



# **Reports for Avaya Communication Manager**

555-233-505  
Issue 6  
February 2007

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## **Contents**

# About this document

This document provides a description of the performance reports that are available with Avaya 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

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## 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 and printing 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 Access Security Gateway Session History report of all session establishment and rejection events.
- [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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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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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 and printing reports

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## 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: Traffic measurement commands](#) on page 17 lists all of the commands associated with traffic measurements. For a complete list of all commands, refer to *Maintenance Commands for Avaya 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 6**

**Commands**

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

**1 of 6**

**Table 1: Traffic measurement commands 2 of 6**

**Commands**

<b>Action</b>	<b>Object</b>	<b>Qualifier</b>
change	meas-selection wideband-trunk-group	
change	report-scheduler	<report number>
clear	measurements ds1	<CabCarSSF> [options]
clear	measurements ds1-facility	<CabCarSSF> [options] [print or schedule]
clear	measurements occupancy	busiest-intervals
clear	measurements security-violations	
display	communications-interface links	[print or schedule]
display	meas-selection coverage	[print or schedule]
display	meas-selection principal	[print or schedule]
display	meas-selection route-pattern	[print or schedule]
display	meas-selection trunk-group	[print or schedule]
display	meas-selection wideband-trunk-group	[print or schedule]
list	aca-parameters	[options] [print or schedule]
list	emergency	[print or schedule]
list	hunt group	[option] [print or schedule]
list	logins	[print or schedule]
list	measurements aca	[print or schedule]
list	measurements attendant group	[print or schedule]
list	measurements attendant positions	[print or schedule]
list	measurements blockage pn	<required field> [print or schedule]
list	measurements blockage sn	[option] [print or schedule]

**2 of 6**

**Table 1: Traffic measurement commands 3 of 6**

**Commands**

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

**3 of 6**

**Table 1: Traffic measurement commands 4 of 6**

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

**4 of 6**

**Table 1: Traffic measurement commands 5 of 6**

**Commands**

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

**5 of 6**

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

**Commands**

<b>Action</b>	<b>Object</b>	<b>Qualifier</b>
list	measurements voice-conditioners hourly	[print or schedule]
list	measurements voice-conditioners summary	[options] [print or schedule]
list	measurements wideband-trunk-group hourly	<tgn>[print or schedule]
list	measurements wideband-trunk-group summary	<required field>[print or schedule]
list	performance attendant	<required field>[print or schedule]
list	performance hunt-group	<required field>[print or schedule]
list	performance summary	<required field>[print or schedule]
list	performance trunk-group	<required field>[print or schedule]
list	report-scheduler	[print or 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>

**6 of 6**

---

## 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: Traffic measurement commands](#) on page 17 and the resulting reports are described in detail in Chapters 2–6.

Each of the `monitor` and `list` commands depicted in [Table 1: Traffic measurement commands](#) on page 17 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

```

list measurements attendant positions
Switch Name: Customer_Switch_Name
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    0
2   0      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

```

Annotations in the image:

- switch name: list measurements attendant positions
- command line which generated report: list measurements attendant positions
- report title: ATTENDANT POSITIONS MEASUREMENTS
- page numbers for multi-page reports: Page 1 of xx
- report data: Yesterday's Peak, Today's Peak, Last Hour
- informational/status message line: press CANCEL to quit -- press NEXT PAGE to continue

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
```

# 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: Feature-Related System Parameters](#) on page 27 shows this screen. [Table 2: System printer hardware administration field descriptions](#) on page 28 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 form. 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 17.

---

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

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

Field	Description
<b>Job Id</b>	This is a display-only field. When a command is executed with the qualifier <code>schedule</code> , 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.
<b>Job Status</b>	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.”
<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>	<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 30). 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 31).

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 **print** and **schedule** options are available.

[Figure 7](#) shows the screen for the `list report-scheduler` command. [Table 4: Report Scheduler field descriptions](#) on page 33 describes the data fields for this screen.

**Figure 7: List Report Scheduler**

Job Id	Days (smtwtfs)	Time	User	Status	Type
list report-scheduler <span style="float: right;">Page 1 of x</span>					
Report Scheduler					
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 <code>schedule</code> 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
<b>Status</b>	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>Type</b>	The type of print interval scheduled for the report.
<b>Command</b>	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                                     Page 1
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 this screen. [Table 6: Remove Report Scheduler field descriptions](#) on page 37 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**

<b>Field</b>	<b>Description</b>
<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.

## **System printer and the report scheduler feature**

# 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.

- **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.
- **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.
- **Call Coverage Measurements.** Describes the Principal Coverage and Coverage Path measurement reports available with Communication Manager systems.
- **Cell Traffic Measurements.** Describes the wireless traffic data 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.

## Traffic data analysis 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 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.
- **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 the customer 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 the data was 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\*\***.

## Attendant group reports

The attendant group reports are used to assess the quality of service provided to customers 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:

1. Type `list measurements attendant group [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

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

[Table 7: Attendant Group Measurements report field descriptions](#) on page 43 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 54). 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 54.</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>

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

Field	Description
<b>Time Avail</b>	<p data-bbox="570 310 1289 464">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 data-bbox="570 485 1321 638"><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>

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

Field	Description
<p><b>Time Avail (cont.)</b></p>	<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>

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

Field	Description
<p><b>Time Talk</b></p>	<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>
<p><b>Time Held</b></p>	<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>

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**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> 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> $(\text{Time To Abandoned}) \times (\# \text{ of Abandoned Calls}) + (\text{Speed of Answer}) \times (\# \text{ of Calls Answered})$ $\text{Avg Delay} = \frac{\text{Total Delay}}{\text{Calls Answered} + \text{Calls Aband}}$ <p><b>Note:</b> If the average time to abandon is equal to or exceeds 9999 seconds, the value 9999 displays in the field.</p>

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>

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---

## 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:

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

**Options:** The `print` and `schedule` options are available for this command.

## Screens

[Figure 11](#) and [Figure 12](#) show a typical Attendant Positions Measurements report. [Table 8: Attendant Positions Measurement report field descriptions](#) on page 51 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    0
2   0      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
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**

<b>Field</b>	<b>Description</b>
<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 the user 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:

1. Type `list performance attendant <yesterday/today> [print/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 `print` and `schedule` options are 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: Attendant Speed of Answer report field descriptions](#) on page 53 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 was 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 43) 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 43 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 Aband times the AWT (average work time). You can determine the AOL with the following equation:

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

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

## Traffic data analysis reports

### Example:

The typical report screen shown earlier in this section (see [Figure 10: Attendant Group Measurements](#) on page 43) 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 198.

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 59, 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 59. 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 60.

Figure 15: Estimating the speed of answer

SPEED OF ANSWER (SECONDS)	AHT			AVERAGE DELAY IN MULTIPLES OF AVERAGE HOLDING TIME																SPEED OF ANSWER (SECONDS)
	.001	.005	.010	.10	.200	.300	.400	.500	.600	.700	.800	.900	1.00	1.10	1.20	1.30	1.40	1.50		
1	0.0	0.2	0.4	.7	1.0	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5
2	2.3	3.1	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8
3	2.7	3.6	4.1	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8	9.1
4	3.1	3.3	3.8	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8
5	3.6	3.2	4.1	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8	9.1
17	11.07	12.94	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32
18	12.16	13.31	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32
19	12.82	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32
20	13.00	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32	13.32

AVERAGE DELAY IN MULTIPLES OF AHT THAT CORRESPONDS TO SPEED OF ANSWER  
 ATTENDANT OFFERED LOAD CLOSEST TO 43.77 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 59, 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

SPEED OF ANSWER (SECONDS)	AHT				AVERAGE DELAY IN MULTIPLES OF AVERAGE HOLDING TIME																SPEED OF ANSWER (SECONDS)
	.001	.005	.010	.020	.10	.200	.300	.400	.500	.600	.700	.800	.900	1.00	1.10	1.20	1.30	1.40	1.50		
1	.001	.005	.010	.020	.130	.147	.160	.171	.181	.190	.200	.209	.218	.227	.236	.245	.254	.263	.272	.281	.290
2	.002	.009	.016	.031	.192	.227	.254	.278	.300	.321	.341	.360	.379	.398	.417	.436	.455	.474	.493	.512	.531
3	.003	.013	.028	.053	.229	.276	.321	.366	.411	.456	.501	.546	.591	.636	.681	.726	.771	.816	.861	.906	.951
4	.003	.015	.029	.053	.235	.287	.332	.377	.422	.467	.512	.557	.602	.647	.692	.737	.782	.827	.872	.917	.962
5	.004	.016	.033	.060	.277	.331	.376	.421	.466	.511	.556	.601	.646	.691	.736	.781	.826	.871	.916	.961	.004
6	.005	.020	.036	.060	.298	.350	.394	.438	.482	.526	.570	.614	.658	.702	.746	.790	.834	.878	.922	.966	.005
17	.018	.033	.059	.130	.310	.373	.421	.469	.517	.565	.613	.661	.709	.757	.805	.853	.901	.949	.997	.018	
18	.018	.033	.059	.130	.312	.376	.423	.471	.519	.567	.615	.663	.711	.759	.807	.855	.903	.951	.999	.018	
19	.018	.034	.059	.140	.313	.376	.424	.472	.520	.568	.616	.664	.712	.760	.808	.856	.904	.952	.999	.018	
20	.018	.034	.059	.141	.317	.380	.428	.476	.524	.572	.620	.668	.716	.764	.812	.860	.908	.956	.999	.018	

AVERAGE DELAY IN MULTIPLES OF AHT (.700)  
 ESTIMATED PROBABILITY OF DELAY (.502)

Traffic data analysis reports

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	1.02	.100	.200	.300	.400	.500	.600	.700	.800	.900	1.00	2.00				
1	0.17	0.49	1.01	1.02	1.13	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.70	2.00	2.00	1	
2	0.58	0.58	0.58	0.58	0.70	0.68	0.90	0.94	1.02	1.07	1.13	1.18	1.23	1.28	1.33	1.51	1.71	2.00	2
3	0.37	0.37	0.82	0.81	0.66	0.72	0.74	0.68	0.90	0.95	1.01	1.06	1.11	1.16	1.21	1.39	1.40	2	3
4	0.29	0.29	0.33	0.34	0.39	0.45	0.71	0.77	0.63	0.68	0.91	0.99	1.04	1.09	1.14	1.31	1.31	2	4
5	0.23	0.23	0.30	0.31	0.38	0.42	0.46	0.72	0.74	0.67	0.69	0.91	0.98	1.03	1.08	1.24	1.24	2	5
17	0.07	0.09	0.11	0.11	0.29	0.33	0.80	0.84	0.51	0.54	0.41	0.46	0.48	0.48	1.17	1.17	1.17	17	17
18	0.07	0.09	0.11	0.11	0.29	0.33	0.80	0.83	0.51	0.54	0.41	0.46	0.48	0.48	1.17	1.17	1.17	18	18
19	0.07	0.09	0.10	0.10	0.29	0.33	0.80	0.83	0.50	0.54	0.41	0.46	0.48	0.48	1.16	1.17	1.17	19	19
20	0.07	0.09	0.10	0.10	0.29	0.33	0.80	0.83	0.50	0.53	0.41	0.46	0.48	0.48	1.16	1.17	1.17	20	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 45: Estimating attendant position requirements](#) on page 132, 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 SERVING	AVERAGE DELAY - AVERAGE HOLDING TIME																OFFERED LOAD SERVING	
	.001	.003	.010	.30	.100	.130	.150	.200	.250	.300	.350	.400	.450	.500	.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	18.8	18.0	28.0	1
2	2.3	3.1	7.7	0.7	21.7	23.6	26.0	29.8	32.2	34.6	36.9	39.1	41.4	44.2	46.2	50.9	58.8	2
3	9.7	14.8	21.1	3.2	46.8	49.6	53.2	58.0	61.9	65.1	67.8	70.1	72.2	74.3	79.7	85.3	98.2	3
4	21	32	45	7.3	73	75	78	83	87	91	93	97	100	103	108	118	130	4
5	36	52	71	12	108	109	113	120	124	128	131	135	139	142	149	158	173	5
17	1187	1598	1333	322	1380	1338	1369	1389	1402	1413	1424	1434	1443	1452	1460	1468	1475	17
18	1218	1321	1343	367	1373	1362	1403	1428	1438	1449	1457	1463	1469	1473	1480	1485	1491	18
19	1289	1343	1418	402	1410	1428	1481	1480	1478	1488	1493	1499	1503	1509	1512	1513	1516	19
20	1380	1398	1433	437	1414	1460	1474	1494	1510	1528	1528	1533	1538	1541	1543	1544	1545	20

COLUMN CLOSELY CORRESPONDS TO OBJECTIVE DELAY OF .4710      ATTENDANT OFFERED LOAD CLOSEST TO 47.83

**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:

1. Type `list aca-parameters [number x] [to number x] [name x] [aca-on x] [count n] [print/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.
- **print and schedule**  
This option allows you to print the report immediately or schedule the report to print at another time.

## Screen

[Figure 20](#) 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
<b>Group Number</b>	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.
<b>TAC</b>	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>dioid</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> 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>

---

## 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:

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

**Options:** The `print` and `schedule` options are available for this command.

### Screens

[Figure 22: Automatic Circuit Assurance Measurements report— page 1](#) on page 68 and [Figure 44: Estimating attendant position requirements](#) on page 132 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: Automatic Circuit Assurance Measurements report— page 1](#) on page 68, 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: Automatic Circuit Assurance Measurements report field descriptions](#) on page 69 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 of Referral	Trunk Group No.	Trunk Access Code	Trunk Member	Type of 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 64 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:

1. Type `display meas-selection route-pattern [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are 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:

1. Type `list measurements route-pattern <assigned pattern number (1-254)> <yesterday/today/last-hour> [print/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 `print` and `schedule` options are 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> $\text{Calls Offered (With Queue)} = \# \text{ of Calls Carried} + \# \text{ of Queue Overflow Calls} + \# \text{ of Queue Abandon Calls}$ $\text{Calls Offered (Without Queue)} = \# \text{ of Calls Carried} + \# \text{ of Calls Blocked}$
<b>Calls Carried</b>	The total number of seizures (for all trunk groups) in the routing pattern.

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

Field	Description
<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>

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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 309) 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 proper **FRL** assigned to the 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.

## Traffic data analysis reports

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:

1. 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>	<p>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.</p> <p>If there are matching entries in the entered location, those get used.</p> <p>If there are no matching entries in the entered location, Communication Manager tries the entries in location <b>all</b>.</p>
<b>Partitioned Group Number</b>	<p>Partitioned Group Number as entered on the command line. Default is 1.</p>
<b>Selected Location</b>	<p>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>.</p>
<b>Match</b>	<p>numeric = the entry in the <b>Call Type Digit Analysis Table</b> that was selected for the dialed string.</p> <p>Blank = no matching entries for this dialed string in the <b>Call Type Digit Analysis Table</b></p>
<b>Length</b>	<p>numeric = the entry in the <b>Call Type Digit Analysis Table</b> that was selected for the dialed string.</p> <p>Blank = no matching entries for this dialed string in the <b>Call Type Digit Analysis Table</b></p>
<b>After Delete and Insert</b>	<p>The digit string as it appears after call type digit manipulation for that pattern, up to 4 manipulations.</p>

1 of 2

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

Field	Description
<b>Type</b>	<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>).</p> <p>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>
<b>Result</b>	<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>

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---

## 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:

1. Type `list measurements call-rate <total/service-link/multimedia/data/voice> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 27](#) shows a typical Total Call Rate Measurements report. Each call rate measurements report contains the same data fields. [Table 15: Call Summary Measurements report field descriptions](#) on page 86 describes the data fields for these reports.

**Figure 27: Total Call Rate Measurements report**

