System Administrators Guide

Ericsson Multi Activation 5.0

ERICSSON

Contents

System Administrators Guide

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1 Introduction

This document is intended for system administrators of Ericsson Multi Activation. The document covers regular maintenance, node administration and corrective procedures.

1.1 Prerequisites

Prerequisites for the user of this document are as follows:

- System administration knowledge of Unix and Sun Solaris

- System administration knowledge of Sun Cluster

- Database administration knowledge of Oracle database

- Be familiar with third-party documentation

1.2 Typographical Conventions

This section describes the typographical conventions used in this document.

Table 1   Typographical Conventions

Convention	Description	Example
User Input	A command to enter in a Command Line Interface (CLI) exactly as written	`cd home`
Command Variables (Mandatory)	Values the user must specify	`<home_directory>`
Command Variables (Optional)	Optional	`[-t starttime-stoptime]`
GUI Objects	Menus, fields, buttons, and so on	Click the menu item **File > Exit**[1].
Key Combinations	Combinations of keys to press for a specific function	Press **Ctrl+x** to delete the selected value.[2]

Convention	Description	Example
System Elements	Command and parameter names, program names, path names, Uniform Resource Locators (URLs), and directory names.	The files are located in `/user/home/bin`
Output Information	Text the system displays	`System awaiting input`
Code Examples	Code examples	`grep ':title. ' $i | \awk`

(1) The greater than symbol (>) between two Graphical User Interface (GUI) objects indicates the operating sequence.
(2) The plus sign (+) indicates that the keys must be pressed simultaneously.

Table 2   Product Users

User	Prompt
root	`#`
adm	`adm>`
Boot-prompt	`ok`

Note: When a command is too long to fit into one row in the document, it is shown with a backslash (\) that the command continues on the next row. Do not leave out or add spaces at the command line compared to the document. Do not press space before or after the backslash as the example below:

```
# more /var/sog/logs/backup\
/system_backup_exec.log.yyyy.mm.dd.hh:mm:ss
```

