary report.
- **Port Network /Load Balance.** Describes the Blockage Study report which provides information on loading and blocking for each port network as well as between switch node pairs; and the Load Balance report which provides information on load and balance for each port network and indications of the source of the load.
- **System Status.** Describes the System Status reports, which provide an overall view of how the system is performing.
- **Tone Receiver.** Describes the Tone Receiver Summary and Tone Receiver Detailed Measurements reports which display traffic data for tone receivers.
- **Traffic Summary.** Describes the Traffic Measurements Summary report.

- **Trunk Groups.** Describes the traffic, outage, lightly used and measurements/selection reports, call-by-call (**CBC**), performance and status reports for trunk groups; it also provides the validation and analysis of the data provided in the reports.
- **Voice/Network Statistics.** Describes the voice/network statistics reports which display hourly and summary level measurement data on packet loss, jitter, round trip delay, and data calls.
- **Wideband Trunk Groups.** Describes the Wideband Trunk Group Summary and Hourly reports and the Wideband Trunk Group Selection screen.

---

## About reports

The following standard fields appear on all traffic data analysis reports, unless otherwise indicated.

---

### Switch name

The **Switch Name** field appears at the top left of all the traffic data analysis screens, just below the command. The field value is a 20-character string administered by you that uniquely defines the switch being measured.

---

### Time and date

The time and date the report is requested displays at the top right.

When a question mark appears in the time fields, three possible explanations exist.

- The attendant presses **START**, then immediately presses **CANCEL**.
- Pressing start and letting calls time-out after ten seconds.
- No staffing, but making calls.

---

### Measurement hour

The **Measurement Hour** field displays the starting time (using a 24-hour clock) of the hour during which data is recorded.

---

## Changing the time

If you change the time, the hour in which the time was changed is shown on the measurements reports as **hh\*\***.

---

## Measurement Data Updates

**Note:**

On large, busy systems, measurement data updates may be delayed at the Top Of The Hour for up to a few minutes due to required processing time for the list measurements reports.

---

## Attendant group reports

The attendant group reports are used to assess the quality of service provided to customers while calling through the listed directory numbers, and to facilitate the management of the attendant group so it is neither under- nor over-staffed.

Attendant group measurements appear on two reports.

- The Attendant Group report provides hourly traffic measurements for the attendant group as a whole.
- The Attendant Positions report gives peak individual attendant position measurements.

Both reports are available as PEAK reports for yesterday's peak hour, today's peak hour, and the last hour. A peak hour is the hour within a 24-hour period with the greatest usage (Time Talk plus Time Held) for the specified day.

Hourly data for the entire attendant group can be obtained by polling the Attendant Group Report on an hourly basis.

---

## Attendant Group Measurements report

### Command

To display the Attendant Group Measurements report:

Type **list measurements attendant group [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 10](#) shows a typical screen for the Attendant Group Measurement Report.

[Table 7](#) describes the data fields presented in this report.

**Figure 10: Attendant Group Measurements**

list measurements attendant group												
Switch Name: Cust_Switch_Name						Date: 4:47 pm WED JAN 25, 2006						
ATTENDANT GROUP MEASUREMENTS												
Grp	Meas	-----		Calls			-----		Time	----	Time	Speed
Siz	Hour	Ans	Abnd	Qued	H-Abd	Held	Avail	Talk	Held	Abnd	Ans(sec)	
0	0	0	0	0	0	0	0	0	0	0	0	YEST PEAK
10	1200	1006	0	0	0	0	212	76	0	0	0	TODAY PEAK
10	1500	1007	0	0	0	0	224	64	0	0	1	LAST HOUR

**Table 7: Attendant Group Measurements report field descriptions 1 of 7**

Field	Description
<b>Grp Siz</b>	Group Size. The number of attendant positions (consoles) administered for the groups.
<b>Meas Hour</b>	Measurement Hour. The hours represented are indicated by the labels in the right-hand column ( <b>YEST PEAK</b> — the hours of yesterday's peak activity, <b>TODAY PEAK</b> — today's peak activity, and <b>LAST HOUR</b> — the last hour activity).  <b>Note:</b> A pair of asterisks in the minute portion of the measurement hour indicates the switch time was changed during the measurements interval. All measurement data for this interval is set to zero.
<b>Calls Ans</b>	Calls Answered. The number of calls answered by all active attendants during the measurement hour. With Total Usage and Calls Answered, you can determine the Average Work Time ( <b>AWT</b> ), which is the time it takes an attendant to handle a call (refer to <a href="#">Data analysis guidelines for attendant group reports</a> on page 56). Calls placed to individual attendant extensions or that route to an attendant via a hunt group do not increment the <b>Calls Ans</b> counter.

1 of 7

Table 7: Attendant Group Measurements report field descriptions 2 of 7

Field	Description
<b>Calls Aband</b>	<p>Calls Abandoned. The number of calls that ring an attendant group and drop (the caller hangs up) before an attendant answers. Where applicable, this total includes calls abandoned from the attendant queue before answered. A call abandoned after placed on hold is <i>not</i> included in this measurement, because it is already added to the calls answered measurement.</p> <p><b>Suggested action:</b> Observe times during which the calls abandoned number may be higher than desirable, and then schedule additional attendants in the group as needed during the indicated times. Also, see “Percent Occupancy,” located under <a href="#">Data analysis guidelines for attendant group reports</a> on page 56.</p>
<b>Calls Qued</b>	<p>Calls Queued. The total number of calls placed in the attendant queue (delayed) because no attendants are available. Calls remain in the queue until one of the following occurs:</p> <ul style="list-style-type: none"> <li>• An attendant becomes available and the call is connected.</li> <li>• The caller, while waiting in the queue, abandons the call (hangs up) before an attendant is available. See “suggested action” in the description of the <b>Calls Aband</b> field.</li> <li>• The call covers to another point in a coverage path.</li> </ul>
<b>Calls H-Abd</b>	<p>Calls Held-Abandoned. The number of calls that abandon while the caller is in hold mode. Held calls which time out and re-alert are included in the held-abandoned call count.</p> <p><b>Suggested action:</b> If this number is determined to be excessive, you should investigate and attempt to identify the reasons.</p>
<b>Calls Held</b>	<p>Calls Held. The number of calls answered by the attendant group and subsequently placed on hold by the attendant group.</p>

2 of 7

**Table 7: Attendant Group Measurements report field descriptions 3 of 7**

Field	Description
<b>Time Avail</b>	<p>Time Available. The time during which the “pos avail” lamp is lit on all attendant consoles, and the attendants are not talking on calls but are available to handle new calls. Measured in Centum (hundred) Call Seconds (CCS).</p> <p><b>Note:</b> An attendant can have calls on hold and still be available. For example, if two attendants are available for 15 minutes each during the measurement hour, the total available time would be 30 minutes or 18 <b>CCS</b> (0.5 hour X 36 <b>CCS</b> per hour).</p>

**3 of 7**

Table 7: Attendant Group Measurements report field descriptions 4 of 7

Field	Description
<b>Time Avail (cont.)</b>	<p>Consoles may be administered either with their own unique extension number or without any extension number. For the “with extension number” case, traffic measurements for outgoing calls and incoming calls to the extension are allotted to the console’s extension number and not to the attendant group. For the “without” case, all traffic measurements are allotted to the attendant group. The time the console is on outgoing calls is not included in the attendant group’s Time Avail measurement. Attendants are not available and do not accumulate time available when:</p> <ul style="list-style-type: none"> <li>• The position is in Night Service</li> <li>• The position was busied-out</li> <li>• The headset is unplugged</li> <li>• The attendant is servicing a call</li> </ul> <p><b>Suggested actions:</b></p> <ul style="list-style-type: none"> <li>• If the <b>Time Avail</b> plus <b>Time Talk</b> fields total to a number less than 36 <b>CCS</b> X the number of attendants, then some of the attendant positions are not staffed for the measurement hour. If this is a problem, then it is appropriate to staff additional positions during the busy hour(s).</li> <li>• If the <b>Time Avail</b> plus <b>Time Talk</b> fields equal 36 <b>CCS</b> X the number of attendants, then any time available is idle time or time not spent on calls. A large number for the <b>Time Avail</b> field indicates a low occupancy. If this is a problem, then it is appropriate to reduce the number of attendant positions that are staffed. Staffed time is usually very close to the sum of the <b>Time Avail</b> and <b>Time Talk</b> fields.</li> </ul>

4 of 7



**Table 7: Attendant Group Measurements report field descriptions 5 of 7**

Field	Description
<b>Time Talk</b>	<p>Also referred to as <i>talk time</i>. The total time, during the measurement interval, attendant(s) are active or talking on a loop (measured in <b>CCS</b>).</p> <p>Talk time is not started until the call is answered by the attendant. The duration of time between the call terminating at the attendant console and when the call is answered is not accumulated as either Avail Time or Talk Time.</p> <p>Calls split by the attendant do not accumulate talk time from the point when the attendant presses the start button until the call is placed.</p> <p>Calls routed to an attendant via a hunt group are treated as calls to the attendant extension and therefore do not accumulate talk time.</p> <p><b>Note:</b></p> <p style="padding-left: 40px;">An attendant can have up to six calls on hold at any one time. However, each attendant can only be active on one loop at a time.</p> <p><b>Suggested action:</b> If talk time is acceptable, but one or more of the other measurements are unacceptable, then all parameters should be studied in order to identify what should be changed (the number of consoles, number of attendant positions staffed, attendants schedule, faulty trunks, and so on).</p>
<b>Time Held</b>	<p>Also referred to as <i>held time</i>. The total amount of time (measured in <b>seconds</b>) the attendants have calls on hold.</p>

**5 of 7**

Table 7: Attendant Group Measurements report field descriptions 6 of 7

Field	Description
<b>Time Abnd</b>	<p>Also referred to as <i>time to abandoned</i>. The average amount of time calls spend in queue and/or ringing at the console before the callers hang up (measured in seconds).</p> <p><b>Note:</b></p> <p>Time to abandoned does not include calls that overflow the attendant group queue.</p> <p><i>Time To Abandoned</i> =</p> $\frac{\text{Total Delay For All Abandoned Calls (in seconds)}}{\text{Total Number of Calls Abandoned}}$ <p><b>Suggested action:</b> If the <b>Time Abnd</b> value is smaller than the <b>Speed Ans (sec)</b> value, you need more agents. As a contrast, if the <b>Time Abnd</b> value is larger than the <b>Speed Ans (sec)</b> value, the attendant group should process the calls faster. The attendant group should be engineered so <b>Time Abnd</b> approximately equals the calculated average delay.</p> <p><i>Total Delay</i> =</p> $(\text{Time To Abandoned}) \times (\# \text{ of Abandoned Calls}) +$ $(\text{Speed of Answer}) \times (\# \text{ of Calls Answered})$ <p><i>Avg Delay</i> = <math display="block">\frac{\text{Total Delay}}{\text{Calls Answered} + \text{Calls Aband}}</math></p> <p><b>Note:</b></p> <p>If the average time to abandon is equal to or exceeds 9999 seconds, the value 9999 displays in the field.</p>

6 of 7

Table 7: Attendant Group Measurements report field descriptions 7 of 7

Field	Description
<b>Speed Ans (Sec)</b>	<p>Speed of Answer. The average elapsed time from when a call terminates at the attendant group to when the call is answered by an attendant (measured in seconds). The average time calls wait to ring an attendant (Queue Usage / Calls Answered). The Queue Usage is the total time calls spend in the attendant queue.</p> <p><b>Note:</b></p> <p>Calls terminate either directly to an attendant console and subsequently begin ringing or in the attendant queue when there are no attendant positions available.</p> <p><i>Speed of Answer =</i></p> $\frac{\text{Total Delay For All Answered Calls (in seconds)}}{\text{Total Number of Calls Answered}}$ <p>If the average time to abandon is equal to or exceeds 9999 seconds, the value 9999 displays in the field.</p> <p><b>Suggested action:</b> If this number appears to be too high and all attendants are working at acceptable efficiency levels, consider additional training that may help the attendants complete calls more quickly. Alternatively, observe the hours during which speed of service becomes unacceptable and consider adding consoles and staffing additional attendants during those hours.</p>

7 of 7

## Attendant Positions Measurements report

The Attendant Positions Measurements report provides hourly individual attendant position measurements. It is used to assess personnel performance, and to identify when additional training may be necessary.

### Command

To display the Attendant Positions Measurements report:

Type `list measurements attendant positions [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

## Screens

[Figure 11](#) and [Figure 12](#) show a typical Attendant Positions Measurements report.

[Table 8](#) describes the data fields presented in this report.

**Figure 11: Attendant Positions Measurements report — page 1**

list measurements attendant positions												
Switch Name: Customer_Switch_Name								Date: 4:46 pm WED JAN 25, 2006				
ATTENDANT POSITIONS MEASUREMENTS												
Yesterday's Peak				Today's Peak				Last Hour				
Meas Hour: 0				Meas Hour: 1200				Meas Hour: 1500				
Attd	-----	Time	-----	Calls	-----	Time	-----	Calls	-----	Time	-----	Calls
ID	Avail	Talk	Held	Ans	Avail	Talk	Held	Ans	Avail	Talk	Held	Ans
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	27	9	0	127	28	8	0	126
7	0	0	0	0	26	10	0	125	28	8	0	126
8	0	0	0	0	26	10	0	125	28	8	0	126
9	0	0	0	0	26	10	0	125	28	8	0	126
10	0	0	0	0	27	9	0	126	28	8	0	126
15	0	0	0	0	26	10	0	126	28	8	0	125
press CANCEL to quit -- press NEXT PAGE to continue												

**Figure 12: Attendant Positions Measurements report — page 2**

list measurements attendant positions												Page 2
Switch Name: Customer_Switch_Name								Date: 4:46 pm WED JAN 25, 2006				
ATTENDANT POSITIONS MEASUREMENTS												
Yesterday's Peak					Today's Peak				Last Hour			
Meas Hour: 0					Meas Hour: 1200				Meas Hour: 1500			
Attd	-----	Time	-----	Calls	-----	Time	-----	Calls	-----	Time	-----	Calls
ID	Avail	Talk	Held	Ans	Avail	Talk	Held	Ans	Avail	Talk	Held	Ans
20	0	0	0	0	27	9	0	126	28	8	0	126
25	0	0	0	0	27	9	0	126	28	8	0	126

Table 8: Attendant Positions Measurement report field descriptions

Field	Description
<b>Attd ID</b>	Attendant ID. A number between 1 and the maximum number of attendants to identify which attendant's data is being displayed. This number is chosen by you upon administering this attendant.
<b>Time Talk</b>	The time the attendant is active on calls (in CCS), measured from the time the attendant activates an attendant loop until the loop is released. If more than one loop is active on an attendant console at one time, the usage is counted only once (for example, one attendant is not counted as being busy more than once at a single time).
<b>Time Held</b>	The time the attendant had calls on hold (measured in seconds).
<b>Time Avail</b>	Time Available. The total time the subject attendant is available to receive calls during the polling interval (measured in CCS).
<b>Calls Ans</b>	Calls Answered. The total number of calls answered by this attendant (measured in CCS). Calls placed to an individual attendant extension or that route to an attendant via a hunt group do not increment the <b>Calls Ans</b> field.

## Attendant Speed of Answer report

The Attendant Speed of Answer report gives the console attendant group average speed of answer for each hour of a 24-hour period, for either yesterday or today.

### Command

To display the Attendant Speed of Answer report:

Type `list performance attendant <yesterday/today> [schedule]` and press **Enter**.

**Required fields:** There is one required field for this command — **yesterday/today**.

- Enter **yesterday** to list the attendant group activity for yesterday.
- Enter **today** to list the attendant group activity for today.

**Options:** The **schedule** option is available for this command.

Screens

[Figure 13](#) and [Figure 14](#) show typical screens for the Attendant Speed of Answer report, using the **yesterday** option.

Page 1 of the display shows hours from 0000 (midnight) through 1100 (11:00 am); page 2 shows hours from 1200 (noon) through 2300 (11:00 pm). As shown at the bottom of page 1, press **CANCEL** to exit the Attendant Speed of Answer report, or press **NEXT PAGE** to see page 2 of the report.

[Table 9](#) describes the data fields presented in the Attendant Speed of Answer report.

**Figure 13: Attendant Speed of Answer report — page 1**

list performance attendant yesterday																	Page 1	
Switch Name: Customer_Switch_Name Date: 1:58 pm WED JAN 25, 2006																		
ATTENDANT SPEED OF ANSWER																		
Meas	-----Average Speed of Answer (sec) -----																Speed	
Hour	1	2	3	4	5	6	7	8	9	10	15	20	30	40	50	100	200	Ans(sec)
0																		0
100																		0
200																		0
300																		0
400																		0
500																		0
600																		0
700	////////																3	
800	//////////																5	
900	//////////																5	
1000	//////////																5	
1100	//////////																7	
press CANCEL to quit -- press NEXT PAGE to continue																		

**Figure 14: Attendant Speed of Answer report — page 2**

list performance attendant yesterday																	Page 2	
Switch Name: Customer_Switch_Name										Date: 1:58 pm WED JAN 25, 2006								
ATTENDANT SPEED OF ANSWER																		
Meas	-----Average Speed of Answer (sec) -----																Speed	
Hour	1	2	3	4	5	6	7	8	9	10	15	20	30	40	50	100	200	Ans(sec)
1200	//////////																6	
1300	//////////																5	
1400	//////////																17	
1500	//////////																5	
1600	//////////																9	
1700	////																2	
1800																	0	
1900																	0	
2000																	0	
2100																	0	
2200																	0	
2300																	0	
Command successfully completed																		
Command:																		

**Table 9: Attendant Speed of Answer report field descriptions**

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Average Speed of Answer (sec)</b>	A graphic display of the average time taken by attendants to answer calls.
<b>Speed Ans (sec)</b>	Speed of Answer (in seconds). The average speed of answer is also displayed numerically in seconds for each hour in the report interval. <b>Suggested action:</b> If this number appears to be too high and all attendants are working at acceptable efficiency levels, consider additional training that may help the attendants complete calls more quickly. Alternatively, observe the hours during which speed of answer becomes unacceptable and consider adding consoles and scheduling more attendants during those hours.

## Data analysis guidelines for attendant group reports

The following guidelines are intended to show an easy method for determining whether currently reported data is acceptable. These guidelines represent the minimum you should do to verify that recorded measurement values are consistent with expected and historic values. You should perform additional checks as necessary.

To check the acceptability of hourly attendant measurements reports, verify the following:

- The system clock or group size was not changed during the measurement hour. If the system clock was changed, the minutes field displays double asterisks (for example, 11\*\*) and all other fields (for the indicated time interval) display zero.
- The average work time (**AWT**) typically ranges between 10 and 30 seconds per call (different values may be acceptable for specific applications).

**Note:**

Time Talk (in CCS) plus Time Avail (in CCS) should not exceed 36 X the group size. For example, with two attendant positions, this should not exceed 2 X 36 = 72 CCS for data collection.

**Note:**

The attendant can have up to six calls on hold at one time.

## Analyzing attendant group data

To use the attendant measurements reports to estimate the number of attendant positions for the application, you need additional data. The additional data needed can be calculated using data from the reports which you subsequently recorded on Worksheet 1 (see [Chapter 7: Blank worksheets](#)). The following paragraphs describe how to use data from the completed Worksheet 1 to evaluate average work time, staffed time, attendant offered load, percent occupancy, and percent of calls queued.

**Note:**

The attendant data worksheet serves to backup the data from the reports and to provide an easy means for identifying the peak hour. The data from the identified peak hour should be used in subsequent calculations.

### Average work time

The **AWT** is the average number of seconds it takes attendants to process calls. The number of calls answered and the total time the attendants are busy handling these calls (talk to me) are used to determine the **AWT**.



To determine AWT, use the figures for Time Talk, Time Held (provided that time held is considered to be a part of the agent's normal work time), and Calls Ans in the following equation:

$$AWT = \left[ \frac{\text{Talk Time} + \text{Time Held CCS}}{\text{Calls Answered}} \right] \times \left[ \frac{100 \text{ Seconds}}{\text{CCS}} \right]$$

**Example:** - The typical report screen shown earlier in this section (see [Figure 10: Attendant Group Measurements](#) on page 45) lists the following data for yesterday's peak hour:

- Time Talk = 43 CCS or 4300 seconds
- Time Held = 4 CCS or 400 seconds
- Calls Ans = 170

Using these figures as an example, the average work time is:

$$AWT = \left[ \frac{43 \text{ CCS} + 4 \text{ CCS}}{170 \text{ calls}} \right] \times 100 \text{ Seconds} = 27.6 \text{ Seconds per call}$$

### Staffed time

Staffed time is the time the attendant positions are active (ready for calls). If staffed time (per agent) equals 36 **CCS**, then all agents were active for the full hour. Using [Figure 10: Attendant Group Measurements](#) on page 45 as an example, staffed time per agent is:

$$\text{Staffed Time (per Agent)} = \frac{\text{Time Available} + \text{Talk Time}}{\# \text{ of Agents}}$$

$$\text{Staffed Time (per Agent)} = \frac{29 \text{ CCS} + 43 \text{ CCS}}{2} = 36 \text{ CCS}$$

### Attendant offered load

The attendant offered load (AOL) is the sum of the Calls Ans plus Calls Abnd times the AWT (average work time). You can determine the AOL with the following equation:

$$AOL \text{ (in seconds)} = (\text{Calls Ans} + \text{Calls Abnd}) \times AWT \text{ in seconds}$$

$$AOL \text{ (in CCS)} = \frac{AOL \text{ in seconds}}{100}$$

### Example:

The typical report screen shown earlier in this section (see [Figure 10: Attendant Group Measurements](#) on page 45) lists the following data for yesterday's peak hour:

- Calls Ans = 170
- Calls Aband = 3

And from the calculations in the previous example:

- **AWT** = 27.6 seconds

### Percent occupancy

The occupancy level may be expressed as a function of the total time of the measurement hour or a function of the time the positions were active and attended. Generally, it is expected all positions are staffed 100 percent of the time during the peak busy hour. Therefore, the measurement percent occupancy (total time) is sufficient in most instances.

Assuming attendant positions are staffed 100 percent of the time, then each position can handle 36 **CCS** of load during the peak hour. Therefore, based upon the calculated **AOL** of 47.75 **CCS**, two attendant positions are required.

The two status reports **monitor system view1** and **monitor system view2**, can be used to display status of the attendant console positions. Specifically, you can use these two reports to determine, real-time, how many attendant positions are activated, and the identifying number of those deactivated.

#### Note:

Since the **monitor system view1** and **view2** commands not only display status of the attendant consoles but also maintenance and traffic status, they are included under [Attendant and Maintenance Status report](#) on page 224.

For this example, the percent occupancy is calculated as follows:

$$\text{Maximum Possible Usage} = 36 \text{ CCS} \times \text{Total \# of Members}$$

**Suggested actions:** You should staff a sufficient number of positions so the attendants are neither underworked nor overworked. If the percent occupancy is high and the time available (from the worksheet) is low, the recommendation is to staff another attendant position. If the percent occupancy is low and the time available (from the worksheet) is high, the recommendation is to staff fewer attendant positions.

#### Note:

The percent occupancy should not exceed 92% (even on large systems with several attendant consoles). The 92% is a human factors limitation and does not apply to hardware servers.

Percent occupancy (attended) is defined as follows:

$$\text{Percent Occupancy (attended)} = \frac{AOL}{\text{Time Avail} + \text{Time Talk}} \times 100$$

When all positions of the attendant group are staffed, the equation for percent occupancy (attended) yields the same results as the equation for percent occupancy (total time).

### Percent of calls queued

As the percent of calls queued increases, the **Speed of Ans** field also increases. Callers are more likely to become frustrated as they are delayed and more likely to abandon their calls, thus contributing to the perception that the level of service has decreased.

Percent of calls queued (or delayed) is defined as follows:

$$\begin{aligned} \% \text{ Queued} &= \frac{\text{Calls Queued}}{\text{Calls Ans} + \text{Calls Aband}} \\ \% \text{ Queued} &= \frac{78 \text{ calls}}{170 \text{ calls} + 3 \text{ calls}} = \frac{78 \text{ calls}}{173 \text{ calls}} = 45\% \end{aligned}$$

### Analyzing customer-supplied (theoretical) data

For an installed system, the measurement reports are always recommended over theoretical data derived from traffic tables. However, we recognize there are occasions when the use of traffic tables is necessary and desirable. For example, as a part of responding to a request for proposal (**RFP**), a potential customer may supply certain traffic data obtained independent of the switch, and request that the **RFP** include calculations indicating how well the switch accommodates the specified traffic. It may also be desirable to use traffic tables during the system engineering and planning stage.

#### Note:

Traffic engineering capacity tables such as the Erlang-C Infinite Queue, Erlang-C Finite Queue, and Retrial Capacity are used for data analysis when necessary. Traffic engineering capacity tables are based on mathematical models in which certain assumptions are made about call arrivals, the serving process, and the disposition of blocked calls.

**Speed of answer** - Given the appropriate variables, you can estimate the speed of answer. You need the following:

- Erlang-C Infinite Queue capacity tables (found in *Basic Traffic Analysis*)
- **AWT (average work time)**
- Number of attendant positions staffed (working servers)
- AOL, where: AOL = (Calls Ans + Calls Aband) X AWT

### Example:

Given the following data, estimate the speed of answer:

- Time Talk = 43 CCS
  - Time Held = 4 **CCS**
  - Calls Answered = 170
  - Using Time Talk, Time Held, and Calls Answered, the calculations indicate **AWT**= 27.6 seconds
  - Number of Attendant Positions Staffed = 2
  - Calls Abandoned = 3
  - Using Calls Answered, Calls Abandoned, and **AWT**, the calculations indicate that **AOL** = 47.83 **CCS**
1. In the table shown in [Figure 15: Estimating the speed of answer](#) on page 61, locate the row that corresponds to two attendant positions (working servers).
  2. Read across to find the offered load closest to 47.83 **CCS**. (The closest is 46.2 **CCS**, when rounding up.)
  3. Read up to find the Average Delay in Multiples of Average Holding Time that corresponds to 46.2 **CCS** (for this example, the Average Delay in Multiples of Average Holding Time is .700).
  4. Estimate the theoretical Speed of Answer by multiplying the Average Delay in Multiples of Average Holding Time by **AWT** (that is, Speed of Answer = .7 X 27.6 seconds = 19.3 seconds).

### Note:

This example implies all calls have an average of 19.3 seconds delay. Some of the calls are answered immediately, while the remaining calls are delayed. To find the portion of calls that experience a delay before service can be estimated, use the table shown in [Figure 16: Estimating the percentage of delayed calls](#) on page 61. The average delay of these calls can be estimated using the table shown in [Figure 17: Estimating the average delay of delayed calls](#) on page 62.

Figure 15: Estimating the speed of answer

NUMBER OF WORKING SERVERS	AHT	E (AVERAGE DELAY - AVERAGE HOLDING TIME)																NUMBER OF WORKING SERVERS
	.001	.005	.010	.020	.030	.040	.050	.060	.070	.080	.090	.100	.110	.120	.130	.140	.150	
1	0.0	0.2	0.8	1.7	4.0	7.2	10.3	13.3	16.2	19.0	21.8	24.5	27.1	29.7	32.2	34.7	37.1	1
2	2.3	5.1	7.2	1.0	29.8	32.2	34.6	36.7	38.5	40.1	41.6	43.1	44.5	45.9	47.3	48.6	49.9	2
3	9.7	14.6	21.1	1.2	58.0	61.9	65.1	67.9	70.1	72.2	74.1	75.9	77.5	79.1	80.6	82.0	83.4	3
4	31	33	40	1.3	89	93	97	100	103	106	108	110	112	114	116	118	120	4
5	36	32	41	1.8	130	124	120	123	125	127	129	131	132	134	135	137	138	5

17	1147	1294	1332	532	1580	1558	1549	1529	1492	1463	1421	1424	1433	1434	1434	1434	1434	17
18	1214	1331	1329	547	1575	1529	1483	1428	1374	1319	1263	1243	1243	1243	1243	1243	1243	18
19	1289	1343	1314	482	1410	1421	1411	1400	1378	1348	1318	1288	1268	1268	1268	1268	1268	19
20	1360	1394	1332	437	1484	1440	1404	1364	1310	1250	1194	1154	1154	1154	1154	1154	1154	20

AVERAGE DELAY IN MULTIPLES OF AHT THAT CORRESPONDS TO AHT

ATTENDANT OFFERED LOAD CLOSEST TO 47.83 CCS

5. To determine the percentage of calls that experience a delay, use the Average Delay in Multiples of Average Holding Time that is closest to the expected **AOL**.
  - a. In the Erlang-C Infinite Queue Capacity table shown in [Figure 15](#), locate the row that corresponds to two working servers.
  - b. Read across until you find the value closest to the expected **AOL** (the value closest to 47.83 **CCS** is 46.2 **CCS**).
  - c. Read up to find the Average Delay in Multiples of Average Holding Time that corresponds to 46.2 **CCS** (the Average Delay in Multiples of AHT is .700).
  - d. In the Erlang-C Probability of Delay table shown in [Figure 16: Estimating the percentage of delayed calls](#) on page 61, find the .700 column.
  - e. Read down this column until it intersects the row with two servers. The value at the intersection is .502, which represents the probability of delay. This value shows that 50.2 percent of the calls experience some delay before being answered.

Figure 16: Estimating the percentage of delayed calls

NUMBER OF WORKING SERVERS	AHT	E (AVERAGE DELAY - AVERAGE HOLDING TIME)																NUMBER OF WORKING SERVERS
	.001	.005	.010	.020	.030	.040	.050	.060	.070	.080	.090	.100	.110	.120	.130	.140	.150	
1	.001	.005	.010	.020	.130	.147	.160	.171	.180	.188	.195	.202	.209	.216	.223	.230	.237	1
2	.002	.009	.014	.021	.192	.227	.254	.274	.288	.299	.309	.317	.325	.333	.340	.347	.354	2
3	.003	.013	.021	.028	.229	.270	.301	.324	.341	.351	.359	.367	.374	.381	.388	.395	.402	3
4	.003	.015	.029	.035	.235	.287	.322	.340	.358	.371	.381	.389	.396	.403	.410	.417	.424	4
5	.004	.014	.023	.030	.277	.331	.354	.371	.383	.393	.401	.408	.415	.422	.429	.436	.443	5
6	.005	.020	.034	.041	.298	.350	.374	.384	.390	.396	.402	.408	.414	.420	.426	.432	.438	6

17	.018	.033	.039	.130	.312	.373	.421	.459	.490	.514	.537	.558	.579	.599	.619	.639	.659	17
18	.018	.033	.039	.130	.312	.374	.423	.461	.492	.516	.539	.560	.581	.601	.621	.641	.661	18
19	.018	.034	.039	.140	.313	.374	.424	.463	.494	.518	.540	.561	.582	.602	.622	.642	.662	19
20	.018	.034	.039	.141	.317	.380	.424	.463	.494	.518	.540	.561	.582	.602	.622	.642	.662	20

AVERAGE DELAY IN MULTIPLES OF AHT (.700)

ESTIMATED PROBABILITY OF DELAY (.502)

6. To determine the Average Delay of the Delayed Calls, proceed as follows:
  - a. In [Figure 17](#), locate the .700 column.
  - b. Read down this column until it intersects the row with two servers. (The value at the intersection is 1.40. This is the Average Delay of Delayed Calls in Multiples of Average Holding Time).
  - c. To obtain the Average Delay of Delayed Calls in seconds, multiply the Average Holding Time by 1.40 (1.40 X 27.6 seconds = 38.6 seconds).

In summary, when two attendant positions are provided to accommodate 173 calls during the busy hour, the speed of answer for all calls is 19.3 seconds. While 49.8 percent of the calls are answered immediately, the remaining 50.2 percent have an average delay of 38.6 seconds.

**Figure 17: Estimating the average delay of delayed calls**

ATTENDANT POSITIONS REQUIRED	AVERAGE DELAY - AVERAGE HOLDING TIME																ATTENDANT POSITIONS REQUIRED
	.001	.005	1.01	.020	.100	.200	.300	.400	.500	.600	.700	.800	.900	1.00	2.00	3.00	
1	0.17	0.49	1.01	1.03	1.13	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.70	1.80	1
2	0.38	0.58	0.94	0.90	0.76	0.68	0.60	0.54	0.48	0.42	0.37	0.33	0.29	0.25	1.71	2.72	2
3	0.37	0.37	0.82	0.81	0.66	0.57	0.50	0.44	0.38	0.33	0.28	0.24	0.20	0.17	1.52	2.40	3
4	0.29	0.29	0.73	0.74	0.59	0.49	0.41	0.35	0.29	0.24	0.20	0.16	0.13	0.10	1.31	2.13	4
5	0.23	0.23	0.60	0.62	0.51	0.42	0.35	0.29	0.24	0.20	0.16	0.13	0.10	0.08	1.13	1.84	5
17	0.07	0.09	0.11	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.17	2.17	17
18	0.07	0.09	0.11	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.17	2.17	18
19	0.07	0.09	0.10	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.16	2.17	19
20	0.07	0.09	0.10	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.16	2.17	20

**Estimating the number of attendant positions required** - Given the appropriate variables, you can estimate the number of attendant positions required to achieve a desired Speed of Answer. You need the following:

- Erlang-C **CCS** Capacity Tables
- **AWT**
- **AOL**
- Desired Speed of Answer

**Example:**

For this example, we continue with the previous example's data; that is:

- **AWT** = 27.6 seconds
- **AOL** = 47.83 **CCS**
- Assuming that the Desired Speed of Answer = 13 seconds

To determine the Average Delay in Multiples of **AWT**:

**Figure 18: Estimating the average delay of delayed calls**

*Average Delay in Multiples of AWT =*

$$\frac{\text{Desired Speed of Answer}}{\text{AWT}} = \frac{13 \text{ seconds}}{27.6 \text{ seconds}} = .4710$$

1. In the table shown in [Figure 47: Estimating attendant position requirements](#) on page 136, Erlang-C Infinite Queue Capacity, locate the column that most closely corresponds to the objective delay of .4710 (this falls between .450 and .500, so use the .500 column).
2. Read down the column until the offered load closest to 47.83 **CCS** is found (this falls between 41.6 and 74.3, so use the 41.6 row).
3. Read horizontally to the left or right margin to find the number of servers required (number of servers required = 2).

**Figure 19: Estimating attendant position requirements**

OFFERED LOAD PERCENT	AVERAGE DELAY IN MULTIPLES OF AWT																		OFFERED LOAD PERCENT	
	.001	.003	.010	.30	.100	.130	.150	.200	.250	.300	.350	.400	.450	.500	.550	.600	.700	1.00		2.00
1	0.0	0.2	0.8	.0	3.3	3.9	4.7	6.0	7.3	8.3	9.3	10.3	11.2	12.0	12.8	13.6	14.4	15.2	16.0	1
2	2.3	5.1	7.2	0.7	21.7	23.4	24.0	29.8	32.2	33.4	34.7	36.5	38.1	39.6	41.0	42.4	43.8	45.2	46.6	2
3	9.7	14.0	21.1	3.2	44.6	49.4	52.2	58.0	61.2	63.1	64.8	67.0	69.1	71.2	73.2	75.2	77.2	79.2	81.2	3
4	21	33	40	7.3	73	78	82	89	93	97	100	103	106	109	112	115	118	120	123	4
5	36	52	61	12	108	116	121	129	135	140	144	148	152	156	160	164	168	172	176	5
6	51	73	84	17	144	154	160	169	176	182	187	191	195	199	203	207	211	215	219	6
7	67	93	106	22	168	180	187	197	205	212	218	223	227	231	235	239	243	247	251	7
8	83	113	128	27	192	206	214	225	234	242	248	253	257	261	265	269	273	277	281	8
9	100	134	151	32	216	232	241	253	263	272	279	284	288	292	296	300	304	308	312	9
10	117	155	174	37	240	258	268	281	292	302	309	314	318	322	326	330	334	338	342	10

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COLUMN CLOSEST TO OBJECTIVE DELAY OF .4710

ATTENDANT OFFERED LOAD CLOSEST TO 47.83 CCS

**Estimating percent occupancy** - To determine the percent occupancy (total time) you need the following data:

- Number of attendant positions staffed
- **AOL**

**Example:**

For this example we continue with the previous example's data; that is:

- **AOL = 47.83 CCS**
- # of positions staffed = 2

Assume the attendant positions are staffed 100 percent of the time, then each position can handle 36 **CCS** of load during the peak hour.

**Figure 20: Estimating attendant position requirements**

$$\% \text{ Occupancy (total time)} = \frac{AOL}{\# \text{ positions} \times 36 \text{ CCS}} \times 100 =$$

$$\frac{47.83 \text{ CCS}}{2 \times 36 \text{ CCS}} \times 100 = 66\%$$

## Automatic circuit assurance reports

This section describes the parameters and measurements reports for the automatic circuit assurance (**ACA**) feature. Specifically, these two reports are identified as the **ACA** Parameters report and **ACA** Measurements report.

The **ACA** feature can be used to identify possible malfunctioning trunks by providing an alerting mechanism that monitors:

- The occurrence of an excessive number of short holding time calls
- The occurrence of calls that have an abnormally long holding time

When the number of short holding time calls exceeds the threshold administered for a trunk group, or the duration of a call exceeds the administrated long holding time limit for the trunk group, the following actions occur:

1. An entry is made on the **ACA** Measurement report.
2. A referral call is placed to a designated attendant console or display-equipped voice terminal.

**Note:**

For a more complete description of the **ACA** feature, refer to *Administrator's Guide for Avaya Communication Manager*.

**Background information:**

- To determine if the **ACA** feature is enabled, use the **display system-parameters feature** command.
- When **ACA** is enabled, it may be used either on a single system basis or in a Distributed Communications System (**DCS**) network. Administration of the **ACA Referral Calls** field (also displayed on the System Parameters screen) determines where referral calls terminate. For **DCS** networks, one switch (the primary) is administered to receive ACA referred calls from remote nodes in the network for all switches within the network. Furthermore, the field **ACA Remote PBX Identification** must be administered with the **PBX ID** of the node that is designated as primary.

For non-**DCS** arrangements, the switch is administered as local.



- The switch that displays the **ACA** measurements must have a valid number administered in the **ACA Referral Destination** field.

A valid **ACA** referral destination can be any of the following:

- An individual attendant
- The attendant group
- A designated station that is equipped with an alphanumeric display
- Those systems equipped with a speech synthesizer circuit pack may also provide an audio (voice-synthesized) report of the referral calls.

---

## ACA Parameters report

The **ACA** Parameters report lists all trunk groups in the system and displays the current definitions (parameters) for long and short holding times.

### Note:

The parameters are administered on the trunk group screens.

## Command

To display the **ACA** Parameters report:

Type `list aca-parameters [number x] [to number x] [name x] [aca-on x] [count n] [schedule]` and press **Enter**.

**Options:** There are six options for this command:

- `number n`  
Enter the beginning trunk group number.
- `to-number n`  
Enter the ending trunk group number.
- `name n`  
Enter the trunk group name.
- `aca on n`  
Enter **y** to indicate the trunk group is monitored by aca.
- `count n`  
Enter the number of trunk groups to list.
- `schedule`  
This option allows you to schedule the report to print at another time.

Screen

[Figure 21](#) shows a typical screen for the **ACA** Parameters report.  
[Table 10](#) describes the data fields presented in this report.

**Figure 21: ACA Parameters report**

```
list aca-parameters
ACA PARAMETERS
Group      Group      Group      ACA      Short      Short      Long
Number    TAC    Type      Name      On?    Hold Time Thresh Hold Time
41        351    tie      MARKETING      n      10      15      1
42        352    tie      PURCHASING      n      10      15      1
43        353    isdn-pri D5-G2 PRI Tie      n      10      15      1
44        354    tie      FINANCE      n      10      15      1
45        355    tie      SALES      n      10      15      1
46        356    tie      NEW YORK      n      10      15      1
54        373    wats      SERVICE-WATS      y      10      15      1
55        371    tie      DATA LINK      n      10      15      1
57        387    tie      2 WAY TIE LINE      y      10      15      1
58        386    wats      NJ-WATS      y      10      15      1
59        385    wats      WATS-800      y      10      15      1
60        384    did      DID      y      10      15      1
61        383    co      WASHINGTON      y      10      15      1
Command successfully completed
Command:
```

**Table 10: ACA Parameters report field descriptions 1 of 3**

Field	Description
Group Number	A unique number (assigned during administration) that identifies each trunk group. It may be any number within the range of one to the maximum number of trunk groups supported by the system.
TAC	Trunk Access Code. The TAC (assigned during administration) for the trunk group.

1 of 3

Table 10: ACA Parameters report field descriptions 2 of 3

Field	Description
<b>Group Type</b>	<p>The type of trunk. The system allows the following trunk types:</p> <ul style="list-style-type: none"> <li>• Access (<b>access</b>)</li> <li>• Advanced Private Line Termination (<b>aplt</b>)</li> <li>• Central Office (<b>co</b>) or Public Network Service</li> <li>• Customer Provided Equipment (<b>cpe</b>)</li> <li>• Digital Multiplexed Interface-Bit Oriented Signaling (<b>dmi-bos</b>)</li> <li>• Direct Inward Dialing (<b>did</b>)</li> <li>• Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>• Foreign Exchange (<b>fx</b>)</li> <li>• Integrated Services Digital Network (<b>isdn-pri</b>)</li> <li>• Release Link Trunk (<b>rlt</b>)</li> <li>• Session Initiated Protocol (<b>sip</b>)</li> <li>• Tandem (<b>tandem</b>)</li> <li>• Tie Trunk (<b>tie</b>)</li> <li>• Wide Area Telecommunications Service (<b>wats</b>)</li> </ul> <p><b>Note:</b></p> <p>For a complete description of these trunk group types, refer to the <i>Administrator's Guide for Avaya Communication Manager</i>.</p>
<b>Group Name</b>	The trunk group identification administered on the Trunk Group screen.

**2 of 3**

Table 10: ACA Parameters report field descriptions 3 of 3

Field	Description
<b>ACA On?</b>	<p>Indicates whether or not the trunk group is monitored by <b>ACA</b>.</p> <p><b>Suggested actions:</b> The decision to monitor a trunk group (field entry <b>y</b>) may depend on a complaint from a user, historical problems, or suspicious data from another report. <b>ACA</b> measurements may be used in conjunction with other measurement reports for confirmation purposes. These other reports include:</p> <ul style="list-style-type: none"> <li>• The list performance trunk-group</li> <li>• The list performance summary</li> <li>• The list measurements outage-trunk</li> <li>• The list measurements trunk-group summary or hourly</li> </ul>
<b>Short Hold Time</b>	<p>The maximum number of seconds a call is considered a short holding time call. A holding time longer than this value is considered as a normal call up until the long holding time is exceeded. The short holding time value is specified on the Trunk Group screen when the trunk group is administered. The field range is from 0 to 160 seconds with 10 seconds being the default.</p>
<b>Short Thresh</b>	<p>Short Threshold. The system maintains a running count of each call with a duration <math>\leq</math> the administered short holding time. The count is increased by one for each call that meets the short holding time criteria. When this count reaches the designated threshold, an entry is made in the <b>ACA</b> Measurements Report, and a referral call is placed. The threshold value is specified on the Trunk Group screen when the trunk group is administered. The field range is from 0 to 30 with 15 being the default.</p>
<b>Long Hold Time</b>	<p>The minimum time of seizure, in hours, the system considers a call as having a long holding time. This number is specified on the Trunk Group screen when the trunk group is administered. The number has a range of zero to 10 hours with one hour as the default. A referral call is placed as soon as a single long holding call is detected.</p>

3 of 3

---

## Automatic Circuit Assurance Measurements report

The **Automatic Circuit Assurance** Measurements report displays the audit trail list of short and long holding time referral calls placed.

### Command

To display the **Automatic Circuit Assurance** Measurements report:

Type `list measurements aca [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screens

[Figure 22](#) and [Figure 46](#) show typical screens for the **Automatic Circuit Assurance** Measurements report. The date and time the report was requested is displayed to the right, following the name of the report.

This report may contain up to 64 entries on several pages. If more than 64 referrals have been entered since the last system reinitialization, the report shows the 64 most recent entries; older entries, if any, are overwritten. As shown in [Figure 22](#), if more than 14 referrals have occurred since the last system re-initialization, press **NEXT PAGE** to see additional entries, or press **CANCEL** to exit the report.

**Note:**

For wideband calls that consume more than 64 kbps of bandwidth, only the lowest numbered B-channel is shown on the **Automatic Circuit Assurance** Measurements Report. In addition, on the report, entries that pertain to referral calls associated with wideband facilities are designated by a "W" in the far right position of the report entry.

If the **Automatic Circuit Assurance** Measurements report contains entries for referral calls pertaining to wideband facilities, the subtitle (w = Wideband Support) will append to the report title.

[Table 11](#) describes the data fields presented in this report.

**Figure 22: Automatic Circuit Assurance Measurements report— page 1**

list measurements aca				Page 1
Switch Name: Cust_Switch_Name		Date: 2:11 pm WED JAN 25, 2006		
Automatic Circuit Assurance Measurements (W=Wideband Support)				
Day & Time	Trunk	Trunk	Trunk	Type of
of Referral	Group No.	Access Code	Member	Referral
29/10:00	57	387	6	Long
28/14:00	62	382	4	Short
27/20:00	59	385	1	Long
27/19:00	59	385	1	Long
24/15:58	59	385	2	Long
24/10:00	63	381	1	Long
24/09:00	63	381	1	Long
23/11:00	61	383	9	Short
23/09:00	61	383	9	Long
22/13:18	63	381	5	Long
22/11:42	62	382	12	Long
22/06:44	57	387	11	Short
21/13:00	62	382	5	Long
20/21:22	61	383	1	Long
press CANCEL to quit -- press NEXT PAGE to continue				

**Figure 23: Automatic Circuit Assurance Measurements report — page 2**

list measurements aca				Page 2
Switch Name: Cust_Switch_Name		Date: 2:11 pm WED JAN 25, 2006		
Automatic Circuit Assurance Measurements (W=Wideband Support)				
Day & Time	Trunk	Trunk	Trunk	Type of
of Referral	Group No.	Access Code	Member	Referral
20/15:52	63	381	3	Long
20/13:00	60	384	8	Long
17/16:26	63	381	2	Long
17/13:38	63	381	3	Short
16/22:17	60	384	7	Long
16/12:26	57	387	5	Short
16/12:26	43	353	2	Long W
16/11:46	60	384	7	Long
Command successfully completed				
Command:				

**Table 11: Automatic Circuit Assurance Measurements report field descriptions 1 of 2**

Field	Description
<b>Day &amp; Time of Referral</b>	<p>The day and time at which either the threshold for short holding time calls was exceeded or long holding time call was reached and a referral call was placed (see <a href="#">Table 10: ACA Parameters report field descriptions</a> on page 66 for definitions of short and long holding times and the short threshold counter). Expressed as: day of the current month/hour:minute</p> <p>The report lists referral calls beginning with the most recent and continuing back in time until either all referrals are listed or the most recent 64 are listed. A referral call is completed if the call is answered. A call that is not answered is attempted again at the top of the next hour and each subsequent hour until it is answered or when a new <b>ACA</b> call is received.</p>
<b>Trunk Group No.</b>	Trunk Group Number. The number of the trunk group over which the referral call was placed.
<b>Trunk Access Code</b>	Trunk Access Code for the trunk group.
<b>Trunk Member</b>	The specific trunk in the group that experienced the short or long holding time infraction. This information can be used, with other maintenance tests, to identify the equipment location (circuit pack) of the trunk group member. For wideband trunk groups, the number shown is the lowest numbered trunk used in the wideband call.

**1 of 2**

Table 11: Automatic Circuit Assurance Measurements report field descriptions 2 of 2

Field	Description
<b>Type of Referral</b>	Indicates whether the referral occurred as the result of too many <i>short</i> holding time calls or an excessively <i>long</i> holding time call. <b>Suggested action:</b> Generally, a referral call should serve as a warning of potential trunk failures. In addition, an excessively long-holding call may indicate a security breach. Resolution of the problem should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel if they have not already been alerted.
<b>Wideband Flag</b>	If the call was a wideband call, a “W” appears next to the entry. In addition, if any wideband calls appear on the report, the tag “W = Wideband Support” appears in the report heading.

2 of 2

## ARS/AAR/UDP route pattern reports

Automatic Route Selection (**ARS**), Automatic Alternate Routing (**AAR**), and the Uniform Dial Plan (**UDP**) are features that route calls over public and private networks. To route the calls, **ARS**, **AAR**, and **UDP** select a routing pattern. A routing pattern is a list of trunk groups and a set of parameters that define the conditions under which each trunk group should be chosen to route calls.

There are two measurement screens related to routing patterns.

## Route Pattern Measurement Selection screen

The Route Pattern Measurements Selection screen displays the list of patterns to be measured. The Route Pattern Measurements report displays traffic data for the specified pattern (as a whole) as well as the distribution of traffic on the trunk groups in the pattern.

## Command

To display the list of route patterns to be measured:

Type **display meas-selection route-pattern [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for the display command only.



**Note:**

Routing pattern numbers are administered as a part of the system implementation process; more specifically, as a part of administering the **ARS**, **AAR**, or **UDP** features. This procedure is fully described in the *Administrator's Guide for Avaya Communication Manager*.

To change the list of routing patterns to be measured:

1. Type **change meas-selection route-pattern** and press **Enter**.
2. Enter the route pattern number to be measured and press **Enter**.

Pattern numbers do not have to be in numerical order. If the pattern number you want is not listed, add the number (if there is space available), or replace an existing pattern number you no longer need. Press **Enter** until the cursor is placed on the unwanted pattern number and enter the new number, or press **CLEAR FIELD** and enter the new number.

## Screen

[Figure 24](#) shows a typical Route Pattern Measurement Selection screen containing entries for the 25 patterns to be measured.

[Table 12](#) describes the data fields in this screen.

**Figure 24: Route Pattern Measurement Selection screen**

```
change meas-selection route-pattern
ROUTE PATTERN MEASUREMENT SELECTION
Pattern No.   Pattern No.   Pattern No.   Pattern No.   Pattern No.
1: _____ 6: _____ 11: _____ 16: _____ 21: _____
2: _____ 7: _____ 12: _____ 17: _____ 22: _____
3: _____ 8: _____ 13: _____ 18: _____ 23: _____
4: _____ 9: _____ 14: _____ 19: _____ 24: _____
5: _____ 10: _____ 15: _____ 20: _____ 25: _____
```

**Table 12: Route Pattern Measurement Selection screen field descriptions**

Field	Description
<b>Pattern No.</b>	Pattern number. Lists the numbers of the 25 patterns selected for measurement.

---

## Route Pattern Measurements report

The Route Pattern Measurements report contains usage measurements for each of the 25 selected routing patterns. This report displays traffic data for the specified pattern (all trunk groups within the pattern, as a whole) as well as the distribution of traffic on each trunk group in the pattern.

### Command

To display the Route Pattern Measurements report:

Type **list measurements route-pattern <assigned pattern number (1-254)> <yesterday/today/last-hour> [schedule]** and press **Enter**.

**Required Fields:** There are two required fields for this command.

#### 1. assigned pattern number

- Enter the identifying **pattern number** you wish to display.

This number must previously have been assigned to one of the numbers on the Route Pattern Measurement Selection screen. In order to obtain data for the pattern, it must previously have been administered on the ARS/AAR/UDP screens.

#### 2. yesterday/today/last-hour

- Enter **yesterday** to list the route pattern activity for yesterday.
- Enter **today** to list the route pattern activity for today.
- Enter **last-hour** to list the route pattern activity of the most recently completed hour.

For example, to display yesterday's measurements for route pattern 27, type **list measurements route-pattern 27 yesterday**.

**Options:** The schedule option is available for this command.

### Screen

[Figure 25](#) shows a typical screen for the Route Pattern Measurements Report.

[Table 13](#) describes the data fields presented in this report.

**Figure 25: Route Pattern Measurements report**

```

list measurements route-pattern 1 last-hour
Switch Name: Cust_Switch_Name                      Date: 1:54 pm WED JAN 25, 2006

    ROUTE PATTERN MEASUREMENTS (W=Wideband Support)

Pat.   Queue   Calls   Calls   Calls   Calls   Queue
No.    Size    Offered  Carried  Blocked  Queued  Ovflo.
1       5       7       7       0       0       0

    TRUNK GROUP MEASUREMENTS FOR PATTERN
    (trunk groups are shown in order of selection)
Grp  Grp      Grp   Grp   ----- % Calls Carried -----      %      Total
No.  Type     Size  Dir   10 20 30 40 50 60 70 80 90 100  Calls  Calls
37  isdn-pri  22    two  ///// 100 7 W

```

**Table 13: Route Pattern Measurements report field descriptions 1 of 4**

Field	Description
<b>Pat. No.</b>	Pattern number. The number of the route pattern measured.
<b>Queue Size</b>	The size (length) of the queue for the first trunk group in the route pattern. This is commonly referred to as the route pattern queue size. A queue is an ordered sequence of calls waiting to be processed. For this example, a maximum of five calls may be in queue at any one time.
<b>Calls Offered<sup>1</sup></b>	<p>The total number of calls offered to the route pattern.</p> $\text{Calls Offered (With Queue)} = \# \text{ of Calls Carried} +$ $\# \text{ of QueueOverflowCalls} +$ $\# \text{ of QueueAbandonCalls}$ $\text{Calls Offered (Without Queue)} = \# \text{ of Calls Carried} +$ $\# \text{ of CallsBlocked}$
<b>Calls Carried</b>	The total number of seizures (for all trunk groups) in the routing pattern.

**1 of 4**

**Table 13: Route Pattern Measurements report field descriptions 2 of 4**

<b>Field</b>	<b>Description</b>
<b>Calls Blocked</b>	<p>The number of offered outgoing calls that found all trunk groups in the pattern busy. If the queue overflows, then the call is still blocked. Specifically, a blocked call is a call that:</p> <ul style="list-style-type: none"> <li>• Arrives when there are no available resources</li> <li>• Arrives and gets queued</li> <li>• Arrives when the queue is full</li> <li>• Arrives and cannot queue because the queue length is set to zero</li> <li>• Cannot queue because the Automatic Callback (<b>ACB</b>) button is busy</li> <li>• Cannot queue because there is no <b>ACB</b> button</li> </ul>
<b>Calls Queued</b>	<p>The number of offered calls that found all trunk groups in the pattern busy and were placed in queue for the first trunk group (first-choice trunk group) in the pattern. These calls also increment the blocked calls counter.</p>
<b>Queue Ovflo.</b>	<p>Queue Overflow. The number of calls that find the queue on the first trunk group full. Calls attempted while the queue is in overflow receive a reorder signal. These calls also increment the blocked calls counter.</p>
<b>Grp No.</b>	<p>Group Number. The number, assigned via the Trunk Group screen, that identifies each trunk group associated with the displayed data. Trunk groups are listed in the same order as they are assigned on the Route Pattern screen. The first trunk group listed is the first selected (preference 1); the second listed is the second selected (preference 2), and so on.</p>

**2 of 4**

Table 13: Route Pattern Measurements report field descriptions 3 of 4

Field	Description
<b>Grp Type</b>	<p>Group Type. The type of trunk in the group. The following types of trunk groups can be accessed through the route pattern:</p> <ul style="list-style-type: none"> <li>● Access (<b>access</b>)</li> <li>● Advanced Private Line Termination (<b>aplt</b>)</li> <li>● Local Central Office (<b>co</b>)</li> <li>● Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>● Foreign Exchange (<b>fx</b>)</li> <li>● Integrated Services Digital Network-Primary Rate Interface (<b>isdn-pri</b>)</li> <li>● Session Initiated Protocol (<b>sip</b>)</li> <li>● Tandem (<b>tandem</b>)</li> <li>● Tie Trunk (<b>tie</b>)</li> <li>● Wide Area Telecommunications Service (<b>wats</b>)</li> </ul>
<b>Grp Size</b>	Group Size. The number of trunks in the group.
<b>Grp Dir</b>	Group Direction. Identifies whether the assigned trunk groups are outgoing ( <b>out</b> ) or 2-way ( <b>two</b> ). Incoming trunks are not included in route patterns.
<b>% Calls Carried</b>	Percentage of Calls Carried. A graphic display showing the percentage of total calls carried over the route pattern by the trunk groups.
<b>% Calls</b>	<p>Percentage of Calls. The percentage of the total calls carried over the route pattern by the trunk group.</p> <p><b>Suggested action:</b> The first trunk group listed in the report is the first choice trunk group. This trunk group should always carry a significantly larger percentage of the calls than any of the other trunk groups. If not, you should add more members so the first choice trunk group has significantly more members than any other group in the pattern.</p>

3 of 4

**Table 13: Route Pattern Measurements report field descriptions 4 of 4**

Field	Description
<b>Total Calls</b>	<p>The total number of calls carried by the route pattern by the trunk group. For the <b>today</b> report, this field indicates the number of calls carried since the previous midnight. For the <b>yesterday</b> report, this field indicates the number of calls carried all day (24 hours) yesterday.</p> <p><b>Note:</b></p> <p>This column displays a cumulative number; there are no peak data measurements for the route pattern reports. However, you can use the trunk group reports to display “peak” as well as other data for the trunk groups.</p>
<b>Wideband Flag</b>	<p>If a trunk group is administered to support wideband switching, a “W” appears next to the trunk group entry. In addition, if any of the trunk groups on the report support wideband switching, the tag “W = Wideband Support” appears in the report heading.</p>

**4 of 4**

1. See [Specifying trunks to monitor for Trunk Group Hourly report](#) for this measurement.

Specifically the number of offered calls includes:

- The number of calls carried on all trunks in the route pattern.
- The number of calls that could not queue because there were no available queue slots.
- The number of calls that queued, but abandoned the queue before seizing a trunk.
- The number of calls that could not be queued because the queue length was zero.

## Data analysis guidelines for route pattern reports

The following guidelines are intended to show an easy and fast method of determining whether the collected data is invalid or questionable. These guidelines represent the least that you should do for validation. You should perform additional validation as necessary.

To validate the Route Pattern Measurements report, verify the following data is in order:

- Total Calls Offered to a pattern should always be equal to the sum of the columns “Calls Carried” plus “Queue Overflow” plus “Queue Abandoned” if there is a queue on the first preference.
- Total percent of all calls carried in a pattern (sum of the % Calls column for each trunk group) should never exceed 100.

## Analyzing the route pattern data

The Routing Pattern Data worksheet (see [Worksheet 2](#) on page 367) serves to back up the data from the reports and to provide an easy means to view overall performance of the specified route-pattern. The routing pattern reports/worksheet do not identify a peak hour but do total the data for the identified time period.

The Routing Pattern Measurements report summarizes data for the specified routing pattern. This report is intended to assist you in determining the following:

- How traffic is distributed over the trunk groups in the pattern
- Whether the Facility Restriction Levels (**FRL**) are administered properly
- The proper number of trunk members and trunk groups

Routing patterns are administered as a part of ARS/AAR/UDP administration. If, after analyzing the data presented with this report, you determine the routing pattern should be changed (for example, you need to increase the number of trunk members or trunk groups), then you must go back to the Routing Pattern screen to make the changes.

For example, if the **FRL** for the routing pattern is to be changed, you must go back to the ARS/AAR/UDP Routing Pattern screen to make this change. A more likely scenario is that the users, attempting to originate calls over the routing pattern, are blocked because the number assigned to their FRL is lower than that assigned to the trunk group. A user can only access trunk groups with numbers the same as or lower than their FRL number. (They cannot access trunk groups with numbers higher than their **FRL**.)

A pattern may have enough trunks but may not have a proper **FRL** to work with FRLs assigned to users, attempting to originate calls with the pattern. If the report indicates a high number for the Calls Queued column and/or Queue Overflow column, but the usage on trunks in the groups following the first choice trunk group is low, consider identifying the group of users who are attempting to originate calls but are blocked. Then raise this group's **FRL**. This can be accomplished by accessing the Class of Restriction screen and increasing the **FRL** number for the identified group or groups of users.

If the report indicates a high Queue Overflow rate and a high usage rate for all trunk groups in the pattern, then this probably indicates there are not enough trunks. Generally, the simplest solution is to increase the number of first choice trunks. Another consideration is to add more trunk groups to the pattern. Perhaps the most drastic change is to reorganize the ARS/AAR/UDP routing patterns.

Generally, you want to minimize the number in the Calls Blocked column. In addition, there may be certain users' calls you want to block.

Additional and somewhat related information is available on the Performance Summary report. For example, the Performance Summary report lists the five trunk groups with the highest percent of blocking during their peak hour. Furthermore, the report lists the trunk group members out of service. Also listed are the trunk members, by trunk group, that were not used during the reporting period.

The Trunk Groups and Wideband Trunk Groups reports provide measurement data that relates to the Routing Pattern Measurements report. For example, the total number of calls that overflow from the first choice trunk group is listed in the **Grp Ovfl** field. It should be understood that, depending on how the trunk group is administered, these overflow calls are rerouted to the other (second, third, and so on) trunk groups.

---

## Call Type Analysis Route Chosen report

Use the Call Type Analysis Route Chosen Report (**list calltype route-chosen**) to see what would happen if the telephone number you enter into your administration terminal were dialed from a phone's call log.

### Command

To display a Call Type Analysis Route Chosen report:

Type **list calltype route-chosen *n* [location *n*] [partition *n*] [schedule]** and press **Enter**.

### Screen

[Figure 26](#) shows a typical Call Type Analysis Route Chosen report.

---

**Figure 26: Call Type Analysis Route Chosen report**

```
list calltype route-chosen 6001452 location 1
                                CALL TYPE ANALYSIS ROUTE CHOSEN REPORT

Location:  1                      Partitioned Group Number: 1

Match:  6001452
length: Min 7 Max 7
Selected Location: all

    After Delete and Insert      Type   Result
1: 6001452                      ext    No dialplan match.
2: 452                          aar    Match 452, min=3, max = 7
```

---



Table 14: Call Type Analysis Route Chosen report field descriptions 1 of 2

Field	Description
<b>Location</b>	Location from the command line. Allows you to see what would happen if the telephone number you enter into your administration terminal were dialed from a phone's call log in this location.  If there are matching entries in the entered location, those get used.  If there are no matching entries in the entered location, Communication Manager tries the entries in location <b>all</b> .
<b>Partitioned Group Number</b>	Partitioned Group Number as entered on the command line. Default is <b>1</b> .
<b>Selected Location</b>	Shows the location used by Communication Manager to route the entered digit string. 1- 250, or <b>all</b> . If there are matching entries in the entered location, those get used. If there are no matching entire in the entered location, Communication Manager tries the entries in location <b>all</b> .
<b>Match</b>	numeric = the entry in the <b>Call Type Digit Analysis Table</b> that was selected for the dialed string.  Blank = no matching entries for this dialed string in the <b>Call Type Digit Analysis Table</b>
<b>Length</b>	numeric = the entry in the <b>Call Type Digit Analysis Table</b> that was selected for the dialed string.  Blank = no matching entries for this dialed string in the <b>Call Type Digit Analysis Table</b>
<b>After Delete and Insert</b>	The digit string as it appears after call type digit manipulation for that pattern, up to 4 manipulations.
<b>1 of 2</b>	

Table 14: Call Type Analysis Route Chosen report field descriptions 2 of 2

Field	Description
Type	<p>The call type used by the call type algorithm to test the modified string. Call types correspond to the equivalent entries on the <b>Call Type Digit Analysis Table</b> (<code>display calltype analysis</code>). Valid entries are:</p> <ul style="list-style-type: none"> <li>• <b>ext</b></li> <li>• <b>aar</b></li> <li>• <b>ars</b></li> <li>• <b>udp</b></li> </ul>
Result	<p>Results of the analysis on the dialed string. If there was a successful match and completion of the call, the modifications to the dialed string appear. Results stop at the first successful match and valid route.</p> <p>Use this information to view the call type's specific routing analysis form (AAR Routing Table, ARS Routing Table, dial plan analysis tables and the uniform-dial plan tables) for more information about the routing of the call.</p>

2 of 2

## AAR/ARS Route Chosen reports

Automatic Alternate Routing (AAR) and Automatic Route Selection (ARS) are features that route calls over public and private networks. To route the calls, ARS and AAR select a routing pattern.

