



Nortel Networks Multiservice Switch

7400/15000/20000

# Data Management

NN10600-561



---

Nortel Networks Multiservice Switch 7400/15000/20000

# Data Management

---

Publication: NN10600-561

Document status: Standard

Document version: 6.1S1

Document date: August 2004

---

Copyright © 2004 Nortel Networks.  
All Rights Reserved.

Printed in Canada

NORTEL, NORTEL NETWORKS, the globemark design, the NORTEL NETWORKS corporate logo, and PASSPORT are trademarks of Nortel Networks.  
UNIX is a trademark licensed exclusively through X/Open Company Ltd.

---



## Publication history

---

### August 2004

6.1S1 Standard

General availability. Contains information on Nortel Networks Multiservice Switch 7400, 15000, and 20000 for the PCR6.1 release.



---

# Contents

---

<b>About this document</b>	<b>11</b>
Who should read this document and why	11
What you need to know	12
How this document is organized	12
What's new in this document	13
Log file access configuration	13
Text conventions	14
Procedure conventions	14
Operational mode	15
Provisioning mode	15
Activating configuration changes	16
Related documents	17
How to get more help	18
<hr/>	
<b>Chapter 1</b>	
<b>Configuring the data collection system</b>	<b>19</b>
Data collection system configuration task flow	19
Configuring the agent queue sizes for each LP and each datatype	22
Turning collector spooling on or off for each datatype	26
Configuring the maximum number of closed spooling files for each datatype	29
Configuring the number of days to retain a spooled file for the log datatype	32
Configuring the active alarm list	35

## **Chapter 2**

### **Troubleshooting a node using the data collection system 39**

- Troubleshooting a node using the data collection system task flow 39
  - Verifying that spooling is activated 41
    - Prerequisites 41
  - Obtaining real-time statistics data 42
  - Creating a new spooling file 44
  - Stopping spooling 46
- 

## **Chapter 3**

### **Understanding statistics collection 49**

- Statistics 49
    - Collection process 51
    - Collection times 54
  - Real-time statistics 54
    - Collection process 56
    - Collection times 57
  - Collected statistics and real-time statistics records 58
  - Spooled statistics records 59
- 

## **Chapter 4**

### **Understanding Multiservice Switch data collection systems 61**

- Agent queue sizes 62
  - Spooled data files 62
    - Location of spooling files 63
    - File name format 63
    - Timestamps 64
    - Open and closed spooling files 64
    - Maximum spooling file sizes 65
    - Maximum number of closed spooling files 65
    - Removing spooled data files 66
  - Active alarm list 67
  - Types of data 69
    - Accounting data 69
-

- Statistics data 69
- Real-time statistics data 70
- Alarm data 70
- State change notification data 71
- Log data 71
- Debug data 71
- Trap data 71

## List of figures

- Figure 1 Data collection system configuration task flow 20
- Figure 2 Configuring the agent queue sizes for each LP and each datatype component hierarchy 25
- Figure 3 Turning collector spooling on or off for each datatype component hierarchy 28
- Figure 4 Configuring the maximum number of closed spooling files for each datatype component hierarchy 31
- Figure 5 Configuring the number of days to retain a spooled file for the log datatype 34
- Figure 6 Configuring the active alarm list component hierarchy 37
- Figure 7 Troubleshooting the node using the data collection system task flow 40
- Figure 8 Obtaining real-time statistics data component hierarchy 43
- Figure 9 Creating a new spooling file component hierarchy 45
- Figure 10 Stopping spooling component hierarchy 47
- Figure 11 Statistics collection components and attributes 51
- Figure 12 Network statistics flow 53
- Figure 13 Collection times of statistics 54
- Figure 14 Real-time statistics collection components and attributes 56
- Figure 15 Network real-time statistics flow 57
- Figure 16 Collection times of real-time statistics 58
- Figure 17 AAList architecture 68

## About this document

---

This document provides conceptual and procedural information about Nortel Networks Multiservice Switch data collection system.

The following topics are discussed in this section:

- “Who should read this document and why” (page 11)
- “What you need to know” (page 12)
- “How this document is organized” (page 12)
- “What’s new in this document” (page 13)
- “Text conventions” (page 14)
- “Procedure conventions” (page 14)
- “Related documents” (page 17)
- “How to get more help” (page 18)

### Who should read this document and why

This guide is for anyone who performs the following tasks for data collection from the Nortel Networks Multiservice Switch system:

- planning
- installing and provisioning
- operating and maintaining

## What you need to know

This guide assumes that you understand the architecture and operation of Nortel Networks Multiservice Switch networks and products. You also require basic UNIX knowledge.

You can acquire Multiservice Switch product knowledge by reading NN10600-030 *Nortel Networks Multiservice Switch 7400/15000/20000 Overview*.

Before you operate and maintain Multiservice Switch networks, make sure you understand the following:

- Multiservice Switch concepts
  - hardware and software
  - installation, commissioning, and provisioning
  - Multiservice Switch node-to-Multiservice Switch node interworking
  - Multiservice Switch node-to-DPN-100 module interworking (applicable to Multiservice Switch 7400 series only)
- UNIX
  - UNIX workstations
  - UNIX operating system, its facilities, and commands
- standard network operations and maintenance activities
- Preside Multiservice Data Manager workstation concepts

## How this document is organized

This document contains the following sections:

- “Understanding Multiservice Switch data collection systems” (page 61)

This section contains conceptual information about Nortel Networks Multiservice Switch data collection systems, including information about agents, collectors, and spoolers.

- “Understanding statistics collection” (page 49)  
This section describes Multiservice Switch statistics, including information on the statistics collection process and statistics collection times.
- “Configuring the data collection system” (page 19)  
This section contains procedural information on how to configure a Multiservice Switch data collection system.

## What’s new in this document

The following feature was added to this document:

- “Log file access configuration” (page 13)

Other changes made to this document include the following:

- The terms Passport and PVG have been rebranded in conjunction with the new Nortel Networks’ brand simplified naming format. Passport is now referred to as the Nortel Networks Multiservice Switch, and PVG is now Media Gateway 7480/15000. For more information on the product rebranding, refer to NN10600-000 *Nortel Networks Multiservice Switch 7400/15000/20000 What’s New in PCR6.1*.

## Log file access configuration

The following sections were updated for this feature.

- “Configuring the number of days to retain a spooled file for the log datatype” (page 32)
- “Stopping spooling” (page 46)
- “Spooled data files” (page 62)
- “Maximum number of closed spooling files” (page 65)

## Text conventions

This document uses the following text conventions:

- `nonproportional spaced plain type`

Nonproportional spaced plain type represents system generated text or text that appears on your screen.

- **nonproportional spaced bold type**

Nonproportional spaced bold type represents words that you should type or that you should select on the screen.

- *italics*

Statements that appear in italics in a procedure explain the results of a particular step and appear immediately following the step.

Words that appear in italics in text are for naming.

- `[optional_parameter]`

Words in square brackets represent optional parameters. The command can be entered with or without the words in the square brackets.

- `<general_term>`

Words in angle brackets represent variables which are to be replaced with specific values.

## Procedure conventions

This document uses the following procedure conventions:

- You can enter commands using full component and attribute names, or you can abbreviate them. The commands used in the procedures contain the full component and attribute names in the first instance. In the second instance, the component and attribute names are abbreviated. For more information on abbreviating component and attribute names, see NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference*. All component and attribute names are formatted in italics.

- The introduction of every procedure states whether you must perform the procedure in operational mode or provisioning mode. For more information on these modes, see “Operational mode” (page 15) or “Provisioning mode” (page 15).
- When you complete a procedure, you can verify your changes and activate them as the new node configuration. For more information on completing configuration changes and exiting provisioning mode, see “Activating configuration changes” (page 16).

## Operational mode

Procedures contained within this document can either be performed in operational mode or provisioning mode. When you initially log into a Nortel Networks Multiservice Switch node, you are in operational mode. Multiservice Switch nodes use the following command prompt when in operational mode:

```
#>
```

where:

# is the current command number.

In operational mode, you work with operational components and attributes. In operational mode, you can do the following:

- list operational components and display operational attributes to determine the current operating parameters for the node
- control the state of parts of the node by locking and unlocking components
- set certain operational attributes and enter commands to perform diagnostic tests

## Provisioning mode

To change from operational mode to provisioning mode, type the following command at the operator prompt:

```
start Prov
```

Only one user can be in provisioning mode at a time. Nortel Networks Multiservice Switch nodes use the following command prompt when in provisioning mode:

```
PROV #>
```

where:

# is the current command number.

In provisioning mode, you work with the provisionable components and attributes that contain the current and future configurations of the node. You can add and delete components, and display and set provisionable attributes. For information on completing the configuration changes, exiting provisioning mode, and returning to operational mode, see “Activating configuration changes” (page 16).

For information on operational and provisionable attributes, see NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference*.

## Activating configuration changes

Several procedures in this document ask that you complete the configuration changes. When you complete the configuration changes, you are activating the configuration changes, confirming that you want to activate them, and saving the changes. You are instructed to complete the configuration changes only at the end of procedures that you perform in provisioning mode.



### CAUTION

#### Activating a provisioning view can affect service

Activating a provisioning view can result in a control processor (CP) reload or restart, causing all services on the Multiservice Switch node to fail. See NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference* for more information.

Use the following procedure to activate configuration changes:

- 1 Verify that the provisioning changes you have made are acceptable:

**check Prov**

Correct any errors and verify the provisioning changes again.