1.3   Architecture Overview

The Figure 1 on page 3 shows the overall architecture of Ericsson Multi Activation in a layered presentation. The system is logically divided into three layers, named Load Balancer Layer, Processing Layer and Resource Layer. In physical deployment, the Processing Layer and Resource Layer can be integrated into one hardware node.
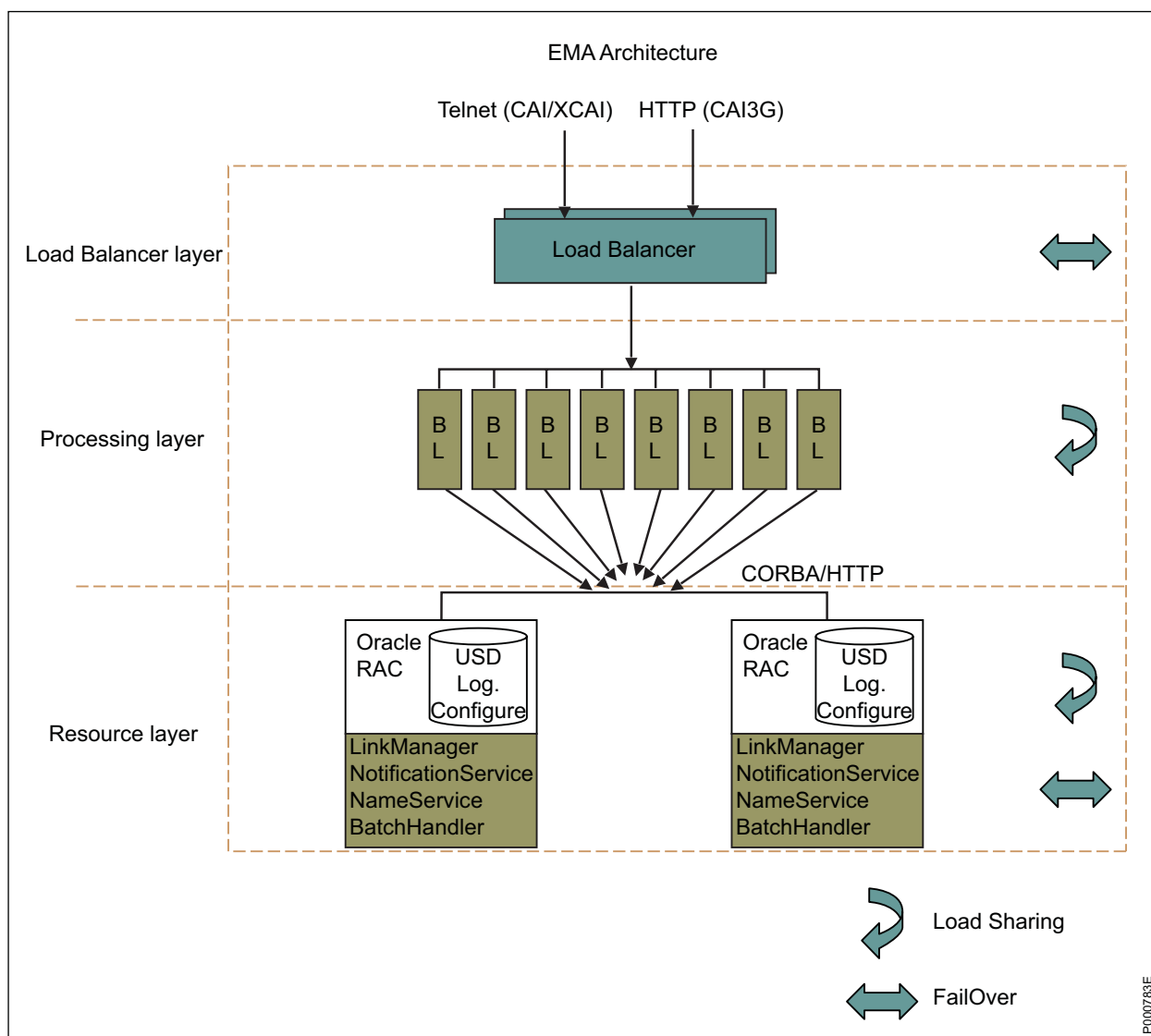
Figure 1   Ericsson Multi Activation Architecture Overview

1.3.1   Load Balancer Layer

The Load Balancer Layer distributes the provisioning and some other loads to different nodes in the Processing Layer. The Load Balancer Layer is only applicable when there is more than one server instance in Processing Layer. Failover function is needed in an High Availability (HA) deployment in order not to be the single point of failure. Two Load Balancers are used for achieving the high availability of the Load Balancer Layer. The Load Balancer is implemented by dedicated hardware. The Load Balancer has an error detection mechanism to detect the status of the server instances in Processing Layer.

The main incoming traffic for Ericsson Multi Activation includes:

- Customer Administration Interface (CAI) provisioning (TCP/IP)

- eXtended Customer Administration Interface (XCAI) provisioning (TCP/IP)

- Customer Administration Interface 3rd Generation (CAI3G) provisioning (SOAP)

- Configuration and provisioning from Ericsson Multi Activation administration GUI (HTTP)

- Configuration from Flexible Distributed System (FDS) administration tool (HTTP)

- Configuration from User and Subscription Management (USM) GUI (HTTP)

The objects above will be load balanced except for the Configuration from FDS administration tool which will be done on a node-by-node basis and in this area one system view is not supported.

The interfaces provided by the Load Balancer are CAI, XCAI, and CAI3G. The Load Balancer uses the corresponding interface provided by the Processing Layer. The Load Balancer finds the processing nodes based on the configuration in the Load Balancer and their status.

