Alcatel-Lucent 5620

SERVICE AWARE MANAGER | RELEASE 9.0 R1

MAINTENANCE GUIDE

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Preface

The Preface provides general information about the 5620 Service Aware Manager documentation suite.

Note — You can use the Search function of Acrobat Reader (File→Search) to find a term in a PDF of this document. To refine your search, use appropriate search options (for example, search for whole words only or enable case-sensitive searching). You can also search for a term in multiple PDFs at once. For more information, see the Help for Acrobat Reader.

5620 SAM documentation suite

The 5620 SAM documentation suite describes the 5620 SAM and the associated network management of its supported devices. Contact your Alcatel-Lucent support representative for information about specific network or facility considerations.

Table 1 lists the documents in the 5620 SAM documentation suite.

Table 1 5620 SAM customer documentation suite

Guide	Description
5620 SAM core documentation	
5620 SAM Planning Guide	The *5620 SAM Planning Guide* provides information about 5620 SAM scalability and recommended hardware configurations.

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Guide	Description
5620 SAM | 5650 CPAM Installation and Upgrade Guide	The *5620 SAM | 5650 CPAM Installation and Upgrade Guide* provides OS considerations, configuration information, and procedures for the following: • installing, upgrading, and uninstalling 5620 SAM and 5650 CPAM software in standalone and redundant deployments • 5620 SAM system migration to a different system • conversion from a standalone to a redundant 5620 SAM system
5620 SAM User Guide	The *5620 SAM User Guide* provides information about using the 5620 SAM to manage the service-aware IP/MPLS network, including GUI basics, commissioning, service configuration, and policy management. The *5620 SAM User Guide* uses a task-based format. Each chapter contains: • a workflow that describes the steps for configuring and using the functionality • detailed procedures that list the configurable parameters on the associated forms 5620 SAM management information specific to LTE network elements is covered in the *5620 SAM LTE ePC User Guide* and *5620 SAM LTE RAN User Guide*. 5620 SAM management information specific to 1830 PSS network elements is covered in the *5620 SAM Optical User Guide*.
5620 SAM Parameter Guide	The *5620 SAM Parameter Guide* provides: • parameter descriptions that include value ranges and default values • parameter options and option descriptions • parameter and option dependencies • parameter mappings to the 5620 SAM-O XML equivalent property names There are dynamic links between the procedures in the *5620 SAM User Guide* and the parameter descriptions in the *5620 SAM Parameter Guide*. See Procedure 2 for more information. Parameters specific to LTE network elements are covered in the *5620 SAM LTE Parameter Reference*. Parameters specific to 1830 PSS network elements are covered in the *5620 SAM Optical Parameter Reference*.
5620 SAM Statistics Management Guide	The *5620 SAM Statistics Management Guide* provides information about how to configure performance and accounting statistics collection and how to view counters using the 5620 SAM. Network examples are included.
5620 SAM Scripts and Templates Developer Guide	The *5620 SAM Scripts and Templates Developer Guide* provides information that allows you to develop, manage, and execute CLI-based or XML-based scripts or templates. The guide is intended for developers, skilled administrators, and operators who are expected to be familiar with the following: • CLI scripting, XML, and the Velocity engine • basic scripting or programming • 5620 SAM functions

5620 SAM Troubleshooting Guide	The *5620 SAM Troubleshooting Guide* provides task-based procedures and user documentation to:
	• help resolve issues in the managed and management networks
	• identify the root cause and plan corrective action for:
	  • alarm conditions on a network object or customer service
	  • problems on customer services with no associated alarms
	• list problem scenarios, possible solutions, and tools to help check:
	  • network management LANs
	  • network management platforms and operating systems
	  • 5620 SAM client GUIs and client OSS applications
	  • 5620 SAM servers
	  • 5620 SAM databases

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Guide	Description
5620 SAM Maintenance Guide	The *5620 SAM Maintenance Guide* provides procedures for: • generating baseline information for 5620 SAM applications • performing daily, weekly, monthly, and as-required maintenance activities for 5620 SAM-managed networks
5620 SAM Integration Guide	The *5620 SAM Integration Guide* provides procedures to allow the 5620 SAM to integrate with additional components.
5620 SAM System Architecture Guide	The *5620 SAM System Architecture Guide* is intended for technology officers and network planners to increase their knowledge of the 5620 SAM software structure and components. It describes the system structure, software components, and interfaces of the 5620 SAM. In addition, 5620 SAM fault tolerance, security, and network management capabilities are discussed from an architectural perspective.
5620 SAM Network Element Compatibility Guide	The *5620 SAM Network Element Compatibility Guide* provides release-specific information about the compatibility of managed device features in 5620 SAM releases.
5620 SAM Release Description	The *5620 SAM Release Description* provides information about the new features associated with a 5620 SAM software release.
5620 SAM Glossary	The *5620 SAM Glossary* defines terms and acronyms used in all of the 5620 SAM documentation, including 5620 SAM LTE documentation.
5620 SAM XML OSS Interface Developer Guide	The *5620 SAM XML OSS Interface Developer Guide* provides information that allows you to: • use the 5620 SAM XML OSS interface to access network management information • learn about the information model associated with the managed network • develop OSS applications using the packaged methods, classes, data types, and objects necessary to manage 5620 SAM functions
5620 SAM LTE documentation	
5620 SAM LTE ePC User Guide	The *5620 SAM LTE ePC User Guide* describes how to discover, configure, and manage LTE ePC devices using the 5620 SAM. The guide is intended for LTE ePC network planners, administrators, and operators. Alcatel-Lucent recommends that you review the entire *5620 SAM LTE ePC User Guide* before you attempt to use the 5620 SAM in your LTE network.
5620 SAM LTE RAN User Guide	The *5620 SAM LTE RAN User Guide* describes how to discover, configure, and manage the eNodeB using the 5620 SAM. The guide is intended for LTE RAN network planners, administrators, and operators. Alcatel-Lucent recommends that you review the entire *5620 SAM LTE RAN User Guide* before you attempt to use the 5620 SAM in your LTE network.
5620 SAM LTE Parameter Reference	The *5620 SAM LTE Parameter Reference* provides a list of all LTE ePC and LTE RAN parameters supported in the 5620 SAM.
5620 SAM LTE Alarm Reference	The *5620 SAM LTE Alarm Reference* provides a list of LTE ePC and LTE RAN alarms that can be reported in the 5620 SAM GUI.
5620 SAM 3GPP OSS Interface Developer Guide	The *5620 SAM 3GPP OSS Interface Developer Guide* describes the components and architecture of the 3GPP OSS interface to the 5620 SAM. It includes procedures and samples to assist OSS application developers to use the 3GPP interface to manage LTE devices.
5620 SAM 3GPP OSS Interface Compliance Statements	The *5620 SAM 3GPP OSS Interface Compliance Statements* document describes the compliance of the 5620 SAM 3GPP OSS interface with the 3GPP standard.
5620 SAM LTE RAN Release Description	The *5620 SAM LTE RAN Release Description* provides information about the LTE RAN features associated with the release.
5620 SAM optical documentation	

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Guide	Description
5620 SAM Optical User Guide	The *5620 SAM Optical User Guide* describes how to discover, configure, and manage optical devices using the 5620 SAM. The guide is intended for optical network planners, administrators, and operators. Alcatel-Lucent recommends that you review the entire *5620 SAM Optical User Guide* before you attempt to use the 5620 SAM in your network.
5620 SAM Optical Parameter Reference	The *5620 SAM Optical Parameter Reference* provides a list of all optical device parameters supported in the 5620 SAM.
5620 SAM Optical Alarm Reference	The *5620 SAM Optical Alarm Reference* provides a list of optical device alarms that can be reported in the 5620 SAM GUI.

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Procedure 1 To find the 5620 SAM user documentation

The user documentation is available from the following sources:

- the User_Documentation directory on the product DVD-ROM
- Help→5620 SAM User Documentation in the 5620 SAM client GUI main menu

Note — Users of Mozilla browsers may receive an error message when using the User Documentation Index page (index.html) to open the PDF files in the 5620 SAM documentation suite. The offline storage and default cache values used by the browsers are the cause of the error message.

Alcatel-Lucent recommends changing the offline storage (Mozilla Firefox) or cache (Mozilla 1.7) values to 100 Mbytes to eliminate the error message.

Procedure 2 To view parameter descriptions from the *5620 SAM User Guide*

You can click on a parameter name in a *5620 SAM User Guide* procedure to open the matching parameter description in the *5620 SAM Parameter Guide*. Ensure the following conditions are true beforehand:

- the *5620 SAM Parameter Guide* and *5620 SAM User Guide* are located in the same directory
- Adobe Reader Release 5.0 or later is installed

1 To view a parameter description when both the *5620 SAM User Guide* and the *5620 SAM Parameter Guide* are open in Adobe Acrobat, click on the parameter name in the *5620 SAM User Guide*.

The parameter description is displayed in the *5620 SAM Parameter Guide*.

2 To view a parameter description when only the *5620 SAM User Guide* is open in Adobe Acrobat:

i Click on a parameter name in a procedure in the *5620 SAM User Guide*. The *5620 SAM User Guide* closes and the *5620 SAM Parameter Guide* opens to display the parameter description.

ii Double-click on the Previous View button in Adobe Acrobat (or press Alt + ←) to re-open the *5620 SAM User Guide*. The *5620 SAM User Guide* opens and displays the parameter from step i.

Prerequisites

Readers of the 5620 SAM documentation suite are assumed to be familiar with the following:

- 5620 SAM software structure and components
- 5620 SAM GUI operations and tools
- typical 5620 SAM management tasks and procedures
- device and network management concepts

Conventions

Table 2 lists the conventions that are used throughout the documentation.

Table 2 Documentation conventions

Convention	Description	Example
Key name	Press a keyboard key	Delete
Italics	Identifies a variable	*hostname*

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Convention	Description	Example
Key+Key	Type the appropriate consecutive keystroke sequence	CTRL+G
Key–Key	Type the appropriate simultaneous keystroke sequence	CTRL–G
*	An asterisk is a wildcard character, which means “any character” in a search argument.	log_file*.txt
↵	Press the Return key	↵
—	An em dash indicates there is no information.	—
→	Indicates that a cascading submenu results from selecting a menu item	Policies→Alarm Policies

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Procedures with options or substeps

When there are options in a procedure, they are identified by letters. When there are substeps in a procedure, they are identified by Roman numerals.

Example of options in a procedure

At step 1, you can choose option a or b. At step 2, you must do what the step indicates.

1 This step offers two options. You must choose one of the following.

- **a** This is one option.
- **b** This is another option.

2 You must perform this step.

Example of substeps in a procedure

At step 1, you must perform a series of substeps within a step. At step 2, you must do what the step indicates.

1 This step has a series of substeps that you must perform to complete the step. You must perform the following substeps.

- **i** This is the first substep.
- **ii** This is the second substep.
- **iii** This is the third substep.

