Call Agent Performance Management

The Call Agent Manager provides performance statistics such as memory and processor usage for the Call Agent hardware and software platform. Call processing application statistics such as call attempts per hour are available from the MAP.

What's new for SN08

There are no changes to this document in SN08.

Performance strategy overview

Check the performance of the call processing application at the MAP. If performance is degraded, follow the MAP procedures and also investigate the performance of the platform from the Call Agent Manager.

In addition to the CAPACITY performance management information in this section, refer to *CS 2000 Performance Monitoring*, NN10149-711 for information about using the call processing application operational measurements. Refer to the *DMS-100 Operational Measurements Reference Manual*, 297-8001-814 (NA) or 297-9051-814 (EMEA) for information about the available operational measurement groups.

MAP performance procedures

The MAP is the call processing application interface.

Begin monitoring performance of the call processing application before monitoring the platform performance.

3

CAPACITY

The CAPACITY level provides call processing statistics. Levels PARMS and SCHEDMAP are available from the CAPACITY level. These levels provide office parameter information and scheduler information.

CAPACITY level

Access the CAPACITY level from the CI level:

CI:>
>MAPCI;MTC;CAPACITY

```
             IOD                 CCS    Lns    Trks          APPL
              .                   .      .       .             .

CAPACITY
 0 Quit     CATMP/HR UTIL ENGCATMP ENGLEVEL SYNC CCOVRLD IDLE
 2 Parms     103320    --     --     BELOW  YES    OFF   YES
 3 SchedMap
 4
 5
 6
 7
 8
 9
10
11
12
13
14
15
16
17
18
  USERNAME
Time  10:29  >
```

Note: Fields UTIL and ENGCATMP do not display a value if CPU UTIL is below 15% or if field SYNC is "NO."

The following performance statistics are available.

Measurement	Unit	Description
CATMP/HR	Number	Call attempts per hour.
UTIL	Number	If the call processing application is synchronized, then this field represents: $$UTIL = \frac{(callp\ occ + IO\ occ + SYS\ occ)}{(eng\_cp\_time + eng\_io\_time + eng\_sys)}$$ ***Note 1:*** Processor occupancy is abbreviated to "occ" in the above calculations. Variables eng_cp_time, eng_io_time, and eng_sys are equal to the expected CPU occupancy of each class at capacity. For example, eng_sys is the amount of CPU time the SYS class is expected to require at capacity. The Call processing (callp) class processes calls, the IO class sends and receives messages, and the SYS class is used mostly to maintain synchronization of the call processing application between the two Call Agents. ***Note 2:*** The sum of eng_cp_time, eng_io_time, and eng_sys is equal to the engineering point, 70%.
ENGCATMP	Number	This field is equal to CATMP/HR divided by UTIL.
ENGLEVEL	String	This field indicates if the current CATMP/HR are BELOW or ABOVE the calculated value for ENGCATMP.
CCOVRLD	ON/OFF	Status of Central Control Overload controls in the last minute.

The call attempts data is obtained from registers in the OFZ operational measurement (OM) group. The following table provides additional information on the specific registers used from OFZ.

OM registers in OM group OFZ used to determine Call Rate

OM Field	Description
NIN	Number of incoming calls
NIN2	Extension register for NIN
NORIG	Number of originating calls
NORIG2	Extension register for NORIG

PARMS level

Access the PARMS level from the CAPACITY level.

>PARMS

```
              IOD                  CCS     Lns     Trks          APPL
               .                    .       .       .             .

CAPACITY
  0 Quit      CATMP/HR UTIL ENGCATMP ENGLEVEL SYNC CCOVRLD IDLE
  2 Parms        103320    --        --     BELOW  YES    OFF  YES
  3 SchedMap
  4            Parms
  5            Guaranteed_Terminal_CPU_Share = 0%
  6            AUXCP_CPU_Share                = 1%
  7            CC_Englevel_Warning_Threshold = 77%
  8            NETM share setting             = 0%
  9            DNC share setting              = 3%
 10            SNIP share setting             = 1%
 11            1% CPU allocation              = -- CATMP/HR
 12
 13
 14
 15
 16
 17
 18
   USERNAME
Time  10:42  >
```

- **GUARANTEED_TERMINAL_CPU_SHARE**

  Displays the current setting for this office parameter in table OFCENG (Office Engineering). This value determines the expected occupancy for GTERM at capacity and determines the ratio shown in the GTERM field on the SCHEDMAP level.

- **AUXCP_CPU_SHARE**

  Displays the current setting for this office parameter in table OFCENG. This value determines the expected occupancy for AUXCP at capacity and determines the ratio shown in the AUXCP field on the SCHEDMAP level.