Hardware Load Balancer is not available for Two Nodes HA. Load Distribution feature is realized by Sun Cluster and implemented in Processing Layer.

1.3.2 Processing Layer

The Processing Layer contains software components that carry out the main processing of the incoming requests but do not keep any persistent data. A number of processing nodes that the layer can scale to is up to 8 nodes. The nodes can be in active(s)-active mode or active(s)-standby mode. In order not to lose throughput when one node fails it is possible to leave one node extra idle. Another alternative is to plan extra capacity into each of the nodes so when one node fails the other ones can take over all the traffic.

Ericsson Multi Activation Processing Layer uses Ericsson proprietary FDS system as the platform. Each of the processing nodes is a standalone FDS domain and there is no communication between them. When data synchronization is needed it is done with the database. When one node updates the data hence the other nodes immediately need to be updated. The database will send notifications to all nodes that have been subscribed.

The fact that all the nodes in the Processing Layer are the same makes the scalability solution highly available when there are two or more nodes. Rolling upgrade in the processing layer is also possible because the upgrade in the Processing Layer is done in zero down time.

The processing nodes find configuration from the resource nodes. In an HA setup the virtual address provided by clustering mechanism guarantees

that failover in the Resource Layer does not impact the addressing from the processing nodes. Note that operational connections would be reset.

In Two Nodes HA, load distribution is realized by Sun Cluster as a software load balancer. 1 MA Shared Address IP is needed to represent the Processing Layer. Provisioning load from Customer Administration System (CAS) toward this IP will be evenly distributed to both nodes.

For Standalone configuration, MA shared Address IP is also needed to represent the Processing Layer.

For Processing Nodes in Scalable HA configuration, a unique Shared Address IP is needed for each node to represent the Processing layer.

1.3.3 Resource Layer

The Resource Layer keeps all persistent data and serves concurrent requests from the Processing Layer. It contains the following services:

- Oracle RAC Database

- LinkManager

- Notification Service / Name Service

- BatchHandler

- Agent Controller

Oracle RAC Database running on the Resource Layer provides the Multi Activation system database.

Link Manager running on the Resource Layer manages all the connections to the NEs and affiliates as the only process in the whole system for outbound traffic (towards NEs and affiliates).

Notification Service running on the Resource Layer is used for accepting the Subscription from Operation and Support System (OSS) and sending out the defined system alarms to OSS.

BatchHandler running on the Resource Layer provides a Provisioning entry for batch job.

Agent Controller running on the Resource Layer provides a HA framework for standalone applications.

All services are monitored by Sun Cluster except Oracle RAC, and each of them needs a unique IP for one Multi Activation system.

Oracle RAC needs a unique VIP on each resource node for its own usage.

High Availability Solution

The HA solution in resource nodes consists of two parts:

1. High Available Application

   All the Ericsson Multi Activation application excluding database provides high availability by a failover service using Sun Cluster. If some part of Ericsson Multi Activation application failed to provide service, the service can be switched to the other resource node automatically.

   If Ericsson Multi Activation fails due to any software problem (for example file corrupted) or hardware problem (for example server failed), Ericsson Multi Activation will not be available unless the problem is resolved. This lowers the availability of Ericsson Multi Activation. As a solution to this, the HA feature is introduced to improve the availability of Ericsson Multi Activation. It enables Ericsson Multi Activation to recover from problems (both software and hardware) within a short downtime. This solution is based on Sun Cluster platform and all design is based on it and compliant to its rule.

   Sun Cluster 3.1 delivers HA through a combination of well-managed hardware and software components. Availability is maximized by configuring the cluster without any single points of failure, including public network, cluster interconnect, storage and software service components. Data integrity is maintained by the cluster feature Global File System (GFS), ensuring that only healthy nodes are allowed to participate in delivery of service. The health of each individual node and its hardware and software components are constantly monitored. Failing or failed nodes are prevented from delivering service and access data. Failed software components can be restarted within the cluster and failed nodes can be recovered in the cluster after troubleshooting.