### Command

To display an AAR Route Chosen report:

Type `list aar route-chosen [location n] [partition n] [schedule]` and press **Enter**.

### Screen

[Figure 27](#) shows a typical AAR Route Chosen report.

[Table 15](#) describes the data fields for these reports.

**Figure 27: AAR Route Chosen Report**

```
list aar route-chosen 508
```

AAR ROUTE CHOSEN REPORT						
Location: all			Partitioned Group Number: 1			
Dialed String	Total Min    Max		Route Pattern	Call Type	Node Number	Location
50	5	5	50	aar	-	all

## Command

To display an ARS Route Chosen report:

Type **list ars route-chosen [location n] [partition n] [schedule]** and press **Enter**.

## Screen

[Figure 28](#) shows a typical ARS Route Chosen report.

[Table 15](#) describes the data fields for these reports.

**Figure 28: ARS Route Chosen Report**

```
list ars route-chosen 441
```

ARS ROUTE CHOSEN REPORT						
Location: 1			Partitioned Group Number: 1			
Dialed String	Total Min    Max		Route Pattern	Call Type	Node Number	Location
4	5	5	90	loc1		all

Table 15: AAR/ARS Route Chosen report field descriptions

Field	Description
<b>Location</b>	Indicates Location from the command line. Allows you to see what would happen if the telephone number you enter into your administration terminal were dialed from a phone's call log in this location. If there are matching entries in the entered location, those get used. If there are no matching entries in the entered location, Communication Manager tries the entries in location <b>all</b> .
<b>Partitioned Group Number</b>	Indicates Partitioned Group Number as entered on the command line. Default is <b>1</b> .
<b>Dialed String</b>	Indicates up to 18 digits that the call-processing server analyzes.
<b>Total Min/Max</b>	Indicates the maximum/minimum number of user-dialed digits the system collects to match to the dialed string.
<b>Route pattern</b>	The time stamp that indicates when the Measurement Route Pattern Selection Administration screen was last updated. This time stamp is retrieved when the measurements for the associated report(s) are collected each hour. The time at which the identification of routing patterns to be studied was last changed.
<b>Call Type</b>	The call type used by the call type algorithm to test the modified string. Call types correspond to the equivalent entries on the <b>Call Type Digit Analysis Table</b> . Valid entries are: <ul style="list-style-type: none"> <li>• <b>ext</b></li> <li>• <b>aar</b></li> <li>• <b>ars</b></li> <li>• <b>udp</b></li> <li>• <b>locl</b></li> </ul>
<b>Node Number</b>	Enter the number of the destination node in a private network if you are using node number routing or DCS. If you complete this field, leave the Route Index field blank. Valid entries are: 1 to 999 or blank.

---

## Call Rate Measurements report

This section describes the Call Rate Measurements report, which provides traffic data for all calls (incoming, outgoing, and intercom) completed on the system during defined time intervals:

- Last hour
- Current day's peak hour
- Previous day's peak hour

The peak hours are the hours with the greatest number of calls and the hours with the busiest 36-second intervals. A 36-second interval (1 one-hundredth of an hour) is used so the number of busy intervals X 100 gives the peak call rate for the listed hour. For example, assume you have normal traffic and there were 31 calls for the peak 36-second interval of the last hour, then the peak calling rate would have been 3100 calls for an equivalent hour. The number of calls actually completed is normally much fewer than this number.

### Command

To display a Call Rate Measurements report:

Type `list measurements call-rate <total/service-link/multimedia/data/voice> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — **total/service-link/multimedia/data/voice**.

- Enter **total** to list the traffic data for all calls (incoming, outgoing, and intercom).
- Enter **voice** to list the traffic data for voice calls (incoming, outgoing, and intercom).
- Enter **data** to list the traffic data for data calls (incoming, outgoing, and intercom).
- Enter **multimedia** to list the traffic data for multimedia calls (incoming, outgoing, and intercom). This command is only available if MMCH (Basic) is enabled. (G3si and G3r only)
- Enter **service-link** to list the traffic data for service link calls (incoming, outgoing, and intercom). This command is only available if MMCH (Basic) is enabled. (G3si and G3r only)

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 29](#) shows a typical Total Call Rate Measurements report. Each call rate measurements report contains the same data fields.

[Table 16](#) describes the data fields for these reports.

**Figure 29: Total Call Rate Measurements report**

```

list measurements call-rate total
Switch Name: Cust_Switch_Name
TOTAL CALL RATE MEASUREMENTS
Page 1
Date: 2:24 pm WED JAN 25, 2006

Last Hour
-----
Hour      # Compl   Busy Int. (36 sec.)  # Busy Int. Calls Compl
1300      18532      13:58:48              193

Today Peak
-----
Hour      # Compl   Busy Int. (36 sec.)  # Busy Int. Calls Compl
Busiest Hour: 900      20481      09:51:00              224
Busiest Interval: 900      20481      09:51:00              224

Yesterday Peak
-----
Hour      # Compl   Busy Int. (36 sec.)  # Busy Int. Calls Compl
Busiest Hour: 1000     21560      00:00:00              220
Busiest Interval: 1000 21560      00:00:00              220
Command successfully completed
Command:

```

The primary purpose of these reports is to identify system-level peak calling activity and the hour the activity occurred. Typically, the busiest hour for peak calling activity (such as, the 9:00 AM hour in this example) is the same as the peak hour for all trunk groups, which is identified on the Trunk Group Measurements Report. However, conditions could be such that the two reports indicate different hours.

**Note:**

The Call Summary report lists the number of completed calls for the last 24 hours. Therefore, if you compare the Call Rate Measurement reports with the Call Summary report you should see some of the same information.

<b>Field</b>	<b>Description</b>
<b>Hour</b>	<p>Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.</p> <p><b>Note:</b></p> <p>A pair of asterisks in the minute portion of the measurement hour indicates the switch time was changed during the measurements interval (for example, 10**).</p>
<b># Compl</b>	Number of Calls Completed. The number of calls completed, or answered (including incoming, outgoing, and intercom), during the listed hour.
<b>Busy Int. (36 sec.)</b>	Busy Interval (36 seconds). The 36-second interval within the listed hour that had the most calls completed. There are one hundred 36-second intervals in a 1 hour period.
<b># Busy Int. Calls Compl</b>	<p>Number of Busy Interval Calls Completed. The number of calls completed in the listed busy interval.</p> <p><b>Note:</b></p> <p>All originated calls except those directed to an announcement or those generated by maintenance are counted. For example, a facility access test call is not counted as a completed call. Wideband calls count as a single call.</p>
<b>Busiest Hour</b>	For peak listings, this row identifies the busiest hour for today's and yesterday's peak hour. This is the hour with the largest number of completed calls.
<b>Busiest Interval</b>	For peak listings, this row identifies the hour with the busiest 36-second interval for today and yesterday. The hour containing the busiest 36-second interval is not necessarily the same hour as the one reported as the busiest complete hour of the 24-hour period.

---

# Call Summary Measurements report

The Call Summary Measurements report provides an hourly summary of the traffic data for the last 24 hours. All call completions, except those generated by maintenance, are counted. For example, a Facility Test Call is not counted as a call completion.

**Note:**  
Calls are counted on initial completion and not as conference and transfer calls.

## Command

To display the Call Summary Measurements report:  
Type `list measurements call-summary [schedule]` and press **Enter**.  
**Options:** The **schedule** option is available for this command.

## Screen

[Figure 30](#) shows a typical Call Summary Measurements report.  
[Table 16](#) describes the data fields in this report.

---

**Figure 30: Call Summary Measurements report**

list measurements call-summary						Date: 3:50 pm WED JAN 25, 2006					
Switch Name: Cust_Switch_Name											
CALL SUMMARY MEASUREMENTS											
Summary of Last 24 Hours											
-----# Calls Completed-----						-----# Calls Completed-----					
Multi-Service						Multi-Service					
Hour	Voice	Data	Media	Link	Total	Hour	Voice	Dta	Media	Link	Total
1400	46	15	0	0	61	0200	0	0	0	0	0
13**	23	20	0	0	43	0100	0	0	0	0	0
1200	22	16	0	0	38	0000	0	0	0	0	0
1100	45	22	0	0	67	2300	0	0	0	0	0
1000	33	22	0	0	55	2200	0	0	0	0	0
0900	21	14	0	0	35	2100	0	0	0	0	0
0800	11	10	0	0	21	2000	3	0	0	0	3
0700	1	0	0	0	1	1900	4	2	0	0	6
0600	0	0	0	0	0	1800	4	2	0	0	6
0500	0	0	0	0	0	1700	4	7	0	0	11
0400	0	0	0	0	0	1600	21	12	0	0	33
0300	0	0	0	0	0	1500	21	15	0	0	36
Command successfully completed											
Command:											

---



Data is displayed beginning with the most recently-completed hour and going back for 24 consecutive hours. For example, since the report is displayed during the 1500-hour time interval, the last completed hour is 1400. Therefore, the left hour column begins with 1400 and lists (from top to bottom) the 12 preceding hours.

This report indicates the system clock was reset during the 1300 hour interval. Therefore, the hour is displayed as **13\*\***.

**Table 16: Call Summary Measurements report field descriptions**

Field	Description
<b>Hour</b>	<p>Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.</p> <p><b>Note:</b></p> <p>A pair of asterisks in the minute portion of the measurement hour indicates the switch time was changed during the measurements interval (for example, <b>10**</b>).</p>
<b># of Calls Completed</b>	<p>Number of Calls Completed. This field contains the following five subfields:</p> <ul style="list-style-type: none"> <li>● <b>Voice</b> — The number of voice calls completed during the listed hour.</li> <li>● <b>Data</b> — The number of data calls completed during the listed hour. A data call carries digital signals between two endpoints, enabling end terminals to communicate directly.</li> <li>● <b>Multi Media</b> — The number of multimedia calls completed during the listed hour. A multimedia call is a call involving one or more media calls (for example, voice, video, and data) between a multimedia user and other users. This subfield only applies to customers using MMCH (Basic).</li> <li>● <b>Service Link</b> — The number of service links established during the listed hour. A service link provides voice, video, and data connectivity to a multimedia user. This subfield only applies to customers using MMCH (Basic).</li> <li>● <b>Total</b> — The total number of calls completed during the listed hour.</li> </ul> <p>Calls are counted in the hour they are answered and not in the hour they are dropped. Therefore, a call that starts in one hour and ends in another hour is counted only in the hour it originates.</p> <p><b>Suggested action:</b> To determine the types of calls during the measurement hour, use the List Measurements Occupancy Summary Report.</p>

---

## Cell Traffic report

The Cell Traffic report provides hourly and daily summaries of the wireless traffic data. These reports are designed to study the wireless traffic patterns. Used in conjunction with maintenance tests and other tools, these reports are useful for trouble analysis. For example, excessive load on a cell of Wireless Fixed Base (WFB) or too many handovers may indicate deficiencies or potential problem areas in the system.

### Command

To display the Cell Traffic report for an individual cell:

Type `list measurements cell-traffic <cell-addr> [wfb-address] [cell-number] <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Note:**

The qualifier `cell-addr` identifies cabinet (1-64), carrier (A-E), and slot (00-20).

**Options:** The `wfb-address`, `cell-number`, `print`, and `schedule` options are available for this command.

To display the Cell Traffic Summary report:

Type `list measurements cell-traffic summary <today-peak/yesterday-peak/last-hour> [schedule]` and press **Enter**.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 31](#) shows a typical screen for the Cell Traffic Summary report.

[Table 17](#) describes the data fields presented in this report.

**Figure 31: Cell Traffic summary report**

```
list measurements cell-traffic summary last-hour
Switch Name:                               Date: 1:01 pm WED JAN 25, 2006**
WIRELESS REPORT : CELL TRAFFIC
                                     =No Measurements *=Invalid Hour
Total wireless call connectivity for the hour: 2044
Total wireless call connectivity for the day: 2096
```

Cell Address	Meas Hour	%Time In-Sys	Usage (CCS)	TotBch Seized	PeakBch In-Use	%Time ACB	%Time OutServ	Hand Overs
SYSTEM	1400	NA	1224	2112	NA	NA	NA	850
01B03A1	1400	NA	76	132	NA	NA	NA	44
01B03A2	1400	NA	150	240	NA	NA	NA	68
01B03A3	1400	NA	100	140	NA	NA	NA	68
01B03A4	1400	NA	56	140	NA	NA	NA	48
01B03A	1400	100	382	652	10	15	12	NA
01B03A1	1400	NA	72	120	NA	NA	NA	88
01B18A	1400	89	72	120	7	11	10	NA
01B18B1	1400	NA	78	112	NA	NA	NA	48
01B18B2	1400	NA	158	212	NA	NA	NA	68
01B18B3	1400	NA	34	84	NA	NA	NA	80
01B18B4	1400	NA	72	120	NA	NA	NA	88
01B18B	1400	100	342	528	9	15	12	48

**Table 17: Cell Traffic Summary report field descriptions 1 of 2**

Field	Description
<b>Total wireless call connectivity for the hour</b>	Provides a count of the actual number of calls originated and calls offered as a whole. These are call attempts that may or may not have been completed.
<b>Total wireless call connectivity for the day</b>	Provides a count of the actual number of calls originated and calls offered as a whole. These are call attempts that may or may not have been completed. For the interval extending from midnight until the last hour of the current day.
<b>Cell Address</b>	Location and number in terms of Port Network Number and the Port ID associated with number.
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>%Time In-Sys</b>	Percent of Time In-System. The percentage of time during the polling interval that a WFB was administered.

**1 of 2**

Table 17: Cell Traffic Summary report field descriptions 2 of 2

Field	Description
<b>Usage (CCS)</b>	The total time in CCS (Centum Call Seconds/ Hundred Call Seconds) that bearer channels are allocated for the WTs (Wireless Terminals) at a cell.
<b>TotBch Seized</b>	Total Bearer Channels Seized. The number of times the bearer channels were seized by this cell for call or mobility related activities during the polling interval.
<b>PeakBch In-Use</b>	Peak Bearer Channel In-Use. Peak number of traffic bearer channels that are simultaneously in use at a WFB.
<b>%Time ACB</b>	Percent of Time All Channels Busy. The percentage of time that all ACB (All Channels Busy) traffic bearer channels are simultaneously in use at a WFB during the measurement interval.
<b>%Time OutServ</b>	Percent of Time Out-of-Service. The percentage of time during the polling interval that a WFB was made busy by maintenance and was not available for call related activities.
<b>Hand Overs</b>	The number of handovers handled by the cell during the measuring period.
<b>2 of 2</b>	

---

## Call coverage measurements reports

There are two reports that provide measurement information about call coverage.

- The Coverage Path Measurement report describes coverage activity as it relates to the coverage paths.
- The Principal Coverage Measurement report describes coverage activity as it relates to principal extensions and Personal Central Office Line (PCOL) groups.

For each report, there is a selection screen that lists the specific coverage paths or principal extensions to be measured.

These reports are used to provide information about what happens to calls that go to coverage. The reports can be used to refine and improve call coverage patterns and to manage the system's principals. The reports are used in conjunction with the **list coverage path** and **display coverage sender-group [number]** commands.

---

## Terms

Typically, a principal is the party or group for which a call is originally intended. A principal may be a station user, a hunt group, a terminating extension group, or a **PCOL**.

---

## Feature interactions

**Bridged Call** - A call answered by a bridge of a coverage point extension is considered answered by the coverage point. A call answered by the bridge of a principal is considered answered by the principal.

**Call Pick-Up** - If the principal is a member of a pickup group, a call ringing at the principal and picked up by a member of the pickup group is considered answered by the principal. If the coverage point extension is a member of a pickup group, a call ringing at the coverage point and picked up by a member of the pickup group is considered answered by the coverage point.

**Leave Word Calling and Automatic Callback** - A call for which the calling party activates Leave Word Calling (**LWC**) or Automatic Callback (**ACB**) before the call is redirected and before it is answered is considered a call back for the principal. If **LWC** or **ACB** is activated after the call is redirected, it is considered a call back for the coverage path.

**Trunks** - **CO** trunks and other trunks that have ring-back provided by the **CO** repeatedly attempts to complete the call to the principal. Each attempt is considered a new offered call and is counted for principal or coverage as appropriate.

---

## Data analysis guidelines for call coverage measurements

There is no column for answered calls for principals. Normally, you can assume:

$$\text{Answered Calls} = \text{Calls Offered} - [\text{Calls Redirected} + \text{Calls Abandoned} + \text{Callback}]$$

However, this is not always the case. A number of interactions affect the totals on the measurement reports so that the column totals do not sum to the total calls offered.

**Call Forwarding** - A forwarded call from the principal is counted as offered or abandoned to the principal. If the call abandons, the call is counted as abandoned at the principal. If the forwarded-to extension is a measured principal, the call is counted as an offered call to the forwarded-to extension, but it does not have an “abandon” or a “redirection” associated with it and appears as answered.

**Bridging and Pickup Groups** - The principal, the principal bridge and members of their pickup group(s) all have access to a call *even if* it goes to coverage.

If one of these parties answers the call, the count shows the call was offered to the coverage path without a corresponding count of “answered” or “abandoned.” The count is thrown off and the columns do not add up.

**Distributed Communications System (DCS)** - Call Forwarding abandon interactions are different than those described above if forwarding is done off-switch. In that case, each extension is treated as a principal and calls are counted as abandoned if the caller drops the call.

When a call is forwarded across **DCS** it goes to coverage based on the forwarded-to principal's path criteria rather than the principal's unless the principal is using cover-all.

Because the one-switch appearance of **DCS** is achieved using more than one trunk, **ACB** and **LWC** calls are counted as abandoned.

---

## Selecting coverage paths to be measured

You can select up to 100 coverage paths for measurement.

### Command

To display the list of coverage paths to be measured:

Type **display meas-selection coverage [schedule]** and press **Enter**.

To display the list of all the coverage paths on your system:

Type **list coverage path [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for the display and list commands only.

To change the list of coverage paths to be measured:

1. Type **change meas-selection coverage** and press **Enter**.
2. Enter the coverage path number to be measured and press **Enter**.

Coverage path numbers do not have to be in numerical order. If the coverage path you want is not listed, add the coverage path number (if there is space available), or replace an existing coverage path number you no longer need. Press **Enter** until the cursor is placed on the unwanted coverage path and enter the new coverage path number, or press **CLEAR FIELD** and enter the new coverage path number.

### Screen

[Figure 32](#) shows a typical selection screen for the Coverage Path Measurements report. [Table 18](#) describes the data fields presented on this screen.

Figure 32: Measured Coverage Paths screen

change meas-selection coverage						Page 1 of x
1ST HUNDRED MEASURED COVERAGE PATHS						
Path No.	Path No.	Path No.	Path No.	Path No.	Path No.	Path No.
1:	17:	33:	49:	65:	81:	97:
2:	18:	34:	50:	66:	82:	98:
3:	19:	35:	51:	67:	83:	99:
4:	20:	36:	52:	68:	84:	100:
5:	21:	37:	53:	69:	85:	
6:	22:	38:	54:	70:	86:	
7:	23:	39:	55:	71:	87:	
8:	24:	40:	56:	72:	88:	
9:	25:	41:	57:	73:	89:	
10:	26:	42:	58:	74:	90:	
11:	27:	43:	59:	75:	91:	
12:	28:	44:	60:	76:	92:	
13:	29:	45:	61:	77:	93:	
14:	30:	46:	62:	78:	94:	
15:	31:	47:	63:	79:	95:	
16:	32:	48:	64:	80:	96:	

Table 18: Measured Coverage Paths field descriptions

Field	Description
Path No.	Path Number. Displays the numbers of up to 100 coverage paths selected for measurement.

Coverage Path Measurements report

The Coverage Path Measurements report contains measurements for each of the 100 selected coverage paths from the Measured Coverage Paths screen.



## Command

To display the Coverage Path Measurements report:

Type `list measurements coverage-path [starting path] [count (1-100)] <yesterday-peak/today-peak/last-hour> [external] [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`. You must choose one of these.

- Enter `yesterday-peak` to list the activity for yesterday's peak hour.
- Enter `today-peak` to list the activity for today's peak hour.
- Enter `last-hour` to list the activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** There are four options for this command:

- **starting path**

Enter the number of the coverage path you wish to display. This number must have been previously assigned to one of the available numbers on the Coverage Path Measurement Selection screen. If you do not enter a number, all the measured coverage paths are displayed.

- **count (1-100)**

Enter a number between 1 and 100.

- **external**

This option produces a version of the report showing incoming trunk calls only. Attendant extended calls are considered external.

- **schedule**

This option allows you to schedule the report to print at another time.

For example, to display yesterday's peak measurements for coverage path 68, type `list measurements coverage-path 68 count 1 yesterday-peak`.

## Screen

[Figure 33](#) shows a typical screen for the Coverage Path Measurements report. The time and date the report is requested displays at the top right.

[Table 19](#) describes the data presented in this report.

**Figure 33: Coverage Path Measurements report**

```
list measurements coverage-path 68 count 1 yesterday-peak
Switch Name: Cust_Switch Name                      Date: 3:00 pm WED JAN 25, 2006
                                COVERAGE PATH MEASUREMENTS
Path  Meas  Calls  ----- Criteria -----      Point1/4  Point2/5  Point3/6
No.   Hour   Offrd  Act  Bsy  DA  All  SAC  Cbak Ans  Abd  Ans  Abd  Ans  Abd
68    1400   20     2    0    4    0   14    3 5    2    3    3    1    3

Command successfully completed
Command:
```

**Table 19: Coverage Path Measurements report field descriptions 1 of 2**

Field	Description
<b>Path No.</b>	Path Number. The number that identifies the measurement coverage path.
<b>Meas Hour</b>	Measurement Hour. The starting time (using a 24-hour clock) of the last hour or the hour during which the greatest number of calls are offered to the coverage path.  <b>Note:</b> A pair of asterisks in the minute portion of the measurement hour indicates that the switch time was changed during the measurements interval (for example, 10**).
<b>Calls Offrd</b>	Calls Offered. The total number of calls offered to the path. <b>Suggested action:</b> If this number is large, review the principal report and investigate why calls are not being answered. To find the principal for this coverage path, use the <b>display coverage sender-group [number]</b> command.
<b>Act Criteria</b>	Active Criteria. The number of calls offered to this path due to the principal being active. <b>Suggested action:</b> If this number is large compared to the <b>Calls Offrd</b> field, you should investigate. A possible reason is the path is administered for "active" only.
<b>Bsy Criteria</b>	Busy Criteria. The number of calls offered to this path due to the principal being busy.

**1 of 2**

Table 19: Coverage Path Measurements report field descriptions 2 of 2

Field	Description
<b>DA Criteria</b>	<p>Don't Answer Criteria. The number of calls offered to this path because the principal did not answer the call after the administered number of rings. To find the administered number of rings, use the <b>display coverage path [number]</b> command.</p> <p><b>Suggested action:</b> If this number is large compared to the <b>Calls Offrd</b> field, investigate the reason these calls are leaving the principal. A possible reason is, the path is only administered for "don't answer".</p>
<b>All Criteria</b>	<p>The number of calls offered to this path due to the use of Cover All.</p>
<b>SAC Criteria</b>	<p>Send-All-Calls Criteria. The number of calls offered to this path due to the principal's use of Send-All-Calls, or the calling party using Go To Coverage.</p> <p><b>Suggested action:</b> If this number, or the <b>All Criteria</b> field, are unusually large, you should investigate why calls are still offered to this principal.</p>
<b>Cback</b>	<p>Call Back. The number of calls offered to this path where the calling party used <b>LWC</b> or <b>ACB</b> before a coverage point answered the call. These cases are separated out because they are usually considered abandons but counting them as such would be misleading.</p> <p><b>Suggested action:</b> If this number appears high, verify why calls are not being answered.</p>
<b>Point Ans</b>	<p>Point Answered. The total number of calls answered by the specified point.</p>
<b>Point Abd</b>	<p>Point Abandoned. The total number of calls abandoned by the caller while ringing at the specified point.</p> <p><b>Suggested action:</b> If this number is high, you may want to re-engineer the coverage paths so less traffic is offered to this point.</p>

2 of 2

---

## Selecting principal extensions to be measured

You can select up to 100 principal extensions or PCOL **TACs** for measurement.

For definitions of principal extensions and **TACs**, refer to [Terms](#) on page 94.

### Command

To display the list of principal extensions to be measured:

Type **display meas-selection principal [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for the display command only.

To change the list of principal extensions to be measured:

1. Type **change meas-selection principal** and press **Enter**.
2. Enter the extension to be measured and press **Enter**.

Extension numbers do not have to be in numerical order. If the extension you want is not listed, add the extension number (if there is space available), or replace an existing extension you no longer need. Press **Enter** until the cursor is placed on the unwanted extension and enter the new extension number, or press **CLEAR FIELD** and enter the new extension number.

### Screen

[Figure 34](#) shows a typical Measured Principals selection screen containing entries for the 100 principal extensions or **TACs** to be measured.

[Table 20](#) describes the data fields presented in this screen.

**Figure 34: Measured Principals selection screen**

change meas-selection principal					
MEASURED PRINCIPALS					
Ext/TAC	Ext/TAC	Ext/TAC	Ext/TAC	Ext/TAC	Ext/TAC
1:	19:	37:	55:	73:	91:
2:	20:	38:	56:	74:	92:
3:	21:	39:	57:	75:	93:
4:	22:	40:	58:	76:	94:
5:	23:	41:	59:	77:	95:
6:	24:	42:	60:	78:	96:
7:	25:	43:	61:	79:	97:
8:	26:	44:	62:	80:	98:
9:	27:	45:	63:	81:	99:
10:	28:	46:	64:	82:	100:
11:	29:	47:	65:	83:	
12:	30:	48:	66:	84:	
13:	31:	49:	67:	85:	
14:	32:	50:	68:	86:	
15:	33:	51:	69:	87:	
16:	34:	52:	70:	88:	
17:	35:	53:	71:	89:	
18:	36:	54:	72:	90:	

**Table 20: Measured Principals selection screen field descriptions**

Field	Description
<b>Ext/TAC</b>	External/Trunk Access Code. Lists the extension or PCOL <b>TAC</b> numbers of up to 100 principals whose coverage is selected for measurement.

---

## Principal Measurements report

The Principal Measurements report contains measurements for each of the 100 selected principal extensions or **TACs** from the Measured Principals Coverage Measurements Selection screen.

### Command

To display the Principal Measurements report:

Type `list measurements principal [starting extension/tac] [count(1-100)] <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`. You must choose one of these.

- Enter `yesterday-peak` to list the activity for yesterday's peak hour.
- Enter `today-peak` to list the activity for today's peak hour.
- Enter `last-hour` to list the activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** There are three options available for this command:

- `starting extension/tac`

Enter the number of the extension or PCOL **TAC** you wish to display. This number must have been previously assigned to one of the 100 available numbers on the Principal Coverage Measurement Selection screen. If you don't enter a number, all the measured principals are displayed.

- `count`

Enter a number between 1 and 100.

- `schedule`

This option allows you to schedule the report to print at another time.

For example, to display yesterday's peak measurements for extension 76068 and the next two principals, in order, type `list measurements principal 76068 count 3 yesterday-peak`.

### Screen

[Figure 35](#) shows a typical screen for the Principal Measurements report. The time and date the report is requested displays at the top right.

[Table 21](#) describes the data fields presented in this report.

**Figure 35: Principal Measurements report**

list measurements principal 76068 count 3 yesterday-peak												
Switch Name:		Cust_Switch_Name							Date: 9:14 am WED JAN 25, 2006			
PRINCIPAL MEASUREMENTS												
	Meas	Calls		-----Criteria-----								
Ext/TAC	Hour	Offrd	Aband	Redir	Act	Bsy	DA	All	SAC	Cback	Coverage	Paths
76068	1000	120	6	15	0	15	0	0	0	0	12	
76069	1100	8	0	0	0	0	0	0	8	0	1	
76075	1400	40	4	30	15	15	0	0	0	5	1	2 5

**Table 21: Principal Measurements report field descriptions 1 of 2**

Field	Description
<b>Ext/TAC</b>	Extension/Trunk Access Code. The principal extension or <b>PCOL</b> group/ <b>TAC</b> being reported.
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>Calls Offrd</b>	Calls Offered. The total number of calls offered to the principal.
<b>Aband</b>	<p>Abandoned. The total number of abandoned calls, where the calling party hung up before the call was answered or sent to coverage.</p> <p><b>Suggested Action:</b> If this number is high at the principal, you may need to redirect traffic.</p> <p><i>The number of calls answered by principal =</i></p> <p><i>Calls Offered – Calls Abandoned – Calls Redirected</i></p>
<b>Redir</b>	<p>Redirected. The total number of calls not answered by the principal and subsequently sent to coverage.</p> <p><b>Suggested action:</b> If this number is large compared to <b>Calls Offrd</b>, investigate the reasons.</p>
<b>Act Criteria</b>	Active Criteria. The number of calls sent to coverage by this principal due to the principal being active.
<b>Bsy Criteria</b>	Busy Criteria. The number of calls sent to coverage by this principal due to the principal being busy.

**1 of 2**

Table 21: Principal Measurements report field descriptions 2 of 2

Field	Description
<b>DA Criteria</b>	Don't Answer Criteria. The number of calls sent to coverage by this principal because the principal didn't answer the call after the administered number of rings. To find the administered number of rings, use the <b>display coverage-path [number]</b> command.
<b>All Criteria</b>	The number of calls sent to coverage by this principal due to the principal's use of Cover All.
<b>SAC Criteria</b>	Send All Calls Criteria. The number of calls sent to coverage by this principal due to the principal's use of Send All Calls, or because the calling party used the Go To Cover feature.
<b>Cback</b>	Call Back. The number of calls offered to this principal where the calling party used <b>LWC</b> or <b>ACB</b> before the principal answered the call and before it went to coverage. These cases are separated out because they look like abandons and counting them as such would be misleading.
<b>Coverage- Paths</b>	<p>The coverage paths used by this principal. To find the associated extensions, use the <b>display coverage sender-group</b> command.</p> <p><b>Note:</b> This command displays other principals using some coverage paths.</p>

2 of 2

## DS1 link performance measurements

This section describes performance measurements for DS1 links. It includes the **DS1** Link Performance Measurements Summary report and the **DS1** Link Performance Measurements Detailed Log report.

Many conventional error measurements rely on the parameter Bit Error Rate to describe the quality of digital transmission facilities. However, with **DS1** links, when errors do occur, they tend to be as error bursts rather than single bit errors. Therefore, the Errored Seconds, Bursty-Errored Seconds, Severely-Errored Seconds, and Failed Seconds measurements more accurately describe the operational characteristics of **DS1** links.

**DS1** link performance is based on the number of error events counted per second. An error event is defined as any one of the following:

- **Misframe.** An error detected as an erroneous bit pattern in the bits used to frame on the DS1 signal.



- **Slip.** An error detected as the deletion or repetition of a single frame. The error is caused by clock differences between systems due to improper synchronization.
- **Extended Superframe Format (ESF) CRC-6 Error.** A data communications error over a **DS1** link using the **ESF** format that is detected as a mismatch between the calculated CRC-6 (6-bit cyclic redundancy check) character appended to the transmitted data and the CRC-6 character recalculated by the receiver.

**DS1** link performance is measured by the following error event counts:

- **Errored Second.** Any second that contains one or more error events.

The percent of Error Free Seconds (%EFS) is defined as:

$$\%EFS = \left[ 1 - \frac{\text{Errored Seconds}}{\text{Total Seconds}} \right] \times 100$$

- **Bursty-Errored Second.** Any second that contains from 2 to 319 error events.
- **Severely-Errored Second.** Any second that contains 320 or more error events.
- **Failed Second.** A state that exists when ten or more consecutive severely-errored seconds are detected. A Failed Second state is cleared when no severely-errored seconds are detected for a period of 10 consecutive seconds.
- **Controlled Slip Second.** Any second with one or more controlled slips (a replication or deletion of a DS1 frame by the receiver).
- **Loss of Frame Count.** The number of times a loss of frame is declared. A loss of frame is declared when there is a continuous loss of signal or out of frame condition for greater than 2.5 seconds.

**Note:**

Events such as a Failed Second or Severely-Errored Second typically result in a serious impact on the customers' applications.

If the misframe or slip errors become too severe, an alarm is raised. The actual rate at which the errors occur determines whether the alarm is minor or major. *Maintenance for Avaya MultiVantage and DEFINITY Server R, Si, or CSi*, identify the recommended procedures maintenance personnel should perform to resolve these alarms.

The error event data, collected by the DS1 Interface circuit pack, is available for up to 24 hours in 15-minute increments. Measurement data older than 24 hours is overwritten by the current measurement data.

A system reboot from tape clears the error event counters. The **DS1** error event counters may also be cleared using the `clear measurements ds1 log CabCarSSF` maintenance command.

This command uses the following qualifiers:

**Cab** = Port network number

**Car** = Carrier

**SSF** = Slot

If a TN767 or TN464 circuit pack is removed or taken out of service, data for that circuit pack is not available for the time the pack is removed. In addition, if a TN767E or TN464F or later suffix circuit pack administered for ESF framing is removed or taken out of service, data for the entire 24-hour collection period is lost since ESF measurements are stored on the board rather than in switch memory.

---

## DS-1 Link Performance Measurements Summary report

The **DS-1** Link Performance Measurements Summary report provides an indication of the quality of a **DS1** link that connects to a **DS1** Interface circuit pack.

**Note:**

The error message “Measurements command has timed out. See Traffic Reports manual (555-230-511).” indicates no response was received from the DS1 circuit pack. Try the command again (maximum of two more times). Note, however, this error message may be returned from a “list measurements ds1” or “clear measurements ds1” command that uses the “remote” option (for example, “list measurements ds1 summary 1c19 remote”), if Interface Unit (IU) equipment in the network is deliberately configured not to respond to ESF performance measurements message inquiries. This is a common network setup and should be considered normal. In this case, the command will never succeed. If, however, this error message is displayed when the network or far-end PBX should be responding to the remote ESF performance measurements inquiries, then the IU itself could have problems or there could be problems on the Facility Data Link span. If the command times out three times, and the configuration is one where a reply to the request should be returned, the problem should be escalated to Tier III.

## Command

To display the **DS-1** Link Performance Measurements Summary report:

Type `list measurements ds1 summary <CabCarSSF> [local/carrier-local/remote] [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — **CabCarSS**. Enter the port network number, the Carrier number, and the slot number.

**Options:** There are four options available for this command:

- **local**

Displays your (local) measurements. These are your copies of the local (near-end) performance measurements and can be cleared by you. These measurements cannot be cleared by the carrier.

- **carrier-local**

Displays carrier (network) measurements. These are the carrier copies of the local (near-end) performance measurements. They can only be cleared by the carrier.

- **remote**

Displays remote CSU measurements. These measurements are available from the CSU at the far end of the link. They can be cleared from the near end of the link.

- **schedule**

This option allows you to schedule the report to print at another time.

## Screen

[Figure 36](#) shows a typical screen for the **DS-1** Link Performance Measurements Summary report.

[Table 22](#) describes the data fields in this report.

**Figure 36: DS-1 Link Performance Measurements Summary report**

```
list measurements ds1 summary 1c05
Switch Name: Cust_Switch_Name          Date: 17:59 pm WED JAN 25, 2006
```

DS-1 LINK PERFORMANCE MEASUREMENTS SUMMARY REPORT

Counted Since: 4:27 pm WED JAN 22, 2003

Valid 15-Minute Intervals in Last 24 Hours: 6

Seconds Elapsed In Current Interval: 135    ESF Error Events: 0

Test: far-csu-loopback                      Pattern: 3-in-24    Synchronized: y

Loopback/Span Test Bit-Error Count: 53                      Test Duration: 00:13:26

	Worst 15-Minute Interval		24-Hour	Current
Category	Date	Time	Count	Interval Count
Errored Seconds	4/13	16:42	68	133
Bursty Errored Seconds	4/13	17:57	540	636
Severely Errored Seconds	4/13	17:57	0	0
Unavailable/Failed Seconds	4/13	17:57	3	5
Controlled Slip Seconds	4/13	17:57	100	167
Loss Of Frame Count	4/13	17:57	2	2

**Note:**

ESF Error Events, Test, Pattern, Synchronized, Loopback/Span Test Bit-Error Count, Test Duration, **Controlled Slip Seconds**, and Loss Of Frame Count apply only to the TN767E and TN464F or later suffix circuit packs.

**Table 22: DS-1 Link Performance Measurements Summary report field descriptions 1 of 3**

Field	Description
<b>Counted Since</b>	The date and time the counters were last cleared and restarted. The counters are set to 0 and start accumulating data when the system is administered or reinitialized. The current system time appears in this field after the system clock is set. Because the <b>Counted Since</b> field is calculated based on the current time, an error message results if the system clock is not set following a system reinitialization.
<b>Valid 15-Minute Intervals in Last 24 Hours</b>	The total number of 15-minute intervals (0 to 96) in the past 24-hour period with valid values. (An invalid interval is any 15-minute interval during which the system clock was changed, a system reinitialization occurred, or the specified TN767 or TN464 circuit pack was pulled from the carrier. Refer to the DS1 log report for details.)

**1 of 3**

**Table 22: DS-1 Link Performance Measurements Summary report field descriptions 2 of 3**

<b>Field</b>	<b>Description</b>
<b>Seconds Elapsed In Current Interval</b>	The number of seconds (0 to 899) counted in the current 15-minute interval.
<b>ESF Error Events</b>	The number of ESF errors (CRC-6 errors or out-of-frame errors) counted with a maximum cumulative value of 65535.
<b>Test</b>	The type of DS1 loopback/span test currently active. None indicates no test is currently active.
<b>Pattern</b>	The type of bit pattern generated during an extended duration DS1 loopback/span test. None indicates no pattern is being sent.
<b>Synchronized</b>	Indicates whether the test pattern generated by the DS1 board is synchronized (detected properly by the receiving DS1 circuit pack). N/A is displayed if no pattern is generated.
<b>Loopback/ SpanTest Bit-Error Count</b>	The number of bit-errors detected in the received signal when an extended duration loopback test is performed.
<b>Test Duration</b>	The duration in seconds the extended loopback test has run. The maximum value is 99:59:59 (99 hours, 59 minutes, and 59 seconds).
<b>Errored Seconds</b>	The number of errored seconds for the specified interval (maximum of 900). An errored second is any second in which one or more data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available, typically because the circuit pack was not inserted during the interval.
<b>Bursty Errored Seconds</b>	<p>The number of bursty errored seconds for the specified interval (maximum of 900). A bursty errored second is any second in which 2 to 319 data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a minor alarm.</p> <p><b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel if they have not already been alerted.</p>

**2 of 3**

**Table 22: DS-1 Link Performance Measurements Summary report field descriptions 3 of 3**

Field	Description
<b>Severely Errored Seconds</b>	The number of severely errored seconds for the specified interval (maximum of 900). A severely errored second is any second in which 320 or more data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available. <b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel if they have not already been alerted.
<b>Unavailable/Failed Seconds</b>	A count of one-second intervals during which service is unavailable (0 to 900).
<b>Controlled Slip Seconds</b>	The number of seconds (0 to 255 — counts greater than 255 are still displayed as 255) with one or more controlled slips (a replication or deletion of a <b>DS1</b> frame by the receiver).
<b>Loss of Frame Count</b>	The accumulation of the number of times a loss of frame is declared (0 to 255 — counts greater than 255 are still displayed as 255). A loss of frame is declared when there is a continuous loss of signal or out of frame condition for greater than 2.5 seconds. The condition is cleared after 15 seconds without a loss of signal or out-of-frame condition.
<b>Worst 15-Minute Interval</b>	The date, ending time, and count for the 15-minute period that contained the maximum count in each error category. If there are no errors, the field displays <b>0</b> with the most recent interval.
<b>24-Hour Count</b>	The total count in each error category for the last 24-hour period (0 to 65535 — counts greater than 65535 are displayed as 65535). See <a href="#">Figure 41: DS-1 Facility Link Performance Measurements Detailed Log report</a> on page 120 to view the last 96 intervals.
<b>Current Interval Count</b>	The count in each error category for the 15-minute interval in progress when the report is requested. If no errors have occurred yet in any of the categories during the current 15-minute interval, the respective field contains the number <b>0</b> . If the system is busy performing call processing functions and cannot respond within 8 seconds, then the field displays <b>N/A</b> .

**3 of 3**

---

## DS-1 Link Performance Measurements Detailed Log report

The **DS-1** Link Performance Measurements Detailed Log report lists errored event records for the past 24 hours. The errored event records are listed for each 15-minute interval. This shows the 96 records (the number of 15-minute intervals in 24 hours) from the current 15-minute interval back to 24 hours before the current interval.

### Command

To display the **DS-1** Link Performance Measurements Detailed Log report:

Type `list measurements ds1 log <CabCarSS> [local/carrier-local/remote] [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — **CabCarSS**. Enter the port network number, the Carrier number, and the slot number.

**Options:** There are two options available for this command:

- **local/carrier-local/remote**
  - Enter `local` to display your (local) measurements.  
These are your copies of the local (near-end) performance measurements and can be cleared by you. These measurements cannot be cleared by the carrier.
  - Enter `carrier-local` to display carrier (network) measurements.  
These are the carrier copies of the local (near-end) performance measurements. They can only be cleared by the carrier.
  - Enter `remote` to display remote CSU measurements.  
These measurements are available from the CSU at the far end of the link. They can be cleared from the near end of the link.
- **schedule**  
This option allows you to schedule the report to print at another time.

**Note:**

The errored event records for TN767E and TN464F or later suffix circuit packs administered for ESF framing are displayed starting from the most recent interval. Measurements for previous suffix TN767 and TN464 boards and for later suffix boards administered for D4 framing are displayed from oldest to newest interval.

## Screens

[Figure 37](#) and [Figure 38](#) show typical screens for the **DS-1** Link Performance Measurements Detailed Log report.

[Table 23](#) describes the data fields presented in this report.

---

**Figure 37: DS-1 Link Performance Measurements Detailed Log report — page 1**

---

```
list measurements dsl log 1c05
Switch Name: cust_switch_name_____
Date: 10:44 pm MON MAY 1, 2006
Page 1 SPE A
```

```
DS-1 LINK PERFORMANCE MEASUREMENTS DETAILED LOG REPORT
```

```
Counted Since:10:42 am SUN APR 30, 2006
```

Date	Time	ES	BES	SES	UAS/FS	CSS	LOFC
04/30	10:57	0__	0__	0__	0__	N/A	N/A
04/30	11:12	0__	0__	0__	0__	N/A	N/A
04/30	11:27	0__	0__	0__	0__	N/A	N/A
04/30	11:42	0__	0__	0__	0__	N/A	N/A
04/30	11:57	0__	0__	0__	0__	N/A	N/A
04/30	12:12	0__	0__	0__	0__	N/A	N/A
04/30	12:27	0__	0__	0__	0__	N/A	N/A
04/30	12:42	0__	0__	0__	0__	N/A	N/A
04/30	12:57	0__	0__	0__	0__	N/A	N/A
04/30	13:12	0__	0__	0__	0__	N/A	N/A
04/30	13:27	0__	0__	0__	0__	N/A	N/A



**Figure 38: DS1 Link Performance Measurements Detailed Log report — page 2**

list measurements dsl log 1c05						Page 2	
Switch Name: cust_switch_name_____						Date: 10:44 pm MON MAY 1, 2006	
DS-1 LINK PERFORMANCE MEASUREMENTS DETAILED LOG REPORT							
Counted Since: 10:42am SUN APR 29, 2006							
Date	Time	ES	BES	SES	UAS/FS	CSS	LOFC
04/30	13:42	0__	0__	0__	0__	N/A	N/A
04/30	13:57	0__	0__	0__	0__	N/A	N/A
04/30	14:12	0__	0__	0__	0__	N/A	N/A
04/30	14:27	0__	0__	0__	0__	N/A	N/A
04/30	14:42	0__	0__	0__	0__	N/A	N/A
04/30	14:57	0__	0__	0__	0__	N/A	N/A
04/30	15:12	0__	0__	0__	0__	N/A	N/A
04/30	15:27	0__	0__	0__	0__	N/A	N/A
04/30	15:42	0__	0__	0__	0__	N/A	N/A
04/30	15:57	0__	0__	0__	0__	N/A	N/A
04/30	16:12	0__	0__	0__	0__	N/A	N/A

**Table 23: DS1 Link Performance Measurements Detailed Log report field descriptions 1 of 2**

Field	Description
<b>Date</b>	The date of the 15-minute interval.
<b>Time</b>	The ending time for the 15-minute interval.
<b>ES</b>	Errored Second. The number of errored seconds for the specified interval (maximum of 900). An errored second is any second in which one or more data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available, typically because the circuit pack was not inserted during the interval.
<b>BES</b>	Bursty Errored Seconds. The number of bursty errored seconds for the specified interval (maximum of 900). A bursty errored second is any second in which 2 to 319 data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a minor alarm. <b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel if they have not already been alerted.

**1 of 2**

**Table 23: DS1 Link Performance Measurements Detailed Log report field descriptions 2 of 2**

Field	Description
<b>SES</b>	Severely Errored Seconds. The number of severely errored seconds for the specified interval (maximum of 900). A severely errored second is any second in which 320 or more data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a major alarm. <b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements it may be appropriate to alert maintenance personnel if they have not already been alerted.
<b>UAS/FS</b>	Unavailable/Failed Seconds. The number of seconds the link is in the failed seconds state for the specified interval (maximum of 900). A failed second state exists any time 10 or more consecutive severely-errored seconds occur. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a major alarm. <b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel, if they have not already been alerted.
<b>CSS</b>	Controlled Slip Seconds. The number of seconds (maximum of 255) with one or more controlled slips (a replication or deletion of a DS1 frame by the receiver).
<b>LOFC</b>	Loss of Frame Count. The accumulation of the number of times a loss of frame is declared (maximum of 255). A loss of frame is declared when there is a continuous loss of signal or out of frame condition for greater than 2.5 seconds. The condition is cleared after 15 seconds without a loss of signal or out-of-frame condition.

**2 of 2**


---

## DS1 Converter reports

This section describes performance measurements for the four facilities associated with a **DS1** Converter board. It includes the **DS1** Facility Link Performance Measurements Summary report and the **DS1** Facility Link Performance Measurements Detailed Log report. These reports are available only on the G3r server.

The **DS1** Converter board is part of the **DS1** Converter Complex which consists of two **DS1** Converter boards connected by between one and four facilities (**DS1** Facility).

Errors on **DS1** facilities tend to occur in error bursts rather than single bit errors. Therefore, the Errored Seconds, Bursty Errored Secs, Severely Errored Secs and Failed Seconds measurements more accurately describe the operational characteristics of **DS1** facilities.

There are two **DS1** converter reports:

- The **DS-1** Facility Link Performance Measurements Summary report provides information about the worst 15 minutes, the last 24 hours, and the current 15 minutes for each measurement type.
- The **DS-1** Facility Link Performance Measurements Detailed Log report displays a detailed log for the last ninety-six 15-minute intervals for each type of data measured.

**DS1** facility performance is based on the number of error events counted per second. An error event is defined as any one of the following:

- **Misframe.** An error detected as an erroneous bit pattern in any single frame.
- **Slip.** An error detected as the deletion or repetition of a single frame.
- **Extended Superframe Format (ESF) CRC-6 Error.** A data communications error over a **DS1** facility using the **ESF** format detected as a mismatch between the calculated CRC-6 (6-bit cyclic redundancy check) character appended to the transmitted data and the CRC-6 character recalculated by the receiver.

**DS1** link performance is measured by the following error event counts:

- **Errored Second.** Any second that contains one or more error events.

The percent of Error Free Seconds (%EFS) is defined as shown in [Figure 39](#).

---

**Figure 39: Estimating Attendant Position Requirements**

$$\%EFS = \left[ 1 - \frac{\text{Errored Seconds}}{\text{Total Seconds}} \right] \times 100$$


---

- **Bursty-Errored Second.** Any second that contains from 2 to 319 error events.
- **Severely-Errored Second.** Any second that contains 320 or more error events.
- **Failed Second.** A state that exists when ten or more consecutive severely-errored seconds are detected. A Failed Second state is cleared when no severely-errored seconds are detected for a period of 10 consecutive seconds.

**Note:**

Such events as a Failed Second or Severely-Errored Second typically result in a serious impact on the customers' applications.

If the errors become too severe, an alarm is raised. The actual rate the errors occurred at determines whether the alarm is minor or major.

## Traffic data analysis reports

The error event counters, located on each **DS1 Converter** board for each administered facility, are polled every 900 seconds (15 minutes). The data is available for up to 24 hours. Measurement data older than 24 hours is overwritten by current measurement data.

A system re-boot from tape clears the error event counters. The **DS1** error event counters may also be cleared using the `clear measurements ds1-facility log | esf-error-events | loopback/spantest CabCarSSF` maintenance command.

If a DS1 Converter circuit pack is removed, or taken out of service, data for that circuit pack is not available for the time periods it is removed.

## Command

To clear the **DS1 Converter** measurements:

Type `clear measurements ds1-facility log | esf-error-events | loopback/spantest CabCarSSF [local/remote] [schedule]` and press **Enter**.

This command uses the following qualifiers:

Cab	=	Cabinet Number
Car	=	Carrier
SS	=	Slot
F	=	Facility

This command is only available on the G3r model. In addition, you can reset all software counters associated with the specified **DS1 Converter** circuit pack facility. The **Counted Since** time is also reset and the **Number of Valid Intervals** count is set to zero.

To display the DS-1 Facility Link Performance Measurements Summary report:

Type `list measurements ds1-facility summary CabCarSSF [local/carrier-local/remote] [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

To display the **DS-1** Facility Link Performance Measurements Detailed Log report:

Type `list measurements ds1-facility log CabCarSSF [schedule]` and press **Enter**.

This command uses the same qualifiers as the “clear measurements” command above.

**Options:** The **schedule** option is available for this command.

## Screens

[Figure 40](#) shows a typical screen for the DS-1 Facility Link Performance Measurements Summary report.

[Table 24](#) describes the data fields presented in that report.

[Figure 41](#) shows a typical **DS-1** Facility Link Performance Measurements Detailed Log report.

[Table 25](#) describes the data fields presented in that report.

---

#### Figure 40: DS-1 Facility Link Performance Measurements Summary report

```
list measurements dsl-facility summary 1c21a
Switch Name: Cust_Switch_Name                               Date: 9:51 am TUES SEP 26, 2006

DS-1 FACILITY LINK PERFORMANCE MEASUREMENTS SUMMARY REPORT

                                Counted Since: 9:03 am MON SEP 25, 2006
Valid 15-minute Intervals in Last 24 Hours: 96
    Seconds Elapsed Into Current Interval: 875      ESF Error Events: N/A
Test: N/A                                           Pattern: N/A      Synchronized: N/A
    Loopback/Span Test Bit-Error Count: N/A      Test Duration: N/A

Category                                Worst 15-Minute Interval    24-Hour    Current
                                Date    Time    Count    Count    Interval Count
    Errored Seconds    9/24    09:03    0            0            0
    Bursty Errored Seconds    9/24    09:03    0            0            0
    Severely Errored Seconds    9/24    09:03    0            0            0
    Unavailable/Failed Seconds    9/24    09:03    0            0            0
    Controlled Slip Seconds    N/A      N/A      N/A          N/A          N/A
    Loss of Frame Count    N/A      N/A      N/A          N/A          N/A
```

**Table 24: DS1 Facility Link Performance Measurements Summary report field descriptions 1 of 2**

Field	Description
<b>Counted Since</b>	The date and time when the associated measurement counters are cleared or the <b>DS1 Converter</b> facility is administered. The counters are set to 0 and start accumulating data when the system is administered or re-initialized. The current system time appears in this field after the system clock is set. Since the <b>Counted Since</b> field is calculated based on the current time, an error message is prompted back to you if the system clock is not set following a system re-initialization.
<b>Valid 15-Minute Intervals in Last 24 Hours</b>	The total number of 15-minute intervals (0 to 96) in the past 24-hour period that contain valid data. The <b>Valid Interval</b> field indicates whether or not a valid count is provided by the DS1 interface circuit pack. A value of <b>y</b> indicates that all counts are valid for the interval. A value of <b>n</b> indicates that the interval is invalid. An invalid interval is any 15-minute time interval during which the system clock is changed, a system re-initialization occurred, or the specified circuit pack is pulled from the carrier.
<b>Seconds Elapsed In Current Interval</b>	The number of seconds (0 to 899) counted in the current 15-minute interval.
<b>ESF Error Events</b>	The number of <b>ESF</b> errors (CRC-6 errors or out-of-frame errors) counted with a maximum cumulative value of 65535.
<b>Test</b>	The type of DS1 loopback/span test currently active. None indicates no test is currently active.
<b>Pattern</b>	The type of bit pattern generated during an extended duration DS1 loopback/span test. None indicates that no pattern is being sent.
<b>Synchronized</b>	Indicates whether the test pattern being generated by the DS1 board is synchronized (detected properly by the receiving DS1 circuit pack). N/A is displayed if no pattern is generated.
<b>Loopback/ SpanTest Bit-Error Count</b>	The number of bit-errors detected in the received signal when an extended duration loopback test is performed.
<b>Test Duration</b>	The duration in seconds the extended loopback test runs. The maximum value is 99:59:59 (99 hours, 59 minutes, and 59 seconds).

**1 of 2**

**Table 24: DS1 Facility Link Performance Measurements Summary report field descriptions 2 of 2**

Field	Description
<b>Category</b>	The type of error to which the count applies (errored seconds, bursty errored seconds, severely errored seconds, unavailable/failed seconds, controlled slip seconds, and loss of frame count). For more information about these categories, refer to <a href="#">Table 12: Route Pattern Measurement Selection screen field descriptions</a> on page 73.
<b>Worst 15-Min Interval</b>	The date, ending time, and count for the 15-minute period that contains the maximum value for each error category. If there are no errors, the field displays <b>0</b> with the most recent interval, or <b>N/A</b> if no data is collected.
<b>24-Hour Count</b>	The total count in each error category for the last 24-hour period (0 to 65535 — counts greater than 65535 are still displayed as 65535). To view the last 96 intervals, refer to <a href="#">Figure 41: DS-1 Facility Link Performance Measurements Detailed Log report</a> on page 120.
<b>Current Interval Count</b>	The count so far in each category for the 15-minute interval in progress when the report is requested. If no errors have occurred yet in any of the categories during the current 15-minute interval, the respective field contains the number <b>0</b> . If the system is busy performing call processing functions and cannot respond within 8 seconds, then the field displays <b>N/A</b> .

**2 of 2**

[Figure 41](#) shows one page of a typical **DS-1** Facility Link Performance Measurements Detailed Log report. This report shows errors in 15-minute intervals, over the last 24 hour period, and usually extends for several pages. The headings and type of information shown here do not change on subsequent pages.

**Figure 41: DS-1 Facility Link Performance Measurements Detailed Log report**

```
list measurements ds1-facility log le21a
Switch Name: Cust_Switch_Name
Date: 9:55 am TUES SEP 26, 2006
Page 1
```

DS-1 FACILITY LINK PERFORMANCE MEASUREMENTS DETAILED LOG REPORT

Counted Since: 9:03 am MON SEP 25, 2006

Date	Time	ES	BES	SES	UAS/FS	CSS	LOFC
9/25	09:18	0	0	0	0	N/A	N/A
9/25	09:33	0	0	0	0	N/A	N/A
9/25	09:48	0	0	0	0	N/A	N/A
9/25	10:03	0	0	0	0	N/A	N/A
9/25	10:18	0	0	0	0	N/A	N/A
9/25	10:33	0	0	0	0	N/A	N/A
9/25	10:48	0	0	0	0	N/A	N/A
9/25	11:03	0	0	0	0	N/A	N/A
9/25	11:18	0	0	0	0	N/A	N/A
9/25	11:33	0	0	0	0	N/A	N/A

press CANCEL to quit -- press NEXT PAGE to continue

**Table 25: DS-1 Facility Link Performance Measurements  
Detailed Log report field descriptions 1 of 2**

Field	Description
<b>Date</b>	The time and date of the current report.
<b>Counted Since</b>	The start time and date when the associated measurement counters are cleared or the <b>DS1 Converter</b> facility is administered.
<b>Date and Time</b>	The date and end time of the 15-minute interval.
<b>ES</b>	Errored Seconds. The number of the errored seconds for the specified 15-minute interval (maximum of 900). An errored second is any second in which one or more data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available, typically because the circuit pack was not inserted during that interval.

**1 of 2**



**Table 25: DS-1 Facility Link Performance Measurements**  
**Detailed Log report field descriptions 2 of 2**

Field	Description
<b>BES</b>	<p>Bursty Errored Seconds. The number of bursty errored seconds for the specified interval (maximum of 900). A bursty errored second is any second in which 2 to 319 data transmission errors occurred. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a minor alarm.</p> <p><b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel if they have not already been alerted.</p>
<b>SES</b>	<p>Severely Errored Seconds. The number of the severely errored seconds counter for the specified interval (maximum of 900). A severely errored second is any second in which 320 or more data transmission errors occur. <b>N/A</b> indicates the count for that interval is not available. An error count of this severity results in a major alarm.</p> <p><b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements it may be appropriate to alert maintenance personnel, if they have not already been alerted.</p>
<b>UAS/FS</b>	<p>The value of the unavailable or failed seconds counter for the specified interval (maximum of 900). A failed second state exists any time that 10 or more consecutive severely errored seconds occur. An error count of this severity results in a major alarm. <b>N/A</b> indicates the count for that interval is not available.</p> <p><b>Suggested action:</b> Resolution of the alarm should, in most cases, be the function of maintenance personnel. Depending upon local arrangements, it may be appropriate to alert maintenance personnel, if they have not already been alerted.</p>
<b>CSS</b>	<p>Controlled Slip Second. Any second with one or more controlled slips (a replication or deletion of a DS1 frame by the receiver).</p>
<b>LOFC</b>	<p>Loss of Frame Count. The number of times a loss of frame is declared. A loss of frame is declared when there is a continuous loss of signal or out of frame condition for greater than 2.5 seconds.</p>

**2 of 2**

---

## Emergency Access Calls report

The Emergency Access Calls report tracks emergency calls by extension, event, type of call, and time of day. This report prints in the system journal printer with name, time and event code (attendant crisis alert).

### Command

To display the Emergency Access Calls report:

Type **list emergency [schedule]** and press **Enter**.

**Options:** The **schedule** option is available with this command.

### Screen

[Figure 42](#) shows a typical screen for the Emergency Access Calls report.  
[Table 26](#) describes the data presented in this report.

---

**Figure 42: Emergency Access Calls report**

list emergency				
EMERGENCY ACCESS CALLS				
Extension	Event	Type of Call	Time	
3104	crisis alert	ars alrt call type	11:21 A	
3405	crisis alert ack'd	ars alrt call type	11:22 A	
3104	crisis pager1 pass	ars alrt call type	11:23 A	
3104	crisis pager2 pass	ars alrt call type	11:24 A	
3104	crisis pager3 pass	ars alrt call type	11:25 A	
3104	crisis pager1 fail	ars alrt call type	11:23 A	
3104	crisis pager2 fail	ars alrt call type	11:24 A	
3104	crisis pager3 fail	ars alrt call type	11:25 A	

---

Table 26: Emergency Access Calls report field descriptions

Field	Description
<b>Extension</b>	The extension where the crisis alert originated.
<b>Event</b>	The event code for the emergency access call: <ul style="list-style-type: none"> <li>● <b>crisis alert</b>—crisis alert sent</li> <li>● <b>crisis alert ack'd</b>—crisis alert acknowledged</li> <li>● <b>crisis pager pass</b>—crisis alert sent to a pager</li> <li>● <b>crisis pager fail</b>—crisis alert sent to a pager and the page failed</li> </ul>
<b>Type of Call</b>	The type of call that is being logged: <ul style="list-style-type: none"> <li>● <b>ars slrt call type</b></li> <li>● <b>feature access code</b></li> <li>● <b>off hook alert</b></li> </ul>
<b>Time</b>	The time (A–AM or P–PM) the crisis alert originated (for example, 11:21 A).

---

## Hunt group reports

This section describes the traffic measurements, performance, and status reports for ACD/UCD/DDC Hunt Groups.

For more detailed **ACD** measurements, the **BCMS** or **CMS** option is recommended. Contact your Avaya Account Team.

---

### Hunt Groups report

The Hunt Groups report lists the hunt groups defined on your system.

#### Command

To display the Hunt Groups report:

Type `list hunt group [number] [to-number x] [name x] [type x] [ext x] [to-ext x] [count n] [schedule]` and press **Enter**.

**Options:** There are eight options for this command:

- **number x**  
Enter the beginning hunt group number.
- **to-number x**  
Enter the ending hunt group number.
- **name x**  
Enter the hunt group name.
- **type x**  
Enter the hunt group type.
- **ext x**  
Enter the beginning hunt group extension.
- **to-ext x**  
Enter the ending hunt group extension.
- **count n**  
Enter the number of hunt groups to list.
- **schedule**  
This option allows you to schedule the report to print at another time.

## Screen

[Figure 43](#) shows a typical screen for the Hunt Groups report.

[Table 27](#) describes the data presented in this report.

**Figure 43: Hunt Groups report**

list hunt-group												
HUNT GROUPS												
Grp No.	Grp Name/Ext.	Grp Typ	ACD/MEAS	Vec	MCH	Que Siz	No. Mem	Cov Path	Notif/ Ctg	Dom Adj	Ctrl	Message Center
1	hu 1 meas vec 3001	ucd-mia	y/B	y	many	5	4		n			n
2	hu 2 meas vec 3002	ucd-mia	n/-	y	none	5	11		n			n
33	hu 33 non acd 3003	ucd-mia	n/-	n	none	S	5	1	n			n

**Table 27: Hunt Groups report field descriptions 1 of 2**

Field	Description
<b>Grp No.</b>	Group Number. Shows the number of a hunt group.
<b>Grp Name/Ext</b>	Group Name/Extension. Shows the name administered for the hunt group and the extension.
<b>Grp Typ</b>	Group Type. Shows the type of the hunt group. See the Group Type field description for page 1 of the Hunt Group screen.
<b>ACD/MEAS</b>	Automatic Call Distribution/Measured. ACD indicates whether Automatic Call Distribution is used. Measured provides the measurement data for the ACD split/skill collected (internal to the switch) for VuStats or BCMS. <b>y/n</b> —Indicates whether the hunt group functions as an ACD split/skill. <b>I</b> (internal), <b>E</b> (external), <b>B</b> (both), or <b>N</b> (none)—Indicates how it is measured.
<b>Vec</b>	Vector. Shows an indicator of whether the hunt group is controlled by a vector. See the Vector field description for page 1 of the Hunt Group screen.