- **CC_ENGLEVEL_WARNING_THRESHOLD**

  Displays the current setting for this office parameter in table OFCENG (default value of 100). This value triggers the display for the ENGLEVEL field at the Capacity MAP level and uses the value ABOVE or BELOW.

- **NETM Share setting**

  Time allocated to NETMTC class. This value determines the expected occupancy for NETM at capacity and determines the ratio shown in the NETM field on the SCHEDMAP level.

- **DNC Share setting**

  Time allocated to NOSFT class. This value determines the expected occupancy for NOSFT at capacity and determines the ratio shown in the DNC field on the SCHEDMAP level.

- **SNIP Share setting**

  Time allocated to SNIP class. This value determines the expected occupancy for SNIP at capacity and determines the ratio shown in the SNIP field on the SCHEDMAP level.

- **1% CPU Allocation**

  The 1% CPU Allocation measurement is no longer supported.

SCHEDMAP level

This level provides information about the scheduler system.

Office parameters AUXCP and GTERM settings can be changed in table OFCENG. Changing these parameters alters the amount of time that is available for call processing and changes the reported call capacity utilization.

```
              IOD                  CCS     Lns     Trks            APPL
              .                     .       .        .               .
 SchedMap
  0 Quit    CATMP/HR   UTIL ENGCATMP ENGLEVEL SYNC CCOVRLD IDLE
  2 Parms    103800      --       --     BELOW  YES     OFF  YES
  3
  4         SCHED   FORE MAINT    DNC AUXCP    OM GTERM  BKG NETM SNIP
  5           367   3163    11      0     5    58     0  169    0   32
  6
  7
  8         SCHEDMAP:
  9
 10
 11
 12
 13
 14
 15
 16
 17
 18
   USERNAME
 Time  11:02  >
```

The following table describes the fields for the SCHEDMAP level.

Measurement	Unit	Description
SCHED	Percent	Observed scheduler overhead utilization relative to the expected overhead occupancy at capacity (Expected occupancy or OCCexp = 8%).
FORE	Percent	Observed operating system utilization relative to the expected occupancy at capacity. Foreground includes SYSTEMCLASS, SYSTOOLCLASS, INITCLASS (OCCexp = 1%).
MAINT	Percent	Observed MAINTCLASS utilization relative to the expected occupancy at capacity (OCCalloc = 8%).
DNC	Percent	Observed NOSFTCLASS utilization relative to the expected occupancy allocated at capacity. DNC includes NOSFT class (OCCalloc = 3%).
AUXCP	Percent	Observed AUXCPCLASS utilization relative to the expected occupancy at capacity. This value can be altered via the office parm AUXCP_CPU_SHARE (OCCalloc = 1% to 25%).
OM	Percent	Observed OM utilization relative to the expected occupancy at capacity. OM includes GOMCLASS and NGOMCLASS (OCCalloc = 3%).
GTERM	Percent	Observed GTERMCLASS utilization relative to the expected occupancy at capacity. This value can be altered via the office parm GUARANTEED_TERMINAL_CPU_SHARE (OCCalloc = 2% to 16%).
BKG	Percent	Observed background classes utilization relative to the expected occupancy at capacity. Background includes BKGCLASS and AUDITCLASS (OCCalloc = 3%).
NETM	Percent	Observed NETMTCCLASS utilization relative to the expected occupancy allocated at capacity (OCCalloc = 0%).
SNIP	Percent	Observed SNIPCLASS utilization relative to the expected occupancy at capacity (OCCalloc = 1%).

Call Agent Mgr performance procedures

The Call Agent Manager provides performance statistics for the Call Agent hardware and software platform. This information includes statistics like memory and processor usage. Call processing statistics are not reported to the Call Agent Manager. Call processing statistics are available at the MAP.

Retrieve processor load

The Call Agent uses the number of processes in a runnable state to indicate the processor load.

At the Call Agent Manager

1   Enter the CoreMtc level.

   CoreMtc

2   Enter the Sys level.

   Sys

3   Enter the QryCPU command.

   QryCPU

```
CallAgent       SYS      CON      APPL              Unit: 0
   .            .        .        .

Sys                     Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit      Unit0  Inact  no    . Inact . Act    .     . insync .
 2 QryCPU    Unit1  Act    no    . Inact . Act    .     . insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd     CPU report retrieved on Tue Jul  2 11:54:23 2003:
 8 QryNTP
 9 QryCpUtl       1 min Load Avg: 0.25
10                5 min Load Avg: 0.17
11               15 min Load Avg: 0.08
12
13 LogQuery   Number of Processes: 50
14 Alarm
15 QueryIP      Alarm Description: 1 minute load average
16               Minor threshold: 10.00
17 Help          Major threshold: 20.00
18 Refresh    Critical threshold: 40.00
  mtc
Time  11:54  >
```

4   This procedure is complete.

Retrieve disk usage

The Call Agent implements a filesystem in RAM (RAMDISK) for platform applications. Use this procedure to determine statistics for this RAMDISK.