   HA clusters add availability features on top of operating system infrastructures. Availability is achieved by using Sun Cluster agents that monitor application services health on individual cluster nodes. In case of service failure (due to the failure of disk, network, or the application service itself), the application will try to restart on the server that was operational. If this fails it will be restarted on the other node. Individual cluster nodes are primarily administered independently of each other.

2. Horizontal Scalable Database

   Ericsson Multi Activation database provides horizontal scalability based on Oracle RAC. The database work load will be shared by all resource nodes, and it can be extended via adding more resource nodes at runtime.

Oracle RAC is a cluster database with a shared cache and disk architecture to provide highly scalable and available database solutions for all business applications.

2 Ericsson Multi Activation Overview

This chapter describes the software and directory structure used in Ericsson Multi Activation. It also gives an overview about configuration files and log files in Processing and Resource Node. The scripts used in Ericsson Multi Activation to start and stop processes are listed.

2.1 Software

The Ericsson Multi Activation has a component-based architecture. The components communicate using Common Object Request Broker Architecture (CORBA) solution set.

The major Third Party Product (3PP) software installed on Ericsson Multi Activation server is found in Table 3 on page 7.

Table 3   3PP Software

Software	Description	Available
SUN Solaris 10	Solaris 10 is the operating system used in Ericsson Multi Activation servers	Processing Node Resource Node
Mozilla	By default, Mozilla is installed when installing the operating system. It is the web browser for user `sogadm` to manage Ericsson Multi Activation on the server. To be able to launch Mozilla as user `sogadm` enter command mozilla	Processing Node Resource Node
Solaris Volume Manager (SVM)	SVM formerly DiskSuite is used for disk mirroring and striping of disks	Processing Node Resource Node
VisiBroker	Borland Visibroker is the CORBA solution set implementation used in the Ericsson Multi Activation system	Processing Node Resource Node
X.25 (optional)	Solstice X.25 is used as X.25 driver in the Ericsson Multi Activation server. (X.25 is not supported in the Scalable HA configuration).	Processing Node Resource Node

Software	Description	Available
Apache web server	Apache web server is used for Ericsson Multi Activation GUI	Processing Node Resource Node
HSI / P (optional)	High speed serial interface	Processing Node
Visinotify (optional)	CORBA solution set implementation is used in the Ericsson Multi Activation system to send alarms to Core Network - Operation Support System (CNOSS).	Resource Node
Oracle	The relational database used in Resource Layer	Resource Node
SUN Cluster	SUN Cluster is used not only for HA solution	Processing Node Resource Node
ESA	Ericsson Simple Network Management Protocol (SNMP) Agent	Processing Node Resource Node

2.2 Software Version Check

Table 4 on page 8 contains some of the commands used to check the versions of related programs for Processing Node. Run the command # **`su - sogadm`** as user `sogadm`, then run the following commands listed in table.

The Function Specification lists the 3PP software versions used in this release.

Table 4   Check Version of Programs

Program	Command

Solaris	`more /etc/release`
	
	`showrev`

OS kernel version	`uname -a`

Specific OS patch	`showrev -p`
	
	`patchadd -p`

VisiBroker	`vbver-v /opt/sog/bin/visinotify`
Apache webserver	`httpd -v`
Ericsson Multi Activation packages	`pkginfo -c sogappl -x`
X.25	`pkginfo -x SUNWx25a`

Program	Command
HSI/P	`pkginfo -x SUNWhsip`
Oracle	`emadba>` **`sqlplus / as sysdba`** `SQL>`**`select BANNER from v$version;`**
SUN Cluster	`scinstall -pv`