2 You must perform this step.

Measurement conventions

Measurements in this document are expressed in metric units and follow the Système international d’unités (SI) standard for abbreviation of metric units. If imperial measurements are included, they appear in brackets following the metric unit.

Table 3 lists the measurement symbols used in this document.

Table 3 Bits and bytes conventions

Measurement	Symbol
bit	b
byte	byte
kilobits per second	kb/s

Important information

The following conventions are used to indicate important information:

Warning — Warning indicates that the described activity or situation may, or will, cause equipment damage or serious performance problems.

Caution — Caution indicates that the described activity or situation may, or will, cause service interruption.

Note — Notes provide information that is, or may be, of special interest.

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1.1 Maintenance overview

The *5620 SAM Maintenance Guide* is intended for NOC operations or other engineering operational staff that are responsible for developing and implementing maintenance procedures in 5620 SAM-managed IP/MPLS networks.

The 5620 SAM maintenance tasks and procedures are categorized by frequency. Alcatel-Lucent recommends the implementation of a regular maintenance schedule to help:

- prevent downtime caused by software, platform, or network failure
- your 5620 SAM applications operate at maximum performance

The appropriate maintenance frequency depends on the network conditions of the individual service provider or operation. Tailor the suggested maintenance actions and frequency to the unique needs of your network.

Table 1-1 lists where to find maintenance information.

Table 1-1 Maintenance information

For information about	See chapter
Performance maintenance baselines	2
Daily maintenance tasks	3
Weekly maintenance tasks	4
Monthly maintenance tasks	5
As required maintenance tasks	6

1.2 5620 SAM maintenance guidelines

Use this guide as a basis for developing new or enhancing existing maintenance procedures and workflows that are used in the NOC. This guide does not provide a complete list of the features and functionality of the 5620 SAM. The guide includes a high-level view of maintenance actions based on frequency, suggests baseline measures to ensure performance tracking, and describes how to use 5620 SAM applications to check performance.

The staff responsible for developing or performing 5620 SAM maintenance tasks need a good understanding of:

- creating and interpreting 5620 SAM-O XML requests and responses
- executing 5620 SAM client GUI functions and operations
- the relationship of 5620 SAM software applications, log files, and the platforms on which the applications run

See the other documentation, as described in the Preface, to supplement the development of individualized maintenance procedures for your network.

1.3 Obtaining technical assistance

Collect the information listed in Table 1-2 before you call your Alcatel-Lucent technical-support representative or use Alcatel-Lucent web support The list of Alcatel-Lucent support contacts is available at the following URL: http://support.alcatel-lucent.com.

Table 1-2 Required 5620 SAM technical-support Information

Information to collect	Description
Software and platform	• 5620 SAM software release ID • OS type, version and patch or hotfix level • platform information such as the number of CPUs, CPU type, disk size and layout, and amount of RAM On a Solaris station, you can run the getDebugFiles.bash utility to collect the system and application logs. See the *5620 SAM Troubleshooting Guide* for information about using getDebugFiles.bash.
Software logs	The appropriate 5620 SAM log files from the station on which the issue occurs. For example, for server maintenance issues, retrieve the *installation_directory*/nms/log/server/EmsServer.log file. On a Solaris station, run the *installation_directory*/nms/bin/getDebugFiles.bash utility as the root user to collect a series of system and application log files for troubleshooting by Alcatel-Lucent technical support. See the *5620 SAM Troubleshooting Guide* for more information.
Description of performed actions and apparent results	• screen captures or text versions of messages • recent 5620 SAM GUI or CLI operations • troubleshooting activity in response to the problem

1.4 5620 SAM maintenance checklist

Table 1-3 is a checklist of the recommended 5620 SAM maintenance tasks.

Table 1-3 Recommended 5620 SAM preventive maintenance tasks

✓	Maintenance task	Purpose	See section
Daily maintenance tasks			
	Managing alarms	• Track and handle incoming alarms. • Log historical logs for record keeping.	3.1
	Verifying the synchronization of managed-device and 5620 SAM database information	Ensure consistency between the 5620 SAM database and managed device databases.	3.2
	Scheduling a database backup	Prevent the loss of network data.	3.3
	Collecting and storing system and log files	Record historical system activities and current configuration settings.	3.4
	Backing up NMS domain platforms	Back up an entire platform to ensure that all data can be restored.	3.5
Weekly maintenance tasks			
	Verifying performance statistics collection	Ensure that there is sufficient capacity to process and store network statistics.	4.1
	Gathering inventory data for device base performance checks	Collect inventory information for future baseline checks and post processing of equipment trends and use.	4.2
	Testing 5620 SAM database restores	Ensure that database backups are viable in the event that a restore is required.	4.3
	Checking scheduled device backups	Ensure that managed device configuration backups are stored and collected correctly if a restore is required.	4.4
	Cleaning up 5620 SAM Oracle database session creation logs	Ensure that the logs do not use excessive disk space.	4.5
Monthly maintenance tasks			
	Generating and storing a user account list	Keep up-to-date records of staff and their assigned user accounts.	5.5
	Verifying documentation and support contact list updates	Check for product updates and new load information.	5.6
	Setting the time and date	Keep network devices and the NMS domain on the same clock.	5.7
	Checking Windows client platform performance	Compare platform performance over time to check for degradation.	5.3
	Checking Solaris platform performance	Compare platform performance over time to check for degradation.	5.2
	Checking LAN TCP/IP connections between network-management domain elements	Test connectivity between the 5620 SAM platforms.	5.4
As required maintenance tasks			
	Listing customer service information	Record customer service inventory information.	6.7
	Increasing disk space	Add swap space on Solaris stations.	6.2

(1 of 2)

✓	Maintenance task	Purpose	See section
	Backing up a 5620 SAM database	Create a 5620 SAM database backup in case of a database failure.	6.5
	Restoring a 5620 SAM database	Restore a 5620 SAM database using a previously created database backup.	6.6
	Checking for duplicate service or resource names	Check for duplicate names to ensure naming conventions are followed.	6.8
	Relinking the Oracle executable files	Relink the Oracle program files after an OS upgrade or the application of an OS patch.	6.4

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2 — 5620 SAM maintenance base measures

2.1 Base measures overview *2-2*

2.2 Base measures guidelines *2-2*

2.1 Base measures overview

Maintenance base measures can be used by NOC operations or engineering staff that are responsible for maintenance issues to evaluate the activity and performance of network components, for example, client GUI response times when listing equipment.

The data from a series of base measures can be used, over time, to track performance trends. For example, if there are reports that client GUI response times for listing equipment degrades over time, you can use the base measures to determine how much performance has degraded. The procedures in this guide can help narrow the search for the cause of performance degradation.

You should:

- determine the types of base measures that should be implemented for your network
- record base measures data
- create and regularly perform the tasks necessary to gather and compare base measures over time

This chapter provides base measure information for:

- platform—to ensure system sizes are tracked
- performance and scalability—to categorize system limitations as a baseline against NMS response times
- inventory counts—to generate inventory lists for storage and post-processing
- reachability—to ensure that customer services are available

2.2 Base measures guidelines

Base measures can be affected by issues that are beyond the scope of this guide, including:

- network topology design
- NOC or operations area LAN design

The 5620 SAM service test manager (STM) provides the ability to group OAM diagnostic tests into test suites that you can run as scheduled tasks. You can customize a test suite to your network topology and execute the test suite to establish baseline performance information. You can retain the test suite, modify it to accommodate network topology changes, and execute the test suite to establish new base measures as required. Scheduled execution of the test suite and regular review of the results may reveal deviations from the baseline. See the *5620 SAM User Guide* for information about using the STM and creating scheduled tasks.

Platform base measures

You can use 5620 SAM base measures to:

- record the details of the platform configuration
- track network-specific growth to provide a delta for performance measures, for example, how long it takes to list 1000 ports on the current station compared to 10 000 ports on the same station, or on a smaller or larger station

You can use Table 2-1 to record 5620 SAM station specifications and capacities.

Table 2-1 Platform base data

Application	Platform information
Windows	
5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Disk space: Monitor: Graphics card:
Windows	
Additional 5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Disk space: Monitor: Graphics card:
Additional 5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Disk space: Monitor: Graphics card:
Solaris	
5620 SAM main server 1	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Disk slices:
5620 SAM database 1	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:

(1 of 3)

Application	Platform information
5620 SAM main server 2	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Disk slices:
5620 SAM database 2	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:
5620 SAM preferred auxiliary server 1	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:
5620 SAM preferred auxiliary server 2	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:
5620 SAM reserved auxiliary server 1	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:
5620 SAM reserved auxiliary server 2	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Database disk file systems: Disk slice sizes:
5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Disk slices: Monitor: Graphics card:

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Application	Platform information
Additional 5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Disk slices: Monitor: Graphics card:
Additional 5620 SAM client GUI	RAM: CPU (quantity, type, speed): OS version, patch level: Swap space: Disk slices: Monitor: Graphics card:

(3 of 3)

Inventory base measures

You can use inventory base measures to:

- create lists of network objects for future processing
- track network-specific growth to provide a delta for any performance measures, for example, how long it takes 5 versus 15 client GUIs to list 1000 ports

Use the following sequence to create inventory base measures, for example, for access ports. You can modify the sequence to create additional inventory base measures for other objects.

1. Determine the type of object data for which you want to create inventory records, for example, access ports.
2. List the ports of all managed network devices using the client GUI equipment window or create an XML OSS request to generate the list.
3. Format the inventory for future processing, based on your inventory processing applications.
4. Generate the inventory data, using the same listing and filtering criteria, on a weekly or monthly basis, as necessary to track changes to the network.

   When new devices are added to the network on a regular basis, increase the inventory frequency.
5. Use the generated list to record the current inventory of network objects and as a baseline measure of performance.

   For example, baseline the time required to generate a client GUI list of 1000 access ports.

   When an access port list is later generated, record the time required to generate the list using 2000 ports. Ideally, it takes twice as long to list twice as many ports; if the ratio of listing time to number of ports is highly nonlinear, there may be scalability issues that require investigation.

Performance and scalability base measures

You can use the following 5620 SAM performance and scalability base measures to:

- record the system limit numbers and compare to the measurement data collected in your network
- track network-specific growth to provide a delta for any performance measures on similarly-sized platforms, for example, how long it takes to discover 10 new devices versus 20 new devices
- quantify user perceptions of performance

Table 2-2 indicates some scalability base measures that can be used to baseline and record scalability data.