- 2 If you want to store the provisioning changes in a file, save the provisioning view:

```
save Prov
```

- 3 If you want these changes as well as other changes made in the edit view to take effect immediately, activate, confirm, and commit the provisioning changes:

```
activate Prov
```

```
confirm Prov
```

```
commit Prov
```

- 4 End the provisioning session:

```
end Prov
```

## Related documents

See the following documents for related information:

- NN10600-030 *Nortel Networks Multiservice Switch 7400/15000/20000 Overview*. This document provides conceptual information about Nortel Networks Multiservice Switch management system user interface.
- NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference*. This document describes the commands you use to operate and maintain Multiservice Switch systems.
- NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*. This document provides conceptual and procedural information about troubleshooting Multiservice Switch systems.
- NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*. This document provides conceptual and procedural information about configuring Multiservice Switch systems.
- NN10600-605 *Passport - MDM Network Security: Operations*. This document provides conceptual and procedural information about setting up and maintaining security for the Passport system.

- 241-6001-100 *Preside MDM Installation*. This document provides instructions on installing and configuring Nortel Networks Preside Multiservice Data Manager network management application.
- 241-6001-303 *Preside MDM Administrator Guide*. This document provides conceptual and procedural information about setting up and configuring network access for Preside Multiservice Data Manager.
- 241-6001-310 *Preside MDM Server Reference Guide*. This document provides reference information on the Preside Multiservice Data Manager servers.
- For information on last minute updates, see Nortel Networks Multiservice Switch Release Notes for this PCR release. You receive this document with each software release.
- *Nortel Networks Multiservice Switch Release Notes* provides performance specifications.

## How to get more help

For information on training, problem reporting, and technical support, see the “Nortel Networks support services” section in the product overview document.

# Chapter 1

## Configuring the data collection system

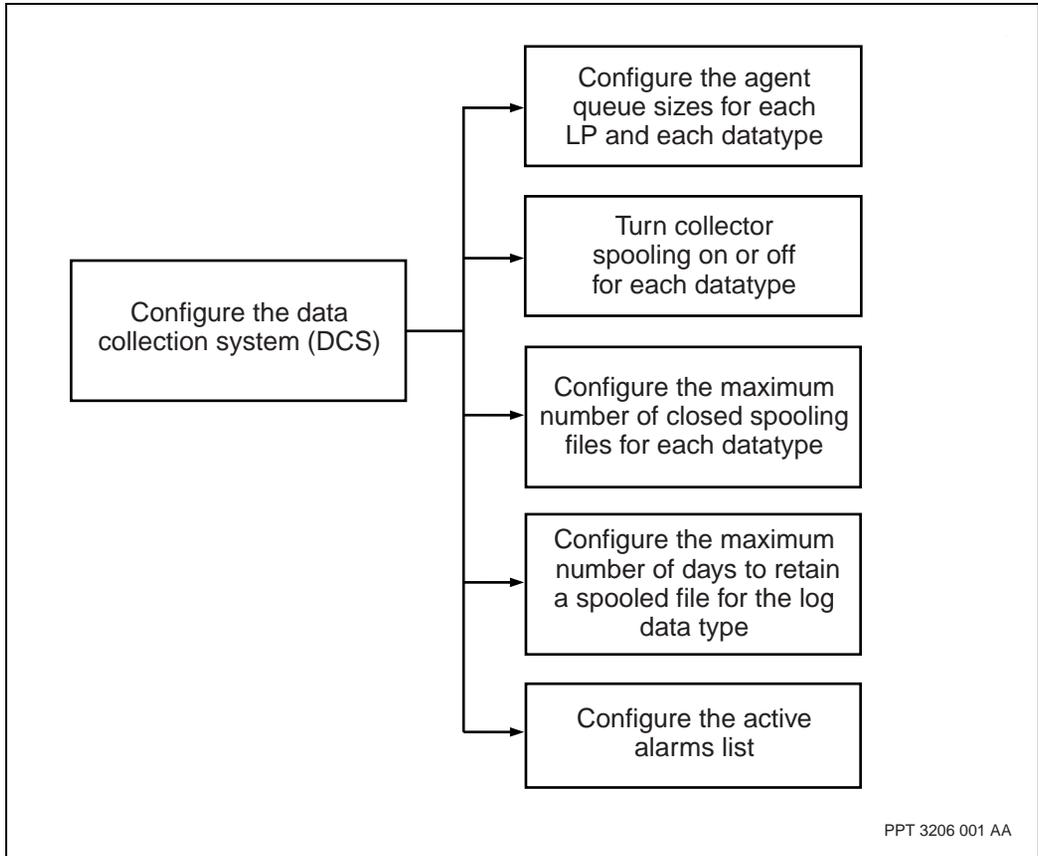
---

Configure the Nortel Networks Multiservice Switch data collection system (DCS) to collect data about node operation and to store that data on the file system for future analysis.

### **Data collection system configuration task flow**

This task flow shows you the sequence of procedures to perform in order to configure the data collection system. To link to any procedure, go to the list that follows the task flow.

**Figure 1**  
**Data collection system configuration task flow**



### Navigation links

- “Configuring the agent queue sizes for each LP and each datatype” (page 22)
- “Turning collector spooling on or off for each datatype” (page 26)
- “Configuring the maximum number of closed spooling files for each datatype” (page 29)
- “Configuring the number of days to retain a spooled file for the log datatype” (page 32)

**Note:** Configuring the number of days to retain a spooled file applies only to the log datatype.

- “Configuring the active alarm list” (page 35)

**Note:** After you set up DCS logs, SNMP logs will also be visible as part of the DCS log stream. For more information on logging SNMP set requests see NN10600-300 *Nortel Networks Multiservice Switch 7400/15000/20000 Operations: SNMP*.

## Configuring the agent queue sizes for each LP and each datatype

Change agent queue sizes at initial setup or when you identify new engineering requirements.

### Prerequisites

- For guidelines on determining appropriate values for agent queue sizes, see NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference*.
- To modify the agent queue size for the log datatype, you must have a command impact of system administration.



#### **CAUTION**

##### **Risk of operational data loss**

When its queue is full, the agent discards any additional operational data originating on the LP.

### Procedure steps

- 1 Add a component to override the agent queue size for each data type you want to reset:  

```
add Lp/<n> Eng DataStream/<datatype> Override
```
- 2 Set the maximum queue size for each data type:  

```
set Lp/<n> Eng Ds/<datatype> Ov agentQueueSize <size>
```
- 3 Verify that you correctly configured the queue sizes:  

```
display LogicalProcessor/<n> Engineering DataStream/*
```

## Variable definitions

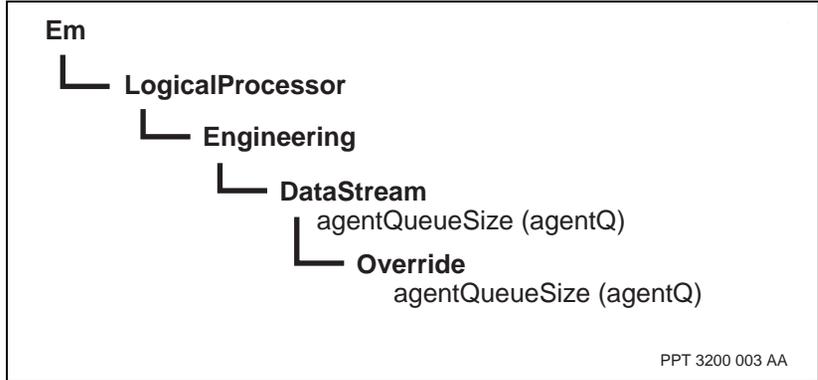
Variable	Value
<n>	The number of the LP.  Add a <i>DataStream/log</i> component only to <i>Lp/0</i> . <i>Lp/0</i> is the only LP that supports the <i>DataStream/log</i> component since only control processors generate log data.
(Sheet 1 of 2)	

Variable	Value
<p>&lt;datatype&gt;</p> <p>&lt;size&gt;</p>	<p>One of accounting, alarm, debug, log, rtstats, scn, stats, or trap</p> <p>The maximum number of records the queue can hold.</p> <p>Set the size to 0 (zero) if you want the agent to discard all data of this type. A setting of 0 (zero) does not prevent applications from generating the data. If possible, configure the application so that it does not generate this unrequired data.</p> <p><b>Note:</b> You cannot set the size to zero for the log datatype.</p> <p>If you want to collect a particular data type, do not set the queue size smaller than 20. Small queue sizes trigger queue threshold alarms more often than necessary.</p> <p>When using the 4pOC3ChSmIrr FP, the following override queue sizes should be used:</p> <ul style="list-style-type: none"> <li>• accounting: 0 for the FP</li> <li>• alarm: 1500 for the FP and 500 for the CP</li> <li>• scn: 1000 for the FP and 1500 for the CP</li> </ul> <p>The default agent queue sizes are as follows:</p> <ul style="list-style-type: none"> <li>• accounting: 10 000 records</li> <li>• alarm: 100 records</li> <li>• debug: 0 records</li> <li>• log: 50 records</li> <li>• rtstats: 0 records</li> <li>• scn: 200 records</li> <li>• stats: 0 records</li> <li>• trap: 50 records</li> </ul>
(Sheet 2 of 2)	

## Procedure job aid

Figure 2

Configuring the agent queue sizes for each LP and each datatype component hierarchy



## Turning collector spooling on or off for each datatype

Configure the spooling option to specify whether or not a data type spools to the file system.

### Prerequisites



#### CAUTION

##### Data can spool before NMIS session starts

If a spooler is set to on, data can begin spooling as soon as the control processor becomes active. If data that spools and appears in a user session (such as alarms) has already spooled before you log on, that data does not appear in your user session. For example, alarms that spool before you establish a user session are only spooled to disk and do not appear in your user session.

On rare occasions, Preside Multiservice Data Manager Active Alarms display does not clear after a node reload if the spooler, local operator, Telnet session, or SNMP agent logs in too quickly. Using the on-switch active alarm list feature will minimize, but not eliminate, these potential issues.