```

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

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.

Field	Description
<b>Hour</b>	<p>Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data was recorded.</p> <p><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 (for example, 10**).</p>
<b># Compl</b>	<p>Number of Calls Completed. The number of calls completed, or answered (including incoming, outgoing, and intercom), during the listed hour.</p>
<b>Busy Int. (36 sec.)</b>	<p>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.</p>
<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> 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>	<p>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.</p>
<b>Busiest Interval</b>	<p>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.</p>

## 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:

1. Type `list measurements call-summary [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

[Figure 28](#) shows a typical Call Summary Measurements report. [Table 15: Call Summary Measurements report field descriptions](#) on page 86 describes the data fields in this report.

**Figure 28: Call Summary Measurements report**

```
list measurements call-summary
Switch Name: Cust_Switch_Name                               Date: 3:50 pm WED JAN 25, 2006
                                CALL SUMMARY MEASUREMENTS
                                Summary of Last 24 Hours
-----# Calls Completed-----
      Multi-Service
Hour Voice Data Media Link Total
1400  46   15   0   0   61
13**  23   20   0   0   43
1200  22   16   0   0   38
1100  45   22   0   0   67
1000  33   22   0   0   55
0900  21   14   0   0   35
0800  11   10   0   0   21
0700   1    0   0   0    1
0600   0    0   0   0    0
0500   0    0   0   0    0
0400   0    0   0   0    0
0300   0    0   0   0    0
Command successfully completed
Command:
```

```
-----# Calls Completed-----
      Multi-Service
Hour Voice Dta Media Link Total
0200  0    0   0   0   0
0100  0    0   0   0   0
0000  0    0   0   0   0
2300  0    0   0   0   0
2200  0    0   0   0   0
2100  0    0   0   0   0
2000  3    0   0   0   3
1900  4    2   0   0   6
1800  4    2   0   0   6
1700  4    7   0   0  11
1600 21   12   0   0  33
1500 21   15   0   0  36
```

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 15: 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 was recorded.</p> <p><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 (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:

1. Type `list measurements cell-traffic <cell-addr> [wfb-address] [cell-number] <yesterday-peak/today-peak/last-hour> [print/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:

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

**Options:** The `print` and `schedule` options are available for this command.

### Screen

[Figure 29](#) shows a typical screen for the Cell Traffic Summary report. [Table 16: Cell Traffic Summary report field descriptions](#) on page 88 describes the data fields presented in this report.

**Figure 29: 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 16: 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 was 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 16: 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.

**2 of 2**

---

## 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:

1. Type `display meas-selection coverage [print/schedule]` and press **Enter**.

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

1. Type `list coverage path [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are 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 30](#) shows a typical selection screen for the Coverage Path Measurements report. [Table 17](#) describes the data fields presented on this screen.

**Figure 30: 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 17: 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:

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

- **print or schedule**

This option allows you to print the report immediately or 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 31](#) shows a typical screen for the Coverage Path Measurements report. The time and date the report is requested displays at the top right. [Table 18](#) describes the data presented in this report.

**Figure 31: 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 18: 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 18: 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 <code>display coverage path [number]</code> 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>

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## 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 90.

### Command

To display the list of principal extensions to be measured:

1. Type `display meas-selection principal [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are 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 32](#) shows a typical Measured Principals selection screen containing entries for the 100 principal extensions or **TACs** to be measured. [Table 19](#) describes the data fields presented in this screen.

**Figure 32: 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 19: 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:

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

- `print` or `schedule`

This option allows you to print the report immediately or 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 33](#) shows a typical screen for the Principal Measurements report. The time and date the report is requested displays at the top right. [Table 20](#) describes the data fields presented in this report.