**1 of 2**

Table 27: Hunt Groups report field descriptions 2 of 2

Field	Description
<b>MCH</b>	Multiple Call Handling. Shows the MCH type assigned to the hunt group. <ul style="list-style-type: none"> <li>● <b>none</b>—</li> <li>● <b>req</b>—For on-request</li> <li>● <b>one</b>—For one-forced</li> <li>● <b>per</b>—For one-per-skill</li> <li>● <b>many</b>—For many-forced</li> </ul>
<b>Que Siz</b>	Queue Size. Shows the maximum number of calls that can be in queue for the hunt group.
<b>No. Mem</b>	Number of Members. Shows the actual number of hunt group members.
<b>Cov Path</b>	Coverage Path. Shows the number of the coverage path for the hunt group.
<b>Notif/Ctg Adj</b>	Notifying/Controlling Adjunct. <ul style="list-style-type: none"> <li>● <b>N</b>—Notification. Contains the extension of the ASAI application link that has the notification. You can have up to three ASAI applications monitoring a single hunt group.</li> <li>● <b>C</b>—Controlling adjunct. Displays the extension of the controlling adjunct. You can have one controlling adjunct for each hunt group.</li> <li>● <b>n</b>—None.</li> </ul>
<b>Dom Ctrl</b>	Domain Control. Shows the extension of the ASAI link over which the domain split is set up.
<b>Message Center</b>	Shows an indicator of the type of message (if any) used. See the Messaging Center field description for page 2 of the Hunt Group screen.

2 of 2

## Hunt Group Members report

The Hunt Group Members report helps you administer a split or skill to verify that all agents are logged out and to identify any agents logged in. This report lists all logged in agents for a split or skill, or limits the list to a range of login IDs or physical extensions.

**Note:**

You can use the `list members hunt-group` command to list the agents administered in non-ACD hunt groups. However, since non-ACD hunt groups do not use agent logins, the report will display all administered agents.

## Command

To display the Hunt Group Members report:

Type `list members hunt-group <hunt group number> [name x] [logname x] [loginid x] [to-loginid x] [ext x] [to-ext x] [count n] [schedule]`

**Required Fields:** There is one required field for this command — **hunt group number**.  
Enter the hunt group number

**Options:** There are eight options for this command:

- **name x**  
Enter the hunt group member extension name.
- **logname x**  
Enter the login ID extension name.
- **loginid x**  
Enter the beginning login ID extension.
- **to-loginid x**  
Enter the ending login ID extension.
- **ext x**  
Enter the beginning hunt group member extension.
- **to-ext x**  
Enter the ending hunt group member extension.
- **count n**  
Enter the number of members to list
- **schedule**  
This option allows you to schedule the report to print at another time.

## Screen

[Figure 44](#) shows a typical screen for the Hunt Group Members report.

[Table 28](#) describes the data presented in this report.

**Figure 44: Hunt Group Members report**

```
list members hunt-group 2
```

HUNT GROUP MEMBERS									
Group Number: 2		Group Name: Sanity Test Hun				Group Extension: 39100			
Group Type: ucd-mia		ACD? n		Skill? n		Members: 4			
Station	Station	Login	Login			Agt	Per	Wrk	
Extn	Name	ID	Name			Prf	Lv	All	SO DF Tim Occ AR
31101	1b1801	x31101	c						
32301	2b0410	x32301	c						
33001	3a0901	x33001	c						
34103	4b0823	x34103	c						

**Table 28: Hunt Group Members report field descriptions 1 of 2**

Field	Description
<b>Group Number</b>	The number of the hunt group.
<b>Group Name</b>	The name administered for the hunt group.
<b>Group Extension</b>	The extension administered for the hunt group.
<b>Group Type</b>	Indicates the type of the hunt group. See the Group Type field description for page 1 of the Hunt Group screen.
<b>ACD</b>	Automatic Call Distribution. Indicates whether Automatic Call Distribution is used.
<b>Skill</b>	Indicates whether the hunt group functions as an ACD skill.
<b>Members</b>	The number of hunt group members.
<b>Phys Ext</b>	Physical Extension (ACD, non-ACD, or EAS). The physical station extension of the hunt group member.
<b>Phys Name</b>	Physical Name (ACD, non-ACD, or EAS). The physical station name of the hunt group member.
<b>Login Ext</b>	Login ID Extension (EAS only). The login ID extension of the hunt group member.

**1 of 2**



**Table 28: Hunt Group Members report field descriptions 2 of 2**

Field	Description
<b>Login Name</b>	Login ID Name (EAS only). The login ID extension name of the hunt group member.
<b>Agt Prf</b>	Call Handling Preference (EAS only). The call handling preference routes calls based on agent skill level, greatest need, or percent allocation. <ul style="list-style-type: none"> <li>• lvl—skill level</li> <li>• grt—greatest need</li> <li>• pal—percent allocation</li> </ul>
<b>Lv</b>	Skill Level or Reserve Level (EAS only). The skill level routes incoming calls to an available agent with the skill assigned. The skill levels are as follows: <ul style="list-style-type: none"> <li>• 01 - 02 (Skill Level)—without EAS PHD</li> <li>• 01 - 16 (Skill Level)—with EAS PHD</li> <li>• R1 - R2 (Reserve Level)—with EAS and CentreVu Advocate</li> </ul>
<b>Per All</b>	Percent Allocation (EAS and CentreVu Advocate only). Indicates percentage of this agents time devoted to this skill (0 - 100). Displays only if Call Handling Preference (Agt Prf) is percent allocation.
<b>SO</b>	Service Objective (EAS and CentreVu Advocate only). Indicates whether Service Objective is active for this agent. Displays only if Call Handling Preference (Agt Prf) is skill level or greatest need.
<b>DF</b>	Direct Agent Calls First (EAS and CentreVu Advocate only). Indicates whether Direct Agent Calls delivered first to this agent. Displays only if Call Handling Preference (Agt Prf) is percent allocation.
<b>Wrk Tim</b>	Work Time (EAS and CentreVu Advocate only). The ratio of agent work time in this skill and agent staffed time.
<b>Occ</b>	Occupancy (EAS and CentreVu Advocate only). The ratio of agent work time in all skills and agent staffed time.
<b>AR</b>	Auto Reserve Agent. Identifies this station as belonging to an auto reserve agent. Valid values are <b>y</b> , <b>n</b> , and blank.

**2 of 2**

---

## Hunt Group Measurements report

The Hunt Group Measurements report assists you in monitoring and managing the **DDC** and **UCD** hunt groups and **ACD** splits. These features permit incoming calls to be terminated directly to a prearranged group of answering positions.

This report shows hunt group measurements for yesterday's peak hour, today's peak hour (as of the time of day that this report is run), and the last hour. A peak hour is the hour within a 24-hour period with the greatest usage for the specified day.

### Command

To display the Hunt Group Measurements report:

Type `list measurements hunt-group <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the hunt group activity for yesterday's peak hour.
- Enter `today-peak` to list the hunt group activity for today's peak hour.
- Enter `last-hour` to list the hunt group activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 45](#) shows a typical screen for the Hunt Group Measurements report, using the last-hour option. The time and date the report is requested displays at the top right.

[Table 29](#) describes the data presented in this report.

**Figure 45: Hunt Group Measurements report**

```
list measurements hunt-group last-hour
Switch Name: Customer-Name                               Date: 4:16 pm  MON JAN 23, 2006

HUNT GROUP MEASUREMENTS
```

Grp No.	Grp Name	Grp Siz/ Typ.	Meas Hour	Total Usage	Calls Ans/ Aban.	Que Siz	Calls Que.	Que Ovfl	Time Avail	Speed Answer (sec)
1	Dial-up SAT's	4 ucd	1500	36	0 0	0	0	0	108	0
2	manual hunt group	1 ucd	1500	0	0 0	5	0	0	36	0
3	CC_Capacity_3	0 ead	1500	0	0 0	15	0	0	0	0
4	CC_Capacity_4	0 ead	1500	0	0 0	15	0	0	0	0
5	CC_Capacity_5	0 ead	1500	0	0 0	15	0	0	0	0
6	CC_Capacity_6	0 ead	1500	0	0 0	15	0	0	0	0

press CANCEL to quit -- press NEXT PAGE to continue

**Table 29: Hunt Group Measurements report field descriptions 1 of 3**

Field	Description
<b>Grp No.</b>	Group Number. A number that identifies each hunt group.
<b>Grp Name</b>	Group Name. Name assigned, during administration, to the hunt group.
<b>Grp Siz/ Typ.</b>	Group Size. The number of extensions assigned to the hunt group (not necessarily staffed). Group Type. Identifies the type of hunt group, which may be one of the following: <ul style="list-style-type: none"> <li>● <b>ddc</b> - direct department calling</li> <li>● <b>ucd</b> - uniform call distribution</li> <li>● <b>ead</b> - expert agent distribution</li> </ul>
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.

**1 of 3**

Table 29: Hunt Group Measurements report field descriptions 2 of 3

Field	Description
<b>Total Usage</b>	<p>The sum of all times (in <b>CCS</b>) that the members of a hunt group are busy on hunt group calls. Total Usage is the most important parameter for this report. The maximum possible usage is:</p> <p><i>Maximum Possible Usage = 36 CCS × Total # of Members</i></p> <p><b>Suggested action:</b> If the Total Usage number approaches the total <b>CCS</b>, you may consider adding another extension to the hunt group but only staffing it during the peak hours. If the hunt group has several extensions and the Total Usage is low, this may be acceptable if the personnel perform other duties.</p> <p><b>Note:</b></p> <p>ACD hunt groups administered to support Multiple Call Handling displays a series of 5 asterisks (*****) in the <b>Total Usage</b> field. This measurement is not collected for ACD hunt groups that support Multiple Call Handling.</p>
<b>Calls Ans/ Aban.</b>	<p>Calls Answered/Abandoned. The total number of calls which attempt to reach the hunt group but abandon the attempt before being answered. Calls may abandon either while in the hunt group queue or while ringing a hunt group extension. This total does not include calls answered by Call Pick Up, other hunt groups, or calls abandoned while listening to a forced first announcement.</p> <p><b>Note:</b> ACD calls redirected to other splits within the system via the intraflow feature are not counted as abandoned calls. <b>ACD</b> calls redirected to another switch (interflow feature) are not counted as abandoned calls.</p> <p><b>Suggested actions:</b> Observe times during which the Calls Abandoned number may be higher than desired. Subsequently, consider adding one or more agents to the hunt group and staffing these additional positions during the problem times. Also, see “Suggested action” in the <a href="#">Total usage</a> description.</p>

2 of 3

**Table 29: Hunt Group Measurements report field descriptions 3 of 3**

<b>Field</b>	<b>Description</b>
<b>Que Size</b>	<p>Queue Size. The length of the queue assigned to the hunt group during administration.</p> <p><b>Recommendations:</b> There are no specific guidelines for setting queue size. However, the following general recommendations apply. The queue size should be larger than the group size; but, typically not more than three times as large as the group size. An indication the queue size is too large is the observance of a higher than expected number for the Calls Aban field. An indication the queue size is too small is that a larger than expected number of Queue Ovfls occurred.</p>
<b>Calls Que.</b>	<p>Calls Queued. Total number of calls that arrive to find all members of the hunt group busy and are placed in the hunt group queue. Calls Queued includes all calls that go to coverage.</p>
<b>Que Ovfl</b>	<p>Queue Overflow. The number of calls that arrive when all slots in the hunt group queue are occupied.</p>
<b>Time Avail</b>	<p>Time Available. The total time (in CCS) the hunt group extensions are not in use but are available to receive hunt group calls during the measurement hour. Time Available is calculated only when an agent (extension) is ready to receive calls from the specified hunt group. For example, if the hunt group had four extensions and each was available for 15 minutes during the measurement hour, the total time available would be 60 minutes or 36 <b>CCS</b>.</p> <p><b>Note:</b></p> <p>ACD hunt groups administered to support Multiple Call Handling displays a series of 5 asterisks (*****) in the total usage field. This measurement is not collected for ACD hunt groups that support Multiple Call Handling.</p>
<b>Speed Answer (sec)</b>	<p>Speed of Answer (seconds). The average time interval (in seconds) from when the call first enters the hunt group or hunt group queue until the call is answered by a hunt group member. This does not include the time taken by a forced first announcement.</p>

**3 of 3**

## Data analysis guidelines for hunt group reports

The following guidelines are intended to show an easy method for determining whether currently reported data is acceptable. These guidelines represent the minimum you should do to verify the recorded measurement values are consistent with expected and historic values. You should perform additional checks as necessary.

To check the acceptability of hourly Hunt Group Measurements reports, verify the following:

- The system clock or group size has not been changed during the measurement hour.
- The average time agents spend working on calls is typically between 60 and 300 seconds. The actual application and specific types of work being performed may permit you to arrive at a more precise number. If your calculated average call length is out of this range, it should be investigated.

**Note:**

Total Usage plus Total Avail (both in **CCS**) should not exceed 36 X the group size. For example, with a hunt group containing two extensions, total usage measured should not exceed  $2 \times 36 = 72$  **CCS** for data collection.

## Analyzing the hunt group measurement data

The Hunt Group Data Worksheet (see [Worksheet 3](#) on page 368) serves to back up the data from the reports and to provide an easy means for identifying the peak hour. The data from the identified peak hour should be used in subsequent calculations.

Before analyzing data obtained from the hunt group reports, several additional considerations relating to both **ACD** hunt groups and non-**ACD** hunt groups need mentioning. This information includes their similarities and differences.

**Note:**

Note that data collected in a real-time environment virtually always deviates from the theoretically predicted data because of the asynchronous nature of processes and interactions with other events such as maintenance.

### Important considerations for both ACD and non-ACD hunt groups

- **Total Usage:** If the extension is a member of more than one hunt group, then Total Usage is only accumulated for the group that answers the call. But, Time Avail is decremented for all groups. For example, assume extension x3000 belongs to hunt groups 1, 2, and 3. Furthermore, assume a call terminates on hunt group 2 and x3000 answers the call. The end result is that usage time is accumulated for hunt group 2 (thus increasing Total Usage for group 2 and decrementing Time Avail for groups 1, 2, and 3).

Time (Total Usage) is not accumulated when a hunt group member is on an incoming or outgoing personal call.

- Time Avail: If an extension is a member of more than one hunt group, then Time Avail is accumulated for each group. For example, assume extension x3000 belongs to hunt groups 1, 2, and 3. Furthermore, assume extension x3000 is available for the full measurement hour. The end result is that 36 **CCS** is added to Time Avail for hunt groups 1, 2, and 3.

Time (Time Available) is not accumulated when a hunt group member is on an incoming or outgoing personal call.

## Differences between non-ACD and ACD hunt groups

For non-ACD hunt groups:

- Calls Ans: Incoming calls that route to call coverage (or don't answer criteria) accumulate time (Total Usage and Time Avail) as if they are answered within the hunt group. Furthermore, calls to a hunt group picked up by a member of a pickup group are counted as answered within the hunt group.
- Calls Aband: Incoming calls that route to call coverage (or don't answer criteria) are counted as abandoned, for the hunt group, if the caller hangs up when the call is at the ringing coverage point.
- Speed of Answer: Speed of Answer includes any and all times spent in covering to other stations, but does not include the time spent for forced first announcements.

For ACD hunt groups

- Calls Aband: If the caller hangs-up when the call is in queue or while ringing at the agent's position, the call is counted as abandoned. If all members of an ACD split are logged out or in Aux-work mode, incoming ACD calls are not queued for the split and, therefore, are never counted as abandoned.
- Speed of Answer: The Speed of Answer count is set to zero every time a call reaches a new coverage point.

### Note:

Because of this difference, the Speed of Answer values for **ACD** hunt groups tend to be less (smaller) than for non-**ACD** type hunt groups.

- Calls Ans: Calls that go to call coverage (or don't answer criteria) and are answered at the coverage point are not included in the number displayed for this report. Unlike non-ACD hunt groups, the ACD hunt group member who initially received the call is available to answer other ACD calls while the coverage point is answering the covered call.
- Time Avail — Not accumulated for ACD calls that go to coverage.
- Total Usage — Not accumulated for ACD calls that go to coverage.

## Total usage

Total Usage is the sum of all times the members of a hunt group are busy on incoming group calls.

---

### Figure 46: Estimating attendant position requirements

$$\text{Total Holding Time (in seconds)} = \sum \text{ of the individual Holding Time (in sec)}$$

$$\text{Total Usage (in seconds)} = \text{Total Holding Time (in seconds)}$$


---

For demonstration purposes, we consider a hunt group with three calls. Assume the call durations were of 480, 300, and 220 seconds.

---

### Figure 47: Estimating attendant position requirements

$$\text{Total Usage (in seconds)} = 480 + 300 + 220 \text{ seconds}$$

$$\text{Total Usage (CCS)} = \frac{1000 \text{ seconds}}{100 \text{ seconds per CCS}}$$

$$\text{Total Usage (CCS)} = 10 \text{ CCS}$$


---

## Average holding time

With the number of Calls Answered and the number for Total Usage, the average length of time the hunt group members spend answering the calls (Average Holding Time) may be calculated. The calculation is as follows:

---

### Figure 48: Estimating attendant position requirements

$$\text{Average Holding Time} = \left[ \frac{\text{Total Usage CCS}}{\text{Calls Answered}} \right] \times \frac{100 \text{ Seconds}}{\text{CCS}}$$


---

For demonstration purposes, we consider the following calculations.

---

### Figure 49: Estimating attendant position requirements

$$\text{Average Holding Time} = \left[ \frac{10 \text{ CCS}}{3 \text{ calls}} \right] \times \frac{100 \text{ seconds}}{\text{CCS}}$$

$$\text{Average Holding Time} = 333 \text{ seconds (or 5 minutes and 33 seconds per call)}$$


---



---

## Hunt Group Performance report

The Hunt Group Performance report gives the slowest hourly average speed of answer for each hunt group for either the previous day or the current day (yesterday or today) along with the hour the measurement occurred. The report displays the information both graphically and numerically.

### Command

To display the Hunt Group Performance report:

Type `list performance hunt-group <yesterday/today> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday/today`.

- Enter `yesterday` to list the hunt group performance activity for yesterday.
- Enter `today` to list the hunt group performance activity for today.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 50](#) shows a typical screen for the Hunt Group Performance report, using the `today` option.

[Table 30](#) describes the data fields presented in this report.

**Figure 50: Hunt Group Performance report**

```

list performance hunt-group today

Switch Name:                               Date: 1:13 pm  MON JAN 23, 2006

                Hunt Group Performance
                SLOWEST HOURLY SPEED OF ANSWER

No.  Size  Type  1 2 3 4 5 6 7 8 9 10 20 40 60 80 100 200  Ans(sec)  Hour  Avg.
1    3    ucd  ///
2    2    ddc  //////////////////////////////////
3    5    ddc  //////////////////////////////////
4    9    ucd  //////////////////////////////////
5    2    ucd  //////////////////////////////////
6    1    ddc  //////////////////////////////////
7    6    ucd  //////////
8    4    ddc  //////////

Command successfully completed
Command:

```

**Table 30: Hunt Group Performance report field descriptions 1 of 2**

Field	Description
<b>No.</b>	Number. A number that identifies each hunt group.
<b>Size</b>	The number of extensions assigned to the hunt group (not necessarily staffed).
<b>Type</b>	Identifies the type of hunt group, which may be one of the following: <ul style="list-style-type: none"> <li>• <b>ddc</b> - direct department calling</li> <li>• <b>ucd</b> - uniform call distribution</li> <li>• <b>ead</b> - expert agent distribution</li> </ul>
<b>1 2 3 4 5 6 7 8 9 10 20 40 60 80 100 200</b>	Slowest Speed of Answer (seconds). A bar graph representation of the “slowest hourly average speed of answer” for the report interval (either yesterday or today).
<b>Ans (sec)</b>	Answer in seconds. The number of seconds corresponding to the “slowest hourly average speed of answer” (longest amount of time to answer) for the report interval. This time includes queue time and ring time, but does not include the time spent on a forced first announcement.

**1 of 2**

**Table 30: Hunt Group Performance report field descriptions 2 of 2**

Field	Description
Hour	<p>The starting time (using the 24-hour clock) of the hour during which the data is recorded.</p> <p><b>Suggested actions:</b> From analyzing <a href="#">Figure 50: Hunt Group Performance report</a> on page 138 you can determine hunt group #5 has the “slowest hourly speed of answer” for all of yesterday. The value was 31 seconds and the time interval was 1500 hours (3:00 p.m. to 4:00 p.m.). If this time interval happens to be the peak usage hour as indicated from the list measurements hunt group yesterday-peak report, then consider adding/staffing more agents during the peak hour.</p>
Avg.	<p>Average. The number corresponding to the 24-hour daily “average speed of answer” for each hunt group.</p> $\text{Daily Average} = \frac{\sum \text{ of the Delays For Each Answered Call}}{\text{Total \# of Answered Calls (so far today)}}$

**2 of 2**

## Hunt Group Status report

The Hunt Group Status report gives an instantaneous indication of the load pending (number of calls waiting to be serviced) for various hunt groups. The report also indicates the length of time the oldest call in the queue has been waiting for service.

**Note:**

The information on this report is updated every 60 seconds.

## Command

To display the Hunt Group Status report:

Type `monitor traffic hunt-groups [starting group number]` and press **Enter**.

**Options:** Enter the number of the hunt group that you want to begin the list. This is referred to as the starting group number. The report displays a list of 32 consecutively numbered hunt groups. The default is to begin the report with hunt group 1.

Because the command is constantly updating, you must press cancel key to end the report.

Screen

[Figure 51](#) shows a typical screen for the Hunt Group Status report.

Each screen displays 32 hunt group fields, even though they may not all be administered. If the hunt group is not administered, then its corresponding fields are blank. For each administered hunt group, the report displays the time the first call in the queue has been waiting for service, the LCIQ field. The data on the screen is updated every 60 seconds.

[Table 31](#) describes the data fields presented in this report. The abbreviated labels are also identified in a key at the bottom of the screen.

**Figure 51: Hunt Group Status report**

monitor traffic hunt-groups										
HUNT GROUP STATUS						14:27 MON JAN 23 2006				
#	S	A	Q	W	LCIQ	#	S	A	Q	W LCIQ
1	3	0	10	0	0	17				
2	2	0	20	0	0	18				
3	5	2	10	0	0	19				
4	1	0	40	0	0	20				
5	6	0	10	1	67	21				
6	1	0	10	0	0	22				
7	6	1	10	1	141	23				
8	4	0	0	0	0	24				
9						25				
10						26				
11						27				
12						28				
13						29				
14						30				
15						31				
16						32				
(#: Group; S: Grp Size; A: Active Members; Q: Q Length; W: Calls Waiting)										
(LCIQ: Longest Call In Queue in seconds )										

**Table 31: Hunt Group Status report field descriptions 1 of 2**

Field	Description
#	Group Number. The number that identifies the hunt groups.
S	Group Size. The number of extensions assigned to the hunt group (not necessarily staffed).

1 of 2

Table 31: Hunt Group Status report field descriptions 2 of 2

Field	Description
<b>A</b>	Active Hunt Group Members. The number of members in a group currently active (only) on incoming hunt group calls.  <b>Note:</b> This measurement does not include individual extension type calls.
<b>Q</b>	Maximum Queue Length. The number of calls allowed to wait for an agent.
<b>W</b>	Waiting Calls. The number of calls currently waiting in the hunt group queue to be serviced by an agent.
<b>LCIQ</b>	Longest Call In Queue. The time in seconds the oldest call in the hunt group queue has been waiting to be serviced. <b>Suggested actions:</b> If the number of calls waiting (W) is too high (for example, the queue is full or approaching its maximum) it may be desirable to increase the number of active members (A). If the LCIQ field indicates calls are having to wait in queue too long, it may be appropriate to determine if the calls can be processed faster. Alternately, it may be appropriate to increase the number of active members (A).
<b>2 of 2</b>	

---

## IP Signaling Groups Latency and Loss report

The IP Signaling Groups Latency and Loss report provides information on the 10 worst-performing signaling groups for the last hour, current hour, today, or yesterday.

### Commands

To display the IP Signaling Groups Latency and Loss report:

Type `list measurements ip signaling-groups <yesterday/today/current-hour/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday/today/current-hour/last-hour`.

- Enter **yesterday** to list the 10 worst signaling groups for the previous day's 24 hours. This report will take 24 pages, one for each hour. The groups for each hour will be rank ordered from worst to least worst based on the Hour Average Latency.

- Enter **today** to list the 10 worst signaling groups for each hour of the current day, starting with the most recent whole hour. This report will take 24 pages, one for each hour. The groups for each hour will be rank ordered from worst to least worst based on the Hour Average Latency.
  - Enter **current-hour** to list the 10 worst signaling groups for the current hour.
  - Enter **last-hour** to list the 10 worst signaling groups for the last full hour.
- The region number is assigned on the Ip-interfaces screen during switch administration.

## Screen

[Figure 52](#) shows a typical screen for the IP Signaling Groups Latency and Loss report for the current-hour.

[Table 32](#) describes the data fields presented in any version of this report.

**Figure 52: IP Signaling Groups Latency and Loss report**

```
list measurements ip signaling-groups current-hour
```

Switch Name: \_\_\_\_\_ Date: 2:20 pm MON JAN 23, 2006

IP SIGNALING GROUPS LATENCY AND LOSS REPORT  
10 WORST PERFORMING IP SIGNALING GROUPS  
RANK ORDERED STARTING WITH WORST PERFORMING GROUP

Sig Grp No	Region	Hour Average Latency (ms)	Hour Packets Sent	Hour Packets Lost (%)	Hour/ Worst Interval	Interval Average Latency (ms)	Interval Packets Sent	Interval Packets Lost (%)
001	01	10	40	0%	18:03	10	10	0%
001	02	10	40	0%	18:06	10	10	0%
001	03	10	40	0%	18:09	10	10	0%
001	04	10	40	0%	18:12	10	10	0%
001	05	10	40	0%	18:15	10	10	0%
001	06	10	40	0%	18:18	10	10	0%
001	07	10	40	0%	18:21	10	10	0%
001	08	10	40	0%	18:24	10	10	0%

**Table 32: IP Signaling Groups Latency and Loss report field descriptions 1 of 2**

Field	Description
<b>Sig Grp No</b>	Signaling Group Number. The group number in rank order.
<b>Region</b>	The network region of the group.

**1 of 2**

**Table 32: IP Signaling Groups Latency and Loss report field descriptions 2 of 2**

<b>Field</b>	<b>Description</b>
<b>Hour Average Latency (ms)</b>	The average latency for the whole hour.
<b>Hour Packets Sent</b>	The number of packets sent during the whole hour.
<b>Hour Packets Lost(%)</b>	Hour Packets Percentage of Loss. The percent of lost packets for the whole hour (if 100% the corresponding latency is shown as ****)
<b>Hour/Worst Interval</b>	The hour and the worst 3 minute interval within the hour.
<b>Interval Average Latency (ms)</b>	The interval is identifies by the last minute of the interval.
<b>Interval Packets Sent</b>	The number of packets sent during the interval.
<b>Interval Packets Lost(%)</b>	Interval Packets Percentage of Loss. The percent lost packets for the interval (if 100%, the corresponding latency is shown as ****).

**2 of 2**


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## IP traffic measurements reports

There are six reports that list the activity on your IP media processor circuit packs.

- IP Codec Resource Hourly report - lists the codec resources used on all IP media processors for the last 24 hours, from the current hour backwards, for a specific region. This report lists separate information for the G.711 codecs and the G.723/G.729 codecs. The IP Codec Resource Hourly report also shows DSP activity on the IP port networks.
- IP Codec Resource Summary report - lists the codec resources used on all IP media processors for a specific peak hour for all regions. You can list reports for yesterday's peak, today's peak, or the last hour. This report lists separate information for the G.711 codecs and the G.723/G.729 codecs. The IP Codec Resource Summary report also shows DSP activity on the IP port networks.

- IP Codec Resource Detail report - lists the codec resources used on all IP media processors for a specific peak hour for a specific region. You can list reports for yesterday's peak, today's peak, or the last hour. This report lists separate information for the G.711 codecs and the G.723/G.729 codecs. The detail report is generated only for the network regions.
- IP DSP Resource Hourly report - lists the dsp resources used on all IP media processors for the last 24 hours, from the current hour backwards, for a specific region and DSP activity on the IP port networks. In addition, the DSP Hourly report allows views of DSP traffic for a customer's H.248 gateway(s) and IGC traffic (Inter-Gateway Connections) between H.248 gateways and port networks.
- IP DSP Resource Summary report - lists the dsp resources used on all IP media processors for a specific peak hour for all regions. You can list reports for yesterday's peak, today's peak, or the last hour. In addition to reporting by network regions and port networks, the DSP Summary report allows views of DSP traffic for a customer's H.248 gateway(s) and IGC traffic (Inter-Gateway Connections) between H.248 gateways and port networks.
- IP DSP Resource Detail report - lists the dsp resources used on all IP media processors for a specific peak hour for a specific region. You can list reports for yesterday's peak, today's peak, or the last hour. The detail report is generated only for the network regions.

**Note:**

The peak hour is the hour in which the IP media processors are used the most in a specific region.

**Note:**

On IP traffic measurements reports, the report shows \*\* if the switch clock time is changed.

---

## IP Codec Resource Hourly report

### Commands

To display the IP Codec Resource Hourly report:

Type `list measurements ip codec hourly <region number> [schedule]` and press **Enter**.

For example, to display the traffic on media processors for the last 24 hours in region 4, type `list measurements ip codec hourly 4`.

**Options:** The **schedule** option is available for this command.

The region number is assigned on the Ip-interfaces screen during switch administration.



## Screen

[Figure 53](#) shows a typical screen for the IP Codec Resource Hourly report.

[Table 33](#) describes the data fields presented in this report.

**Figure 53: IP Codec Resource Hourly report**

list measurements ip codec hourly 4						Page 1 of x			
Switch Name:			Date: 3:34 pm MON JAN 23, 2006						
IP CODEC RESOURCE HOURLY REPORT									
			G711			G723/9			
			-----			-----			
Meas		DSP	Usage	In Reg	Out of	Usage	In Reg	Out of	
Hour	Region	Rscs	(Erl)	Peg	Reg Peg	(Erl)	Peg	Reg Peg	
1200	4	0	1.8	36	0	0.0	0	0	
0	4	0	1.8	36	0	0.0	0	0	
0	4	0	1.8	36	0	0.0	0	0	
0	4	0	1.8	36	0	0.0	0	0	
0	4	0	1.8	36	0	0.0	0	0	

**Table 33: IP Codec Resource Hourly report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data is collected, from the current hour backward.
<b>Region</b>	1-44	The network region of the IP media processors being measured. The region number is assigned on the Ip-interfaces screen during switch administration.
<b>DSP Rscs</b>	0-9999	Digital Signaling Processor Resources. Total number of IP codec resources, or voice channels, in the region.
<b>G711 Usage (Erl)</b>	0-9999	Amount of time (in erlangs) that G.711 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use, divided by 3600.
<b>G711 In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region is allocated to a G.711 call.

**1 of 2**

Table 33: IP Codec Resource Hourly report field descriptions 2 of 2

Field	Range	Description
<b>G711 Out of Reg peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.711 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.
<b>G723/9 Usage (ERL)</b>	0-9999	Amount of time (in erlangs) that G.723 or G.729 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.723 or G.729 resources on all IP media processors are in use, divided by 3600.
<b>G723/9 In Reg peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a G.723 or G.729 call.
<b>G723/9 Out of Reg peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.723 or G.729 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.

2 of 2

## IP Codec Resource Summary report

### Commands

To display the IP Codec Resource Summary report:

Type `list measurements ip codec summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

For example, to display the previous day's peak hour traffic for all regions with media processors, type `list measurements ip codec summary yesterday-peak`.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the peak hour traffic on media processors for all regions for yesterday.

- Enter **today-peak** to list the peak hour traffic on media processors for all regions for today.
- Enter **last-hour** to list the peak hour traffic on media processors for all regions in the most recently completed hour.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 54](#) shows a typical screen for the IP Codec Resource Summary report.

[Table 34](#) describes the data fields presented in this report.

**Figure 54: IP Codec Resource Summary report**

list measurements ip codec summary yesterday-peak										Page 1
Switch Name:					Date: 4:05 pm					MON JAN 23, 2006
IP CODEC RESOURCE SUMMARY REPORT										
		G711				G723/9				
		-----				-----				
Meas	DSP	Usage	In Reg	Out of	Usage	In Reg	Out of			
Hour Region	Rscs	(Erl)	Peg	Reg Peg	(Erl)	Peg	Reg Peg			
0400 1	0	0.0	0	0	0.0	0	0			
0300 2	0	0.0	0	0	0.0	0	0			
0600 44	0	0.0	0	0	0.0	0	0			

**Table 34: IP Codec Resource Summary report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data is collected.
<b>Region</b>	1-44	The network region of the IP media processors being measured. The region number is assigned on the IP Interfaces screen during switch administration.
<b>DSP Rscs</b>	0-9999	Digital Signaling Processor Resources. Total number of IP codec resources, or voice channels, in the region.

**1 of 2**

**Table 34: IP Codec Resource Summary report field descriptions 2 of 2**

<b>Field</b>	<b>Range</b>	<b>Description</b>
<b>G711 Usage (Erl)</b>	0-9999	Amount of time (in erlangs) that G.711 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use, divided by 3600.
<b>G711 In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a G.711 call.
<b>G711 Out of Reg peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.711 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.
<b>G723/9 Usage (ERL)</b>	0-9999	Amount of time (in erlangs) that G.723 or G.729 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.723 or G.729 resources on all IP media processors are in use, divided by 3600.
<b>G723/9 In Reg peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a G.723 or G.729 call.
<b>G723/9 Out of Reg peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.723 or G.729 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.

**2 of 2**

## IP Codec Resource Detail report

### Commands

To display the IP Codec Resource Detail report:

Type `list measurements ip codec detail <region number> <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

For example, to display the previous day's peak hour traffic for media processors in region 4, type `list measurements ip codec detail 4 yesterday-peak`.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the peak hour traffic on media processors for a specific region for yesterday.
- Enter `today-peak` to list the peak hour traffic on media processors for a specific region for today.
- Enter `last-hour` to list the peak hour traffic on media processors for a specific region in the most recently completed hour.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 55](#) shows a typical screen for the IP Codec Resource Detail report.

[Table 35](#) describes the data fields presented in the report.

**Figure 55: IP Codec Resource Detail report**

list measurements ip codec detail 4 yesterday-peak										Page 1	
Switch Name:					Date: 4:05 pm MON JAN 23, 2006						
IP CODEC RESOURCE DETAIL REPORT											
					G711			G723/9			
-----					-----						
Meas		DSP	Usage	In Reg	Out of	Usage	In Reg	Out of			
Hour	Region	Rscs	(Erl)	Peg	Reg Peg	(ERL)	Peg	Reg Peg			
0400	4	0	0.0	0	0	0.0	0	0			

**Table 35: IP Codec Resource Detail report field descriptions 1 of 2**

<b>Field</b>	<b>Range</b>	<b>Description</b>
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data is collected.
<b>Region</b>	1-44	The network region of the IP media processors being measured. The region number is assigned on the Ip-interfaces screen during switch administration.
<b>DSP Rscs</b>	0-9999	Digital Signaling Processor Resources. Total number of IP codec resources, or voice channels, in the region.
<b>G711 Usage (Erl)</b>	0-9999	Amount of time (in erlangs) that G.711 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use, divided by 3600.
<b>G711 In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a G.711 call.
<b>G711 Out of Reg Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.711 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.
<b>G723/9 Usage (Erl)</b>	0-9999	Amount of time (in erlangs) that G.723 or G.729 codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. This measurement is calculated by adding the total time (in seconds) that G.723 or G.729 resources on all IP media processors are in use, divided by 3600.

**1 of 2**

**Table 35: IP Codec Resource Detail report field descriptions 2 of 2**

Field	Range	Description
<b>G723/9 In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a G.723 or G.729 call.
<b>G723/9 Out of Reg Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a G.723 or G.729 call, but was successfully allocated to a resource in another region. If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.

**2 of 2**


---

## IP DSP Resource Hourly report

### Commands

To display the IP DSP Resource Hourly report:

Type **list measurements ip dsp-resource hourly <region number> [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 56](#) shows a screen for the IP DSP Resource Hourly report.  
[Table 36](#) describes the data fields presented in this report.

**Figure 56: IP DSP Resource Hourly report**

list measurements ip dsp-resource hourly 1										
Switch Name:						Date: 1:19 pm WED FEB 25, 2009				
IP DSP RESOURCE HOURLY REPORT										
		G711	Equivalent DSP		Total	Endpoint Calculations				
Net	Meas	Rsrc	Rsrc	Usage	DSP	In Reg	Out Reg	Denied	%	% Out
Reg	Hour	Capcty	Peak	(Erl)	Pegs	Pegs	Pegs	Pegs	Denied	of Srv
1	1200	64	4	0.0	0	0	0	0	0	0
1	1100	64	4	0.0	0	0	0	0	0	0
1	1000	64	* 4	0.1	3	3	0	0	0	0

**Table 36: IP DSP Resource Hourly Report Field Descriptions 1 of 3**

Field	Range	Description/Algorithm
Net Reg	1 - 250	The network region represents the network region of the IP media processors being measured. The region number is assigned on the ip-interface screen during switch administration.
Meas Hour	0000 – 2300	Hour for which data is collected.
G711 Equivalent DSP Rsrc Capcty	0 - 99999 “**”	DSP resource capacity indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given network region. The “**” indicates that the media processor capacity changed during the measurement hour. <b>Calculation:</b> For the existing network region level reports: G711 DSP Rsrcs = the total number of G711 equivalent DSP resources available at the top of the measurement hour for a specific network region (total G711 equivalent TN2302/TN2602 DSP resources + total G.711 equivalent H.248 DSP resources within the same network region).
G711 Equivalent DSP Rsrc Peak	0 - 99999	Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour. Spikes in traffic patterns can be used by you to determine if media processor resources should be added.
G711 Equivalent DSP Usage (ERL)	0 - 9999.9 Erlangs	DSP Usage. Total G.711 equivalent usage for all codecs that were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.). <b>Calculations:</b> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ Result is to 1 decimal point.

**1 of 3**



**Table 36: IP DSP Resource Hourly Report Field Descriptions 2 of 3**

Field	Range	Description/Algorithm
Total DSP Pegs	0 - 65535	<p>The total number of times media processor resources were allocated in a network region during the measurement hour.</p> <p><b>Calculation:</b> Endpoint In Region Pegs + Pegs from other regions that come into this network region.</p> <p>(Note: You can derive the number of times that a different network region obtained resources from this network region by taking Total DSP Pegs - Endpoint In Reg Pegs).</p>
Endpoint In Reg Pegs	0 - 65535	<p>The total number of times an IP media processor port in the region was allocated to a call/request within that same network region during the measurement hour.</p> <p>Endpoint calculations also include IP/SIP trunks and IGCs.</p>
Endpoint Out Reg Pegs	0 - 65535	<p>The total number of times an endpoint request for an IP media processor port in the region was allocated to a call/request from outside that same network region. This might occur when there are no available resources in the requested network region, a call has been re-directed to another port network.</p> <p>If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.</p>
Endpoint Denied Pegs	0 - 65535	<p>The total number of times an IP media processor port was requested for a call, but was denied because there were no media processing resources available in the system.</p> <p>Note: Calls that were re-directed are not considered denied calls</p> <p>Denied peg counts are against the network region or the IP endpoint that is requesting the resource.</p> <p>Denied peg counts for IGCs are against the network region of the cabinet that is requesting the resource.</p>

**2 of 3**

**Table 36: IP DSP Resource Hourly Report Field Descriptions 3 of 3**

Field	Range	Description/Algorithm
% Denied	0-99	<p>Percentage Denied: The percent of pegs which were denied during the measurement period.</p> <p><b>Calculations:</b> For network region level, blockage is computed as:</p> $\frac{\text{\# of denied pegs}}{\text{\# of denied + in-region pegs + out of region pegs}} \times 100$ <p><b>Note:</b> It is possible to have denied calls even though Peak DSP usage has not been exceeded. For example, Peak DSP is 479 out of 480. The next call that comes in could be denied because it needs two DSP resources and only one is available (for example, if the call used a G.729 codec).</p>
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p><b>Calculations:</b> [total resource time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

**3 of 3**


---

## IP DSP Resource Summary report

### Commands

To display the IP DSP Resource Summary report:

Type `list measurements ip dsp-resource summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

For example, to display the previous day's peak hour traffic for IP DSP processors in all regions, type `list measurements ip dsp summary yesterday-peak`.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter **yesterday-peak** to list the peak hour traffic on media processors for a specific region for yesterday.
- Enter **today-peak** to list the peak hour traffic on media processors for a specific region for today.
- Enter **last-hour** to list the peak hour traffic on media processors for a specific region in the most recently completed hour.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 57](#) shows a screen for the IP DSP Resource Summary report.

[Table 37](#) describes the data fields presented in the report.

**Figure 57: IP DSP Resource Summary report**

list measurements ip dsp-resource summary today-peak										
Switch Name:						Date: 1:36 pm WED FEB 25, 2009				
IP DSP RESOURCE SUMMARY REPORT										
Endpoint Calculations										
Net	Peak	Rsrc		Rsrc	Usage	DSP	In Reg	Out Reg	Denied	%
Reg	Hour	Capcty		Peak	(Erl)	Pegs	Pegs	Pegs	Pegs	Denied
1	1000	64	*	4	0.1	3	3	0	0	0
										% Out
										of Srv

**Table 37: IP DSP Resource Summary Report Field Descriptions 1 of 4**

Field	Range	Description/Algorithm
Net Reg	1 - 250	The network region represents the network region of the IP media processors being measured. The region number is assigned on the ip-interface screen during switch administration.
Peak Hour	0000 – 2300	The measurement hour with the highest Erlang usage for a specific network region.

**1 of 4**

**Table 37: IP DSP Resource Summary Report Field Descriptions 2 of 4**

Field	Range	Description/Algorithm
G711 Equivalent DSP Rsrc Capcty	0 - 99999 “**”	DSP resource capacity indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given network region. The “**” indicates that the media processor capacity changed during the measurement hour. <b>Calculations:</b> For the existing network region level reports: G711 DSP Rsrcs = the total number of G711 equivalent DSP resources available at the top of the measurement hour for a specific network region (total G711 equivalent TN2302/TN2602 DSP resources + total G.711 equivalent H.248 DSP resources within the same network region).
G711 Equivalent DSP Rsrc Peak	0 - 99999	Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour. The “spike” traffic pattern helps to determine when resources should be added.
G711 Equivalent DSP Usage (ERL)	0 - 9999.9 Erlangs	DSP Usage. Total G.711 equivalent usage for all codecs that were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.). <b>Calculations:</b> $\frac{\sum_i (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ Result is to 1 decimal point.
Total DSP Pegs	0 - 65535	The total number of times media processor resources were allocated in a network region during the measurement hour. <b>Calculation:</b> Endpoint In Region Pegs + Pegs from other regions that come into this network region. <b>Note:</b> You can derive the number of times that a different network region obtained resources from this network region by taking Total DSP Pegs - Endpoint In Reg Pegs.

**2 of 4**

**Table 37: IP DSP Resource Summary Report Field Descriptions 3 of 4**

Field	Range	Description/Algorithm
Endpoint In Reg Pegs	0 - 65535	<p>The total number of times an IP media processor port in the region was allocated to a call/request within that same network region during the measurement hour.</p> <p>Endpoint calculations also include IP/SIP trunks and IGCs.</p>
Endpoint Out Reg Pegs	0 - 65535	<p>The total number of times an endpoint request for an IP media processor port in the region was allocated to a call/request from outside that same network region. This might occur when there are no available resources in the requested network region, a call has been re-directed to another port network.</p> <p>If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.</p>
Endpoint Denied Pegs	0 - 65535	<p>The total number of times an IP media processor port is requested for a call, but was denied because there were no media processing resources available in the system.</p> <p>Note: Calls that were re-directed are not considered denied calls</p> <p>Denied peg counts are against the network region or the IP endpoint that is requesting the resource.</p> <p>Denied peg counts for IGCs are against the network region of the cabinet that is requesting the resource.</p>

**3 of 4**

**Table 37: IP DSP Resource Summary Report Field Descriptions 4 of 4**

Field	Range	Description/Algorithm
% Denied	0-99	<p>Percentage Denied: The percent of pegs which were denied during the measurement period.</p> <p><b>Calculations:</b>  For network region level, blockage is computed as:  <math display="block">\frac{\text{\# of denied pegs}}{\text{\# of denied + in-region pegs + out of region pegs}} \times 100</math></p> <p><b>Note:</b>  It is possible to have denied calls even though Peak DSP usage has not been exceeded. For example, Peak DSP is 479 out of 480. The next call that comes in could be denied because it needs two DSP resources and only one is available (for example, if the call used a G.729 codec).</p>
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p>

**4 of 4**


---

## IP DSP Resource Detail report

### Commands

To display the IP DSP Resource Detail report:

Type `list measurements ip dsp-resource detail <region number> <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

For example, to display the previous day's peak hour traffic for ip dsp processors in region 4, type `list measurements ip dsp-resource detail 4 yesterday-peak`.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the peak hour traffic on media processors for a specific region for yesterday.

- Enter **today-peak** to list the peak hour traffic on media processors for a specific region for today.
- Enter **last-hour** to list the peak hour traffic on media processors for a specific region in the most recently completed hour.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 58](#) shows a screen for the IP DSP Resource Detail report.

[Table 38](#) describes the data fields presented in this report.

**Figure 58: IP DSP Resource Detail report**

```
list measurements ip dsp-resource detail 1 yesterday-peak
```

Switch Name:						Date: 1:41 pm WED FEB 25, 2009				
IP DSP RESOURCE DETAIL REPORT										
		G711	Equivalent	DSP	Total	Endpoint Calculations				
Net	Meas	Rsrc	Rsrc	Usage	DSP	In Reg	Out Reg	Denied	%	% Out
Reg	Hour	Capcty	Peak	(Erl)	Pegs	Pegs	Pegs	Pegs	Denied	of Srv
1	0	0	0	0.0	0	0	0	0	0	0

**Table 38: IP DSP Resource Detail Report Field Descriptions 1 of 4**

Field	Range	Description/Algorithm
Net Reg	1 - 250	The network region represents the network region of the IP media processors being measured. The region number is assigned on the ip-interface screen during switch administration.
Meas Hour	0000 – 2300	Hour for which data is collected.

**1 of 4**

**Table 38: IP DSP Resource Detail Report Field Descriptions 2 of 4**

Field	Range	Description/Algorithm
G711 Equivalent DSP Rsrc Capcty	0 - 99999 “*”	DSP resource capacity indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given network region. The “*” indicates that the media processor capacity changed during the measurement hour. <b>Calculation:</b> For the existing network region level reports: G711 DSP Rsrcs = the total number of G711 equivalent DSP resources available at the top of the measurement hour for a specific network region (total G711 equivalent TN2302/TN2602 DSP resources + total G.711 equivalent H.248 DSP resources within the same network region).
G711 Equivalent DSP Rsrc Peak	0 - 99999	Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour. Spikes in traffic patterns can be used by you to determine if media processor resources should be added.
G711 Equivalent DSP Usage (ERL)	0 - 9999.9 Erlangs	DSP Usage. Total G.711 equivalent usage for all codecs that were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.). <b>Calculations:</b> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ Result is to 1 decimal point.
Total DSP Pegs	0 - 65535	The total number of times media processor resources were allocated in a network region during the measurement hour. <b>Calculation:</b> Endpoint In Region Pegs + Pegs from other regions that come into this network region. (Note: You can derive the number of times that a different network region obtained resources from this network region by taking Total DSP Pegs - Endpoint In Reg Pegs).

2 of 4



**Table 38: IP DSP Resource Detail Report Field Descriptions 3 of 4**

Field	Range	Description/Algorithm
Endpoint In Reg Pegs	0 - 65535	<p>The total number of times an IP media processor port in the region was allocated to a call/request within that same network region during the measurement hour.</p> <p>Endpoint calculations also include IP/SIP trunks and IGCs.</p>
Endpoint Out Reg Pegs	0 - 65535	<p>The total number of times an endpoint request for an IP media processor port in the region was allocated to a call/request from outside that same network region. This might occur when there are no available resources in the requested network region, a call has been re-directed to another port network.</p> <p>If the "Region" fields on the Inter Network Region Connection Management screen are blank, then this measurement will always be 0.</p>
Endpoint Denied Pegs	0 - 65535	<p>The total number of times an IP media processor port was requested for a call, but was denied because there were no media processing resources available in the system.</p> <p>Note: Calls that were re-directed are not considered denied calls</p> <p>Denied peg counts are against the network region or the IP endpoint that is requesting the resource.</p> <p>Denied peg counts for IGCs are against the network region of the cabinet that is requesting the resource.</p>

**3 of 4**

**Table 38: IP DSP Resource Detail Report Field Descriptions 4 of 4**

Field	Range	Description/Algorithm
% Denied	0-99	<p>Percentage Denied: The percent of pegs which were denied during the measurement period.</p> <p><b>Calculations:</b> For network region level, blockage is computed as:</p> $\frac{\text{\# of denied pegs}}{\text{\# of denied + in-region pegs + out of region pegs}} \times 100$ <p><b>Note:</b> It is possible to have denied calls even though Peak DSP usage has not been exceeded. For example, Peak DSP is 479 out of 480. The next call that comes in could be denied because it needs two DSP resources and only one is available (for example, if the call used a G.729 codec).</p>
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p><b>Calculations:</b> [total resource time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

**4 of 4**


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## Port Network level DSP-Resource reports

These reports show DSP activity on the media processors for relevant fiber and IP port networks. That is, port networks without media processors do not show usage data, but they show counts for endpoints that have to go out of their region to obtain a DSP resource. You have the option of viewing peak DSP usage in a summary report, or detailed DSP usage in an hourly report.

**Note:**

A breakdown of usage for each port network on a network region basis is not available at this time. The "Net Reg" column is included in this report as a place holder. In these reports, your configurations in which a single port network contains media processors over multiple network regions will reflect total DSP numbers; not a break down of traffic for each network region.

---

## PN Summary DSP Resource report

The PN Summary report displays a cumulative/total line of output that shows the hour with the greatest DSP usage for all of the fiber-connected port networks based on the highest Erlang usage. A single line is shown for each fiber- or IP-connected port network. This line represents the peak hour of dsp resource usage for all network regions in a given port network. This includes media resources administered across more than one network region.

---

## Command

To display the PN Summary DSP Resource Report:

1. Type `list meas ip dsp-resource pn summary ['yest' | 'today' | 'last-hr'] [<blank> | 'pn' <pn number> 'count <number>' | 'pn' <pn number> 'to' 'pn' <pn number>], ['schedule']` and press **Enter**.

The following are examples of valid command entries:

- 'list meas ip dsp-resource pn summary today pn 8 - lists summary DSP resource peak usage data for today only for port network 8 (i.e., implies a count of 1)
- 'list meas ip dsp-resource pn summary today pn 8 count 10' - lists summary DSP resource peak usage data for today starting with port network 8 and continuing for the next ten applicable port networks
- 'list meas ip dsp-resource pn summary today pn8 to pn25' - lists summary DSP resource peak usage data for today starting with port network 8 and continuing through port network 25.

**Options:** The **schedule** option is available for this command.

---

## Screen

[Figure 59](#) shows a typical screen for the PN Summary DSP Resource Report.

[Table 39](#) describes the data fields presented in this report.

**Figure 59: Port Network Summary DSP Resource Report**

list measurements ip dsp-resource pn summary today												
Switch Name:						Date: 1:45 pm WED FEB 25, 2009						
IP DSP RESOURCE						PORT NETWORK						
G711 Equivalent DSP						Total						
PN#-	Net	Peak	Rsrc	Rsrc	Usage	IGC	DSP	IGC	PN	Denied	%	% Out
Type	Reg	Hour	Capty	Peak	(Erl)	Usage	Pegs	Pegs	Pegs	Den		Of Srv
C -F	all	1000	128*	4	0.1	0.0	3	0	0	0	0	0
1 -I	all	1000	128*	4	0.1	0.0	3	0	0	0	0	0

**Table 39: PN Summary DSP Resource Report Field Descriptions 1 of 3**

Field	Range	Description/Algorithm
PN#- Type	1-64 F(iber) or I(P)	Indicates the port network of the media processor being measured. A port network number followed by "F" (for example, 1 -F) indicates that this is a fiber-connected PN. Similarly, a port network number followed by "I" (for example 4 -I) indicates that this is a IP-connected PN. Up to five rows of data is shown for each PN, based on the five lowest network region numbers administered. C = Cumulative total of all fiber connected PNs (that is, CCS, ATM)
Net Reg	All	Shows data for a given PN across all network regions in that PN (note that typically media processors in a port network are administered for a single network region. However, that is not always the case).
Peak Hour	0000 - 2300	The measurement hour with the highest Erlang usage for the specific port network/network region combination.

**1 of 3**

**Table 39: PN Summary DSP Resource Report Field Descriptions 2 of 3**

Field	Range	Description/Algorithm
G711 Equivalent DSP Rsrc Capcty	0 - 99999	<p>G.711 Equivalent Digital Signaling Processor Resource Capacity. Indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given port network. The "*" in this column indicates that media processor capacity changed during the measurement hour.</p> <p><b>Calculation:</b> For PN level DSP resource reports:</p> <ul style="list-style-type: none"> <li>● If PN# = C, G711 DSP Rscs = running sum of available G711 equivalent DSP resources for fiber-connected PNs for the peak measurement hour.</li> <li>● If resources in a PN are assigned to more than one network region (network region =all), G711 DSP Rscs = running sum of available G711 equivalent DSP resources for this specific PN for the peak measurement hour.</li> <li>● For individual PNs assigned to a single network region: G711 DSP Rscs = total number of G711 equivalent DSP resources available at that port network for the measurement hour.</li> </ul> <p>Totals are shown for all fiber- and IP-connected PNs in cases where a port network has multiple media processors across different network regions.</p>
G711 Equivalent DSP Rsrc Peak	0-99999	<p>Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour for that port network. This is helpful if you experience "spike" traffic patterns to determine when resources should be added.</p> <p><b>Calculation:</b> For PN level DSP resource reports:</p> <ul style="list-style-type: none"> <li>● If PN# = C, Peak Usage = running sum of available G711 equivalent DSP resources for fiber-connected PNs for the peak measurement hour.</li> <li>● If resources in a PN are assigned to more than one network region (network region =all), G711 Peak Rscs = running sum of available G711 equivalent DSP resources for this specific PN for the peak measurement hour.</li> </ul>

**2 of 3**

Table 39: PN Summary DSP Resource Report Field Descriptions 3 of 3

Field	Range	Description/Algorithm
G711 Equivalent DSP Usage (ERL)	0 - 9999.9 Erlangs	<p>G.711 Equivalent DSP Usage. Total G.711 equivalent usage for all codecs that were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.).</p> <p><b>Calculations:</b></p> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ <p>Result is to 1 decimal point.</p>
G711 Equivalent DSP IGC Usage	0-999.9 Erlangs	<p>Total usage of a port-network or gateway for its involvement in Inter-PN or Inter-GW connections. Channel usage may be from IP endpoints or an IGC.</p> <p>Result is to 1 decimal point.</p>
Total DSP Pegs	0 - 65535	The total number of times media processor resources were allocated in a network region during the measurement hour.
IGC Pegs	0 - 65535	Inter-Gateway Connection Pegs - the number of times media processor resources were allocated in a port network to connect two endpoints via an IGC (this is a subset of total DSP pegs).
PN Denied Pegs	0 - 65535	The total number of times an IP media processor port was needed in the port network for a call, but was denied because there were no media processing resources available in that port network.
% Den	0-99 (pegs)	<p>Percentage Denied: The percent of pegs which were denied during the measurement period.</p> <p><b>Calculations:</b></p> <p>For pn/gw reports, % denied is computed as:</p> $\frac{\# \text{ of denied pegs}}{\# \text{ of denied} + \text{total pegs}} \times 100$
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p><b>Calculations:</b> [total time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

3 of 3

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## PN Hourly DSP Resource report

The PN Hourly DSP Resource report displays up to 24 hours worth of data per port network.

---

### Command

To display the PN Hourly DSP Resource Report:

1. Type `list meas ip dsp-resource pn hourly [<blank> | <pn number> | <pn number> 'count' <number> | 'pn' <pn number> 'to' 'pn' <pn number>], ['schedule']` and press **Enter**.

The following are examples of valid command entries:

- 'list meas ip dsp-resource pn hourly <blank>' - lists detailed information for peak DSP resource usage that occurred over the last 24 hours for all port networks in the system.
- 'list meas ip dsp-resource pn hourly 8 count 12' - lists detailed information for peak DSP resource usage that occurred over the last 24 hours starting with port network 8 and including the next 12 administered port networks
- 'list meas ip dsp-resource pn hourly pn8 to pn12' - lists detailed information for peak DSP resource usage that occurred over the last 24 hours starting with port network 8 through port network 12.

**Options:** The **schedule** option is available for this command.

---

### Screen

[Figure 60](#) shows a typical screen for the PN Hourly DSP Resource Report.

[Table 40](#) describes the data fields presented in this report.

**Figure 60: Sample List measurements DSP-Resource Port Network Hourly Report**

```
list measurements ip dsp-resource pn hourly
```

Switch Name: \_\_\_\_\_ Date: 1:49 pm WED FEB 25, 2009

IP DSP RESOURCE PORT NETWORK HOURLY REPORT

PN#-	Meas	Rsrc	Rsrc	Usage	IGC	Total	IGC	PN		
Type	Hour	Capty	Peak	(Erl)	Usage	Pegs	Pegs	Pegs	Den	% Out
C -F	1200	128	4	0.0	0.0	0	0	0	0	0
C -F	1100	128	4	0.0	0.0	0	0	0	0	0
C -F	1000	128*	4	0.1	0.0	3	0	0	0	0
1 -I	1200	128	4	0.0	0.0	0	0	0	0	0
1 -I	1100	128	4	0.0	0.0	0	0	0	0	0
1 -I	1000	128*	4	0.1	0.0	3	0	0	0	0

**Table 40: PN Hourly DSP Resource Report Field Descriptions 1 of 3**

Field	Range	Description/Algorithm
PN#- Type	1-64 F(iber) or I(P)	Indicates the port network of the media processor being measured. A port network number followed by "F" (for example, 1-F) indicates that this is a fiber-connected PN. Similarly, a port network number followed by "I" (for example, 4 -I) indicates that this is a IP-connected PN. Up to five rows of data is shown for each PN, based on the five lowest network region numbers administered.  C = Cumulative total of all fiber connected PNs (that is, CCS, ATM)
Meas Hour	0000 - 2300	The hour for which data is collected for the port network.

**1 of 3**



**Table 40: PN Hourly DSP Resource Report Field Descriptions 2 of 3**

Field	Range	Description/Algorithm
G711 Equivalent DSP Rsrc Capcty	0 - 99999	<p>G.711 Equivalent Digital Signaling Processor Resource Capacity. Indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given port network. The "*" in this column indicates that media processor capacity changed during the measurement hour.</p> <p><b>Calculation:</b> For PN level DSP resource reports:</p> <ul style="list-style-type: none"> <li>● If PN# = C, G711 DSP Rscs = running sum of available G711 equivalent DSP resources for fiber-connected PNs for the peak measurement hour.</li> <li>● If resources in a PN are assigned to more than one network region (network region =all), G711 DSP Rscs = running sum of available G711 equivalent DSP resources for this specific PN for the peak measurement hour.</li> <li>● For individual PNs assigned to a single network region: G711 DSP Rscs = total number of G711 equivalent DSP resources available at that port network for the measurement hour.</li> </ul> <p>Totals are shown for all fiber- and IP-connected PNs in cases where a port network has multiple media processors across different network regions.</p>
G711 Equivalent DSP Rsrc Peak	0-99999	<p>Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour for that port network. This is helpful if you experience "spike" traffic patterns to determine when resources should be added.</p> <p><b>Calculation:</b> For PN level DSP resource reports:</p> <ul style="list-style-type: none"> <li>● If PN# = C, Peak Usage = running sum of available G711 equivalent DSP resources for fiber-connected PNs for the peak measurement hour.</li> <li>● If resources in a PN are assigned to more than one network region (network region =all), G711 Peak Rscs = running sum of available G711 equivalent DSP resources for this specific PN for the peak measurement hour.</li> </ul>

**2 of 3**

Table 40: PN Hourly DSP Resource Report Field Descriptions 3 of 3

Field	Range	Description/Algorithm
G711 Equivalent DSP Usage (ERL)	0 - 9999.9 Erlangs	<p>G.711 Equivalent DSP Usage. Total G.711 equivalent usage for all codecs that were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.).</p> <p><b>Calculations:</b></p> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ <p>Result is to 1 decimal point.</p>
IGC Usage	0-999.9 Erlangs	Total usage of a port-network or gateway for its involvement in Inter-PN or Inter-GW connections. Channel usage may be from IP endpoints or an IGC.
Total DSP Pegs	0 - 65535	The total number of times media processor resources were allocated in a network region during the measurement hour.
IGC Pegs	0 - 65535	Inter-Gateway Connection Pegs - the number of times media processor resources were allocated in a port network to connect two endpoints via an IGC (this is a subset of total DSP pegs).
PN Denied Pegs	0 - 65535	The total number of times an IP media processor port was needed in the port network for a call, but was denied because there were no media processing resources available in that port network.
% Den	0-99 (pegs)	<p>Percentage Denied: The percent of pegs which were denied during the measurement period.</p> <p><b>Calculations:</b></p> <p>For pn/gw reports, % denied is computed as:</p> $\frac{\# \text{ of denied pegs}}{\# \text{ of denied} + \text{total pegs}} \times 100$
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p><b>Calculations:</b></p> <p>[total time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

3 of 3

---

## H.248 GW Level DSP-Resource reports

Similar to PN level dsp resource reports, the H.248 Gateway level dsp resource reports show DSP activity on the media processors for relevant gateways. You have the option of viewing peak DSP usage in a summary report, or detailed DSP usage in an hourly report. Similar to the port network level reports, the gateway level DSP usage reports will include the following data according to H.248 gateway:

- Total number of G.711 equivalent DSP resources available in the gateway for the measurement hour
- Number of G.711 equivalent DSP resources used by the gateway for a given measurement hour
- Peak G.711 equivalent DSP usage during the measurement hour
- Total seizures - that is, the number of DSP resources used within the gateway itself
- DSP usage in a specific gateway for an IGC

---

### GW Summary DSP Resource report

The gateway summary report shows peak hour DSP usage for a specific H.248 gateway.

---

### Command

To display the GW Summary DSP Resource Report:

1. Type `list meas ip dsp-resource gw summary ['yest' | 'today' | 'last-hr'] [<blank> | 'gw' <gw number> 'count <number>' | 'gw' <gw number> 'to' 'gw' <gw number>], ['schedule']` and press **Enter**.