Table 2-2 Scalability base measures

Type of base measure	System limits	Expected response time	Network base measure response time	Additional information
Total devices managed	See the appropriate Release Description and *5620 SAM Planning Guide* for information about release-specific system limits.	The client GUI is operational *XX* seconds after launching.		The time to open icons in the Equipment navigation tree increases depending on the number of configured MDAs.
Total services		• XML OSS configuration of 300 VLL services in *X* min • XML OSS configuration of 100 VPLS services with 3 sites and one SAP in 5 min		The complexity of the service configuration affects response time. For example, adding additional SAPs to a VPLS increases provisioning time.
Outstanding alarms		The client GUI is able to retrieve and display *XX* 000 alarms in the dynamic alarm list during startup.		—
Client GUIs for each server		—		Open a configuration form using the client GUI in X amount of time. Measure X against a constant platform size over time
Device discovery		Discover one additional device with an IP address in the X.X.X.1 to 255 range in less than 1 min.		—

Performance base measures

For networks, commonly available tools such as ping, which measures round trip time using ICMP, can be used to determine quantities such as packet loss and round trip delay. See the ping command information in this guide, and the *5620 SAM Troubleshooting Guide*, for more information about performing the commands.

- Packet loss is defined as the fraction of packets sent from a measurement agent to a test point for which the measurement agent does not receive an acknowledgement from the test point. Acknowledgements that do not arrive within a predefined round trip delay at the measurement agent are considered lost.
- Round trip delay is defined as the interval between the time a measurement agent application sends a packet to a test point and the time it receives acknowledgement that the packet was received by the test point.

You can baseline the packet loss results and round trip delay times for specific NMS LAN and network scenarios. Record those results for future baselines against regularly run packet loss and round trip delay tests.

Reachability base measures

System reachability is important in business-critical applications. Service reachability components are:

- Can the customer reach the service? (reachability)
- If so, is the service available for customer use? (service availability)
- If not, how frequently and how long do service outages last? (service outage duration)

The types of measures and baselines necessary to ensure reachability and availability are network-dependent, and vary depending on the topology of the network, the networking technologies used to move data, and the types of equipment used.

Reachability

A test point is reachable from a testing measurement agent when the agent can send packets to the test point and receive a response from the test point that the packet was received. The ping test and the OAM diagnostics using the 5620 SAM or device CLI can test reachability. The results from these tests should be recorded for future baselining.

These tests can be performed when you troubleshoot a customer service, or when you perform SLA tests before you enable a customer service.

Service availability

The network between a measurement agent and a test point is considered available at a given time when the measured packet loss rate and the round trip delays are both below predefined thresholds. The threshold values are dependent on network topology. The ping test and the OAM diagnostics using the 5620 SAM or CLI to a device can test service availability. The results from these tests should be recorded for future baselining.

Service outage duration

The duration of an outage is defined as the difference between the time a service becomes unavailable and the time it is restored. Time between outages is defined as the difference between the start times of two consecutive outages. Troubleshooters that resolve customer problems, or the data generated to resolve SLAs, can provide the baseline metrics to measure outages, and the time between outages. Record the information for future baselining.

3 — Daily maintenance tasks

3.1 Managing alarms *3-2*

3.2 Verifying the synchronization of managed-device and 5620 SAM database information *3-4*

3.3 Scheduling a database backup *3-5*

3.4 Collecting and storing system and log files *3-6*

3.5 Backing up NMS domain platforms *3-7*

3.1 Managing alarms

In large 5620 SAM-managed networks where 5620 SAM applications are constantly interacting with a busy network in a non-stop management environment, many alarms are raised on the 5620 SAM. These alarms should be:

- tracked as they arrive
- historically logged for trend and performance analysis

You should review alarms on a daily basis to check the type and characteristics of the alarms, and to resolve the network problems caused by the alarms. You can create search filters to identify alarms for a specific site or service, and view up to six filtered alarm lists to monitor network wide issues. You can analyze the alarm history log to determine whether there are any chronic or prolonged failures, or trends. You should correct physical equipment failure alarms or network device alarms immediately.

Note — If your NOC is organized to feed alarm streams from multiple vendor equipment to a third-party application, you should verify that all alarms are correctly logged by the third-party application and then remove alarms from the 5620 SAM client GUI. You can use the Faults tab on most 5620 SAM client GUI forms to view correlated alarm information for specific objects. See the *5620 SAM User Guide* for more information.

Procedure 3-1 To list all incoming alarms

The dynamic alarm list allows you to monitor all incoming network and network management domain alarms, as shown in Figure 3-1.

Figure 3-1 Dynamic alarm list

1 Ensure that the Alarm Table tab button in the Alarm Window at the bottom of the 5620 SAM client GUI is selected.

2 Right-click on an alarm entry row.

The contextual alarm menu appears.

3 Handle the alarms according to your company alarm policies.

For example, to acknowledge an alarm and then delete the alarm:

i Choose Acknowledge Alarm(s) from the contextual menu.

The Alarm Acknowledgement form appears.

ii Modify the Severity and Urgency parameters, as required.

iii In the Acknowledgement Text parameter, enter data about the alarm, according to your company alarm policies.

iv Click on the OK button.

v Confirm the action.

The Ack column in the alarm row indicates that the alarm is acknowledged.

vi Right-click on the alarm entry row.

The contextual alarm menu appears.

vii Choose Delete Alarm(s) from the contextual menu to delete the alarm.

Caution — You cannot recover a deleted alarm unless you store alarms in the alarm history log. Perform Procedure 3-2 to store the alarm in the history log.

viii Confirm the action. The alarm is deleted.

Procedure 3-2 To store alarms in an alarm history log and view alarm history logs

1 Choose Administration→Alarm Settings from the 5620 SAM main menu. The Alarm Settings form appears.

2 Click on the Alarm History DB Behavior tab button.

3 Set the alarm history behavior:

i Specify the Max 24hr Partition Log Size (records) parameter to set the maximum number of entries in the alarm history log.

ii Ensure that the Administrative State parameter is set to Up to enable alarm history logging.

iii Select the Log on Change check box to specify whether to log an alarm when one of its properties changes, for example, to log an alarm when the alarm is acknowledged.

iv Select the Log on Deletion check box to specify whether to log an alarm when it is deleted.

Note — Alcatel-Lucent recommends that you select the Log on Deletion option to ensure that there are logged records of all deleted alarms saved as historical alarm records.

4 Set filters to the DB policy to determine the criteria for an alarm to be logged:

i Click on the Set Purge Range button. The Alarm Settings Filter form opens.

ii Configure the list filter criteria.

iii Click on the OK button.

5 Delete the alarms according to your alarm handling policies.

The deleted alarms are logged to the alarm history logs. To view logged alarm history records:

i Choose Tools→Historical Alarms from the 5620 SAM main menu. The Alarm History filter form opens.

ii If required, configure the filter criteria to limit the range of historical alarms displayed.

iii Click on the Search button. The historical alarms appear based on the filtering criteria.

Note — When you sort more than 50 000 outstanding or logged alarms, GUI performance is affected. Use filters to limit the number of alarms that are listed.

6 Review the alarm history log data for trends and other fault management purposes. Transfer the data from the 5620 SAM platform for post-processing, as required.

3.2 Verifying the synchronization of managed-device and 5620 SAM database information

Monitor device synchronization to confirm that the 5620 SAM database information is maintaining synchronization with the device database information.

Procedure 3-3 To verify 5620 SAM database information

1 Check for deployment failures. Deployment failures indicate that communication with a managed device is failing or has failed.

   i Choose Administration→NE Maintenance→Deployment from the 5620 SAM main menu. The Deployment form opens with the Incomplete Deployments tab displayed.

   ii Click on the Search button to display the latest information.

      When no failed deployments are listed, deployment problems are not causing a synchronization issue.

   iii If deployments are listed, view the state of a deployment in the State column. The possible deployment states include:

      - Cancelled
      - Deployed
      - Failed (Configuration). Failure occurred because the configuration could not be applied to the specified objects.
      - Failed (Internal Error). Failure occurred due to general error conditions. The state is intended for all other possible errors.
      - Failed (Partial). Failure occurred at deployment and some of the configuration may have been sent to the network.
      - Failed (Resource Unavailable). Failure occurred because one of the resources required to apply the configuration is not in the 5620 SAM database.
      - Not Deployed
      - Pending
      - Postponed

   iv Identify the source of the deployment problem. For example, for a Failed configuration state, ensure the configuration was performed correctly on the client GUI.

2 If you determine that there is a deployment problem and the problem is unrelated to the 5620 SAM or device configuration, use your company IT policies to check the LAN for connectivity and transmission problems, such as collisions and CRC errors.

3.3 Scheduling a database backup

Alcatel-Lucent recommends that you back up the database to prevent the loss of network data in the event of a failure. You should perform a backup every day, and after you make major changes to the network.

Schedule database backups during times of low activity to minimize the impact on processing requests from XML OSS clients and client GUIs.

Procedure 3-4 To schedule a daily database backup

Perform this procedure to create a schedule that defines when an automated database backup occurs. See the *5620 SAM Parameter Guide* for detailed parameter information.

1. Choose Administration→Database from the 5620 SAM menu. The Database Manager form opens.
2. Click on the Backup tab button.
3. Configure the parameters in the Backup Schedule panel.
4. Configure the Scheduled Backup Directory parameter in the Backup Setting panel. The parameter value that you specify is the directory on the database station in which the 5620 SAM stores the database backup file sets. Each backup file set is stored in a subdirectory under this directory, and is named backupset*n*

   where *n* is a sequential number; the lowest value is 1, and the highest value is the Number to Keep parameter value

   Caution — Before the 5620 SAM performs a database backup, it deletes the contents of the specified backup directory. Ensure that the backup directory that you specify in this step does not contain files that you want to retain.

   Note 1 — The Scheduled Backup Directory must be a directory on the local file system.

   Note 2 — The Oracle management user requires read and write permissions on the Scheduled Backup Directory.
5. After each scheduled database backup occurs, move the new database backup to another station for safekeeping.

3.4 Collecting and storing system and log files

When a 5620 SAM system runs for long periods with significant activity, the number of generated log files can consume a large amount of disk space. Ensure that the contents of the various log directories are backed up on a regular basis to maintain a system activity record, and to ensure that a copy of the system configuration files is available for research and restores.

Note — Contact your TAC or technical support representative to modify the log file size and retention parameters.

Procedure 3-5 To collect and store system and log files

1. Collect the installation log files from the /tmp directory on a Solaris system, or from the C:\5620sam directory on a Windows client station. The installation log files are named 5620_SAM_*application_type*_stderr.txt and 5620_SAM_*application_type*_stdout.txt.

   where *application_type* indicates the 5620 SAM component type, for example, dbconfig or Server_Install

2. Collect the following 5620 SAM database, server, JMS server, and client system and log files, as required.

   i. Collect the database dbconfig.properties file, which contains database configuration setting information, from the *installation_directory*/config directory on each database station.

   ii. Collect the nms-server.xml file, which contains server configuration setting information, from the *installation_directory*/nms/config directory on each main server station.

   iii. Collect the log files from the *installation_directory*/nms/log/ directory. There may be many log files in this directory, depending on how long the 5620 SAM software has been running.

   iv. Collect the nms-auxserver.xml file, which contains server configuration settings, from the *installation_directory*/nms/config directory on each auxiliary server.

   v. Collect the *installation_directory*/nms/config/nms-client.xml file from each client station. This file contains the client configuration settings. Rename each file to indicate the client GUI station from which it is copied.