**Figure 33: 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
                -----Criteria-----
Ext/TAC  Meas  Calls
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 20: 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>	Abandoned. The total number of abandoned calls, where the calling party hung up before the call was answered or sent to coverage. <b>Suggested Action:</b> If this number is high at the principal, you may need to redirect traffic.  <i>The number of calls answered by principal =</i>  <i>Calls Offered - Calls Abandoned - Calls Redirected</i>
<b>Redir</b>	Redirected. The total number of calls not answered by the principal and subsequently sent to coverage. <b>Suggested action:</b> If this number is large compared to <b>Calls Offrd</b> , investigate the reasons.
<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 20: 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 <code>display coverage-path [number]</code> 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>	The coverage paths used by this principal. To find the associated extensions, use the <code>display coverage sender-group</code> command.  <b>Note:</b> This command displays other principals using some coverage paths.

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---

## 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.

## Traffic data analysis reports

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:

1. Type `list measurements ds1 summary <CabCarSSF> [local/carrier-local/remote] [print/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 user (local) measurements. These are the user copies of the local (near-end) performance measurements and can be cleared by the user. 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.

- **print/schedule**

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

## Screen

[Figure 34](#) shows a typical screen for the **DS-1** Link Performance Measurements Summary report. [Table 21: DS-1 Link Performance Measurements Summary report field descriptions](#) on page 104 describes the data fields in this report.

**Figure 34: 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   Count   Interval Count
Errored Seconds            4/13  16:42  68      133    24
Bursty Errored Seconds    4/13  17:57  540     636    0
Severely Errored Seconds  4/13  17:57  0        0      0
Unavailable/Failed Seconds 4/13  17:57  3        5      0
Controlled Slip Seconds    4/13  17:57  100     167    5
Loss Of Frame Count       4/13  17:57  2        2      0
    
```

**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 21: 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.)

**Table 21: 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>	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.

**2 of 3**

**Table 21: 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 39: DS-1 Facility Link Performance Measurements Detailed Log report</a> on page 116 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> .

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---

## 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:

1. Type `list measurements ds1 log <CabCarSS> [local/carrier-local/remote] [print/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 user (local) measurements.  
These are the user copies of the local (near-end) performance measurements and can be cleared by the user. 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.
- `print/schedule`  
This option allows you to print the report immediately or 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 35](#) and [Figure 36: DS1 Link Performance Measurements Detailed Log report — page 2](#) on page 109 show typical screens for the **DS-1** Link Performance Measurements Detailed Log report. [Table 22: DS1 Link Performance Measurements Detailed Log report field descriptions](#) on page 109 describes the data fields presented in this report.

**Figure 35: DS-1 Link Performance Measurements Detailed Log report — page 1**

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

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

```

list measurements dsl log 1c05
Switch Name: cust_switch_name_____
Date: 10:44 pm MON MAY 1, 2006
Page 2

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

Field	Description
Date	The date of the 15-minute interval.
Time	The ending time for the 15-minute interval.
ES	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.
BES	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.

**Table 22: DS1 Link Performance Measurements Detailed Log report field descriptions 2 of 2**

Field	Description
<b>SES</b>	<p>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.</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>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.</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 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).</p>
<b>LOFC</b>	<p>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.</p>

**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 37](#).

---

### Figure 37: 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:

1. Type `clear measurements ds1-facility log | esf-error-events | loopback/spantest CabCarSSF [local/remote] [print/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, the user 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:

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

**Options:** The `print` and `schedule` options are available for this command.

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

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

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

**Options:** The `print` and `schedule` options are available for this command.

## Screens

[Figure 38: DS-1 Facility Link Performance Measurements Summary report](#) on page 113 shows a typical screen for the DS-1 Facility Link Performance Measurements Summary report.

[Table 23: DS1 Facility Link Performance Measurements Summary report field descriptions](#) on page 114 describes the data fields presented in that report.

[Figure 39: DS-1 Facility Link Performance Measurements Detailed Log report](#) on page 116 shows a typical **DS-1** Facility Link Performance Measurements Detailed Log report.

[Table 24: DS-1 Facility Link Performance Measurements Detailed Log report field descriptions](#) on page 116 describes the data fields presented in that report.

---

### Figure 38: 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
Errorred Seconds  9/24   09:03   0         0         0
Bursty Errorred  9/24   09:03   0         0         0
Severely Errorred 9/24   09:03   0         0         0
Unavailable/Failed 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 23: 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 the user 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).

**Table 23: 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 71.
<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 39: DS-1 Facility Link Performance Measurements Detailed Log report</a> on page 116.
<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 39](#) 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 39: DS-1 Facility Link Performance Measurements Detailed Log report**

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

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 24: 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.

**Table 24: 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:

1. Type `list emergency [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available with this command.

### Screen

[Figure 40](#) shows a typical screen for the Emergency Access Calls report. [Table 25](#) describes the data presented in this report.

---

**Figure 40: 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 25: 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>● ars slrt call type</li> <li>● feature access code</li> <li>● off hook alert</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:

1. Type `list hunt group [number] [to-number x] [name x] [type x] [ext x] [to-ext x] [count n] [print/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.
- **print and schedule**  
This option allows you to print the report immediately or schedule the report to print at another time.

## Screen

[Figure 41](#) shows a typical screen for the Hunt Groups report. [Table 26](#) describes the data presented in this report.

**Figure 41: 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	Adj	Dom Ctrl	Message Center
1	hu 1 meas 3001	vec	ucd-mia y/B	y	many	5	4		n			n
2	hu 2 meas 3002	vec	ucd-mia n/-	y	none	5	11		n			n
33	hu 33 non 3003	acd	ucd-mia n/-	n	none	S	5	1	n			n

**Table 26: 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 26: 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] [print/
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
- **print** and **schedule**  
This option allows you to print the report immediately or schedule the report to print at another time.

## Screen

[Figure 42](#) shows a typical screen for the Hunt Group Members report. [Table 27](#) describes the data presented in this report.

**Figure 42: 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 27: 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 27: Hunt Group Members report field descriptions 2 of 2**

<b>Field</b>	<b>Description</b>
<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:

1. Type `list measurements hunt-group <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 43](#) 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 28](#) describes the data presented in this report.

**Figure 43: 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  Grp      Grp  Meas  Total  Calls  Que  Calls  Que  Time  Speed
No.  Name      Siz/ Hour Usage Ans/   Siz  Que.  Ovfl  Avail Answer
                                Typ.  Hour  Aban.
1    Dial-up  4    1500  36    0     0   0    0    108   0
     SAT's   ucd
2    manual  1    1500  0     0     5   0    0    36   0
     hunt   ucd
     group
3    CC_Capacity_3  0    1500  0     0    15   0    0    0    0
     ead
4    CC_Capacity_4  0    1500  0     0    15   0    0    0    0
     ead
5    CC_Capacity_5  0    1500  0     0    15   0    0    0    0
     ead
6    CC_Capacity_6  0    1500  0     0    15   0    0    0    0
     ead

press CANCEL to quit -- press NEXT PAGE to continue
  
```

**Table 28: 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 was recorded.

**1 of 3**

**Table 28: Hunt Group Measurements report field descriptions 2 of 3**

Field	Description
<p><b>Total Usage</b></p>	<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> 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>
<p><b>Calls Ans/ Aban.</b></p>	<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>

**Table 28: Hunt Group Measurements report field descriptions 3 of 3**

Field	Description
<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 310) 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 44: 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 45: 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 46: 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 47: 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:

1. Type `list performance hunt-group <yesterday/today> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 48](#) shows a typical screen for the Hunt Group Performance report, using the `today` option. [Table 29](#) describes the data fields presented in this report.

**Figure 48: 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 29: Hunt Group Performance report field descriptions**

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.
<b>Hour</b>	The starting time (using the 24-hour clock) of the hour during which the data was recorded. <b>Suggested actions:</b> From analyzing <a href="#">Figure 48: Hunt Group Performance report</a> on page 133 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.
<b>Avg.</b>	Average. The number corresponding to the 24-hour daily “average speed of answer” for each hunt group.  $\text{Daily Average} = \frac{\sum \text{ of the Delays For Each Answered Call}}{\text{Total \# of Answered Calls (so far today)}}$

---

## 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:

1. 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 49](#) 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 30: Hunt Group Status report field descriptions](#) on page 136 describes the data fields presented in this report. The abbreviated labels are also identified in a key at the bottom of the screen.

**Figure 49: 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 30: Hunt Group Status report field descriptions 1 of 2**

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

**1 of 2**

Table 30: Hunt Group Status report field descriptions 2 of 2

Field	Description
LCIQ	<p>Longest Call In Queue. The time in seconds the oldest call in the hunt group queue has been waiting to be serviced.</p> <p><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).</p> <p>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).</p>

**2 of 2**

---

## 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:

1. 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 50](#) shows a typical screen for the IP Signaling Groups Latency and Loss report for the current-hour. [Table 31](#) describes the data fields presented in any version of this report.

**Figure 50: 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 31: 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.
<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 ****)

**1 of 2**

**Table 31: IP Signaling Groups Latency and Loss report field descriptions 2 of 2**

Field	Description
<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**

---

## 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.
- 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.
- 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.
- IP DSP 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.
- IP DSP 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.

## Traffic data analysis reports

- IP DSP 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.

**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:

1. Type `list measurements ip codec hourly <region number> [print/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 `print` and `schedule` options are available for this command.

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

### Screen

[Figure 51](#) shows a typical screen for the IP Codec Resource Hourly report. [Table 32](#) describes the data fields presented in this report.

**Figure 51: 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 32: IP Codec Resource Hourly report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-230 0	Measurement Hour. The hour that the data was 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 was allocated to a G.711 call.

**1 of 2**

**Table 32: 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:

1. Type `list measurements ip codec summary <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 51](#) shows a typical screen for the IP Codec Resource Summary report. [Table 33](#) describes the data fields presented in this report.

**Figure 52: 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 33: 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 was 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 33: 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:

1. Type `list measurements ip codec detail <region number> <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 53](#) shows a typical screen for the IP Codec Resource Detail report. [Table 34: IP Codec Resource Detail report field descriptions](#) on page 146 describes the data fields presented in the report.

---

**Figure 53: 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 34: 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 was 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 34: 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:

1. Type `list measurements ip dsp-resource hourly <region number> [print/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 dsp-resource hourly 4`.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

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

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

**Figure 54: IP DSP Resource Hourly report**