#### CAUTION

##### Risk of operational data loss

If a spooler containing data is set to off, the data currently held in the spooler queue is lost. Ensure that the spooler queue is empty before turning the spooler off.

### Procedure steps

- 1 Verify that the spooler queue is empty by displaying the spooler queue statistics:

```
display Collector/* Spooler Statistics
```

- 2 Turn the spooling option on or off:

```
set Col/<datatype> Sp spool <setting>
```

- 3 If the spooler is set to off and the collection type is either accounting or stats, then configure the agentQueueSize for this data type on each Lp as zero:

```
set Lp/<n> Eng Ds/<datatype> Ov agentQueueSize 0
```

- 4 Verify that you have correctly configured the spooling option:

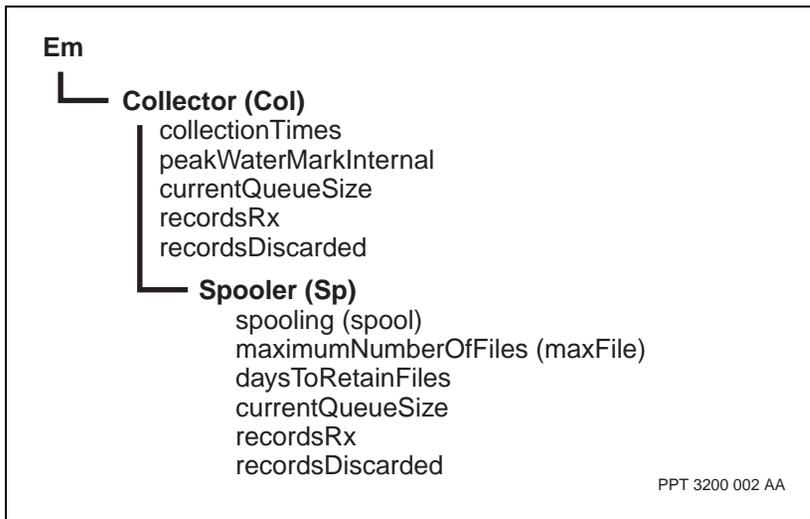
```
display Collector/<datatype>
```

## Variable definitions

Variable	Value
<datatype>	One of accounting, alarm, debug, log, scn, or stats.
<n>	is the number of the Lp.
<setting>	On or off.  If you want to spool the data type, use on. If you do not want to spool the data type, use off.  <b>Note:</b> You cannot turn off spooling for the log datatype.  The default settings for the spooling option are as follows: <ul style="list-style-type: none"> <li>• accounting: on</li> <li>• alarm: on</li> <li>• debug: off</li> <li>• log: on</li> <li>• rtstats: off</li> <li>• scn: on</li> <li>• stats: on</li> <li>• trap: off</li> </ul>

## Procedure job aid

**Figure 3**  
**Turning collector spooling on or off for each datatype component hierarchy**



## Configuring the maximum number of closed spooling files for each datatype

For each data type, you can set the maximum number of closed spooling files that Nortel Networks Multiservice Switch nodes store on their file systems.

### Prerequisites

- For guidelines on determining appropriate values for maximum closed spooler files, see *Nortel Networks Multiservice Switch Release Notes*.



#### CAUTION

##### Risk of data loss and service interruption

If you set the spooler to keep an unlimited number of files, the disk can fill up with data files. When the disk is full, data records are lost because the new data cannot be saved. When the active disk is full the node cannot support file system redundancy and cannot always perform necessary functions. If you use this setting, you must carefully monitor disk usage.

### Procedure steps

- 1 Display the current maximum file settings for all data types:  

```
display Col/* Sp maxFile
```
- 2 Specify the maximum number of files to be kept on disk for each data type:  

```
set Col/<datatype> Sp maxFile <number>
```
- 3 Verify the new maximum file settings:  

```
display Collector/* Spooler maxFile
```

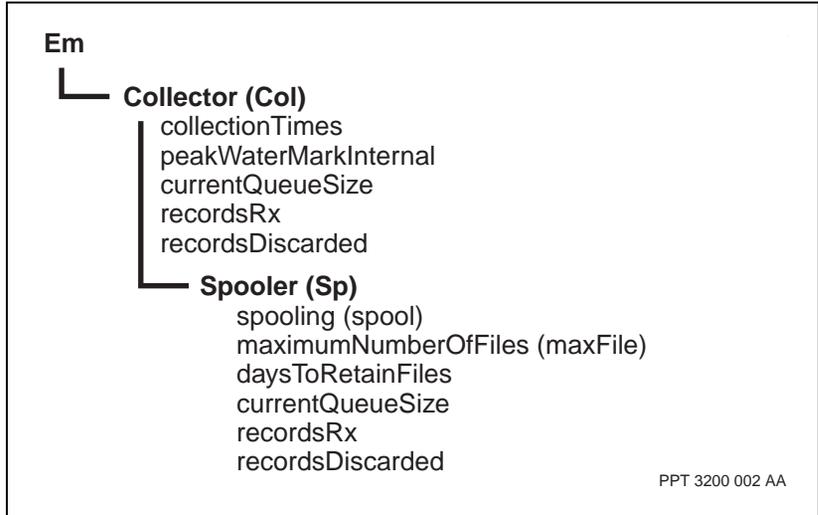
## Variable definitions

Variable	Value
<datatype>	One of accounting, alarm, debug, log, scn, or stats.
<number>	<p>The number of files to be kept on disk (any integer between 1 and 200).</p> <p>If you want to keep an unlimited number of files, enter 0 (zero). However, carefully monitor disk usage when using the unlimited setting.</p> <p><b>Note:</b> You cannot modify the maximum number of files for the log datatype.</p> <p>The default maximums are as follows:</p> <ul style="list-style-type: none"><li>• accounting: 200 files</li><li>• alarm: 20 files</li><li>• debug: 2 files</li><li>• log: 0 files</li><li>• scn: 10 files</li><li>• stats: 200 files</li></ul>

## Procedure job aid

Figure 4

Configuring the maximum number of closed spooling files for each datatype component hierarchy



## Configuring the number of days to retain a spooled file for the log datatype

For the log datatype, set the number of days to retain a spooled log file on the disk.

### Prerequisites

- Refer to *Nortel Networks Multiservice Switch Release Notes*, to determine the appropriate values for days to retain files.
- To modify the *daysToRetainFiles* attribute, you must have a command impact of system administration.

### Procedure steps

- 1 Display the current setting for the *daysToRetainFiles* attribute for the log datatype:

```
display Col/log Sp daysToRetainFiles
```

- 2 Set the value of the *daysToRetainFiles* attribute for the Col/log Spooler component:

```
set Col/log Sp daysToRetainFiles <number>
```

- 3 Verify the attribute setting:

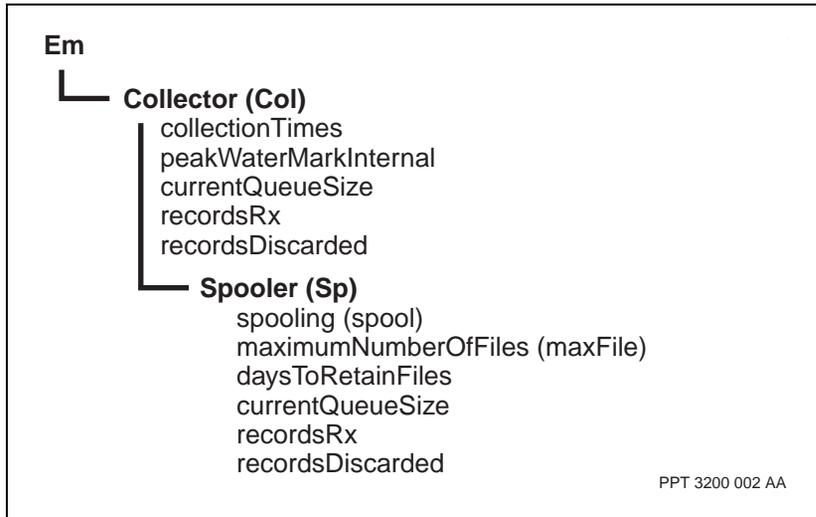
```
display Col/log Sp daysToRetainFiles
```

## Variable definitions

Variable	Value
<number>	<p>The number of days to retain spooled files for the log datatype.</p> <p>You cannot set the number to zero for the log datatype.</p> <p>The default values of this attribute are as follows:</p> <ul style="list-style-type: none"><li>• accounting: 0</li><li>• alarm: 0</li><li>• debug: 0</li><li>• log: 5</li><li>• scn: 0</li><li>• stats: 0</li></ul> <p><b>Note:</b> You cannot change the value of this attribute for accounting, stats, alarm, debug, scn and stats datatypes.</p>

## Procedure job aid

**Figure 5**  
**Configuring the number of days to retain a spooled file for the log datatype**



## Configuring the active alarm list

Configure the active alarm list (AAList) to enable a running list of all active alarms that have been raised, but not yet cleared.

### Prerequisites

- Guidelines for determining the appropriate value for the AAList maximum list size are available in *Nortel Networks Multiservice Switch Release Notes*.
- Ensure that the proper Preside Multiservice Data Manager server setup for utilization of Active Alarm lists has been completed. See 241-6001-310 *Preside MDM Server Reference Guide* for details.

### Procedure steps

- 1 Add the *activeAlarmList* feature directly to the feature list associated with the control processor (CP):

```
set sw logicalProcessorType/<y> fl activeAlarmList
```

The *activeAlarmList* feature is not maintained for the standby CP if the operator changes the *cpEquipmentProtection* attribute (under the *Shelf* component) from hot to cold before committing the view in which the *activeAlarmList* feature has been added.