At the Call Agent Manager

1   Enter the CoreMtc level.

    CoreMtc

2   Enter the Sys level.

    Sys

3   Enter the QryDsk command.

    QryDsk

```
CallAgent      SYS       CON      APPL              Unit: 0
    .           .         .         .

Sys                     Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit      Unit0  Inact  no    . Inact . Act    .     .   insync .
 2 QryCPU    Unit1  Act    no    . Inact . Act    .     .   insync .
 3 QryDsk
 4 QryMem    Disk report retrieved on Tue Jul  2 11:57:02 2005:
 5 QryZmb
 6 QryNFS        Total Disk Size:   30.40 MB
 7 QryLd         Free Root Disk:    12.34 MB (41%)
 8 QryNTP        Free User Disk:    10.77 MB (35%)
 9 QryCpUtl
10             Total File Nodes:    8064 blocks
11              Free File Nodes:    6320 blocks (78%)
12                   Block Size:       1 KB
13 LogQuery  Max Filename Length:     255
14 Alarm
15 QueryIP    Alarm Description: Percentage root free disk space
16              Minor threshold: 15
17 Help        Major threshold: 10
18 Refresh  Critical threshold: 5
  mtc
Time  12:02  >
```

4   This procedure is complete.

Retrieve memory usage

Use this command to determine the amount of platform RAM available and the amount used.

At the Call Agent Manager

1 Enter the CoreMtc level.

CoreMtc

2 Enter the Sys level.

Sys

3 Enter the QryMem command.

QryMem

```
CallAgent        SYS       CON       APPL              Unit: 0
    .            .         .          .

Sys                        Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit     Unit0  Inact   no    . Inact . Act     .      . insync .
 2 QryCPU   Unit1  Act     no    . Inact . Act     .      . insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS   Memory report retrieved on Tue Jul  2 08:33:34 2005:
 7 QryLd
 8 QryNTP        Total Memory:     961 MB
 9 QryCpUtl       Free Memory:      92 MB (10%)
10              Cached Memory:     240 MB (25%)
11              Shared Memory:      87 MB ( 9%)
12              Buffer Memory:      31 MB ( 3%)
13 LogQuery
14 Alarm
15 QueryIP    Alarm Description: % avail (free+cached+buffer-reserved)
16               Minor threshold: 20
17 Help        Major threshold: 15
18 Refresh   Critical threshold: 10
  mtc
Time  08:33  >
```

4 This procedure is complete.

Retrieve zombie process statistics

Use this command to query information about the number of zombie processes running on the Call Agent card.

At the Call Agent Manager

1   Enter the CoreMtc level.

CoreMtc

2   Enter the Sys level.

Sys

3   Enter the QryZmb command.

QryZmb

```
CallAgent      SYS      CON      APPL            Unit: 0
   .            .        .        .

Sys                        Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit     Unit0  Inact  no    . Inact . Act     .     .  insync .
 2 QryCPU   Unit1  Act    no    . Inact . Act     .     .  insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd
 8 QryNTP
 9 QryCpUtl
10
11             Zombie process report retrieved on Fri Nov  2 12:23:46 2005:
12
13 LogQuery   Number of Zombie Processes: 0
14 Alarm
15 QueryIP     Alarm Description: Number of zombie processes
16               Minor threshold: 5
17 Help         Major threshold: 10
18 Refresh   Critical threshold: 15
  mtc
Time  12:24  >
```

4   This procedure is complete.

Retrieve NFS mount points

Nonvolatile storage for the Call Agent is provided by the STORage Management (STORM) unit. The Call Agent accesses this storage through the STORM unit. Each STORM controls and accesses mount points.

Use this procedure to determine the number of mount points and the number of accessible mount points.