```

list measurements ip dsp-resource hourly 4
Page 1

Switch Name:
Date: 4:05 pm MON JAN 23, 2006
IP DSP RESOURCE HOURLY REPORT

Meas      DSP      DSP Usage   In Reg   Out of   Denied   %      % Out
Hour Region Rscs      (Erl)    Peg     Reg Peg   Peg     Blk     of Srv
0400 1    64        1.8      160     0        0        0.00   0.01
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
0000 1    0         0.0      0        0        0        0.00   0.00
    
```

**Table 35: IP DSP Resource Hourly report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data was 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>DSP Usage (Erl)</b>	0-9999	Digital Signaling Processor Usage in Erlangs. Amount of time (in erlangs) 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.  This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use plus twice the total time (in seconds) that G.723 and G.729 resources are in use plus twice the time (in seconds) that fax relay resources are in use, divided by 3600.
<b>In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a call

Table 35: IP DSP Resource Hourly report field descriptions 2 of 2

Field	Range	Description
<b>Out of Reg Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a 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>Denied Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a call, but all media ports in all regions were busy and the call did not go through.
<b>% Blk</b>	0-99	Percentage Blocked. The percent of attempted use of IP media processor ports in the region that were not successful (blocked). This percent includes calls that were denied after they were successfully allocated out of the region.
<b>% out of Srv</b>	0-99	Percentage Out of Service. The percent of CCS time that any IP media processor 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. This measurement is calculated by multiplying by 100 the following: Total time (in CCS) that any port was out of service divided by the number of available resources times 36

2 of 2

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## IP DSP Resource Summary report

### Commands

To display the IP DSP Resource Summary report:

1. Type `list measurements ip dsp-resource summary <yesterday-peak/today-peak/last-hour> [print/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`.

## Traffic data analysis reports

- 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 `print` and `schedule` options are available for this command.

## Screen

[Figure 55](#) shows a typical screen for the IP DSP Resource Summary report. [Table 36](#) describes the data fields presented in the report.

**Figure 55: IP DSP Resource Summary report**

```
list measurements ip dsp-resource summary yesterday-peak

Switch Name:                               Date:4:07pm MON JAN 23,2006
                                IP DSP RESOURCE SUMMARY REPORT

Meas      DSP      DSP Usage   In Reg   Out of    Denied    %      % Out
Hour Region Rscs      (Erl)   Peg     Reg Peg   Peg      Blk    of Srv
0100 1     64        6.8     5817    0        0        0.00   0.00
2300 3     0         0.0     0        0        0        0.00   0.00
```

**Table 36: IP DSP Resource Summary report field descriptions 1 of 2**

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data was 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 36: IP DSP Resource Summary report field descriptions 2 of 2

Field	Range	Description
<b>DSP Usage (Erl)</b>	0-9999	Digital Signaling Processor Usage in Erlangs. Amount of time (in erlangs) 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.  This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use plus twice the total time (in seconds) that G.723 and G.729 resources are in use, plus twice the time (in seconds) that fax relay resources are in use, divided by 3600.
<b>In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a call
<b>Out of Reg Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a 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>Denied Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a call, but all media ports in all regions were busy and the call did not go through.
<b>% Blk</b>	0-99	Percent Blocked. The percent of attempted use of IP media processor ports in the region that were not successful (blocked). This percent includes calls that were denied after they were successfully allocated out of the region.
<b>% Out of Srv</b>	0-99	Percent Out of Service. The percent of CCS time that any IP media processor 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.  This measurement is calculated by multiplying by 100 the following: Total time (in CCS) that any port was out of service divided by the number of available resources times 36.

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---

## IP DSP Resource Detail report

### Commands

To display the IP DSP Resource Detail report:

1. Type `list measurements ip dsp-resource detail <region number> <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 56](#) shows a typical screen for the IP DSP Resource Detail report. [Table 37: IP DSP Resource Detail report field descriptions](#) on page 153 describes the data fields presented in this report.

---

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

```
list measurements ip dsp-resource detail 4 yesterday-peak
```

Switch Name:	Date:4:07pm MON JAN 23,2006							
IP DSP RESOURCE DETAIL REPORT								
Meas Hour	Region	DSP Rscs	DSP Usage (Erl)	In Reg Peg	Out of Reg Peg	Denied Peg	% Blk	% Out of Srv
0100	1	64	6.8	5817	0	0	0.00	0.00

Table 37: IP DSP Resource Detail report field descriptions 1 of 2

Field	Range	Description
<b>Meas Hour</b>	0000-2300	Measurement Hour. The hour that the data was 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>DSP Usage (ERL)</b>	0-9999	Digital Signaling Processor Usage in Erlangs. Amount of time (in erlangs) 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.  This measurement is calculated by adding the total time (in seconds) that G.711 resources on all IP media processors are in use plus twice the total time (in seconds) that G.723 and G.729 resources are in use, plus twice the time (in seconds) that fax relay resources are in use divided by 3600.
<b>In Reg Peg</b>	0-65535	The total number of times an IP media processor port in the region was allocated to a call
<b>Out of Reg peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a 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>Denied Peg</b>	0-65535	The total number of times an IP media processor port was needed in the region for a call, but all media ports in all regions were busy and the call did not go through.
<b>% Blk</b>	0-99	Percent Blocked. The percent of attempted use of IP media processor ports in the region that were not successful (blocked). This percent includes calls that were denied after they were successfully allocated out of the region.

1 of 2

**Table 37: IP DSP Resource Detail report field descriptions 2 of 2**

Field	Range	Description
% Out of Srv	0-99	Percent Out of Service. The percent of CCS time that any IP media processor 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. This measurement is calculated by multiplying by 100 the following: Total time (in CCS) that any port was out of service divided by the number of available resources times 36.

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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 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:

1. Type `list measurements clan ethernet <cabinet-carrier-slot address of circuit pack> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 57](#) shows a typical screen for the C-LAN Ethernet Performance Measurements Detailed report. [Table 38](#) describes the data fields presented in this report.

**Figure 57: 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 10000000570           20          10000000570           20
01/28 0208 10000000550 10000000550 10000000550 10000000550

```

**Table 38: C-LAN Ethernet Performance Measurements Detailed report field descriptions 1 of 2**

Field	Description
<b>Date</b>	The date that the data was collected.
<b>Time</b>	The current 15-minute interval in which the action was performed.

**Table 38: C-LAN Ethernet Performance Measurements Detailed report field descriptions 2 of 2**

Field	Description
<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 <code>reset board</code> 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:

1. Type `list measurements clan ppp <cabinet-carrier-slot address of circuit pack> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 58](#) shows a typical screen for the C-LAN PPP Performance Measurement Detailed report. [Table 39](#) describes the data fields presented in this report.

**Figure 58: C-LAN PPP Performance Measurement Detailed report**

```
list measurements clan ppp 1C1017
```

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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 39: C-LAN PPP Performance Measurement Detailed report field descriptions**

Field	Description
<b>Date</b>	The date that the data was 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>	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. 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.
<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:

1. Type `list measurements clan sockets hourly <board location>` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

[Figure 59: CLAN Sockets Hourly Report](#) on page 158 shows a typical screen for the CLAN Sockets Hourly report. [Table 40: CLAN Sockets Hourly report field descriptions](#) on page 159 describes the data fields presented in this report.

**Figure 59: 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	Board	Region	Socket Usage (Erl)	Socket Peg	Socket Denial Peg	% Denials	% Time ASB
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 40: 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 the customer has 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:

1. Type `list measurements clan sockets summary <yesterday-peak/today-peak/last-hour> [print/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.

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- Enter `last-hour` to list the peak hour traffic on CLAN sockets in the most recently completed hour.

**Options:** The `print` and `schedule` options are available for this command.

## Screen

[Figure 60](#) shows a typical screen for the CLAN Sockets Summary report. [Table 41](#) describes the data fields presented in this report.

**Figure 60: 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      Socket      Socket
Hour  Board  Region  Usage  Socket  Denial  %      % Time
                (Erl)  Peg    Peg    Denials  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 41: 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 the customer has 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 41: 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:

1. Type `list measurements clan sockets detail <board location> <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 61: CLAN Sockets Detail report](#) on page 162 shows a typical screen for the CLAN Sockets Detail report. [Table 42: CLAN Sockets Detail report field descriptions](#) on page 162 describes the data fields presented in this report.

**Figure 61: 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 42: 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 the customer has 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:

1. Type `list measurements lar-route-pattern <assigned pattern number> <yesterday/today/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 62](#) shows a typical screen for the LAR Measurements for Preferences in Pattern report. [Table 43](#) describes the data fields presented in this report.

**Figure 62: 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 Grp  LAR  LAR  Total  Suc.  Total  Suc.
  No.  No.  Type Calls  Rehunt Rehunt Next  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 43: 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 43: 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):

1. Type `list logins [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

[Figure 63](#) shows a typical Logins report. [Table 44](#) describes the data fields presented in this report.