2.3 Ericsson Multi Activation Parts Structure

Ericsson Multi Activation Processing Node consists of a number of components that exchange data with CORBA (see Figure 2 on page 10).
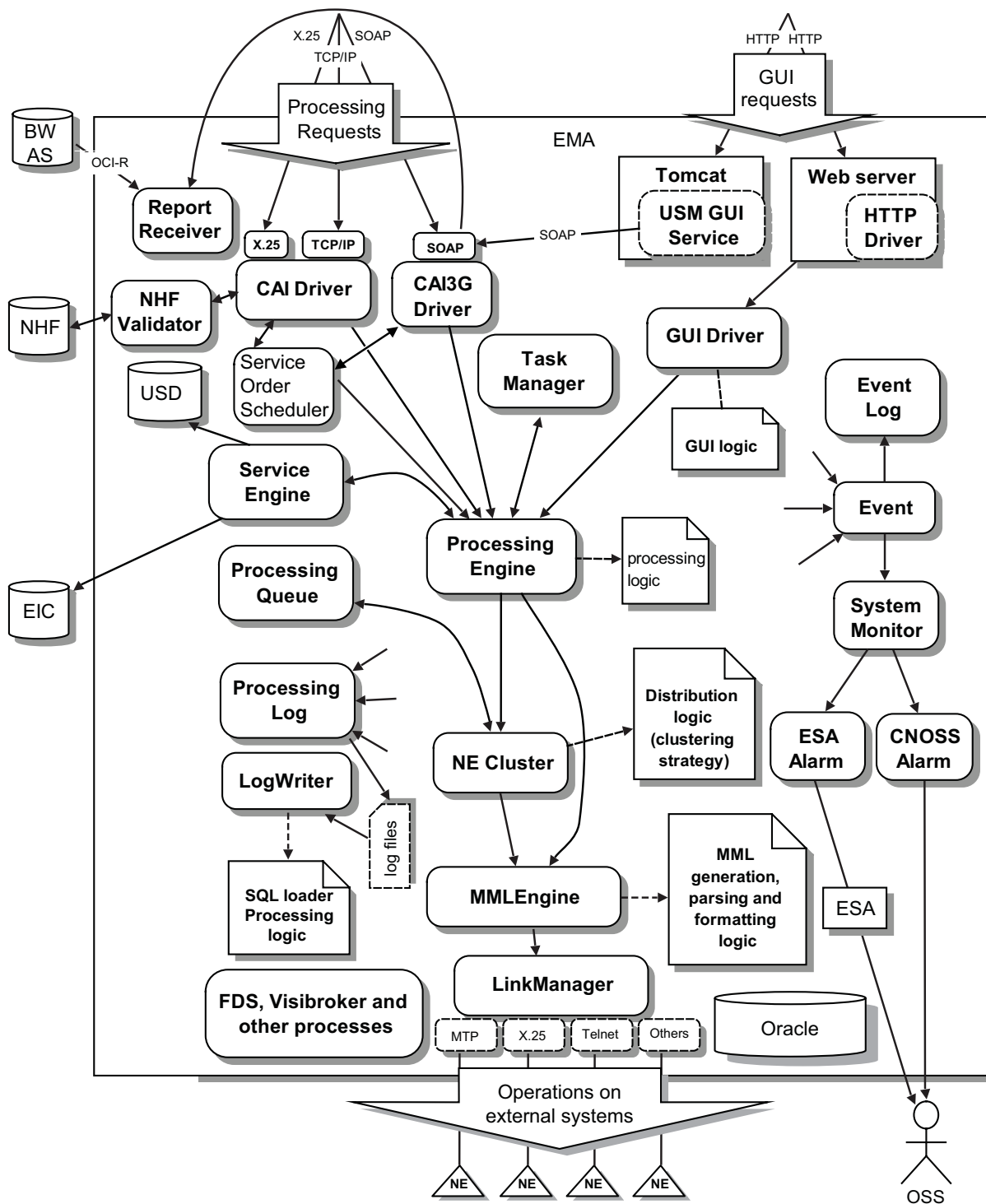
Figure 2   Ericsson Multi Activation Processing Node Structure