The following are examples of valid command entries:

- 'list meas ip dsp-resource gw summary today gw8 - lists summary DSP resource peak usage data for today only for H.248 gateway 8 (i.e., implies a count of 1)
- 'list meas ip dsp-resource gw summary today gw8 count 10' - lists summary DSP resource peak usage data for today starting with H.248 gateway 8 and continuing for the next ten applicable gateways.
- 'list meas ip dsp-resource gw summary today-peak gw8 to gw25' - lists summary DSP resource peak usage data for today starting with H.248 gateway 8 and continuing through gateway 25.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 61](#) shows a typical screen for the GW Summary DSP Resource Report.

[Table 41](#) describes the data fields presented in this report.

**Figure 61: List Measurements DSP-Resource Summary Report for H.248 Gateways**

```
list measurement ip dsp-resource gw summary yest
```

Switch Name:					Date: 1:49 pm WED FEB 25, 2009							
IP DSP RESOURCE H.248 GW SUMMARY REPORT												
		G711		Equivalent		DSP		Total		GW		
GW	GW	Peak	Net	Rsrc	Rsrc	Usage	IGC	DSP	IGC	Denied	%	% Out
Num	Type	Hour	Reg	Cpty	Peak	(Erl)	Usage	Pegs	Pegs	Pegs	Den	Srv
G001	G700	1200	23	8	8	1.0	0.0	10	0	2	20	0
G002	G700	1100	13	64	62	32.5	0.0	2000	0	0	0	0
G003	G350	1000	102	32	32	29.3	3.2	4500	6	0	0	0
G004	G350	900	125	32	28	15.3	0.0	650	0	0	0	0

**Table 41: GW Summary DSP Resource Report Field Descriptions 1 of 4**

Field	Range	Description/Algorithm
GW Num	G001 - G250	Indicates the number of the administered H.248 gateway for which DSP resource usage is being reported for the given measurement hour.
GW Type	g700 g350 g250 g450 ig550 trm480	Indicates the H.248 gateway type containing the DSP resource being used.
Peak Hour	0000 - 2300	The measurement hour with the highest Erlang usage for the specific gateway.

**1 of 4**

**Table 41: GW Summary DSP Resource Report Field Descriptions 2 of 4**

Field	Range	Description/Algorithm
Net Reg	1 - 250	The network region represents the network region of the IP media processors being measured. The region number is assigned on the ip-interface screen during switch administration.
G711 Equivalent DSP Rsrc Capty	0-99999	<p>G711 Equivalent DSP Resource Capacity. Indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given network region.</p> <p>The "*" in this column indicates that media processor capacity changed during the measurement hour.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculation:</b> For H.248 gateway level DSP resource reports:</p> <ul style="list-style-type: none"> <li>For individual H.248 gateways: G711 DSP Rscs = total number of G711 equivalent DSP resources available at a specific gateway for that measurement hour.</li> </ul>
G711 Equivalent DSP Rsrc Peak	0 - 99999	<p>Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour. This is helpful if you experience "spike" traffic patterns to determine when resources should be added.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
G711 Equivalent DSP Usage (Erl)	0-9999.9 Erlangs	<p>G.711 Equivalent DSP Usage. Total G.711 equivalent usage that all codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.).</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p>Calculations:</p> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ <p>Result is to 1 decimal point.</p>

**2 of 4**

**Table 41: GW Summary DSP Resource Report Field Descriptions 3 of 4**

Field	Range	Description/Algorithm
IGC Usage	0-999.9 Erlangs	<p>Total usage of a port-network or gateway for its involvement in Inter-PN or Inter-GW connections. Channel usage may be from IP endpoints or an IGC.</p> <p>Result is to 1 decimal point.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
Total DSP Pegs	0 - 65535	<p>The total number of attempts at allocating a media processor resource in a gateway during the measurement hour.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculation:</b> In Region Pegs + Pegs from other regions that come into this network region.</p> <p><b>Note:</b> You can derive the number of times that a different network region obtained resources from this network region by taking Total Peg - In Reg Peg.</p>
IGC Pegs	0 - 65535	<p>Inter-Gateway Connection Pegs - the number of times media processor resources were allocated in a gateway to connect two endpoints via an IGC (this is a subset of total DSP pegs).</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
GW Denied Pegs	0 - 65535	<p>The total number of times an IP media processor port was needed in the gateway for a call, but was denied because there were no media processing resources available in that gateway.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>

**3 of 4**

**Table 41: GW Summary DSP Resource Report Field Descriptions 4 of 4**

Field	Range	Description/Algorithm
% Den	0-99 (pegs)	<p>PN Percentage Denied. PN denied pegs shown as a percentage.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b> For pn/gw reports, % denied is computed as:  <math display="block">\frac{\text{\# of denied pegs}}{\text{\# of denied + total pegs}} \times 100</math></p>
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b> [total time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

**4 of 4**


---

## GW Hourly DSP Resource report

The gateway hourly report displays up to 24 hours worth of data per gateway.

---

## Command

To display the GW Hourly DSP Resource Report:

1. Type `'list meas ip dsp-resource gw hourly [<blank> | <gw number> | <gw number> 'count' <number> | 'gw' <gw number> 'to' 'gw' <gw number>]', ['schedule']` and press **Enter**.

The following are examples of valid command entries:

- `'list meas ip dsp-resource gw hourly <blank>'` - lists detailed information for peak DSP resource usage that occurred over the last 24 hours for all H.248 gateways in the system.
- `'list meas ip dsp-resource gw hourly 8 count 12'` - lists detailed information for peak DSP resource usage that occurred over the last 24 hours starting with H.248 gateway 8 and including the next 12 administered H.248 gateways.

- 'list meas ip dsp-resource gw hourly gw8 to gw12' - lists detailed information for peak DSP resource usage that occurred over the last 24 hours starting with H.248 gateway 8 through gateway 12.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 62](#) shows a typical screen for the GW Hourly DSP Resource Report.

[Table 42](#) describes the data fields presented in this report.

**Figure 62: List Measurements DSP-Resource Hourly Report for H.248 Gateways**

list measurement ip dsp-resource gw hourly												
Switch Name:				Date: 1:49 pm WED FEB 25, 2009								
H.248 GW DSP RESOURCE HOURLY REPORT												
				G711 Equivalent DSP				Total		GW		
GW	Meas	Net	GW	Rsrc	Rsrc	Usage	IGC	DSP	IGC	Denied	%	%Out
Num	Hour	Reg	Type	Capcty	Peak	(Erl)	Usage	Pegs	Pegs	Pegs	Den	Srv
G001	0000	23	G700	64	60	22.5	0.0	2000	0	2	0	0
G001	2200	23	G700	64	64	44.3	0.0	3400	0	0	0	0
G001	2100	23	G700	64	45	29.3	0.0	2500	0	0	0	0

**Table 42: GW Hourly DSP Resource Report Field Descriptions 1 of 4**

Field	Range	Description/Algorithm
GW Num	G001 - G250	Indicates the number of the administered H.248 gateway for which DSP resource usage is being reported for the given measurement hour.
Meas Hour	0000 - 2300	The hour for which data is collected for the port network.
Net Reg	1 - 250	The network region represents the network region of the IP media processors being measured. The region number is assigned on the ip-interface screen during switch administration.

**1 of 4**



**Table 42: GW Hourly DSP Resource Report Field Descriptions 2 of 4**

Field	Range	Description/Algorithm
GW Type	g700 g350 g250 g450 ig550 trm480	Indicates the H.248 gateway type containing the DSP resource being used.
G711 Equivalent DSP Rsrc Capty	0-99999	<p>G711 Equivalent DSP Resource Capacity. Indicates the maximum number of unencrypted, simultaneous G.711 DSP resources that could be supported for a given network region.</p> <p>The "*" in this column indicates that media processor capacity changed during the measurement hour.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculation:</b> For H.248 gateway level DSP resource reports:</p> <ul style="list-style-type: none"> <li>For individual H.248 gateways: G711 DSP Rsrcs = total number of G711 equivalent DSP resources available at a specific gateway for that measurement hour.</li> </ul>
G711 Equivalent DSP Rsrc Peak	0 - 99999	<p>Indicates the maximum number of G.711 equivalent DSP resources used at any point in time in the measurement hour. This is helpful if you experience "spike" traffic patterns to determine when resources should be added.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>

**2 of 4**

**Table 42: GW Hourly DSP Resource Report Field Descriptions 3 of 4**

Field	Range	Description/Algorithm
G711 Equivalent DSP Usage (Erl)	0-9999.9 Erlangs	<p>G.711 Equivalent DSP Usage. Total G.711 equivalent usage that all codecs were in use during the measurement period. The time is measured from the time the voice channel is allocated until it is released, including the time that the voice channel is on a call. Depending on the media processor being used usage counts may vary per codec (for example, TN2302 counts G.729/3 as 2, encryption counts as 1.25, etc.).</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b></p> $\frac{\sum (\text{Call Duration}) \times (\# \text{ points}) \times (\text{conversion})}{3600 \text{ seconds}} = X.X$ <p>Result is to 1 decimal point.</p>
IGC Usage	0-999.9 Erlangs	<p>Total usage of a port-network or gateway for its involvement in Inter-PN or Inter-GW connections. Channel usage may be from IP endpoints or an IGC.</p> <p>Result is to 1 decimal point.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
Total DSP Pegs	0 - 65535	<p>The total number of attempts at allocating a media processor resource in a gateway during the measurement hour.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b> In Region Pegs + Pegs from other regions that come into this network region.</p> <p><b>Note:</b></p> <p>You can derive the number of times that a different network region obtained resources from this network region by taking Total Peg - In Reg Peg.</p>

**3 of 4**

**Table 42: GW Hourly DSP Resource Report Field Descriptions 4 of 4**

Field	Range	Description/Algorithm
IGC Pegs	0 - 65535	<p>Inter-Gateway Connection Pegs - the number of times media processor resources were allocated in a gateway to connect two endpoints via an IGC (this is a subset of total DSP pegs).</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
GW Denied Pegs	0 - 65535	<p>The total number of times an IP media processor port was needed in the gateway for a call, but was denied because there were no media processing resources available in that gateway.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p>
% Den	0-99 (pegs)	<p>PN Percentage Denied. PN denied pegs shown as a percentage.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b>            For pn/gw reports, % denied is computed as:  <math display="block">\frac{\text{\# of denied pegs}}{\text{\# of denied + total pegs}} \times 100</math> </p>
% Out of Srv	0 - 99	<p>Percentage Out of Service: The percent of total resource time that ports were out of service during the measurement period. This percent includes ports that were manually busied out or maintenance busy during the measured interval.</p> <p>Gateways with older firmware that do not support this feature shall display capacity data of "n/a", indicating that data is not available.</p> <p><b>Calculations:</b> [total time (in CCS) that any port was out of service divided by the number of available resources x 36] x 100.</p>

**4 of 4**

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## LAN performance reports

These reports provide a 24-hour history of important packet-level statistics from which you can infer some LAN performance characteristics. For example,

- High collision counts could indicate high traffic on the LAN segment (congestion on the bus).
- High Cyclic Redundancy Check (CRC—detects and corrects errors on every frame) errors could suggest that:
  - the LAN connection may be “noisy”
  - a wire connection is loose
  - a wire is frayed or broken

The 24-hour histories give the ability to look back at these measures if the trouble is cleared.

The data is collected at 15-minute intervals over 24 hours for the Cyclic Redundancy Check (CRC) and collisions for Ethernet connections. If the data cannot be retrieved for the 15-minute interval, **N/A** displays in the field. The delta (the change from the last inquiry) and the total are provided for each error count. After the occurrence of “N/A” (not available), the delta equals the total.

The primary use of these reports is to quickly and unambiguously determine if the fault lies within the Avaya-provided equipment or if the fault is with the LAN or LAN administration to which the Avaya Avaya Communication Manager configuration is connected.

---

## C-LAN Ethernet Performance Measurements Detailed report

### Commands

To display the C-LAN Ethernet Performance Measurements Detailed report:

Type `list measurements clan ethernet <cabinet-carrier-slot address of circuit pack> [schedule]` and press **Enter**.

For example, to display the performance of the Ethernet circuit pack with the address 05B11, type `list measurements clan ethernet 05B11`.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 63](#) shows a typical screen for the C-LAN Ethernet Performance Measurements Detailed report.

[Table 43](#) describes the data fields presented in this report.

**Figure 63: C-LAN Ethernet Performance Measurements Detailed Report**

llist measurements clan ethernet 05B11					Page 1	
Switch Name:			Date: 3:21 pm SAT JAN 28, 2006			
C-LAN ETHERNET PERFORMANCE MEASUREMENTS DETAILED REPORT						
Date	Time	CRC CHECK		Collision Count		
		Total	Delta	Total	Delta	
01/28	0308	650	50	650	250	
01/28	0253	600	600	400	400	
01/28	0238	N/A	N/A	N/A	N/A	
01/28	0223	1000000570	20	1000000570	20	
01/28	0208	1000000550	10000000550	1000000550	10000000550	

**Table 43: C-LAN Ethernet Performance Measurements Detailed report field descriptions**

Field	Description
<b>Date</b>	The date that the data is collected.
<b>Time</b>	The current 15-minute interval in which the action is performed.
<b>CRC CHECK</b>	Cyclic Redundancy Check. The error count for CRC errors.
<b>total</b>	The total value of the counter on the board.  <b>Note:</b> The counter value can be up to 11 digits long because of the 32-bit counter on the board. After the occurrence of an "N/A," the delta equals the total. The following activities clear the firmware counters: busy-out or release of a board or a port, the <b>reset board</b> command, and reseating the board.
<b>delta</b>	The difference between the current and the previous sample
<b>Collision Count</b>	The error count for collisions on the Ethernet.

---

## C-LAN PPP Performance Measurement Detailed report

### Commands

To display the C-LAN PPP Performance Measurement Detailed report:

Type `list measurements clan ppp <cabinet-carrier-slot address of circuit pack> [schedule]` and press **Enter**.

For example, to display the performance of the ppp circuit pack with the address 1C1017, type `list measurements clan ppp 1C1017`.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 64](#) shows a typical screen for the C-LAN PPP Performance Measurement Detailed report.

[Table 44](#) describes the data fields presented in this report.

**Figure 64: C-LAN PPP Performance Measurement Detailed report**

list measurements clan ppp 1C1017						Page 1 of x	
Switch Name:		Date:4:07pm WED FEB 1, 2006					
C-LAN PPP PERFORMANCE MEASUREMENT DETAILED REPORT							
Date	Time	CRC CHECK		Invalid Frame		CHAP Failures	
		Total	Delta	Total	Delta	Total	Delta
02/01	03:08	85	25	185	85	5	0
02/01	02:53	60	60	100	100	5	5
02/01	02:38	N/A	N/A	N/A	N/A	N/A	N/A
02/01	02:23	1000060	10	1000090	10	25	5
02/01	02:08	1000050	1000050	1000080	1000080	20	20

**Table 44: C-LAN PPP Performance Measurement Detailed report field descriptions**

Field	Description
<b>Date</b>	The date that the data is collected.
<b>Time</b>	The current 15-minute interval in which the action was performed.
<b>CRC CHECK</b>	Cyclic Redundancy Check. The error count for CRC errors.
<b>Total</b>	<p>The total value of the counter on the board</p> <p><b>Note:</b></p> <p>The counter value can be up to 11 digits long because of the 32-bit counter on the board. After the occurrence of an "N/A," the delta equals the total. Busy-out or release of a board or a port, the <b>reset board</b> command, and reseating the board all clear the firmware counters.</p>
<b>Delta</b>	The difference between the current and the previous sample
<b>Invalid Frame</b>	The number of invalid frames detected. Invalid frames are the frames that are misaligned.
<b>CHAP Failures</b>	The number of failed attempts for ppp authentication

## CLAN Sockets Hourly report

### Commands

To display the CLAN Sockets Hourly report:

Type `list measurements clan sockets hourly <board location>` and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 65](#) shows a typical screen for the CLAN Sockets Hourly report.

[Table 45](#) describes the data fields presented in this report.

**Figure 65: CLAN Sockets Hourly Report**

list measurements clan sockets hourly 05b11

Page 1

Switch Name:

Date: 2:11 pm TUE JAN 24, 2006

CLAN SOCKETS HOURLY REPORT

(Last 24 Hours)

Meas			Socket Usage	Socket Peg	Socket Denial Peg	% Denials	% Time ASB
Hour	Board	Region	(Erl)				
1300	05B11	3	10.0	121	0	0.00	0.00
1200	05B11	3	10.0	123	0	0.00	0.00
1100	05B11	3	9.9	123	0	0.00	0.00
1000	05B11	3	10.0	124	0	0.00	0.00
900	05B11	3	10.0	122	0	0.00	0.00
800	05B11	3	10.0	125	0	0.00	0.00
700	05B11	3	10.0	123	0	0.00	0.00
600	05B11	3	10.0	124	0	0.00	0.00
500	05B11	3	10.0	123	0	0.00	0.00
400	05B11	3	10.0	124	0	0.00	0.00
300	05B11	3	10.0	123	0	0.00	0.00
200	05B11	3	9.9	123	0	0.00	0.00

press CANCEL to quit -- press NEXT PAGE to continue



**Table 45: CLAN Sockets Hourly report field descriptions**

Field	Range	Description
<b>Meas Hour</b>	0000–2300	Measurement Hour. The hour the measurement was taken. Switches in multiple time zones are treated as in the current MMI reports. We do not assume that you have made any correlation between LAN regions and time zones.
<b>Board</b>	CCccss	The cabinet, carrier, and slot for the specified board.
<b>Region</b>	1–44	The network region that the C-LAN for this measurement is in. (The increase to 44 regions is required by [75101-2])
<b>Socket Usage (Erl)</b>	0–9999.9	The total time, in Erlangs, that is available from sockets on this C-LAN board. Calculated by: (Total Socket Seconds of usage)/3600
<b>Socket Peg</b>	0–65535	Total number of times a C-LAN socket on the board was allocated to a call or link.
<b>Socket Denial Peg</b>	0–65535	Total number of times a C-LAN socket on the board was needed for a call or link, but was not available.
<b>% Denials</b>	0–99	(Socket Denial Peg)/(Socket Denial Peg + Socket Peg)
<b>% Time ASB</b>	0–99	The percentage of time during the measured interval that all C-LAN sockets on the board were unavailable for use.

---

## C-LAN Sockets Summary report

### Commands

To display the CLAN Sockets Summary report:

Type `list measurements clan sockets summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the peak hour traffic on CLAN sockets for yesterday.
- Enter `today-peak` to list the peak hour traffic on CLAN sockets for today.

- Enter **last-hour** to list the peak hour traffic on CLAN sockets in the most recently completed hour.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 66](#) shows a typical screen for the CLAN Sockets Summary report.

[Table 46](#) describes the data fields presented in this report.

**Figure 66: CLAN Sockets Summary Report**

```
list measurements clan sockets summary yesterday-peak
```

---

Switch Name: \_\_\_\_\_ Date: 2:21 pm TUE JAN 24, 2006

CLAN SOCKETS SUMMARY REPORT  
(Yesterday-Peak Hour for Each Board)

Meas	Board	Region	Socket Usage (Erl)	Socket Peg	Socket Denial Peg	% Denials	% Time ASB
2300	01A11	2	11.0	0	0	0.00	0.00
2300	05B11	3	10.0	126	0	0.00	0.00

Command successfully completed

**Table 46: CLAN Sockets Summary report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour the measurement was taken. Switches in multiple time zones are treated as in the current MMI reports. We do not assume that you have made any correlation between LAN regions and time zones.
<b>Board</b>	CCccss	The cabinet, carrier, and slot for the specified board.
<b>Region</b>	1-44	The network region that the C-LAN for this measurement is in. (The increase to 44 regions is required by [75101-2])
<b>Socket Usage (Erl)</b>	0-9999.9	The total time, in Erlangs, that is available from sockets on this C-LAN board. Calculated by: (Total Socket Seconds of usage)/3600
<b>Socket Peg</b>	0-65535	Total number of times a C-LAN socket on the board was allocated to a call or link.

**1 of 2**

Table 46: CLAN Sockets Summary report field descriptions 2 of 2

Field	Range	Description
<b>Socket Denial Peg</b>	0-65535	Total number of times a C-LAN socket on the board was needed for a call or link, but was not available.
<b>% Denials</b>	0-99	(Socket Denial Peg)/(Socket Denial Peg + Socket Peg)
<b>% Time ASB</b>	0-99	Percent of Time All Sockets Busy. The percentage of time during the measured interval that all C-LAN sockets on the board were unavailable for use.

2 of 2

## CLAN Sockets Detail report

### Commands

To display the CLAN Sockets Detail report:

Type `list measurements clan sockets detail <board location> <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the peak hour traffic on CLAN sockets for yesterday.
- Enter `today-peak` to list the peak hour traffic on CLAN sockets for today.
- Enter `last-hour` to list the peak hour traffic on CLAN sockets in the most recently completed hour.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 67](#) shows a typical screen for the CLAN Sockets Detail report.

[Table 47](#) describes the data fields presented in this report.

**Figure 67: CLAN Sockets Detail report**

```
list measurements clan sockets detail 05b11 yesterday-peak

Switch Name:                               Date: 2:34 pm TUE JAN 24, 2006
                                CLAN SOCKETS DETAIL REPORT
                                (Yesterday-Peak Hour)

Meas      Socket      Socket
Hour  Board  Region  Usage  Socket  Denial  %      % Time
                (Erl)  Peg      Peg      Denials  ASB
2300  05B11  3        10.0  126      0        0.00    0.00

Command successfully completed
```

**Table 47: CLAN Sockets Detail report field descriptions**

Field	Range	Description
<b>Meas Hour</b>	<b>0000-2300</b>	Measurement Hour. The hour the measurement was taken. Switches in multiple time zones are treated as in the current MMI reports. We do not assume that you have made any correlation between LAN regions and time zones.
<b>Board</b>	<b>CCccss</b>	The cabinet, carrier, and slot for the specified board.
<b>Region</b>	<b>1-44</b>	The network region that the C-LAN for this measurement is in. (The increase to 44 regions is required by [75101-2])
<b>Socket Usage (Erl)</b>	<b>0-9999.9</b>	The total time, in Erlangs, that is available from sockets on this C-LAN board. Calculated by: (Total Socket Seconds of usage)/3600
<b>Socket Peg</b>	<b>0-65535</b>	Total number of times a C-LAN socket on the board was allocated to a call or link.
<b>Socket Denial Peg</b>	<b>0-65535</b>	Total number of times a C-LAN socket on the board was needed for a call or link, but was not available.
<b>% Denials</b>	<b>0-99</b>	(Socket Denial Peg)/(Socket Denial Peg + Socket Peg)
<b>% Time ASB</b>	<b>0-99</b>	Percent of Time All Sockets Busy. The percentage of time during the measured interval that all C-LAN sockets on the board were unavailable for use.

---

## LAR Measurements for Preferences in Pattern report

The Look Ahead Routing (LAR) Measurements for Preferences in Pattern report contains usage measurements for LAR processing. This report displays the number of reroute attempts performed and the number of successful ISDN call attempts.

### Command

To display the LAR Measurements for Preferences in Pattern report:

Type `list measurements lar-route-pattern <assigned pattern number> <yesterday/today/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There are two required fields for this command.

- `assigned pattern number`
- Enter the identifying **pattern number** you wish to display.

This number must previously have been assigned to one of the numbers on the meas-selection route-pattern screen. In order to obtain data for the pattern, it must previously have been administered on the ARS/AAR/UDP screens.

- `yesterday/today/last-hour`.
  - Enter `yesterday` to list the LAR route pattern activity for yesterday.
  - Enter `today` to list the LAR route pattern activity for today.
  - Enter `last-hour` to list the LAR route pattern activity of the most recently completed hour.

For example, to display yesterday's measurements for route pattern 2, type `list measurements lar-route-pattern 2 yesterday`.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 68](#) shows a typical screen for the LAR Measurements for Preferences in Pattern report. [Table 48](#) describes the data fields presented in this report.

**Figure 68: LAR Measurements for Preferences in Pattern report**

```
list measurements lar-route-pattern 2 yesterday
```

Switch Name: \_\_\_\_\_ Date: 2:55 pm TUE JAN 24, 2006

LAR MEASUREMENTS FOR PREFERENCES IN PATTERN 2  
(trunk groups are shown in order of selection)

Pref No.	Grp No.	LAR Type	LAR Calls	Total Rehunt	Suc. Rehunt	Total Next	Suc. Next
1	10	*rehu	0	0	0	0	0
2	*1	*none	0	0	0	0	0
3	11	next	0	0	0	0	0
4	*2	*none	0	0	0	0	0

Command successfully completed

**Table 48: LAR Measurements for Preferences in Pattern report field descriptions 1 of 2**

Field	Description
<b>Pref No.</b>	Route Preference Number. The number of the administered route preference.
<b>Grp No.</b>	Trunk Group Number. The number, assigned via the Trunk Group screen, that identifies each trunk group associated with the displayed data. Trunk groups are listed in the same order as they are assigned on the Route Pattern screen. The first trunk group listed is the first selected (preference 1); the second listed is the second selected (preference 2), and so on. If an entry in the column is prefixed with an *, it indicates LAR administration for the preference was changed during the measurement period currently displayed. (LAR valid for ISDN-PRI trunk groups.)
<b>LAR Type</b>	Look Ahead Routing Type. Type of LAR administered on the AAR and ARS Route Pattern screen for the trunk group including. Possible values are: <ul style="list-style-type: none"> <li>• none — no LAR</li> <li>• rehu — rehunt in the same preference</li> <li>• next — reroute to next preference</li> </ul>
<b>LAR Calls</b>	Look Ahead Routing Calls. The number of calls initiating LAR processing in the displayed trunk group. Only the initial call is counted, not subsequent rerouting attempts.

**1 of 2**

**Table 48: LAR Measurements for Preferences in Pattern report field descriptions 2 of 2**

Field	Description
<b>Total Rehunt</b>	The number of LAR rehunt attempts within the trunk group.
<b>Suc. Rehunt</b>	Successful Rehunt. The number of successful hunts out of Total Rehunt attempts within the trunk group that ended in the LAR call rerouted successfully.
<b>Total Next</b>	The total number of LAR attempts directed to this trunk group from a previous preference in the route pattern.
<b>Suc. Next</b>	Successful Next. The number of successful LAR attempts directed to this trunk group from a previous preference in the route pattern.

**2 of 2**

---

## Logins report

The Logins report shows logins with the same, or lower, service level as the person making the request.

### Command

To display a list of logins (with the same or lower service level as you):

Type `list logins [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 69](#) shows a typical Logins report.

[Table 49](#) describes the data fields presented in this report.

**Figure 69: Logins report**

```
list logins
```

LOGINS							
Login	Service Level	Status	Pwd. Aging Cycle (Days)	ASG	Blk	Expiration Date	No. of Sess. Sess. Used
init	init	active		y	n	/ /	
inads	inads	inactive		y	n	/ /	
acpsnmp	non-super-user	void		n	n	/ /	
greta	super-user	inactive	60	n	n	/ /	
andy	super-user	inactive	2	n	n	/ /	
tak	super-user	inactive		n	n	/ /	
taw	non-super-user	inactive		n	n	/ /	
tas	super-user	inactive		n	n	/ /	
remote	remote	inactive		n	n	/ /	
chuck	super-user	inactive		n	n	/ /	

**Table 49: Logins report field descriptions**

Valid values	Usage
<b>Login</b>	Your login ID.
<b>Service Level</b>	The service level of the login ID.
<b>Status</b>	The status of the login ID.
<b>Pwd. Aging Cycle (Days)</b>	Password Aging Cycle (Days). The number of days from creation before the password must be changed.
<b>ASG</b>	Access Security Gateway. This field indicates whether the login ID must use ASG authentication to access the system.
<b>Blk</b>	Block. This field indicates whether the login ID is temporarily disabled from accessing the system through the Access Security Gateway interface.
<b>Exp. Date</b>	Expiration Date. The date the login ID expires.
<b>No. of Sess</b>	Number of Sessions. The number of sessions allowed before the login ID is disabled.
<b>Sess. Used</b>	Sessions Used. The number of session this login ID has already used.



---

# Modem Pool Measurements report

This section describes the traffic measurements report for modem pools.

The Modem Pool Measurements report contains measurements for monitoring the performance of the modem pooling feature. The system records data for the current day's peak hour, the previous day's peak hour, and the last hour. A peak hour is the hour within a 24-hour period that had the greatest usage for the specified day.

## Command

To display the Modem Pool Measurements report:

Type `list measurements modem-pool <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the modem pool activity for yesterday's peak hour.
- Enter `today-peak` to list the modem pool activity for today's peak hour.
- Enter `last-hour` to list the modem pool activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

## Screen

[Figure 70](#) shows a typical screen for the Modem Pool Measurements report. The time and date the report is requested displays at the top right.

[Table 50](#) describes the data fields presented in this report.

---

**Figure 70: Modem Pool Measurements report**

list measurements modem-pool yesterday-peak													
Switch Name:							Date: 3:25 pm TUE JAN 24, 2006						
MODEM POOL MEASUREMENTS													
Meas	Pool	Pool	Pool	Total	Inc	Tan	Calls	Inc	Tan	Calls	Calls	%	
Hour	No.	Size	Type	Usage	Usage	Usage	Carried	Calls	Calls	Blk	Ovfl	AMB	
1200	1	2	integ	0	0	0	0	0	0	0	0	0	

Table 50: Modem Pool Measurements report field descriptions 1 of 2

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>Pool No.</b>	Pool Number. A number that identifies the modem pool group. The number is assigned during administration.
<b>Pool Size</b>	The number of conversion resources administered in the modem pool group (up to 16 for integrated or up to 32 for combined).
<b>Pool Type</b>	The type of group, either integrated (integ) or combined (comb).
<b>Total Usage</b>	<p>The time in <b>CCS</b> the members of the modem pool group are active on calls during the polling interval.</p> $\text{Maximum Usage} = \text{Pool Size} \times 36 \text{ CCS}$
<b>Inc Usage</b>	<p>Incoming Usage. The usage in CCS for modem pool calls (originating from incoming or two-way trunks) that terminate on the switch.</p> $\text{Outgoing Usage} = \text{Total Usage} - \text{Inc Usage}$
<b>Tan Usage</b>	Tandem Usage. The usage in <b>CCS</b> for tandem calls that used a modem pool member.
<b>Calls Carried</b>	The number of calls carried, during the polling interval, by the identified modem pool. This includes both incoming and outgoing calls.
<b>Inc Calls</b>	<p>Incoming Calls. The number of calls (originating from incoming or two-way trunks) that terminate on the switch.</p> $\text{Outgoing Calls} = \text{Calls Carried} - \text{Inc Calls}$
<b>Tan Calls</b>	Tandem Calls. The number of tandem calls that used a modem pool member.

1 of 2

**Table 50: Modem Pool Measurements report field descriptions 2 of 2**

Field	Description
<b>Calls Blocked</b>	<p>The number of calls blocked due to the unavailability of a conversion resource.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. If this field indicates a significant number of modem pool calls are blocked, then verify the users have their data modules set for autobaud.</li> <li>2. An alternate option is to increase the <b>Pool Size</b>.</li> </ol>
<b>Calls Ovflw</b>	Calls Overflow. The number of calls directed to a modem pool group that overflow and terminate successfully in another group.
<b>% AMB</b>	Percent All Modems Busy. The percent of the time all modem pool members are busy processing calls.

**2 of 2**

---

## Multimedia reports

These reports are available to help you determine the amount of traffic your switch carries for multimedia conferences and conversion calls. All reports show traffic over multimedia circuit packs housed within the same switch, although not necessarily in the same port network. Use these reports to determine if you have adequate resources to handle the multimedia traffic on your system.

**Note:**

Point-to-point multimedia calls between Basic mode or standalone multimedia endpoints do not use MultiMedia Interfaces (MMI) or voice conditioners (VC), and therefore do not count in these measurements.

The following reports are available:

- MultiMedia Interface (MMI) Hourly and Summary reports
- Expansion Service Module (ESM) Hourly and Summary reports
- Voice Conditioners (VC) Hourly and Summary reports

The hourly and summary reports provide the same types of information. The hourly report shows measurements for the last 24 hours, whereas the summary reports show measurements for one hour, according to the type of summary you request.

---

## ESM Hourly and ESM Summary reports

The ESM Hourly report shows hourly traffic over the MMI that is cabled to the expansion service module. The ESM Summary report shows a summary of traffic over the multimedia interface that is cabled to the ESM.

### Command

To display the ESM Hourly report:

Type `list measurements expansion-service-mod hourly [schedule]` and press **Enter**.

To display the ESM Summary report:

Type `list measurements expansion-service-mod summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`. You must choose one of these.

- Enter `yesterday-peak` to list the activity for yesterday's peak hour.
- Enter `today-peak` to list the activity for today's peak hour.
- Enter `last-hour` to list the activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

### Screens

[Figure 71](#) shows a typical screen for the ESM Hourly report.

[Figure 72](#) shows a typical screen for the ESM Summary report.

[Table 51](#) describes all the data presented in both reports.

**Figure 71: ESM Hourly report**

```
list measurements expansion-services-mod hourly
```

Page 1

Switch Name: Date: 3:49 pm TUE JAN 24, 2006

ESM HOURLY REPORT

Meas	Avail	Avail	Total	Total	ESM	Out of	%	%
Hour	Ports	Usage	Usage	Alloc	Denials	Srv-CCS	APB	Blockage
0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0

press CANCEL to quit -- press NEXT PAGE to continue

**Figure 72: ESM Summary report**

```
list measurements expansion-services-mod summary yesterday-peak
```

Switch Name: Date: 11:42 am WED JAN 25, 2006

ESM SUMMARY REPORT

Peak Hour For All ESM-MMIs : 0

Meas	Avail	Avail	Total	Total	ESM	Out of	%	%
Hour	Ports	Usage	Usage	Alloc	Denials	Srv-CCS	APB	Blockage
1100	0	0	0	0	0	0	0	0

Table 51: ESM Hourly and EMS Summary report field descriptions

Field	Description
<b>Peak Hour For All ESM-MMIs</b>	This field is only available on the ESM Summary report if you use the <b>yesterday-peak</b> or <b>today-peak</b> qualifier. Displays the hour of greatest usage for the specified day.  <b>Note:</b> This field is not available on the ESM Hourly report.
<b>Meas Hour</b>	Measurement Hour. The hour for which these measurements apply, on the 24-hour clock.
<b>Avail Ports</b>	Available Ports. Total network ESM-MMIs in the system.
<b>Avail Usage</b>	Available Usage. Total time, in CCS units, that is available in the system for ESM-MMI ports.
<b>Total Usage</b>	The total time, in CCS units, that ESM-MMI ports are in use on a call. Includes the time that the ports are out of service or maintenance busy. Usage is measured from the time the port is allocated until it is released.
<b>Total Alloc</b>	Total Allocation. The total number of times that an ESM-MMI port was allocated to a call.
<b>ESM Denials</b>	Total number of times an ESM-MMI port was needed but could not be allocated because all ports were busy.
<b>Out of Srv-CCS</b>	Out of Service in CCS Units. The total time, in CCS units, that any ESM-MMI ports were out of service during any part of the measured interval.
<b>%APB</b>	Percent All Ports Busy. The percentage of time during the measured interval that all ESM-MMI ports are unavailable to carry a new call.
<b>% Blockage</b>	Percent Blockage. The percentage of attempted allocations of ESM-MMI ports that are not successful. This value is calculated as $\% \text{ blockage} = (\text{MMI Denials} / \text{Total Alloc} + \text{MMI Denials}) * 100$

---

## MMI Hourly and MMI Summary reports

The MMI Hourly report displays traffic activity for the multimedia interface, broken down by hour. The MMI Summary report shows a summary of traffic activity for the multimedia interface.

### Commands

To display an MMI Hourly report:

Type `list measurements multimedia-interface hourly [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

To display an MMI Summary report:

Type `list measurements multimedia-interface summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — **yesterday-peak/today-peak/last-hour**. You must choose one of these.

- Enter **yesterday-peak** to list the activity for yesterday's peak hour.
- Enter **today-peak** to list the activity for today's peak hour.
- Enter **last-hour** to list the activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The **schedule** option is available for this command.

### Screens

[Figure 73](#) shows a typical screen for the MMI Hourly report.

[Figure 74](#) shows a typical screen for the MMI Summary report.

[Table 52](#) describes all the data presented in both reports.

**Figure 73: MMI Hourly report**

```
list measurements multimedia-interface hourly                                     Page 1
```

```
Switch Name:                                                                    Date: 11:54 am WED JAN 25, 2006
```

```
MMI HOURLY REPORT
```

Meas	Avail	Avail	Total	Total	MMI	Out of	%	%
Hour	Ports	Usage	Usage	Alloc	Denials	Srv-CCS	APB	Blockage
0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0

**Figure 74: MMI Summary report**

```
list measurements multimedia-interface summary yesterday-peak
```

Switch Name: Date: 1:29 pm WED JAN 25, 2006

MMI SUMMARY REPORT

Peak Hour For All MMIs : 0

Meas Hour	Avail Ports	Avail Usage	Total Usage	Total Alloc	MMI Denials	Out of Srv-CCS	% APB	% Blockage
0	0	0	0	0	0	0	0	0



Table 52: MMI Hourly and MMI Summary report field descriptions

Field	Description
<b>Peak Hour For All MMIs</b>	<p>This field is only available on the MMI Summary report if you use the <b>yesterday-peak</b> or <b>today-peak</b> qualifier. Displays the hour of greatest usage for the specified day.</p> <p><b>Note:</b> This field is not available on the MMI Hourly report.</p>
<b>Meas Hour</b>	Measurement Hour. The hour for which these measurements apply, on the 24-hour clock.
<b>Avail Ports</b>	Available Ports. Total network MMI ports in the system. This does not include any MMIs that are cabled to an ESM. ESM-MMIs are measured separately.
<b>Avail Usage</b>	Available Usage. Total time that is available in the system for network MMI ports, in CCS units.
<b>Total Usage</b>	The total time, in CCS units, that MMI ports are in use on a call. Includes the time that the ports are out of service or maintenance busy. Usage is measured from the time the port is allocated until it is released.
<b>Total Alloc</b>	Total Allocated. The total number of times that an MMI port was allocated to a call. Keep in mind that a 2-channel call occupies 2 ports, so this number does not necessarily reflect the number of calls that took place. Also, point-to-point calls do not use MMI resources, so these allocations are for conversion calls of multimedia conferences.
<b>MMI Denials</b>	Total number of times an MMI port was needed but could not be allocated because all ports were busy. Ideally, this number should be zero. If you see denials on a regular basis, you should consider adding MMIs to your system.
<b>Out of Srv - CCS</b>	The total time, in CCS units, that any MMI ports were out of service during any part of the measured interval.
<b>% APB</b>	Percent All Ports Busy. The percentage of time during the measured interval that all MMI ports are unavailable to carry a new call.
<b>% Blockage</b>	Percent Blockage. The percentage of attempted allocations of MMI ports that are not successful. This value is calculated as $\% \text{ blockage} = (\text{MMI Denials} / \text{Total Alloc} + \text{MMI Denials}) * 100$

## Voice Conditioners report

### Command

To display a VC Hourly report:

Type `list measurements voice-conditioners hourly [schedule]` and press **Enter**.

To display a VC Summary Report:

Type `list measurements voice-conditioners summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/today-peak/last-hour`. You must choose one of these.

- Enter `yesterday-peak` to list the activity for yesterday's peak hour.
- Enter `today-peak` to list the activity for today's peak hour.
- Enter `last-hour` to list the activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The **schedule** option is available for this command.

### Screens

[Figure 75](#) shows a typical screen for the VC Hourly report.

[Figure 76](#) shows a typical screen for the VC Summary report. The time and date the report is requested displays at the top right.

[Table 55](#) describes the data presented in these reports.



Table 53: VC Hourly and VC Summary report field descriptions *1 of 2*

Field	Description
<b>Peak Hour For All VCs</b>	This field is only available on the VC Summary report if you use the <b>yesterday-peak</b> or <b>today-peak</b> qualifier. Displays the hour of greatest usage for the specified day.  <b>Note:</b> This field is not available on the VC Hourly report.
<b>Meas Hour</b>	Measurement Hour. The hour for which these measurements apply, on the 24-hour clock.
<b>Avl Prt</b>	Available Ports. Total number of VC ports in the system.
<b>Usage - Avail</b>	Available Usage. Total time, in CCS, that all VC ports are available in the system. Calculated as #MMI ports x 36.
<b>Usage - H320</b>	H320 Usage. Total time that VC ports are allocated to H320 endpoints.
<b>Usage - Voice</b>	Total time VC ports are allocated to voice endpoints.
<b>Usage -Total</b>	Total time, in CCS units, that VC ports are unavailable to carry a new call. This includes time that the ports are busy on a call, out of service or maintenance busy. Measured from the time that the port is allocated until it is released.
<b>Allocations - H320</b>	Total time VC ports are allocated to H320 endpoints.
<b>Allocations - Voice</b>	Total time VC ports are allocated to voice endpoints.
<b>Allocations - Total</b>	Total number of times a VC port was allocated to a call. Each B-channel used on a multimedia call counts as one allocation.
<b>Denials - H320</b>	Number of times a port was needed for an H320 call, but was not available.
<b>Denials - Voice</b>	Number of times a port was needed for a voice call, but was not available.
<b>Denials - Total</b>	Total number of times a VC port was needed for any call, but was not allocated because all VC ports were busy.
<b>Out Srv</b>	Time Out of Service. The total time, in CCS units, that any MMI ports were out of service during any part of the measured interval.

*1 of 2*

Table 53: VC Hourly and VC Summary report field descriptions 2 of 2

Field	Description
%APB	Percent All Ports Busy. The percentage of time during the measured interval that all MMI ports are unavailable to carry a new call.
% Blk	Percent Blockage. The percentage of attempted allocations of MMI ports that are not successful. This value is calculated as % blockage = (MMI Denials / Total Alloc + MMI Denials) * 100

2 of 2

## Performance Summary report

This section describes the traffic measurements Performance Summary report. The Performance Summary report summarizes the Peak Hour Trunk Blocking Daily Routing Pattern traffic data, Trunks Out of Service, and Trunks Not Used. The system gives a summary report for the previous day or the current day.

### Command

To display the Performance Summary report:

Type `list performance summary <yesterday/today> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday/today`.

- Enter `yesterday` to list a summary of the activity for yesterday.
- Enter `today` to list a summary of the activity for today.

**Options:** The `schedule` option is available for this command.

### Screens

[Figure 77](#) and [Figure 78](#) show typical screens for the Performance Summary report. On each screen, the time and date the report is requested displays at the top right. The report displays the information both graphically and numerically.

[Table 54](#) describes the data fields presented in this report.

**Figure 77: Performance Summary Report - page 1**

list performance summary yesterday														Page 1												
Switch Name:														Date: 3:03 pm WED JAN 25, 2006												
SUMMARY PERFORMANCE REPORT																										
PEAK HOUR TRUNK BLOCKING														DAILY ROUTE PATTERN CALLS CARRIED												
Grp	- %Out Blocking or % ATB - Grp													Grp	- % Calls Per Group Type - %											
No.	1	2	3	4	5	6	7	8	9	10	20	50	Blk	Type	1	10	20	30	40	50	60	80	100	Calls		
54	////////////////													42	co	////////////////										62
59	////////////////													39	fx	////////										28
58	////////////////													36	wats	//										5
63	////////////////													34	tie	//										5
61	////////////////													10	misc											0

**Figure 78: Performance Summary Report - page 2**

```
list performance summary yesterday
```

Switch Name: Date: 3:03 pm WED JAN 25, 2006

SUMMARY PERFORMANCE REPORT

TRUNKS OUT OF SERVICE											TRUNKS NOT USED					
Grp	Trunks Out Of Service All Day										Grp	Trunks Not Used All Day				
No.	-----										No.	-----				
41	9 19										55	1				
73	7										60	9				
211	1 2 3 4 5 6 7 8 9 10										223	19 20 21 22 23				
more trunks out of service											more trunks not used					

Table 54: Performance Summary report field descriptions 1 of 3

Field	Description
<b>PEAK HOUR TRUNK BLOCKING</b>	<p>Lists up to a maximum of five trunk groups with the highest percent of blocking in a measurement hour (for example, Grp No. 54 had 42 percent blocking). For incoming trunk groups, the percent of blocking is referred to as Percent All Trunks Busy (% ATB). For outgoing and two-way trunk groups, the percent blocking is referred to as % Out Blocking.</p> <p>% ATB is the percentage of time that all trunks in the trunk group were simultaneously in use during the measurement interval.</p> <p>% Out Blocking is the percentage of outgoing calls that arrive when all trunks are busy (ATB). For trunk groups with no queue, the calls not carried are those calls that could not be carried over any trunk member. For trunk groups with queues, the calls not carried are those calls that could not be carried over any trunk member and could not be queued because the queue was full (for example, the Queue Overflow calls).</p> <p><b>Suggested action:</b> You should determine the exact reason that a trunk group is blocking calls. To determine if blocking is being caused by a high volume of calls, refer to Trunk Group Performance report (for the indicated trunk group). If it is because of calling volume alone, consider the possibility of adding more members to the trunk group.</p> <p>The <b>Total Calls</b> field on the Trunk Group Performance report indicates the calling volume. If blocking is not because of calling volume, the reason must be because trunks are in the maintenance busy state. Determine whether maintenance personnel have been or should be alerted.</p>

1 of 3

Table 54: Performance Summary report field descriptions 2 of 3

Field	Description
<b>DAILY ROUTING PATTERN CALLS CARRIED</b>	<p>The percentage of calls carried, on a per-trunk-type basis, by the 25 routing patterns selected and measured (with the <code>change meas-selection route-pattern</code> command). The report displays the information both graphically and numerically.</p> <p>This measurement is simply a summation of the Total Calls Carried on a per-trunk-type basis for the trunk groups listed in the measured route-patterns, divided by the system-wide Total Calls Carried for all trunk types all day. The trunk group types for which routing pattern performance is reported in the summary report are: <b>co</b>, <b>fx</b>, <b>wats</b>, <b>tie</b>, and <b>misc</b>.</p> <ul style="list-style-type: none"> <li>• The tie trunk group type includes both internal and external tie, both internal and external Advanced Private Line Termination (<b>APLT</b>) access, and tandem trunk group types.</li> <li>• The term misc represents all other remaining trunk group types over which ARS/AAR/UDP calls may be routed.</li> </ul>
<b>TRUNKS OUT OF SERVICE</b>	<p>Lists trunk groups with out-of-service trunks over the report interval. A list of the first 10 trunks out of service is also given. The indication “more trunks out of service” is given if there are more than four trunk groups with out of service trunks or more than 10 members are out of service in any of the groups listed.</p> <p><b>Note:</b> This measurement is a summary of the <b>list measurements outage-trunk</b> report.</p>

2 of 3



Table 54: Performance Summary report field descriptions 3 of 3

Field	Description
<b>TRUNKS NOT USED</b>	<p>Lists trunk groups with trunks not used over the report interval (yesterday or today). A list of the first five trunks, in each of the identified groups, not used is also listed. The indication “more trunks not used” is given if there are more than four trunk groups with trunks not used or whenever more than five members are not used in any of the groups listed.</p> <p><b>Suggested action:</b> You should determine the exact reason the trunks are not being used. Is the reason because there are more trunks than actually needed or because there is a problem? If the identified trunk group has a large number of members and there are several trunks within that trunk group that receive few or zero calls, then the obvious conclusion is there are more trunk members than needed for the trunk group. As a contrast, if there is only one trunk member identified for the trunk group and that member has zero calls, then the trunk probably is defective.</p>

3 of 3

## Port network load balance study reports

The **port network load balance** reports are designed to show the loading on each **port network** and give an indication of the load source by call type. Knowing the load source means informed decisions can be made on how best to decrease the load or the effect of adding various kinds of ports to the **port network**. Growth can be accommodated with a minimum of new equipment.

There are five **port network load balance** reports.

- The Total report provides an overview of time slot usage, blockage, pegs, and occupancy for time slots on the **TDM** bus and port network links. This report also contains an **EI** board control utilization field (G3r only). See [Port Network Load Balance Study - Total report](#) on page 210.
- The other four reports include time slot usage and pegs for the following call types:
  - intercom (see [Port Network Load Balance Study - Intercom report](#) on page 213)
  - incoming trunk (see [Port Network Load Balance Study - Incoming report](#) on page 214)
  - outgoing trunk (see [Port Network Load Balance Study - Outgoing report](#) on page 216)
  - tandem trunk (see [Port Network Load Balance Study - Tandem report](#) on page 217)

These reports show characteristic patterns of the load on each port network for each of the call types.

All the reports are peak reports; data is provided for yesterday-peak, today-peak, and last-hour. The peak for each of the four call-type reports is time-coincident with the peak from the Total Report (**TDM** usage field).

## Command

To display any variation of the Port Network Load Balance Study Report:

Type `list measurements load-balance <total/intercom/incoming/outgoing/tandem> <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There are two required fields for this command.

- `total/intercom/incoming/outgoing/tandem`
  - Enter `total` for an overview of time slot usage, blockage, pegs, and occupancy.
  - Enter `intercom` for time slot usage and pegs for the intercom call type.
  - Enter `incoming` for time slot usage and pegs for the incoming call type.
  - Enter `outgoing` for time slot usage and pegs for the outgoing call type.
  - Enter `tandem` for time slot usage and pegs for the tandem call type.
- `yesterday-peak/today-peak/last-hour`
  - Enter `yesterday-peak` to list the load balance activity for yesterday's peak hour.
  - Enter `today-peak` to list the load balance activity for today's peak hour.
  - Enter `last-hour` to list the load balance activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

---

## Port Network Load Balance Study - Total report

### Screen

[Figure 79](#) depicts an example of a typical screen for the Port Network Load Balance Study report with the `total` qualifier.

[Table 55](#) describes the data fields presented in this report.

**Figure 79: Port Network Load Balance Study - Total report**

```
list measurements load-balance total today-peak
```

Switch Name: \_\_\_\_\_ Date: 2:15 pm FRI JAN 27, 2006

PORT NETWORK LOAD BALANCE STUDY REPORT

TOTAL CALLS

PN	Meas Hour	Time Division Multiplexed(TDM)					Port Network(PN) Link				
		Usage	Peg	Peak	Blockage	%Occ	Usage	Peg	Peak	Blockage	%Occ
1	1300	0	0	0	0	0	0	0	0	0	0
2	1300	0	0	0	0	0	0	0	0	0	0
3	900	2470	24661	96	0	14	0	0	0	0	0
4	100	2096	20105	83	0	12	0	0	0	0	0
5	300	1109	10921	43	0	6	0	0	0	0	0
6	900	1103	10893	44	0	6	0	0	0	0	0
7	100	498	3768	20	0	3	0	0	0	0	0
8	1300	0	0	0	0	0	0	0	0	0	0

**Table 55: Port Network Load Balance Study - Total report field descriptions 1 of 3**

Field	Description
<b>PN</b>	Port Network. Identifies the port network being measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>TDM Usage</b>	Time Division Multiplexed Usage. The total <b>TDM</b> time-slot usage, in <b>CCS</b> , for the <b>PN</b> being measured: <i>TDM Usage = Sum of the allocated TDM Time Slots at the end of each 100 second interval in a measurement hour</i> <i>TDM Total Potential Usage = 483 x 36 CCS = 17,388 CSS</i>
<b>TDM Peg</b>	Time Division Multiplexed Peg. The total count of circuit switch TDM time-slot seizure attempts for the PN during the measurement hour (requests for maintenance processes are not included).
<b>TDM Peak</b>	Time Division Multiplexed Peak. The maximum number of TDM time-slots allocated at any one time during the measurement hour.

**1 of 3**

**Table 55: Port Network Load Balance Study - Total report field descriptions 2 of 3**

Field	Description
<b>TDM Blockage</b>	Time Division Multiplexed Blockage. The total count of TDM blockages, that is, the total number of times a <b>TDM</b> time-slot request is denied for the <b>PN</b> being measured, during the measurement hour.
<b>TDM Occ</b>	Time Division Multiplexed Occupancy. The percent TDM Occupancy is computed as follows: $(TDM\ Usage / TDM\ Total\ Potential\ Usage) \times 100$ <b>Suggested action:</b> Generally, the load should be distributed evenly across port networks. If the percent occupancy is out of line with the occupancy on other port networks, consideration should be given to shifting resources. Use the Intercom, Outgoing, Incoming, and Tandem reports to help determine which resources to shift.
<b>Port Network (PN) Link Usage</b>	The total circuit switch usage (Measured in CCS) of the <b>PN</b> Link(s). <i>PN Link Usage = Sum of the allocated <b>PN</b> link time-slots at the end of each 100 second interval in a measurement hour.</i> <i>PNL Total Potential Usage = 766 x 36 CCS = 27,576 CCS</i>
<b>PNL Peg</b>	Port Network Link Peg. The total number of circuit switched time slot seizure attempts for the PN during the measurement hour.
<b>PNL Peak</b>	Port Network Link Peak. The maximum number of PNL time slots allocated at any one time during the measurement.
<b>PNL Blockage</b>	Port Network Link Blockage. The total count of circuit switched <b>PN</b> link blockages, that is, the total number of times a <b>PN</b> link time-slot is denied, during the measurement hour. This count includes calls originating or terminating on this <b>PN</b> . This field should be zero for all configurations that do not use T1 remoting and are smaller than 16 <b>PNs</b> since the center stage is non-blocking in these configurations. <b>Suggested action:</b> If blockages occur in the switching fabric, consider shifting resources. Use the Intercom, Outgoing, Incoming and Tandem reports to determine which resources to switch.

**2 of 3**

**Table 55: Port Network Load Balance Study - Total report field descriptions 3 of 3**

Field	Description
<b>PNL Occ</b>	Port Network Link Occupancy. The percent Port Network Link Occupancy is computed as follows: <i>(PN Link Usage/PNL Total Potential Usage) x 100</i>
<b>Control Util (G3r only)</b>	The fraction of the total capacity of the processor on the measured <b>EI</b> board. This value is expressed in percent, where 0% is the processor occupancy corresponding to no control measure traffic, and 100% is the processor occupancy corresponding to the maximum message traffic that can be handled and meet delay criteria. The data used to calculate this field is obtained as a traffic counter from the <b>EI</b> board. When the processor is idle, it usually reads about 14%.

**3 of 3**

## Port Network Load Balance Study - Intercom report

### Screen

[Figure 80](#) shows a typical screen for the Port Network Load Balance Study report with the **intercom** qualifier.

[Table 56](#) describes the data fields presented in this report

**Figure 80: Port Network Load Balance Study - Intercom report.**

list measurements load-balance intercom last-hour

Switch Name:Date: 5:01 pm FRI JAN 27, 2006

PORT NETWORK LOAD BALANCE STUDY REPORT

INTERCOM CALLS

	Meas	Intra PN		Inter PN	
PN	Hour	Usage	Peg	Usage	Peg
1	1200	441	490	1329	1964
3	1200	2401	75	6221	1020
4	1200	1031	520	5754	2972

**Table 56: Port Network Load Balance Study - Intercom report field descriptions**

Field	Description
<b>PN</b>	Port Network. The port network measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Intra PN Usage</b>	Intra Port Network Usage. The TDM time-slot usage caused by station-to-station calls between terminals on the same port network. Usage is displayed in CCS.
<b>Intra PN Peg</b>	Intra Port Network Peg. The count of TDM time-slot seizures caused by station-to-station calls between terminals on the same port network.
<b>Inter PN Usage</b>	Inter Port Network Usage. The TDM time slot usage caused by station-to-station calls between terminals on different port networks. Usage is displayed in CCS.
<b>Inter PN Peg</b>	Inter Port Network Peg. The <b>TDM</b> time slot seizures caused by station-to-station calls between terminals on different port networks. <b>Suggested action:</b> Generally, load across port networks should be evenly distributed. If inter <b>PN</b> usage is high on a particular network, you should consider shifting station resources to another port network. Although usage data is not displayed for each port network pair, analyzing the distribution of data across each port network can provide insight.

---

## Port Network Load Balance Study - Incoming report

### Screen

[Figure 81](#) shows a typical screen for the Port Network Load Balance Incoming Calls Report. [Table 67](#) describes the data fields presented in this report.

**Figure 81: Port Network Load Balance Study - Incoming report**

```
list measurements load-balance incoming last-hour
```

Switch Name: \_\_\_\_\_ Date: 5:06 pm FRI JAN 27, 2006

PORT NETWORK LOAD BALANCE STUDY REPORT

INCOMING TRUNK

PN	Meas Hour	Intra PN Usage	Intra PN Peg	Incoming Usage	Incoming Peg	Outgoing Usage	Outgoing Peg1
	1200	0	0	1784	506	0	0
3	1200	0	0	6111	80	0	0
4	1200	6932	916	0	0	532	586

Field	Description
<b>PN</b>	Port Network. The port network measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Intra PN Usage</b>	Intra Port Network Usage. The TDM time-slot usage caused by incoming trunk calls to a station on the same port network. Usage is displayed in <b>CCS</b> .
<b>Intra PN Peg</b>	Intra Port Network Peg. The count of TDM time-slot seizures caused by incoming trunk calls to a station on the same port network.
<b>Incoming Usage</b>	<b>The TDM</b> time-slot usage caused by calls to a station on the port network from an incoming trunk on another port network. Usage is displayed in <b>CCS</b> .
<b>Incoming Peg</b>	The count of <b>TDM</b> time-slot seizures caused by calls to a station on the port network from an incoming trunk on another port network.
<b>Outgoing Usage</b>	The <b>TDM</b> time-slot usage caused by calls to a station on another port network from an incoming trunk on the measured port network. Usage is displayed in <b>CCS</b> .
<b>Outgoing Peg</b>	The count of <b>TDM</b> time-slot seizures caused by calls to a station on another port network from an incoming trunk on the measured port network.

# Port Network Load Balance Study - Outgoing report

## Screen

[Figure 82](#) shows a typical screen for the Port Network Load Balance Study - Outgoing report. [Table 57](#) describes the data fields presented in this report.

**Figure 82: Port Network Load Balance Study - Outgoing report**

list measurements load-balance outgoing last-hour							
Switch Name:				Date: 6:05 pm FRI JAN 27, 2006			
PORT NETWORK LOAD BALANCE STUDY REPORT							
OUTGOING TRUNK							
	Meas	Intra PN		Incoming		Outgoing	
PN	Hour	Usage	Peg	Usage	Peg	Usage	Peg
1	1200	318	506	1260	1160	0	0
2	1200	0	0	0	0	950	186
3	1200	52	38	72	28	404	1002

**Table 57: Port Network Load Balance Study - Outgoing report field descriptions 1 of 2**

Field	Description
PN	Port Network. The port network measured.
Meas Hour	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
Intra PN Usage	Intra Port Network Usage. The TDM time-slot usage caused by outgoing calls made by stations on the measured port network and serviced by outgoing trunks on the same port network. Usage is displayed in <b>CCS</b> .
Intra PN Peg	Intra Port Network Peg. The count of <b>TDM</b> time-slot seizures caused by outgoing calls made by stations on the measured port network and serviced by outgoing trunks on the same port network.
Incoming Usage	The <b>TDM</b> time-slot usage resulting from outgoing calls originated at stations on another port network but serviced by trunks on the port network measured. Usage is displayed in <b>CCS</b> .

1 of 2



**Table 57: Port Network Load Balance Study - Outgoing report field descriptions 2 of 2**

Field	Description
<b>Incoming Peg</b>	The count of <b>TDM</b> time-slot seizures resulting from outgoing calls originated at stations on another port network but serviced by trunks on the port network measured.
<b>Outgoing Usage</b>	The <b>TDM</b> time-slot usage resulting from outgoing calls originated at stations on the port network measured but serviced by trunks on another port network. Usage is displayed in <b>CCS</b> .
<b>Outgoing Peg</b>	The count of <b>TDM</b> time-slot seizures resulting from outgoing calls originated at stations on the port network measured but serviced by trunks on another port network.

**2 of 2**

## Port Network Load Balance Study - Tandem report

### Screen

[Figure 83](#) shows a typical screen for the Port Network Load Balance Study - Tandem report. [Table 58](#) describes the data fields presented in this report.

**Figure 83: Port Network Load Balance Tandem Calls Report**

list measurements load-balance tandem last-hour							
Switch Name:				Date: 6:08 pm FRI JAN 27, 2006			
PORT NETWORK LOAD BALANCE STUDY REPORT							
TANDEM TRUNK							
	Meas	Intra	PN	Incoming		Outgoing	
PN	Hour	Usage	Peg	Usage	Peg	Usage	Peg
1	1200	0	0	0	0	0	0
3	1200	0	0	0	0	0	0
4	1200	0	0	0	0	0	0

**Table 58: Port Network Load Balance Study - Tandem report field descriptions**

Field	Description
<b>PN</b>	Port Network. The port network measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Intra PN Usage</b>	Intra Port Network Usage. The TDM usage caused by tandem trunk calls originating and terminating on the port network being measured. The usage is represented in <b>CCS</b> .
<b>Inter PN Peg</b>	Intra Port Network Peg. The count of <b>TDM</b> time-slot seizures caused by tandem trunk calls originating and terminating on the port network being measured.
<b>Incoming Usage</b>	The <b>TDM</b> usage resulting from tandem trunk calls originating on another port network but terminating on the port network measured. The usage is represented in <b>CCS</b> .
<b>Incoming Peg</b>	The count of <b>TDM</b> time-slot seizures resulting from tandem trunk calls originating on another port network but terminating on the port network measured.
<b>Outgoing Usage</b>	The <b>TDM</b> usage resulting from tandem trunk calls originating on the port network measured but terminating on another port network. The usage is represented in <b>CCS</b> .
<b>Outgoing Peg</b>	The count of <b>TDM</b> time-slot seizures resulting from tandem trunk calls originating on the port network measured but terminating on another port network.

---

## Blockage study reports

The blockage study reports provide information on usage and blockage for each port network as well as between switch node pairs.

There are two reports: one provides port network (**PN**) and port network link (PNL) data and the other provides switch node link (**SNL**) data. The latter report is available only on the G3r server.

A port network link is the hardware that provides a bridge between two port networks in a direct-connect configuration or between a port network and a switch node in a center stage configuration. A switch network link is the hardware that provides a bridge between two switch nodes.

The blockage study reports are designed to identify where congestion is occurring within the switching fabric and provide insight on how ports (load) can be adjusted to achieve satisfactory service. Planning for growth additions is also simplified because the report allows quick identification and quantification of reserve switching capacity.

Both reports are available for the following time intervals:

- last-hour
- today-peak
- yesterday-peak

The Blockage Study report for port networks provides local Time Division Multiplexed (**TDM**) time slot usage, pegs, and blockages, as well as PNL time slot usage, pegs, and blockages. The Blockage Study report for switched networks provides **SN** to **SN** time-slot usage, pegs, blockages, and overflow.

Of the 512 **TDM** time slots in each port network, usage measurements are only provided for 483 time slots employed in call processing, data links, and maintenance. Usage is not reported for the remaining 29 time slots, which primarily serve system functions.

The **TDM** time slots are sampled every 100 seconds. Usage measurements for these sampled intervals are expressed in hundred call seconds or **CCS**. For example, any time slot in use when the sample is taken is assumed busy for the entire sampling interval and is counted as one **CCS** for the interval. Because there are 36 **CCS** in an hour and 483 reported time slots, the maximum **TDM** usage per port network is:

$$\text{Maximum TDM usage} = 483 \times 36 \text{ CCS} = 17,388 \text{ CCS}$$

It should be understood that 17,388 **CCS** represents the maximum calling volume a single port network can support. Any calls that attempt to exceed this maximum are blocked because there are no time slots available. When this happens, the blockage field (TDM blockage) is incremented.