3. FTP or copy the system files and log files to a secure location that is not in the network management domain.

3.5 Backing up NMS domain platforms

Alcatel-Lucent recommends that you should backup all NMS domain platforms running the 5620 SAM application software on a daily basis.

Use your company IT maintenance policies to create backups of all directories on each network management station. These backups can be used to restore an entire platform after a hardware or OS failure.

4 — Weekly maintenance tasks

4.1 Verifying performance statistics collection ***4-2***

4.2 Gathering inventory data for device base performance checks ***4-3***

4.3 Testing 5620 SAM database restores ***4-6***

4.4 Checking scheduled device backups ***4-8***

4.5 Cleaning up 5620 SAM Oracle database session creation logs ***4-9***

4.1 Verifying performance statistics collection

Use the performance monitoring statistic log records to determine whether performance statistics are collected within the scheduled interval using the client GUI.

Procedure 4-1 To check for performance monitoring statistics collection

1. Choose Tools→Statistics Browser from the 5620 SAM main menu. The Browse Statistics window appears.
2. Set the Statistics Type parameter to Statistics Record to retrieve a list of historical data for the type of logged statistics.
3. Choose a type of statistics to collect from the Select Object Type... drop-down list. For example, to check interface statistics for managed devices, choose Interface Additional Stats (Physical Equipment).

Note — You must specify a filter to limit the number of log records to less than 15 000; otherwise, a problem encountered form appears.

4. Perform one of the following:
   - **a** Click on the Search button. Go to step 6.
   - **b** Choose No Filter from the Saved Filters drop-down list.
5. Configure the filter criteria and click on the Search button.
6. Review the data for the selected statistic.
   - **i** Click on the Monitored Object or Monitored Object Name headings to sort the historical statistics records by type of object.
   - **ii** Review the Time Captured heading for one or more objects.

     Verify that the time captured intervals match the intervals set for the object or the statistic logging class, as specified in the *5620 SAM User Guide*.

     If the time captured intervals are not sufficient, there will be gaps in the historical record.

7 If there are gaps in the historical record, check the mediation policy to ensure that:

- polling is enabled and administratively up
- the polling interval for a specific MIB or MIB entry is sufficient for collecting the required statistics

Note — Each row that represents a log record shows the Suspect column. When a check mark is present for an interval, there may have been a problem with collection during that interval.

8 Record the data for the selected device and type of statistics. Use this data as a base measurement to verify that statistics data was collected correctly over the scheduled interval.

4.2 Gathering inventory data for device base performance checks

You can collect device hardware inventory information to:

- create a list of managed devices objects, for example, access ports that are available as SAPs
- save the lists for future processing and inventory uses
- compare the current and historical lists for status change trends, usage, and other post-processing applications
- record the time required to gather inventory data as a base measure for future performance checks

See the inventory chapter in the *5620 SAM User Guide* for more information about generating specific types of inventory reports.

Procedure 4-2 To gather port inventory data for a specific managed device

For most inventory lists you can:

- generate an inventory of the listed data
- reorganize the information from most important to least important
- remove columns of data
- sort rows in ascending or descending order

1 Choose Application→Equipment Window from the 5620 SAM main menu. The Equipment Window filter form appears.

2 If required, filter on the Site Name for the device from which you want to collect port information and click on the OK button. The Equipment Window filter form closes.

3 Set the Network Element parameter to the Site Name specified in step 2. The equipment window displays the device.

4 Click on the Ports tab button. A list of ports appears with the Physical Ports tab button selected, sorted by CLI name.

5 Generate a list based on the inventory collection or comparison that you plan to make. For example, to compare weekly lists of access ports, generate a filter to list only access ports.

6 Record the amount of time required to generate the inventory list for future base measure comparisons.

7 Show or hide columns of access port information as required. For example, to hide Administrative State information:

- **i** Right-click on the Site ID heading. The contextual list menu appears.
- **ii** Deselect the Administrative State check box. The Administrative State column of data is removed from the access port list.

8 Save the list of access ports.

- **i** Right-click on a column heading to display the contextual list menu.
- **ii** Choose Save To File from the contextual list menu. The Save form opens.
- **iii** Enter a filename; for example, access_device123_*dateoflistgeneration*.
- **iv** Click on the Files of Type button to specify the file type.
- **v** Browse to choose a location in which to save the file.
- **vi** Click on the Save button. The file is saved to the specified location with the appropriate file extension. Figure 4-1 shows a list table saved in HTML format.

Figure 4-1 Port list in HTML format

Site ID	Site Name	Operational State	Name	CLI Name	Interface ID	Class	Description	Hardware MAC	Configured MAC	Mode	Encap Type	Spee
10.1.200.134	pc134	Down	Port 1/1/13	1/1/13	19300352	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-0D	90-86-01-01-00-0D	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/14	1/1/14	19333120	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-0E	90-86-01-01-00-0E	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/15	1/1/15	19365888	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-0F	90-86-01-01-00-0F	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/16	1/1/16	19398656	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-10	90-86-01-01-00-10	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/17	1/1/17	19431424	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-11	90-86-01-01-00-11	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/18	1/1/18	19464192	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-12	90-86-01-01-00-12	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/19	1/1/19	19496960	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-13	90-86-01-01-00-13	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/20	1/1/20	19529728	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-14	90-86-01-01-00-14	Access	Null	100
10.1.200.134	pc134	Down	Port 1/1/21	1/1/21	19562496	Fast Ethernet	10/100 Ethernet TX	90-86-01-01-00-15	90-86-01-01-00-15	Access	Null	100
10.1.200.134	pc134	Down	Port	1/1/22	19595264	Fast	10/100	90-86-01-	90-86-01-	Access	Null	100

9 You can save the table preferences for future use.

i Right-click on a column heading to display the contextual list menu.

ii Choose Save Table Preferences from the contextual menu. A dialog box appears.

iii Confirm the action by clicking on the Yes button.

The table preferences for the list form and user are saved. For example, when you choose another device, and click on the Ports tab button and the Physical Ports tab button, the Administrative State heading is not displayed. However, when you click on the SONET Channels tab button, the Administrative State heading appears.

10 Move the file to another station, as required, for inventory analysis or post-processing.

4.3 Testing 5620 SAM database restores

When you create daily 5620 SAM database backups, the 5620 SAM backups should be tested to ensure that they can be used to restore the 5620 SAM database in the case of a catastrophic failure.

Caution 1 — Do not perform the database restore test in the NMS domain. Ensure that there is no IP connectivity to any live network devices.

Caution 2 — This procedure does not cover managed device database backups. See the *5620 SAM User Guide* for more information about managed device database backups and restores.

Procedure 4-3 To test a 5620 SAM database restore

Caution — Performing any database modifications using the Oracle database or tablespace tools can cause irreparable harm to the database and your network management data. Performing such modifications can void your Alcatel-Lucent warranty and support agreements. Contact your Alcatel-Lucent technical support representative to help you troubleshoot your database.

1 Generate comparison points for the 5620 SAM database, for example, the number of managed devices and cards, by creating an inventory of information, as described in the *5620 SAM User Guide*. This information is used to compare against the restored database information in a test environment to check the validity of the database backup.

2 Ensure that a recent database backup, such as from as scheduled backup operation, is available. Perform a 5620 SAM database backup, if required, as described in Procedure 3-4.

3 Shut down:

- any currently running 5620 SAM applications on the station on which the database restore test is to occur
- other 5620 SAM applications in the domain where the restore is to occur

4 FTP the database backup to the test station.

Caution — The station must not have IP connectivity to the managed devices in the network.

5 Ensure that the test database station has the same system configuration as the actual database station, for example, partitioning, OS version and OS patch level.

6 As the oracle management user, open the 5620 SAM database installer from the appropriate directory on the product DVD.

a On a SPARC station:

i Enter the following at the CLI prompt:

```
bash$ cd Solaris ↵
```

ii Enter the following at the CLI prompt:

```
bash$ ./DBConfig_SAM_release_revision.bin ↵
```

where
revision is the revision identifier, such as R1, R3, or another descriptor
release is the release identifier, for example, 9_0

b On an x86-based station:

i Enter the following at the CLI prompt:

```
bash$ cd Solarisx86 ↵
```

ii Enter the following at the CLI prompt:

```
bash$ ./DBConfig_x86_SAM_release_revision.bin ↵
```

where
revision is the revision identifier, such as R1, R3, or another descriptor
release is the release identifier, for example, 9_0

The 5620 SAM database configuration utility opens.

7 Follow the prompts, as specified in the *5620 SAM | 5650 CPAM Installation and Upgrade Guide*. Specify a restore of the database from a backup version.

8 Enter the following database restore information, which is available when you choose Administration→Database from the 5620 SAM client GUI main menu:

- database name; for example, samdb
- DBID, the unique numerical identifier of the database
- database instance name; for example, samdb1 or samdb2

9 Specify the directory in which the recently backed-up database is located.

10 Specify whether to create a copy of the backup database. When the backup database is restored, Oracle modifies the backup and it cannot be reused. Create a copy if you want an additional database backup.

11 Specify any additional parameters, as described in the *5620 SAM | 5650 CPAM Installation and Upgrade Guide*.

12 Review the comparison points of the restored backup database with the actual database, as generated in step 1. When the databases are the same, the backup and restore operation is successful.

4.4 Checking scheduled device backups

When the 5620 SAM performs a backup of node configurations, the 5620 SAM FTPs to the node and gets the:

- node BOF (bof.cfg)
- primary-config file specified in the BOF
- index file (primary-config file with an .ndx extension)

Before you schedule a backup, you must:

- have a 5620 SAM user account with an assigned admin scope of command role or a scope of command role with write access to the mediation package.
- have a user account with FTP access on the managed device
- ensure the BOF persist parameter is set by typing the command: <show bof>. The parameter should be set to <persist on>.

Procedure 4-4 To check scheduled device backup status

1. Choose Administration→NE Maintenance→Backup/Restore from the 5620 SAM main menu. The Backup/Restore form opens with the Backup/Restore Policy tab displayed.
2. Click on the Backup/Restore Status tab button. The managed devices are listed and backup and restore status information is displayed.
3. Select the device and click on the Properties button. The NE Backup/Restore Status form opens with the General tab displayed.
4. View the information in the Backup Status panel. A Backup State other than Successful may indicate a communication problem or a backup policy configuration error.
5. Ensure that the device configuration file and the associated index file are saved on the device and available for backup. Click on the Configuration Saves tab button, and ensure that the Config Save State indicator reads Success.

   See the appropriate device operating-system documentation for more information.
6. Click on the Backups tab button to view a list of backup operations that are currently in progress. A backup operation disappears from the list after it completes.
7. Click on the Faults tab to view additional troubleshooting information.
8. Close the NE Backup/Restore Status form.The Backup/Restore form is displayed.
9. Use the information obtained from the NE Backup/Restore Status form to check the backup policy configuration, if required. Click on the Backup/Restore Policy tab button.
10. Select the backup policy for the device and click on the Properties button. The Backup Policy (Edit) form opens with the General tab displayed.