Ericsson Multi Activation Resource Node uses CORBA and a few 3PP databases to exchange data (see Figure 3 on page 11).
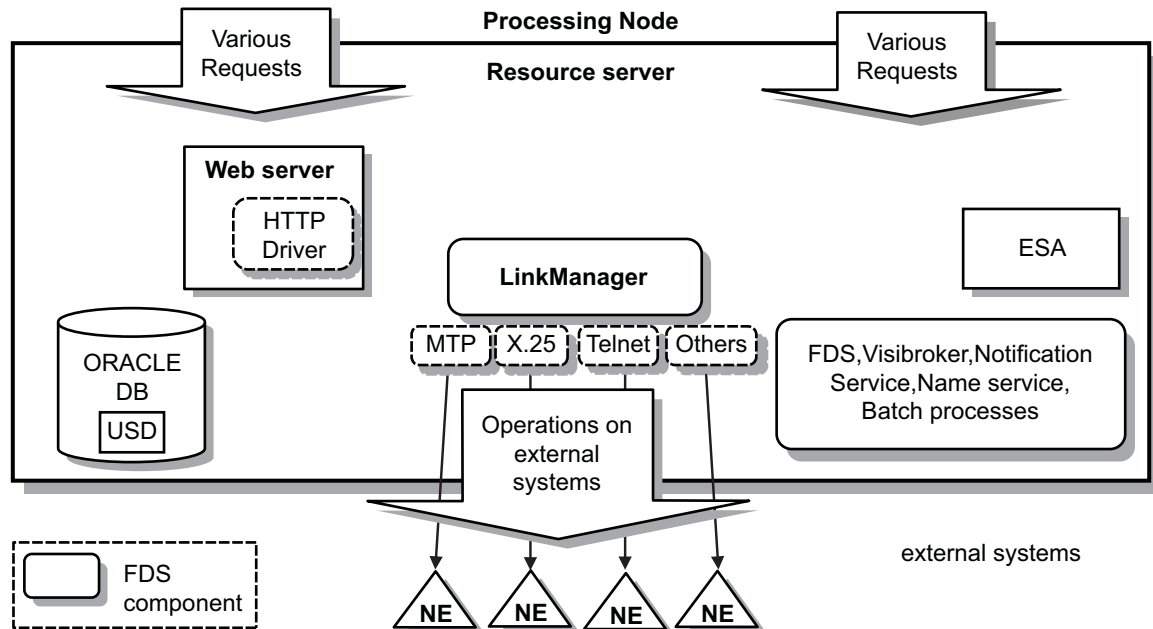
Figure 3   Ericsson Multi Activation Resource Node Structure

Table 5 on page 11 describes the parts in Processing Node.

Table 5   Components in Processing Node

Components	Description
CAI Driver	Handles the CAI interface between Ericsson Multi Activation and CAS system.
CAI3G Driver	Handles the CAI3G interface between Ericsson Multi Activation and CAS system.
GUI Driver	Handles the interface between the Ericsson Multi Activation server and the Ericsson Multi Activation GUIs (with help of the web server).
Processing Engine	Runs most of the logic for provisioning and administration. Main component of Ericsson Multi Activation.
Service Order Scheduler	Handles asynchronous provisioning feature in Ericsson Multi Activation.
Service Engine	Implements the logic for user and subscription management data model.
MML Engine	Handles the version specific Network Element (NE) command generation and response parsing.