At the Call Agent Manager

1   Enter the CoreMtc level.

      CoreMtc

2   Enter the Sys level.

      Sys

3   Enter the QryNFS command.

      QryNFS

```
CallAgent       SYS       CON       APPL              Unit: 0
     .           .         .          .

Sys                         Jam:   Link0:   Link1:  BLnk  FC: Appl:
 0 Quit       Unit0  Act    no     . Act    . Inact  .    .   insync .
 2 QryCPU     Unit1  Inact  no     . Act    . Inact  .    .   insync .
 3 QryDsk
 4 QryMem     NFS mount report retrieved on Tue Jul  2 12:23:08 2005:
 5 QryZmb
 6 QryNFS       Number of accessible mounts: 6 / 6
 7 QryLd
 8 QryNTP       Local Name                                  Accessible
 9 QryCpUtl     /TAPE                                            Y
10              /TAPE1                                           Y
11              /3PC/sd00                                        Y
12              /3PC/sd01                                        Y
13 LogQuery     /var/log                                         Y
14 Alarm        /var/log_mate                                    Y
15 QueryIP
16              Alarm Description: Number of accessible mounts
17 Help           Minor threshold: 5
18 Refresh        Major threshold: 3
  mtc             Critical threshold: 2
Time  12:37  >
```

    4   This procedure is complete.

Additional information

The Minor threshold is always one less than the number of mount points.

Retrieve software versions

Use this command to determine the platform operating system and platform application versions.

At the Call Agent Manager

1   Enter the CoreMtc level.

      CoreMtc

2   Enter the Sys level.

      Sys

3   Enter the QryLd command.

      QryLd

```
CallAgent       SYS        CON       APPL              Unit: 0
   .            .          .          .

Sys                        Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit      Unit0  Inact  no    . Inact . Act     .     .  insync .
 2 QryCPU    Unit1  Act    no    . Inact . Act     .     .  insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd
 8 QryNTP
 9 QryCpUtl
10
11
12
13 LogQuery  System load report retrieved on Thu Aug 19 08:51:56 2004:
14 Alarm
15 QueryIP      Ramdisk: ncgl_cca_image_5.33.1.0
16              Linux: 2.4.22-ncgl-010363 #2 Tue Aug 17 14:28:26 EDT 2004
17 Help            Peel: 6.4.63
18 Refresh   Maintenance: 5.0.63
   mtc
Time  08:53  >
```

4   This procedure is complete.

Retrieve Network Time Protocol information

Use this command to query the number of Network Time Protocol (NTP) servers accessible by the Call Agent and any time offset from the time servers. NTP servers are provisioned at the CS 2000 SAM21 Manager client.

At the Call Agent Manager

1   Enter the CoreMtc level.

   CoreMtc

2   Enter the Sys level.

   Sys

3   Enter the QryNTP command.

   QryNTP

```
CallAgent      SYS        CON        APPL              Unit: 0
   .           .          .          .

Sys                        Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit      Unit0  Inact  no   . Inact . Act    .     .   insync .
 2 QryCPU    Unit1  Act    no   . Inact . Act    .     .   insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd
 8 QryNTP
 9 QryCpUtl
10
11
12
13 LogQuery  NTP report retrieved on Tue Jul  2 13:01:21 2003:
14 Alarm
15 QueryIP     Total number of time servers: 2
16             Number of accessible servers: 2
17 Help      Number of synchronized servers: 2
18 Refresh   Time Offset from server 10.40.24.251: 0(ms)
   mtc
Time   13:02  >
```

4   This procedure is complete.

Retrieve CPU utilization

Use this procedure to measure CPU utilization. This metric is a more accurate measure of system load than **QryCPU**.

At the Call Agent Manager

1   Enter the CoreMtc level.

CoreMtc

2   Enter the Sys level.

Sys

3   Enter the QryCpUtl command.

QryCpUtl

```
CallAgent       SYS       CON       APPL              Unit: 0
    .           .         .         .

Sys                      Jam:  Link0:  Link1:  BLnk: FC: Appl:
 0 Quit      Unit0  Inact  no    . Inact . Act    .    .  insync .
 2 QryCPU    Unit1  Act    no    . Inact . Act    .    .  insync .
 3 QryDsk
 4 QryMem
 5 QryZmb
 6 QryNFS
 7 QryLd
 8 QryNTP
 9 QryCpUtl
10            CPU Utilization report retrieved on Mon Mar  3  8:54:52 2003:
11
12              5 min Util Avg: 53.08
13 LogQuery    20 min Util Avg: 52.83
14 Alarm       30 min Util Avg: 52.78
15 QueryIP    Alarm Description: cpu utilization average
16             Minor threshold: over 95.00% for 5 minutes
17 Help        Major threshold: over 99.00% for 20 minutes
18 Refresh  Critical threshold: over 99.00% for 30 minutes
  mtc
Time   8:55  >
```

4   This procedure is complete.

Message controller

When the CS 2000 - Compact is deployed in a Time Division Multiplex (TDM) network, a pair of Message Controller cards are installed in the SAM21 shelf. These cards work between the Call Agent cards and the Message Switch (MS).