11 Ensure that the policy is assigned to the device.

   i Click on the Backup/Restore Policy Assignment tab button. The Backup Policy - Filter form opens.

   ii Configure the policy filter criteria.

   iii Click on the OK button. The Backup Policy - Filter form closes.

   iv Move the device to the Assigned Sites list if it is not there by selecting the site from the Unassigned Sites list and clicking on the right-arrow button.

   v Click on the Apply button to save changes, as required.

12 Click on the General tab button.

13 Select the Enable Backup check box.

14 Modify the other parameters, if required.

15 Click on the OK button to save the changes and close the form.

4.5 Cleaning up 5620 SAM Oracle database session creation logs

As part of the Oracle security functions, audit files are automatically created to track database session creations. These files are not removed automatically by the 5620 SAM or by Oracle. You must monitor the directory that contains these files to ensure the audit files do not consume excessive disk space.

Procedure 4-5 To manage 5620 SAM database Oracle database session creation logs

1 As an Oracle privileged user, log in to the 5620 SAM database station.

2 Navigate to the directory that contains the Oracle audit files, for example, *Oracle_installation_location*/rdbms/audit

   where *Oracle_installation_location* is the directory in which the Oracle software is installed, for example, /opt/5620sam/oracle11r2

3 Archive or delete the files as required. If the number of audit files grows quickly, you may want to audit the directory more frequently.

5 — Monthly maintenance tasks

5.1 Performing main server and database activity switches *5-2*

5.2 Checking Solaris platform performance *5-2*

5.3 Checking Windows client platform performance *5-5*

5.4 Checking LAN TCP/IP connections between network-management domain elements *5-7*

5.5 Generating and storing a user account list *5-9*

5.6 Verifying documentation and support contact list updates *5-9*

5.7 Setting the time and date *5-11*

5.1 Performing main server and database activity switches

In a redundant 5620 SAM deployment, performing regular main server and database activity switches is important for the following reasons:

- to ensure that 5620 SAM server and database redundancy functions correctly and responsively
- to identify problems that may interfere with a 5620 SAM upgrade

Note — Alcatel-Lucent strongly recommends that you perform a main server activity switch and a database activity switch monthly, or at least quarterly, if a monthly test is not possible. See the *5620 SAM User Guide* for information about performing a server or database activity switch. Contact your Alcatel-Lucent technical-support representative for further assistance.

5.2 Checking Solaris platform performance

Use the following procedure to test Solaris performance and record base measures. You can compare Solaris platform performance monthly to:

- collect base measure information related to platform performance
- ensure that there is no degradation in performance

If the platform performance degrades, collect all necessary logs and performance data measures and contact your Alcatel-Lucent support representative.

Procedure 5-1 To check Solaris platform performance

Use UNIX utilities to review process and CPU usage data.

1 Open a command or shell tool.

2 Change to the 5620 SAM installation directory by typing:

```
cd /installation_directory ↵
```

where *installation_directory* is the installation directory of the 5620 SAM software

3 Run the prstat command on the client GUI, server, and database stations to check CPU usage for processes:

i Type:

```
prstat ↵
```

Depending on your system configuration, approximately the top 20 processes are displayed.

ii Review the output.

The top 5620 SAM process listed under the CPU column should be the Java process. However, the Java process should not consume the majority of CPU cycles, compared to previous base measures. Some Oracle processes may also take CPU time, depending on the database load.

iii Record the data for future base measure comparison of station performance.

iv Press ESC-Q to quit or CTRL-C to stop the prstat command.

4 Use the UNIX utility mpstat command to review the activities performed by the CPU.

i To provide 5 s of output, type:

```
mpstat 5 ↵
```

ii Review the mpstat output. Ignore the first line of data, because the sample period is not the full 5 s.

The following shows sample mpstat output. See Table 5-1 for a description of the output.

```
CPU minf mjf xcal  intr  ithr  csw  icsw migr smtx  srw  syscl

 0    5   0    0   258    55    87    1    0    0    0   196

usr sys  wt idl

5  15 0  80
```

Table 5-1 mpstat output description

Heading	Description (events per second unless noted)
CPU	Processor identification
minf	Minor faults
mjf	Major faults
xcal	Interprocessor cross-calls
intr	Interrupts
ithr	Interrupts as threads (not counting clock interrupts)
csw	Context switches
icsw	Involuntary context switches
migr	Thread migrations to another processor
smtx	Spins on mutexes (lock not acquired on first try)
srw	Spins on readers/writer locks (lock not acquired on first try)
syscl	System calls
usr	Percent user time
sys	Percent system time
wt	Percent wait time

(1 of 2)

Heading	Description (events per second unless noted)
idl	Percent idle time

(2 of 2)

The key information generated by the mpstat command is the smtx data. When the smtx output is high on a multiple CPU system, the CPUs are competing for resources.

iii Record the data for future base measure comparisons of station performance.

Look for differences in the output of the data for similar loads on each station. Such differences indicate performance degradation.

iv Press ESC-Q to quit or CTRL-C to stop the mpstat command.

5 Use the iostat command to collect disk read and write data for determining whether there is a disk bottleneck.

i Type:

iostat -x *time* ↵

where *time* is the time period, in seconds, over which you want to collect data. Alcatel-Lucent recommends that you start with 2 s.

ii Review the iostat output. An example is shown below. See Table 5-2 for a description of the iostat output.

```
                          extended device statistics
device r/s   w/s   Kr/s   Kw/s  wait actv  svc_t  %w  %b
sd1      0.1  0.2    0.9    3.3   0.0  0.0   34.3   0   0
sd3      0.1  0.5    1.1    3.7   0.0  0.0   73.1   0  90
```

Table 5-2 iostat output description

Heading	Description
device	Name of the device
r/s	Reads per second
w/s	Writes per second
Kr/s	Reads per second (kb/s)
Kw/s	Writes per second (kb/s)
wait	Average number of transactions waiting for service (queue length)
actv	Average number of transactions actively being serviced (removed from the queue but not yet complete)
svc_t	Average service time in ms
%w	Percentage of time there are transactions waiting for service (non-empty queue)

(1 of 2)

Heading	Description
%b	Percentage of time the disk is busy (transactions in progress)

(2 of 2)

iii The %b and svc_t columns are the key fields determining whether a disk bottleneck exists. When the svc_t is between 30 and 50 ms, and the %b) is greater than 20% busy, there is a minor disk loading problem. If the svc_t exceeds 50 ms, the disk is considered I/O-bound, and a disk bottleneck exists.

In the sample output, the sd3 disk had 90% disk activity in the %b column. Because disk sd3 is busier than disk sd1, disk performance may be enhanced by moving data from disk sd3 to disk sd1.

iv Record the data for future comparison of platform performance. Look for differences in the output of the data for similar loads on each station, which indicate performance degradation.

v Press CTRL-C to stop the iostat command.

6 Use the netstat command to check for network interface performance issues.

i Type:

`netstat -i` *`time`* ↵

where *time* is the time period, in seconds, over which you want to collect data. Alcatel-Lucent recommends that you start with 5 s.

ii Review the netstat output.

5.3 Checking Windows client platform performance

You can compare Windows client station performance monthly to:

- collect base measure information related to platform performance
- ensure that there is no degradation in performance

Procedure 5-2 To check Windows client station performance

1 Open a command window on the client station.

2 Enter the following at the command prompt:

`ping` *`name_of_machine`* ↵

where *name_of_machine* is the 5620 SAM main server to which you want to test connectivity

3 Review the ping output for round-trip delays or lost packets. Resolve any connectivity issues that cause delays or dropped packets. Store ping round-trip delay or lost-packet data as a performance base measure for the station. You can use the data for future performance comparisons.

4 Choose Start→Run from the Windows menu bar. The Run form opens.

5 Enter the following in the Open field:

taskmgr ↵

The Windows Task Manager form opens. It provides details about the programs and processes that run on the station. If you are connected to a LAN, you can also view the network status and check network performance. Depending on the NOC work environment and shared computer usage policy, you can also view additional information about other users.

6 Check performance using the appropriate Task Manager tab.

a Click the Processes tab button. A list of processes appears.

Organize the processes according to CPU usage. The name of each 5620 SAM process begins with 5620SAM. The CPU usage percentage for each 5620 SAM process should fall within your IT specifications or the established performance base measures.

b Click on the Performance tab button. The CPU and page file usage charts appear.

The memory and page-file usage percentages should fall within your IT specifications or the established performance base measures.

c Click on the Networking tab button. The Local Area Connection chart appears.

Network utilization greater than 10 or 20 percent may indicate collisions or other LAN problems that could affect performance in the network management domain.

7 Choose File→Exit Task Manager to close the form.

8 Open an MS-DOS command window.

9 Type:

tracert *name_of_machine* ↵

where *name_of_machine* is the 5620 SAM main server to which you want to test connectivity

The tracert command provides details about network connectivity.

10 Review the tracert data, including:

- number of hops required to reach the main server
- average time between hops

Record the data for future base measure comparison. For example, when the number of hops between a client GUI and main server increases over time, traffic takes longer to travel between them, which can degrade performance.

11 Check regularly for advisories related to the OS. If updates or patches are required, contact your IT department or your Alcatel-Lucent support representative for information about potential effects on the 5620 SAM software.

5.4 Checking LAN TCP/IP connections between network-management domain elements

Use the ping and traceroute functions each month to check LAN TCP/IP connectivity between elements in the network-management domain, such as the 5620 SAM client, main server, auxiliary server, and database platforms. Contact your IT department if there appears to be a communication problem between elements.

Procedure 5-3 To check network management connections

1 Open a console window on the station.

2 Ping the hostname of another station in the network management domain by entering one of the following:

a On a Solaris station:

ping -s *name_of_machine* ↵

where *name_of_machine* is the hostname of the other station

b On a Windows station:

ping *name_of_machine* ↵

where *name_of_machine* is the hostname of the other station

3 Review the output. The following is an example of ping output:

```
# ping -s name_of_machine

PING name_of_machine: 56 data bytes

64 bytes from name_of_machine (138.120.106.169): icmp_seq=0,
time=1. ms

64 bytes from name_of_machine (138.120.106.169): icmp_seq=1,
time=0. ms

64 bytes from name_of_machine (138.120.106.169): icmp_seq=2,
time=0. ms

----name_of_machine PING Statistics----

3 packets transmitted, 3 packets received, 0% packet loss
```

```
round-trip (ms) min/avg/max = 0/0/1
```

LAN congestion may be a problem if packets are received out of order, are dropped, or take too long to complete the round trip.

4 Store the output for future base measure comparison.

Compare the output over time to ensure that changes in the data are not caused by deteriorating LAN conditions.

5 Check the routing information.

i Open a console window on the station.

ii Enter one of the following traceroute commands to determine the path taken to a destination by an ICMP echo request message:

- traceroute ↵ on a Solaris station
- tracert ↵ on a Windows station

The list of near-side interfaces in the path between a source host and a destination device is displayed. The near-side interfaces are the interfaces closest to the source host.