**Figure 63: 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 44: Logins report field descriptions**

Valid values	Usage
<b>Login</b>	The user 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:

1. Type `list measurements modem-pool <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 64](#) shows a typical screen for the Modem Pool Measurements report. The time and date the report is requested displays at the top right. [Table 45: Modem Pool Measurements report field descriptions](#) on page 168 describes the data fields presented in this report.

---

**Figure 64: Modem Pool Measurements report**

```
list measurements modem-pool yesterday-peak
```

Switch Name: \_\_\_\_\_ Date: 3:25 pm TUE JAN 24, 2006

MODEM POOL MEASUREMENTS

Meas Hour	Pool No.	Pool Size	Pool Type	Total Usage	Inc Usage	Tan Usage	Calls Carried	Inc Calls	Tan Calls	Calls Blk	Calls Ovfl	% AMB
1200	1	2	integ	0	0	0	0	0	0	0	0	0

---

**Table 45: Modem Pool Measurements report field descriptions 1 of 2**

<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 was 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>	The time in <b>CCS</b> the members of the modem pool group are active on calls during the polling interval.  <i>Maximum Usage = Pool Size × 36 CCS</i>
<b>Inc Usage</b>	Incoming Usage. The usage in CCS for modem pool calls (originating from incoming or two-way trunks) that terminate on the switch.  <i>Outgoing Usage = Total Usage – Inc Usage</i>
<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>	Incoming Calls. The number of calls (originating from incoming or two-way trunks) that terminate on the switch.  <i>Outgoing Calls = Calls Carried – Inc Calls</i>
<b>Tan Calls</b>	Tandem Calls. The number of tandem calls that used a modem pool member.

**Table 45: Modem Pool Measurements report field descriptions 2 of 2**

<b>Field</b>	<b>Description</b>
<b>Calls Blocked</b>	The number of calls blocked due to the unavailability of a conversion resource. <b>Suggested actions:</b> <ol style="list-style-type: none"> <li>2. 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>3. 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:

1. Type `list measurements expansion-service-mod hourly [print/schedule]` and press **Enter**.

To display the ESM Summary report:

1. Type `list measurements expansion-service-mod summary <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screens

[Figure 65: ESM Hourly report](#) on page 171 shows a typical screen for the ESM Hourly report.

[Figure 66: ESM Summary report](#) on page 171 shows a typical screen for the ESM Summary report.

[Table 46: ESM Hourly and EMS Summary report field descriptions](#) on page 172 describes all the data presented in both reports.

**Figure 65: 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 66: 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 Blockagee
1100   0      0      0      0      0      0      0      0
```

**Table 46: ESM Hourly and EMS Summary report field descriptions**

<b>Field</b>	<b>Description</b>
<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 % blockage = (MMI Denials / Total Alloc + 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:

1. Type `list measurements multimedia-interface hourly [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

To display an MMI Summary report:

1. Type `list measurements multimedia-interface summary <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screens

[Figure 67: MMI Hourly report](#) on page 174 shows a typical screen for the MMI Hourly report. [Figure 68: MMI Summary report](#) on page 174 shows a typical screen for the MMI Summary report. [Table 47: MMI Hourly and MMI Summary report field descriptions](#) on page 175 describes all the data presented in both reports.

**Figure 67: MMI Hourly report**

```
list measurements multimedia-interface hourly Page 1
```

Switch Name: Date: 11:54 am WED JAN 25, 2006

MMI HOURLY REPORT

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
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 68: 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 47: MMI Hourly and MMI Summary report field descriptions

Field	Description
<b>Peak Hour For All MMIs</b>	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.  <b>Note:</b> This field is not available on the MMI 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 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:

1. Type `list measurements voice-conditioners hourly [print/schedule]` and press **Enter**.

To display a VC Summary Report:

1. Type `list measurements voice-conditioners summary <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screens

[Figure 69](#) shows a typical screen for the VC Hourly report. [Figure 70](#) shows a typical screen for the VC Summary report. The time and date the report is requested displays at the top right. [Table 50: Port Network Load Balance Study - Total report field descriptions](#) on page 185 describes the data presented in these reports.

**Figure 69: VC Hourly report**

```
list measurements voice-conditioners hourly
```

Page 1

Switch Name: Date: 2:41 pm WED JAN 25, 2006

VC SUMMARY REPORT

Meas	Avl	-----USAGE-----			--ALLOCATIONS---			-----DENIALS-----			Out	%	%	
Hour	Prt	Avail	H320	Voice	Total	H320	Voice	Total	H320	Voice	Total	Srv	APB	Blk
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Figure 70: VC Summary report**

```
l1ist measurements voice-conditioners summary today-peak
```

Switch Name: Date: 2:43 pm WED JAN 25, 2006

VC SUMMARY REPORT

Peak Hour For All VCs : 1300

Meas	Avl	-----USAGE-----			--ALLOCATIONS---			-----DENIALS-----			Out	%	%	
Hour	Prt	Avail	H320	Voice	Total	H320	Voice	Total	H320	Voice	Total	Srv	APB	Blk
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Table 48: VC Hourly and VC Summary report field descriptions 1 of 2**

<b>Field</b>	<b>Description</b>
<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.

Table 48: 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

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---

## 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:

1. Type `list performance summary <yesterday/today> [print/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 `print` and `schedule` options are available for this command.

### Screens

[Figure 71](#) and [Figure 72](#) 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 49: Performance Summary report field descriptions](#) on page 181 describes the data fields presented in this report.

**Figure 71: 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 72: 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.  -----

41      9 19
73      7
211     1 2 3 4 5 6 7 8 9 10
more trunks out of service

55      1
60      9
223    19 20 21 22 23
more trunks not used
```

Table 49: Performance Summary report field descriptions 1 of 3

Field	Description
<b>PEAK HOUR TRUNK BLOCKING</b>	<p data-bbox="581 331 1318 537">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 data-bbox="581 541 1268 632">% ATB is the percentage of time that all trunks in the trunk group were simultaneously in use during the measurement interval.</p> <p data-bbox="581 636 1308 869">% 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 data-bbox="581 873 1321 1077"><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 data-bbox="581 1081 1318 1255">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 49: Performance Summary report field descriptions 2 of 3**

Field	Description
<p><b>DAILY ROUTING PATTERN CALLS CARRIED</b></p>	<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>
<p><b>TRUNKS OUT OF SERVICE</b></p>	<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>

Table 49: 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>

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---

## 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 184.
- 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 187)
  - incoming trunk (see [Port Network Load Balance Study - Incoming report](#) on page 188)
  - outgoing trunk (see [Port Network Load Balance Study - Outgoing report](#) on page 190)
  - tandem trunk (see [Port Network Load Balance Study - Tandem report](#) on page 191)

## Traffic data analysis reports

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:

1. Type `list measurements load-balance <total/intercom/incoming/outgoing/tandem> <yesterday-peak/today-peak/last-hour> [print/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` or 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 `print` and `schedule` options are available for this command.

---

## Port Network Load Balance Study - Total report

### Screen

[Figure 73](#) depicts an example of a typical screen for the Port Network Load Balance Study report with the `total` qualifier. [Table 50](#) describes the data fields presented in this report.

**Figure 73: 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
Time Division Multiplexed(TDM)           Port Network(PN) Link
-----
Meas  -----
PN  Hour  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 50: 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 was 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 50: 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: <i>(TDM Usage/TDM Total Potential Usage) x 100</i> <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 PN 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.

**Table 50: 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%.

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## Port Network Load Balance Study - Intercom report

### Screen

[Figure 74](#) shows a typical screen for the Port Network Load Balance Study report with the **intercom** qualifier. [Table 51](#) describes the data fields presented in this report

**Figure 74: 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 51: 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 was 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 75](#) shows a typical screen for the Port Network Load Balance Incoming Calls Report. [Table 61](#) describes the data fields presented in this report.

**Figure 75: 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

      Meas      Intra PN      Incoming      Outgoing
PN  Hour      Usage      Peg      Usage      Peg      Usage      Peg1
  1  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 was 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 76](#) shows a typical screen for the Port Network Load Balance Study - Outgoing report. [Table 52](#) describes the data fields presented in this report.

**Figure 76: 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 52: Port Network Load Balance Study - Outgoing report field descriptions 1 of 2**

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 was recorded.
<b>Intra PN Usage</b>	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> .
<b>Intra PN Peg</b>	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.
<b>Incoming Usage</b>	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 52: 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 77](#) shows a typical screen for the Port Network Load Balance Study - Tandem report. [Table 53: Port Network Load Balance Study - Tandem report field descriptions](#) on page 192 describes the data fields presented in this report.

**Figure 77: 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 53: Port Network Load Balance Study - Tandem report field descriptions**

<b>Field</b>	<b>Description</b>
<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 was 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>	<b>The 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:

$$\text{Maximum PNL usage} = 766 \times 36 \text{ CCS} = 27,576 \text{ CCS}$$

## Traffic data analysis reports

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:

1. Type `list measurements blockage <pn/sn> <yesterday-peak/today-peak/last-hour> [print/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 `print` and `schedule` options are available with this command.

## Blockage Study - Port Network report

[Figure 78](#) shows a typical Blockage Study report for port networks. [Table 54: Blockage Study - Port Network report field descriptions](#) on page 195 describes the data fields presented in this report.

**Figure 78: Blockage Study - Port Network report**

```
list measurements blockage pn last-hour
```

Switch Name: \_\_\_\_\_ Date: 10:56 am FRI, JAN 27, 2006

BLOCKAGE STUDY REPORT

PN	Meas Hour	Time Division Multiplexed(TDM)				Port Network(PN) Link				
		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 54: 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 was 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 <b>CCS</b> = 27,576 <b>CCS</b>.</i>

1 of 2

**Table 54: 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>	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. <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.