There are a maximum of 766 port network fiber time slots associated with a port network connected to another port network or between a port network and a switch node in a center stage configuration. Some of those time slots may be allocated for packet bandwidth, in which case the number is lower. For T1 remoting, there is a maximum of 188 fiber time slots (PNL Time Slots).

The PNL time slots are sampled every one hundred seconds. Usage measurements for these sampled intervals are expressed in hundred call seconds or **CCS**. For example, any time slot in use when the sample is taken is assumed busy for the entire sampling interval and is counted as one **CCS** for the interval. Because there are 36 **CCS** in an hour and 766 reported time slots, the maximum PNL usage per port network is:

$$\text{Maximum PNL usage} = 766 \times 36 \text{ CCS} = 27,576 \text{ CCS}$$

It should be understood that 27,576 **CCS** represents the maximum calling volume supported between port networks or between a port network and a switch node. Any calls that attempt to exceed this maximum are blocked because there are no time slots available. When this happens, the blockage field (TDM blockage) is incremented.

Command

To display the Blockage Study report:

Type `list measurements blockage <pn/sn> <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There are two required fields for this command — **pn/sn** and **yesterday-peak/today-peak/last-hour**.

- Enter **pn** to display the Blockage Study report for port networks; or **sn** to display the Blockage Study report for switch nodes
- Enter **yesterday-peak** to list the blockage activity for yesterday’s peak hour; **today-peak** to list the blockage activity for today’s peak hour; **last-hour** to list the blockage activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The **schedule** option is available with this command.

Blockage Study - Port Network report

[Figure 84](#) shows a typical Blockage Study report for port networks.

[Table 59](#) describes the data fields presented in this report.

Figure 84: Blockage Study - Port Network report

list measurements blockage pn last-hour										
Switch Name:						Date: 10:56 am FRI, JAN 27, 2006				
BLOCKAGE STUDY REPORT										
Meas		Time Division		Multiplexed(TDM)		Port Network(PN)		Link		
PN	Hour	Usage	Peg	Peak	Blockage	Time-slots	Usage	Peg	Peak	Blockage
1	1200	2650	5435	125	0	758	2125	3696	72	0
3	1200	7887	1581	250	0	762	6265	1272	170	0
4	1200	6199	8197	190	0	760	5862	4667	195	0

Table 59: Blockage Study - Port Network report field descriptions 1 of 2

Field	Description
<b>PN</b>	Port Network. The port network being measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>TDM Usage</b>	Time Division Multiplexed Usage. The total TDM time-slot usage, in <b>CCS</b> , for the <b>PN</b> being measured, during the measurement hour. This is calculated as follows: <i>TDM Usage = Sum of the allocated TDM time slots at the end of each 100 second interval in a measurement hour.</i> TDM usage max = 483 x 36 <b>CCS</b> = 17,388 <b>CCS</b> After each 100-second interval, a snapshot is taken of the number of <b>TDM</b> time-slots used on each port network.
<b>TDM Peg</b>	Time Division Multiplexed Peg. The total count of circuit switch <b>TDM</b> time-slot seizure attempts for the <b>PN</b> during the measurement hour (requests for maintenance processes not included).
<b>TDM Peak</b>	Time Division Multiplexed Peak. The maximum number of time-slots allocated at any one time during the measurement hour.
<b>TDM Blockage</b>	Time Division Multiplexed Blockage. The total count of TDM blockages, that is, the total number of times a <b>TDM</b> time-slot request is denied for the <b>PN</b> measured, during the measurement hour. <b>Suggested Action:</b> Generally, it is desirable to balance the traffic across port networks. If the usage nears the maximum <b>CCS</b> , some resources should be moved to another port network.
<b>PNL Time-Slots</b>	Port Network Link. The number of port network link time-slots available between port networks or between port networks and switch nodes. At any given time interval, this translation value is fixed. (Remember, this refers to available time slots, not measurement data.)
<b>Port Network Link Usage</b>	The total circuit switch usage of the available <b>PN</b> Link(s) connecting the <b>PN</b> to the <b>SN</b> or to other <b>PNs</b> . For directly connected <b>PNs</b> in three <b>PN</b> systems, this is the <b>sum of the usage</b> for both links. <i>PN LINK USAGE = Sum of the allocated PN Link time-slots at the end of each 100 second interval in a measurement hour.</i> <i>PN Link Usage Max = 766 x 36 CCS = 27,576 CCS.</i>

1 of 2

**Table 59: Blockage Study - Port Network report field descriptions 2 of 2**

Field	Description
<b>Port Network Link Peg</b>	The total count of circuit switched time-slot seizure attempts for the link(s) during the measurement hour.
<b>Port Network Link Peak</b>	The maximum number of time slots allocated at any one time on the port network links.
<b>Port Network Link Blockage</b>	<p>The total count of circuit switched <b>PN</b> blockages, that is, the total number of times a <b>PN</b> link time-slot is denied during the measurement hour. This count includes calls originating or terminating on this <b>PN</b>. This field should be zero for all configurations that do not use T1 remoting and are smaller than 16 <b>PNs</b> since the center stage is non-blocking in these configurations.</p> <p><b>Suggested action:</b> Generally, it is desirable to balance traffic between port networks, or between port networks and switch nodes. If the usage is high for a port network, resources may need to be moved from one port network to another.</p>

**2 of 2**

## Blockage Study - Switch Node report

[Figure 85](#) shows a typical Blockage Study report for switch nodes.

[Table 60](#) describes those data fields presented in this report which are different from those in the Blockage Study - Port Network report. Refer to [Table 59](#) for data fields that are the same.

This report is only accessible from the G3r server.

**Figure 85: Blockage Study - Switch Node report**

list measurements blockage sn last-hour						
Switch Name:			Date: 11:03 am FRI JAN 27, 2006			
BLOCKAGE STUDY REPORT						
CENTER STAGE						
SN Pair	Meas Hour	Time-slots	Switch Node (SN) Usage	Link Peg	Blockage	Overflow
1/2	1600	766	9800	49267	0	0

Table 60: Blockage Study - Switch Node report field descriptions

Field	Description
<b>SN Pair</b>	Switch Node Pair. Identifiers for the two <b>SNs</b> connected by the <b>SNL</b> being measured.
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Switch Node Link (SN) Time-Slots</b>	The number of switch node link time-slots available between switch nodes. At any given time interval, this translation value is fixed. The <b>SNL</b> time slot maximum is 766; for T1 remoting it is 94.
<b>Switch Node Link Usage</b>	The total circuit switch usage of the <b>SNL</b> connecting the two <b>SNs</b> . This is the total usage on <b>interconnecting fibers</b> . At the end of each 100-second interval, a snapshot is taken of the number of <b>SNL</b> time-slots used on each port network. <i>Max SNL usage = 766 x 36 CCS = 27,576.</i>
<b>Switch Node Link Peg</b>	The total count of circuit switched <b>SNL</b> time-slot seizure attempts during the measurement hour between the two measured <b>SNs</b> . This is the total peg count on <b>all interconnecting fibers</b> .
<b>Switch Node Link Blockage</b>	The total count of circuit switched <b>SNL</b> blockages, that is, the total number of times a call is blocked because no time-slots are available either in the most direct route or through any alternate route, during the measurement hour.
<b>Switch Node Link Overflow</b>	The total number of times a call is routed over an alternate route. This counter is incremented when a call was not successfully routed over the most direct route and is routed over an alternate route. This allows you to distinguish true blockage of a call from the direct route blockage. <b>Suggested action:</b> Generally, the usage between switch nodes should be equally distributed. If the usage between switch nodes is high, you may want to move resources to another switch node or add a new switch node.

---

## Attendant and Maintenance Status report

This section describes the attendant and maintenance status reports which provide an overall view of how the system is performing in real-time.

The **monitor system** commands generate dynamic one-page status reports that summarize the overall current condition of the system and last-hour traffic status.

Using these commands, you can generate two different status report screens. These two screens contain the following information:

- **monitor system view1**. Includes the attendant status, maintenance status, and last hour's traffic data for attendant, hunt, and trunk groups. The screen also shows the date and time of day at which you requested the report.
- **monitor system view2**. Includes attendant status, maintenance status, and last hour's traffic data for attendant and trunk groups. The screen also shows the date and time of the day at which you requested the report.

Data for attendant and maintenance status updates every 60 seconds. Data for the traffic status updates once every hour because traffic status is obtained from existing measurements collected on an hourly basis.

**Note:**

Requesting either of the system status reports should be your last request during your current log on. The screens are exited by pressing **CANCEL**, which also logs you off the system, or after a 30-minute time-out.

### Command

To display the desired system status report:

1. Choose one of the following:
  - Type **monitor system view1**
  - Type **monitor system view2**
2. Press **Enter**.

### Screens

[Figure 86](#) shows a typical screen for view 1 of the attendant and maintenance status report; [Figure 87](#) shows a typical screen for view 2 of that report.

[Table 61](#) describes the data fields presented in both report views.



**Figure 86: Attendant and maintenance status report - view 1**

```

monitor system view1

                ATTENDANT STATUS                      MAINTENANCE STATUS

                Console no.                            # of alarms for trunks: 0
Activated: 3                                         # of alarms for stations: 0
Deactivated: 1 2                                   # of alarms for other res: 0
                                                First OSS number has been informed? n

TRAFFIC STATUS
Measurement Hour: 18
  Trunk Group Measurement                        Hunt groups Measurement
(4 grps with highest %time ATB)                (4 grps with highest # of qued calls)
    Grp no:  41  12  23  221                      Grp no: 6
    Grp dir:  inc out two two                      Calls qued: 2
Calls qued:   17   9  19  12                      Calls aban: 2
  %Out blkkg:  *   9  18  11                      Attendant Group Measurement
  %Time ATB:   86  79  91  93                      Calls qued: 9  Calls aban: 1

                                                    13:26 FRI FEB 3 2006

                - press CANCEL to quit -

```

**Figure 87: Attendant and maintenance status report - view 2**

```

monitor system view2

                ATTENDANT STATUS                      MAINTENANCE STATUS

                Console no.                            # of alarms for trunks: 0
Activated: 3                                         # of alarms for stations: 0
Deactivated: 1 2                                   # of alarms for other res: 0
                                                First OSS number has been informed ? n

TRAFFIC STATUS Measurement Hour: 18
  Trunk Group Measurement
(4 grps with highest %time ATB)
    Grp no:  41  12  23  221
    Grp dir:  inc out two two
Calls qued:   17   9  19  12
  %Out blkkg:  *   9  18  11
  %Time ATB:   86  79  91  93
  Attendant Group Measurement
Calls qued: 9    Calls aban: 1

                                                    13:28 FRI FEB 3 2006

                - press CANCEL to quit -

```

**Table 61: Attendant and maintenance status report field descriptions 1 of 2**

Field	Description
<b>ATTENDANT STATUS</b>	<p>Shows the activated and deactivated attendant consoles. In the sample screens, console #1 and console #2 are deactivated and console #3 is activated.</p> <p><b>Note:</b> Activated means the agent's headset/handset is plugged into the console, and the console is not busied-out or set for Night Service. To obtain other details, use the <b>status attendant</b> command.</p>
<b>MAINTENANCE STATUS</b>	<p>Shows the number of alarms (including minor and major alarms) that may indicate problems on trunks, stations, and other resources. If any alarm exists in the system or if remote maintenance has acknowledged an alarm, indications are shown on the report. A y indicates acknowledgment. An n indicates no acknowledgment. To determine exactly what alarms currently exist, use the <b>display alarms</b> command.</p>

**1 of 2**

Table 61: Attendant and maintenance status report field descriptions 2 of 2

Field	Description
<b>TRAFFIC STATUS</b>	<p>View1 displays the call handling status for trunk, hunt, and attendant groups; View2 only displays the call handling status for trunk and attendant groups. For trunk groups, the reports indicate the number of queued calls during the previously completed measurement interval for the identified trunk groups.</p> <p>For hunt groups, the reports indicate the number of queued calls and abandoned calls during the previously completed measurement interval for the identified trunk groups. For the trunk group measurements, only the four trunk group numbers with the highest percentage of blocking are listed. The reports also display trunk group direction (two-way, outgoing, or incoming), the number of calls queued, the percentage of outgoing blocking (for outgoing and two-way trunks), and the percentage of all trunks busy.</p> <p>For outgoing and two-way trunk groups only experiencing a high number in the %Time ATB field, no action is required since this indicates that the trunks are used very efficiently. However, a bad condition is when both the %Time ATB and %Out blkg fields display high numbers, indicating calls arrive and are blocked because all trunks are already in use. For incoming trunk groups experiencing a high number in the %Time ATB field, then some incoming calls are probably blocked.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>3. For outgoing and two-way trunk groups experiencing a high number in both the %Time ATB and %Out blkg fields, use the <b>list performance trunk-group</b> command and follow the suggested actions specified for that command.</li> <li>4. For incoming trunk groups experiencing a high number in the %Time ATB field, use the <b>list performance trunk-group</b> command and follow the suggested actions specified for that command.</li> </ol>

2 of 2

## Tone receiver reports

### Tone Receiver Summary Measurements report

The Tone Receiver Summary Measurements report provides traffic data for Dual Tone Multi frequency (**DTMF**) receivers, general purpose tone detectors (GPTDs), and Call Classifiers (**CCs**). **DTMF** receivers detect touch tones, while GPTDs detect call progress tones. **CCs** can function either as Call Progress Tone Receivers (**CPTRs**), touch-tone receivers (**TTRs**), or multi frequency compelled receivers (**MFCRs**).

**Note:**

Tone receivers are required to support the **ARS**, Terminal Dialing, Abbreviated Dialing, LND, and Call Prompting features. for additional details, refer to the *Avaya Aura™ Communication Manager Hardware Description and Reference*.

Reports can be requested on tone receiver activity for yesterday's peak hour, today's peak hour, or the last hour. The peak is the hour of the day with the highest Peak Req measurement. The data in this report can be used to determine if there is a need for additional Tone Detector or Tone Detector/Generator circuit packs.

### Command

To display the Tone Receiver Summary Measurements report:

Type `list measurements tone-receiver summary <yesterday-peak /today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/ today-peak/last-hour`.

- Enter `yesterday-peak` to list the tone receiver activity for yesterday's peak hour.
- Enter `today-peak` to list the tone receiver activity for today's peak hour.
- Enter `last-hour` to list the tone receiver activity of the most recently completed last hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 88](#) shows a typical screen for the Tone Receiver Measurements Summary report. [Table 62](#) describes the data fields presented in the Tone Receiver Measurements Summary report.

**Figure 88: Tone Receiver Summary Measurements report**

```
list measurements tone-receiver summary today-peak
```

Switch Name: \_\_\_\_\_ Date: 2:41 pm FRI FEB 3, 2006

TONE RECEIVER SUMMARY MEASUREMENTS

Hour	Meas Type	Total Req	Peak Req	Total Queued	Peak Queued	Total Denied	Peak Denied
1300	DTMF	0	0	0	0	0	0
1300	GPTD	0	0			0	0
1300	CC-TTR	0	0	0	0	0	0
1300	CC-CPTR	0	0			0	0
1300	CC-MFCR	0	0			0	0

TR Type	Total Avail	Capabilities
DTMR-PT	4	DTMF
GPTD-PT	2	GPTD
CLAS-PT	0	DTMF, CC-TTR, CC-CPTR, MFCR
ETR-PT	0	DTMF, CC-TTR, CC-CPTR, MFCR, GPTD

**Table 62: Tone Receiver Measurements Summary Report 1 of 3**

Field	Description
<b>Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the last hour or the hour with the highest Peak Req measurement.
<b>Type</b>	The type of tone receiver measured.
<b>Total Req</b>	Total Requests. The system-wide total number of requests, by call processing, for <b>DTMF</b> , GPTD, CC-TTR, CC-CPTR, or MFCR receivers during the listed hour. The total number of requests is calculated by incrementing a counter for each request.

**1 of 3**

**Table 62: Tone Receiver Measurements Summary Report 2 of 3**

<b>Field</b>	<b>Description</b>
<b>Peak Req</b>	<p>Peak Requests. The system-wide peak number of simultaneous requests for DTMF, GPTD, CC-TTR, CC-CPTR, or MFCR receivers that occurred at any one time for the listed hour. The peak (or maximum) number is calculated by incrementing a counter for each request and decreasing the counter when the request fails or a tone receiver is released.</p> <p><b>Note:</b> If the Peak Req field indicates a number higher than listed in the Avail field, then certain requests were either queued or denied during the peak time interval. Denied requests fail and are given the reorder tone.</p>
<b>Total Queued</b>	<p>The system-wide total number of requests queued during the listed hour. A request is queued when there are no receivers immediately available. Only <b>DTMF</b> and CC-TTR requests are queued.</p> <p><b>Note:</b> If a request for a receiver is made in one port network, and no receivers are available, then the request is offered to the next port network. If no receivers are available on any port network, then the request is queued. Queued call requests do not receive dial tone until a tone receiver becomes available.</p>
<b>Peak Queued</b>	<p>The system-wide maximum number of call requests queued at any one time during the listed hour.</p> <p><b>Note:</b> The system has a maximum queue size of 4 for <b>DTMF</b> requests and 80 for CC-TTR call vectoring requests.</p>
<b>Total Denied</b>	<p>The system-wide total number of requests denied because no receivers were available during the listed hour. For DTMF-receiver or CCTR requests, this happens only after the queue is full. Those requests denied are given reorder tone.</p>

**2 of 3**

**Table 62: Tone Receiver Measurements Summary Report 3 of 3**

Field	Description
<b>Peak Denied</b>	The system-wide peak number of requests denied because no receivers were available during the listed hour. <b>Suggested action:</b> At a minimum you should increase the number of tone receivers by the number displayed in the Peak Denied field. Furthermore, you may want to consider engineering the switch as “non-blocking” for tone receivers. This involves increasing the number of tone receivers (the Avail field) so all requests receive service immediately and no requests are queued. For example, keep the value displayed in the Avail field greater than that displayed in the Peak Req field.
<b>TR Type</b>	Tone Receiver Type. The tone receiver circuit packs physically connected at the time of the hour measurement.
<b>Total Avail</b>	Total Available. The number of the ports available for the type of tone receiver listed in the previous column.
<b>Capabilities</b>	The types of tone(s) the tone receiver can detect.

**3 of 3**

---

## Tone Receiver Detail report

The Tone Receiver Measurements Detail report provides traffic data for Dual Tone Multifrequency (**DTMF**) receivers, general purpose tone detectors (GPTDs), and Call Classifiers (**CCs**) as Call Progress Tone Receivers (CC-CPTRs) for call classification, as touch-tone receivers (CC-TTRs) for call vectoring, and as multifrequency compelled receivers (MFCRs).

**Note:**

Tone receivers are required to support the **ARS**, Terminal Dialing, Abbreviated Dialing, LND, and Call Prompting features. For additional details, refer to the *Avaya Aura™ Communication Manager Hardware Description and Reference*.

Reports can be requested on tone receiver activity for yesterday’s peak hour, today’s peak hour, or the last hour. The peak is the hour of the day with the highest Peak Req measurement. The data in this report can be used to determine if there is a need for additional Tone Detector or Tone Detector/Generator circuit packs.

## Command

To display the Tone Receiver Measurements Detail report screen:

Type `list measurements tone-receiver detail <yesterday-peak /today-peak/ last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak /today-peak/last-hour`.

- Enter `yesterday-peak` to list the tone receiver activity for yesterday's peak hour.
- Enter `today-peak` to list the tone receiver activity for today's peak hour.
- Enter `last-hour` to list the tone receiver activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

## Screens

[Figure 89](#) shows a typical screens for the Tone Receiver Detail Measurements report.

[Table 63](#) describes the data fields presented in this report.

**Figure 89: Tone Receiver Detailed Measurements report**

```
list measurements tone-receiver detail last-hour
```

Switch Name: \_\_\_\_\_ Date: 2:47 pm FRI FEB 3, 2006

TONE RECEIVER DETAIL MEASUREMENTS

Hour	PN	Type	PN Req	PN Alloc	Peak Alloc	Total Off-PN	Peak Off-PN
1300	1	DTMF	8	8	8	0	5
1300	1	GPTD	12	12	3	0	0
1300	1	CC-TTR	0	0	0	0	0
1300	1	CC-CPTR	0	0	0	0	0
1300	1	CC-MFCR	0	0	0	0	0

**Table 63: Tone Receiver Detail Measurements report field descriptions 1 of 2**

Field	Description
Hour	Measurement Hour. The starting time (using 24-hour clock) of the last hour or of the hour with the highest Peak Req measurement.

**1 of 2**



**Table 63: Tone Receiver Detail Measurements report field descriptions 2 of 2**

<b>Field</b>	<b>Description</b>
<b>PN</b>	Port Network. The port network in which the circuit pack containing the type of tone receiver listed is physically located.
<b>Type</b>	<p>The type of tone receiver measured.</p> <p><b>Note:</b> Each TN748 and TN420 circuit pack provides four <b>DTMF</b> ports (for touch-tone reception) and two GPTD ports (for call progress tone reception). The TN744 Call Classifier Circuit Pack provides eight ports for call progress tone reception (CC-CPTR), touch-tone reception (CC-TTR), or <b>MFC</b> (CC-MFCR) reception.</p>
<b>PN Req</b>	Port Network Requests. The number of requests for <b>DTMF</b> , GPTD, CC-TTR, CC-CPTR, or MFCR receivers within the port network during the listed hour.
<b>PN Alloc</b>	Port Network Total Allocation. The total number of <b>DTMF</b> , GPTD, CC-TTR, CC-CPTR, or MFCR receivers located in the listed port network allocated for use during the listed hour.
<b>Peak Alloc</b>	Peak Allocation. The peak number of <b>DTMF</b> , GPTD, CC-TTR, CC-CPTR, or MFCR receivers located in the listed port network in use simultaneously during the listed hour.
<b>Total Off-PN</b>	<p>Total Off-Port Network. For the identified hour and port network, this is the total number of <b>DTMF</b>, GPTD, CC-TTR, CC-CPTR, or MFCR receivers allocated on a different port network for requests originated on this port network.</p> <p><b>Note:</b> With ideal conditions, this field displays the number 0. However, with more practical conditions, the field displays a larger number.</p> <p><b>Suggested actions:</b> Locate communities of interest within the same port network. Provide sufficient tone receivers for each port network.</p>
<b>Peak Off-PN</b>	<p>Peak Off-Port Network. For the identified hour and port network, this is the peak number of <b>DTMF</b>, GPTD, CC-TTR, CC-CPTR, or MFCR receivers simultaneously allocated on a different port network for requests originated on this port network.</p> <p><b>Note:</b> A desirable goal is to minimize (within reason) the number displayed with this field.</p> <p><b>Suggested actions:</b> Locate communities of interest within the same port network. Provide sufficient tone receivers for each port network. Perhaps you should move one TN748 and TN420 circuit pack (or, if you are working with a CC-TTR, CC-CPTR, and MFCR, move a TN744 circuit pack) to the <b>PN</b> with the Off-<b>PN</b> counts to minimize Off-<b>PN</b> allocations.</p>

**2 of 2**

---

## Abbreviated Dialing report

Abbreviated Dialing lists are accessed by both the SYSTEM 75 abbreviated dialing button feature and the abbreviated dialing code feature. The difference between the two features is feature activation. Abbreviated dialing code feature is activated by dialing a feature activation code (which identifies the list), and dialing an entry number. Abbreviated dialing button feature is activated by a button depression, which identifies the feature access code and the entry number.

Abbreviated dialing lists may be assigned to the following:

- Multi-function stations
- Analog stations
- Data terminals
- Attendant group

**Note:**

To access the abbreviated dialing reports, create group abb dialing or personal dialing into your switch.

## Command

To display the Abbreviated Dialing report:

Type **list abbreviated dialing group or personal [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for this command.

## Screens

---

**Figure 90: Abbreviated Dialing Group report**

list abbreviated-dialing group						
ABBREVIATED DIALING LISTS						
List Type	List No.	List Name	Total Entries	No. Unused	Privileged	Prg Ext
group	1	Abbrev1	5	4	n	31106

**Figure 91: Abbreviated Dialing Personal report**

list abbreviated-dialing personal					
ABBREVIATED DIALING PERSONAL LISTS					
List Type	List Id.	List No.	List Name	Total Entries	No. Unused
personal	20001	1	Abbrev1	10	0

**Table 64: Abbreviated Dialing report field descriptions**

Field	Description
<b>List Type</b>	Indicates whether the list is group, personal, or system type.
<b>List No.</b>	Indicates list number used to identify a particular list.
<b>List Id</b>	Indicates list Id used to identify a particular list.
<b>List Name</b>	Indicates list name used to identify a particular list.
<b>Total Entries</b>	Indicates the number of abbreviated dialing list entries.
<b>No. unused</b>	Indicates the number of entries not used for abbreviated dialing list.
<b>Privileged</b>	Indicates whether the system or group list is privileged or not privileged.
<b>Prg Ext</b>	Indicates privileged extension number.

## Traffic Summary report

The Traffic Summary report provides an overview of system performance. Summarized in the report are peak hour call processing and system management occupancy, peak hour blocking for TDM time slots on each port network, peak hour blocking for port network links and switch node links, and the peak hour for the TDM time slots, port network links and switch node links combined, peak hour for the worst attendant speed of service, and the peak for today and yesterday for trunk blocking for the worst five trunk groups.

## Traffic data analysis reports

Also included are a series of traffic flags and counters provided for the last hour of measurement data. They include a time stamp for a major alarm, trunk group, wideband trunk group, coverage path, coverage principals, and routing-pattern time stamps for measurement selection modifications.

There are, as well, for last hour, totals for Trunks Out of Service, **CDR** high water mark and overflow, and total security violations.

### Note:

Data in this report is not updated on demand. It is generated every hour on the hour and can be used to identify problem areas in the system. More detailed data can be retrieved from other measurements reports, as noted in the field descriptions.

When a potential problem is identified from this report, other more detailed reports in the suspect area are required to adequately characterize the problem.

## Command

To display the Traffic Summary report:

Type `list measurements summary [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

## Screens

[Figure 92](#), [Figure 93](#) and [Figure 94](#) show typical screens for the Traffic Summary Reports. [Table 65](#) describes the data fields presented in these screens.

**Figure 92: Traffic Summary report — page 1**

list measurements summary			Page	1
Switch Name:		Date: 3:11 pm FRI FEB 3, 2006		
TRAFFIC SUMMARY REPORT				
	Last Hour	Today's	Yesterday's	
OCCUPANCY MEASUREMENTS				
Meas Hour:	700	500	1300	
Static Occupancy:	7	7	0	
CP Occupancy:	0	3	5	
SM Occupancy:	18	1	16	
BLOCKAGE MEASUREMENTS				
Meas Hour:	700	700	2300	
Total Blockage:	0	0	0	
High PN Blk:	0	0	0	
High SNL/PNL Blk:	0	0	0	
ATTENDANT SPEED MEASUREMENTS				
Meas Hour:	700	700	2300	
Attendant Speed:	0	0	0	

**Figure 93: Traffic Summary report — page 2**

list measurements summary		Page	2
Switch Name:	Date: 3:11 pm FRI FEB 3, 2006		
TRAFFIC SUMMARY REPORT			
TRAFFIC FLAGS			
Major Alarm: NO MAJOR ALARM			
Trunk Group:			
Wideband Trunk Group:			
Coverage Path:			
Covered Principals:			
Route Pattern:			
Total Trunks Out of Service: 0			
Security Violations: 0			
CDR High-Water-Mark: 0			
CDR Overflow: 0			

**Figure 94: Traffic Summary report — page 3**

```
list measurements summary
```

Switch Name: \_\_\_\_\_ Date: 3:11 pm FRI FEB 3, 2006

TRAFFIC SUMMARY REPORT

FIVE TRUNK GROUPS LOWEST SPEED OF SERVICE

-----Today's Peak-----			-----Yesterday's Peak-----		
Grp No	Meas Hour	%ATB	Grp No	Meas Hour	%ATB
30	700	100	30	2300	100
40	700	0	40	1000	5
39	700	0	39	2300	0
38	700	0	38	2300	0
37	700	0	37	2300	0

**Table 65: Traffic Summary report field descriptions 1 of 4**

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data is recorded.
<b>Static Occupancy</b>	Static Occupancy. The percentage of processor occupancy required by background processes in support of call processing, maintenance, and system management. Examples of this activity are high-level sanity checks, system timing, and polling of adjuncts.
<b>CP Occupancy</b>	Call Processor Occupancy. The percentage of processor occupancy due to high priority processing and dynamic call processing. The peak hour is determined by the hour with the largest combined call processing and static occupancy. To correlate data as well as to determine necessary actions, refer to <a href="#">Figure 125: Occupancy Summary Measurements report — page 1</a> on page 330.
<b>SM Occupancy</b>	System Management Processor Occupancy. The percentage of processor occupancy due to system management processes. This measurement is time coincident with the peak value of the combined call processing and static processor occupancy.
<b>Total Blockage</b>	The percent of total circuit switched time slot seizures blocked due to insufficient <b>TDM</b> or <b>CSS</b> time slots. Total Blocking = (( <b>TDM</b> Blockage + <b>SNL</b> Blockage + PNL Blockage) x 100) / ( <b>TDM</b> Pegs + <b>SNL</b> Pegs + PNL Pegs)

**1 of 4**

Table 65: Traffic Summary report field descriptions 2 of 4

Field	Description
High PN Blk	Highest Port Network Blocking. The highest percent of <b>TDM</b> time slot seizure failures due to insufficient time slots for any <b>PN</b> . This is time coincident with Peak Total Blocking above. It is computed as follows: Highest <b>PN Blk</b> = ( <b>TDM</b> Blockage x 100) / <b>TDM</b> Pegs
High PNL/SNL Blk	Highest Port Network Link/Switch Node Link Blocking. (G3r only). The highest percent of <b>SNL</b> and PNL seizure failures due to insufficient time slots. This measurement is only meaningful for links between Center Stage Nodes or T1 remote <b>PNs</b> since connectivity to the Center Stage from any <b>PN</b> is non-blocking with fiber connectivity. This is time coincident with Peak Total Blocking. It is computed as follows: <i>Highest PNL/SNL Blk = ((SNL Blockage + PNL Blockage) * 100) / SNL Pegs + PNL Pegs</i> The data from Total Blockage, High <b>PN Blk</b> and High <b>PN/SNL Blk</b> can be correlated to data on the Blockage <b>PN</b> and Blockage <b>SN</b> Reports. The peak hour has the worst total ( <b>TDM</b> , <b>PNL</b> , and <b>SNL</b> ) blockage.
Attendant Speed	Attendant Group Speed of Service. The average time calls are in the attendant queue. The peak hour has the slowest speed of service. <i>Attendant Speed = Total Delay for all Answered Call (in seconds) / Total Number of Calls Answered</i> <b>Suggested action</b> If the speed of answer is not acceptable, review the attendant group and attendant positions reports for suggested actions.
Major Alarm	The time stamp of the last major alarm active when the report was generated for the last hour. <b>Suggested action</b> If measurement data on reports seems inconsistent, further study of alarms may point to a potential problem ("display alarms").
Trunk Group	The time stamp that indicates when the Trunk Groups Measurement Selection screen was last updated. This time stamp is retrieved when the measurements for the Trunk Group Hourly Report are collected each hour.
Wideband Trunk Group	The time stamp that indicates when the Wideband Trunk Group Measurement Selection screen was last updated. This time stamp is retrieved when the measurements for the Wideband Trunk Group Hourly Report are collected each hour.

2 of 4

Table 65: Traffic Summary report field descriptions 3 of 4

Field	Description
<b>Coverage Path</b>	The time stamp that indicates when the Coverage Measurement Selection screen was last updated. This time stamp is retrieved when the measurements for the associated report(s) are collected each hour.
<b>Covered Principals</b>	The time stamp that indicates when the Principal Measurement Selection Administration screen was last updated. This time stamp is retrieved when the measurements for the associated report(s) are collected each hour.
<b>Route Pattern</b>	The time stamp that indicates when the Measurement Route Pattern Selection Administration screen was last updated. This time stamp is retrieved when the measurements for the associated report(s) are collected each hour. The time at which the identification of routing patterns to be studied was last changed.
<b>Total Trunks Out of Service</b>	The total number of trunks out of service for the entire system as of the last hour. For more details and suggested actions, refer to <a href="#">Figure 99: Trunk Out of Service report</a> on page 256.
<b>Security Violations</b>	The total number of security violations, login, barrier code, and authorization code, as recorded in the Security Violations Summary Report. Generally, this number should not be high. If it is, refer to <a href="#">Figure 132: Security Violations Summary report</a> on page 350 for suggested actions.
<b>CDR High Water Mark</b>	Call Detail Recording High Water Mark. The number of times during the measurement interval the <b>CDR</b> Record Buffer High Water Mark is exceeded. This is a warning level reached when the number of <b>CDR</b> records stored on the switch is close to the maximum number of buffers allocated.
<b>CDR Overflow</b>	Call Detail Recording Overflow. The number of times during the last hour the <b>CDR</b> record buffer overflowed invoking the administration selectable overflow response. Special handling procedures occur when all <b>CDR</b> buffers are filled. To prevent undesired loss of data, options are put in effect to redirect calls generating <b>CDR</b> records to the attendant or to give those calls intercept treatment. <b>Suggested actions:</b> Both the above conditions may indicate that the <b>CDR</b> primary link is down and that maintenance tests should be done to check the link doesn't have hardware problems ("test cdr-link primary").

3 of 4



Table 65: Traffic Summary report field descriptions *4 of 4*

Field	Description
Grp No	Group Number. The trunk group number.
% ATB	Percent All Trunks Busy. The observed blocking as determined by All Trunks Busy (ATB) for the trunk group. This is reported for the 5 trunk groups with the highest % <b>ATB</b> for today and yesterday.

**4 of 4**

---

## Trunk group reports

This section describes the traffic, outage, performance, status, call-by-call, and lightly used reports for trunk groups, and describes the validation and analysis of the data provided in the reports.

---

### Trunk Group Summary report

The Trunk Group Summary report gives traffic measurements for all trunk groups except for personal central office line groups. By using this report, you can determine the trunk group total usage (in **CCS**), the total number of calls, trunk blockage, and other measurement data.

#### Command

To display the Trunk Group Summary report:

Type `list measurements trunk-group summary <yesterday-peak/  
today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday-peak/  
today-peak/last-hour`.

- Enter `yesterday-peak` to list a summary of the trunk group activity for yesterday's peak hour.
- Enter `today-peak` to list a summary of the trunk group activity for today's peak hour.
- Enter `last-hour` to list a summary of the trunk group activity for the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The `schedule` option is available for this command.

#### Screen

[Figure 95](#) shows a typical screen for the Trunk Group Summary report.

[Table 66](#) describes the data fields presented in this report.

**Figure 95: Trunk Summary Report**

```
list measurements trunk-group summary today-peak
```

Switch Name: Date: 3:30 pm FRI FEB 3, 2006

TRUNK GROUP SUMMARY REPORT

Peak Hour For All Trunk Groups: 1000

Grp No.	Grp Siz	Grp Type	Grp Dir	Meas Hour	Total Usage	Total Seize	Inc. Seize	Grp Ovfl	Que Siz	Call Qued	Que Ovfl	Que Abd	Out Srv	% ATB	Out Blk
20	1	did	inc	1200	0	0	0	0	0	0	0	0	0	0	*
30	1	tie	two	1200	36	0	0	0	0	0	0	0	0	100	0
37	22	tand	two	1200	598	179	0	0	0	0	0	0	0	0	0
38	23	isdn	two	1200	171	654	0	0	0	0	0	0	0	0	W
39	22	isdn	two	1200	270	762	762	0	0	0	0	0	0	0	0
40	5	co	two	1200	61	32	0	6	0	0	0	0	0	6	15

**Table 66: Trunk Group Summary report field descriptions 1 of 5**

Field	Description
<b>Peak Hour for All Trunk Groups</b>	The hour during the specified day with the largest total usage, when summed over all trunk groups. Peak hour and busy hour are synonymous. With conventional traffic theory data analysis, there are two methods for determining the peak hour. One is the time-coincident peak hour, meaning that hourly usage values are averaged across days for each hour of the day. The other is the bouncing peak hour, meaning that the highest usage is selected for each day without regard to the average across days. For the bouncing peak hour the highest load on a given day may or may not occur during the time-coincident busy hour. These traffic reports and accompanying trunk group data worksheet only use the bouncing peak hour method. Note that if the total usage for the current hour equals the total usage for the previous peak hour, then the peak hour is the hour with the greatest number of total seizures.
<b>Grp No.</b>	Group Number. A number that identifies each trunk group associated with the displayed data. Group numbers are displayed in numerical order, beginning with the lowest administered number and continuing to the highest administered number.
<b>Grp Siz</b>	Group Size. The number of administered trunks in the trunk group.

**1 of 5**

Table 66: Trunk Group Summary report field descriptions 2 of 5

Field	Description
<b>Grp Type</b>	<p>Group Type. The type of trunk in the trunk group. The system monitors/ measures the following trunk types:</p> <ul style="list-style-type: none"> <li>● Access Tie Trunk (<b>Access</b>)</li> <li>● Advanced Private Line Termination (<b>aplt</b>)</li> <li>● Central Office (<b>co</b>)</li> <li>● Public Network Service Customer Provided Equipment (<b>cpe</b>)</li> <li>● Direct Inward Dialing (<b>did</b>)</li> <li>● Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>● Digital Multiplexed Interface Bit Oriented Signaling (<b>dmi-bos</b>)</li> <li>● Foreign Exchange (<b>fx</b>)</li> <li>● Integrated Services Digital Network (<b>isdn-pri</b>)</li> <li>● Release Link Trunk (<b>rlt</b>)</li> <li>● Session Initiated Protocol (<b>sip</b>)</li> <li>● Tandem (<b>tan</b>)</li> <li>● Tie Trunk (<b>tie</b>)</li> <li>● Wide Area Telecommunications Service (<b>wats</b>)</li> </ul>
<b>Grp Dir</b>	Trunk Group Direction. Identifies whether the trunk group is incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
<b>Meas Hour</b>	Measurement Hour. The hour (using 24-hour clock) in which the measurements are taken. For the <b>last-hour</b> report, it is the last hour of measurement (each trunk group's measurement hour is identical; but not necessarily the same as the indicated peak hour for the day). For the <b>today-peak</b> report, the measurement hour is the peak hour for each trunk group thus far today (each trunk group's measurement hour could be different). For the <b>yesterday-peak</b> report, the measurement hour is the peak hour for each trunk group yesterday (each trunk group's measurement hour can be different).
<b>Total Usage<sup>1</sup></b>	Total usage (in <b>CCS</b> ) for all trunks in the trunk group. Represents the total time the trunks are busy (with calls) during the one-hour measurement period. Total usage measures each time a trunk is seized for use by an incoming call (whether it is picked up or not) or an out going call (only after digits have been dialed).
<b>Total Seize</b>	The number of incoming and outgoing seizures carried on the trunk group. This includes the number of times a trunk in the group is seized, including false starts, don't answer, and busy.

2 of 5

Table 66: Trunk Group Summary report field descriptions 3 of 5

Field	Description
<b>Inc. Seize</b>	Incoming Seize. The number of incoming seizures carried on the trunk group.
<b>Grp Ovf</b>	Group Overflow. The number of calls offered to a trunk group not carried or queued (if a queue is present). Calls rejected for authorization reasons are not included.
<b>Que Siz</b>	Trunk Group Queue Size. A number (0 to 100) that identifies the number of slots assigned to the trunk group queue. This number represents how many calls may be held in queue by the trunk group. If 0 is displayed, then no queue is administered. Hence, the other queue measurements are also 0. Generally, the queue size should be larger than the trunk group size; however, not more than three times as large as the trunk group size.
<b>Call Qued</b>	Calls Queued. The total number of calls that entered the trunk group queue after finding all trunks busy.
<b>Que Ovf</b>	Queue Overflow. The total number of calls not queued because the queue is full. These calls receive a reorder signal. <b>Suggested actions:</b> Generally, this field indicates the number 0. If this field indicates a high number, then either the queue size may be too small, or add more trunks to reduce the number of calls queuing.
<b>Que Abd</b>	Queue Abandoned. The number of calls removed from the queue in one of the following manners: <ul style="list-style-type: none"> <li>• By the system because they have been in the queue for more than 30 minutes</li> <li>• By the user (for example, dialing the cancel code).</li> </ul> <b>Suggested action:</b> Typically, this field indicates a small number. However, a large number generally indicates the queue size is too large and people are abandoning because they remained in queue for a long holding time and gave up.
<b>Out Srv</b>	Out of Service. The number of trunks in the trunk group out of service (listed as maintenance busy) at the time data is collected. An individual trunk may be taken out of service by the switch whenever an excessive number of errors occur, or by maintenance personnel to run diagnostic tests. <b>Suggested action:</b> If the trunks are removed from service by the switch, then the appropriate maintenance personnel should be notified. The objective is to keep all members of a trunk group “in service.” Generally, you should not make adjustments to the trunk group because of “Out of Service” trunks, but should get those trunks returned to service. For specific details, refer to <a href="#">Trunk Out of Service report</a> on page 256.

3 of 5

Table 66: Trunk Group Summary report field descriptions 4 of 5

Field	Description
% ATB	<p>Percentage All Trunks Busy. The percentage of time all trunks in the trunk group were simultaneously in use during the measurement interval.</p> <p><b>Note:</b> In use means the trunks are busy — either serving calls or because they are busied-out by maintenance.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. If the group direction is outgoing or two-way, then a high number in the % ATB field and nothing in the Grp Ovfl or Que Ovfl indicates everything is functioning normally. However, a more typical scenario is a high number in this field and a high number in the Grp Ovfl field. This indicates a possible problem that necessitates further analysis. Unless it is the last trunk group in the pattern, overflow is to the next choice trunk group, and the number in the Grp Ovfl field is of no great significance. Otherwise, the obvious choice is to add more trunks to the trunk group.</li> <li>2. If the group direction is incoming, then a high number in this field is bad. It indicates some incoming calls are probably blocked. Generally, you want to add more trunks, thus lowering the % <b>ATB</b> and decreasing the number of calls blocked.</li> </ol>

4 of 5

Table 66: Trunk Group Summary report field descriptions 5 of 5

Field	Description
% Out Blk	<p>Percentage Outgoing Blocking. The percentage of offered calls not carried on the trunk group. It does not include unauthorized calls denied service on the trunk group (due to restrictions) or calls carried on the trunk group but do not successfully complete at the far end (that is, where there is no answer). For trunk groups without a queue, the calls not carried are those calls that arrive when all trunks are busy. The number of Outgoing Seizures is calculated as follows:</p> $\text{Outgoing Seizures} = \text{Total Seizures} - \text{Incoming Seizures}$ <p>Similarly, the equation for calculating Outgoing Calls Offered is as follows:</p> $\text{Outgoing Calls Offered} = \text{Group Overflow} + \text{Outgoing Seizures}$ $\% \text{ OutBlk} = \left[ \frac{\text{Group Overflow}}{\text{Outgoing Calls Offered}} \right]$ <p>For trunk groups with a queue, the calls not carried are those calls that arrive when all trunks are busy and the queue is full (Queue Overflow) and calls removed from queue before being carried (Queue Abandoned). For this scenario, the Percentage Outgoing Blocking is calculated as follows:</p> $\text{Outgoing Calls Offered} = \text{Que Ovf} + \text{Que Abd} + \text{Outgoing Seizures}$ $\% \text{ OutBlk} = \left[ \frac{\text{Queue Overflow} + \text{Que Abd}}{\text{Outgoing Calls Offered}} \right] \times 100$ <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>3. You can increase the length of the queue rather than adding more trunks. Subsequently, you should monitor the Que Abd field to insure it stays within reasonable limits.</li> <li>4. If conditions are such that Step 1 is not appropriate, then you may find it necessary to add more trunks.</li> </ol> <p><b>Note:</b> If you are using ARS you may see a high number in this field. This only indicates calls are overflowing to the next choice.</p>
Wideband Flag	<p>If the trunk group supports wideband (n X <b>DS0</b>) switching, a "W" appears next to the trunk group entry. In addition, if any trunk group on the report supports wideband switching, the tag "W = Wideband Support" appears in the report heading.</p>

5 of 5

1. The usage that wideband calls contribute to this measurement is proportional to the resources the calls consume. For example, a 384-kbps call contributes six times more to the total usage than does a 64-kbps call.

---

## Trunk Group Hourly report

The Trunk Group Hourly report provides data necessary to validate the information in the Trunk Group Summary report and to size the trunk groups. A separate report is generated for each trunk group. On the G3r, a maximum of 75 trunk groups can be studied hourly at the same time. On the G3csi and G3si, a maximum of 25 trunk groups can be studied.

**Note:**

In order to display these hourly reports, you must first complete the Trunk Group Measurement Selection screen. See [Specifying trunks to monitor for Trunk Group Hourly report](#) on page 251.

## Command

To display the Trunk Group Hourly report:

Type `list measurements trunk-group hourly <assigned trunk group number> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command —`assigned trunk group number`. Enter the trunk group number for which you want to list trunk group activity.

**Options:** The `schedule` option is available for this command.

## Screen

[Figure 96](#) shows a typical screen for the Trunk Group Hourly report.

[Table 67](#) and [Table 68](#) describe the data fields presented in this report. The report contains two sections: a header section that provides report ending time and trunk group administrative information; and a data section that provides the measurement data for 24 hours.

Note that if a translation change has occurred during a particular hour, an asterisk (\*) appears in front the data for the hour in which the translation change occurred.



**Figure 96: Trunk Group Hourly report**

list measurements trunk-group hourly 40												
Switch Name: Cust_Switch_Name							Date: 1:58 pm FRI FEB 3, 2006					
TRUNK GROUP HOURLY REPORT — WIDEBAND Support												
Grp No: 40		Grp Size: 5		Grp Type: isdn		Grp Dir: two		Que Size: 0				
Meas	Total	Maint	Total	Inc.	Tandem	Grp	Call	Que	Que	Out	%	%Out
Hour	Usage	Usage	Seize	Seize	Seize	Ovfl	Qued	Ovf	Abd	Srv	ATB	Blk
1200	61	0	32	0	0	6	0	0	0	0	6	15
1100	62	0	33	0	0	0	0	0	0	0	0	0
1000	69	0	63	0	0	4	0	0	0	0	3	5
*900	26	0	0	0	0	0	0	0	0	0	0	0
800	1	1	4	0	0	0	0	0	0	0	0	0

**Table 67: Trunk Group Hourly report header field descriptions**

Field	Description
<b>Grp No</b>	Group Number. A number that identifies the trunk group associated with the displayed data.
<b>Grp Size</b>	Group Size. The number of trunks in the trunk group.
<b>Grp Type</b>	Group Type. All trunk group types except <b>PCOL</b> trunk groups.
<b>Grp Dir</b>	Group Direction. Incoming, outgoing, or two-way.
<b>Que Size</b>	Queue Size. The size of the trunk group queue. If there is no queue, the size is zero and the other queue measurements are irrelevant.

**Table 68: Trunk Group Hourly report data field descriptions 1 of 2**

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>Total Usage<sup>1</sup></b>	The total time (in CCS) trunks in the trunk group are unavailable to carry a new call. It includes the time the trunks are busy on calls, false starts, don't answers, or any other reason the trunk is unavailable. Not included are calls denied service on the trunk group for authorization reasons or because of queue overflow.

**1 of 2**

**Table 68: Trunk Group Hourly report data field descriptions 2 of 2**

Field	Description
<b>Maint Usage</b>	Maintenance Usage. The total usage (in CCS) of trunks in this trunk group for Maintenance Busy or any other non-call situation where trunks are not available to carry a call.
<b>Total Seize</b>	Total Seizures. The total number of seizures on the trunk group.
<b>Inc. Seize</b>	Incoming Seizures. The number of incoming seizures on the trunk group.
<b>Tandem Seize</b>	Tandem Seizures. The number of trunk-to-trunk call seizures. This count is incremented on the outgoing-trunk side of the connection.
<b>Grp Ovfl</b>	Group Overflow. The outgoing calls offered to the trunk not carried. These are calls that arrive when all trunks in the group are busy and are not queued on the trunk group. It does not include calls denied service on the trunk group because of authorization reasons.
<b>Call Qued</b>	Calls Queued. The calls that enter the trunk group queue. This can happen automatically for analog terminal users or at the request of the caller for other terminal types.
<b>Que Ovfl</b>	Queue Overflow. The number of calls that arrive when all slots in the Trunk Group Queue are occupied.
<b>Que Abd</b>	Queue Abandoned. Calls removed from the queue either by the system because they have been in the queue for the maximum allowed time (currently fixed at thirty minutes), or forced by users when they cancel the auto-call back, set earlier to put the call in the queue.
<b>Out Serv</b>	Out of Service. The number of trunks in the trunk group out of service at the time the data is collected.
<b>% ATB</b>	Percent All Trunks Busy. The percentage of time during the measurement interval all trunks in the group are unavailable to carry a new call (All Trunks Busy).
<b>%Out Blk</b>	Percent Outgoing Blocking. The percent of the outgoing seizures, including tandem seizures, offered to that trunk group that are not carried on that trunk group. The value is calculated as follows: $\% \text{ Out Blk} = \{Grp \text{ Ovfl} / [Total \text{ Seize} - Inc \text{ Seize}]\} \times 100$
<b>Wideband Flag</b>	If the trunk group supports wideband (n X <b>DS0</b> ) switching, "Wideband Support" appears in the report heading.

**2 of 2**

1. The usage that wideband calls contribute to this measurement is proportional to the resources the calls consume. For example, a 384-kbps call contributes six times more to the total usage than does a 64-kbps call.

---

## Specifying trunks to monitor for Trunk Group Hourly report

To specify which trunk groups to monitor for the Trunk Group Hourly report, use the Trunk Group Measurement Selection screen. The Summary Report lists all administered trunks. You can administer a maximum of 75 trunk groups for the hourly report studied hourly on the G3r; on the G3csi and G3si, the maximum is 25. If you do not select which trunk groups to study, none appear on the hourly report.

### Command

To display the Trunk Group Measurement Selection screen:

Type **display meas-selection trunk-group [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for the display command only.

To change a Trunk Group Measurement Selection:

1. Type **change meas-selection trunk-group** and press **Enter**.
2. Enter the trunk group number to be monitored and press **Enter**.

Trunk group numbers do not have to be in numerical order. If the trunk group number you want is not listed, add the trunk group number (if there is space available), or replace an existing trunk group number you no longer need. Press **Enter** until the cursor is placed on the unwanted trunk group number and enter the new number, or press **CLEAR FIELD** and enter the new trunk group number.

### Screen

[Figure 97](#) shows a typical screen for the Trunk Group Measurement Selection screen on the G3r.

[Table 69](#) describes the data fields presented in this screen.

**Figure 97: Trunk Group Measurement Selection screen**

```
display meas-selection trunk-group
```

TRUNK GROUP MEASUREMENT SELECTION					
Trunk Group Numbers					
1: 78	16: 15	31: 96	46: 333	61: 580	
2: 80	17: 16	32: 97	47: 444	62: 590	
3: 666	18: 17	33: 98	48: 555	63: 591	
4: 1	19: 18	34: 100	49: 101	64: 592	
5: 2	20: 81	35: 120	50: 102	65: 10	
6: 3	21: 82	36: 200	51: 103	66: 99	
7: 4	22: 83	37: 22	52: 104	67: 357	
8: 5	23: 88	38: 234	53: 201	68: 467	
9: 6	24: 89	39: 245	54: 203	69: 665	
10: 7	25: 90	40: 246	55: 205	70: 664	
11: 9	26: 91	41: 247	56: 207	71: 663	
12: 11	27: 92	42: 250	57: 209	72: 662	
13: 12	28: 93	43: 255	58: 550	73: 661	
14: 13	29: 94	44: 256	59: 560	74: 599	
15: 14	30: 95	45: 257	60: 570	75: 588	

**Table 69: Trunk Group Measurement Selection screen field descriptions**

Field	Description
Trunk Group Numbers	The trunk group(s) to be studied hourly.

## Highest Hourly Trunk Group Blocking Performance report

The Highest Hourly Trunk Group Blocking Performance report gives a graphical and numerical display of the peak hour blocking for each trunk group. You can display this performance report for the previous (yesterday) or current (today) day.

### Command

To display the Highest Hourly Trunk Group Blocking Performance report:

Type **list performance trunk-group <yesterday/today> [schedule]** and press **Enter**.

**Required Fields:** There is one required field for this command — **yesterday/today**.

- Enter **yesterday** to list the trunk group activity for yesterday.
- Enter **today** to list the trunk group activity for today.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 98](#) shows a typical screen for the Highest Hourly Trunk Group Blocking Performance report.

[Table 70](#) describes the data fields presented in this report.

---

**Figure 98: Highest Hourly Trunk Group Blocking Performance report**

```
list performance trunk-group yesterday
Switch Name:  Cust_Switch_Name           Date: 4:28 pm FRI FEB 3, 2006
      HIGHEST HOURLY TRUNK GROUP BLOCKING PERFORMANCE
Grp Grp  Grp Grp  --% Outgoing Blocking or % ATB-- %Out  %Time Meas  Total
No. Type Dir Size 1 2 3 4 5 6 7 8 9 10 20 30 40 50 Blkg  ATB   Hour  Calls
1  fx   in   6   ////////////////////////////////////////////////// *    9    1200  876
2  wats in   5   ////////////////////////////////////////////////// *   30    1400   94
3  tie  two 14   ////////////////////////////////////////////////// 7    36    1300  312
5  did  in  10   ////////////////////////////////////////////////// *   99    1300  542
12 co   two 18   ////////////////////////////////////////////////// 9    96    1400  614
23 tie  two 7    ////////////////////////////////////////////////// 18   81    1400  359
41 tie  two 8    ////////////////////////////////////////////////// 26   91    1300  411
221 tie two 5    ////////////////////////////////////////////////// 11   77    1300  109
Command successfully completed
Command:
```

---

**Table 70: Highest Hourly Trunk Group Blocking Performance report field descriptions 1 of 2**

Field	Description
<b>Grp No.</b>	Group Number. The number that identifies the trunk group associated with the displayed data.
<b>Grp Type</b>	<p>Group Type. The type of trunk associated with the accumulated data. The system monitors the following trunk types (see <i>Administrator's Guide for Avaya Communication Manager</i>):</p> <ul style="list-style-type: none"> <li>● Access (<b>access</b>)</li> <li>● Advanced Private Line Termination (<b>aplt</b>)</li> <li>● Central Office (<b>co</b>) or Public Network Service</li> <li>● Customer Provided Equipment (<b>cpe</b>)</li> <li>● Direct Inward Dialing (<b>did</b>)</li> <li>● Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>● Digital Multiplexed Interface Bit Oriented Signaling (<b>dmi-bos</b>)</li> <li>● Foreign Exchange (<b>fx</b>)</li> <li>● Integrated Services Digital Network (<b>isdn-pri</b>)</li> <li>● Release Link Trunk (<b>rlt</b>)</li> <li>● Session Initiated Protocol (<b>sip</b>)</li> <li>● Tandem (<b>tandem</b>)</li> <li>● Tie Trunk (<b>tie</b>)</li> <li>● Wide Area Telecommunications Service (<b>wats</b>)</li> </ul>
<b>Grp Dir</b>	Trunk Group Direction. Identifies whether the trunk group is incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
<b>Grp Size</b>	Group Size. The number of trunks in the trunk group.
<b>%Out Blkg</b>	Percentage Outgoing Blocking. The percentage of calls that arrive when all trunks are busy.

**1 of 2**

**Table 70: Highest Hourly Trunk Group Blocking Performance report field descriptions 2 of 2**

Field	Description
<b>% Outgoing Blocking or % ATB</b>	<p>Percent Outgoing Blocking or Percent All Trunks Busy. A graphical representation equivalent to the numerical value of calls offered but not carried. For two-way and outgoing trunk groups, peak hour blocking is the largest % Outgoing Blocking. For incoming trunks, peak hour is the largest % <b>ATB</b>. Since % Outgoing Blocking is meaningless for incoming trunks, it is displayed as * in that column. For trunk groups without a queue, calls not carried are those calls that arrive when all trunks are busy. For trunk groups with a queue, calls not carried are calls that arrive when all trunks are busy and the queue is full (Queue Overflow) and calls removed from queue before being carried (Queue Abandoned).</p> <p><b>Suggested actions:</b> If a trunk group has a higher percent of blocking than desired, determine the exact reason that the trunk group is blocking calls.</p> <ol style="list-style-type: none"> <li>1. The Total Calls field indicates the calling volume. If excessive blocking is because of calling volume alone, consider the possibility of adding more members to the trunk group.</li> <li>2. If excessive blocking is not because of calling volume, the reason might be because trunks are in the maintenance busy state. You can use the Trunk Outage Report (described next) to identify those trunks determined to be out of service. Furthermore, and as required, use the <b>ACA</b> feature to monitor any trunk group still experiencing unexplained excessive blockage.</li> <li>3. For identified problems, determine whether maintenance has been or should be alerted.</li> </ol>
<b>% Time ATB</b>	<p>Percent of Time All Trunks Busy. The percent of time all trunks in the trunk group are simultaneously in use during the measurement interval.</p> <p><b>Note:</b> In use means the trunks are busy — either serving calls, or because they are busied-out by maintenance.</p>
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>Total Calls</b>	The total number of calls (seizures) for the trunk group during the peak hour of blocking.

**2 of 2**

## Trunk Out of Service report

The Trunk Out of Service report lists up to a maximum of five trunks (in each trunk group) out of service when sampled. The number of times the trunks are out of service when sampled is also given. The trunk outage data is kept for the current day, the previous day, and the last hour.

### Command

To display the Trunk Out of Service report:

Type `list measurements outage-trunk <yesterday/today/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is one required field for this command — `yesterday/today/last-hour`.

- Enter `yesterday` to list the trunk group activity for yesterday.
- Enter `today` to list the trunk group activity for today.
- Enter `last-hour` to list the trunk group activity for the most recently completed hour.

**Options:** The `schedule` option is available for this command.

### Screen

[Figure 99](#) shows a typical screen for the Trunk Out of Service report.

[Table 71](#) describes the data fields presented in this report.

**Figure 99: Trunk Out of Service report**

```
list measurements outage-trunk yesterday
Switch Name: Cust_Switch_Name           Date:  4:01 pm FRI FEB 3, 2006
                TRUNK OUT OF SERVICE REPORT
(trunks sampled for "out-of-service" condition once each hour)
Grp   Grp   Grp   Grp   Grp   #Sampled
No.   Type  Dir   Size  Mbr#  Outages
1     co    two   20    2     1
1     co    two   20    4     8
1     co    two   20    5     3
1     co    two   20    6     2
4     wats  out   10    2     5
4     wats  out   10    4     3
4     wats  out   10    9     2
4     wats  out   10   10     1
Command successfully completed
Command:
```



Table 71: Trunk Out of Service report field descriptions 1 of 2

Field	Description
Grp No.	Group Number. The number that identifies each trunk group associated with the displayed data.
Grp Type	<p>Group Type. The type of trunk associated with the accumulated data. The system monitors the following trunk types (see <i>Administrator's Guide for Avaya Communication Manager</i>):</p> <ul style="list-style-type: none"> <li>● Access (<b>access</b>)</li> <li>● Advanced Private Line Termination (<b>aplt</b>)</li> <li>● Central Office (<b>co</b>) or Public Network Service</li> <li>● Customer Provided Equipment (<b>cpe</b>)</li> <li>● Digital Multiplexed Interface Bit Oriented Signaling (<b>dmi-bos</b>)</li> <li>● Direct Inward Dialing (<b>did</b>)</li> <li>● Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>● Foreign Exchange (<b>fx</b>)</li> <li>● Integrated Services Digital Network (<b>isdn-pri</b>)</li> <li>● Release Link Trunk (<b>rlt</b>)</li> <li>● Session Initiated Protocol (<b>sip</b>)</li> <li>● Tandem (<b>tandem</b>)</li> <li>● Tie Trunk (<b>tie</b>)</li> <li>● Wide Area Telecommunications Service (<b>wats</b>)</li> </ul>
Grp Dir	Group Direction. Identifies whether the trunk group is incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
Grp Size	Group Size. The number of trunks in the trunk group.

1 of 2

**Table 71: Trunk Out of Service report field descriptions 2 of 2**

Field	Description
<b>Grp Mbr#</b>	Group Member Number. The number that identifies a specific trunk member (in the group) out of service.
<b>#Sampled Outages</b>	<p>Number of Sampled Outages. The number of times the group member is sampled as out of service over the period covered by the report (yesterday, today, or last hour). Yesterday includes the 24 hours beginning at midnight and ending at midnight. Today includes those hours from midnight to the most recently completed hour. Last hour only includes the most recently completed hour.</p> <p><b>Note:</b> If there are no outages, no data is displayed.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. The sampling period is once per hour. Therefore, if the report covers several hours (for example, the yesterday or today report) but the column only indicates a small number of outages, then the trunk member may be providing intermittent service. To determine whether a specific trunk member is functioning, use the Facility Test Calls feature.</li> <li>2. If a trunk is suspected of causing problems, use the <b>ACA</b> feature to monitor the particular trunk group.</li> <li>3. If a trunk member is totally out of service, then (depending on local arrangements) you may choose to refer the problem to maintenance personnel.</li> </ol>

**2 of 2**


---

## Trunk Group Status report

The Trunk Group Status report gives a current indication of the load on various trunk groups in terms of the number of calls waiting to be serviced.

For each trunk group, the Trunk Group Status Report displays the number of calls in the queue waiting to be serviced. For comparative analysis, the trunk members in the group active on calls are also displayed. With this data, it is possible to rearrange the members in the groups to provide load balancing. For example, if one group shows a higher number of calls waiting in the queue and the size of the group is too small, more members can be added to that group.

## Command

To display the Trunk Group Status report:

Type **monitor traffic trunk-groups** [option] and press **Enter**.

**Options:** Entering the command without an option produces a display of the first 60 administered trunk groups. To display higher numbered trunk groups, enter the number of the first group of the 60 trunk groups to be displayed. Only those trunk groups administered are shown on the report.

Because the command is constantly updated, you must press **CANCEL** to cancel the command.

## Screen

[Figure 100](#) shows a typical screen for the Trunk Group Status report. If the system has less than 60 groups administered, then some of the right-hand columns are blank. The date and time at which the report was requested are displayed to the right of the screen title.

[Table 72](#) describes the data fields presented in the Trunk Group Status report.

The data on the screen is updated every 60 seconds. If the values of any of the fields for a given trunk group are changed, all fields for that trunk group are updated.