- 2 Complete the configuration changes. See “Activating configuration changes” (page 16).
- 3 Optionally, you can override the automatically supplied default value for the *maxListSize* attribute of the *activeAlarmList* component on the LP:

```
add lp/<x> eng activeAlarmList
add lp/<x> eng activeAlarmList override
set lp/<x> eng activeAlarmList override maxListSize
<list_size>
```

**Note:** The default value assigned to the maximum size of the AAList is 100. To see the current size of the AAList, as well as other AAList statistics, display the attributes for the *activeAlarmList* component:

```
display lp/<x> eng activeAlarmList
```

- 4 Using step 1 to remove the AAList results in a shelf-wide outage. To disable the AAList without impacting service, you can disable the *activeAlarmList* component for each provisioned logical processor (LP):

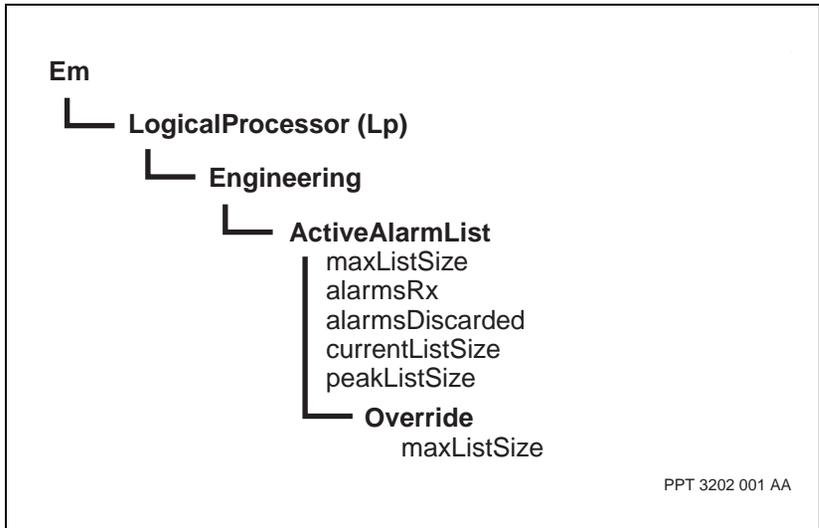
```
add lp/<x> eng activeAlarmList
add lp/<x> eng activeAlarmList override
set lp/<x> eng activeAlarmList override maxListSize
disabled
```

## Variable definitions

Variable	Value
<x>	The instance value of the logical processor (LP).
<y>	The instance value of the logical processor type.
<list_size>	The maximum size of the AAList on the LP. The possible values are: <ul style="list-style-type: none"><li>• any integer from 10 to 200</li><li>• disabled (this indicates that active alarms are not stored on this LP)</li><li>• autoConfigured (this automatically supplies a maximum list size which is equal to the value of the <i>maxListSize</i> attribute associated with the <i>activeAlarmList</i> component)</li><li>• unlimited (no list size limit is imposed)</li></ul>

## Procedure job aid

Figure 6  
Configuring the active alarm list component hierarchy





## **Chapter 2**

# **Troubleshooting a node using the data collection system**

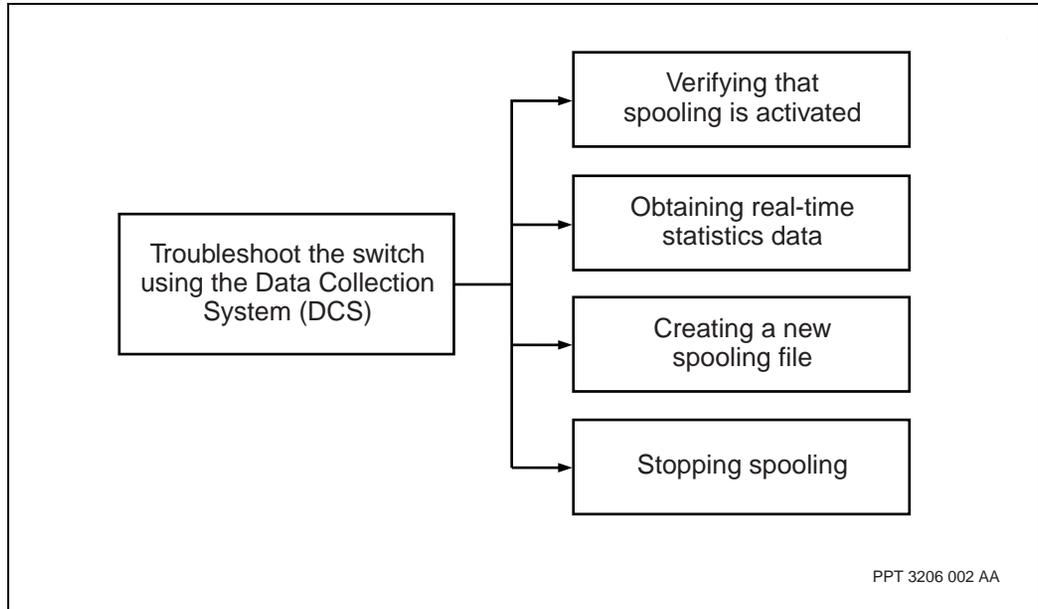
---

Use the data collection system (DCS) to troubleshoot the operation of Nortel Networks Multiservice Switch nodes.

### **Troubleshooting a node using the data collection system task flow**

This task flow shows the sequence of procedures to perform when using the data collection system to troubleshoot a node. To link to any procedure, go to the list that follows the task flow.

**Figure 7**  
**Troubleshooting the node using the data collection system task flow**



### Navigation links

- “Verifying that spooling is activated” (page 41)
- “Obtaining real-time statistics data” (page 42)
- “Creating a new spooling file” (page 44)
- “Stopping spooling” (page 46)

## Verifying that spooling is activated

Verify that spooling is activated to determine which types of data are being spooled to the disk.

### Prerequisites

- Perform this procedure in provisioning mode.

### Procedure steps

- 1 Display the spooling attribute to determine the types of data being spooled to the disk.

```
display collector/* spooler spooling
```

A value of "on" for each datatype indicates that spooling is activated for that type.

## Obtaining real-time statistics data

Use this procedure only when troubleshooting a node. Nortel Networks recommends that this procedure be performed by a GNPS representative.

### Prerequisites

- To perform this procedure, your user ID must have a minimum scope of device and a minimum impact of service.

### Procedure steps

- 1 Add an *Override* component to the LP:

```
add LogicalProcessor/<n> Engineering DataStream/  
rtstats Override
```

- 2 Set the maximum agent queue size for the LP:

```
set LogicalProcessor/<n> Engineering DataStream/  
rtstats Override agentQueueSize <size>
```

- 3 Verify your configuration of PMs collection:

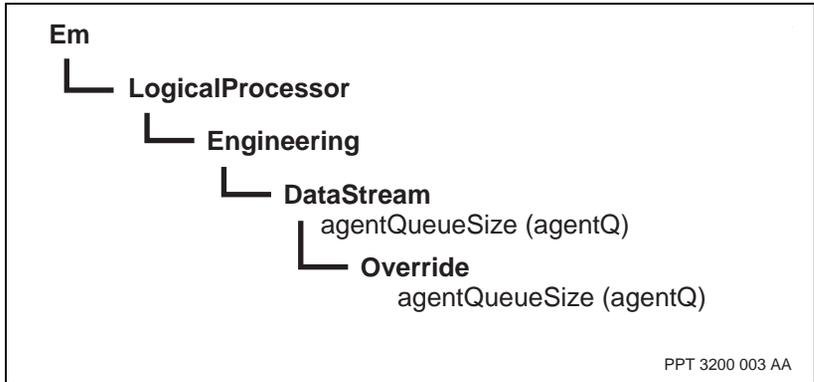
```
display LogicalProcessor/<n> Engineering DataStream/  
rtstats
```

### Variable definitions

Variable	Value
<n>	The number of the LP.
<size>	The maximum number of records in the queue.  Use a value between 20 and 200, depending on the number of applications configured on that LP to generate records. The typical setting is 100.

## Procedure job aid

**Figure 8**  
**Obtaining real-time statistics data component hierarchy**



## Creating a new spooling file

Create a new spooling file when you want to retrieve the latest set of data of a particular data type.

After the node creates a new spooling file, it closes the open spooling file. You can retrieve only closed spooling files. Once the spooling file is closed, you can retrieve the latest set of data for analysis.

### Procedure steps

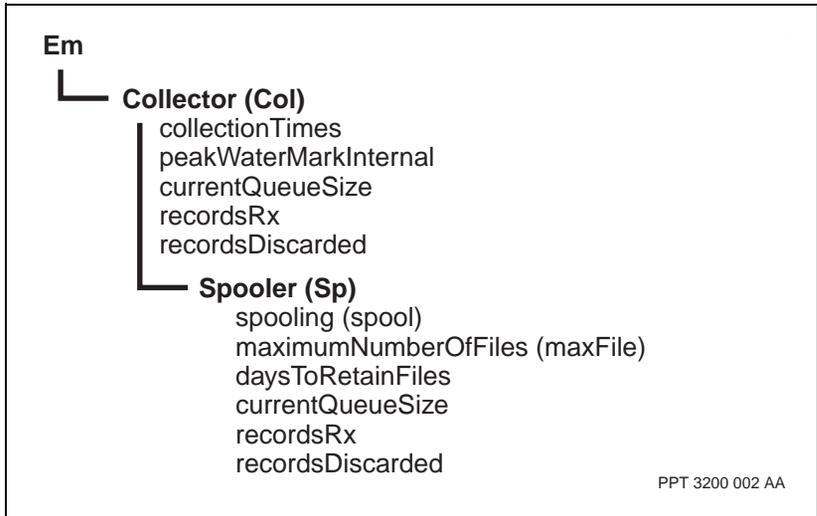
- 1 Create the new spooling file.  
`newfile Col/<datatype> sp`
- 2 Optionally, transfer closed files to another location for analysis using the Management Data Provider (MDP).