2 of 2

## Blockage Study - Switch Node report

[Figure 79](#) shows a typical Blockage Study report for switch nodes. [Table 55](#) describes those data fields presented in this report which are different from those in the Blockage Study - Port Network report. Refer to [Table 54: Blockage Study - Port Network report field descriptions](#) on page 195 for data fields that are the same.

This report is only accessible from the G3r server.

**Figure 79: 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 55: 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 was 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 80](#) shows a typical screen for view 1 of the attendant and maintenance status report; [Figure 81](#) shows a typical screen for view 2 of that report. [Table 56: Attendant and maintenance status report field descriptions](#) on page 200 describes the data fields presented in both report views.

Figure 80: 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 blkg:  *   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 81: 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 blkg:  *   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 56: 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 <code>status attendant</code> 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 <code>display alarms</code> command.</p>

**1 of 2**

Table 56: 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 <code>list performance trunk-group</code> 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 <code>list performance trunk-group</code> command and follow the suggested actions specified for that command.</li> </ol>

2 of 2

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## 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 *Hardware Guide for Avaya Communication Manager*.

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:

1. Type `list measurements tone-receiver summary <yesterday-peak /today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 82](#) shows a typical screen for the Tone Receiver Measurements Summary report. [Table 57](#) describes the data fields presented in the Tone Receiver Measurements Summary report.

**Figure 82: 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 57: 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 57: Tone Receiver Measurements Summary Report 2 of 3**

Field	Description
<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>

**Table 57: 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.

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---

## 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 *Hardware Guide for Avaya Communication Manager*.

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:

1. Type `list measurements tone-receiver detail <yesterday-peak /today-peak/ last-hour> [print/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 `print` and `schedule` options are available for this command.

## Screens

[Figure 83](#) shows a typical screens for the Tone Receiver Detail Measurements report. [Table 58: Tone Receiver Detail Measurements report field descriptions](#) on page 207 describes the data fields presented in this report.

**Figure 83: 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 58: Tone Receiver Detail Measurements report field descriptions 1 of 2

Field	Description
<b>Hour</b>	Measurement Hour. The starting time (using 24-hour clock) of the last hour or of the hour with the highest Peak Req measurement.
<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>	The type of tone receiver measured.  <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.
<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>	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.  <b>Note:</b> With ideal conditions, this field displays the number 0. However, with more practical conditions, the field displays a larger number.  <b>Suggested actions:</b> Locate communities of interest within the same port network. Provide sufficient tone receivers for each port network.

1 of 2

**Table 58: Tone Receiver Detail Measurements report field descriptions 2 of 2**

Field	Description
<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>, <b>GPTD</b>, <b>CC-TTR</b>, <b>CC-CPTR</b>, or <b>MFCR</b> 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

---

## 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.

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:

1. Type `list measurements summary [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

## Screens

[Figure 84](#), [Figure 85](#) and [Figure 86: Traffic Summary report — page 3](#) on page 210 show typical screens for the Traffic Summary Reports. [Table 59: Traffic Summary report field descriptions](#) on page 211 describes the data fields presented in these screens.

**Figure 84: 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 85: 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 86: 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 59: Traffic Summary report field descriptions 1 of 3

Field	Description
<b>Meas Hour</b>	Measurement Hour. The starting time (using the 24-hour clock) of the hour during which the data was 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 100: Occupancy Summary Measurements report — page 1</a> on page 270.
<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. $\text{Total Blocking} = ((\text{TDM Blockage} + \text{SNL Blockage} + \text{PNL Blockage}) \times 100) / (\text{TDM Pegs} + \text{SNL Pegs} + \text{PNL Pegs})$
<b>High PN Blk</b>	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: $\text{Highest PN Blk} = (\text{TDM Blockage} \times 100) / \text{TDM Pegs}$
<b>High PNL/SNL Blk</b>	Highest Port Network Link/Switch Node Link Blocking. (G3r only). The highest percent of <b>SNL</b> and <b>PNL</b> 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: $\text{Highest PNL/SNL Blk} = ((\text{SNL Blockage} + \text{PNL Blockage}) \times 100) / (\text{SNL Pegs} + \text{PNL Pegs})$ <p>The data from Total Blockage, High <b>PN</b> Blk and High <b>PN/SNL</b> Blk 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.</p>

1 of 3

**Table 59: Traffic Summary report field descriptions 2 of 3**

Field	Description
<b>Attendant Speed</b>	<p>Attendant Group Speed of Service. The average time calls are in the attendant queue. The peak hour has the slowest speed of service.</p> <p><i>Attendant Speed = Total Delay for all Answered Call (in seconds) / Total Number of Calls Answered</i></p> <p><b>Suggested action</b> If the speed of answer is not acceptable, review the attendant group and attendant positions reports for suggested actions.</p>
<b>Major Alarm</b>	<p>The time stamp of the last major alarm active when the report was generated for the last hour.</p> <p><b>Suggested action</b> If measurement data on reports seems inconsistent, further study of alarms may point to a potential problem (“display alarms”).</p>
<b>Trunk Group</b>	<p>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.</p>
<b>Wideband Trunk Group</b>	<p>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.</p>
<b>Coverage Path</b>	<p>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.</p>
<b>Covered Principals</b>	<p>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.</p>
<b>Route Pattern</b>	<p>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.</p>
<b>Total Trunks Out of Service</b>	<p>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 91: Trunk Out of Service report</a> on page 228.</p>

Table 59: Traffic Summary report field descriptions 3 of 3

Field	Description
<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 107: Security Violations Summary report</a> on page 290 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").
<b>Grp No</b>	Group Number. The trunk group number.
<b>% ATB</b>	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.

3 of 3

## 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:

1. Type `list measurements trunk-group summary <yesterday-peak/  
today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

#### Screen

[Figure 87](#) shows a typical screen for the Trunk Group Summary report. [Table 60: Trunk Group Summary report field descriptions](#) on page 215 describes the data fields presented in this report.

**Figure 87: 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  Grp  Grp  Grp  Meas  Total  Total  Inc.  Grp  Que  Call  Que  Que  Out  %  Out
No.  Siz  Type Dir  Hour Usage Seize Seize Ovfl Siz Qued Ovfl Abd  Srv ATB 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   0
38  23  isdn two  1200  171   654    0      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   0
40  5   co   two  1200  61    32     0      6   0   0   0   0   0   6   15
```

**Table 60: 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.

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**Table 60: 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>	<p>Trunk Group Direction. Identifies whether the trunk group is incoming (<b>inc</b>), outgoing (<b>out</b>), or two-way (<b>two</b>).</p>
<b>Meas Hour</b>	<p>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).</p>
<b>Total Usage<sup>1</sup></b>	<p>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).</p>
<b>Total Seize</b>	<p>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.</p>

Table 60: 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 228.

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**Table 60: Trunk Group Summary report field descriptions 4 of 5**

Field	Description
<p><b>% ATB</b></p>	<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>2. 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>3. 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>

Table 60: Trunk Group Summary report field descriptions 5 of 5

Field	Description
<b>% Out Blk</b>	<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>4. 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>5. 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>
<b>Wideband Flag</b>	<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>

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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 223.

## Command

To display the Trunk Group Hourly report:

1. Type `list measurements trunk-group hourly <assigned trunk group number> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 88: Trunk Group Hourly report](#) on page 221 shows a typical screen for the Trunk Group Hourly report. [Table 61: Trunk Group Hourly report header field descriptions](#) on page 221 and [Table 62: Trunk Group Hourly report data field descriptions](#) on page 221 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 88: 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 61: 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 62: 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 was 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 62: 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:

1. Type `display meas-selection trunk-group [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are 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 89](#) shows a typical screen for the Trunk Group Measurement Selection screen on the G3r. [Table 63](#) describes the data fields presented in this screen.

**Figure 89: 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 63: 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:

1. Type `list performance trunk-group <yesterday/today> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 90](#) shows a typical screen for the Highest Hourly Trunk Group Blocking Performance report. [Table 64: Highest Hourly Trunk Group Blocking Performance report field descriptions](#) on page 226 describes the data fields presented in this report.

**Figure 90: 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 64: 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>dioid</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 64: 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>2. 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>3. 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>4. 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>	<p>Measurement Hour. The starting time (using 24-hour clock) of the hour during which the data is recorded.</p>
<b>Total Calls</b>	<p>The total number of calls (seizures) for the trunk group during the peak hour of blocking.</p>

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## 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:

1. Type `list measurements outage-trunk <yesterday/today/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 91](#) shows a typical screen for the Trunk Out of Service report. [Table 65: Trunk Out of Service report field descriptions](#) on page 229 describes the data fields presented in this report.

---

**Figure 91: 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 65: Trunk Out of Service report field descriptions 1 of 2

Field	Description
<b>Grp No.</b>	Group Number. The number that identifies each 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 trunks in the trunk group.

1 of 2

**Table 65: 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>2. 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>3. If a trunk is suspected of causing problems, use the <b>ACA</b> feature to monitor the particular trunk group.</li> <li>4. 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:

1. 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 92](#) 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 66: Trunk Group Status report field descriptions](#) on page 232 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 92: 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 66: 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

## Traffic data analysis reports

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

$$\text{Total Calls Offered} = \text{Calls Carried} + \text{Group Overflow}$$

## Traffic data analysis reports

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:

$$\text{Calls Offered} = \text{Calls Carried} + \text{Group Overflow}$$

$$\text{Calls Offered} = 81 + 5$$

$$\text{Calls Offered} = 86$$

## Traffic data analysis reports

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:

1. Type `list measurements cbc-trunk-group <ISDN CBC trunk group number> last-hour [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 93](#) 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 67: CBC Trunk Group Measurements report field descriptions](#) on page 241 describes the data fields presented in this report.

**Figure 93: 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 67: CBC Trunk Group Measurements report field descriptions 1 of 7

Field	Description
<b>Queue Size</b>	<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>
<b>Calls Queued</b>	The total number of calls entered the <b>CBC</b> trunk group queue during the hour.
<b>Queue Overflow</b>	<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 67: CBC Trunk Group Measurements report field descriptions 2 of 7**

Field	Description
<p><b>Queue Abandonments</b></p>	<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 his/her 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>
<p><b>Out of Service</b></p>	<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>
<p><b>Usage Allocation Plan Used</b></p>	<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>
<p><b>Usage Allocation Plan Used (Contd)</b></p>	<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>
<p><b>Service Feature</b></p>	<p>The names of up to 10 services/features and the special identifier “other” for which the associated measurements are reported.</p>

Table 67: 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.

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**Table 67: CBC Trunk Group Measurements report field descriptions 4 of 7**

Field	Description
Ovf S/F	<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>

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Table 67: CBC Trunk Group Measurements report field descriptions 5 of 7

Field	Description
<b>Ovf Max</b>	<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:           <math display="block">\text{Max} - \text{Min (for the identified S/F)} \leq \text{Free Pool}</math> <p>For example, use the above equations with the data in the formula as follows:</p> <math display="block">\text{Free Pool} = \text{Total \# of in-service trunks} - \sum \text{Min for each S/F}</math> <math display="block">\text{Free Pool} = 18 - (5+4)</math> <math display="block">\text{Free Pool} = 9</math> <math display="block">8 - 4 \text{ (for SDN)} \leq 9</math> <math display="block">4 \leq 9 \text{ Therefore, you can increase the Max}</math> </li> <li>Consider adding more trunks to the trunk group and increase the maximum for the identified service/feature.</li> </ol>
<b>% TBM</b>	<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>

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**Table 67: CBC Trunk Group Measurements report field descriptions 6 of 7**

Field	Description
<b>% ATB</b>	<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>

Table 67: 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>

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## 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.

## Traffic data analysis reports

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:

1. Type `list measurements lightly-used-trunk <yesterday/  
today/last-hour> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 94](#) shows a typical screen for the Trunk Lightly Used report. The time and date the report is requested displays at the top right. [Table 68: Trunk Lightly Used report field descriptions](#) on page 250 describes the data fields presented in this report.

**Figure 94: 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 68: 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>Hardware Guide for Avaya Communication Manager</i> .
<b>Grp Mbr#</b>	Group Member Number. The number that identifies a specific trunk member (in the group number).

Table 68: 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>

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---

## 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 announcements <all, integ-all, board-loc>
<period>
```