**Figure 100: Trunk Group Status report**

```
monitor traffic trunk-groups
```

TRUNK GROUP STATUS					19:03 FRI FEB 3 2006														
#	S	A	Q	W	#	S	A	Q	W	#	S	A	Q	W	#	S	A	Q	W
1	20	10	0	0	16	14	3	0	0	59	9	1	0	0					
2	21	21	20	10	23	4	6	8	0	60	8	1	18	0					
3	31	12	0	0	25	5	0	0	0	61	2	0	0	0					
4	10	5	10	8	27	12	2	18	0	62	4	1	8	0					
5	9	5	10	0	30	7	2	14	0	63	6	1	15	0					
6	10	8	10	0	41	5	1	0	0	73	6	0	8	0					
7	4	1	8	0	42	12	4	20	0	211	22	2	0	0					
8	4	4	8	2	43	6	3	0	0										
9	5	2	10	0	44	16	6	18	0										
10	7	3	14	0	45	8	0	0	0										
11	6	2	12	0	46	8	3	18	0										
12	5	2	10	0	54	9	2	0	0										
13	4	1	0	0	55	6	6	12	3										
14	5	4	8	0	57	8	4	10	0										
15	5	3	9	0	58	4	1	0	0										

(#: Group; S: Grp Size; A: Active Members; Q: Q length; W: Calls Waiting.)

Table 72: Trunk Group Status report field descriptions

Field	Description
#	Group Number. The number that identifies each trunk group.
S	Group Size. The number of trunks administered for the trunk group.
A	Active Group Members. The number of trunk members in the group active on a call. Busied-out trunks are not active.
Q	Queue Length. The length of the queue administered for the group.
W	Waiting Calls. The number of calls waiting in the group queue.

## Data analysis guidelines for trunk group reports

The following guidelines are intended to show an easy and fast method of determining whether the collected data is invalid or questionable. These guidelines represent the least you should do for validation. Perform additional validation as necessary.

Use the list performance trunk-group report to obtain an overall indication of those trunk groups that may be providing poor service. The five trunk groups with the highest percentage of blocking are listed in the list performance summary report. However, this report (summary) has the following limitations:

- The Group Blocking shown on this report is the percentage of blocking for outgoing and two-way trunk groups. For incoming trunk groups, the Group Blocking value is the percentage of all trunks busy (**ATB**). A high value for either % **ATB** or the % Out Blocking is an indication of possible traffic load problems.
- A two-way trunk group with undesirable incoming blocking do not show any problems on this report, since only outgoing blocking is displayed on two-way trunks.

Use data from the Trunk Group Measurements report for a more accurate estimate of service levels on incoming and two-way trunk groups. To validate the Trunk Group Measurements report, verify the following data is in order:

- Total Usage (in **CCS**) should not exceed 36 times group size. For example, with two trunks, the total usage measured should not exceed  $2 \times 36 = 72$  **CCS**.
- On incoming trunks, total seizures should be equal to total incoming seizures.
- Incoming trunk groups should have a queue length of zero.
- The number of incoming calls should never be greater than the total number of calls carried by all trunks in the group.
- Outgoing trunk groups should indicate zero as their number of incoming calls.
- Out-of-service trunks should never be greater than group size.

- For trunk groups with queues, the two fields (Calls Queued and Queue Overflow) should total the number displayed in the Group Overflow field.
- For trunk groups with queues, the Queue Overflow field is incremented whenever a call finds the all trunks busy condition and the queue is full.
- For trunks groups without queues, the Calls Queued and Queue Overflow fields are always zero. The blocked call count is reflected in the Group Overflow field.
- If the Percent Outgoing Blocking field shows a value greater than zero, the Queue Overflow (if a queue is administered for the trunk group), Queue Abandon, and Group Overflow fields should also have values greater than zero.
- Measurement hour data reported in the System Status Report (for example, monitor system view1 or monitor system view2) should correspond to those shown on the hourly trunk group measurements and performance reports.

## Analyzing trunk group data

The Trunk Group Summary report may be used to determine:

- Average holding time
- Trunk blockage
- Number of trunks required for a specified Grade of Service

**Note:**

Data collected in a real-time environment virtually always deviates from the theoretically predicted data because of the asynchronous nature of processes and interactions with other events such as maintenance.

### Determining Average Holding Time

Determine the Average Holding Time (in seconds) of a trunk group by dividing the Total Usage **CCS** by Calls Answered and multiplying the result by 100. A short holding time can indicate trouble.

**Example:**

Assume the following data is reported for a one-way trunk group:

- Total Usage **CCS** = 656 **CCS**
- Total Seizures = 280

Determine the Average Holding Time as follows:

$$\text{Average Holding Time} = \left[ \frac{\text{Total Usage CCS}}{\text{Total Seizures}} \right] \times \frac{100 \text{ Seconds}}{\text{CCS}}$$

$$\text{Average Holding Time} = \left[ \frac{656 \text{ CCS}}{280} \right] \times \frac{100 \text{ Seconds}}{\text{CCS}}$$

$$\text{Average Holding Time} = 234 \text{ seconds (or 3 minutes and 54 seconds)}$$

### Determining Trunk Group Blockage

Generally, use either the list measurements trunk-group summary or list performance trunk-group report for determining trunk group blockage. All of the appropriate calculations are performed by the system and the results are displayed via the reports. However, to be complete, the equations and an example are included.

To determine the Percent Blocking for one-way outgoing and two-way trunk groups, respectively, use the following equations:

One-Way Trunk Group (outgoing)

$$\text{Percent Out Blocking} = \left[ \frac{\text{Group Overflow}}{\text{Total Seizures} + \text{Group Overflow}} \right] \times 100 \%$$

Two-Way Trunk Group

$$\text{Percent Out Blocking} = \left[ \frac{\text{Group Overflow}}{\text{Total Seizures} - \text{Incoming Seizures} + \text{Group Overflow}} \right] \times 100 \%$$

#### Note:

If the trunk group has a queue, group overflow is calculated as follows:

$$\text{Group Overflow} = \text{Queue Overflow} + \text{Queue Abandons}$$

#### Example:

With the following data, determine the Percent Blocking of a two-way **CO** trunk group without a queue:

- Total Seizures = 280
- Incoming Seizures = 170
- Group Overflow = 6

Using the equation for two-way trunk groups, you can calculate average Percent Blocking as follows:

$$\text{Percent Blocking} = \left[ \frac{6}{(280 - 170) + 6} \right] \times 100 = 5.2 \%$$

### Determining the number of trunks required for a specified Grade of Service

For both stand-alone and last-choice trunk groups, use the trunk group peak traffic reports to determine the number of trunks required to provide a specified Grade of Service. The number of trunks required strictly depends on the Grade of Service you want to provide.

#### Note:

Stand-alone and last-choice trunk groups do not reroute their blocked calls. As a contrast, Alternate Routing trunks do reroute their blocked calls.

The procedure for determining the optimal number of trunk members for a particular trunk group requires you initially generate the appropriate reports and subsequently record the data on the Trunk Group Data Worksheets. What you attempt to accomplish is to identify the peak hour and the traffic data for that hour. The **list measurements trunk-group summary yesterday-peak scheduled** command results in generating all of the necessary data on a daily basis. You can enter 20 weekdays of data on each Trunk Group Data Worksheet. Subsequently, you need only scan the worksheet to identify which measurement hour occurs most frequently. The most frequent measurement hour is considered the peak hour. You should use the data for the identified peak hour, that has the highest total usage, to calculate the required number of trunks.

#### Example 1:

##### Assumptions

1. You obtain data (daily) and record that data on appropriately identified Trunk Group Data Worksheets.
2. 1300 is the peak hour (or bouncing peak hour).
3. Trunk Group 1 is suspected of not providing the desired Grade of Service.

For two-way trunk groups the equation for determining Calls Carried is as follows:

$$\text{Calls Carried} = \text{Total Seize}$$

$$\text{Calls Carried} = 280$$

For Trunk Groups Without a Queue

$$\text{Total Calls Offered} = \text{Calls Carried} + \text{Group Overflow}$$

### For Trunk Groups With a Queue

$$\begin{aligned} \text{Total Calls Offered} &= \\ \text{Calls Carried} &+ \text{Queue Overflow} + \text{Queue Abandoned} \end{aligned}$$

Since Trunk Group 1 has a queue, the equation for Calls Offered is as follows:

$$\begin{aligned} \text{Total Calls Offered} &= \text{Calls Carried} + \text{Queue Overflow} \\ \text{Total Calls Offered} &= 280 + 50 + 1 \\ \text{Total Calls Offered} &= 331 \end{aligned}$$

The Average Holding Time is determined as follows:

$$\begin{aligned} \text{Average Holding Time (in seconds)} &= \left[ \frac{\text{Total Usage (in CCS)}}{\text{Total Seizures}} \right] \times \frac{100 \text{ seconds}}{\text{CCS}} \\ \text{Average Holding Time (in seconds)} &= \left[ \frac{656 \text{ CCS}}{280 \text{ seizures}} \right] \times \frac{100 \text{ seconds}}{\text{CCS}} \\ \text{Average Holding Time (in seconds)} &= 234.29 \text{ seconds} \end{aligned}$$

Offered Load is defined as the number of calls in progress if there had been no blocking or delay. The Offered Load is calculated as follows:

$$\begin{aligned} \text{Offered Load} &= \text{Average Holding Time (in seconds)} \times \text{Calls Offered} \\ \text{Offered Load (in CCS)} &= \frac{234.29 \text{ (in seconds)} \times 331 \text{ calls}}{100 \text{ seconds per CCS}} \\ \text{Offered Load (in CCS)} &= 775.5 \end{aligned}$$

The calculated Offered Load is used with the Retrial Capacity tables, to determine the number of trunks required to provide a specified Grade of Service. For more information, refer to *Basic Traffic Analysis*.

The desired Grade of Service is dependent on the particular trunk type (for example, **CO**, **did**, **tie**, **FX**, **WATS**, and so on) and the nature of the business the trunk type supports. Generally, those trunk types that are least expensive (for example, **CO**) are engineered for a 1 percent (P.01) Grade of Service. Those trunk types that are more expensive are engineered to provide from 2 percent to 5 percent (P.02 to P.05) Grade of Service.



**Note:**

A one percent Grade of Service means the fraction of calls blocked during the identified bouncing peak hour should not exceed 1 percent.

Assuming we desire a P.01 Grade of Service on Trunk Group 1, for the calculated Offered Load of 775.5 **CCS**, the Retrial Capacity tables in *Basic Traffic Analysis* indicate (under the column heading GROUP SIZE) 32 trunks are required.

The number of currently functioning (or in service) trunks is calculated as follows:

$$\# \text{ of In-Service Trunks} = \text{Trunk Group Size} - \text{Out of Service Trunks}$$

$$\# \text{ of In-Service Trunks} = 32 - 9$$

$$\# \text{ of In-Service Trunks} = 23$$

Therefore, since 32 trunks are required but only 23 are currently in service, nine additional trunks must be added to obtain the desired Grade of Service.

**Example 2:****Assumptions**

1. You obtain data (daily) and record that data on appropriately identified Trunk Group Data Worksheets.
2. 1300 is the peak hour (or bouncing peak hour).
3. Data on trunk group 4 indicates a higher than desired percentage of outgoing blockage.

For one-way outgoing trunk groups, the equation for determining Calls Carried is as follows:

$$\text{Calls Carried} = \text{Total Seize}$$

$$\text{Calls Carried} = 81$$

Since Trunk Group 4 does not have a queue, the equation for Calls Offered is as follows:

$$\text{Calls Offered} = \text{Calls Carried} + \text{Group Overflow}$$

$$\text{Calls Offered} = 81 + 5$$

$$\text{Calls Offered} = 86$$

The Average Holding Time is determined as follows:

$$\text{Average Holding Time (in seconds)} = \left[ \frac{\text{Total Usage (in CCS)}}{\text{Total Calls}} \right] \times \frac{100 \text{ seconds}}{\text{CCS}}$$

$$\text{Average Holding Time (in seconds)} = \left[ \frac{73 \text{ CCS}}{81 \text{ calls}} \right] \times \frac{100 \text{ seconds}}{\text{CCS}}$$

$$\text{Average Holding Time (in seconds)} = 90.12 \text{ seconds}$$

Offered Load is defined as the number of calls in progress if there is no blocking or delay. The Offered Load can be calculated as follows:

$$\text{Offered Load} = \text{Average Holding Time (in seconds)} \times \text{Calls Offered}$$

$$\text{Offered Load (in CCS)} = 90.12 \text{ (in seconds)} \times 86 \text{ calls}$$

$$\text{Offered Load (in CCS)} = 77.50 \text{ CCS or } 78 \text{ CCS}$$

The calculated Offered Load is used, with the Retrial Capacity tables, to determine the number of trunks required to provide a specified Grade of Service.

Assuming we desire a P.03 Grade of Service on Trunk Group 4, then for the calculated Offered Load of 78 **CCS** the Retrial Capacity tables in *Basic Traffic Analysis* indicate (under the column heading GROUP SIZE) six trunks are required. The number of currently functioning (or in-service) trunks is as follows:

$$\# \text{ of In-Service Trunks} = \text{Trunk Group Size} - \text{Out of Service Trunks}$$

$$\# \text{ of In-Service Trunks} = 5 - 1$$

$$\# \text{ of In-Service Trunks} = 4$$

Therefore, since six trunks are required but only four are currently in-service, two additional trunks are needed to obtain the desired Grade of Service. The obvious options are have the out-of-service trunk repaired and just add one new trunk, or add two new trunks.

### Example 3:

#### Assumptions

1. You obtain data (daily) and record that data on appropriately identified Trunk Group Data worksheets.
2. 1300 is the peak hour (or bouncing peak hour).
3. That Trunk Group 2 indicates a higher % **ATB** than desired.

Incoming trunk groups do not have queues. Therefore, from the switch perspective you cannot determine the number of calls blocked. But, in this case Total Usage is actually the Carried **CCS**. You can use the Carried **CCS**, with the Retrial Capacity tables, to determine the number of trunks required to provide a specified Grade of Service.

Assuming you desire a P.05 Grade of Service on trunk group #2, then for a Carried **CCS** of 201 **CCS** the Retrial Capacity tables in the *DEFINITY Communications System and System 75 and System 85 Traffic Tables*, 555-104-503, indicates (under the column heading GROUP SIZE) 10 trunks are required. The number of currently functioning (or in-service) trunks is as follows:

$$\# \text{ of In-Service Trunks} = \text{Trunk Group Size} - \text{Out of Service Trunks}$$

$$\# \text{ of In-Service Trunks} = 6 - 0$$

$$\# \text{ of In-Service Trunks} = 6$$

Therefore, since 10 trunks are required but only 6 are currently in-service, four additional trunks are needed to obtain the desired Grade-of-Service. The solution is to add four trunk members to the trunk group.

---

## CBC Trunk Group Measurements report

The CBC Trunk Group Measurements report displays last-hour traffic data for any specified Call-by Call trunk group, provided the trunk group had a Usage Allocation Plan (**UAP**) administered for the last-hour. Use the report to monitor the trunk group and to determine if the **UAP** meets current needs. Whenever it is determined changes are required, you must make these changes on the appropriate trunk group screen(s).

### Note:

If the trunk group is administered to support wideband switching, the tag “WIDEBAND Support” appears in the report title.

## Command

To display the Trunk Group **CBC** Measurements Report:

Type **list measurements cbc-trunk-group <ISDN CBC trunk group number> last-hour [schedule]** and press **Enter**.

**Required Fields:** There is only one required field for this command—**ISDN CBC trunk group number**. Enter the ISDN CBC trunk group number for which you want to list the last-hour traffic data.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 101](#) shows a typical screen for the CBC Trunk Group Measurements report. The line just above the report title displays the date and time for which the report was requested.

[Table 73](#) describes the data fields presented in this report.

---

**Figure 101: CBC Trunk Group Measurements report**

```
list measurements cbc-trunk-group 99 last-hour
Switch Name:  Cust_Switch_Name           Date: 2:15 pm FRI FEB 3 2006
CBC TRUNK GROUP MEASUREMENTS (WIDEBAND Support)
  Peak Hour For CBC Trunk Group 99 : 1300
    Queue Size:40
    Calls Queued:23
    Queue Overflow: 0
    Queue Abandonments: 4
    Out of Service: 0
    Usage Allocation Plan Used
    Plan Number:  1  0  0  0  0  0
    Duration: 60  0  0  0  0  0

Service/      Min Max Meas Total Total Inc.  Tan  Ovf Ovf Ovf %    %    %Out
Feature      Chn Chn Hour Usage Seize Seize Seize TG S/F Max TBM ATB BLK
outwats-bnd   5  12 1300   240   333   0    55   0  0  23   10   2   1
sdn           4   8 1300    40    30  22    1   0  0  0    62   1   0
other         0  20 1300    70    41  36    3   0  0  0     0   0   0
Command successfully completed
Command:
```

---

Table 73: CBC Trunk Group Measurements report field descriptions 1 of 7

Field	Description
Queue Size	<p>Size of the queue for the ISDN-PRI <b>CBC</b> trunk group. If zero is displayed, then no queue is administered. Hence, the other queue measurements is also zero. If the queue is administered, then it serves all of the network services/features administered for the trunk group. However, its functional operation is somewhat different than the queue used with conventional trunk groups. When a particular service/feature uses its allotted maximum number of channels, then any additional call attempts are queued, even though not all of the trunks are currently in use. If the queue is already full, any additional call attempts simply overflow with the caller receiving reorder tone.</p> <p><b>Recommendations:</b> Since one service/feature generally does not experience peak traffic the same time as another service/feature, there is an averaging effect. Furthermore, the queue size for a <b>CBC</b> trunk group need not be much larger than for a non-<b>CBC</b> trunk group. The Queue Size should be larger than the trunk group size; but, typically, not more than three times as large as the trunk group size.</p>
Calls Queued	The total number of calls entered the <b>CBC</b> trunk group queue during the hour.
Queue Overflow	<p>The total number of calls denied access to a trunk, found the queue full, and the caller received reorder tone.</p> <p><b>Suggested actions:</b> Generally, this field displays the number <b>0</b>. If this field indicates a high number, then the queue size may be too small, more trunks may be needed so fewer calls will queue, or the <b>UAP</b> may be too restrictive (for example, some of the “Min Chn” values may be too high, or some of the “Max Chn” values may be too low). Also, see <b>Suggested actions</b> in the % TBM description.</p>

1 of 7

Table 73: CBC Trunk Group Measurements report field descriptions 2 of 7

Field	Description
<b>Queue Abandonments</b>	<p>The number of calls removed from the queue by either the system or the user. The system automatically removes calls from the queue after 30 minutes. A user may abandon that call by canceling the Automatic Callback feature (set earlier to place their call in the queue).</p> <p><b>Suggested action:</b> Recall that a trunk group and its associated queues are sized to accommodate peak-hour traffic loads. Typically, this field indicates a small number. However, a large number generally indicates the queue size is too large and people are abandoning because they remained in queue for a long time. Consider adding more trunks so fewer calls queue.</p>
<b>Out of Service</b>	<p>The number of trunks in the trunk group out of service at the time the measurements are collected. An individual trunk may be taken out of service either automatically by the switch whenever an excessive number of errors occur, or by maintenance personnel in order to run diagnostic tests.</p> <p><b>Suggested action:</b> If the trunks were removed from service by the switch, then the appropriate maintenance personnel should be notified. The objective is to keep all members of a trunk group in service. Generally, you should not make adjustments to the <b>CBC</b> trunk group because of Out of Service trunks, but should get those trunks returned to service.</p>
<b>Usage Allocation Plan Used</b>	<p>A list of the Usage Allocation Plan numbers followed by a list of the durations (in minutes) each plan was in effect during the measurement interval. The Number field can display up to a maximum of six plan numbers. A maximum of three different UAPs (identified by the numbers 1, 2, and 3) may be defined for each trunk group. All three plans are defined on Page 3 of the trunk group screen. Page 4 of the corresponding trunk group screen is where you administer plan assignments.</p>
<b>Usage Allocation Plan Used (Contd)</b>	<p>Each <b>CBC</b> trunk group is administered with either “fixed” allocation or “scheduled” allocation. If fixed, it remains in effect continuously. If scheduled, the designated plans are activated on a per-day and time-of-day basis determined by the schedule.</p>
<b>Service Feature</b>	<p>The names of up to 10 services/features and the special identifier “other” for which the associated measurements are reported.</p>

2 of 7

Table 73: CBC Trunk Group Measurements report field descriptions 3 of 7

Field	Description
<b>Min Chn</b>	Minimum Number of Channels. The minimum number of channels in the ISDN-PRI <b>CBC</b> trunk group allocated to the specified service/feature at the time the measurements are collected.
<b>Max Chn</b>	Maximum Number of Channels. The maximum number of channels in the ISDN-PRI <b>CBC</b> trunk group allocated to the specified service or feature at the time the measurements are collected.
<b>Total Usage</b>	The sum of time, in hundred-call-seconds ( <b>CCS</b> ), for all channels used by the specified service/feature during the measurement interval.
<b>Total Seize</b>	Total Seizures. The total number of incoming and outgoing calls that requested the specified service/feature through the ISDN-PRI <b>CBC</b> trunk group.
<b>Inc. Seize</b>	Incoming Seizures. The total number of incoming calls that requested the specified service/feature through the ISDN-PRI <b>CBC</b> trunk group. For two-way and outgoing trunks, the number of <i>Outgoing Seizures</i> can be calculated as follows:  $Out\ Seize = Total\ Seize - In\ Seize$
<b>Tan Seize</b>	Tandem Seizures. The total number of trunk-to-trunk call seizures using this Service/Feature.
<b>Ovf TG</b>	Overflow Trunk Group. The number of outgoing calls that requested the specified service/feature, on the ISDN-PRI <b>CBC</b> trunk group, but are not carried because the calls arrived to find no idle trunk members available.  <b>Note:</b> There are three overflow fields, each with a different priority. They are: overflow trunk group ( <b>Ovf TG</b> ) (priority 1), overflow maximum ( <b>Ovf Max</b> ) (priority 2), and overflow services/features ( <b>Ovf S/F</b> ) (priority 3). If more than one of the overflow conditions is met, only the field that represents the condition with the highest priority is incremented.

3 of 7

**Table 73: CBC Trunk Group Measurements report field descriptions 4 of 7**

Field	Description
<b>Ovf S/F</b>	<p>Overflow Services/Features. The number of calls that requested the specified service/feature but denied because the calls arrived under the following conditions:</p> <ul style="list-style-type: none"> <li>● The specified service/feature is at or above its minimum channel allocation and below its maximum allocation.</li> <li>● There are idle channels available in the trunk group, but they are reserved to meet the minimum channel allocation for other services/features.</li> </ul> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. Investigate the possibility of raising the “Min Chn” requirements for this service/feature.</li> <li>2. Investigate the possibility of increasing the number of members for the trunk group.</li> <li>3. Determine whether or not the “Min Chn” assignments for the other services/features are appropriate. For example, if the column “% TBM” displays a high number for one or more of the other service/features, then you can lower the minimums (for one or more of the other services/features). This makes more trunks available for this service/feature.</li> </ol>

**4 of 7**



Table 73: CBC Trunk Group Measurements report field descriptions 5 of 7

Field	Description
Ovf Max	<p>Overflow maximum. The number of calls not carried because the calls originated at a time when the service/feature already used-up its allotted maximum number of channels. In this case, the trunk group may still have trunk members available for the other services/features.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>Investigate the possibility of raising the number administered in the Max Chn field. This is only possible provided the free pool is not exceeded. To determine whether or not you have more trunks available for a S/F calculate the following:</li> </ol> $\text{Max} - \text{Min (for the identified S/F)} \leq \text{Free Pool}$ <p>For example, use the above equations with the data in the formula as follows:</p> $\text{Free Pool} = \text{Total \# of in-service trunks} - \sum \text{Min for each S/F}$ $\text{Free Pool} = 18 - (5+4)$ $\text{Free Pool} = 9$ $8 - 4 \text{ (for SDN)} \leq 9$ $4 \leq 9 \text{ Therefore, you can increase the Max}$ <ol style="list-style-type: none"> <li>Consider adding more trunks to the trunk group and increase the maximum for the identified service/feature.</li> </ol>
% TBM	<p>Percentage of Trunks Below Minimum. The percentage of time during the polling interval that the number of channels in use by the specified service/feature is below the specified minimum.</p> <p><b>Suggested action:</b> Lower the “Min Chn” since this may be the cause for the “Ovf S/F”.</p> <p><b>Note:</b> If the % TBM field is high, then you are reserving more trunk members than will be used. Determine if another service/feature needs more trunks and, if so, lower the “Min Chn” for this service/feature.</p>

5 of 7

Table 73: CBC Trunk Group Measurements report field descriptions 6 of 7

Field	Description
% ATB	<p>Percentage All Trunks Busy. The percentage of time (0 to 100%) during the measurement interval that the specified service/feature could not get a channel because of at least one of the following reasons:</p> <ul style="list-style-type: none"> <li>● All trunks in the ISDN-PRI <b>CBC</b> trunk group are busy on a call or busied-out by maintenance.</li> <li>● This service/feature is above its minimum; and all available trunks are reserved for other features/ services below their minimums.</li> <li>● The specified feature or service is at its maximum number of channels.</li> </ul> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. A number in the Ovf <b>TG</b> field indicates the physical maximum number of trunks is exhausted. Unless the trunk group is the last preference in the routing pattern, overflow is to the next trunk group. Otherwise, the obvious choice is to add more trunks to the trunk group.</li> <li>2. If the Ovf S/F field indicates a problem (for example, a significant number), refer to <b>Suggested actions</b> in the Ovf S/F description.</li> <li>3. If the Ovf Max field indicates a problem (for example, a significant number), refer to <b>Suggested actions</b> in the Ovf Max description.</li> </ol> <p><b>Note:</b> If the ISDN-PRI CBC trunk group is administered to support wideband switching, the title WIDEBAND Support appears in the report title.</p>

6 of 7

Table 73: CBC Trunk Group Measurements report field descriptions 7 of 7

Field	Description
% BLK	<p>Percentage Outgoing Blocking. The ratio of outgoing calls not carried for a specified service/feature to the outgoing calls offered by the service/feature. For an ISDN-PRI <b>CBC</b> trunk group without a queue, the calls not carried are those calls that find all facilities busy for the specified service/feature. For an ISDN-PRI <b>CBC</b> trunk group with a queue, the calls not carried are queue abandons plus those calls that find all facilities for the specified service/feature busy and cannot be queued because the queue is full.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. Look at the % <b>ATB</b> column and identify any service/feature with a high value. Follow the <b>Suggested actions</b> in the % <b>ATB</b> description.</li> <li>2. You can increase the length of the queue rather than adding more trunks. Subsequently, you should monitor the Queue Abandonments field to insure it stays within reasonable limits.</li> <li>3. If conditions are such that Item 1 above is not appropriate, you may find it necessary to add more trunks.</li> </ol>

7 of 7

## Background information

For background information:

1. In a non-Call-By-Call Service Selection environment, a trunk group must be preassigned and provisioned for each desired service (for example, MEGACOM telecommunications service, **WATS**, **SDN**, and so on). With this arrangement, each trunk group must be designed to accommodate the peak traffic load for the intended service application. Furthermore, the time when one service application encounters peak traffic may not coincide with when another service application encounters peak traffic. As an alternative, if multiple network services are accommodated with a single trunk group (referred to as a **CBC** Trunk Group), and that trunk group is provided with allocation and scheduling controls, significant trunking efficiencies may be realized by distributing the total traffic for all of the specified network services over the total number of available trunk members.

2. By implementing Usage Allocation Plans (**UAPs**) you can optimize, within certain limits, the **CBC** trunk group without involving any of the Inter-Exchange Carrier/Local Exchange Carrier (IXC/LEC) network services personnel. Each Usage Allocation Plan specifies the network services/features that may be accommodated with the trunk group. It also specifies the minimum number of reserved channels and maximum number of channels each service/feature may use at a given time.
3. The free pool concept is associated with **UAP**'s. Specifically, free pool refers to the number of trunks not reserved for a specific service/feature and free to be assigned to another service or feature. The free pool is calculated as:

$$\text{Free Pool} = \text{Total \# of in-service Trunks} - \sum \text{of the Mins* (for each S/F)}$$

\* Minimum channel assignment.

4. Each UAP may be administered as fixed or scheduled. If fixed, a specified plan remains in effect continuously. If scheduled, two or three UAPs may be scheduled to vary both by day of week and time of day.
5. Before you analyze the Trunk Group **CBC** Measurements Report, you must know the intent of the strategy for each UAP. You should have (in hand) a completed copy of the **CBC** Trunk Group UAP and the associated Assignment Schedule, which are Pages 3 and 4 of the Trunk Group Administration screen. For additional details, refer to your *Administrator's Guide for Avaya Communication Manager*, or to the *DEFINITY ECS Communications System Generic 1 DS1/DMI/ISDN-PRI Reference*.
6. For wideband calls that consume more than 64 kbps of bandwidth, the total usage consumed is reflected in the Total Usage field. (For example, the usage for a 384-kbps call is six times more than for a 64-kbps call.) However, these calls are counted only as a single call. The call counts that may be incremented due to wideband calls are: Total Seize, Incoming Seize, Overflow Trunk Group, Overflow Service/Feature, and Overflow Maximum Service/Feature. The %**ATB** and %Out Blk fields are also affected by wideband calls.

---

## Trunk Lightly Used report

The Trunk Lightly Used report lists the five trunk members with the lowest number of calls carried for each trunk group. The trunk lightly used data is kept for the current day, the previous day, and the last hour.

## Command

To display the Trunk Lightly Used report:

Type `list measurements lightly-used-trunk <yesterday/  
today/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is only one required field for this command—`yesterday/today/last-hour`.

- Enter `yesterday` to list the trunk activity for yesterday.
- Enter `today` to list the trunk activity for today.
- Enter `last-hour` to list the trunk activity of the most recently completed hour.

**Options:** The `schedule` option is available for this command.

## Screen

[Figure 102](#) shows a typical screen for the Trunk Lightly Used report. The time and date the report is requested displays at the top right.

[Table 74](#) describes the data fields presented in this report.

---

**Figure 102: Trunk Lightly Used report**

```
list measurements lightly-used-trunk yesterday
Switch:                               Date: 10:13 am  FRI FEB 3, 2006
                                TRUNK LIGHTLY USED REPORT
(five trunks with lowest number of calls carried)    (W = Wideband Support)
Grp   Grp   Grp   Grp   Grp   Calls
No.   Type  Dir   Size  Mbr#  Carried
1     co    two    5     3     0
1     co    two    5     4     3
2     isdn  two    5     3     7           W
2     isdn  two    5     4     8           W
2     isdn  two    5     5    10           W
4     wats  out   10     2     6
4     wats  out   10     6     6
4     wats  out   10     9     7
4     wats  out   10     4    12
4     wats  out   10    10    13
Command successfully completed
Command:
```

---

Table 74: Trunk Lightly Used report field descriptions **1 of 2**

Field	Description
<b>Grp No.</b>	Group Number. A number that identifies the trunk group associated with the displayed data.
<b>Grp Type</b>	<p>Group Type. The type of trunk associated with the accumulated data. The system monitors the following trunk types (see <i>Administrator's Guide for Avaya Communication Manager</i>):</p> <ul style="list-style-type: none"> <li>● Access (<b>access</b>)</li> <li>● Advanced Private Line Termination (<b>aplt</b>)</li> <li>● Central Office (<b>co</b>) or Public Network Service</li> <li>● Customer Provided Equipment (<b>cpe</b>)</li> <li>● Digital Multiplexed Interface Bit Oriented Signaling (<b>dmi-bos</b>)</li> <li>● Direct Inward Dialing (<b>did</b>)</li> <li>● Direct Inward/Outward Dialing (<b>diod</b>)</li> <li>● Foreign Exchange (<b>fx</b>)</li> <li>● Integrated Services Digital Network (<b>isdn-pri</b>)</li> <li>● Release Link Trunk (<b>rlt</b>)</li> <li>● Session Initiated Protocol (<b>sip</b>)</li> <li>● Tandem (<b>tandem</b>)</li> <li>● Tie Trunk (<b>tie</b>)</li> <li>● Wide Area Telecommunications Service (<b>wats</b>)</li> </ul>
<b>Grp Dir</b>	Group Direction. Identifies whether the trunk group is incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
<b>Grp Size</b>	Group Size. The number of administered trunks in a specified trunk group. For additional details, refer to the <i>Avaya Aura™ Communication Manager Hardware Description and Reference</i> .
<b>Grp Mbr#</b>	Group Member Number. The number that identifies a specific trunk member (in the group number).

**1 of 2**

Table 74: Trunk Lightly Used report field descriptions 2 of 2

Field	Description
<b>Calls Carried</b>	<p>The number of calls carried on the trunk member over the report interval (yesterday, today, or last hour). Wideband calls increment this counter once for every trunk or 64-kbps channel that they use.</p> <p><b>Suggested actions:</b></p> <ul style="list-style-type: none"> <li>● If the identified trunk member has zero or a very small number of calls (seizures) in comparison to other listed trunk members, use the Facility Test Calls feature to determine whether a specific trunk member is functioning.</li> <li>● If a trunk is just suspected of causing problems, use the <b>ACA</b> feature to monitor the particular trunk group.</li> </ul>
<b>Wideband Flag</b>	<p>If any trunks in the trunk group are used in a wideband (n X <b>DS0</b>) connection, a "W" appears next to the trunk entry. In addition, the tag "W = Wideband Support" appears in the report heading.</p>

2 of 2

---

## Voice Announcement Measurements report

Use this command to generate a detailed report about the announcement usage for all integrated and non-integrated announcements.

### Command

The command syntax is

```
list measurements announcement <all, integ-all, board <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 (TN2051AP or TN750) in the order they were activated. The report for each circuit pack starts on a new page.
- **board** 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 report apply to announcements that are administered as type **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**

[Figure 103](#) shows an example of a report for all administered announcements with the **today-peak** reporting period.

**Figure 103: Voice Announcement Measurements report**

list measurements announcements all today-peak

Page 1

Switch Name:

Date: 3:02 pm MON MAR 30, 2009

VOICE ANNOUNCEMENT MEASUREMENTS

Ext	Name (first 24 chars)	Meas Play		Calls			Queue	Mport	Mx	Max
		Hour	Reqts	Que	ASP	PSP	Drops	Plays	Pt	Cls
3001	Announcement-num-3001	1000	0	0	0	0	0	0	0	0
3002	Announcement-num-3002	1000	0	0	0	0	0	0	0	0
3003	Announcement-num-3003	1000	0	0	0	0	0	0	0	0
3004	Announcement-num-3004	1000	0	0	0	0	0	0	0	0

[Figure 104](#) shows an example of a report for a specific integrated announcement circuit pack with the **last-hour** reporting period.



**Figure 104: Voice Announcement Measurements report (last hour)**

list measurements announcements board 01B01 last-hour

Page 1

Switch Name:

Date: 3:15 pm MON MAR 30, 2009

VOICE ANNOUNCEMENT MEASUREMENTS

Board Location: 01C04

Play Ports: 31

Max. Callers On Board in Period: 0

All-Ports-Busy in Period: 0

Ext	Name (first 24 chars)	Meas Hour	Play Reqts	Calls Que	ASP	PSP	Queue Drops	Mport Plays	Mx Pt	Max Cls
3023	Announcement-num-3001	1000	0	0	0	0	0	0	0	0
3024	Announcement-num-3024	1000	0	0	0	0	0	0	0	0
3025	Announcement-num-3025	1000	0	0	0	0	0	0	0	0
3026	Announcement-num-3026	1000	0	0	0	0	0	0	0	0

**Table 75: Voice Announcement Measurements report field descriptions 1 of 2**

Field	Description
<b>Switch Name</b>	The administered switch name.
<b>Date</b>	The date and time of the report submission.
<b>Board Location</b>	The physical location (UUCSS) of the TN750B or C or TN2501AP circuit packs. This field displays only with the <b>integ-all</b> and <b>board-loc</b> qualifiers.
<b>Play Ports</b>	The number of ports available on the circuit pack. This field displays only with the <b>integ-all</b> and <b>board-loc</b> qualifiers.
<b>Max Callers on Board in Period</b>	The peak number callers simultaneously connected to a circuit pack (sum of the ports) at the same time. This field displays only with the <b>integ-all</b> and <b>board-loc</b> qualifiers.
<b>All-Ports-Busy in Period</b>	A count of how many times the all-ports-busy condition occurred within the reporting period. This field displays only with the <b>integ-all</b> and <b>board-loc</b> qualifiers.
<b>Ann No.</b>	The administered announcement number.
<b>Ext</b>	Assigned extension.
<b>Name (first 24 chars)</b>	The first 24 characters of the 27-character announcement name as administered on the announcement form.

1 of 2

**Table 75: Voice Announcement Measurements report field descriptions 2 of 2**

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.
<b>Play Reqts</b>	Play Requests. The number of requests to play this announcement. <ul style="list-style-type: none"> <li>• If there is a queue, equals the number of times played plus abandons</li> <li>• If there is no queue, equals the number of times played plus “busys” no ports are available)</li> </ul>
<b>Calls Que</b>	Calls Queued. The number of announcements that were held in queue while waiting for a port during the period.
<b>ASP</b>	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 (sum of the queue time divided by the number of calls queued).
<b>PSP</b>	Peak speed to play, that is, the maximum amount of time an announcement was in the queue until the time it starts playing.
<b>Queue Drops</b>	Calls that dropped while in 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.
<b>MPort Plays</b>	Multi-port Plays. A count of how many times the announcement played through more than one port simultaneously during the period.
<b>Mx Pt</b>	Maximum Ports. The peak number of ports used simultaneously for playing the same announcement during the period (1-16 for TN750; 1-31 for TN2501AP).
<b>Max CIs</b>	Maximum Calls. The peak number callers simultaneously connected to a port by announcement during the period.

**2 of 2**


---

## Voice/Network Statistics reports

The **Voice/Network Statistics** feature provides you measurement data to resolve voice quality issues within your network. You can view the measurement data through the SAT interface in

the form of reports, which is helpful to troubleshoot threshold events (packet loss, jitter, and round trip delay) during calls.

The media processor board gathers data on a per call basis, based on SAT-administered threshold events that have been exceeded. Then it supplies this data to Communication Manager that in turn generates the voice/network statistics reports. These reports help you to determine the cause of a voice quality issue.

The SYSTEM PARAMETERS IP-OPTIONS form and IP INTERFACES form provide information on Voice/Network Statistics. In the IP-OPTIONS SYSTEM PARAMETERS form, a Voice/Network Stats field is added to the System-Parameters IP-Options Report and in IP INTERFACES form, the VOIP/Network Thresholds fields are added to the IP-Interfaces Report.

---

## Voice/Net Stats Field on System-Parameters IP-Options Form

The **Enable Voice/Network Stats?** field in the **change system-parameters ip-options** form, enables/disables Voice/Network Statistics at the system level. When the **Enable Voice/Network Stats?** is set to **y**, Voice/Network Statistics for threshold events are recorded on the media processor boards. However, Voice/Network Statistics feature has to be turned on at the media processor board level as well.

---

## Command

To display the System-Parameters IP-Options report:

1. Type **change system-parameters ip-options** and press **Enter**.

**Options:** The value in the **Enable Voice/Network Stats?** field can be changed from **n** (No) to **y** (Yes). The default value for **Enable Voice/Network Stats?** field is **n**.

---

## Screen

[Figure 105](#) shows a form for the System-Parameters IP-Options report.

[Table 76](#) describes the data fields presented in this report.

**Figure 105: Voice/Network Stats Field on System-Parameters IP-Options form**

```

change system-parameters ip-options                                     Page 1 of 4
                                IP-OPTIONS SYSTEM PARAMETERS

IP MEDIA PACKET PERFORMANCE THRESHOLDS
  Roundtrip Propagation Delay (ms)      High: 800      Low: 400
      Packet Loss (%)                   High: 40        Low: 15
      Ping Test Interval (sec): 20
  Number of Pings Per Measurement Interval: 10
      Enable Voice/Network Stats? y

RTCP MONITOR SERVER
  Default Server IP Address: . . .
      Default Server Port: 5005
  Default RTCP Report Period(secs): 5

AUTOMATIC TRACE ROUTE ON
  Link Failure? y

H.248 MEDIA GATEWAY                                H.323 IP ENDPOINT
  Link Loss Delay Timer (min): 5      Link Loss Delay Timer (min): 5
      Primary Search Time (sec): 75
      Periodic Registration Timer (min): 20

```

**Table 76: System-Parameters IP-Options report field descriptions**

Field	Description
Enable Voice/Network Stats?	Enables/disables the recording of voice/network statistics at a system level for all TN2302/TN2602 media processor boards in your network.

## Thresholds Fields on IP-Interface Form

The **change ip-interface** form includes Voice/Network thresholds at the media processor board level. The threshold fields and their default values are displayed only when the value in the **Enable Voice/Network Stats?** field on the **change system-parameters ip-interface** form is **y** and a valid TN2302 or TN2602 media processor board is used, and has also been entered on the *change meas-sel media-processor* form.

---

## Command

To display the IP-Interfaces report:

1. Type **change ip-interface 1A03** and press **Enter**.

**Options:** The value in the **Enable Voice/Network Stats?** field can be changed from **n** (No) to **y** (Yes). The default value for **Enable Voice/Network Stats?** field is **n**.

**Note:**

If duplicated TN2602s have been administered, the voice network statistics are applied to both boards (provided each is capable of supporting this feature).

**Note:**

If going from **y** to **n**, the board must be removed from the *ch meas-sel media-processor* form first.

---

## Screen

[Figure 106](#) shows a form for the IP-Interfaces report.

[Table 77](#) describes the data fields presented in this report.

**Figure 106: IP-Interfaces Form for Media Processor Threshold Options**

change ip-interface 1A03	Page 3 of 3
IP INTERFACES	
VOIP/NETWORK THRESHOLDS	
Enable VoIP/Network Thresholds? y	
Packet loss (%)	: 5
Jitter (ms)	: 50
RT Delay (ms)	: 500

**Table 77: IP-Interface Form for Media Processor Threshold Options**

Field	Description
Enable VoIP/Network Thresholds?	Enables/disables the recording of Voice/Network Statistics at a single media processor board level (applies to both TN2602 boards, if duplicated).
Packet Loss (%)	Unacceptable packet loss coming into the administered media processor board.  <b>Note:</b> "xxx" indicates 100% packet loss.
Jitter (ms)	Unacceptable jitter coming into the media processor board at which point data is captured to send up to Communication Manager.
RT Delay (ms)	Unacceptable elapsed time for a packet to reach remote location and revert. (Round Trip Delay)

## Status Station report

A page on Voice Statistics is added to the Status Station report. This page allows you to view real time Voice Statistics for the calls in progress, which may or may not exceed the administered Voice/Network thresholds.

## Command

To display the Status Station report:

1. Type **status station 4901201** and press **Enter**.

## Screen

[Figure 107](#) shows a screen for the Status Station report.

[Table 78](#) describes the data fields presented in this report.

**Figure 107: Voice Statistics Page for Status Station**

status station 4901201	Page 8 of 10
VOICE STATISTICS	
TN Code: TN2602AP	Board loc: 01B0704
Encryption: none	
DSP Number: 4	Endpoint ID: 33164
UDP Port: 3104	Codec: G.711MU
Called Number:	Dst Net Reg: 1
Far-end IP Addr: 172.30.1.237	
Echo Canc:	
Echo Tail (ms): 0	Silence Suppresion:
Comfort Noise Gen: n	Data Call/Type:
THRESHOLD DATA	
Total Exceptions: 0	Jitter Buffer Size (ms): 0
Packet Size: 5	Jitter Buffer Overruns: 29
% Packet Loss: 0	Jitter Buffer Underruns: 0
Peak Packet Loss% : 10	Average Jitter (ms): 15
	Peak Jitter (ms): 39
Avg RT Delay (ms): 9	Peak RT Delay (ms): 99

**Table 78: Voice Statistics on Status Station Report field descriptions 1 of 3**

Field	Description
TN Code	The media processor board code used for the call.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Encryption	The type of media encryption used on the call (for example, aes, aea, srtp1, none, etc.)
DSP Number	The number of the DSP on the media processor board used for the call.
Endpoint ID	The endpoint ID assigned for the call.
UDP Port	The UDP port used by the media processor board for the call.
Codec	The codec used for the call.

**1 of 3**

**Table 78: Voice Statistics on Status Station Report field descriptions 2 of 3**

Field	Description
Called Number	The number of the endpoint which received the call (far end).
Dst Net Reg	The network region where the destination media processor is located.
Far-End IP Addr	IP address of the device on the far end of the call (called party).
Echo Canc	Indicates whether the echo cancellation is on/off for the call.
Echo Tail (ms)	The tail length of the echo canceller used for the call. "0" implies that a different echo canceller was used than the one on the media processor.
Silence Suppression	Indicates whether Voice Activation Detection (VAD) is used for the call.
Comfort Noise Gen	Indicates whether CNG is being used for the call.
Data Call/Type	Indicates whether the call is a data call. Indicates type of data call (for example, FAX, Modem, Clear Channel, TTY, Fax-PT (pass-thru), Mod-PT, TTY-PT) For instance, Data Call/Type: y/T.38 FAX
Total Exceptions	A total number of thresholds that are exceeded for the call.
Packet Size (ms)	The size for each steam of data for the associated call, measured in milliseconds.
% Packet Loss	The amount of packet loss for the call.  <b>Note:</b> "xxx" indicates 100% packet loss.
Peak Packet Loss (%)	The peak packet loss percentage recorded for the call.
Jitter Buffer Size (ms)	The size of the jitter buffer used for the call, measured in milliseconds.
Jitter Buffer Overruns	A number of jitter buffer overruns occurred for the call. Overruns occur when too many packets arrive into the jitter buffer very quickly, causing the jitter buffer to fill up. When it happens, the jitter buffer is unable to handle additional traffic/packets. If the number of overruns exceeds 99, the value in this field is "99+".

**2 of 3**



**Table 78: Voice Statistics on Status Station Report field descriptions 3 of 3**

Field	Description
Jitter Buffer Underruns	A number of jitter buffer underruns occurred for the call. When the arrival time of packets goes beyond the size of the jitter buffer, the jitter buffer underrun occurs which results in silence until there are additional packets in the jitter buffer to process. If the number of underruns exceeds 99, the value in this field is "99+".
Average Jitter (ms)	The average amount of jitter recorded for the call over a 10-second reporting interval, measured in milliseconds.
Peak Jitter (ms)	The peak amount of jitter recorded for the call, measured in milliseconds.
Avg RT Delay (ms)	The average round trip delay of packets, measured in milliseconds.
Peak RT Delay (ms)	The peak round trip delay recorded for the call, measured in milliseconds.

**3 of 3**

---

## Hourly Voice/Network Statistics reports

These reports are generated to record the voice statistics for the TN media processor boards. They comprise measurement data for up to a 24-hour period for three of the threshold events, namely jitter, packet loss, and round trip delay, at both an hourly and summary level. The fourth report type contains information on data calls.

---

### Hourly Jitter Network Region report

The Hourly Jitter Network Region report is used to assess the jitter at the network region per hour during calls.

---

### Command

To display the Hourly Jitter Network Region report:

1. Type `list measurements ip voice-stats hourly jitter <net reg #>` and press **Enter**.

## Screen

[Figure 108](#) shows a typical screen for the Hourly Jitter Network Region report.

[Table 79](#) describes the data fields presented in this report.

**Figure 108: Hourly Jitter Network Region Report**

list measurements ip voice-stats hourly jitter 1											Page	1
Switch Name: skipper						Date: 10:53 am TUE FEB 10, 2009						
IP VOICE STATISTICS NETWORK REGION JITTER REPORT												
						Pkt	Time	Jitter-Buffer	Jitter			
Meas	Board	Calling	Called Number/			Size	of	Size	Orn	Avg	Peak	
Hour	Loc	Number	Farend	IP-Addr	Codec	(ms)	Call	(ms)			(ms)	
900	01B07	4908005	4908062		g711m	60	5904	9999	72	24	9999 9999	
			172.26.198.255									
900	01B07	4908131	4908056		g711m	60	5832	9999	55	25	9999 9999	
			172.26.198.253									
900	01B07	4908281	4908178		g711m	60	5822	9999	76	27	9999 9999	
			172.26.198.252									
900	01B07	4908145	4908669		g711m	60	5812	9999	75	31	9999 9999	
			172.26.198.252									
900	01B07	4908544	4908385		g711m	60	5732	9999	57	21	9999 9999	
			172.26.199.255									

**Table 79: Hourly Jitter Network Region Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which measurement data is being collected/ reported.
Date	Time and date for which measurement data is requested.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number	The number of the endpoint initiating the call (near end).
Called Number/ FarEnd IP Addr	The number of the endpoint which has received the call (far end), followed by the corresponding IP Address.
Codec	The codec used for the call.

**1 of 2**

**Table 79: Hourly Jitter Network Region Report field descriptions 2 of 2**

Field	Description
Pkt Size (ms)	The packet size for each stream of data for the associated call, measured in milliseconds.
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).
Jitter Buffr Size (ms)	The size of the jitter buffer used for the call, measured in milliseconds.
Jitter Buffr Orn	The number of jitter buffer overruns occurred for the call. Overruns occur when many packets arrive into the jitter buffer very quickly, causing the jitter buffer to fill up. When this happens, the jitter buffer is unable to handle additional traffic/packets. If the number of overruns exceeds 99, the value in this field is "99+".
Jitter Buffr Urn	The number of jitter buffer underruns occurred for the call. When the arrival time of packets goes beyond the size of the jitter butter, a jitter buffer underrun occurs. This results in silence until there are additional packets in the jitter buffer to process. If the number of underruns exceeds 99, the value in this field is "99+".
Avg Jitter (ms)	The average amount of jitter recorded for the call over a 10-second reporting interval, measured in milliseconds.
Peak Jitter (ms)	The peak amount of jitter recorded for the call, measured in milliseconds.

**2 of 2**

---

## Hourly Delay Network Region report

The Hourly Delay Network Region report is used to assess the round trip delay at the network region per hour during calls.

---

## Command

To display the Hourly Delay Network Region report:

1. Type `list measurements ip voice-stats hourly rtdelay <net reg #>` and press **Enter**.

## Screen

[Figure 109](#) shows a typical screen for the Hourly Delay Network Region report.

[Table 80](#) describes the data fields presented in this report.

**Figure 109: Hourly Delay Network Region Report**

list measurements ip voice-stats hourly rtdelay 1											Page	1
Switch Name: skipper					Date: 11:04 am TUE FEB 10, 2009							
IP VOICE STATISTICS NETWORK REGION RTDELAY REPORT												
		Calling Number/		Pkt	RT-Delay		Time					
Meas	Board	Called#	FE-Addr	Codec	Size	Dst	Avg	Peak	of	Data		
Hour	Loc				(ms)	Reg	(ms)		Call	Call	Encryp EC	
1000	01B07	4908208		g711m	60	1	901	7765	1620	n	n n	
		4908539	172.26.199.255									
1000	01B07	4908853		g711m	60	1	1025	7633	2234	n	n n	
		4908467	172.26.199.255									
1000	01B07	4908965		g711m	60	1	793	6738	5612	n	n n	
		4908707	172.26.198.252									
1000	01B07	4908444		g711m	60	1	862	6643	0700	n	n n	
		4908123	172.26.199.254									
1000	01B07	4908251		g711m	60	1	929	6635	2354	n	n n	
		4908573	172.26.199.252									
900	01B07	4908704		g711m	60	1	971	7724	4252	n	n n	
		4908371	172.26.199.252									

**Table 80: Hourly Delay Network Region Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end) The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.

1 of 2

**Table 80: Hourly Delay Network Region Report field descriptions 2 of 2**

Field	Description
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Dst Reg	The network region where the destination media processor is located.
Avg RT Delay (ms)	The average round trip delay of packets, measured in milliseconds.
Peak RT Delay (ms)	The peak round trip delay recorded for the call.
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).
Data Call	Indicates whether the call is a data call.
Encryp	Indicates whether media encryption was used for the call.
EC	Indicates whether the echo cancellation is on/off for the call.

**2 of 2**

---

## Hourly Packet Loss Network Region report

The Hourly Packet Loss Network Region report is used to assess the packet loss at the network region per hour during calls.

---

### Command

To display the Hourly Packet Loss Network Region report:

1. Type `list measurements ip voice-stats hourly pktloss <net reg #>` and press **Enter**.

---

### Screen

[Figure 110](#) shows a typical screen for the Hourly Packet Loss Network Region report.

[Table 81](#) describes the data fields presented in this report.

**Figure 110: Hourly Packet Loss Network Region Report**

list measurements ip voice-stats hourly pktloss 12										Page 1
Switch Name: skipper					Date: 1:44 pm TUE FEB 24, 2009					
IP VOICE STATISTICS NETWORK REGION PKTLOSS REPORT										
Meas	Board	Calling	Number/		Time		Pkt	Total	Packet	
Hour	Loc	Called#	/FEAddr	Codec	Reg	Call	Port	(ms)	#lost	Loss
1200	02A10	4901302		g729a	9996	1659	6808	60	9999	32
		4901301	172.30.1.236							n
1200	02A10	4906667		g729a	9996	1951	2688	60	47	28
		4906157	172.26.194.254							n
1200	02A10	4906592		g729a	9996	0741	2464	60	107	26
		4906396	172.26.195.255							n
1200	02A10	4906439		g729a	9996	0415	2480	60	44	26
		4906282	172.26.194.255							n
1200	02A10	4906693		g729a	9996	1509	2500	60	43	25
		4906607	172.26.195.253							n

**Table 81: Hourly Packet Loss Network Region Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.
Dst Reg	The network region where the destination media processor is located.
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).
UDP Port	The UDP port used by the media processor for this call.
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.

**1 of 2**

**Table 81: Hourly Packet Loss Network Region Report field descriptions 2 of 2**

Field	Description
Total #Lost Pkts	The total number of packets lost for the call.
Pkt Loss (%)	The peak packet loss for the call. The packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> “xxx” indicates 100% packet loss.
Sil Sup	Indicates whether the silence suppression was used for the call.

**2 of 2**

---

## Hourly Data Network Region report

The Hourly Data Network Region report is used to assess the data calls which exceeded a threshold event at the network region. This report is not applied to the specific threshold exceeded, but applies only to pass-through and TTY relay calls, which exceed any one of the three thresholds.

---

## Command

To display the Hourly Data Network Region report:

1. Type `list measurements ip voice-stats hourly data <net reg #>` and press **Enter**.

---

## Screen

[Figure 111](#) shows a typical screen for the Hourly Data Network Region report.

[Table 82](#) describes the data fields presented in this report.

**Figure 111: Hourly Data Network Region Report**

list measurements ip voice-stats hourly data 12										Page 1
Switch Name: skipper					Date: 10:07 am WED FEB 25, 2009					
IP VOICE STATISTICS NETWORK REGION DATA REPORT										
Meas	Board	Calling	Called Num/		Data	Packet	Loss	Peak		
Hour	Loc	Number	Farend IPAddr	Codec	Type	Size (ms)	%	Jit (ms)	Dly EC	
900	02A10	1056	1061	g729a	fax-pt	20	0	75	0	y
			172.30.0.199							
900	02A10	1056	1061	g729a	fax-pt	20	0	72	0	y
			172.30.0.199							
900	02A10	1056	1061	g729a	fax-pt	20	0	72	0	y
			172.30.0.199							
900	02A10	1056	1061	g729a	fax-pt	20	0	71	0	y
			172.30.0.199							
900	02A10	1056	1061	g729a	fax-pt	20	0	71	0	y
			172.30.0.199							

**Table 82: Hourly Data Network Region Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number	The number of the endpoint initiating the call (near end).
Called Num/ Farend IPAddr	The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.
Data Type	Indicates the type of data call. Valid options include: ~ ttyrel (TTY Relay) ~ mod-pt (Modem pass-through) ~ fax-pt (FAX pass-through) ~ tty-pt (TTY pass-through) ~ t38fax (T.38 FAX) ~ faxrel (FAX relay) ~ modrel (Modem relay)

**1 of 2**



**Table 82: Hourly Data Network Region Report field descriptions 2 of 2**

Field	Description
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Pkt Loss (%)	The packet Loss for the call. The Packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> “xxx” indicates 100% packet loss.
Peak Jit (ms)	The peak amount of jitter recorded for the call, measured in milliseconds.
Peak Dly (ms)	The peak round trip delay recorded for the call, measured in milliseconds.
EC	Indicates whether the echo cancellation is turned on/off for the call.

**2 of 2**

---

## Hourly Jitter Media Processor report

The Hourly Jitter Media Processor report is used to assess the jitter at the media processor region per hour during calls.

---

## Command

To display the Hourly Jitter Media Processor report:

1. Type `list measurements ip voice-stats hourly jitter <medpro location>` and press **Enter**.

---

## Screen

[Figure 112](#) shows a typical screen for the Hourly Jitter Media Processor report.

[Table 83](#) describes the data fields presented in this report.

**Figure 112: Hourly Jitter Media Processor Report**

list measurements ip voice-stats hourly jitter 1b14										Page 1
Switch Name: skipper					Date: 4:03 pm WED JAN 28, 2009					
IP VOICE STATISTICS MEDIA PROCESSOR JITTER REPORT					NET RGN 1					
Meas	Calling	Called Number/			Pkt	Time	Jitter-Buffer		Jitter	
Hour	Number	Farend	IP-Addr	Codec	Size	of	Size	Orn	Urn	Avg Peak
					(ms)	Call	(ms)			(ms)
1500	4901202	4901201		g711m	60	5832	168	35	20	163 442
		172.30.1.237								
1500	4901202	4901201		g711m	60	5752	187	99+	18	163 442
		172.30.1.237								
1500	4901202	4901201		g711m	60	5744	166	99+	15	163 442
		172.30.1.237								
1400	4901202	4901201		g711m	60	5913	178	99+	99+	163 442
		172.30.1.237								
1400	4901202	4901201		g711m	60	5903	172	99+	99+	163 442
		172.30.1.237								
1400	4901202	4901201		g711m	60	5845	180	99+	99+	163 442
		172.30.1.237								

**Table 83: Hourly Jitter Media Processor Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested
Net Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Calling Number	The number of the endpoint initiating the call (near end).
Called Number/ Farend IP Addr	The number of the endpoint that received the call (far end), followed by the corresponding IP Address.
Codec	The codec used for the call.
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).

**1 of 2**

**Table 83: Hourly Jitter Media Processor Report field descriptions 2 of 2**

Field	Description
Jitter Buffr Size (ms)	The size of the jitter buffer used for the call, measured in milliseconds.
Jitter Buffr Orn	The Number of jitter buffer overruns occurred for the call. Overruns occur when many packets arrive into the jitter buffer very quickly, causing the jitter buffer to fill up. When this happens, the jitter buffer is unable to handle additional traffic/packets. If the number of overruns exceeds 99, the value in this field is "99+".
Jitter Buffr Urn	The number of jitter buffer underruns occurred for the call. When the arrival time of packets goes beyond the size of the jitter butter, a jitter buffer underrun occurs. This results in silence until there are additional packets in the jitter buffer to process. If the number of underruns exceeds 99, the value in this field is "99+".
Avg Jitter (ms)	The average amount of jitter recorded for the call over a 10-second reporting interval, measured in milliseconds.
Peak Jitter (ms)	The peak amount of jitter recorded for the call, measured in milliseconds.

**2 of 2**

---

## Hourly Delay Media Processor report

The Hourly Delay Media Processor report is used to assess the round trip delay at the media processor region per hour during calls.

---

## Command

To display the Hourly Delay Media Processor report:

1. Type `list measurements ip voice-stats hourly rtdelay <medpro location>` and press **Enter**.

---

## Screen

[Figure 113](#) shows a typical screen for the Hourly Delay Media Processor report.

[Table 84](#) describes the data fields presented in this report.

**Figure 113: Hourly Delay Media Processor Report**

list measurements ip voice-stats hourly rtdelay 1b07										Page 1
Switch Name: skipper					Date: 11:01 am TUE FEB 10, 2009					
IP VOICE STATISTICS MEDIA PROCESSOR RTDELAY REPORT								NET RGN 1		
Meas	Calling Number/		Pkt	RT-Delay	Time					
Hour	Called#/FE-Addr	Codec	Size Dst Avg	Peak	of	Data				
			(ms) Reg (ms)		Call	Call	Encryp	EC		
1000	4908208	g711m	60 1 901	7765	1620	n	n	n		
	4908539 172.26.199.255									
1000	4908853	g711m	60 1 1025	7633	2234	n	n	n		
	4908467 172.26.199.255									
1000	4908965	g711m	60 1 793	6738	5612	n	n	n		
	4908707 172.26.198.252									
1000	4908444	g711m	60 1 862	6643	0700	n	n	n		
	4908123 172.26.199.254									
1000	4908251	g711m	60 1 929	6635	2354	n	n	n		
	4908573 172.26.199.252									

**Table 84: Hourly Delay Media Processor Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested
Net Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.
Pkt Size (ms)	The packet size for each stream of data for the associated call, measured in milliseconds
Dst Reg	The network region where the destination media processor is located.
Avg RT Delay (ms)	The average round trip delay of packets, measured in milliseconds.
Peak RT Delay (ms)	The peak round trip delay recorded for the call, measured in milliseconds.

**1 of 2**

**Table 84: Hourly Delay Media Processor Report field descriptions 2 of 2**

Field	Description
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).
Data Call	Indicates whether the call is a data call.
Encryp	Indicates whether media encryption was used for the call.
EC	Indicates whether the echo cancellation is on/off for the call.

**2 of 2**

---

## Hourly Packet Loss Media Processor report

The Hourly Packet Loss Media Processor report is used to assess the packet loss at the media processor region per hour during calls.

---

### Command

To display the Hourly Packet Loss Media Processor report:

1. Type `list measurements ip voice-stats hourly pktloss <medpro location>` and press **Enter**.

---

### Screen

[Figure 114](#) shows a typical screen for the Hourly Packet Loss Media Processor report.

[Table 85](#) describes the data fields presented in this report.

**Figure 114: Hourly Packet Loss Media Processor Report**

list measurements ip voice-stats hourly pktloss 2a10									Page 1
Switch Name: skipper					Date: 2:44 pm FRI FEB 20, 2009				
IP VOICE STATISTICS MEDIA PROCESSOR PKTLOSS REPORT								NET RGN 12	
				Time		Pkt	Total	Packet	
Meas	Calling Number/		Dst	of	UDP	Size	#lost	Loss	Sil
Hour	Called#/FEAddr	Codec	Reg	Call	Port	(ms)	Pkts	%	Sup
1300	4906931	g729a	12	4326	2284	60	44	26	n
	4906546 172.26.195.252								
1300	4906637	g729a	12	4158	2656	60	85	24	n
	4906536 172.26.194.252								
1300	4906712	g729a	12	4104	2280	60	86	24	n
	4906850 172.26.194.254								
1300	4906633	g729a	12	2150	2644	60	70	24	n
	4906006 172.26.195.255								
1300	4901302	g729a	12	1608	6808	60	9867	24	n
	4901301 172.30.1.236								

**Table 85: Hourly Packet Loss Media Processor Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested
Net Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.
Dst Reg	The network region where the destination media processor is located.
Time of Call	A time stamp when threshold was first exceeded for the associated call, shown in MMSS (minutes seconds).
UDP Port	The UDP port used by the media processor for the call.
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.

**1 of 2**

**Table 85: Hourly Packet Loss Media Processor Report field descriptions 2 of 2**

Field	Description
Total #Lost Pkts	The total number of packets lost for the call.
Pkt Loss (%)	The peak packet loss for the call. The packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> “xxx” indicates 100% packet loss.
Sil Sup	Indicates whether the silence suppression is used for the call.

**2 of 2**

---

## Hourly Data Media Processor report

The Hourly Data Media Processor report is used to assess the data calls which exceeded a threshold event at the media processor region. This report is not applied to the specific threshold exceeded, but applies only to pass-through and TTY relay calls which exceed any one of the three thresholds.

---

## Command

To display the Hourly Data Media Processor report:

1. Type `list measurements ip voice-stats hourly data <medpro location>` and press **Enter**.

---

## Screen

[Figure 115](#) shows a typical screen for the Hourly Data Media Processor report.

[Table 86](#) describes the data fields presented in this report.

**Figure 115: Hourly Data Media Processor Report**

list measurements ip voice-stats hourly data 2a10									
Page 1									
Switch Name: skipper					Date: 10:04 am WED FEB 25, 2009				
IP VOICE STATISTICS MEDIA PROCESSOR DATA REPORT					NET RGN 12				
					Packet	Peak			
Meas	Calling	Called Num/		Date	Size	Loss	Jit	Dly	EC
Hour	Number	Farend IPAddr	Codec	Type	(ms)	%	(ms)		
900	1056	1061	g729a	fax-pt	20	0	75	0	y
		172.30.0.199							
900	1056	1061	g729a	fax-pt	20	0	72	0	y
		172.30.0.199							
900	1056	1061	g729a	fax-pt	20	0	72	0	y
		172.30.0.199							
900	1056	1061	g729a	fax-pt	20	0	71	0	y
		172.30.0.199							
900	1056	1061	g729a	fax-pt	20	0	71	0	y
		172.30.0.199							

**Table 86: Hourly Data Media Processor Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Net Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Calling Number	The number of the endpoint initiating the call (near end).
Called#/ Farend IPAddr	The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Codec	The codec used for the call.

**1 of 2**



**Table 86: Hourly Data Media Processor Report field descriptions 2 of 2**

Field	Description
Data Type	Indicates the type of data call. Valid options include: <ul style="list-style-type: none"> <li>• ttyrel (TTY Relay)</li> <li>• mod-pt (Modem pass-through)</li> <li>• fax-pt (FAX pass-through)</li> <li>• tty-pt (TTY pass-through)</li> <li>• t38fax (T.38 FAX)</li> <li>• faxrel (FAX relay)</li> <li>• modrel (Modem relay)</li> </ul>
Pkt Size (ms)	The packet size for each stream of data for the associated call, measured in milliseconds.
Pkt Loss (%)	The packet Loss for the call. The packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> “xxx” indicates 100% packet loss.
Peak Jit (ms)	The peak amount of jitter recorded for the call.
Peak Dly (ms)	The peak round trip delay recorded for the call.
EC	Indicates whether the echo cancellation is turned on/off for the call.

**2 of 2**

---

## Summary Voice/Network Statistics reports

The summary reports can be obtained for yesterday-peak, today-peak, or last-hour interval. The summary reports provide measurement data on the calls during the peak hour per board over a 24-hour period.

---

## Summary Jitter report

The summary jitter report summarizes up to five worst jitter calls for the corresponding peak hour for a given media processor board in the network region.

# Command

To display the Summary Jitter report:

- 1. Type `list measurements ip voice-stats summary jitter ['yesterday' | 'today' | 'last-hour']` and press **Enter**.

# Screen

[Figure 116](#) shows a typical screen for the Summary Jitter report.

[Table 87](#) describes the data fields presented in this report.

**Figure 116: Summary Jitter Report**

list measurements ip voice-stats summary jitter yesterday													
Switch Name: skipper							Date: 11:57 am THU JAN 29, 2009						
IP VOICE STATISTICS SUMMARY							JITTER REPORT						
Src Meas	Board	Calling	Number/	Dst			Pkt	Time	Jitter-Buffer	Jitter			
Reg Hour	Loc	Called#	/FEAddr	Reg Codec			Size	of	Size	Orn	Urn	Avg	Peak
							(ms)	Call	(ms)			(ms)	
1	1600	01B14	4901202	1	g711m		60	1138	170	99+	90	163	442
			4901201	172.30.1.237									
1	1600	01B14	4901202	1	g711m		60	1042	179	99+	86	163	442
			4901201	172.30.1.237									
1	1600	01B14	4901202	1	g711m		60	1034	172	99+	85	163	442
			4901201	172.30.1.237									
1	1600	01B14	4901202	1	g711m		60	1012	176	99+	85	163	442
			4901201	172.30.1.237									
1	1600	01B14	4901202	1	g711m		60	0943	164	97	82	163	442
			4901201	172.30.1.237									

**Table 87: Summary Jitter Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Src Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.

1 of 2

**Table 87: Summary Jitter Report field descriptions 2 of 2**

Field	Description
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number	The number of the endpoint initiating the call (near end).
Called Number/ FarEnd IP Addr	The number of the endpoint that received the call (far end), followed by the corresponding IP Address.
Dst Reg	The network region where the destination media processor is located.
Codec	The codec used for the call.
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Time of Call	A time stamp when the threshold is first exceeded for the associated call, shown in MMSS (minutes seconds).
Jitter Buffer Size (ms)	The size of the jitter buffer used for the call, measured in milliseconds.
Jitter Buffer Orn	The number of jitter buffer overruns occurred for the call. Overruns occur when many packets arrive into the jitter buffer very quickly, causing the jitter buffer to fill up. When this happens, the jitter buffer is unable to handle additional traffic/packets. If the number of overruns exceeds 99, the value in this field is "99+".
Jitter Buffer Urn	The number of jitter buffer underruns occurred for the call. When the arrival time of packets goes beyond the size of the jitter butter, a jitter buffer underrun occurs. This results in silence until there are additional packets in the jitter buffer to process. If the number of underruns exceeds 99, the value in this field is "99+".
Avg Jitter (ms)	The average amount of jitter recorded for the call over a 10-second reporting interval, measured in milliseconds.
Peak Jitter (ms)	The peak amount of jitter recorded for the call, measured in milliseconds.

**2 of 2**


---

## Summary Round Trip Delay report

The summary round trip delay report summarizes up to five worst round trip delay calls for the corresponding peak hour for a given media processor board in the network region.

# Command

To display the Summary Round Trip Delay report:

1. Type `list measurements ip voice-stats summary rtdelay ['yesterday' | 'today' | 'last-hour']` and press **Enter**.

# Screen

[Figure 117](#) shows a typical screen for the Summary Round Trip Delay report.

[Table 88](#) describes the data fields presented in this report.

**Figure 117: Summary Round Trip Delay Report**

list measurements ip voice-stats summary rtdelay yesterday													
Switch Name: skipper								Date: 10:43 am TUE JAN 13, 2009					
IP VOICE STATISTICS SUMMARY RTDELAY REPORT													
				Pkt		RT-Delay		Time					
Src Meas Board	Calling Number/			Size	Dst	Avg Peak		of Data					
Reg Hour Loc	Called#/FE-Addr			(ms)	Reg Codec	(ms)	(ms)	Call	Call	Encr	EC		
1 2300 01B07	4901202			60	1 g711m	72	75	5532	n	n	n		
	4901201			172.30.1.237									
1 1000 01B14	4901202			60	1 g711m	43	76	0117	n	n	y		
	4901201			172.30.1.250									

**Table 88: Summary Round Trip Delay Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Src Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.

1 of 2

**Table 88: Summary Round Trip Delay Report field descriptions 2 of 2**

Field	Description
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Pkt Size (ms)	The packet size for each stream of data for the associated call, measured in milliseconds.
Dst Reg	The network region where the destination media processor is located.
Codec	The codec used for the call.
Avg RT Delay (ms)	The average round trip delay of packets, measured in milliseconds.
Peak RT Delay (ms)	The peak round trip delay recorded for the call.
Time of Call	A time stamp when the threshold is first exceeded for the associated call, shown in MMSS (minutes seconds)
Data Call	Indicates whether the call is a data call.
Encryp	Indicates whether media encryption is used for the call.
EC	Indicates whether the echo cancellation is on/off for the call.

**2 of 2**


---

## Summary Packet Loss report

The summary packet loss report summarizes up to five worst packet loss calls for the corresponding peak hour for a given media processor board in the network region.

---

## Command

To display the Summary Packet Loss report:

1. Type `list measurements ip voice-stats summary pktloss ['yesterday' | 'today' | 'last-hour']` and press **Enter**.

## Screen

[Figure 118](#) shows a typical screen for the Summary Packet Loss report.

[Table 89](#) describes the data fields presented in this report.

**Figure 118: Summary Packet Loss Report**

list measurements ip voice-stats summary pktloss yesterday

Switch Name: skipper

Date: 9:08 am WED JAN 14, 2009

IP VOICE STATISTICS SUMMARY PKTLOSS REPORT

Src Meas	Board	Calling Number/	Dst	Time	Pkt	Total	Packet				
Reg	Hour	Loc	Called#/FEAddr	Reg	Codec	Call	Port	Size	#lost	Loss	Sil
								(ms)	Pkts	%	Sup
1	2300	01B07	4901202	1	g711m	5941	3190	60	9999	35	n
			4901201								
1	2300	01B07	4901202	1	g711m	5929	3190	60	9999	35	n
			4901201								
1	2300	01B07	4901202	1	g711m	5859	3190	60	9999	35	n
			4901201								
1	2300	01B07	4901202	1	g711m	5849	3190	60	9999	35	n
			4901201								
1	2300	01B07	4901202	1	g711m	5839	3190	60	9999	35	n
			4901201								

**Table 89: Summary Packet Loss Report field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Src Reg	The network region associated with the media processor for which data is being recorded.
Meas Hour	The hour (military time) in which data is collected.
Board Loc	The carrier/slot location of the media processor for which data is being reported.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Dst Reg	The network region where the destination media processor is located.

**1 of 2**

**Table 89: Summary Packet Loss Report field descriptions 2 of 2**

Field	Description
Codec	The codec used for the call.
Time of Call	A time stamp when the threshold is first exceeded for the associated call, shown in MMSS (minutes seconds)
UDP Port	The UDP port used by the media processor for the call.
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Total #Lost Pkts	The total number of packets lost for this call.
Pkt Loss (%)	The peak packet loss for the call. The packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> "xxx" indicates 100% packet loss.
Sil Sup	Indicates whether the silence suppression is used for the call.

**2 of 2**

---

## Summary Data report

The summary data report summarizes up to five worst data calls for the corresponding peak hour for a given media processor board in the network region.

---

## Command

To display the Summary Data report:

1. Type `list measurements ip voice-stats summary data ['yesterday' | 'today' | 'last-hour']` and press **Enter**.

---

## Screen

[Figure 119](#) shows a typical screen for the Summary Data report.

[Table 90](#) describes the data fields presented in this report.

**Figure 119: Summary Data Report**

list measurements ip voice-stats summary data yesterday											Page	1
Switch Name: skipper						Date: 11:12 am FRI FEB 27, 2009						
IP VOICE STATISTICS SUMMARY DATA REPORT												
						Packet		Peak				
Src Meas	Board	Calling Number/		Dst		Data	Size	Loss	Jit	Dly	EC	
Reg Hour	Loc	Called#/FE		IPAdr	Reg Codec	Type	(ms)	%	(ms)			
12 2300	02A09	1056		12	g711m	fax-pt	20	29	64	77	n	
		1061		172.30.0.199								
12 2300	02A09	1056		12	g711m	fax-pt	20	99	52	117	n	
		1061		172.30.0.199								
12 2300	02A09	1056		12	g711m	fax-pt	20	29	64	187	n	
		1061		172.30.0.199								
12 2300	02A09	1056		12	g711m	fax-pt	20	30	63	42	n	
		1061		172.30.0.199								
12 2300	02A09	1056		12	g711m	fax-pt	20	28	63	73	n	
		1061		172.30.0.199								

**Table 90: Summary Data Report field descriptions field descriptions 1 of 2**

Field	Description
Switch Name	The name of system from which data is being collected/reported.
Date	Time and date for which data is requested.
Src Reg	The network region associated with the media processor for which data is being captured.
Meas Hour	The hour (military time) in which data is collected.
Calling Number/ Called#/FE Addr	The number of the endpoint initiating the call (near end). The number of the endpoint that received the call (far end), followed by the associated far-end IP address.
Dst Reg	The network region where the destination media processor is located.
Codec	The codec used for the call.
Data Type	Indicates the type of data call. Valid options include: <ul style="list-style-type: none"> <li>• ttyrel (TTY Relay)</li> <li>• mod-pt (Modem pass-through)</li> <li>• fax-pt (FAX pass-through)</li> <li>• tty-pt (TTY pass-through)</li> <li>• t38fax (T.38 FAX)</li> <li>• faxrel (FAX relay)</li> <li>• modrel (Modem relay)</li> </ul>

**1 of 2**



**Table 90: Summary Data Report field descriptions field descriptions 2 of 2**

Field	Description
Pkt Size (ms)	The packet size for each steam of data for the associated call, measured in milliseconds.
Pkt Loss (%)	The packet loss for the call. The packet loss percentage is calculated at 10-second intervals.  <b>Note:</b> “xxx” indicates 100% packet loss.
Peak Jit (ms)	The peak amount of jitter recorded for the call.
Peak Dly (ms)	The peak round trip delay recorded for the call, measured in milliseconds.
EC	Indicates whether the echo cancellation is turned on or off for the call.

**2 of 2**


---

## Change measurement selection forms

When you specify a specific network region or media processor in a **list measurements ip voice-stats** report and that network region or media processor is included in the *ch meas-selection* form, then the system shows a list measurement report, otherwise the following error message is displayed: `Not a measured resource`. For more information, refer to [Voice/Network Statistics reports](#).

There is a major inter-dependency between *ch meas-sel media-processor* form and the *ip-interface* form. For example, you have to have the media processor on both of these forms in order to collect data. In addition, the board has to be Voice/Network Statistics-enabled and Voice/Network Statistics-capable (correct firmware version on the media processor board). You cannot enter **Y** in the **Enable Voice/Net Stats?** field unless the board location has been entered on the *ch meas-sel media-processor* form and that media processor's firmware is Voice/Network Statistics-capable. For more information, refer to [Thresholds Fields on IP-Interface Form](#)

## Command

To display the NETWORK REGION MEASUREMENT SELECTION report:

Type `change meas-selection network-region [schedule]` and press **Enter**.

## Screen

[Figure 120](#) shows a typical screen for the Network Region Measurement Selection report. [Table 91](#) describes the data fields presented in this report.

**Figure 120: Ch Meas-Selection Network Region Form**

change meas-selection network-region				Page	1 of 1
NETWORK REGION MEASUREMENT SELECTION					
Network Region Numbers					
1: 1	11:	21:	31:	41:	
2: 2	12:	22:	32:	42:	
3: 3	13:	23:	33:	43:	
4: 4	14:	24:	34:	44:	
5: 5	15:	25:	35:	45:	
6: 10	16:	26:	36:	46:	
7: 11	17:	27:	37:	47:	
8: 12	18:	28:	38:	48:	
9: 13	19:	29:	39:	49:	
10: 14	20:	30:	40:	50:	

### Note:

If you enter a network region on this form, and have not specified corresponding media processor board location in that same region on the *ch meas-selection media-processor* form, then measurements for that region will not be reported. For example, if you enter network region 10 on the *ch meas-sel network region* form, but do not specify any media processors form region 10 on the *ch meas-sel media-processor* form, no measurements will be reported for network region 10.

## Command

To display the MEDIA PROCESSOR MEASUREMENT SELECTION report:

Type **change meas-selection media-processor [schedule]** and press **Enter**.

The validations for the command are as follows:

- If media processor board is not a TN2302 or TN2602, do not allow it on this form. Communication Manager performs this validation.
- If TN2302/TN2602 is physically inserted, perform a capabilities exchange to confirm that the board can support this feature. Communication Manager performs this validation.
- When a media processor board is removed from the *ch meas-sel media-processor* form, Communication Manager must verify that the Voice/Net Stats feature has been disabled on the *ip-interface* form, otherwise the following error message is displayed: `Must`

first disable voice/net stats on ip-interface form. Also, you must check the same, that is, Voice/Net Stats feature is disabled on the *ip-interface* form, with duplicated TN2602 media processor boards, if your are going to/from duplicated, simplex or load balanced media processor boards.

- In addition, if a board location or network region is moved or deleted, all previous data for that board/network region and measurement hour is lost. If you attempt to move a network region/media processor board from one position to another, the following warning message is displayed: Moving a board/NR from one location to another will result in the loss of existing data.

## Screen

[Figure 121](#) shows a typical screen for the Media Processor Measurement Selection report.

[Table 91](#) describes the data fields presented in this report.

**Figure 121: Ch Meas-Selection Media Processor Form**

change meas-selection media-processor				Page	1 of	1
MEDIA PROCESSOR MEASUREMENT SELECTION						
MEDIA PROCESSOR BOARD LOCATION						
1: 01a03	11: 32a07	21:	31:	41:		
2: 01b05	12: 32b12	22:	32:	42:		
3: 01c03	13:	23:	33:	43:		
4: 01c04	14:	24:	34:	44:		
5: 02d10	15:	25:	35:	45:		
6: 02e11	16:	26:	36:	46:		
7: 04c05	17:	27:	37:	47:		
8: 04c06	18:	28:	38:	48:		
9: 10e13	19:	29:	39:	49:		
10: 11a12	20:	30:	40:	50:		

**Table 91: Change Measurement Selection Forms field descriptions**

Field	Description
Network region	Valid entries: 1-250
Media Processor board location	Valid entries: Five alpha-numeric characters (cabinet/carrier/slot)

---

## Wideband trunk groups reports

This section describes the traffic reports and selection screen for wideband trunk groups. It also provides guidelines for validating and analyzing the wideband trunk group data.

---

### Wideband Trunk Group Summary report

The Wideband Trunk Group Summary report gives traffic measurements for all trunk groups administered to support wideband switching. By using this report, you can determine the trunk group total wideband usage (in **CCS**), the total number of wideband calls, the percentage of wideband calls blocked, and other measurement data.

**Note:**

This report is only available if the **Wideband Switching** field is set to **y** on page 4 of the System-Parameters Customer-Options screen.

### Command

To display the Wideband Trunk Group Summary report:

Type `list measurements wideband-trunk-group summary <yesterday-peak/today-peak/last-hour> [schedule]` and press **Enter**.

**Required Fields:** There is only one required field for this command—`yesterday-peak/today-peak/last-hour`.

- Enter `yesterday-peak` to list the wideband call activity for yesterday's peak hour.
- Enter `today-peak` to list the wideband call activity for today's peak hour.
- Enter `last-hour` to list the wideband call activity of the most recently completed hour.

The peak hour is the hour (within a 24-hour period) with the greatest usage.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 122](#) shows a typical screen for the Wideband Trunk Group Summary report.

[Table 92](#) describes the data fields presented in this report.

**Figure 122: Wideband Trunk Summary report**