### Variable definitions

Variable	Value
<datatype>	One of accounting, alarm, debug, log, scn, or stats.

## Procedure job aid

**Figure 9**  
**Creating a new spooling file component hierarchy**



## Stopping spooling

Stop spooling data to a collector when you want to test a CP's disk or to aid in troubleshooting accounting records. You can stop spooling either temporarily (spooling will resume if the power goes off and back on again) or permanently (until you turn it back on).

### Prerequisites

- You must have a command impact of system administration to modify the agentQueueSize attribute for the log datatype.

### Procedure steps

- 1 To stop spooling temporarily, lock the spooler:

```
lock Col/<datatype> Spooler
```

- 2 To stop spooling permanently, set the agent queue size to 0:

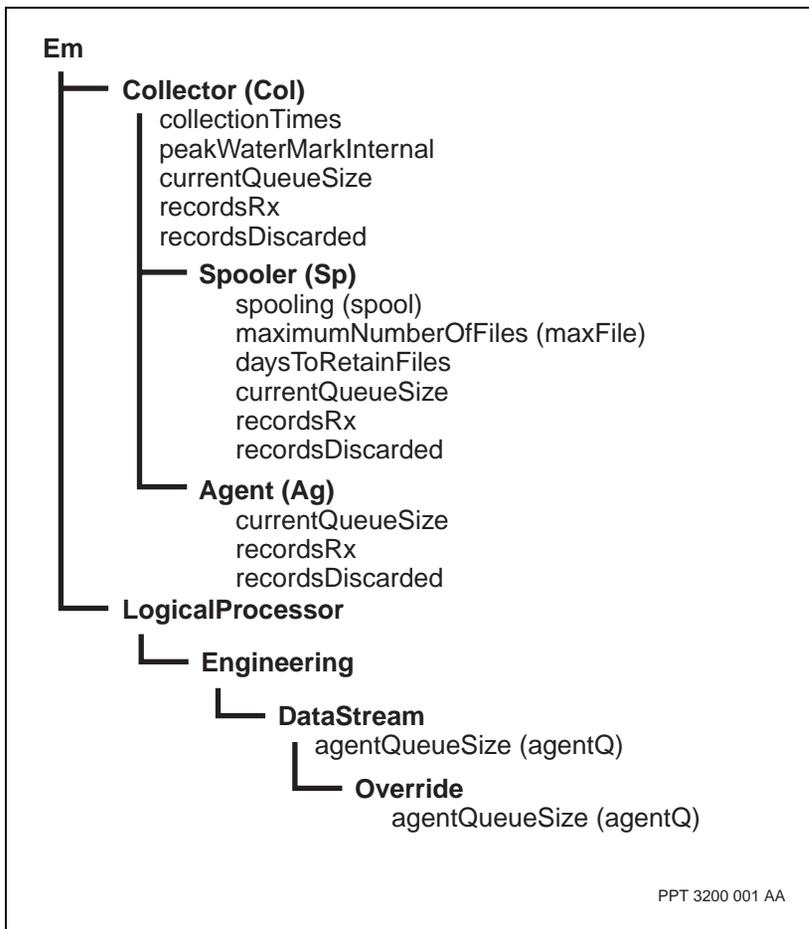
```
set lp/<n> Eng DataStream/<datatype> Override  
agentQueueSize 0
```

### Variable definitions

Variable	Value
<datatype>	One of accounting, alarm, debug, log, scn, or stats.  You cannot set the Agent queue size to zero for the log datatype.  <b>Note 1:</b> You cannot lock a spooler of the log datatype.
<n>	The number of the LP.

## Procedure job aid

**Figure 10**  
**Stopping spooling component hierarchy**



PPT 3200 001 AA



## Chapter 3

# Understanding statistics collection

---

The data collection system (DCS) collects the following types of performance measurements:

- statistics
- real-time statistics

Statistics and real-time statistics help you perform network engineering and long-term planning activities. These performance measurements allow you to verify the network design against the real performance of the network.

See the following sections for more information on statistics:

- “Statistics” (page 49)
- “Real-time statistics” (page 54)
- “Collected statistics and real-time statistics records” (page 58)
- “Spooled statistics records” (page 59)

For procedures related to statistics and real-time statistics, see the following:

- “Obtaining real-time statistics data” (page 42)

## Statistics

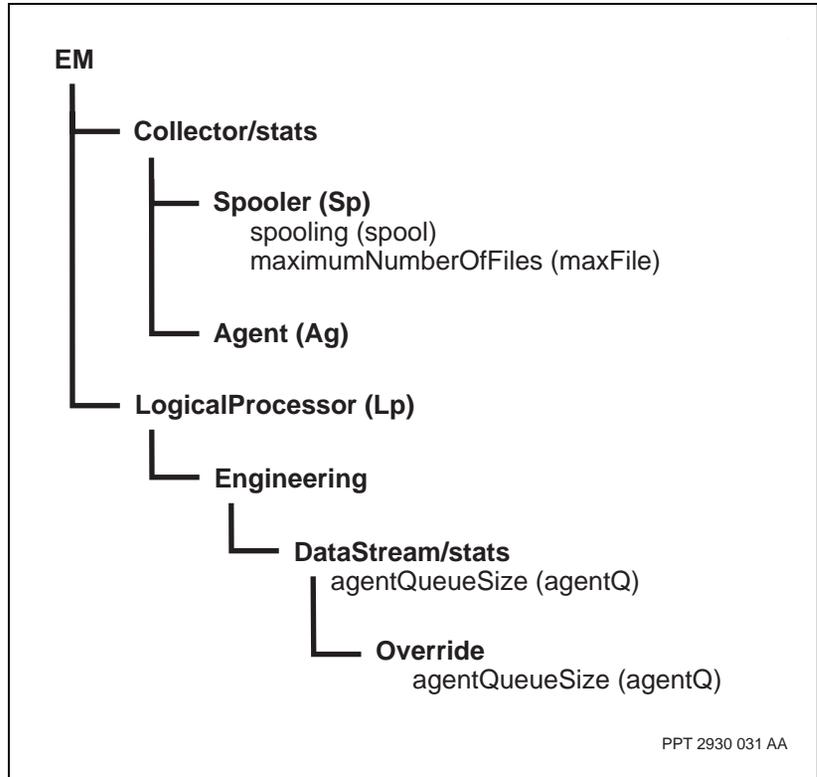
When properly configured, the DCS collects the statistics records and spools them to disk. Once on disk, you can remove statistics files using the management data provider (MDP). See 241-6001-309 *Preside MDM Management Data Provider User Guide* for details.

By default, the DCS does not collect statistics data. The agent queue size for statistics data is set to 0 (zero), which causes the agent to discard all statistics data.

The figure “Statistics collection components and attributes” (page 51) illustrates the data collection components and attributes that collect Nortel Networks Multiservice Switch node statistics. NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference* contains a description of each Multiservice Switch component, and identifies if the node generates a record for it.

For additional guidelines on setting these parameters, see *Nortel Networks Multiservice Switch Release Notes*.

**Figure 11**  
**Statistics collection components and attributes**



## Collection process

Nortel Networks Multiservice Switch network planning and engineering statistics flow through the DCS.

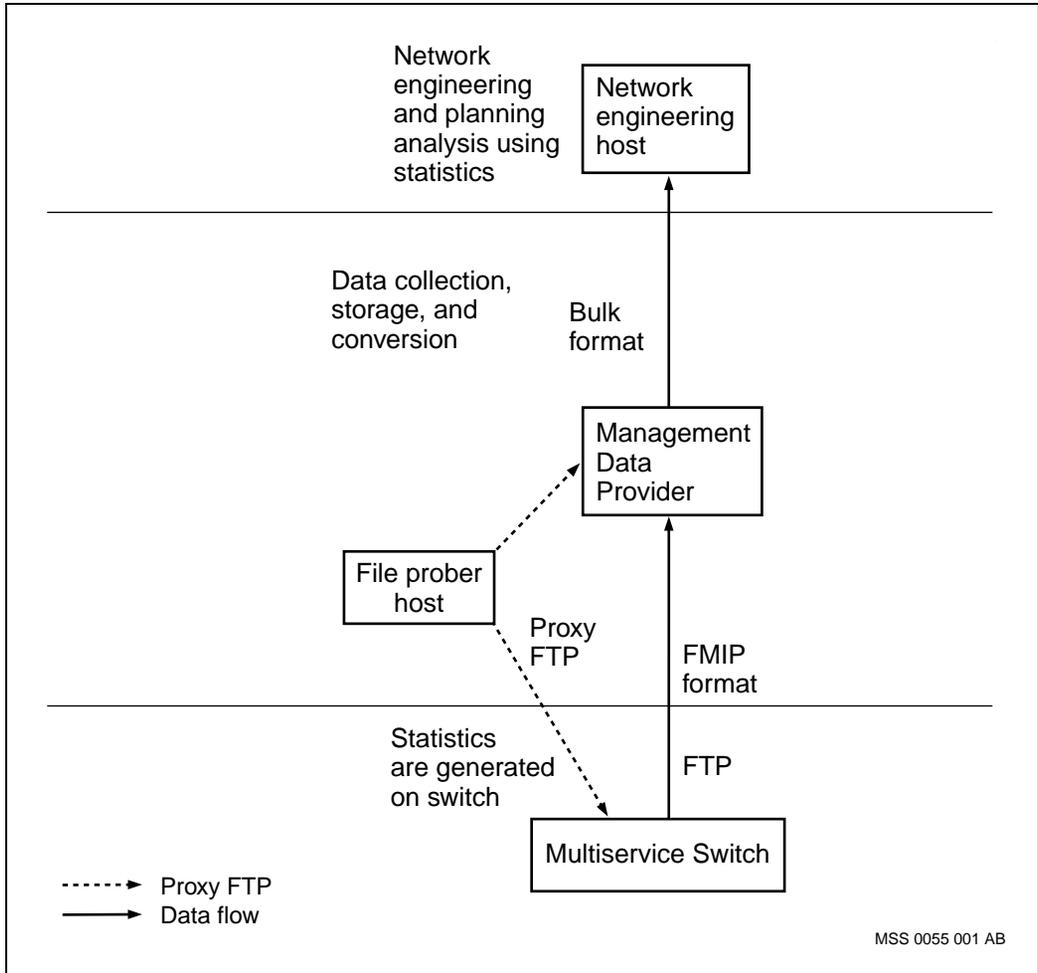
The file prober host is a scheduled UNIX cron job that transfers data from Multiservice Switch nodes to a storage site. The file prober transfers closed statistics files to the MDP spool directory using proxy file transfer protocol (FTP). A file, stored in your local home directory on the file prober host, logs the session. By default, if the file transfer is successful, the file prober host deletes the closed statistics files from the node.