6 Store the output as a record for future base measure comparisons. Compare routes over time to ensure that there is optimal connectivity.

7 To check the routing tables for the platform:

i Open a console window on the station.

ii To view the active routes for the platform, type:

`netstat -rn` ↵

The following information is displayed:

- network destination and gateway IP addresses
- gateway used to reach the network destination
- IP address of the interface on which communication occurs
- metric value of the route

8 Store the output as a record for future base measure comparison. Compare routes over time to ensure that there is optimal connectivity.

5.5 Generating and storing a user account list

System administrators should keep a record of 5620 SAM users to:

- associate staff names with user accounts
- provide account information to TAC or Support staff as required for support to log in
- review user account privileges

Procedure 5-4 To generate and store user account data

1. As admin user, choose Administration→Security→5620 SAM User Security from the 5620 SAM main menu. The User Security -- Security Management (Edit) form opens.
2. Click on the Users tab button.
3. Click on the Search button without setting any filtering. The complete list of user accounts appears.
4. Organize the list of users. For example, to organize the list by the type of group that the user belongs to, click on the User Group column heading. The user accounts are listed alphabetically by user group.
5. Save the list of user accounts.
   - **i** Right-click on the user name list heading and choose Save To File from the contextual menu. The Save form opens.
   - **ii** Enter a name for the user account list, for example, NOCabc_useraccounts_*yearmonthday*.
   - **iii** Click on the Files of Type button to specify the file type.
   - **iv** Browse to choose a location in which to save the file.
   - **v** Click on the Save button. The file is saved to the selected location in the specified format with the appropriate extension.
6. Move the account list to a secure location. Store the latest version of the list and keep existing versions of the list for historical purposes.

5.6 Verifying documentation and support contact list updates

Use the http:\\www.alcatel-lucent.com website as the source for 5620 SAM technical information and updates to:

- check for changes to TAC, Support, and Call Centre information
- find additional product updates, updated user documentation, and documentation generated for specific situations, such as Network Application Notes, Technical Notes, Product Change Notifications, and Field Notices

You should also regularly check your 5620 SAM platform vendor websites for information about OS patches, updates, and other software and hardware issues.

Procedure 5-5 To check for documentation and support updates

Note — You must have a Support Documentation Service account to view customer documentation. Contact your Alcatel-Lucent account representative for more information.

1 Log on to https://www.alcatel-lucent.com/support.

2 Enter your login user name and password when prompted.

3 Click on the Support Documentation Service link.

4 Narrow the documentation search to 5620 SAM.

   i Set the Select a product category field to Network Management.

   The Select a product field list is updated.

   ii Set the Select a product field to 5620 SAM.

   iii Set the Select a type field to the type of information you are looking for, for example:

   - All types to view all applicable documentation for the product
   - Installation for a list of installation guides, sorted by date and release
   - Product Manual for list of guides, such as the *5620 SAM User Guide*, sorted by date and release
   - Release Description for a list of release descriptions that describe release information, such as feature overviews, supported platforms, and scalability considerations
   - Release Notice for a list of release notices that describe load information, such as outstanding and closed problem lists, and restrictions to functionality

5 Click on the Search button. The list of documents appears.

Note — You can also use the enhanced search feature to search for 5620 SAM updates between specified dates. Alternately, you can configure your user profile on the Alcatel-Lucent home page to automatically notify you of new 5620 SAM user information.

6 Download the documents.

7 Check for TAC, Call Center, or Support updates:

   i Click on the Support link.

   ii Click on the Global Support link.

   iii Click on the Carrier/Service Provider link.

iv Click on the link to the global technical support organization that supports your organization.

v Check the contact information for your regional Customer Service or Call Center.

5.7 Setting the time and date

You can use a variety of time synchronization and network time protocol tools, depending on network design needs, including:

- ntpd, xntpd, or rdate, for network management domain devices
- the clock function on Windows a station
- SNTP, for devices in the managed network

Alcatel-Lucent recommends that you keep time synchronous between network devices, for example, timing between routers. See the appropriate OS documentation or man pages for more information about using time and date synchronization protocols.

Note 1 — Timing between the 5620 SAM servers and clients must be synchronized.

Note 2 — Alcatel-Lucent only supports changing the time or date forward on 5620 SAM servers, databases, or clients.

Procedure 5-6 To set time and date

1 Use the ntpd or xntpd command to configure the NMS domain device to communicate with an appropriate time synchronization server, such as an NTP server. See the appropriate man pages or OS documentation for more information.

2 When ntpd and xntpd are not used, you can use rdate on Solaris.

Caution 1 — Alcatel-Lucent recommends that you do not perform this procedure when your network management stations are in different time zones.

Caution 2 — Alcatel-Lucent does not support manually changing the time or date on 5620 SAM servers, databases, or clients while the 5620 SAM application is running.

i As root, change to the crontabs directory by typing:

```
cd /var/spool/cron/crontabs ↵
```

ii Configure the environment to use the vi text editor for editing the root crontab file by typing:

```
csh ↵

setenv EDITOR=vi ↵

export EDITOR ↵

crontab -e ↵
```

iii Add the following line at the end of the crontab file, for example, to synchronize time in the NMS domain at 1:57 a.m. every day:

```
 57 1 * * * /bin/rdate ↵
```

This cron job executes the rdate command every day at 1:57 a.m.

iv Save the changes and close the file.

v Repeat step 2 as required for all stations in the network management domain.

Network devices such as the 7750 SR are configured to operate on universal co-ordinated time. You can configure additional time synchronization methods, such as sntp, as described in the appropriate documentation, for example, the *7750 SR OS System Guide*.

6 — As required maintenance procedures

6.1 General 5620 SAM platform changes *6-2*

6.2 Increasing disk space *6-2*

6.3 Adding or removing database-station RAM *6-2*

6.4 Relinking the Oracle executable files *6-5*

6.5 Backing up a 5620 SAM database *6-6*

6.6 Restoring a 5620 SAM database *6-6*

6.7 Listing customer service information *6-19*

6.8 Checking for duplicate service or resource names *6-20*

6.1 General 5620 SAM platform changes

After you make a change to the physical 5620 SAM server, database, or platform, such as increasing or decreasing the amount of RAM, adding or removing a CPU, or installing a different NIC type, you must uninstall and reinstall the 5620 SAM software.

Caution — To prevent a network-management outage, Alcatel-Lucent recommends that you contact 5620 SAM technical support before you modify the platform of a 5620 SAM component such as a server, database, or client.

6.2 Increasing disk space

Alcatel-Lucent recommends that you use a volume control system to control disk space in the NMS domain.

If you do not use a volume control system, when performance monitoring of disk and platform usage indicate that additional disk space is required, you can add more swap space. For information about increasing swap space, see the *5620 SAM Troubleshooting Guide*. See the appropriate user documentation or IT department guidelines for more information about increasing disk space.

6.3 Adding or removing database-station RAM

When the amount of RAM on a 5620 SAM database station changes, you must reconfigure the Oracle System Global Area, or SGA. Perform Procedure 6-1 to reconfigure the Oracle SGA after a RAM upgrade or downgrade in a standalone 5620 SAM deployment, or Procedure 6-2 in a redundant deployment.

Procedure 6-1 To reconfigure the Oracle SGA after a database RAM change in a standalone 5620 SAM deployment

Perform this procedure after a change in the amount of RAM on a standalone 5620 SAM database station.

Note 1 — You require samadmin user privileges on the main server station to perform this procedure.

Note 2 — You require root or root-equivalent user privileges on the database station to perform this procedure.

1 Log in as the samadmin user on the main server station.

2 Open a console window.

3 Perform the following steps to stop the 5620 SAM main server application.

i Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

ii Enter the following at the CLI prompt to stop the 5620 SAM server software:

```
bash$ ./nmsserver.bash stop ↵
```

iii Enter the following at the CLI prompt to display the 5620 SAM server status:

```
bash$ ./nmsserver.bash appserver_status ↵
```

The command displays a status message.

iv The 5620 SAM server is stopped when the command displays the following status message:

```
Application Server is stopped
```

If the command displays a different message, repeat step 3 iii. Do not proceed to the next step until the server is stopped.

Note — Do not close the console window on the main server station. It is required for starting the main server later in the procedure.

4 Log in as a user with root-equivalent privileges on the database station.

5 Enter the following at the CLI prompt to stop the 5620 SAM database application:

```
# /etc/rc3.d/S95db5620sam stop ↵
```

Do not proceed until the command returns the following text string:

```
Done
```

6 Enter the following at the prompt to run the Oracle SGA reconfiguration script:

```
# /opt/5620sam/db_name/install/config/db_name/SGA_reconfig.sh ↵
```

where *db_name* is the name of the 5620 SAM database, typically samdb

7 When the script execution is complete, enter the following at the CLI prompt to reboot the database station:

```
# shutdown -y -i6 -g0 ↵
```

The database station reboots.

8 When the database station is initialized, enter the following at the CLI prompt on the main server station to start the 5620 SAM main server:

```
bash$ ./nmsserver.bash start ↵
```

Procedure 6-2 To reconfigure the Oracle SGA after a database RAM change in a redundant 5620 SAM deployment

Perform this procedure after a change in the amount of RAM on the database stations in a redundant 5620 SAM deployment.

Note — You require root or root-equivalent user privileges on each database station to perform this procedure.

1 Log in as a user with root-equivalent privileges on the standby database station.

2 Enter the following at the CLI prompt to stop the 5620 SAM database application:

```
# /etc/rc3.d/S95db5620sam stop ↵
```

Do not proceed until the command returns the following text string:

```
Done
```

3 Enter the following at the prompt to run the Oracle SGA reconfiguration script:

```
# /opt/5620sam/db_name/install/config/db_name/SGA_reconfig.sh ↵
```

where *db_name* is the name of the 5620 SAM database, typically samdb

4 When the script execution is complete, enter the following at the CLI prompt to reboot the standby database station:

```
# shutdown -y -i6 -g0 ↵
```

The database station reboots.

5 When the standby database station is initialized, perform the following steps to initiate a database switchover.

i Log in to a 5620 SAM client GUI as a user with one of the following assigned scope of command roles:

- Administrator
- SAM Management and Operations

ii Choose Administration→System Information from the 5620 SAM main menu. The System Information form opens with the General tab displayed.

iii Click on the Switchover button. A dialog box appears.

Note — The Switchover button is disabled when the proper switchover conditions are not in place, for example, if the standby database is not fully initialized. See the *5620 SAM User Guide* for more information about database switchovers.

iv Respond to the dialog-box prompt.

v Click on the Yes button. The 5620 SAM server performs the database switchover.

6 When the switchover is complete, log in as a user with root-equivalent privileges on the primary database station.

7 Perform steps 2 to 5 on the primary database station.

6.4 Relinking the Oracle executable files

You must relink the Oracle executable files on a 5620 SAM database station after you apply an OS patch, or after an OS upgrade.