```
list measurements wideband-trunk-group summary last-hour
```

Switch Name: Cust\_Switch\_Name Date: 1:58 pm FRI FEB 3, 2006

WIDEBAND TRUNK GROUP SUMMARY REPORT

Peak Hour For Wideband Usage For All Trunk Groups: 1000

Grp No.	Grp Size	Grp Dir	Service Type	Meas Hour	Total Usage	Total Seize	Inc. Seize	Grp Ovfl	Out Srv	% ATB	%Out Blk
37	22	two	access	1200	598	5	0	0	0	0	0
38	23	two	cbc	1200	171	2	0	0	0	0	0
39	22	two	sdn	1200	270	3	0	0	0	0	0

**Table 92: Wideband Trunk Group Summary report field descriptions 1 of 3**

Field	Description
<b>Peak Hour for Wideband Usage for All Trunk Groups</b>	The hour during the specified day with the highest total wideband call usage, when summed over all trunk groups. Peak hour and busy hour are synonymous. With conventional traffic theory data analysis, there are two methods for determining the peak hour. One is the time-consistent peak hour, meaning hourly usage values are averaged across days for each hour of the day. The other is the bouncing peak hour, meaning the highest usage is selected for each day without regard to the average across days. For the bouncing peak hour, the highest load on a given day may or may not occur during the time-consistent busy hour. These traffic reports and accompanying trunk group data worksheet only use the bouncing peak hour method. Note that if the total usage for the current hour equals the total usage for the previous peak hour, the peak hour is the hour with the greatest number of total seizures.
<b>Grp No.</b>	Group Number. A number that identifies each trunk group associated with the displayed data. Group numbers are displayed in numerical order, beginning with the lowest administered number and continuing to the highest administered number.
<b>Grp Size</b>	Group Size. The number of administered trunks in the trunk group.
<b>Grp Dir</b>	Trunk Group Direction. Identifies whether the trunk group is incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
<b>Service Type</b>	Service Type. The administered Service Type for the trunk group. Valid entries are <b>accunet</b> , <b>i800</b> , <b>inwats</b> , <b>lds</b> , <b>mega800</b> , <b>megacom</b> , <b>multiquest</b> , <b>operator</b> , <b>other</b> , <b>outwats-bnd</b> , <b>public-ntwrk</b> , <b>sdn</b> , <b>sub-operator</b> , and <b>wats-max-bnd</b> .

**1 of 3**

Table 92: Wideband Trunk Group Summary report field descriptions 2 of 3

Field	Description
<b>Meas Hour</b>	Measurement Hour. The hour (using 24-hour clock) in which the measurements are taken. For the <b>last-hour</b> report, it is the last hour of measurement (each trunk group's measurement hour is identical; but not necessarily the same as the indicated peak hour for the day). For the <b>today-peak</b> report, the measurement hour is the peak hour for each trunk group thus far today (each trunk group's measurement hour could be different). For the <b>yesterday-peak</b> report, the measurement hour is the peak hour for each trunk group yesterday (each trunk group's measurement hour could be different).
<b>Total Usage</b>	Total wideband call usage (in <b>CCS</b> ) for all trunks in the trunk group. Represents the total time the trunks are busy processing wideband calls.
<b>Total Seize</b>	Total Seizures. The number of wideband call attempts. This measurement includes completed calls, false starts, don't answers, and busies.
<b>Inc. Seize</b>	Incoming Seizures. The number of wideband incoming call attempts. This measurement includes completed calls, false starts, don't answers, and busies. The number of Outgoing Seizures can be calculated as follows:  $Out\ Seize = Total\ Seize - Inc\ Seize$
<b>Grp Ovfl</b>	Group Overflow. The number of outgoing wideband calls attempted when the remaining trunk group capacity is insufficient to accommodate the call or the trunk group's remaining bandwidth is in the wrong configuration. This measurement does not include unauthorized calls denied service on the trunk group (due to restrictions). The number of wideband calls equals the number of actual calls, regardless of the number of trunks involved in the call.
<b>Out Srv</b>	Out of Service. The number of trunks in the trunk group out of service (listed as maintenance busy) at the time the data is collected. <b>Suggested action:</b> If the trunks are removed from service by the switch, then the appropriate maintenance personnel should be notified. The objective is to keep all members of a trunk group "in service." Generally, you should not make adjustments to the trunk group because of "Out of Service" trunks, but should get those trunks returned to service. For specific details, refer to the <a href="#">Trunk Out of Service report</a> .

2 of 3

Table 92: Wideband Trunk Group Summary report field descriptions 3 of 3

Field	Description
% ATB	<p>Percentage All Trunks Busy. The percentage of time all trunks in the trunk group were simultaneously in use during the measurement interval.</p> <p><b>Note:</b> In use means that the trunks are busy — either serving calls or because they are busied-out by maintenance.</p> <p><b>Suggested actions:</b></p> <ol style="list-style-type: none"> <li>1. If the group direction is outgoing or two-way, a high number in the % ATB field and nothing in the Grp Ovfl indicates everything is functioning normally. However, a more typical scenario is a high number in this field and a high number in the Grp Ovfl field. This indicates a possible problem that necessitates further analysis. Unless this trunk group is the last preference in the pattern, overflow is to the next choice trunk group, and the number in the Grp Ovfl field is of no great significance. Otherwise, the obvious choice is to add more trunks to the trunk group.</li> <li>2. If the group direction is incoming, a high number in this field is bad. It indicates some incoming calls are probably blocked. Generally, you want to add more trunks, thus lowering the % ATB and decreasing the number of calls blocked.</li> </ol>
% Out Blk	<p>Percentage Outgoing Blocking. The percentage of offered wideband calls not carried on the trunk group. It does not include unauthorized wideband calls denied service on the trunk group (due to restrictions) or calls carried on the trunk group but do not successfully complete at the far end (where there is no answer). The calls not carried are calls made when the remaining trunk group capacity is insufficient to serve them. The Percentage Outgoing Blocking is calculated as follows:</p> $\% \text{ OutBlk} = \left[ \frac{\text{Group Overflow}}{\text{Outgoing Calls Offered}} \right] \times 100$ <p>The number of Outgoing Seizures is calculated as follows:  <i>Outgoing Seizures = Total Seizures - Incoming Seizures</i>          Similarly, the equation for calculating Outgoing Calls Offered is as follows:  <i>Outgoing Calls Offered = Group Overflow + Outgoing Seizures</i></p>

3 of 3

## Wideband Trunk Group Hourly report

For trunk groups chosen at the Wideband Trunk Group Selection screen, the Wideband Trunk Group Hourly report lists the wideband call activity for all hours of switch activity. This information helps you validate the information in the Wideband Trunk Group Summary report.

### Command

To display the Trunk Group Hourly report:

Type **list measurements wideband-trunk-group hourly <assigned wideband-trunk-group number> [schedule]** and press **Enter**.

**Required Fields:** There is only one required field for this command—**assigned wideband-trunk-group number**. Enter a specific trunk group number to list the wideband call activity for all hours of switch activity.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 123](#) shows a typical screen for the Wideband Trunk Group Hourly report.

[Table 93](#) and [Table 94](#) describe the data fields presented in this report. This report contains two sections:

- A header section that provides the report ending time and trunk group administrative information
- A data section that provides the measurement data for 24 hours.

**Figure 123: Wideband Trunk Group Hourly report**

```
list measurements wideband-trunk-group hourly 40
Switch Name: Cust_Switch_Name          Date: 1:58 pm FRI FEB 3, 2006
                                WIDEBAND TRUNK GROUP HOURLY REPORT
Grp No: 40      Grp Size: 23    Grp Dir: two  Service Type: access
```

Meas Hour	Total Usage	Maint Usage	Total Seize	Inc. Seize	Tandem Seize	Grp Ovfl	Out Serv	% ATB	%Out Blk
1200	262	0	3	0	0	6	0	6	15
1100	312	0	3	0	0	0	0	0	0
1000	169	0	1	0	0	4	0	3	5
900	26	0	0	0	0	0	0	0	0
800	1	1	4	0	0	0	0	0	0



Table 93: Wideband Trunk Group Hourly report header field descriptions

Field	Description
<b>Grp No:</b>	Group Number. A number that identifies the trunk group associated with the displayed data.
<b>Grp Size:</b>	Group Size. Number of trunks in the trunk group.
<b>Grp Dir:</b>	Group Direction. Incoming ( <b>inc</b> ), outgoing ( <b>out</b> ), or two-way ( <b>two</b> ).
<b>Service Type:</b>	Service Type. The administered Service Type for the trunk group. Valid entries are <b>accunet</b> , <b>i800</b> , <b>inwats</b> , <b>lds</b> , <b>mega800</b> , <b>megacom</b> , <b>multiquest</b> , <b>operator</b> , <b>other</b> , <b>outwats-bnd</b> , <b>public-ntwrk</b> , <b>sdn</b> , <b>sub-operator</b> , and <b>wats-max-bnd</b> .

Table 94: Wideband Trunk Group Hourly report data field descriptions 1 of 2

Field	Description
<b>Total Usage</b>	Total wideband call usage (in <b>CCS</b> ) for all trunks in the trunk group. Represents the total time the trunks are busy processing wideband calls.
<b>Maint Usage</b>	Maintenance Usage. The total usage of trunks in this trunk group for Maintenance Busy or any other non-call situation where trunks are not available to carry a call.
<b>Total Seize<sup>1</sup></b>	Total Seizures. The number of wideband call attempts. This measurement includes completed calls, false starts, don't answers, and busies.
<b>Inc. Seize*</b>	<p>Incoming Seizures. The number of wideband incoming call attempts. This measurement includes completed calls, false starts, don't answers, and busies. The number of Outgoing Seizures can be calculated as follows:</p> $Out\ Seize = Total\ Seize - Inc\ Seize$ $\% \ OutBlk = \left[ \frac{Group\ Overflow}{Outgoing\ Calls\ Offered} \right] \times 100$

1 of 2

**Table 94: Wideband Trunk Group Hourly report data field descriptions 2 of 2**

Field	Description
<b>Tandem Seize*</b>	Tandem Seizures. The number of trunk-to-trunk wideband call seizures. This count is incremented on the outgoing-trunk side of the connection.
<b>Grp Ovfl</b>	Group Overflow. The number of outgoing wideband calls attempted when the remaining trunk group capacity is insufficient to accommodate the call or the trunk group's remaining bandwidth is in the wrong configuration. This measurement does not include unauthorized calls denied service on the trunk group (due to restrictions).
<b>Out Serv</b>	Out of Service. The number of trunks in the trunk group out of service during the measurement hour.
<b>% ATB</b>	Percent All Trunks Busy. The percentage of time during the measurement interval all trunks in the group are unavailable to carry a new call (All Trunks Busy).
<b>%Out Blk</b>	Percent Outgoing Blocking. The percent of the outgoing wideband call seizures, including tandem wideband call seizures, offered to a trunk group that are not carried on that trunk group. The value is calculated as follows: $\% \text{ Out Blk} = \{ \text{Grp Ovfl} / [\text{Total Seize} - \text{Inc Seize} + \text{Grp Ovfl}] \} \times 100$

**2 of 2**

1. The number of logical calls equals the number of actual calls, regardless of the bandwidth.

---

## Wideband Trunk Group Measurement Selection

The Wideband Trunk Group Measurement Selection screen is used at administration time to specify trunk groups to list on the Wideband Trunk Group Hourly reports. It permits you to administer which trunk groups are to be reported for the hourly report. (Measurements on administered trunk groups are collected to list them on the wideband summary and hourly reports.) A maximum of 10 trunks can be studied on the G3csi and G3si. On the G3r, the maximum is 30. If no selections are made, no trunk groups are studied hourly.

## Command

To display the Wideband Trunk Group Measurement Selection screen:

Type **display meas-selection wideband-trunk-group [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for the display command only.

To change a Wideband Trunk Group Measurement Selection:

1. Type **change meas-selection wideband-trunk-group** and press **Enter**.
2. Enter the wideband trunk group number to be measured and press **Enter**.

Wideband trunk group numbers do not have to be in numerical order. If the wideband trunk group number you want is not listed, add the wideband trunk group number (if there is space available), or replace an existing wideband trunk group number you no longer need. Press **Enter** until the cursor is placed on the unwanted wideband trunk group number and enter the new wideband trunk group number, or press **CLEAR FIELD** and enter the new wideband trunk group number.

## Screen

[Figure 124](#) shows a typical screen for the Wideband Trunk Group Measurement Selection on the G3r.

[Table 95](#) describes the data fields presented in the Wideband Trunk Group Measurement Selection screen.

**Figure 124: Wideband Trunk Group Measurement Selection screen**

display meas-selection wideband-trunk-group									
WIDEBAND TRUNK GROUP MEASUREMENT SELECTION									
Trunk Group Numbers									
1: 78	7: 15	13: 96	19: 333	25: 580					
2: 80	8: 16	14: 97	20: 444	26: 590					
3: 666	9: 17	15: 98	21: 555	27: 591					
4: 1	10: 18	16: 100	22: 101	28: 592					
5: 2	11: 81	17: 120	23: 102	29: 10					
6: 3	12: 82	18: 200	24: 103	30: 99					

**Table 95: Wideband Trunk Group Measurement Selection screen**

Field	Description
<b>Trunk Group Numbers</b>	The trunk group(s) to be studied hourly for wideband activity.

---

## Data analysis guidelines for trunk groups

The wideband summary and hourly reports closely parallel the other trunk group summary and hourly reports. That is, visually they contain similar fields, except there is no queuing for wideband calls, so queuing fields are eliminated. Logically, the difference is that only the wideband reports isolate wideband call usage. If the trunk group processes ordinary narrowband calls during the measurement period, the narrowband measurements are *not* included in the wideband traffic measurements.

With the overall trunk group measurements and the wideband trunk group measurements, you have data for all usage and can calculate the narrowband call usage and counts by subtracting the wideband measurement from the overall measurements.

---

## Summary report

The Wideband Trunk Group Summary report provides data essential for monitoring trunk groups supporting wideband service to assure they provide the expected level of service. The report is modeled after the Trunk Group Summary report but only trunk groups administered to provide wideband service are reported. Other trunk groups do not appear on the report. If a trunk group is administered to provide wideband service but had no wideband traffic during the measurement period, then zeros are shown on the report.

The yesterday-peak and today-peak reports list the wideband call activity for the peak wideband traffic hour. That is, the measurements shown are those that occurred during the hour in which the Total Usage for wideband service for that trunk group was highest. This is not necessarily the same peak hour as the peak hour for total usage as shown on the overall Trunk Group Summary report. Note that on the Wideband Trunk Group Summary report, the measurements for different trunk groups are not necessarily time-coincident with each other.



### **CAUTION:**

The yesterday-peak and today-peak reports cannot be used to determine narrowband usage except in cases where the peak traffic hour for total usage (shown on the overall report) is the same as the peak hour for wideband usage (shown on this report) for a particular trunk group in the same measurement period. In this case alone, narrowband measurements for that trunk group may be determined by subtracting the wideband measurements from the measurements shown on the overall report for the same trunk group.

**CAUTION:**

For trunk groups where the peak hour is different on the overall summary report from that shown on the wideband summary report, the narrowband usage must be determined by using the measurements on the Wideband Trunk Group Hourly report. In addition, if there were calls blocked at that time, the group should be studied using both the overall and wideband hourly reports to determine whether wideband calls were blocked.

---

## Hourly report

The Wideband Trunk Group Hourly report shows the wideband call activity for each hour in the current 24-hour period. A separate report is generated for each measured wideband trunk group.

For trunk groups having mixed wideband and narrowband traffic, it is best to administer the trunk group to appear on both the overall and wideband hourly trunk group reports. In this way a complete picture of usage and blockages is possible. For these trunk groups, direct comparisons can be made between measurements for the same hour on the overall and wideband reports. For example, if the hour beginning at 1:00 p.m. is examined for the same trunk group on both the overall hourly report and on the wideband hourly report, the narrowband usage measurements may be determined by subtracting the wideband data from the overall data. This can be done for each hour in the 24-hour period.

Note that some measurements, such as trunks-out-service and all-trunks-busy, are identical for the same hour on both the wideband and the overall reports for the same trunk group.

---

## Performance considerations

Although Communication Manager supports wideband transmission for from two to 30 channels, the most common transmissions are at the H channel rates:

H Rate	Speed	# 64-Kbps Channels
H0	384 Kbps	6
H11	1.536 Mbps	24
H12	1.920 Mbps	30

When considering how many trunks to put in a trunk group that supports wideband call activity, remember:

- Every wideband call must be carried on a single **DS1** interface. That is, when the bandwidth on one interface is insufficient for the call, another interface must be found that can accommodate the entire call. The bandwidth for the call *cannot* be spread over 2 or more interfaces. The chances for finding enough bandwidth on a single interface are far less than finding the bandwidth on several interfaces.
- Some far end switches (for example, the 4ESS) require the bandwidth for a call be contiguous. That is, not only must the call be carried over a single interface, but the channels over which the call is carried must be consecutively numbered. The chances for finding contiguous bandwidth are far less than for finding the bandwidth on a single interface alone.

To increase the chances of providing the bandwidth a wideband call requires, either put as many trunks as possible in the trunk groups you have designated for wideband call usage or put as many trunk groups as possible in the wideband routing pattern.

# Chapter 4: Processor occupancy reports

---

## About processor occupancy reports

The term *processor occupancy* (or simply, *occupancy*) is defined as the percentage of time the configuration's processor is busy performing call processing tasks, maintenance tasks, administration tasks, and operating system tasks. As a contrast, the percentage of time the processor is not used is referred to as *idle occupancy*.

The primary objectives of the processor occupancy reports are:

- To provide a summary of your usage data so processor occupancy and available capacity can be determined.
- To display, on a per time interval basis, the processor occupancy and associated calling rates which facilitates the isolation of certain customer reported problems.

There are four different processor occupancy commands:

- `list measurements occupancy summary`
- `list measurements occupancy last-hour`
- `list measurements occupancy busiest-intervals`
- `list measurements communications-links`

The first three commands provide processor occupancy data and associated call traffic for different measurement intervals. The last command provides a picture of the traffic data generated on each processor interface link.

The processor occupancy commands can be executed from all user logins if allowed to. However, for most systems, the two primary users are the customers' telecommunications manager and the service technician.

The type of application can significantly affect processor occupancy. For purposes of determining processor occupancy, your calling traffic is defined as one of the following applications:

- General Business — The majority of applications. It does not include the impact of the Inbound Call Management (**ICM**)/Call Management System (**CMS**) or CallVisor Adjunct Switch Applications Interface (**ASAI**)/Outbound Call Management (**OCM**) applications.
- ICM/CMS — Only includes the impact due to the **ICM** traffic (using the **ACD**, Call Vectoring, CallVisor **ASAI**, and **CMS** features).
- CallVisor ASAI/OCM — Only includes the impact due to ASAI/OCM applications.

### Note:

A particular configuration may have a traffic load that consists of any combination of the three defined applications.

Depending on your specific application, the calling traffic may be as simple as a single switch with only **CO** trunks and analog sets, or as complex as a switch in a multinode private network that uses both **DCS** and **ISDN** features and is configured with digital sets. In order to describe this wide range of traffic, four call categories are defined:

- **Intercom (INTCOM)** — Locally made and completed station-to-station calls.
- **Incoming (INC)** — Calls which come into the switch over trunks from a **CO**. The following trunk types are considered public network incoming (**CO**, **DID**, **FX**, **WATS**, and **ISDN-PRI** calls with a public network service type).
- **Outgoing (OUT)** — Calls which exit the switch on trunks that terminate in a **CO**. The following trunk types are considered public network outgoing (**CO**, **WATS**, **FX**, and **ISDN-PRI** calls with a public network service type).
- **Private Network (PNET)** — Incoming and outgoing calls made over private network trunks. The following trunk types are considered private network (**Access**, **CPE**, **DMI-BOS**, **RLT**, **Tandem**, **Tie**, **APLT**, and **ISDN-PRI** with a private network service type).

Your *usage profile* is defined as the percent mix of traffic from each of the four call categories.

Once the traffic application, usage profile, and certain feature use loading factors are determined, it is then possible to calculate the Busy Hour Call Capacity (**BHCC**). The **BHCC** is a measure of the configuration's capacity and is defined as the maximum number of completed calls the configuration can support in an hour without degradation of service.

As a part of the **RFP** process, Avaya marketing can calculate the theoretical maximum **BHCC** for the specified application when provided with the following information:

- Description of your usage profile
- Description of the traffic application
- Certain feature use loading factors for the proposed configuration

This allows Avaya marketing to determine whether the proposed configuration can accommodate the traffic load. This number, the theoretical maximum **BHCC**, is an estimate and is referred to as the *predicted maximum BHCC*.



---

## The summary command

This section describes the **summary** command and the Processor Occupancy Summary report.

---

### When to use the summary command

The main function of this command is to answer the question, “How much of the system is being used?” More specifically, this command should be used whenever you want to:

- Monitor resource usage
- Validate your usage profile (for example, once the configuration is installed and calling traffic is normal, use the summary reports to determine if the actual usage profile is the same as the estimated usage profile)
- Determine the idle occupancy and how much is available for growing the configuration
- Determine the processor occupancy and call levels on an hourly basis for the last 24 hours

---

## Occupancy Summary Measurements report

### Command

To display the processor Occupancy Summary Measurements report:

1. Type **list measurements occupancy summary [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 125](#) and [Figure 126](#) show typical output for the Processor Occupancy Summary report. The time and date the report is requested displays at the top right.

[Table 96](#) describes the data fields presented in the Processor Occupancy Summary report, as well as the Last Hour and Busiest Interval reports.

**Figure 125: Occupancy Summary Measurements report — page 1**

list measurements occupancy summary											Page 1 of x
Switch Name: Cust_Switch_Name											Date: 11:33 am WED JAN 25, 2006
OCCUPANCY SUMMARY MEASUREMENTS											
Peak Hour For Occupancy: 0900											
Meas	Static	CP	Sm	Idle	Total	Tandem	Total	Intcom	Inc	Out	Pnet
Hour	Occ	Occ	Occ	Occ	Calls	Calls	Atmpts	Atmpts	Atmpts	Atmpts	Atmpts
1900	5	58	15	22	761	149	989	247	193	251	298
1800	5	58	16	21	1032	165	1341	335	371	301	334
1700	5	57	16	22	1442	273	1875	468	451	421	535
1600	5	58	15	22	2301	365	2991	747	710	753	781
1500	5	57	15	22	2769	476	3509	877	932	748	952
1400	5	58	15	22	2959	483	3846	961	991	928	966
1300	5	57	15	23	2997	499	3896	974	1021	900	1001
1200	5	59	15	21	4221	923	5487	1371	1520	745	1851
1100	5	59	15	21	5001	826	6501	1625	2000	1223	1653
1000	4	59	13	24	5241	915	6813	1703	2066	1165	1879
press CANCEL to quit -- Press NEXT PAGE to continue											

**Figure 126: Occupancy Summary Measurements report — page 2**

list measurements occupancy summary											Page 2 of x
Switch Name: Cust_Switch_Name											Date: 11:33 am WED JAN 25, 2006
OCCUPANCY SUMMARY MEASUREMENTS											
Peak Hour For Occupancy: 0900											
Meas	Static	CP	Sm	Idle	Total	Tandem	Total	Intcom	Inc	Out	Pnet
Hour	Occ	Occ	Occ	Occ	Calls	Calls	Atmpts	Atmpts	Atmpts	Atmpts	Atmpts
0900	5	65	12	18	5392	1002	7011	1752	2045	1203	2011
0800	5	64	14	17	5364	941	6973	1743	2056	1283	1891
0700	5	58	15	22	5423	935	7049	1762	2070	1346	1871
0600	6	60	17	17	4399	761	5719	1430	2195	569	1525
Command successfully completed											
Command:											

**Table 96: Occupancy Summary Measurements report field descriptions 1 of 5**

<b>Field</b>	<b>Description</b>
<b>Meas Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded. Data is listed beginning with the most recently completed hour in the preceding 24-hour interval. For additional details, refer to the <i>Avaya Aura™ Communication Manager Hardware Description and Reference</i> .
<b>Meas Minute</b>	Measured Minute. (Last-Hour Report) The end-time of the 3-minute interval for which the measurement is taken. It takes the form hh:mm, where “hh” is the hour and “mm” is the end-time for the 3-minute interval.
<b>Date of Occurrence</b>	(Busiest-Interval Report) The date and end-time of the 3-minute interval for which the data is collected. It takes the form MM/dd/mm:hh, where “MM” is the month, “dd” is the day, “hh” is the hour, and “mm” is end of the 3-minute interval.
<b>Stat Occ</b>	<p>Static Occupancy. The percentage of occupancy used by high priority background processes in support of call processing, maintenance, and administration functions. Examples of this activity are high level sanity checks, system timing, polling of adjuncts, and operating system support. This also includes some call processing occupancy for BX.25 and ISDN-PRI traffic.</p> <p><b>Note:</b> Static occupancy remains fairly consistent in an idle configuration. However, it increases as traffic is introduced into the system.</p>

**1 of 5**

**Table 96: Occupancy Summary Measurements report field descriptions 2 of 5**

Field	Description
<b>CP Occ</b>	<p>Call Processing Occupancy. The percentage of occupancy used by call processing-level processes. The processing of <b>CDR</b>, <b>DCS</b>, <b>ISDN</b>, and other adjunct interfaces is also included in this level. Note that some occupancy due to BX.25 and ISDN-PRI call traffic is counted as static occupancy instead of <b>CP Occ</b>.</p> <p><b>Note:</b> It is not desirable for any system to function at 100 percent processor occupancy. Rather, the <b>CP Occ</b> and <b>Stat Occ</b> fields should total no more than a maximum of 75 percent. By maintaining this 75 percent maximum limit, other system functions can be performed and bursts of caller activity can also be accommodated.</p> <p><b>Suggested actions:</b> If the 75 percent maximum limit is exceeded, take one or more of the following steps to lower call processing occupancy:</p> <ul style="list-style-type: none"> <li>● If the users do not get a dial tone immediately, they should be encouraged to wait 10 to 15 seconds before going on-hook and off-hook again.</li> <li>● If the system is part of a private network and is receiving a large amount of traffic from another system in the private network, investigate the possibility of reconfiguring the network.</li> <li>● Check the administration translation and verify all digital sets, administered with display modules, actually have display modules. For those sets without display modules, change the administration translations to indicate the digital sets do not have a display module.</li> <li>● Check the hardware error log for high levels of maintenance activity.</li> </ul>
<b>Sm Occ</b>	<p>System Management Occupancy. The amount of time taken by lower-priority activities such as administration and maintenance command processing, maintenance activity, error logging, and Light-Emitting Diode (<b>LED</b>) audits. For additional details, refer to the <i>Avaya Aura™ Communication Manager Hardware Description and Reference</i>.</p>

**2 of 5**

**Table 96: Occupancy Summary Measurements report field descriptions 3 of 5**

Field	Description
<b>Idle Occ</b>	<p>Idle Occupancy. The amount of time the processor is unused. There are several factors that drive down this number, including the following:</p> <ul style="list-style-type: none"> <li>● A large offered load increases CP occupancy</li> <li>● A switch with many stations and trunks requires a high level of background maintenance, increases SM occupancy</li> <li>● Frequent demand testing or administration increases SM occupancy</li> </ul> <p>These factors may reduce the idle occupancy to almost 0 percent during several 3-minute intervals. On a heavily-loaded configuration with frequent demand testing, the idle occupancy may drop to low levels for longer periods (perhaps 1–2 hours). These situations are normal and do not indicate a problem with the configuration.</p> <p>However, a lightly-loaded configuration with few stations translated and little demand maintenance or administration should not experience long periods of low idle occupancy (less than 15 percent). If this is the case, a problem is likely.</p>
<b>Total Calls</b>	<p>Total Calls. The total number of calls connected during the listed hour. Calls are counted in the time interval they are answered and not in the time interval they are dropped. Therefore, a call that starts in one time interval and ends in another is counted only in the time interval where it originates.</p>
<b>Tandem Calls</b>	<p>Tandem Calls. The number of trunk-to-trunk calls connected during the last hour.</p>

**3 of 5**

**Table 96: Occupancy Summary Measurements report field descriptions 4 of 5**

Field	Description
<b>Total Atmpts</b>	<p>Total Attempts. The number of call attempts made during the measurement interval. The following occurrences count as an attempt:</p> <ul style="list-style-type: none"> <li>• A user lifts the station handset and hangs up before dialing any digits (off-hooks)</li> <li>• A user lifts the station handset, dials the destination number, the far end rings but does not answer, and the user hangs up (no answer)</li> <li>• A user lifts the station handset, dials the destination number, the far end is busy</li> <li>• A user places a call answered by the dialed number</li> <li>• A user conferences a second party onto the call</li> <li>• An incoming trunk seizure</li> <li>• Maintenance requests an outgoing trunk be seized</li> <li>• Tandem calls (either pnet or public network) result in 2 attempts, but only one total call</li> <li>• <b>AUDIX</b> audits of message waiting lamps</li> <li>• <b>AUDIX</b> Leave Word Calling activations</li> </ul> <p><b>Note:</b> Mathematically, the <b>Total Atmpts</b> field is the total of the <b>Intcom</b>, <b>Inc</b>, <b>Out</b>, and <b>Pnet Atmpts</b> fields.</p>
<b>Intcom Atmpts</b>	<p>Intercom Attempts. This field includes the sum of two types of calls. The first type is extension-to-extension calls on the same configuration. The second type is partially completed calls where a local extension goes off-hook and then hangs up before the call is answered. This includes both busy and no-answer calls.</p>
<b>Inc Atmpts</b>	<p>Incoming Attempts. The number of incoming trunk seizures from public network facilities.</p>

**4 of 5**

**Table 96: Occupancy Summary Measurements report field descriptions 5 of 5**

Field	Description
<b>Out Atmpts</b>	Outgoing Attempts. The number of outgoing trunk seizures made over public network facilities.
<b>Pnet Atmpts</b>	Private Network Attempts. The number of incoming and outgoing seizures made over private network facilities. Note that a tandem call is counted as two private network attempts, since it includes both incoming and outgoing trunk seizures.  <b>Note:</b> The determination of whether a call is over public network or over private network facilities depends on the trunk type (for ISDN-PRI facilities it is also dependent on the service type).

5 of 5

---

## The last-hour command

The main function of the `last-hour` command is to:

- Provide a detailed view of the occupancy levels for the last-hour
- Identify potential load related problems that may have occurred during the last hour

---

## Occupancy Last-Hour Measurements report

### Command

To display the Occupancy Last-Hour Measurements report:

1. Type `list measurements occupancy last-hour [schedule]` and press **Enter**.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 127](#) shows typical output for the Occupancy Last-Hour Measurements report. The time and date the report is requested displays at the top right.

**Figure 127: Occupancy Last-Hour Measurements report**

list measurements occupancy last-hour										Page 1 of x	
Switch Name: Customer_Switch_name						Date: 3:13 pm WED Jan 25, 2006					
OCCUPANCY LAST-HOUR MEASUREMENTS											
Meas	Static	CP	Sm	Idle	Total	Tandem	Total	Intcom	Inc	Out	Pnet
Minute	Occ	Occ	Occ	Occ	Calls	Calls	Atmpts	Atmpts	Atmpts	Atmpts	Atmpt
15:11	2	5	26	67	646	710	1421	0	0	0	1421
15:08	4	5	22	69	641	704	1412	0	0	0	1412
15:05	5	6	25	64	639	705	1410	0	0	0	1410
15:02	4	6	24	66	645	710	1420	0	0	0	1420
14:59	3	4	22	71	639	703	1411	2	0	0	1409
14:56	3	5	24	68	639	704	1412	2	0	0	1410
14:53	6	6	24	64	645	704	1418	3	0	0	1415
14:50	4	5	27	64	641	707	1418	3	0	0	1415
14:47	4	6	19	71	648	706	1429	3	0	0	1426
14:44	2	5	26	67	639	701	1405	3	0	0	1402
14:41	4	14	19	63	1624	1075	2399	243	0	0	2156
14:38	6	15	28	51	1786	1133	2556	290	0	0	2266
Command successfully completed											
Command:											

**Note:**

The fields on this report are the same as the summary report, but the data is calculated over a 3-minute time interval. The **Meas Minute** field represents the end of the time interval.

## Using the last-hour report to resolve problems

The following list identifies some areas pursued when investigating a problem believed to be processor occupancy (load) related.

- Multiply the number in the **Total Calls** field by 20 for the identified 3-minute time interval (the time when the problem occurred).

If the product exceeds the advertised BHCC of the configuration, it is the load for this time interval causing the problem. If the product does not exceed the BHCC for the configuration, this load is not the problem.

- Compare the number in the **Total Atmpts** field with the **Total Calls** field for the identified 3-minute time interval (the time when the problem occurred).

If the number of attempts is significantly greater than the number of calls, a significant percent of the occupancy is due to call processing stimuli that do not result in completed calls.



- Examine the hardware error log for an excessive amount of maintenance activity (for example, a high number of errors).
- Refer to the **list measurements communications-links** report to determine if any of the links are receiving an abnormal amount of traffic.
- Check with the users to determine if a certain feature(s) is used heavily during the identified time interval.
- Refer the problem to maintenance personnel with the suggestion they check the software error log.

---

## The busiest-interval command

This section describes the Processor Occupancy Busiest-Interval Measurements report.

---

### When to use the busiest-interval command

The main function of the **busiest-interval** command is to provide a long-term history report of potential performance-related problems.

**Note:**

This report provides a collection of the 20 busiest 3-minute intervals within the last two months. Therefore, this command is most useful to the service technician for investigating habitual performance problems or those problems not reported exactly when they occurred.

---

## Occupancy Busiest 3-Minute-Intervals Measurements report

### Command

To display the Occupancy Busiest 3-Minute Intervals Measurements report:

1. Type **list measurements occupancy busiest-intervals [schedule]** and press **Enter**.

**Options:** The **schedule** option is available for this command.

## Screen

[Figure 128](#) show typical output for the Occupancy Busiest 3-Minute Intervals Measurements report. The time and date the report is requested displays at the top right. The **Date of Occurrence** field identifies the month, day, and time of day for 20 of the busiest intervals (that is, the sum of Stat Occ + CP Occ).

All other fields are described in [Table 96: Occupancy Summary Measurements report field descriptions](#) on page 331.

**Figure 128: Occupancy Busiest 3-Minute Intervals Measurements report**

list measurements occupancy busiest-intervals										Page 1 of x	
Switch Name: Customer_Switch_Name					Date: 3:13 pm WED JAN 25, 2006						
OCCUPANCY BUSIEST 3-MINUTE INTERVALS MEASUREMENTS											
Date of Occurrence	Static Occ	CP Occ	Sm Occ	Idle Occ	Total Calls	Tandem Calls	Total Atmpts	Intcom Atmpts	Inc Atmpts	Out Atmpts	Pnet Atmpts
01/14/10:20	16	9	26	49	686	490	1225	245	0	0	980
01/15/11:14	8	16	27	49	1788	1130	2558	286	0	0	2272
01/21/12:38	7	15	21	57	1786	1131	2554	286	0	0	2268
01/22/13:41	6	16	26	52	1786	1129	2553	290	0	0	2263
01/22/14:11	7	15	25	53	1780	1135	2557	285	0	0	2272
Command successfully completed											
Command:											

### Note:

The fields on this report are the same as on the summary report. However, the data is calculated over 3-minute intervals rather than 1-hour intervals.

## Using the busiest-interval report to resolve problems

The following list identifies some areas that may be pursued when investigating a problem that is believed to be processor occupancy (load) related.

- Multiply the number in the **Total Calls** field by 20 for the identified 3-minute time interval (the time when the problem occurred).

If the product exceeds the advertised **BHCC** of the configuration, it is the load for this time interval causing the problem. If the product does not exceed the **BHCC** for the configuration, this load is not the problem.

- Compare the number in the **Total Atmpts** field with the **Total Calls** field for the identified 3-minute time interval (the time when the problem occurred).

If the number of attempts is significantly greater than the number of calls, a significant percent of the occupancy is due to processing off-hook and on-hook stimuli that do not result in a completed call.

- Examine the hardware error log for an excessive amount of maintenance activity (for example, a high number of errors).
- Refer to the **list measurements communications-links** report to determine if any of the links are receiving an abnormal amount of traffic.
- Check with the users to determine if a certain feature(s) is used heavily during the identified time interval.
- Refer the problem to maintenance personnel with the suggestion they check the software error log.

After a serious performance problem is detected and corrected, use the **clear measurements occupancy busiest-intervals** command and clear the log of busiest entries. This allows attention to be focused on any current performance problems.

**Note:**

The **clear measurements occupancy busiest-intervals** command should only be used to clear out data from resolved problems.

---

## The communications links command

This section describes the processor occupancy **communications links** command.

---

### When to use the communications links command

The main functions of the **communications links** command are to:

- Obtain a report that facilitates the monitoring of traffic over the processor interface links
- Determine if it is necessary to perform load balancing
- Identify defective processor interface links

### Note:

The three processor occupancy commands described earlier may (depending upon the application) indicate the configuration is running at capacity, in keeping with user perceptions. However, these commands, with the exception of pointing to a call overload, do not provide any extra information as to why it is running at capacity. This command provides additional insight into how the processor interface links affect occupancy (for example, link overload, link transmission problems, and so on).

---

## Communication Link Measurements report

### Command

To display the processor occupancy Communication Link Measurements report:

1. Type `list measurements communications-links <1-8/9-16/17-24/25> [schedule]` and press **Enter**.

**Required fields:** There is one required field for this command—1-8/9-16/17-24/25. Enter the range of links you want to display.

**Options:** The **schedule** option is available for this command.

### Screen

[Figure 129](#) and [Figure 127](#) show typical output for the Communication Link Measurements report. The time and date the report is requested displays at the top right.

[Table 97](#) describes the data fields presented in the Processor Occupancy Communications Link Measurements report.

**Figure 129: Communication Link Measurements report — page 1**

list measurements communications-links 1-8							Page 1 of x	
Switch Name: Cust_Switch_Name				Date: 1:55 pm WED JAN 25, 2006				
COMMUNICATION LINK MEASUREMENTS								
Meas	Link	Link	Link	Link	Link	Link	Link	Link
Hour	1	2	3	4	5	6	7	8
1200	10471	576	24	4	0	40	2	0
1100	13764	612	24	14	0	313	4	0
1000	12217	550	24	4	0	36	9	0
900	12365	601	26	4	0	32	2	0
800	12630	559	28	4	0	36	4	0
700	12714	412	24	4	0	36	4	0
600	12531	299	24	4	0	40	4	0
500	12407	352	24	4	0	42	2	0
400	12173	311	34	4	0	32	2	0
300	12121	301	24	4	0	36	4	0
200	12561	412	24	4	0	36	4	0
100	12501	478	24	4	0	36	2	0
press CANCEL to quit -- Press NEXT PAGE to continue								

**Figure 130: Communication Link Measurement report — page 2**

list measurements communications-links 1-8						Page 2 of x		
Switch Name: Cust_Switch_Name				Date: 1:55 pm WED JAN 25, 2006				
COMMUNICATION LINK MEASUREMENTS								
Meas	Link	Link	Link	Link	Link	Link	Link	Link
Hour	1	2	3	4	5	6	7	8
0	12460	345	28	4	0	44	4	0
2300	12413	301	28	4	0	44	4	0
2200	12313	267	24	4	0	26	4	0
2100	12526	472	26	4	0	32	4	0
2000	12297	376	71	4	0	36	4	0
1900	12330	321	24	13	0	32	4	0
1800	12210	283	24	4	0	36	2	0
1700	12549	356	24	4	0	40	2	0
1600	12361	519	34	4	0	23	2	0
1500	12384	494	24	4	0	29	2	0
1400	12422	0	24	4	0	16	2	0
1300	12318	0	26	4	0	32	2	0
Command successfully completed								
Command:								

The processor occupancy Communication Link Measurements reports for each of your application varies significantly since a particular link on one configuration may serve a different function than the same link for another configuration. Furthermore, what is considered to be normal link traffic for one service (for example, **DCS**) may vary widely from what is considered to be normal link traffic for another service (for example, **CMS**). Therefore, we recommend you

to obtain a printed report of what is deemed to be normal traffic (for each configuration) and use that report for comparison purposes.

This report is of significant value in determining the long term impact processor link traffic has on processor occupancy. The report can also be used to identify certain types of link failure (for example, total failure at 1400 hours on link 2 [on page 2]). However, since the report summarizes data at 1-hour time intervals, some types of intermittent problems are not easily recognized with this report. Intermittent transmission problems may be more easily identified by reviewing the software error log.

**Table 97: Communications Link Measurements report field descriptions**

Field	Description
Meas Hour	<i>Measurement Hour.</i> The starting time (using 24-hour clock) of the hour during which the data is recorded. Data is listed beginning with the most recently completed hour and extending back for 24-hour intervals.
Link #	<i>Link Number.</i> The links are identified by numbers 1 through 8, 9 through 16, 17 through 24, or 25. The numbers in each column represent the number of messages traversing the link. Once a link is established and traffic begins flowing over it, the messages are counted automatically; no command is required.

---

## Mapping links to applications

### Command

To see what applications are running on the links:

1. Type `display communication-interface links` and press **Enter**.

### Screen

[Figure 131](#) shows typical output for the Interface Links report for the G3r, G3si and G3csi systems.

[Table 98](#) describes the data fields presented in this report.

**Figure 131: Interface Links report**

display communication-interface links								SPE B
INTERFACE LINKS								
Link	Enab	Est	Ext	Type	Dest.	Conn.	Name	
		Conn			Number	Module		
1:	n	n						
2:	n	n	25902	BX25			proc 02 - audix	
3:	n	n						
4:	y	y	25904	BX25	28007		proc 04	
5:	n	n						
6:	n	n						
7:	n	n						
8:	n	n						

**Table 98: Interface Links report field descriptions 1 of 2**

Field	Description
<b>Link</b>	Indicates the interface link number that connects to another node in a DCS network, a message server, CMS, ISDN gateway, or AUDIX. Interface links always terminate on a port in a PGATE circuit pack for R5r and later configurations or on the PI circuit pack for R5si configurations
<b>Enable</b>	Indicates whether the link is enabled.
<b>Est Conn</b>	Establish Connection. Displays a <b>y</b> when the system is responsible for any part of the call setup required for the link between the system and the far-end data module.
<b>Ext</b>	Extension. This is the data extension assigned on the Processor Interface Data Module screen. If the data module has not been administered, this field will be blank.
<b>Type</b>	Displays the protocol type that is to be established on the link. Valid entries are <b>BX25</b> and <b>isdn</b> .
<b>Destination Number</b>	Displays either <b>external</b> , <b>switched</b> , <b>TAC</b> , or <b>eia</b> if the system is involved in establishing any part of the connection.
<b>DTE DCE</b>	Specifies either <b>DTE</b> or <b>DCE</b> to define the type of interface. This field only contains information if the <b>Type</b> field is <b>BX25</b> . If one endpoint of a link is DTE, then the other must be DCE, and vice-versa.

**1 of 2**

**Table 98: Interface Links report field descriptions 2 of 2**

Field	Description
<b>Conn Mod.</b>	Connected Data Module. This is the data module extension to which the link connects.
<b>Name</b>	Displays the 15-character name for the link (for identification purposes only). It may be used to identify the destination machine.

**2 of 2**

## Data analysis guidelines

The following guidelines are intended to show an easy method for determining whether currently-reported data is acceptable. These guidelines represent the minimum you should do to verify the recorded measurement values are consistent with expected and historic values. Perform additional checks as necessary.

To check the acceptability of hourly data, verify the system clock was not changed during the measurement hour. If the system clock was changed, the **Minutes** field displays double asterisks (for example, **11\*\***).

During a partial system reset (for example, 1 or 2 or Cold 1 or Cold 2) the measurement data is retained for the affected time interval. However, during a full system reset (for example, 3, 4, or 5) the measurement data is not retained for the affected time interval.

## Analyzing the data

To calculate the measured **BHCC**, use the summary report to collect measurement data. Subsequently, record data for the identified peak hour on Worksheet 5 (see [Chapter 7: Blank worksheets](#)). After recording four weeks of data, calculate the column averages and record the averages in the appropriate row and column at the bottom of Worksheet 5.

**Note:**

Before recording each day's data, review the whole day in order to ensure the peak hour is not the result of an abnormality (for example, caused by a snow storm, and so on). If you determine the peak hour is the result of an abnormality, disregard that day's data. Additionally, the weeks you select to record data from should *not* be times of slack business activity. Furthermore, the weeks should *not* be four consecutive weeks; but should be the weeks from two or more months of normal business activity.



[Worksheet 5](#) in [Chapter 7: Blank worksheets](#) provides space to record seven-day-per-week data. If your application is a five-day operation, data should only be recorded for the five days (Monday through Friday). When averaging the data, take care to only divide by the number of days that data was actually recorded (for example, 20 or 28).

**Table 99: Procedures for calculating processor occupancy 1 of 4**

Step	Description
Step 1.	<p>Is there available sufficient Processor Occupancy to grow the configuration?</p> <ul style="list-style-type: none"> <li>• If the sum of Call Processing Occupancy plus Static Occupancy is greater than 70 percent, there is no room to grow and no need to complete Steps 2 through 7.</li> <li>• If the sum of Call Processing Occupancy plus Static Occupancy is less than 70 percent, continue with the following steps.</li> </ul>
Step 2.	<p>Calculate the usage profile. Use the four-week average data (obtained from your completed copy of Worksheet 5) to solve the following equations.</p> $\% \text{ INTCOM} = \frac{\text{Int Atmpt}}{\text{Total Atmpt}} \times 100$ $\% \text{ INC} = \frac{\text{Inc Atmpt}}{\text{Total Atmpt}} \times 100$ $\% \text{ OUT} = \frac{\text{Out Atmpt}}{\text{Total Atmpt}} \times 100$ $\% \text{ PNET} = \frac{\text{Pnet Atmpt} - \text{Tandem Calls}}{\text{Total Atmpt}} \times 100$

**1 of 4**

**Table 99: Procedures for calculating processor occupancy 2 of 4**

Step	Description
Step 3.	<p>Determine the traffic application. Is the traffic application ICM/CMS, or CallVisor ASAI/OCM? You can make this determination based on the type of business served by the configuration, the percentages of incoming and outgoing traffic, and personal knowledge of which features are in use. For example, a General Business application has a more even (in terms of incoming, outgoing, and intercom) distribution of traffic. An ICM/CMS application has a high percentage of incoming calls and also provide those features specific to <b>ACD</b> or Call Vectoring. Some of these include agent and trunk tracking capability (for example, <b>CMS</b> or <b>BCMS</b>), recurring announcements, and so on.</p> <p>If the configuration supports more than one traffic application (for example, ICM/CMS as the primary and General Business as the secondary), then the processor occupancy required for the primary application must be determined first; the remainder is available for the secondary application.</p> <p><b>Note:</b> This document describes the method for calculating the <b>BHCC</b> for a simple General Business traffic application. Those configurations that provide the <b>DCS</b>, <b>CMS</b>, <b>BCMS</b>, and/or ISDN-PRI feature(s) are termed complex and the Design Center must be consulted in order to calculate their <b>BHCC</b>. All <b>ICM</b> (<b>ACD</b> and Call Vectoring), ASAI/OCM, and vectoring and interflow/traffic applications are also termed complex and currently are only evaluated by the Design Center. For more information, contact your Account Team.</p>
Step 4.	<p>Determine the maximum number of calls the configuration should be able to complete in one hour. In order to make this determination, refer to the configuration's guidelines.</p>

**2 of 4**

**Table 99: Procedures for calculating processor occupancy 3 of 4**

Step	Description
Step 5.	<p data-bbox="516 310 1372 342">Determine the normal calling rate for the given level of occupancy.</p> <p data-bbox="581 359 1328 457">a. Calculate how many completed calls the configuration makes for the given level of occupancy. This number is referred to as <i>Calls Predicted</i>.</p> $Calls\ Predicted = \frac{Static\ Occ + CP\ Occ}{70} \times BHCC$ <p data-bbox="581 638 662 669"><b>Note:</b></p> <p data-bbox="654 680 1255 779">1) The divisor number, 70, is the constant from Step 1 and refers to the percentage of the processor used by call processing.</p> <p data-bbox="654 816 1252 884">2) The number for <b>BHCC</b> is the number that is obtained in Step 4.</p> <p data-bbox="581 903 1320 970">b. Compare the Calls Predicted number to the four-week average Total Calls field on Worksheet 5.</p> $Calls\ Predicted < Total\ Calls$ <p data-bbox="829 1087 854 1108">or</p> $Calls\ Predicted > Total\ Calls$ <p data-bbox="581 1190 1372 1360">c. If the Calls Predicted number is less than the Total Calls number, then either of you have a low feature usage rate or is completing more than 70 percent of calls. Therefore, if additional capacity is used in the same way, the following predictions should provide reliable results.</p> <p data-bbox="618 1396 1372 1566">If the Calls Predicted number is greater than the Total Calls number, then either of you have a high feature usage rate or is completing fewer than 70 percent of calls. Therefore, care must be taken in predicting how many additional calls can be supported.</p> <p data-bbox="516 1585 1372 1675"><b>Note:</b> If the Calls Predicted number equals or approximately equals the Total Calls number, then you are using the configuration in a typical manner.</p>

**3 of 4**

**Table 99: Procedures for calculating processor occupancy 4 of 4**

Step	Description
Step 6.	<p>Determine how many additional calls the configuration can complete. The number of additional calls can be calculated with the following equation.</p> $\text{Number of Additional Calls} = \frac{\text{Total Calls (4 Week Avg)}}{\text{Static Occ} + \text{CP Occ}} \times (\text{Idle Occ} - 15)$
Step 7.	<p>Determine how many additional extensions can be added.</p> $\text{Additional Extensions} = \frac{\text{Number of Additional Calls}}{\text{Average Number of Calls per Extension}}$ <p><b>Note:</b> The Average Number of Calls per Extension depends on the traffic application and other customer-specific operating techniques. If this measurement is not known, then you may use 4.05 (a typical figure for a General Business traffic application).</p> <p style="text-align: right;"><b>4 of 4</b></p>

# Chapter 5: Security violations reports

This chapter describes the security violations reports. There are four security violation reports, a summary report and three status reports. These reports show attempts to use station security codes, authorization codes, and remote access barrier codes.

---

## Security Violations Summary report

The system generates a Security Violations Summary report which displays valid and invalid access attempts, and security violations in each of the categories measured (authorization code, barrier code, and station security code).

### Commands

Commands are available to display or clear the Security Violations Summary report.

To display the summary report:

1. Type `list measurements security-violations summary [schedule]` and press **Enter**.

To reset all counters of the Security Violations Summary report to zero:

1. Type `clear measurements security-violations` and press **Enter**.

**Note:**

The Security Violations Summary report accumulates data until it is cleared. This report *will* overflow; therefore, review and clear it at least once a month.

**Options:** The **schedule** option is available for these commands.

### Screen

[Figure 132](#) displays a typical Security Violations Summary report. The report header lists the switch name and date and time the report is requested.

[Table 100](#) describes the data presented in the Security Violations Summary report.

**Figure 132: Security Violations Summary report**