The MDP retrieves and converts node statistics data before transferring it to the network engineering host. The MDP receives the statistics from nodes in file management information protocol (FMIP) format and converts it to bulk format (a form of ASCII/EBCDIC) before storing them.

Once the MDP has converted and stored the collected data, it transfers the data to the network engineering host. The network engineering host uses node statistics data for network engineering and planning analysis.

The figure “Network statistics flow” (page 53) shows the flow of statistics through the system.

**Figure 12**  
**Network statistics flow**



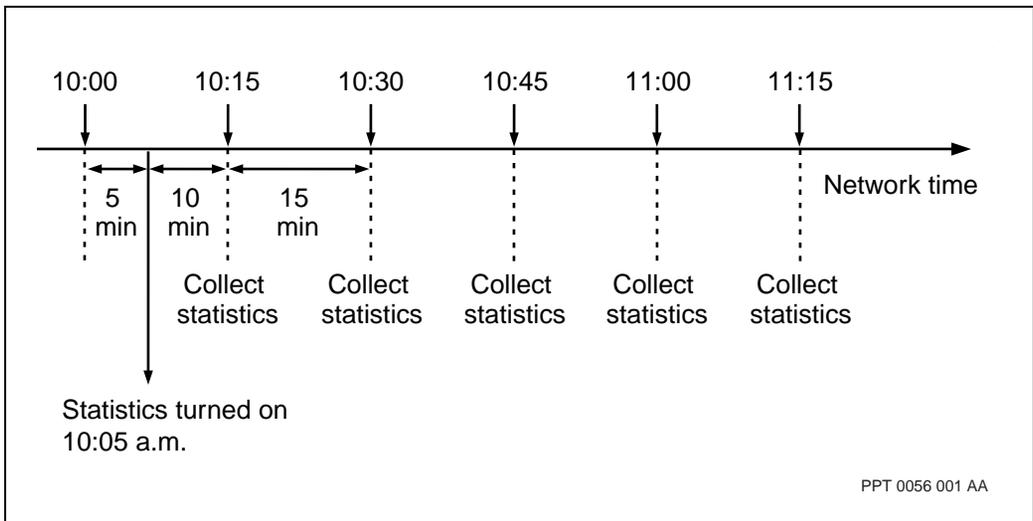
**Note:** The file prober and the MDP hosts can coexist on the same workstation, provided the workstation has sufficient resources and network connectivity.

### Collection times

Nortel Networks Multiservice Switch systems collect statistics every 15 minutes, starting on the hour. The collection times are synchronized with network time (Coordinated Universal Time) throughout a Multiservice Switch network. The figure “Collection times of statistics” (page 54) illustrates the collection times.

When statistics collection begins, the first collection interval can be less than 15 minutes. For example, if statistics collection begins at 10:05 a.m., at 10:15 a.m. the Nortel Networks Multiservice Switch system collects statistics for the time interval between 10:00 a.m. and 10:15 a.m. After this time, the system collects statistics at 15-minute intervals.

**Figure 13**  
**Collection times of statistics**



### Real-time statistics

Real-time statistics cannot be spooled to a disk. They are requested through the network management interface system (NMIS), local operator, Telnet, or FMIP sessions. The DCS collects the values of particular attributes and sends them to the NMIS, local operator, telnet, or FMIP sessions that have requested them.

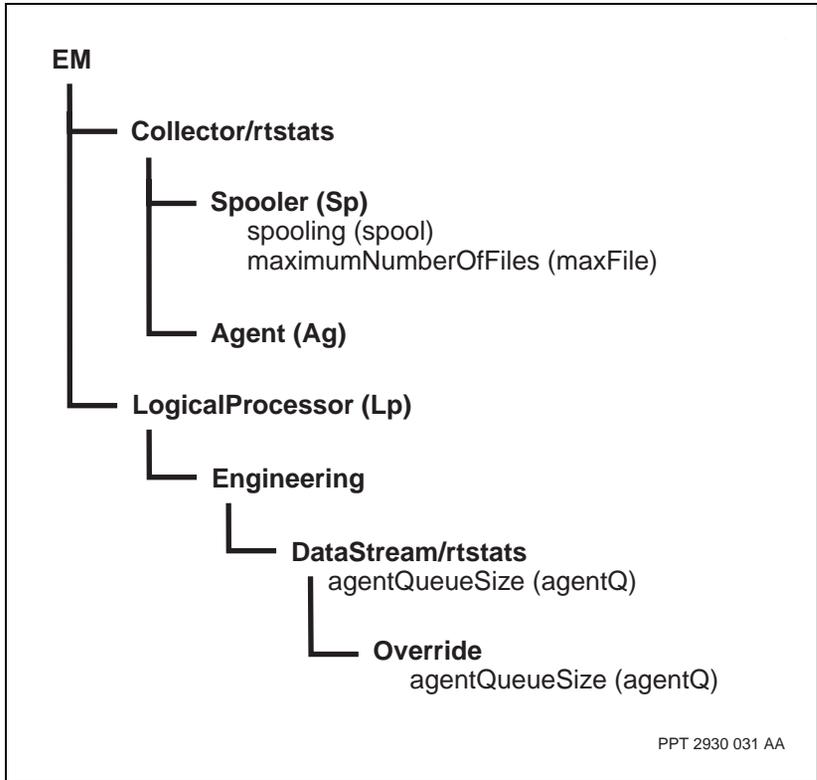
By default, the data collection system (DCS) does not collect real-time statistics data. The maximum agent queue size for real-time statistics data is set to 0 (zero), which causes the agent to discard this type of data. The enabling of the real-time statistics data collection is usually part of the initial installation of the Nortel Networks Multiservice Switch node. If you need to reset the maximum agent queue size for real-time statistics data for a logical processor after its been enabled as part of a troubleshooting procedure, use the agent queue size value for the *rtstats* attribute to determine the maximum number of performance measurement records in the queue.

Real-time statistics are defined for specific use in the Passport for Succession VToA context. Thus, allowing the collection of such data on Multiservice Switch 15000 nodes is always done in conjunction with the MDM application, PMSF, and any other application processing real-time statistics data (on both the SDM and the network management application layer).

**Note:** Synonymous terms for real-time statistics include “Network Traffic Management” (NTM), and “performance measurements” (PMs).

The figure “Real-time statistics collection components and attributes” (page 56) illustrates the data collection components and attributes that collect real-time statistics. NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference* contains a description of each component, and identifies if the node generates a record for it.

**Figure 14**  
**Real-time statistics collection components and attributes**



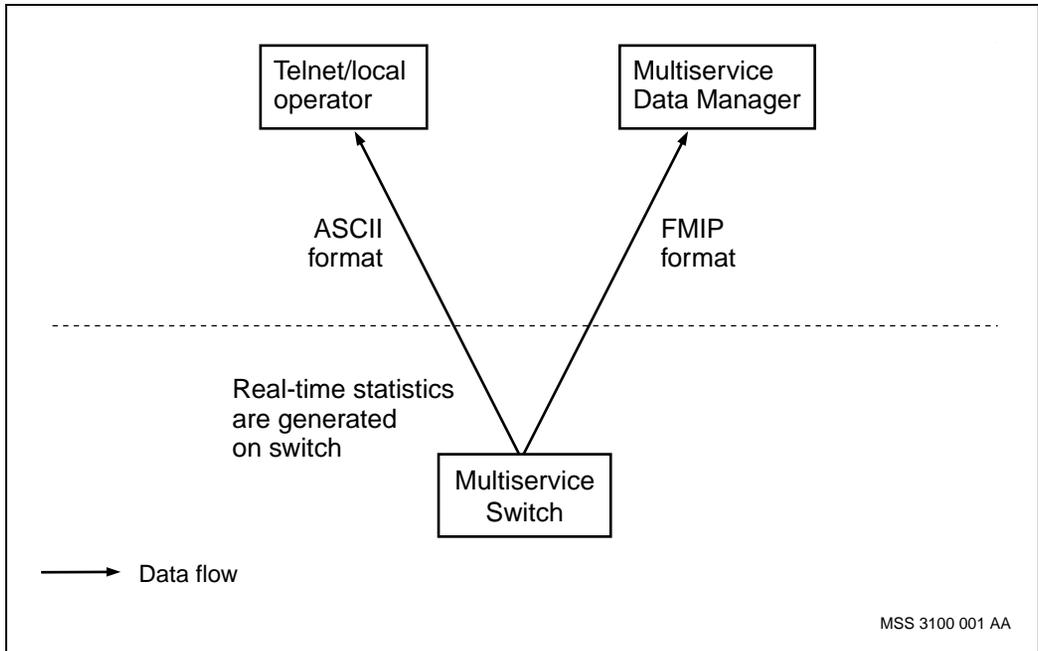
### Collection process

Nortel Networks Multiservice Switch network planning and engineering real-time statistics flow through the DCS to the NMIS, local operator, Telnet, or FMIP sessions, which can request them.