Note 1 — You require Oracle management user privileges on the database station to perform this procedure.

Note 2 — This procedure requires a reboot of the 5620 SAM database station.

Procedure 6-3 To relink the Oracle executable files

1 Log in to the database station as the Oracle management user.

2 Open a console window.

3 Enter the following at the prompt to run the relinking script:

```
bash$
/opt/5620sam/database_name/install/config/database_name/relinkOr
acle.sh ↵
```

where *database_name* is the name of the 5620 SAM database, for example, samdb on a standalone database station

The script relinks the Oracle executable files.

4 When the script execution is complete, reboot the database station.

6.5 Backing up a 5620 SAM database

Alcatel-Lucent recommends that you frequently back up the 5620 SAM database to prevent the loss of network data in the event of a database failure. It is good practice to perform a backup after you make major changes to the network.

You can use the 5620 SAM client GUI to schedule a regular database backup or perform an immediate backup. You can also use a CLI script to perform a backup. See the *5620 SAM User Guide* for database backup configuration information.

Because a database backup is a resource-intensive and time-consuming process, Alcatel-Lucent recommends that database backups occur only during times of low activity.

6.6 Restoring a 5620 SAM database

You can restore a 5620 SAM database using a backup copy.

Note — Before you perform a database restore operation, you must shut down the databases and main servers in the 5620 SAM system. Contact Alcatel-Lucent technical support before you attempt to perform a database restore.

In a redundant 5620 SAM system, you must perform one or both of the following to regain database function and redundancy:

- Restore the primary database.
- Reinstantiate the standby database.

Both operations are required after a primary database failure. After a standby database failure, no restore operation is required, but you must reinstantiate the standby database to restore redundancy. You can use the 5620 SAM client GUI or a CLI script to reinstantiate a database.

Note 1 — In a redundant 5620 SAM system, you can restore a database backup only on a primary database station. To restore a database backup on a station other than the primary station, you must do the following on the station before you attempt the restore:

- Uninstall the 5620 SAM database, if it is installed.
- Install a primary database on the station.

Note 2 — In a redundant 5620 SAM system, you can reinstantiate a database only on a standby database station. To reinstantiate a database on a station other than the standby station, you must do the following on the station before you attempt the reinstantiation:

- Uninstall the 5620 SAM database, if it is installed.
- Install a standby database on the station.

See Procedure 6-4 for information about restoring a standalone 5620 SAM database. See Procedure 6-5 for information about restoring a redundant 5620 SAM database.

Procedure 6-4 To restore the database in a standalone 5620 SAM system

Perform this procedure to restore a standalone 5620 SAM database using a backup copy of the database. You require the following to perform this procedure:

- a database backup file set from the same 5620 SAM release
- the 5620 SAM database installation utility used to create the database, for example, during the most recent installation or upgrade
- the database name, database instance name, and the user names and passwords specified during database creation
- the user name and password of a 5620 SAM client account that has the admin scope of command role
- the original file path of the database backup
- root or root-equivalent user privileges on the main server and database stations
- samadmin user privileges on the main server station
- Oracle management user privileges on the main server and database stations

1 If the database backup file set is on the database station, copy the file set to another station for safekeeping.

2 Perform the following steps to stop the 5620 SAM main server.

i Log in to the main server station as the samadmin user.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iv Enter the following at the CLI prompt to stop the 5620 SAM server software:

```
bash$ ./nmsserver.bash stop ↵
```

v Enter the following at the CLI prompt to display the 5620 SAM server status:

```
bash$ ./nmsserver.bash appserver_status ↵
```

The command displays a status message.

vi The 5620 SAM server is stopped when the command displays the following status message:

```
Application Server is stopped
```

If the command displays a different message, wait 5 m and repeat step 2 v. Do not proceed to the next step until the server is stopped.

3 Perform the following steps to disable the 5620 SAM main server startup daemon.

i Enter the following at the CLI prompt to switch to the root user:

```
# su - ↵
```

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt:

```
# mv S975620SAMServerWrapper
inactive.S975620SAMServerWrapper ↵
```

4 Perform the following steps to stop the 5620 SAM database.

i Log in to the database station as a user with root or root-equivalent privileges.

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt to stop the Oracle proxy daemon:

```
# ./S965620SAMOracleProxyWrapper stop ↵
```

iv Enter the following at the CLI prompt to stop the 5620 SAM database daemon:

```
# ./S95db5620sam stop ↵
```

Do not proceed until the command displays the following text string:

```
Done
```

5 Perform the "To uninstall the 5620 SAM database software" procedure in the *5620 SAM | 5650 CPAM Installation and Upgrade Guide*.

Note 1 — Ensure that the Uninstall Oracle Software parameter on the Uninstall Oracle Software panel is not selected. The Oracle software is required for the restored database.

Note 2 — Do not perform the final step that describes removing files.

6 Log in to the database station as a user with root or root-equivalent privileges.

7 Remove any files that remain in the *install_directory*/tablespace and *install_directory*/archvelog directories

where *install_directory* is the database installation directory, typically /opt/5620sam/samdb

8 Verify that the database backup file set is in the original backup directory on the database station. If it is not, copy the backup file set saved in step 1 to the original backup directory.

Note — The path to the backup file set must be the same as the initial path to the file set after backup creation.

9 Open a console window.

10 Enter the following at the CLI prompt to switch to the Oracle management user:

```
# su - Oracle_management_user_name ↵
```

where *Oracle_management_user_name* is the name of the UNIX account with Oracle management privileges, typically oracle

11 Perform one of the following to open the 5620 SAM database installation utility.

a On a SPARC station, enter the following at the CLI prompt:

```
bash$ path/DBConfig_SAM_8_0_revision.bin ↵
```

where
path is the file path of the 5620 SAM database installation utility
revision is the revision identifier, such as R1, R3, or another descriptor

b On an x86-based station, enter the following at the CLI prompt:

```
bash$ path/DBConfig_x86_SAM_8_0_revision.bin ↵
```

where
path is the file path of the 5620 SAM database installation utility
revision is the revision identifier, such as R1, R3, or another descriptor

The 5620 SAM database installation utility opens.

12 Perform the following steps.

i Click on the Next button.

ii Accept the terms of the license agreement in the Software License Agreement panel.

iii Click on the Next button.

iv Choose Restore a Database in the Choose Installation Type panel.

v Click on the Next button.

vi Choose Do not install Oracle Software in the Install Oracle Software panel.

vii Click on the Next button.

viii Click on the Install button. The installer prepares to restore the database.

ix Click on the Next button.

x Configure the parameters in each successive panel until the Database Restore panel is displayed. Use the values recorded during the most recent database installation or upgrade, and click on the Next button in each panel to continue.

xi Click on the Start Process button in the Database Restore panel. The database restore process begins.

Note — A database restore takes considerable time, depending on the database size.

xii When the Installation Complete panel is displayed, open a separate console window and run the script specified in the panel.

xiii When the script execution is complete, click on the Done button to close the installation utility. The database begins to initialize.

13 Perform the following steps to enable the 5620 SAM main server startup daemon.

i Log in to the main server station as a user with root or root-equivalent privileges.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iv Enter the following at the CLI prompt:

```
# mv inactive.S975620SAMServerWrapper
S975620SAMServerWrapper ↵
```

14 Perform the following steps to start the 5620 SAM main server.

i Log in to the main server station as the samadmin user.

ii Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iii Enter the following at the CLI prompt to start the 5620 SAM server software:

```
bash$ ./nmsserver.bash start ↵
```

15 Close the open console windows on each station.

Procedure 6-5 To restore the database in a redundant 5620 SAM system

Perform this procedure to do the following in a collocated or distributed redundant 5620 SAM system:

- restore a database using a database backup created on the same station; this station is called the primary database station in this procedure
- regain database redundancy when the database restore is complete by reinstantiating the restored primary database on the standby database station

You require the following to perform this procedure:

- a database backup file set from the same 5620 SAM release
- the 5620 SAM database installation utility used to create the database, for example, during the most recent installation or upgrade
- the database name, database instance names, and the user names and passwords specified during database creation
- the user name and password of a 5620 SAM client account that has the admin scope of command role
- the original file path of the database backup
- root or root-equivalent user privileges on the main server and database stations
- samadmin user privileges on the main server stations
- Oracle management user privileges on the main server and database stations

1 If the database backup file set is on the primary database station, copy the file set to another station for safekeeping.

2 Perform the following steps to stop the standby 5620 SAM main server.

i Log in to the standby main server station as the samadmin user.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iv Enter the following at the CLI prompt to stop the 5620 SAM server software:

```
bash$ ./nmsserver.bash stop ↵
```

v Enter the following at the CLI prompt to display the 5620 SAM server status:

```
bash$ ./nmsserver.bash appserver_status ↵
```

The command displays a status message.

vi The 5620 SAM server is stopped when the command displays the following status message:

```
Application Server is stopped
```

If the command displays a different message, wait 5 m and repeat step 2 v. Do not proceed to the next step until the server is stopped.

3 Perform the following steps to disable the standby 5620 SAM main server startup daemon.

i Enter the following at the CLI prompt to switch to the root user:

```
# su - ↵
```

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt:

```
# mv S975620SAMServerWrapper
inactive.S975620SAMServerWrapper ↵
```

4 Perform the following steps to stop the standby 5620 SAM database.

i Log in to the standby database station as a user with root or root-equivalent privileges.

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt to stop the Oracle proxy daemon:

```
# ./S965620SAMOracleProxyWrapper stop ↵
```

iv Enter the following at the CLI prompt to stop the 5620 SAM database daemon:

```
# ./S95db5620sam stop ↵
```

Do not proceed until the command displays the following text string:

```
Done
```

5 Perform the following steps to stop the primary 5620 SAM main server.

i Log in to the primary main server station as the samadmin user.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the server binary directory:

bash$ **cd *path*/nms/bin** ↵

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iv Enter the following at the CLI prompt to stop the 5620 SAM server software:

bash$ **./nmsserver.bash stop** ↵

v Enter the following at the CLI prompt to display the 5620 SAM server status:

bash$ **./nmsserver.bash appserver_status** ↵

The command displays a status message.

vi The 5620 SAM server is stopped when the command displays the following status message:

```
Application Server is stopped
```

If the command displays a different message, wait 5 m and repeat step 2 v. Do not proceed to the next step until the server is stopped.

6 Perform the following steps to disable the primary 5620 SAM main server startup daemon.

i Enter the following at the CLI prompt to switch to the root user:

```
# su - ↵
```

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt:

```
# mv S975620SAMServerWrapper
inactive.S975620SAMServerWrapper ↵
```

7 Perform the following steps to stop the primary 5620 SAM database.

i Log in to the primary database station as a user with root or root-equivalent privileges.

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt to stop the Oracle proxy daemon:

```
# ./S965620SAMOracleProxyWrapper stop ↵
```

iv Enter the following at the CLI prompt to stop the 5620 SAM database daemon:

```
# ./S95db5620sam stop ↵
```

Do not proceed until the command displays the following text string:

```
Done
```

8 Perform the "To uninstall the 5620 SAM database software" procedure in the *5620 SAM | 5650 CPAM Installation and Upgrade Guide*.