Performance management for the Message Controller cards is completed through the Call Agent Manager.

MCMtc level of the Call Agent Manager

```
  CallAgent       SYS       CON       APPL      MC      Unit: 0
    .             .         .         .         .

MCMtc            Blade:  Eth0:     Eth1:      Atm0:     Atm1:
 0 Quit      MC0   .      . Act    . Inact    open      open
 2           MC1   .      . Act    . Inact    open      open
 3
 4
 5 QryLd
 6 QryHits
 7 ClrHits
 8 Trnsl
 9
10
11
12
13 LogQuery
14 Alarm
15          QryHits:  Display link hit rate on an MC blade.
16                    Parms: [MCBladeNum][MCLinkNum]
17 Help               MCBladeNum   -  0 or 1
18 Refresh            MCLinkNum    -  0 or 1
  mtc
Time  13:42  >
```

Retrieve ATM link performance

Use this procedure to query the performance statistics for an ATM link between the Message Controller card and the Message Switch (MS). The statistics are generated and recorded by the ATM PMC interface and made available to the operating system. The **QryHits** command initiates the operating system to refresh the data.

At the Call Agent Manager

1   Enter the MCMtc level.

   MCMtc

2   Use the QryHits command to view the statistics.

   QryHits <mc_no> <lnk_no>

   Example
   QryHits 0 0

Statistics for the link are displayed to the screen.

```
  CallAgent       SYS       CON       APPL      MC      Unit: 0
     .             .         .         .         .

MCMtc            Blade:   Eth0:     Eth1:     Atm0:     Atm1:
  0 Quit      MC0   .      . Act     . Inact   open      open
  2           MC1   .      . Act     . Inact   open      open
  3
  4
  5 QryLd
  6 QryHits
  7 ClrHits
  8 Trnsl     Hit Count report retrieved on Mon Mar 24 14:05:06 2003:
  9
 10               SBIP       = 430
 11               LBIP       = 940
 12               PBIP       = 372
 13 LogQuery     LFEBE      = 2920
 14 Alarm        PFEBE      = 1464
 15               CORR HCS   = 7
 16               UNCORR HCS = 52
 17 Help         TX CELLS   = 2147483647
 18 Refresh      RX CELLS   = 87199426
   mtc
Time  14:05  >
```

3   Repeat the query for the other three ATM links and use the information in <u>Additional information</u> to assess the status of the links.

4   This procedure is complete.

Additional information

Review the abbreviations.

SBIP, LBIP, PBIP
These values indicate the section, line, and path bit interleave parity (BIP) errors for the link.

LFEBE, PFEBE
These values indicate the line and path far end bit errors for the link.

CORR HCS, UNCORR HCS
These values indicate the number of cells with correctable and uncorrectable higher order connection supervision for the link.

RX CELLS, TX CELLS
These values indicate the number cells received and sent over the link.

If the error values appear, check recent log reports to determine if a Message Controller card was removed from service, CCA340 and SM21500, or if the Message Switch entered a trouble condition, MS log reports. Use the **ClrHits** command to zero the counters and monitor the link performance.

The TX CELLS value increases at the constant ATM cell rate of 365 566 cells per second. This value does not indicate the number of cells that carried data only, it is the total number of cells transmitted. At this cell rate, the TX CELLS counter reaches its maximum limit of 2 147 483 647 in 96 minutes.

The RX CELLS value reaches its maximum limit of 2 147 483 647 in approximately 42 hours.

Clear ATM performance counters

Use this procedure to zero the ATM link performance counters.

At the Call Agent Manager

1 Enter the MCMtc level.

MCMtc

2 Use the ClrHits command to zero the statistics.

ClrHits <mc_no> <lnk_no>

Example
ClrHits 0 0

Statistics for the link are displayed to the screen.

```
  CallAgent       SYS       CON       APPL       MC       Unit: 0
     .             .         .         .          .

MCMtc             Blade:   Eth0:     Eth1:       Atm0:     Atm1:
 0 Quit    MC0     .       . Act     . Inact     open      open
 2         MC1     .       . Act     . Inact     open      open
 3
 4
 5 QryLd
 6 QryHits
 7 ClrHits
 8 Trnsl
 9
10
11
12
13 LogQuery
14 Alarm
15
16
17 Help
18 Refresh    Request passed.
   mtc
Time   14:05  > 7 0 0
```

3 If preferred, clear the hits for the other link on the Message Controller.

Example
> 7 0 1

4 This procedure is complete.