The figure “Network real-time statistics flow” (page 57) shows the flow of real-time statistics through the system.

*Note:* Synonymous terms for real-time statistics include “Network Traffic Management” (NTM), and “performance measurements” (PMs).

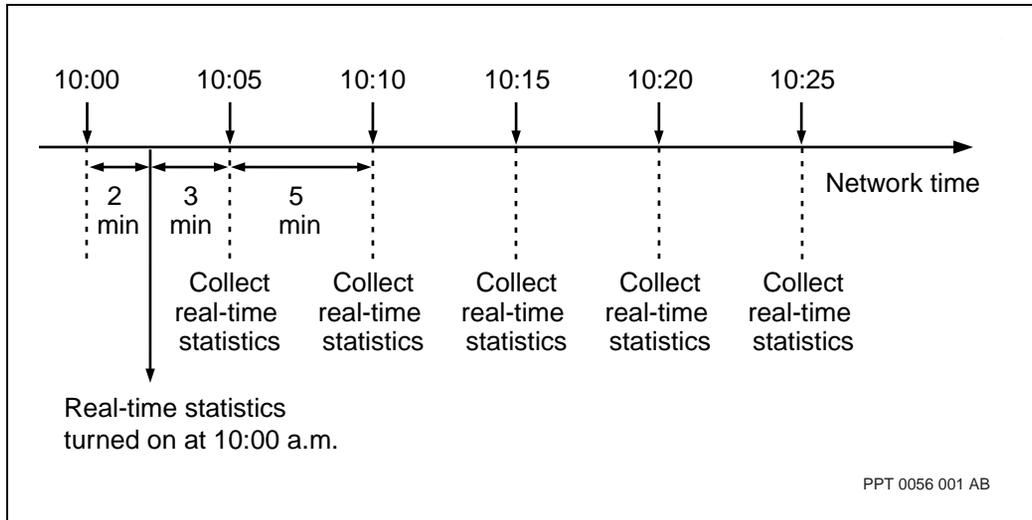
**Figure 15**  
**Network real-time statistics flow**



### Collection times

Nortel Networks Multiservice Switch systems collect real-time statistics every 5 minutes, starting on the hour. The collection times are synchronized with network time (UTC) throughout the network. The figure "Collection times of real-time statistics" (page 58) illustrates the collection times.

**Figure 16**  
**Collection times of real-time statistics**



## Collected statistics and real-time statistics records

At a predetermined time, Nortel Networks Multiservice Switch nodes generate a statistics, and real-time statistics record, for each component that has statistics and real-time statistics. Each statistics and real-time statistics record contains the following information:

- name of the component
- customer ID of the component
- date and time
- statistics for the component

The statistics and real-time statistics collected for a component depend on the component. For example, the statistics collected for each *Lp* component include:

- cardNumber
- cardStatus
- cpuUtilAvg

- cpuUtilAvgMin
- cpuUtilAvgMax

You can find detailed information about the statistics record collected from each type of component in NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference*.

**Note:** Synonymous terms for real-time statistics include “Network Traffic Management” (NTM), and “performance measurements” (PMs).

## Spoiled statistics records

Statistics records spool to the statistics files on the Nortel Networks Multiservice Switch node disk. These files are in a directory structure similar to other types of spooled data. Each statistics record contains statistics data for one component. Spooled statistics files close at midnight each day and whenever:

- a file is larger than 500 kbytes
- the statistics spooler receives a newFile Col Sp command
- the active control processor (CP) resets, restarts, or reboots
- the file system service is disrupted (for example, the file system is in a locked state)

**Note:** Real-time statistics cannot be spooled.



---

## Chapter 4

# Understanding Multiservice Switch data collection systems

---

Nortel Networks Multiservice Switch data collection systems (DCS) (*Collector* component) collect node-generated data that can be used for troubleshooting, performance tuning, and billing. The DCS either:

- sends the data to an external network management system for analysis
- spools it to the file system (for example, accounting data)
- or both (for example, alarms data)

The DCS consists of agents, collectors, and spoolers. Agents reside on each processor card to gather data records from the services running on the processor card. On each processor card, there is one agent for each type of data, represented by *Agent (Ag)* subcomponents. The agents of a particular data type send their data records to a collector (one for each data type), which resides on the active control processor (CP). The collectors are represented by instances of the *Collector (Col)* component. The collectors then send the data records to the network management interfaces, the spoolers, the SNMP agents, or all three. The spoolers are represented by *Spooler (Sp)* subcomponents.

The network management interfaces either display records during operator sessions (local and Telnet interfaces) or send records to Preside Multiservice Data Manager workstations (fast management information protocol (FMIP) interface). The spoolers (one for each data type) format the data and save it on the file system.

Each collector, agent, and spooler has a queue to hold data records until it can process them. If a queue fills up, the DCS starts to discard records. You can review the current number of records in the queue (*currentQueueSize*), the number of records received (*recordsRx*), and the number of records discarded (*recordsDiscarded*) for each collector, agent, and spooler.

For more details on the DCS, see NN10600-030 *Nortel Networks Multiservice Switch 7400/15000/20000 Overview*. For procedures on configuring and monitoring the DCS, see “Configuring the data collection system” (page 19).

## Agent queue sizes

Each LP has its own agent queue size settings. If you do not change the agent queue sizes of an LP, it uses the default queue size for each of its data types.

If necessary, you can adjust the size of an agent queue by setting the *agentQueueSize* attribute of the *Engineering DataStream Override* subcomponent for the logical processor for that agent.

For example, if you need to collect statistics for performance monitoring on an LP, you must change the agent queue size for statistics data from its default of 0 (all statistics data is discarded) to a value such as 100 on the LP.

An agent can discard information of a particular data type if the queue size is too small for the amount of data sent to it. To find out how much data, if any, an agent has discarded, display the data collection queue statistics. With this information, you can select a more appropriate queue size for that data type. However, you must be careful not to overload system resources with high queue size settings.

## Spooled data files

You can turn the spooling of a particular data type on and off by setting the *pooling* attribute of its *Spooler* component.

You can turn data collection on and off for a particular data type on an LP. To turn data collection on, set the LP’s *agentQueueSize* attribute to a non-zero value.

You cannot turn off spooling for log data. You cannot set the *agentQueueSize* attribute to zero or lock the spooler for the log datatype.

You cannot turn on spooling for trap or rtstats data. If you want to stop spooling accounting or stats data, you must either lock its spooler, or set its agent queue size to 0 (zero) for all LPs (see “Stopping spooling” (page 46)).

A spooler discards records if its spooling option is turned off while the spooler still contains records.

Setting a spooler to off has the same immediate effect as locking it (see the lock command in NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference*). However, when a processor restarts, a locked spooler becomes unlocked but keeps its original spooling setting of either on or off.

## Location of spooling files

When turned on, the spooled files are located in the following directories:

```
/spooled/closed/<data_type>
```

```
/spooled/opened/<data_type>
```

where:

<data\_type> is one of alarm, log, accounting, debug, scn, or stats.

## File name format

The name format for spooled data files is as follows:

```
ppc_<data_type>.<YYYY><MM><DD>T<hh><mm><ss>.<XXX>  
.<nodeid>
```

where:

<data type> is one of alarm, log, accounting, debug, scn, trap, or stats.

<YYYY> is the four-digit year the system opened the file.

<MM> is the month (01–12) the system opened the file.

<DD> is the day (01–31) the system opened the file.

<hh> is the hour (00–23) the system opened the file.

<mm> is the minute (00–59) the system opened the file.

<ss> is the second (00–59) the system opened the file.

<XXX> is the sequence number (000–999) the system automatically generated when it opened the file.

<nodeid> is the value of the nodeID attribute of the Mod component at the time the system opened the file.

## Timestamps

Timestamps associated with spool files can be correctly interpreted as follows:

- the timestamp provided by the file system indicates the last time data was received by the file. However, in the case of an empty file it will indicate the time the file was created.
- the timestamp embedded in the name of the file indicates the time a file was created.

## Open and closed spooling files

There are two types of spooling files: open and closed. An open spooling file is a file in which a node is currently writing new data records. Nortel Networks Multiservice Switch nodes automatically close all open spooling files, moves them to the closed directory, and creates a new open spooling file in the opened directory

- when an open spooling file reaches its maximum size (approximately 0.5 Mbyte)
- if a file system is disabled or locked
- at 00:00 hours (midnight), regardless of the file size

You can manually close a spooling file using the *newFile Col Sp* command. See NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference* for information on the *newFile Col Sp* command.

For example, if the MDP is going to run at a certain time (to transfer closed accounting files to a billing host) and a large spooling file is still open, you can close that file to include in the file transfer. See 241-6001-309 *Preside MDM Management Data Provider User Guide* for details on the MDP.

**CAUTION****Risk of CP restart**

Do not delete open spooled data files because it can cause the CP to restart.

### Maximum spooling file sizes

The maximum size for an accounting spool file is approximately 2.0 MB. The maximum size for all other types of spool files is approximately 0.5 MB. There is no such restriction for other types of data.

### Maximum number of closed spooling files

You can limit the number of closed data files stored on the file system by setting the *maximumNumberOfFiles* attribute of a *Spooler* component.

For the log datatype, the number of closed files is determined by the value of the *daysToRetainFiles* attribute of the *Spooler* component.

When the number of files reaches the maximum, the system discards the oldest closed file to make room for a new file. If you set the maximum to equal 0, there is no limit to the number of closed data files stored on the file system.

The *maximumNumberOfFiles* attribute value for the log datatype is zero by default and it cannot be modified. For the log datatype, the system discards the oldest closed file if its age exceeds the value of the *daysToRetainFiles* attribute. You cannot set the *daysToRetainFiles* attribute to zero for the log datatype.