Note 1 — Ensure that the Uninstall Oracle Software parameter on the Uninstall Oracle Software panel is not selected. The Oracle software is required for the restored database.

Note 2 — Do not perform the final step that describes removing files.

9 Log in to the primary database station as a user with root or root-equivalent privileges.

10 Remove any files that remain in the *install_directory*/tablespace and *install_directory*/archvelog directories

where *install_directory* is the database installation directory, typically /opt/5620sam/samdb

11 Verify that the database backup file set is in the original backup directory on the primary database station. If it is not, copy the backup file set saved in step 1 to the original backup directory.

Note — The path to the backup file set must be the same as the initial path to the file set after backup creation.

12 Open a console window.

13 Enter the following at the CLI prompt to switch to the Oracle management user:

```
# su - Oracle_management_user_name ↵
```

where *Oracle_management_user_name* is the name of the UNIX account with Oracle management privileges, typically oracle

14 Perform one of the following to open the 5620 SAM database installation utility.

a On a SPARC station, enter the following at the CLI prompt:

```
bash$ path/DBConfig_SAM_8_0_revision.bin ↵
```

where
path is the file path of the 5620 SAM database installation utility
revision is the revision identifier, such as R1, R3, or another descriptor

b On an x86-based station, enter the following at the CLI prompt:

```
bash$ path/DBConfig_x86_SAM_8_0_revision.bin ↵
```

where
path is the file path of the 5620 SAM database installation utility
revision is the revision identifier, such as R1, R3, or another descriptor

The 5620 SAM database installation utility opens.

15 Perform the following steps.

i Click on the Next button.

ii Accept the terms of the license agreement in the Software License Agreement panel.

iii Click on the Next button.

iv Choose Restore a Database in the Choose Installation Type panel.

v Click on the Next button.

vi Choose Do not install Oracle Software in the Install Oracle Software panel.

vii Click on the Next button.

viii Click on the Install button. The installer prepares to restore the database.

ix Click on the Next button.

x Configure the parameters in each successive panel until the Database Restore panel is displayed. Use the values recorded during the most recent database installation or upgrade, and click on the Next button in each panel to continue.

xi Click on the Start Process button in the Database Restore panel. The database restore process begins.

Note — A database restore takes considerable time, depending on the database size.

xii When the Installation Complete panel is displayed, open a separate console window and run the script specified in the panel.

xiii When the script execution is complete, click on the Done button to close the installation utility. The database begins to initialize.

16 Perform the following steps to enable the primary 5620 SAM main server startup daemon.

i Log in to the primary main server station as a user with root or root-equivalent privileges.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iv Enter the following at the CLI prompt:

```
# mv inactive.S975620SAMServerWrapper
S975620SAMServerWrapper ↵
```

17 Perform the following steps to start the primary 5620 SAM main server.

i Enter the following at the CLI prompt to switch to the samadmin user:

```
# su - samadmin ↵
```

ii Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iii Enter the following at the CLI prompt to start the 5620 SAM server:

```
bash$ ./nmsserver.bash start ↵
```

iv Enter the following at the CLI prompt to check the server status:

```
bash$ ./nmsserver.bash -s nms_status ↵
```

The command returns server status information.

If the main server is not completely started, the first line of status information is the following:

```
Main Server is not ready...
```

The 5620 SAM server is completely started when the command returns the following line of output:

```
 -- Primary Server is UP
```

v If the command output indicates that the server is not completely started, wait five minutes and then repeat step 17 iv.

Note — Do not proceed to the next step until the server is completely started.

18 Perform the following steps to start the standby 5620 SAM database.

i Log in to the standby database station as a user with root or root-equivalent privileges.

ii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iii Enter the following at the CLI prompt to start the 5620 SAM database daemon:

```
# ./S95db5620sam start ↵
```

Do not proceed until the command displays the following text string:

```
Done
```

iv Enter the following at the CLI prompt to start the Oracle proxy daemon:

```
# ./S965620SAMOracleProxyWrapper start ↵
```

19 Perform the following steps to enable the standby 5620 SAM main server startup daemon.

i Log in to the standby main server station as a user with root or root-equivalent privileges.

ii Open a console window.

iii Enter the following at the CLI prompt to change to the /etc/rc3.d directory:

```
# cd /etc/rc3.d ↵
```

iv Enter the following at the CLI prompt:

```
# mv inactive.S975620SAMServerWrapper
S975620SAMServerWrapper ↵
```

20 Perform the following steps to start the standby 5620 SAM main server.

i Log in to the standby main server station as the samadmin user.

ii Enter the following at the CLI prompt to change to the server binary directory:

```
bash$ cd path/nms/bin ↵
```

where *path* is the 5620 SAM server installation location, typically /opt/5620sam/server

iii Enter the following at the CLI prompt to start the 5620 SAM server:

```
bash$ ./nmsserver.bash start ↵
```

21 Perform one of the following to reinstantiate the restored primary database on the standby database station.

Note — Unlike a CLI script, the 5620 SAM client GUI displays a progress indicator during reinstantiation.

a Use the 5620 SAM client GUI. Perform the following steps.

i Log in to the client GUI as a user with the 5620 SAM admin scope of command role.

ii Choose Administration→System Information from the 5620 SAM main menu. The System Information form opens with the General tab displayed.

iii Click on the Re-Instantiate Standby button. A dialog box appears.

Note — The Re-Instantiate Standby button may not display depending on your scope of command. See the *5620 SAM User Guide* for more information about scope of command.

iv Click on the Yes button. The database reinstantiation begins.

The client GUI status bar and the System Information form display the reinstantiation status. The Standby Re-instantiation State changes from In Progress to Success when reinstantiation is complete. The Last Attempted Standby Re-instantiation Time displays the start time of the current reinstantiation.

v Close the System Information form when the reinstantiation is complete.

b Use a CLI script. Perform the following steps.

i Log in to the primary main server station as the samadmin user.

ii Open a console window.

iii Navigate to the 5620 SAM server binary directory, typically /opt/5620sam/server/nms/bin.

iv Enter the following at the CLI prompt:

```
./reinstantiatedb.bash -u username -p password ↵
```

where
username is the user name of a 5620 SAM client account that has the admin scope of command role
password is the password for the user account

The script displays the following confirmation message:

```
This action will rebuild the standby database.

Do you want to proceed? (YES/no) :
```

v Enter the following case-sensitive text at the prompt to begin the reinstantiation:

```
YES ↵
```

The 5620 SAM server begins to reinstantiate the database on the standby database station. Progress is indicated by a rolling display of dots in the console window. Database reinstantiation is complete when the CLI prompt is again displayed.

vi Close the console window when the reinstantiation is complete.

22 Close the open console windows on each station.

23 Open a 5620 SAM GUI client to verify that the 5620 SAM servers and databases are functional. The server and database status are displayed in the status bar at the bottom of the GUI.

6.7 Listing customer service information

Record customer service information to:

- document which devices and interfaces are used to handle customer traffic
- provide raw data for post-processing customer trends and customer information

Procedure 6-6 To list service information

1 Choose Manage→Service→Services from the 5620 SAM main menu. The Manage Services form opens.

2 Specify a filter to narrow the services listed. You can filter based on service ID or other criteria.

3 Click on the Search button. The filtered list of services is displayed.

4 Save the list of customer services.

i Order the columns of service data as required. For example, you can click on the Service Name heading to sort the services by name.

ii Right-click on the Service Name heading and choose Save To File from the contextual menu. The Save form opens.

iii Enter a filename for the customer services; for example:

ABCindustries_services_*yearmonthday*

iv Click on the Files of Type button to specify the file type.

v Browse to choose a location in which to save the file.

vi Click on the Save button. The file is saved to the specified location with the appropriate file extension.

5 You can record other details about the services. For example, you can list Layer 2 access interface information for the customer's VPLS or VLL services.

i Choose Manage→Service→Services→Create from the 5620 SAM main menu. The Manage Service form opens.

ii Click on the Create button and choose VPLS or VLL. The VPLS Service (Create) form or VLL form opens.

iii Order the columns of Layer 2 access interface data as required. For example, you can click on the Service Name heading to sort the Layer 2 access interface data based on the service name.

iv Right-click on the Service Name heading and choose Save To File from the contextual menu. The Save form opens.

v Enter a filename for the customer service Layer 2 interface list; for example:

ABCindustries_services_l2interfacesused_*yearmonthday*

vi Click on the Files of Type button to specify the file type.

vii Browse to choose a location in which to save the file.

viii Click on the Save button. The file is saved to the specified location with the appropriate file extension.

6 Save the customer service data lists for post-processing on another station.

6.8 Checking for duplicate service or resource names

Alcatel-Lucent recommends that you develop standardized naming conventions before you configure network objects, in order to:

- facilitate identifying the object type
- ensure that data passed to a northbound OSS interface or southbound in a data file for processing is named consistently throughout the management domain

It is good practice to include information such as the following when creating or configuring an object using the object properties form:

- the object type; for example, VPRN
- a customer association to the object; for example, site 1.1.1.1 for XYZ Industries
- source and destination endpoint identifiers; for example, the devices at each end of an LSP
- ports and IP addresses used

You can check for duplicate names to ensure that naming conventions are followed and to help prevent confusion when you deal with customers or operations staff. Procedure 6-7 uses ports as the objects to check for duplicate names.

Procedure 6-7 To check for duplicate port descriptions

Perform this procedure to check for duplicate object descriptions on all managed devices. This procedure uses ports as the object type. but you can also check logical entity names; for example, service or policy names. This procedure assumes that the Description parameter uniquely identifies each port.

1 Choose Manage→Equipment from the 5620 SAM main menu. The Manage Equipment form appears.

2 Generate a list of all ports:

i Choose Port (Physical Equipment) from the object drop-down list.

ii Configure the filter for the Administrative State column to display devices that are administratively up.

iii Click on the Search button.

3 Click on the Description heading to list ports alphabetically by description.

4 Scan the list for duplicate names.

Note — By default, ports are assigned a description based on the card type when the Description parameter is not configured.

5 If you find a duplicate description, you can modify the description based on your naming conventions.

i Click on the port row with the duplicate description.

ii Click on the Properties button. The port configuration form opens.

iii Modify the Description parameter to uniquely describe the port.

iv Click on the OK button and confirm the action.

- The port configuration form is saved.
- The Description name on the Browse Equipment form is updated.
- The cursor remains on the port row, even if the row moves up or down the list.
- The port list refreshes with the modified description.

6 Click on the Close button.

Customer documentation and product support

Customer documentation

http://www.alcatel-lucent.com/myaccess

Product manuals and documentation updates are available at alcatel-lucent.com. If you are a new user and require access to this service, please contact your Alcatel-Lucent sales representative.

Technical Support

http://support.alcatel-lucent.com

Documentation feedback

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