The type qualifiers are

- **all** lists announcements regardless of type (analog, aux-trunk and integrated).
- **integ-all** lists all active integrated announcement circuit packs (TN2051AP or TN750) in the order they were activated. The report for each circuit pack starts on a new page.
- **board-loc** lists announcements for the specified circuit pack.

## Traffic data analysis reports

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 95](#) shows an example of a report for all administered announcements with the **today-peak** reporting period.

**Figure 95: Voice Announcement Measurements report**

```
list measurements announcements all today-peak                                     Page 1
Switch Name: Portsmouth-Main                                           Date: 9:23 am FRI FEB 3, 2006

                                VOICE ANNOUNCEMENT MEASUREMENTS

Ann      Meas Play  Calls      Queue Mport  Mx  Max
No.  Ext   Name (first 24 chars)  Hour Reqts Que  ASP  Drops Plays Pt  Cls
-----
1     3001  Announcement-num-3001  1000  0    0    0  0    0    0  0
2     3002  Announcement-num-3002  1000  0    0    0  0    0    0  0
3     3003  Announcement-num-3003  1000  0    0    0  0    0    0  0
4     3004  Announcement-num-3004  1000  0    0    0  0    0    0  0
5     3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
6     3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
7     3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
8     3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
9     3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
10    3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
11    3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
12    3005  Announcement-num-3005  1000  0    0    0  0    0    0  0
```

[Figure 96](#) shows an example of a report for a specific integrated announcement circuit pack with the **last-hour** reporting period.

Figure 96: Voice Announcement Measurements report (last hour)

```

list measurements announcements board 01B01 last-hour
                                                    Page 1

Switch Name:                                     Date: 9:23 am FRI FEB 3, 2006

                VOICE ANNOUNCEMENT MEASUREMENTS

Board Location: 01C04                            Play Ports: 31
Max. Callers On Board in Period: 0              All-Ports-Busy in Period: 0

Ann
No.  Ext      Name (first 24 chars)      Meas Play  Calls      Queue Mport  Mx  Max
    No.  Ext      Name (first 24 chars)      Hour Reqts Que   ASP  Drops Plays Pt  Cls
23  3023  Announcement-num-3001      1000  0    0    0  0    0    0  0
24  3024  Announcement-num-3024      1000  0    0    0  0    0    0  0
25  3025  Announcement-num-3025      1000  0    0    0  0    0    0  0
26  3026  Announcement-num-3026      1000  0    0    0  0    0    0  0
27  3027  Announcement-num-3027      1000  0    0    0  0    0    0  0
28  3028  Announcement-num-3028      1000  0    0    0  0    0    0  0
29  3029  Announcement-num-3029      1000  0    0    0  0    0    0  0
30  3030  Announcement-num-3030      1000  0    0    0  0    0    0  0
31  3031  Announcement-num-3031      1000  0    0    0  0    0    0  0
32  3032  Announcement-num-3032      1000  0    0    0  0    0    0  0
33  3033  Announcement-num-3033      1000  0    0    0  0    0    0  0
34  3034  Announcement-num-3034      1000  0    0    0  0    0    0  0
    
```

Table 69: Voice Announcement Measurements report field descriptions 1 of 2

Field	Description
Switch Name	The administered switch name.
Date	The date and time of the report submission.
Board Location	The physical location (UUCSS) of the TN750B or C or TN2501AP circuit packs. This field displays only with the <i>integ-all</i> and <i>board-loc</i> qualifiers.
Play Ports	The number of ports available on the circuit pack. This field displays only with the <i>integ-all</i> and <i>board-loc</i> qualifiers.
Max Callers on Board in Period	The peak number callers simultaneously connected to a circuit pack (sum of the ports) at the same time. This field displays only with the <i>integ-all</i> and <i>board-loc</i> qualifiers.
All-Ports-Busy in Period	A count of how many times the all-ports-busy condition occurred within the reporting period. This field displays only with the <i>integ-all</i> and <i>board-loc</i> qualifiers.

1 of 2

**Table 69: Voice Announcement Measurements report field descriptions 2 of 2**

<b>Field</b>	<b>Description</b>
<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.
<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>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.

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## 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:

1. Type `list measurements wideband-trunk-group summary <yesterday-peak/  
today-peak/last-hour> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 97](#) shows a typical screen for the Wideband Trunk Group Summary report. [Table 70](#) describes the data fields presented in this report.

**Figure 97: 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  Grp  Grp Service      Meas Total Total  Inc.  Grp  Out  %  %Out
No.  Size Dir Type          Hour Usage Seize  Seize Ovfl  Srv  ATB 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 70: 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> .

Table 70: 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 70: Wideband Trunk Group Summary report field descriptions 3 of 3**

Field	Description
<b>% ATB</b>	<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>
<b>% Out Blk</b>	<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>

# 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:

1. Type `list measurements wideband-trunk-group hourly <assigned wideband-trunk-group number> [print/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 `print` and `schedule` options are available for this command.

## Screen

[Figure 98](#) shows a typical screen for the Wideband Trunk Group Hourly report. [Table 71](#) and [Table 72: Wideband Trunk Group Hourly report data field descriptions](#) on page 260 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 98: 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  Total  Maint  Total  Inc.  Tandem  Grp  Out  %  %Out
Hour  Usage  Usage  Seize  Seize  Seize  Ovfl  Serv  ATB  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 71: 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 72: 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 72: 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 the user 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:

1. Type `display meas-selection wideband-trunk-group [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are 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 99](#) shows a typical screen for the Wideband Trunk Group Measurement Selection on the G3r. [Table 73: Wideband Trunk Group Measurement Selection screen](#) on page 262 describes the data fields presented in the Wideband Trunk Group Measurement Selection screen.

**Figure 99: 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 73: 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 customer 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, the customers' 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.

## Processor occupancy reports

### Note:

A particular configuration may have a traffic load that consists of any combination of the three defined applications.

Depending on the customers' 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).

A customer's *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 the customer's 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 the customer’s 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 [print or schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

### Screen

[Figure 100](#) and [Figure 101](#) show typical output for the Processor Occupancy Summary report. The time and date the report is requested displays at the top right. [Table 74: Occupancy Summary Measurements report field descriptions](#) on page 271 describes the data fields presented in the Processor Occupancy Summary report, as well as the Last Hour and Busiest Interval reports.

**Figure 100: 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 101: 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 74: Occupancy Summary Measurements report field descriptions 1 of 5**

Field	Description
<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>Hardware Guide for Avaya™ Communication Manager</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 74: Occupancy Summary Measurements report field descriptions 2 of 5**

Field	Description
<p><b>CP Occ</b></p>	<p>Call Processing Occupancy. The percentage of occupancy used by call processing-level processes. The processing of <b>CDR, DCS, 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>
<p><b>Sm Occ</b></p>	<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>Hardware Guide for Avaya™ Communication Manager</i>.</p>

**Table 74: 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 74: 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>

**Table 74: 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 [print or schedule]` and press **Enter**.

**Options:** The `print` and `schedule` options are available for this command.

## Screen

[Figure 102](#) shows typical output for the Occupancy Last-Hour Measurements report. The time and date the report is requested displays at the top right.