In most cases, if you set a new maximum that is lower than the number of closed files currently on the disk, the system discards the oldest closed files until only the new maximum number of files remain. For example, if you currently have 200 closed files on the disk and you set the maximum number of files to 125, 75 of the oldest closed files are discarded.

For the log datatype, if you set a new value for the *daysToRetainFiles* attribute that is lower than the existing value, the system discards the closed log files whose age exceeds the new value. For example, if you set the value to 4, all closed log files whose age exceeds 4 days are discarded.

If you try to set a new maximum for a data type and there are already over 250 closed files on the disk, the system does not discard any files. Instead, it operates as if it is keeping an unlimited number of files. For example, you have 400 closed files on the disk because you set the maximum number of files to 0 (unlimited). You now change the maximum to 200. The system ignores the new maximum and continues to keep an unlimited number of files. The node generates an alarm to warn you of this situation.

This behavior prevents large amounts of system resources from being used to delete closed files. You need to remove the closed files using the Management Data Provider (MDP) to get the system to enforce the new maximum. See 241-6001-309 *Preside MDM Management Data Provider User Guide* for details.

## Removing spooled data files

To remove spooled files from the file system, Nortel Networks recommends that you use the management data provider (MDP). MDP provides necessary reformatting of the data in the files as well as interfaces to hosts that analyze the data files. See 241-6001-309 *Preside MDM Management Data Provider User Guide* for further details.

*Note:* MDP does not support retrieval and processing of debug data files.



### CAUTION

Nortel Networks recommends that you remove files from the node on a regular basis. You can do this by using the Management Data Provider to retrieve the files and then delete them. It is very important that you do this before the maximum number of files on the disk is reached.

## Active alarm list

The active alarm list (AAList) is an on-switch list that contains, at any specific time, a list of all active alarms that have been raised, but not yet cleared, on a node. The AAList is used to improve the accuracy and completeness of fault reporting when connected to a Preside Multiservice Data Manager workstation. Each running card, whether it be a function processor (FP) or a control processor (CP), maintains its own list of active alarms.

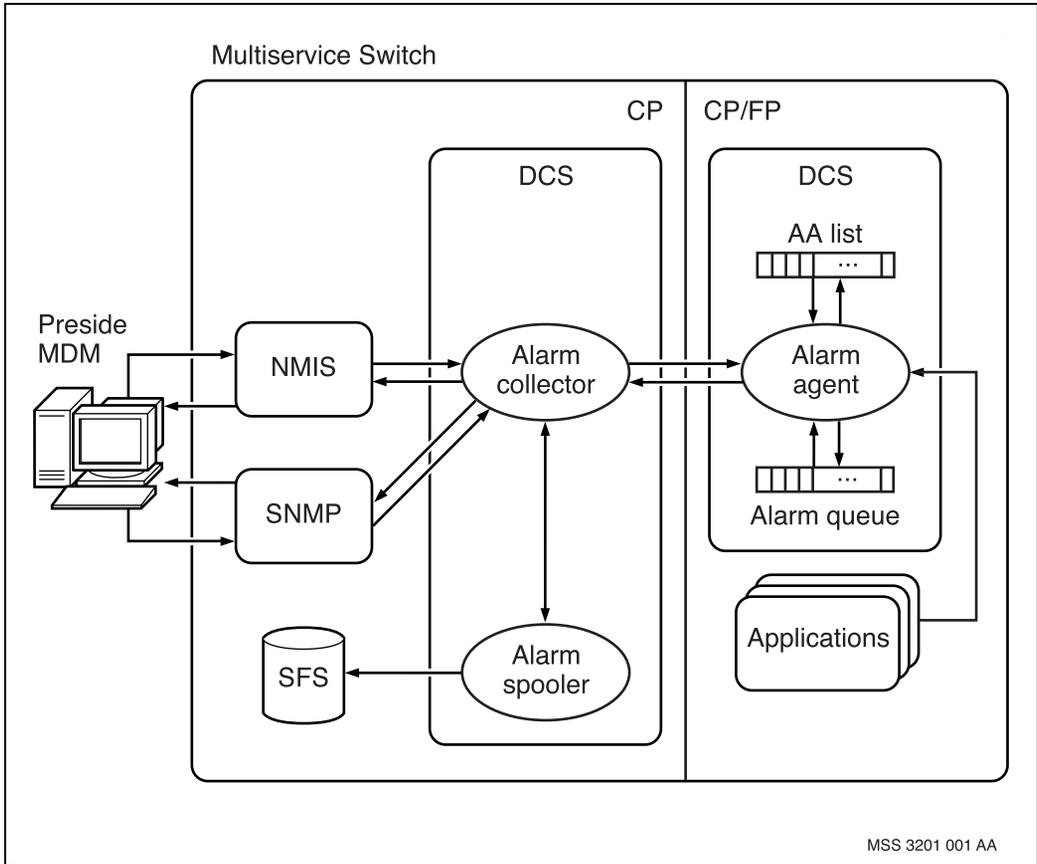
**Note:** The AAList can only be used by Preside Multiservice Data Manager. For any other NMIS sessions (for example, Telnet and Local port), AAList functionality is not supported.

When a unique SET alarm (an alarm that has a unique component name and NTP index field) is generated, the alarm agent adds it to both the AAList and the alarm queue. Through a replay command, all SET alarms contained in the AAList can be replayed to the Preside Multiservice Data Manager workstation. These SET alarms remain in the AAList until one of the following conditions occurs:

- an operator manually clears the SET alarm.
- a matching CLR alarm is received (this results in the SET alarm being removed from the AAList).
- a hierarchical CLR alarm against a specific component is received (this results in all alarms associated with that component, as well as any descendant subcomponents, being removed from the AAList).
- a successive SET alarm is received (this replaces the original SET alarm with the newer SET alarm).
- a card is reset (this clears the AAList from that card completely)

Refer to the figure “AAList architecture” (page 68) for a graphical representation of this process. For more information on the replay command, refer to NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference*. For information on how the AAList is utilized by the Preside Multiservice Data Manager, refer to 241-6001-303 *Preside MDM Administrator Guide*.

**Figure 17**  
**AAList architecture**



The *activeAlarmList* feature must be configured in order to enable the AAList. For information on configuring the AAList, refer to “Configuring the active alarm list” (page 35).

## Types of data

Nortel Networks Multiservice Switch DCS collects the following types of data:

- “Accounting data” (page 69)
- “Statistics data” (page 69)

- “Real-time statistics data” (page 70)
- “Alarm data” (page 70)
- “State change notification data” (page 71)
- “Log data” (page 71)
- “Debug data” (page 71)
- “Trap data” (page 71)

## Accounting data

You use accounting data for billing the users of your network. If you are using accounting data, see the following documents:

- 241-6001-309 *Preside MDM Management Data Provider User Guide*
- NN10600-560 *Nortel Networks Multiservice Switch 7400/15000/20000 Accounting*
- 241-6001-806 *Preside MDM MDP Data Formats for DPN Reference*

By default, accounting data collection is turned on. Accounting data always spools to the file system. You cannot direct accounting data to a network management interface.

## Statistics data

You use statistics data for mid-term to long-term network planning and engineering. If you are using statistics data, see *241-6001-309 Preside MDM Management Data Provider User Guide*.

By default, statistics data collection is turned off. If you turn it on, it spools to the file system. You cannot direct statistics data to a network management interface.

## Real-time statistics data

You use real-time statistics data to identify resource utilization and problem areas in the system.

By default, real-time statistics data collection is turned off.

**Note:** Synonymous terms for real-time statistics include “Network Traffic Management” (NTM), and “performance measurements” (PMs).

## **Alarm data**

Alarm data is essential to provide thorough real-time surveillance of the node. You can also use this data for post-processing and analysis of downtime and other service-affecting problems. For detailed information about each alarm, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*.

By default, alarm data is turned on and goes to the local and Telnet network management interfaces. You can also provision it to go to the simple network management protocol (SNMP) agent as enterprise management information base (MIB) traps. In addition, you can send alarms to Preside Multiservice Data Manager workstations through the FMIP interface. Alarm data also spools to the file system. Keep alarm data collection turned on to ensure you have sufficient information to troubleshoot problems.

## State change notification data

Network management uses state change notification (SCN) data to update the network model. The network model is a repository of network configuration information used by Preside Multiservice Data Manager applications.

By default, SCN data collection is turned on and spools to the file system.

## Log data

You use operator log data to monitor the operator command activity on a node. Only the CP (Lp/0) generates log data.

By default, log data is turned on and spools to the file system.

## Debug data

Nortel Networks Multiservice Switch nodes generate debug data for debugging purposes under application-specific circumstances. Debug data also includes automatically generated information about critical faults and recoverable errors for each processor. Nortel Networks support personnel can use this critical fault and recoverable error information for troubleshooting.

By default, debug data collection is turned off and does not spool to the file system. If you turn it on, debug data can do the following:

- go to the local or telnet network management interfaces
- be spooled to the file system

## Trap data

Traps allow for real-time SNMP management of your node. For further information on SNMP traps, see NN10600-300 *Nortel Networks Multiservice Switch 7400/15000/20000 Operations: SNMP*.

The collector can only send standard MIB trap data to the SNMP agent, which is independent of data collection agents. By default, the DCS sends trap data to the SNMP agent.





# Nortel Networks Multiservice Switch 7400/15000/20000 Data Management

Release 6.1

Copyright © 2004 Nortel Networks.  
All Rights Reserved.

NORTEL, NORTEL NETWORKS, the globemark design, the NORTEL NETWORKS corporate logo, and PASSPORT are trademarks of Nortel Networks. UNIX is a trademark licensed exclusively through X/Open Company Ltd.

Publication: NN10600-561  
Document status: Standard  
Document version: 6.1S1  
Document date: August 2004  
Printed in Canada