```

Switch Name:_____      Date: xx:xx am  WED JAN 25, 2006

      SECURITY VIOLATIONS SUMMARY REPORT
Counted Since: system initialization

Barrier
Codes
-----

      Station Security Codes      Authorization Codes
      -----
      Origination                  Remote
Station  Trunk  Total  Station  Trunk  Access  Attd  Total
Valid    0      1      2      3      0      0      0      0      0
Invalid  0      4      6     10     0      0      0      0      0
Sec Viol 0      0      3      0      0      0      0      0      0

```

**Table 100: Security Violations Summary report field descriptions 1 of 2**

Field	Description
<b>Counted Since</b>	The time at which the counts above were last cleared and started accumulating again, or when the system is initialized.
<b>Barrier Codes</b>	<p>The total number of times a user entered a valid or invalid remote access barrier code, and the number of resulting security violations. Barrier codes are used with remote access trunks.</p> <p>An inexplicable, significant increase in valid barrier code use could indicate the barrier code has been compromised.</p> <p>A marked increase in this number of invalid codes may indicate someone is <i>attempting</i> to break into your system. If you have just administered a new barrier code, or a barrier code expired recently, it may indicate people are making honest mistakes.</p> <p><b>Suggested action:</b> Delete or change the barrier code if you suspect it has been compromised.</p>

**1 of 2**

**Table 100: Security Violations Summary report field descriptions 2 of 2**

Field	Description
<b>Station Security Code Origination/ Total</b>	<p>The number of calls originating from either stations or trunks that generated valid or invalid station security codes, the total number of such calls, and the number of resulting security violations.</p> <p>A dramatic increase in the number of either valid or invalid attempts may be cause for alarm. Unless recording of TTI/PSA events is turned off, they appear in the history log. If usage does not seem legitimate, security codes and/or classes of service should be changed.</p>
<b>Authorization Codes</b>	<p>The number of calls, by origination, that generated valid or invalid authorization codes, the total number of such calls, and the number of resulting security violations. Calls are monitored based on the following origination types:</p> <ul style="list-style-type: none"> <li>● Station</li> <li>● Trunk (other than remote access)</li> <li>● Remote Access</li> <li>● Attd (Attendant)</li> </ul> <p>If valid authorization code usage increases dramatically, you should investigate. Someone may have obtained valid codes; on the other hand, it may turn out that a number of new, legitimate users have come onto the system.</p> <p>If invalid authorization code usage increases dramatically, you should investigate. Someone may be trying to break into your system. However, a legitimate explanation may be that authorization codes have recently been changed and users are making some honest mistakes. If you suspect authorization codes have been compromised, change them.</p>
<b>Total</b>	Measurements totaled for all the above port types.

**2 of 2**

---

# Security violations status reports

The security violations reports provide current status information for login, remote access (barrier code), or authorization code or station security code violation attempts. The data displayed in these reports is updated every 30 seconds. A total of 16 entries are maintained for each type of violation. The oldest information is overwritten by new entries at each 30-second update.

There are four distinct reports:

- Security Violations Status - Security Violations
- Security Violations Status - Remote Access Barrier Code Violations
- Security Violations Status - Authorizations Code Violations
- Security Violations Status - Station Security Code Violations

---

## Security Violations Status - Remote Access Barrier Code Violations report

[Figure 133](#) shows typical output for the Security Violations Status - Remote Access Barrier Code Violations report.

[Table 101](#) describes the data fields presented in this report.

---

**Figure 133: Remote Access Barrier Code Violations report**

-----						
monitor security-violations remote-access						
-----						
SECURITY VIOLATIONS STATUS						
Date: 17:18 WED JAN 25 2006						
REMOTE ACCESS BARRIER CODE VIOLATIONS						
Date	Time	TG No	Mbr	Ext	Bar-Cd	CLI/ANI
01/22	10:55	31	5	4050	1030	2025551234
01/22	10:54	31	1	4050	2345	5559876



**Table 101: Remote Access Barrier Code Violations report data field descriptions**

<b>Field</b>	<b>Description</b>
<b>Date</b>	The date the attempt occurred.
<b>Time</b>	The time the attempt occurred.
<b>TG No</b>	Trunk Group Number. The number of the remote access trunk group over which the barrier code is sent.
<b>Mbr</b>	Trunk Group Member. The number of the remote access trunk group member over which the barrier code is sent.
<b>Ext</b>	Extension. The extension used to interface with the Remote Access feature.
<b>Bar-Cd</b>	Barrier Code. The incorrect barrier code that resulted in the invalid attempt.
<b>CLI/ANI</b>	Calling Line Identifier/Automatic Number Identification. The calling line identifier or automatic number identification, when available on the incoming message, of the party making the invalid attempt.

---

## Security Violations Status - Authorization Code Violations report

[Figure 134](#) shows typical output for the Security Violations Status—Authorization Code Violations report.

[Table 102](#) describes the data fields presented in the Security Violations Status—Authorization Code Violations report.

**Figure 134: Authorization Code Violations report**

-----								
monitor security-violations authorization-code								
-----								
SECURITY VIOLATIONS STATUS								
Date: NN:nn DAY MON nn 200n								
AUTHORIZATION CODE VIOLATIONS								
Date	Time	Originator	Auth-Cd	TG No	Mbr	Bar-Cd	Ext	CLI/ANI
01/07	08:33	STATION	1234567				84321	
01/06	07:32	TRUNK	1233555	35	14			3035551234
01/03	14:22	REM ACCESS	2222	31	3	3295912		5556789
12/25	16:45	ATTENDANT	1212111				84000	
-----								
-----								

**Table 102: Authorization Code Violations report 1 of 2**

Field	Description
Date	The date the attempt occurred.
Time	The time the attempt occurred.
Originator	<p>The type of resource from which the invalid access attempt originated. Originator types include:</p> <ul style="list-style-type: none"> <li>● <b>station</b></li> <li>● <b>remote access</b> (when the invalid authorization code is associated with an attempt to invoke the Remote Access feature)</li> <li>● <b>attendant</b></li> </ul>
Auth-Cd	Authorization Code. The invalid authorization code entered.
TG No	Trunk Group Number. The trunk group number of the trunk where the attempt originated. It appears only when the originator type is "trunk" or "remote access" and an invalid authorization code is entered.

**1 of 2**

**Table 102: Authorization Code Violations report 2 of 2**

<b>Field</b>	<b>Description</b>
<b>Mbr</b>	Trunk Group Member. The number of the trunk in the trunk group where the attempt originated.
<b>Bar-Cd</b>	Barrier Code. The valid barrier code entered with the invalid authorization code. It appears only when an authorization code is required to invoke Remote Access, following entry of the barrier code.
<b>Ext</b>	Extension. The extension associated with the station or attendant originating the call. It appears only when authorization code is entered from the station or attendant console.
<b>CLI/ANI</b>	Calling Line Identifier/Automatic Number Identification. The calling line identifier or automatic number identification, when available on the incoming message, of the party making the invalid attempt.
<b>2 of 2</b>	

---

## Security Violations Status - Station Security Code Violations report

[Figure 135](#) shows typical output for the Security Violations Status - Station Security Code Violations report.

[Table 103](#) describes the data fields presented in this report.

**Figure 135: Station Security Code Violations report**

```

-----
monitor security-violations station-security-codes
-----

                SECURITY VIOLATIONS STATUS
                Date:  11:42 WED JAN 25 2006

                STATION SECURITY CODE VIOLATIONS

Date   Time      TG No   Mbr    Port/Ext   FAC   Dialed Digits
01/07  08:33      6      2          123    3001#12345678#
01/01  07:32          01A0301  135    3001#87654321#
01/03  14:22      3      6          124    #5551234#
12/25  16:45          88888    127    980765432112345
-----
-----

```

**Table 103: Station Security Code Violations report field descriptions**

Field	Description
<b>Date</b>	The date the attempt occurred.
<b>Time</b>	The time the attempt occurred.
<b>TG No</b>	Trunk Group Number. The trunk group number associated with the trunk where the attempt originated.
<b>Mbr</b>	Trunk Group Member. The trunk group member number associated with the trunk where the attempt originated.
<b>Port/Ext</b>	Port/Extension. The port or extension associated with the station or attendant originating the call.
<b>FAC</b>	Feature Access Code. The feature access code dialed that required a station security code.
<b>Dialed Digits</b>	The digits the caller dialed when making this invalid attempt. This may allow judgement as to whether the caller is actually trying to break in to the system, or is a legitimate user making typographical mistakes.

## Chapter 6: History reports

This chapter describes the History (recent changes) and Malicious Call Trace History reports.

You can view a History report of the most recent administration and maintenance changes. The History report also lists each time a user logs in or off the system. This report is used for diagnostic, information, or security purposes.

The system maintains a log in a software buffer of the most recent administration and maintenance commands. This log is called the transaction log. Commands must be data-affecting and successfully entered to save in the transaction log. The data-affecting commands are called data commands.

The transaction log displays as the History report when you enter the **list history** command at the management terminal or a remote terminal. This report can be generated by any login with display administration and maintenance-data permissions.

You can also view a Malicious Call Trace History report showing all session establishment and rejection events associated with users accessing the system administration and maintenance interface.

---

### Data commands

With the exception of login and logoff, only those administration and maintenance commands that change the data state associated with any object and qualifier are maintained in the transaction log.

For example, the **list change station 3600** command changes the state of the translation data and so is classified as a data command and entered in the log. However, the command **display station 3600** does not change the state of the translation data and is not entered in the log.

The following commands are classified as data commands and are saved in the transaction log:

- add, change, remove, duplicate
- backup
- busyout, release
- cancel
- clear
- configure
- enable, disable
- recycle
- refresh
- restart
- save
- set, reset
- start
- test

## History reports

- format
- login/logoff
- mark
- upgrade
- wp (write physical)

The following commands are *not* classified as data commands and are *not* saved in the transaction log:

- copy
- download
- list, display, status
- get
- load, restore
- monitor
- rp (read physical)
- upload

---

## History report

The History report contains associated data saved in the transaction log for every data command. This data includes:

- Date and time
- Port
- Login
- Action, object, and qualifier

**Note:**

If the `Record IP Registrations in History Log` field is enabled on the Feature-Related Systems Parameters screen, then a history log entry occurs each time an IP endpoint registers with the Communication Manager system.

The History report displays or prints data commands in last in, first out (LIFO) order.

---

## Parsing capabilities for the History report

As its name indicates, the history report provides details about every data command. You can use parsing options to limit the data returned in this report.

[Table 104](#) identifies the parsing options available to you.

**Note:**

You can display these options by entering the command **list history**, then clicking **HELP** or pressing **F5**.

**Table 104: History report parsing options**

Option	Description
date	Specify the month ( <b>MM</b> or day ( <b>MM/DD</b> ) for which to display history data.
time	Specify the hour ( <b>HH</b> ) or minute ( <b>HH:MM</b> ) for which to display history data.
login	Specify the login for which you wish to display history data.
action	Specify the command action (the first word of the command string) for which you wish to display history data. You can view the list of available command actions by clicking <b>HELP</b> or pressing <b>F5</b> at the command line.
object	Specify the command object for which you wish to display history data.
qualifier	Specify the command qualifier for which you wish to display history data.

To limit the data displayed in the history report, enter the command **list history** followed by a space and the appropriate parser and, if applicable, format. Only the data for the specified parsers will appear in the report.

You can include multiple parsers, but only a single instance of any parser (for example, you may parse for **date**, **time**, and **login**, but not for **date**, **time**, and two different **logins**).

---

## Command

To display the History report:

Type **list history** and press **Enter**.

---

## Screen

[Figure 136](#) shows a typical screen for the History report.

[Table 105](#) describes the data fields presented in the History report.

**Figure 136: History report**

list history							Page 1
HISTORY							
Date of Loaded Translation: 10:08pm Wed Jan 22,2003							
Date	Time	Port	Login	Actn	Object	Qualifier	
2/18	12:34	1A0301	tti-m	cha	station	4000	
2/18	12:23	1B0401	psa-a	cha	station	4003	
2/16	09:44	2B0608	tti-s	cha	station	4003	
2/16	09:22	1D0708	psa-d	cha	station	4055	
2/15	15:26	01B1203	actr-d	cha	station	2005 EMERGENCY EXT	
2/15	15:25	01B1203	actr-u	cha	station	2004	
2/15	15:20	SYSAM-LCL	init	cha	system-param	features	
2/15	15:17	NET	inads	dup	station	20001 start 30001 count 8	
2/15	15:16	EPN	cust	add	station	507	
2/15	15:15	EPN	ncust	logn			
2/15	15:01	NET	cust	add	station	502	
2/15	14:56	NET	cust	add	station	501	
2/15	14:23	EPN	cust	cha	dialplan		

**Table 105: History report field descriptions**

Field	Description
Date of Loaded Translation	The time and date the translation is saved on tape. When a translation is saved on tape (via the <b>save translation</b> command), the time and date of the save is logged on the tape. Whenever the system is cold-started or rebooted, the transaction log is loaded from the tape and the time and date are included on the History report.
Date	The date the data command is entered.
Time	The time the data command is entered.
1 of 3	



Table 105: History report field descriptions (continued)

Field	Description
Port	<p>The port, or group of ports, to which the user is connected. Users are grouped as follows:</p> <p>G3csi and G3si port types</p> <ul style="list-style-type: none"> <li>● MGR1 - direct system access port connection</li> <li>● INADS - dial up port</li> <li>● EPN - Expansion Port Network connection</li> <li>● NET - Network Controller incoming/outgoing system access port</li> <li>● PHONE - local extension</li> <li>● G3r port types</li> <li>● SYSAM-LCL - direct system access port connection</li> <li>● SYSAM-RMT - dial up port</li> <li>● MAINT - maintenance board RS-232 connection</li> <li>● SYS-PORT - incoming/outgoing system access port</li> <li>● PHONE - local extension</li> </ul> <p>G3csi, G3si, and G3r port types</p> <ul style="list-style-type: none"> <li>● XXXXXX - actual psa/tti port (for example, 1A0301) the phone is either separating from or merging to.</li> </ul>
Login	<p>The system login of the user entering the <b>data</b> command (for example, <b>cust</b>). If the port type is a psa/tti port, the corresponding login will be one of the following:</p> <ul style="list-style-type: none"> <li>● psa-a - psa associate</li> <li>● psa-d - psa disassociate</li> <li>● tti-m - tti merge</li> <li>● tti-s - tti separate</li> <li>● actr-a - actr associate</li> <li>● actr-d - actr denied</li> <li>● actr-u - actr unassociate</li> </ul> <p>Note that these logins associated with the port type will not appear on the Login report. These transactions only appear if the CTA/PSA/TTI Transactions in History Log field is enabled on the Feature-Related System Parameters screen. These transactions appear as two separate records; one recording the moved-from port, the other recording the moved-to port. IP phone registrations are also recorded.</p>
Action	The first command word entered; this specifies the operation to be performed.

2 of 3

**Table 105: History report field descriptions (continued)**

Field	Description
Object	The second command word or words entered; this specifies the object to be acted on (for example <b>station</b> , <b>trunk group</b> ).
Qualifier	The third command word or words entered; this typically is one or more words or digits used to further identify or complete the object (for example, <b>1120</b> [the station number]).
3 of 3	

---

## Malicious Call Trace History report

Malicious Call Identification (MCID) feature enables you to connect to an ETSI ISDN network and request the source of an incoming call be identified and recorded by the network. If you are connected to a public ISDN that has the MCID feature enabled for you, then a Communication Manager server can notify the public network about the malicious call. The public ISDN uses one of the following protocols:

- ETSI: EN 300 130
- Australia: TPH1856

The MCT History form records in the **ISDN Notification** field whether the public ISDN was notified, and whether an acknowledgement was received. Recording a malicious call requires an Aux trunk, which can only be configured in a Port Network.

---

## Command

To display the Malicious Call Trace History report:

Type **list mct-history** and press **Enter**

**Options:** The **schedule** option is available with this command.

---

## Screen

[Figure 137](#) shows a typical screen for the Malicious Call Trace History report.

[Table 106](#) describes the data fields presented in the Malicious Call Trace History report.

**Figure 137: Malicious Call Trace History report**

list mct-history						Page 1
MALICIOUS CALL TRACE HISTORY						
Date	Time	Contr Ext/ Active Ext	Recorder Port	Redir From/ Actual Party	Parties on Call	
3/18	12:35	7025057	02C07001	none	7041004	
		7000151		7000151	no party #3	
					no party #4	
					no party #5	
					no party #6	
ISDN Notification: not sent						

**Table 106: Malicious Call Trace History report field descriptions**

Field	Description
Date	Indicates the date of the session establishment or rejection. The date is displayed in the mm/dd format, where mm = month and dd = day.
Time	Indicates the time of the session establishment or rejection. The time is displayed in the hh:mm format, where hh = hour and mm = minute.
Contr Ext	Indicates the extension of the station that took control of the malicious call.
Active Ext	Indicates the extension of the station that activated MCT. This may or may not be the station that received the malicious call.
Recorder Port	Indicates the port on which the session was recorded. A port enables recording of a malicious call.
Redir From	If the call was redirected or transferred, this field indicates the extension of the station from which the call arrived at the Activating Extension.
Actual Party	Indicates the extension of the station that received the malicious call.
Parties on Call	Indicates the caller IDs or extensions of the other parties on the call.
ISDN Notification	Indicates whether the public ISDN was notified, and whether an acknowledgement was received.



## Chapter 7: Blank worksheets

Worksheets serve as the suggested means for collecting data for historical comparison purposes. To obtain information on how to use these forms, refer to [Data analysis guidelines for trunk groups](#) on page 324 for the corresponding measurements report. Make as many copies of these forms as you need for your data collection and analysis.

## Worksheet 1

ATTENDANT GROUP DATA WORKSHEET

System ID:

Location:

Group Size:

Day of Week	Report Type*	Meas Hour	Calls Ans	Calls Aband	Calls Queued	Calls H-Abd	Calls Held	Time Avail	Time Talk	Time Held	Time Abd	Speed of Answer	Week No. and Date
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													

\* Report Type: LH for last hour, TP for today's peak, or YP for yesterday's peak.

## Worksheet 2

### ARS/AAR ROUTING PATTERN DATA WORKSHEET

System ID:		Location:		Report Type = Yesterday *									
Route-Pattern No:		Queue Size:											
Day of Week	Total Calls Offered	Calls Carried	Calls Blocked	Calls Queued	Queue Overflow	% of Calls Carried						Week No. and Date	
						Pref 1	Pref 2	Pref 3	Pref 4	Pref 5	Pref 6		
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													

\* Use "Yesterday's report" for the full day route-pattern measurement.

## Worksheet 3

HUNT GROUP DATA WORKSHEET

System ID: Group ID:				Location: Group Size: Queue Size:		Group Name: Group Type:		
Day of Week	Report Type*	Meas Hour	Total Usage	Calls Answered	Calls Abandoned	Calls Queued	Speed of Answer	Week No. and Date
M								
T								
W								
T								
F								
S								
S								
M								
T								
W								
T								
F								
S								
S								
M								
T								
W								
T								
F								
S								
S								
M								
T								
W								
T								
F								
S								
S								

\* Report Type: LH for last hour, TP for today's peak, or YP for yesterday's peak



## Worksheet 4

### TRUNK GROUP DATA WORKSHEET

System ID:		Location:		Group Type:									
Group No:		Group Size:		Group Dir:									
		Queue Size:											
Day of Week	Report Type*	Meas Hour	Total Usage	Total Seize	Inc. Seize	Grp Ovfl	Calls Qued	Que Ovfl	Que Abd	Out Serv	% ATB	% Out Blk	Week No. and Date
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													

\* Report Type: LH for last hour, TP for today's peak, or YP for yesterday's peak

## Worksheet 5

WIDEBAND TRUNK GROUP DATA WORKSHEET

System ID: Group No:				Location: Group Size:				Service Type: Group Dir:		
Day of Week	Report Type*	Meas Hour	Total Usage	Total Seize	Inc. Seize	Grp Ovfl	Out Serv	% ATB	% Out Blk	Week No. and Date
M										
T										
W										
T										
F										
S										
S										
M										
T										
W										
T										
F										
S										
S										
M										
T										
W										
T										
F										
S										
S										
M										
T										
W										
T										
F										
S										
S										

\* Report Type: LH for last hour, TP for today's peak, or YP for yesterday's peak

## Worksheet 6

**PROCESSOR OCCUPANCY SUMMARY DATA WORKSHEET**

System ID:		Location:											
Day of Week	Peak Hour	Stat Occ	CP Occ	SM Occ	Idle Occ	Total Calls	Tandem Calls	Total ATMP	INTCOM ATMP	INC ATMP	OUT ATMP	PNET ATMP	Week No. and Date
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
M													
T													
W													
T													
F													
S													
S													
4 Week Avg	NA												

“NA” means that the field () should not be calculated. It is not applicable.



# Index

## A

AAR and ARS features  
     ARS/AAR Routing Pattern Data worksheet . . . . [79](#)  
     reports . . . . . [72](#)  
 action, *see* command line formats  
 Administrator Guide for Communication Manager  
     commenting on . . . . . [18](#)  
 alarms  
     bursty errored seconds (BES) . . . . . [105](#), [115](#)  
     DS1 alarm resolution . . . . . [121](#)  
     DS1 links resolution . . . . . [113](#)  
     errored seconds (ES) . . . . . [105](#), [115](#)  
     failed seconds (FS) . . . . . [105](#), [115](#)  
     major alarm time stamps . . . . . [236](#)  
     severely errored seconds (SES) . . . . . [105](#), [115](#)  
     system printers . . . . . [31](#)  
     unavailable/failed seconds (UAS/FS) . . . . . [114](#), [121](#)  
 announcement measurements . . . . . [279](#)  
 ARS/AAR Routing Pattern Data worksheet . . . [79](#), [367](#)  
 attendant  
     offered loads (AOL) . . . . . [57](#), [264](#)  
     position requirements . . . . . [62](#), [136](#)  
     speed of answer . . . . . [51](#), [60](#)  
 Attendant Group Data worksheet . . . . . [56](#), [366](#)  
 Attendant Group Measurements report . . . . . [44](#), [51](#)  
 Attendant Positions Measurements report . . . . . [51-53](#)  
 Attendant Speed of Answer report . . . . . [53-55](#)  
 Authorization Code Violations report . . . . . [353-355](#)  
 Automatic Call Distribution (ACD) feature  
     hunt group reports . . . . . [124](#)  
     hunt groups, important considerations . . . . . [134](#)  
 Automatic Callback (ACB) feature  
     interactions  
         Call Coverage . . . . . [94](#)  
         queue abandonments . . . . . [270](#)  
 Automatic Circuit Assurance (ACA) feature  
     reports . . . . . [64](#)  
 Automatic Circuit Assurance (ACA) Measurements report  
     [69-72](#)  
 Automatic Circuit Assurance (ACA) Parameters report [65-68](#)  
 Avaya documentation  
     commenting on . . . . . [18](#)  
     obtaining Avaya books on the Web . . . . . [17](#)  
     ordering . . . . . [18](#)  
 average holding times . . . . . [136](#)  
 average work times (AWT) . . . . . [56](#)

## B

Basic Call Management System (BCMS) feature  
     logins . . . . . [31](#)  
 basic call management system (BCMS) feature  
     ACD hunt groups . . . . . [124](#)  
 Blockage Study report  
     port network links (PNL)  
         command . . . . . [220](#)  
         data . . . . . [218](#)  
         field descriptions . . . . . [221](#)  
         screen . . . . . [220](#)  
         TDM usage . . . . . [219](#)  
     switch node links (SNL)  
         command . . . . . [220](#)  
         data . . . . . [218](#)  
         field descriptions . . . . . [223](#)  
         screen . . . . . [222](#)  
 Bridged Call Appearance feature  
     data analysis, Call Coverage . . . . . [95](#)  
     interactions  
         Call Coverage . . . . . [94](#)  
 bursty errored seconds (BES) . . . . . [105](#), [115](#)  
 busy hour call capacities (BHCC) . . . . . [328](#)  
 busyout sp-link command . . . . . [31](#)

## C

calculations  
     attendant offered loads (AOL) . . . . . [57](#), [264](#)  
     attendant positions . . . . . [62](#), [136](#)  
     average delays . . . . . [62](#)  
     average holding times . . . . . [136](#), [261](#)  
     average work times (AWT) . . . . . [56](#)  
     free pools . . . . . [276](#)  
     grades of service . . . . . [265](#)  
     hunt group total usage . . . . . [136](#)  
     outgoing seizures . . . . . [321](#)  
     percent blocking . . . . . [247](#), [262](#)  
     percent calls queued . . . . . [59](#)  
     percent delayed calls . . . . . [61](#)  
     percent error free seconds (%EFS) . . . . . [105](#), [115](#)  
     percent occupancy (total time) . . . . . [58](#), [63](#)  
     processor occupancy . . . . . [345](#)  
     staffed time . . . . . [57](#)  
     time division multiplexing (TDM) usage . . . . . [219](#)  
 Call by Call (CBC) Service Selection feature  
     reports . . . . . [275](#)

## Index

- Call by Call (CBC) Trunk Group Measurements report . . . [267-275](#)
  - call classifiers (CC) . . . . . [228](#), [231](#)
  - Call Coverage feature
    - data analysis
      - Bridged Call Appearance. . . . . [95](#)
      - Call Forwarding . . . . . [94](#)
      - Call Pickup . . . . . [95](#)
      - Distributed Communications System (DCS) . . . [95](#)
    - interactions
      - Automatic Callback (ACB) . . . . . [94](#)
      - Bridged Call Appearance. . . . . [94](#)
      - Call Pickup . . . . . [94](#)
      - Leave Word Calling (LWC) . . . . . [94](#)
      - trunk groups. . . . . [94](#)
    - reports . . . . . [93](#)
  - Call Coverage Measurements reports . . . . . [93-104](#)
  - Call Forwarding feature
    - interactions
      - Call Coverage. . . . . [94](#)
  - Call Pickup feature
    - data analysis, Call Coverage . . . . . [95](#)
    - interactions
      - Call Coverage. . . . . [94](#)
  - call progress tone receivers (CPTR). . . . . [228](#), [231](#)
  - Call Rate Measurements report . . . . . [85-87](#)
  - Call Summary Measurements report . . . . . [88-90](#)
  - capacity tables
    - Erlang-C Queue . . . . . [59](#)
    - Retrial . . . . . [59](#), [264](#)
    - Traffic Engineering . . . . . [59](#)
  - Cell Traffic reports . . . . . [91](#), [93](#)
  - central office (CO)
    - trunks, *see* trunk groups
  - centum call seconds (CCS) usage . . . . . [260](#)
  - change commands. . . . . [19](#), [26](#)
  - change meas-selection commands
    - coverage. . . . . [19](#), [95](#)
      - see also* Measured Coverage Paths report
    - principal . . . . . [19](#)
      - see also* Measured Principals report
    - route-pattern . . . . . [19](#), [73](#)
      - see also* Route Pattern Measurement Selection report
    - trunk-group. . . . . [19](#)
      - see also* Trunk Group Measurement Selection report
    - wideband-trunk-group. . . . . [20](#), [323](#)
      - see also* Wideband Trunk Group Measurement Selection report
  - change meas-selection media-processor . . . . . [314](#)
  - change meas-selection network-region . . . . . [313](#)
  - Change measurement selection forms . . . . . [313](#)
  - change report-scheduler command . . . . . [20](#), [35](#), [36](#)
    - see also* Report Scheduler
  - change station 3600 command . . . . . [357](#)
    - see also* Recent Change History report
  - change system-parameters feature command . . . . . [29](#)
    - see also* Report Scheduler
  - clan ethernet command . . . . . [180](#)
  - C-LAN ethernet networkperformance
    - C-LAN Ethernet Performance Measurements report [180](#), [182](#), [184](#), [185](#), [187](#)
  - clan ppp command . . . . . [182](#), [184](#), [185](#), [187](#)
  - C-LAN PPP networkperformance
    - C-LAN PPP Performance Measurements report . . [180](#), [182](#), [184](#), [185](#), [187](#)
  - clear commands . . . . . [26](#)
  - clear measurements commands
    - ds1 . . . . . [20](#), [105](#)
      - see also* DS1 Link Performance Measurements report
    - ds1-facility . . . . . [20](#)
      - see also* DS1 Facility Link Performance Measurements Summary report
    - ds1-facility log. . . . . [116](#)
      - see also* DS1 Facility Link Performance Measurements Detailed report
    - occupancy . . . . . [20](#), [339](#)
      - see also* Occupancy Busiest 3-Minute Intervals Measurements report
    - security-violations . . . . . [20](#), [349](#)
      - see also* Security Violations Summary report
  - command line
    - formats . . . . . [27](#)
    - qualifiers . . . . . [27](#), [31](#)
    - screen appearance . . . . . [28](#)
  - commands
    - change . . . . . [26](#)
    - clear . . . . . [26](#)
    - display . . . . . [26](#)
    - list . . . . . [26](#)
    - monitor . . . . . [26](#)
    - traffic measurement
  - Communication Link Measurements report . . . [340-342](#)
  - controlled slip seconds (CSS) . . . . . [105](#)
  - conventions used. . . . . [17](#)
  - Coverage Path Measurements report . . . . . [96-99](#)
  - customer supplied (theoretical) data . . . . . [59](#)
  - cyclical redundancy checking (CRC-6) errors . . [105](#), [115](#)
- 
- ## D
- data analysis guidelines, *see* specific report names
  - delayed calls, *see* calculations
  - direct department calling (DDC)
    - hunt group reports. . . . . [124](#)
  - display commands . . . . . [26](#)
  - display communications-interface links command. . [342](#)
    - see also* Interface Links report
  - display meas-selection commands
    - coverage . . . . . [20](#), [95](#)
      - see also* Measured Coverage Paths report
    - principal . . . . . [20](#), [100](#)
      - see also* Measured Principals report

route-pattern . . . . . [20](#), [72](#)  
     see *a/so* Route Pattern Measurement Selection report  
 trunk-group. . . . . [20](#)  
     see *a/so* Trunk Group Measurement Selection report  
 wideband-trunk-group. . . . . [20](#), [323](#)  
     see *a/so* Wideband Trunk Group Measurement Selection report  
 display station 3600 command . . . . . [357](#)  
     see *a/so* Recent Change History report  
 display system-parameters feature command . . . . . [64](#)  
     see *a/so* Automatic Circuit Assurance (ACA) Parameters report  
 displaying reports . . . . . [27](#)  
 Distributed Communications System (DCS) feature interactions  
     Call Coverage. . . . . [95](#)  
 DS1 converters  
     boards . . . . . [114](#)  
     reports . . . . . [114](#)  
 DS1 error events  
     extended superframe format (ESF) CRC-6 errors [105](#), [115](#)  
     messages . . . . . [106](#)  
     misframes . . . . . [104](#), [115](#)  
     slips . . . . . [105](#), [115](#)  
 DS1 Facility Link Performance Measurements Detailed Log report . . . . . [114](#)-[121](#)  
 DS1 Facility Link Performance Measurements Detailed report  
     alarm resolution . . . . . [121](#)  
 DS1 Facility Link Performance Measurements Summary report . . . . . [114](#)-[121](#)  
 DS1 Link Performance Detailed Log report . . . . . [114](#)  
 DS1 link performance measurements  
     bursty errored seconds (BES) . . . . . [105](#), [115](#)  
     controlled slip seconds (CSS) . . . . . [105](#)  
     errored seconds (ES) . . . . . [105](#), [115](#)  
     failed seconds (FS) . . . . . [105](#), [115](#)  
     loss of frame counts (LOFC). . . . . [105](#)  
     percent error free seconds (%EFS) . . . . . [105](#), [115](#)  
     severely errored seconds (SES) . . . . . [105](#), [115](#)  
     unavailable/failed seconds (UAS/FS). . . . . [114](#), [121](#)  
 DS1 Link Performance Measurements Detailed Log report  
     alarm resolution . . . . . [113](#)  
 DS1 Link Performance Measurements Summary report [110](#)  
     interface units (IU) . . . . . [106](#)  
 dual tone multifrequency (DTMF) receivers  
     traffic data . . . . . [228](#), [231](#)

## E

EIA Interface feature  
     system printers . . . . . [30](#)  
 Erlang-C Queue capacity tables . . . . . [59](#)  
 errored seconds (ES) . . . . . [105](#), [115](#)  
 errors

DS1 error event counters . . . . . [105](#)  
 DS1 links . . . . . [106](#)  
 errored event records . . . . . [111](#)  
 messages. . . . . [28](#)  
 expansion interface (EI) circuit boards . . . . . [209](#)  
 extended superframe format (ESF) CRC-6 errors [105](#), [115](#)  
 extensions  
     adding numbers . . . . . [100](#)  
     principal coverage . . . . . [100](#)

## F

Facility Restriction Levels (FRL) and Traveling Class Marks (TCM) features  
     routing pattern data . . . . . [79](#)  
 failed seconds (FS). . . . . [105](#), [115](#)  
 figure  
     estimating attendant position requirements . . . . . [63](#)  
     estimating the average delay of delayed calls . . . . . [62](#)  
     estimating the percentage of delayed calls . . . . . [61](#)  
     estimating the speed of answer. . . . . [61](#)  
 free pools . . . . . [276](#)

## G

general purpose tone detectors (GPTD) . . . . . [228](#), [231](#)  
 grades of service . . . . . [265](#)

## H

H.248 GW Level DSP-Resource Reports. . . . . [171](#)  
 help  
     numbers to call . . . . . [18](#)  
 HELP command . . . . . [19](#)  
 Highest Hourly Trunk Group Blocking Performance report [252](#)-[255](#)  
 History report  
     parsing capabilities . . . . . [358](#)  
     transaction logs . . . . . [358](#)  
 Hourly voice/network statistics reports . . . . . [289](#)  
 Hunt Group Data worksheet. . . . . [134](#), [368](#)  
 Hunt Group Measurements report . . . . . [130](#)-[136](#)  
     command . . . . . [130](#)  
     data analysis . . . . . [134](#)  
     field descriptions . . . . . [123](#), [125](#), [131](#)  
     screen . . . . . [130](#)  
 Hunt Group Members report  
     field descriptions . . . . . [128](#)  
     screen . . . . . [127](#)  
 Hunt Group Performance report . . . . . [137](#)-[139](#)  
 Hunt Group Status report . . . . . [139](#)-[141](#)  
 Hunt Groups feature  
     calculating attendant-position requirements . . . . . [136](#)  
     important considerations . . . . . [134](#)  
     total usage calculations . . . . . [136](#)

## Index

Hunt Groups report  
    command . . . . . [122](#), [124](#)  
    screen . . . . . [122](#), [125](#)

---

## I

Interface Links report. . . . . [342-348](#)  
interface units (IU) . . . . . [106](#)  
ip codec command . . . . . [149](#)  
ip codec hourly command . . . . . [141](#), [144](#)  
ip codec summary command . . . . . [146](#)  
ip dsp-resource command . . . . . [151](#)  
IP dsp-resource performance  
    IP dsp-resource hourly report . . . . . [151](#)  
    IP dsp-resource summary report. . . . . [154](#), [158](#)  
ip dsp-resource summary command . . . . . [154](#), [158](#)  
IP processor performance  
    IP codec summary report . . . . . [146](#)  
    IP measurements codec detail report . . . . . [149](#)  
    IP measurements codec hourly report . . . . . [141](#), [144](#)  
IP traffic measurements reports. . . . . [143](#)

---

## J

job IDs . . . . . [31](#)

---

## L

LAN Performance Measurements reports . . . . . [180](#)  
LAR Route Pattern Measurements report . . . . . [189-191](#)  
Leave Word Calling (LWC) feature  
    interactions  
        Call Coverage . . . . . [94](#)  
links, mapping to applications. . . . . [342](#)  
list aca-parameters command . . . . . [20](#), [65](#)  
    *see also* ACA Parameters report  
list commands  
    historical information . . . . . [26](#)  
list coverage path command . . . . . [95](#)  
    *see also* Measured Coverage Paths report  
list emergency command . . . . . [20](#)  
    *see also* Emergency Access Calls report  
list history command . . . . . [357](#), [359](#)  
    *see also* Recent Change History report  
list hunt-group command . . . . . [20](#)  
    *see also* Hunt Groups report  
list logins command . . . . . [20](#)  
list loginscommand  
    *see also* Logins report  
list measurements  
list measurements commands  
    aca . . . . . [20](#), [69](#)  
        *see also* Automatic Circuit Assurance (ACA)  
        Measurements report  
    attendant group. . . . . [20](#), [44](#)

*see also* Attendant Group Measurements report  
attendant positions . . . . . [20](#), [51](#)  
    *see also* Attendant Positions Measurements report  
blockage pn . . . . . [21](#), [220](#)  
    *see also* Blockage Study report  
blockage sn . . . . . [21](#), [220](#)  
    *see also* Blockage Study report  
call-rate. . . . . [21](#), [85](#)  
    *see also* Call Rate Measurements report  
call-summary . . . . . [21](#), [88](#), [91](#)  
    *see also* Call Summary Measurements report  
cbc-trunk-group . . . . . [21](#), [267](#)  
    *see also* Trunk Group Call-By-Call (CBC)  
    Measurements report  
cell-traffic cell addr  
    *see also* Cell Traffic report  
cell-traffic cell-addr . . . . . [21](#)  
cell-traffic summary . . . . . [21](#)  
    *see also* Cell Traffic report  
clan ethernet . . . . . [21](#)  
clan ethernet command . . . . . [180](#)  
clan ppp . . . . . [21](#)  
clan ppp command . . . . . [182](#), [184](#), [185](#), [187](#)  
clan sockets detail. . . . . [21](#)  
clan sockets hourly . . . . . [21](#)  
communications-links . . . . . [21](#), [340](#)  
    *see also* Communication Link Measurements report  
coverage-path. . . . . [21](#), [97](#)  
    *see also* Coverage Path Measurements report  
ds1 log . . . . . [21](#), [111](#)  
    *see also* DS-1 Link Performance Detailed Log report  
ds1 summary . . . . . [21](#)  
    *see also* DS1 Link Performance Measurements  
    Summary report  
ds1-facility log. . . . . [21](#), [116](#)  
    *see also* DS1 Facility Link Performance  
    Measurements Detailed report  
ds1-facility summary. . . . . [21](#), [116](#)  
    *see also* DS1 Facility Link Performance  
    Measurements Summary report  
hunt-group . . . . . [22](#), [130](#)  
    *see also* Hunt Group Measurements report  
ip codec command . . . . . [149](#)  
ip codec hourly command . . . . . [141](#), [144](#)  
ip codec summary command. . . . . [146](#)  
ip dsp-resource command . . . . . [151](#)  
ip dsp-resource summary command . . . . . [154](#), [158](#)  
lar-route-pattern command. . . . . [189](#)  
    *see also* LAR Route Pattern Measurements report  
lightly-used-trunk . . . . . [22](#), [277](#)  
    *see also* Trunk Lightly Used report  
load-balance incoming. . . . . [22](#), [210](#)  
    *see also* Port Network (PN) Load Balance Study  
    Incoming Trunk report  
load-balance intercom . . . . . [22](#), [210](#)



see *also* Port Network (PN) Load Balance Study  
 Intercom Calls report  
 load-balance outgoing . . . . . [22](#), [210](#)  
 see *also* Port Network (PN) Load Balance Study  
 Outgoing Trunk Intercom Calls report  
 load-balance tandem . . . . . [22](#), [210](#)  
 see *also* Port Network (PN) Load Balance Study  
 Tandem Trunk report  
 load-balance total. . . . . [23](#), [210](#)  
 see *also* Port Network Load Balance Study Total Calls  
 report  
 modem-pool . . . . . [23](#), [193](#)  
 see *also* Modem Pool Measurements report  
 occupancy busiest-intervals . . . . . [23](#), [337](#)  
 see *also* Occupancy Busiest 3-Minute Intervals  
 Measurements report  
 occupancy last-hour . . . . . [23](#), [335](#)  
 see *also* Occupancy Last-Hour Measurements report  
 occupancy summary . . . . . [23](#), [329](#)  
 see *also* Occupancy Summary Measurements report  
 outage-trunk . . . . . [23](#)  
 see *also* Trunk Out of Service report  
 principal . . . . . [23](#), [102](#)  
 see *also* Principal Measurements report  
 route-pattern . . . . . [23](#), [74](#)  
 see *also* Route Pattern Measurement Selection report  
 security-violations detail . . . . . [349](#)  
 security-violations summary . . . . . [23](#), [349](#)  
 see *also* Security Violations Summary report  
 summary. . . . . [23](#), [236](#)  
 see *also* Traffic Summary report  
 tone-receiver detail . . . . . [23](#), [232](#)  
 see *also* Tone Receiver Detail Measurements report  
 tone-receiver summary . . . . . [23](#), [228](#)  
 see *also* Tone Receiver Summary Measurements  
 report  
 trunk-group hourly . . . . . [23](#), [248](#), [320](#)  
 see *also* Trunk Group Hourly report  
 trunk-group summary . . . . . [23](#), [24](#), [316](#)  
 see *also* Trunk Group Summary report  
 wideband-trunk-group hourly . . . . . [24](#)  
 see *also* Wideband Trunk Group Hourly report  
 wideband-trunk-group summary . . . . . [24](#)  
 see *also* Wideband Trunk Group Summary report  
 list performance commands  
 attendant-group . . . . . [24](#), [53](#)  
 see *also* Attendant Group Performance report  
 hunt-group . . . . . [25](#), [137](#)  
 see *also* Hunt Group Performance report  
 summary. . . . . [25](#), [205](#)  
 see *also* Summary Performance report  
 trunk-group. . . . . [25](#), [252](#)  
 see *also* Highest Hourly Trunk Group Blocking  
 Performance report  
 list report-scheduler command . . . . . [25](#), [34](#)  
 see *also* Report Scheduler  
 Listed Directory Numbers (LDN) feature

reports . . . . . [44](#)  
 Login . . . . . [191](#)  
 Login Violations report . . . . . [352](#)  
 logins  
 Basic Call Management System (BCMS) . . . . . [31](#)  
 Report Scheduler . . . . . [31](#)  
 reports . . . . . [357](#)  
 Look Ahead Routing (LAR) feature  
 LAR Route Pattern Measurements report . . . . . [189](#)  
 loss of frame counts (LOFC) . . . . . [105](#)

---

## M

Measured Coverage Paths report . . . . . [96](#)  
 Measured Principals report . . . . . [100-101](#)  
 measurement hours . . . . . [45](#)  
 messages  
 error events . . . . . [28](#)  
 misframes, see DS1 error events  
 Modem Pool Measurements report . . . . . [193-195](#)  
 monitor commands . . . . . [26](#)  
 system view1 . . . . . [25](#)  
 see *also* Monitor System View1 report  
 system view2 . . . . . [25](#)  
 see *also* Monitor System View2 report  
 traffic hunt-groups . . . . . [25](#), [139](#)  
 see *also* Hunt Group Status report  
 traffic trunk-groups . . . . . [25](#), [259](#)  
 see *also* Trunk Group Status report  
 trunk . . . . . [25](#)  
 see *also* Automatic Circuit Assurance (ACA)  
 Parameters report  
 Monitor System View1 report . . . . . [224-226](#)  
 Monitor System View2 report . . . . . [224-226](#)  
 multifrequency compelled receivers (MFCR) . . . . . [228](#), [231](#)

---

## N

narrowband measurements . . . . . [324](#)

---

## O

objects, see command line formats  
 Occupancy Busiest 3-Minute Intervals Measurements report  
[331](#), [337-339](#)  
 troubleshooting . . . . . [338](#)  
 Occupancy Last-Hour Measurements report [331](#), [335-337](#)  
 troubleshooting . . . . . [336](#)  
 Occupancy Summary Measurements report . . . . . [331](#)  
 command . . . . . [329](#)  
 data analysis . . . . . [344](#)  
 screen . . . . . [329](#)  
 occupancy, see processor occupancy

## Index

### P

- parsing capabilities. . . . . [358](#)
- percentages, *see* calculations
- Port Network (PN) Load Balance Study Incoming Trunk report . . . . . [210](#), [215](#)
- Port Network (PN) Load Balance Study Intercom Calls report [210](#), [214](#)
- Port Network (PN) Load Balance Study Outgoing Trunk report . . . . . [210](#), [217](#)
- Port Network (PN) Load Balance Study Tandem Trunk report . . . . . [210](#), [218](#)
- Port Network (PN) Load Balance Study Total Calls report [210-213](#)
  - field descriptions . . . . . [211](#)
- Port Network Blockage Study report. . . . . [218](#)
- Port Network level DSP-Resource reports . . . . . [162](#)
- position requirements . . . . . [62](#), [136](#)
- Principal Measurements report . . . . . [102-104](#)
- printers
  - EIA system device bit rates . . . . . [30](#)
  - print intervals (Report Scheduler) . . . . . [31](#), [32](#)
  - slave printers. . . . . [29](#)
  - system. . . . . [29](#)
    - extension numbers . . . . . [30](#)
    - hardware administration . . . . . [30](#)
    - lines per page . . . . . [30](#)
    - steps for printing. . . . . [34](#)
    - warning alarms . . . . . [31](#)
- processor occupancy reports
  - Communication Link Measurements . . . . . [340](#)
  - Interface Links . . . . . [342](#)
  - Occupancy Busiest 3-Minute Intervals Measurements. [337](#)
  - Occupancy Last-Hour Measurements . . . . . [335](#)
  - Occupancy Summary Measurements . . . . . [329](#)
- Processor Occupancy Summary Data worksheet . . [371](#)

### Q

- qualifiers, *see* command line
- question marks (time field appearances). . . . . [43](#)

### R

- Recent Change History report . . . . . [357](#), [362](#)
  - commands . . . . . [357](#)
  - field descriptions . . . . . [360](#), [363](#)
  - screen . . . . . [359](#), [362](#)
  - transaction logs. . . . . [357](#), [358](#)
- Release 5r servers
  - Blockage Study - SNL data . . . . . [218](#)
  - clear measurements command . . . . . [116](#)
  - DS1 converter reports. . . . . [114](#)
  - EI board control utilization . . . . . [209](#)

- Trunk Group Hourly report . . . . . [248](#)
- Wideband Trunk Group Measurement Selection report [322](#)
- Release 5si servers
  - Trunk Group Hourly report . . . . . [248](#)
  - Wideband Trunk Group Measurement Selection report [322](#)
- remove report-scheduler command . . . . . [25](#), [38](#)
  - see also* Report Scheduler
- Report Scheduler. . . . . [31-39](#)
  - add reports . . . . . [32](#)
  - commands . . . . . [31](#)
  - field descriptions
    - change reports . . . . . [37](#)
    - list reports . . . . . [35](#)
    - remove reports. . . . . [39](#)
    - system hardware administration. . . . . [30](#)
  - print intervals . . . . . [32](#), [33](#)
  - printing . . . . . [29](#), [31](#), [33](#)
- reports
  - ACA Parameters . . . . . [66](#)
  - Attendant Group Measurements . . . . . [44](#), [45](#)
  - Attendant Positions Measurements (page 1) . . . [52](#)
  - Attendant Positions Measurements (page 2) . . . [52](#)
  - Attendant Speed of Answer (page 1) . . . . . [54](#)
  - Attendant Speed of Answer (page 2) . . . . . [55](#)
  - Cell Traffic Summary Last-Hour . . . . . [92](#)
  - Route Pattern Measurements . . . . . [75](#)
- reports, displaying . . . . . [27](#)
- reports, *see*
  - processor occupancy reports
  - Recent Change History report
  - security status reports
  - traffic measurement reports
- Retrial capacity tables . . . . . [59](#), [264](#)
- Route Pattern Measurements report . . . . . [74-80](#), [190](#)
- Route Pattern Measurements Selection screen. . . . [72](#)
- routing
  - patterns. . . . . [72](#)
- routing patterns. . . . . [73](#)
- RS-232 asynchronous serial interface . . . . . [30](#)

### S

- SAT . . . . . [19](#)
- schedule qualifier. . . . . [31](#)
- screen
  - Attendant Group Measurements report . . . . . [45](#)
- screens
  - ACA Parameters report . . . . . [66](#)
  - Attendant Positions Measurements report (page 1) [52](#)
  - Attendant Positions Measurements report (page 2) [52](#)
  - Attendant Speed of Answer report (page 1) . . . . [54](#)
  - Attendant Speed of Answer report (page 2) . . . . [55](#)
  - Cell Traffic Summary Last-Hour report . . . . . [92](#)

Feature-Related System Parameters . . . . .	<a href="#">29</a>
report formats . . . . .	<a href="#">27</a>
Report Scheduler - immediate print interval . . . .	<a href="#">32</a>
Report Scheduler - schedule print interval . . . .	<a href="#">33</a>
Report Scheduler (change) . . . . .	<a href="#">37</a>
Report Scheduler (list) . . . . .	<a href="#">35</a>
Report Scheduler (remove) . . . . .	<a href="#">38</a>
Route Pattern Measurements report . . . . .	<a href="#">75</a>
Route Pattern Measurements Selection . . . . .	<a href="#">73</a>
sample command line . . . . .	<a href="#">28</a>
sample error message . . . . .	<a href="#">28</a>
sample screen format . . . . .	<a href="#">27</a>
Security Violations Detail report . . . . .	<a href="#">349</a>
security violations status reports	
Authorization Code Violations . . . . .	<a href="#">353</a>
Security Violations Summary . . . . .	<a href="#">349</a>
Security Violations Summary report . . . . .	<a href="#">349</a>
service level standards . . . . .	<a href="#">260</a>
severely errored seconds (SES) . . . . .	<a href="#">105</a> , <a href="#">115</a>
slave printers, <i>see</i> printers	
slips, <i>see</i> DS1 error events	
speech synthesizer boards . . . . .	<a href="#">65</a>
speed of answer . . . . .	<a href="#">51</a> , <a href="#">60</a>
staffed time . . . . .	<a href="#">57</a>
Station Security Code Violations report . . . .	<a href="#">352</a> , <a href="#">355</a> - <a href="#">356</a>
Status Station report . . . . .	<a href="#">286</a>
summary command . . . . .	<a href="#">329</a>
Summary Performance report . . . . .	<a href="#">205</a> - <a href="#">209</a>
Summary voice/network statistics reports . . . .	<a href="#">305</a>
system administration terminal (SAT) . . . . .	<a href="#">19</a>
system printers, <i>see</i> printers	
System Status report	
<i>see also</i> Monitor System View 1 and 2 reports	
System-Parameters IP-Options form . . . . .	<a href="#">283</a>

## T

theoretical data, <i>see</i> customer supplied (theoretical data)	
time available . . . . .	<a href="#">47</a>
time division multiplexing (TDM) . . . . .	<a href="#">209</a> , <a href="#">219</a>
time to abandoned number . . . . .	<a href="#">50</a>
TN464F DS1 interface circuit packs . . . . .	<a href="#">111</a>
TN767 DS1 interface circuit packs . . . . .	<a href="#">111</a>
Tone Receiver Detail Measurements report . . .	<a href="#">231</a> - <a href="#">233</a>
Tone Receiver Summary Measurements report .	<a href="#">228</a> - <a href="#">231</a>
total security violations . . . . .	<a href="#">236</a>
touch tone receivers (TTR) . . . . .	<a href="#">228</a> , <a href="#">231</a>
traffic data time intervals . . . . .	<a href="#">85</a>
Traffic Engineering capacity tables . . . . .	<a href="#">59</a>
traffic measurement commands . . . . .	<a href="#">19</a>
<i>see also</i> specific command names	
traffic measurement reports	
<i>see also</i> processor occupancy reports and security violations status reports	
ARS/AAR/UDP route pattern selection reports	

Route Pattern Measurements . . . . .	<a href="#">72</a> , <a href="#">74</a>
attendant group reports . . . . .	<a href="#">44</a>
attendant reports	
Attendant Group Performance . . . . .	<a href="#">53</a>
Attendant Positions Measurements . . . . .	<a href="#">51</a>
automatic circuit assurance (ACA) reports	
ACA Measurements . . . . .	<a href="#">69</a>
ACA Parameters . . . . .	<a href="#">65</a>
call rate measurements reports	
Call Rate Measurements . . . . .	<a href="#">85</a>
Call Summary Measurements . . . . .	<a href="#">88</a>
coverage path measurements reports	
Coverage Path Measurements . . . . .	<a href="#">96</a>
Measured Coverage Paths . . . . .	<a href="#">95</a>
Measured Principals . . . . .	<a href="#">100</a>
Principal Measurements . . . . .	<a href="#">102</a>
DS1 converter reports	
DS1 Facility Link Performance Measurements Detailed Log . . . . .	<a href="#">114</a>
DS1 Facility Link Performance Measurements Summary . . . . .	<a href="#">114</a>
DS1 facility link performance measurements reports	
DS1 Link Performance Measurements Summary	<a href="#">106</a>
hunt group reports	
Hunt Group Measurements . . . . .	<a href="#">130</a>
Hunt Group Members . . . . .	<a href="#">126</a>
Hunt Group Status . . . . .	<a href="#">139</a>
LAN Performance Measurements Reports . . . .	<a href="#">180</a>
LAR Route Pattern Measurements Report . . . .	<a href="#">184</a>
modem pool groups report	
Modem Pool Group Measurements . . . . .	<a href="#">193</a>
performance summary report	
Summary Performance . . . . .	<a href="#">205</a>
port network (PN) reports	
Blockage Study . . . . .	<a href="#">209</a>
Port Network Load Balance Study . . . . .	<a href="#">209</a>
Incoming Calls . . . . .	<a href="#">214</a>
Intercom Calls . . . . .	<a href="#">213</a>
Outgoing Calls . . . . .	<a href="#">216</a>
Tandem Calls . . . . .	<a href="#">217</a>
system status reports	
Monitor System View1 . . . . .	<a href="#">224</a>
Monitor System View2 . . . . .	<a href="#">224</a>
tone receiver reports	
Tone Receiver Detail Measurements . . . . .	<a href="#">231</a>
Tone Receiver Summary Measurements . . .	<a href="#">228</a>
traffic summary report	
Traffic Summary . . . . .	<a href="#">235</a>
trunk group reports	
Highest Hourly Trunk Group Blocking Performance	<a href="#">252</a>
Trunk Group Hourly . . . . .	<a href="#">248</a>
Trunk Group Measurement Selection . . . .	<a href="#">251</a>
Trunk Group Status . . . . .	<a href="#">258</a>
Trunk Group Summary . . . . .	<a href="#">242</a>
Trunk Lightly Used . . . . .	<a href="#">276</a>

## Index

- Trunk Out of Service . . . . . [256](#)
- wideband trunk group reports
  - Wideband Trunk Group Hourly . . . . . [320](#)
  - Wideband Trunk Group Measurement Selection [322](#)
  - Wideband Trunk Group Summary . . . . . [316](#)
- traffic reports
  - Attendant Group Measurements . . . . . [44](#)
- Traffic Summary report . . . . . [235-241](#)
- transaction logs . . . . . [357](#), [358](#)
- troubleshooting, *see*
  - alarms
  - errors
  - Occupancy Busiest 3-Minute Intervals Measurements report
  - Occupancy Last-Hour Measurements report
  - total security violations
- Trunk Group Data worksheet . . . . . [243](#), [263](#), [317](#), [369](#)
- Trunk Group Hourly report . . . . . [248-250](#)
- Trunk Group Measurement Selection report . . . . . [252](#)
- Trunk Group Status report . . . . . [258-267](#)
  - average holding times. . . . . [261](#)
  - command . . . . . [259](#)
  - field descriptions . . . . . [260](#)
  - screen . . . . . [259](#)
- Trunk Group Summary report. . . . . [242-247](#)
- trunk groups
  - Call Coverage . . . . . [94](#)
  - central office (CO) trunks . . . . . [94](#)
- Trunk Lightly Used report. . . . . [276-279](#)
- Trunk Out of Service report. . . . . [256-258](#)
  - field descriptions . . . . . [257](#)
  - screen . . . . . [256](#)

---

## U

- unavailable/failed seconds (UAS/FS) . . . . . [114](#), [121](#)
- uniform call distribution (UCD)
  - hunt group reports . . . . . [124](#)
- Uniform Dial Plan (UDP) feature
  - reports . . . . . [72](#)
- usage allocation
  - usage allocation plans (UAP) . . . . . [276](#)

---

## V

- voice announcement measurements . . . . . [279](#)
- Voice/Network Statistics Reports . . . . . [282](#)

---

## W

- Wideband Trunk Group Data worksheet . . . . . [345](#), [370](#)
- Wideband Trunk Group Hourly report . . . . . [320-322](#)
  - command . . . . . [320](#)
  - data analysis . . . . . [325](#)
  - field descriptions . . . . . [321](#)

- performance considerations . . . . . [325](#)
- screen . . . . . [320](#)
- Wideband Trunk Group Measurements Selection report. [322-326](#)
- Wideband Trunk Group Summary report . . . . . [316-319](#)
  - command . . . . . [316](#)
  - data analysis . . . . . [324](#)
  - field descriptions . . . . . [317](#)
  - screen . . . . . [316](#)
- worksheets (blanks) . . . . . [365](#)
  - see also* specific worksheet names

---

## Y

- yesterday option, *see* Attendant Group Performance report