**Figure 102: 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 Minute	Static Occ	CP Occ	Sm Occ	Idle Occ	Total Calls	Tandem Calls	Total Atmpts	Intcom Atmpts	Inc Atmpts	Out Atmpts	Pnet 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 [print/schedule]` and press **Enter**.

**Options:** The `print` and `schedule` commands are available for this command.

## Screen

[Figure 103](#) 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 74: Occupancy Summary Measurements report field descriptions](#) on page 271.

**Figure 103: 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      Static CP   Sm  Idle Total Tandem Total  Intcom Inc    Out  Pnet
Occurrence  Occ   Occ  Occ Occ  Calls Calls  Atmpts Atmpts Atmpts Atmpts 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> [print/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 `print` and `schedule` options are available for this command.

### Screen

[Figure 104](#) and [Figure 102: Occupancy Last-Hour Measurements report](#) on page 276 show typical output for the Communication Link Measurements report. The time and date the report is requested displays at the top right. [Table 75: Communications Link Measurements report field descriptions](#) on page 282 describes the data fields presented in the Processor Occupancy Communications Link Measurements report.

**Figure 104: 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 105: 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 customer 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 the

## Processor occupancy reports

customer 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 75: 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 106](#) shows typical output for the Interface Links report for the G3r, G3si and G3csi systems. [Table 76: Interface Links report field descriptions](#) on page 283 describes the data fields presented in this report.

**Figure 106: 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
3:   n    n
4:   y    y    25904      BX25  28007      proc 04
5:   n    n
6:   n    n
7:   n    n
8:   n    n

```

**Table 76: 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 76: 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 77: 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 77: 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, CMS, 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 (ACD and Call Vectoring)</b>, 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>

Table 77: Procedures for calculating processor occupancy 3 of 4

Step	Description
Step 5.	<p data-bbox="516 310 1375 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 1256 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="654 821 1252 884">2) The number for <b>BHCC</b> is the number that is obtained in Step 4.</p> <p data-bbox="581 905 1320 968">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 857 1119">or</p> $Calls\ Predicted > Total\ Calls$ <p data-bbox="581 1192 1369 1360">c. If the Calls Predicted number is less than the Total Calls number, then either the customer has 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 1398 1375 1566">If the Calls Predicted number is greater than the Total Calls number, then either the customer has 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 1587 1308 1671"><b>Note:</b> If the Calls Predicted number equals or approximately equals the Total Calls number, then the customer is using the configuration in a typical manner.</p>

3 of 4

**Table 77: 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>

**4 of 4**

# 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 [print/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 options `print` and `schedule` are available for these commands.

### Screen

[Figure 107](#) displays a typical Security Violations Summary report. The report header lists the switch name and date and time the report is requested. [Table 78: Security Violations Summary report field descriptions](#) on page 290 describes the data presented in the Security Violations Summary report.

**Figure 107: 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
                -----
                Origination
                Station  Trunk  Total
Valid          0         1    2    3
Invalid        0         4    6   10
Sec Viol       0         0    0    0

                Authorization Codes
                -----
                Remote
                Station  Trunk  Access  Attd  Total
Valid          0         0        0    0    0
Invalid        0         0        0    0    0
Sec Viol       0         0        0    0    0
    
```

**Table 78: 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>

**Table 78: 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>	<p>Measurements totaled for all the above port types.</p>

**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 108](#) shows typical output for the Security Violations Status - Remote Access Barrier Code Violations report. [Table 108](#) describes the data fields presented in this report.

---

**Figure 108: 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 79: Remote Access Barrier Code Violations report data 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 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 109](#) shows typical output for the Security Violations Status—Authorization Code Violations report. [Figure 109: Authorization Code Violations report](#) on page 294 describes the data fields presented in the Security Violations Status—Authorization Code Violations report.

**Figure 109: 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
01/06  07:32   TRUNK       1233555   35      14
01/03  14:22   REM ACCESS  2222      31      3   3295912
12/25  16:45   ATTENDANT   1212111
                84321
                3035551234
                5556789
                84000
-----
    
```

**Table 80: Authorization Code Violations report 1 of 2**

Field	Description
<b>Date</b>	The date the attempt occurred.
<b>Time</b>	The time the attempt occurred.
<b>Originator</b>	The type of resource from which the invalid access attempt originated. Originator types include: <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>
<b>Auth-Cd</b>	Authorization Code. The invalid authorization code entered.
<b>TG No</b>	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 80: 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.

**2 of 2**

---

## Security Violations Status - Station Security Code Violations report

[Figure 110](#) shows typical output for the Security Violations Status - Station Security Code Violations report. [Table 110](#) describes the data fields presented in this report.

**Figure 110: 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 81: 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 Access Security Gateway Session History reports.

You can view or print 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 or prints as the History report when you enter the **list history** or **list history print** 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 or print an Access Security Gateway Session History report showing all session establishment and rejection events associated with users accessing the system administration and maintenance interface through Access Security Gateway (ASG). This report contains the last 500 session log entries for the G3si and 1250 session log entries for the G3r.

The Access Security Gateway Session History report displays or prints when you enter the **list asg-history** or **list asg-history [print/schedule]** command. This report can only be generated by a login with the super-user permissions.

---

## 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
- recycle
- refresh
- restart

## History reports

- cancel
- clear
- configure
- enable, disable
- format
- login/logoff
- mark
- save
- set, reset
- start
- test
- 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 82: History report parsing options](#) 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 82: 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 <code>HELP</code> 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:

1. Type **list history** and press RETURN.

To print the History report:

1. Type **list history print** and press RETURN.
- 

### Screen

[Figure 111: History report](#) on page 301 shows typical output for the History report.

[Table 83: History report field descriptions](#) on page 301 describes the data fields presented in the History report.

Figure 111: 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 83: 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 83: 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	<p>The first command word entered; this specifies the operation to be performed.</p>

Table 83: 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**

---

## Access Security Gateway Session History report

The Access Security Gateway Session History report logs all session establishment and rejection events associated with users accessing the system administration and maintenance interface through Access Security Gateway (ASG). This report emulates the data provided in the History report, and also contains information on whether the session was accepted or rejected by ASG, and if rejected, the reason for the rejection.

This report is accessible only if, on the System-Parameters Customer-Options screen, the Access Security Gateway (ASG) field is set to **y**.

---

### Command

To display the Access Security Gateway Session History report:

1. Type **list asg-history** and press RETURN.

To print the Access Security Gateway Session History report:

1. Type **list asg-history [print/schedule]** and press RETURN.

Options: The **print** and **schedule** options are available with this command.

---

### Screen

[Figure 112: Access Security Gateway Session History report](#) on page 304 shows typical output for the Access Security Gateway Session History report. [Table 84: Access Security Gateway History report field descriptions](#) on page 304 describes the data fields presented in this report.

**Figure 112: Access Security Gateway Session History report**

ACCESS SECURITY GATEWAY SESSION HISTORY				
Date	Time	Port	Login	Status
01/06	12:45	SYSAM-RMT	csand	AUTHENTICATED
01/05	01:32	SYSAM-LCL	jsmith	REJECT-BLOCK
01/05	12:33	SYSAM-RMT	ajones	REJECT-EXPIRE
01/03	15:10	SYSAM-RMT	swrigh	REJECT-PASSWORD
01/02	08:32	SYSAM-LCL	jsmith	REJECT-INVALID
01/02	07:45	SYSAM-RMT	mehrda	REJECT-RESPONSE

**Table 84: Access Security Gateway History report field descriptions**

Field	Description
Date	Indicates the date of the session establishment or rejection. The date displays in the mm/dd format where mm = month and dd = day.
Time	Indicates the time of the session establishment or rejection. The time displays in the hh:mm format where hh = hour and mm = minute.
Port	Indicates the port mnemonic associated with the port on which the session was established or rejected. The port mnemonics for G3r systems are <b>SYSAM-LCL</b> , <b>SYSAM-RMT</b> , <b>MAINT</b> , and <b>SYS-PORT</b> . For G3si systems, they are <b>MRG1</b> , <b>INADS</b> , <b>NET</b> , and <b>EPN</b> .
<i>1 of 2</i>	

Table 84: Access Security Gateway History report field descriptions (continued)

Field	Description
Login	Indicates the alphanumeric login string entered by the user and associated with the session establishment or rejection.
Status	<p>Indicates the code showing whether the session was established or rejected and, if rejected, the reason for the rejection. The following is a list of the possible status values:</p> <ul style="list-style-type: none"> <li>● <b>AUTHENTICATED</b>—User authentication and session establishment.</li> <li>● <b>REJECT-BLOCK</b>—User rejected because the Blocked field associated with the login ID is set to y.</li> <li>● <b>REJECT-EXPIRE</b>—User rejected because access restriction based on the Expiration Date criteria detected.</li> <li>● <b>REJECT-INVALID</b>—User rejected because the user-supplied login ID did not match any of the administered login IDs.</li> <li>● <b>REJECT-RESPONSE</b>—User rejected because the user-supplied response to the system challenge was not valid.</li> <li>● <b>REJECT-RESTRICT</b>—User rejected because access restriction based on either the Day of Week or Time of Day criteria detected.</li> <li>● <b>REJECT-SESSIONS</b>—User rejected because access restriction based on the Number of Sessions criteria detected.</li> </ul>
<b>2 of 2</b>	

## History reports

## 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 263 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:		Location:		Group Name:				
Group ID:		Group Size:		Group Type:				
		Queue Size:						
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:		Location:						Service Type:		
Group No:		Group Size:						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:											Week No. and Date
Day of Week	Peak Hour	Stat Occ	CP Occ	SM Occ	Idle Occ	Total Calls	Tandem Calls	Total ATMPT	INTCOM ATMPT	INC ATMPT	OUT ATMPT	PNET ATMPT	
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.

**Blank worksheets**

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