Components	Description
NE Cluster	Handles the sending of the same data to multiple NEs.
Processing Queue	Stores the data for later re-send, if the Cluster component is unable to update all of its NEs consistently.
Task Manager	Stores and executes scheduled tasks needed in the system.
Processing Log (ProcLog)	Maintains the log of all commands sent through the Ericsson Multi Activation. It receives log items from all components in Ericsson Multi Activation and writes the log data into processing log raw file (the xml file created by ProcLog component as processing log intermediate file) in local disk.
Log Writer	Reads processing log raw files, then transforms and loads the log data into the processing log database.
Event Server	Receives and distributes events within Ericsson Multi Activation.
Event Log	Logs all events that have been sent in Ericsson Multi Activation.
System Monitor	Configured for listening to certain events. These events will be monitored and compiled to alarms.
CNOSS Alarm	Triggers specified events from the System Monitor as alarms and send to OSS.
ESA Alarm	Triggers specified events from the System Monitor as alarms and send to OSS via ESA.

Table 6 on page 12 describes the parts in Resource Node

Table 6   Components in Resource Node

Components	Description
Link Manager	Handle the connections and interfaces to external systems (NEs) that Ericsson Multi Activation has been configured for.
Notification Service/Name Service	Handle the connection between the CNOSS Alarm component and the actual CNOSS.

Oracle	Contain session information, stores shared configuration data amongst multiple Processing Nodes, Processing Queue , various processing log data, User service data. Also, the statistics data such as the number of NSOs in time interval can be retrieved. **Note**: User and Service Database (USD) is contained in Oracle DataBase.
Batch Handler	Control and execute batch files. Handle automatically a large amount of subscriptions. For example connect a range of new subscribers or change a range of existing subscribers.
USD	The central database to store user and subscription management data like user, entity, service and service subscription.
ESA Alarm	Triggers specified events from the System Monitor as alarms and send to OSS via ESA.

Ericsson Multi Activation Processing Layer and Resource Layer uses Ericsson proprietary FDS system as the platform. The FDS system contains FDS Server, Plug-in Manager and a number of components.

The FDS Server is the controller of the system. It is used when components are created, deleted, started, stopped and restarted. Components are restarted when FDS Server gets a signal from Plug-in Manager that a component is not operational. Another important service is the lookup service used to establish connections between components.

The Plug-in Manager is a supervisory program that can start components if instructed by the FDS Server. It also supervises components and reports to the FDS Server if a component is not operational. At start up, the Plug-in Manager loads the required components into local cache from a repository (FTP) server. This allows for central configuration of Ericsson Multi Activation.

2.4 Configuration Information

There are several standard processes used by Ericsson Multi Activation application.

User `root` is the owner of the web server process.

User `sogadm` is the owner of most other Ericsson Multi Activation related processes.

User `emadba` is the owner of Oracle database related process in Resource Node Standalone Availability and HA.

User `batchadm` is the owner of the Batch Handler process in Resource Node Standalone Availability and HA.

The customer can create own users for the Batch Handler and CAI interface in Resource Node Standalone Availability and HA.

2.4.1 Changing Sogadm Password

The Ericsson Multi Activation applications `sogadm` user is not the same as the UNIX `sogadm` user.

The password for the Ericsson Multi Activation application `sogadm` user must be changed to the same value on each node in the cluster.

Note: To change the password for `sogadm` in the Ericsson Multi Activation application, execute the `sogadm_passwd.sh` script as `root` or `sogadm` on each node with shortest possible intermediate delay.

This does not affect the password for the Unix `sogadm` user that can be set to another value if desired. To change the Ericsson Multi Activation sogadm user password, use the following command:

```
# /opt/sog/bin/sogadm_passwd.sh

Enter a new sogadm password: <new password>

Re-enter a new sogadm password: <new password>

- - - - - - - - - - -

[ Sending request ...]

...

...

Done.
```

3 Regular Maintenance

An administrator main responsibility is to supervise and check the Ericsson Multi Activation system, to control the partitions in use and to search for error reports that indicate problems.

Maintenance of hardware equipment, such as disk arrays, severs, battery and air filters, are not described in this document. Please refer to manufacturers manuals.

3.1 Maintenance Intervals

This section contains brief description of the tasks performed by the System Administrator when maintaining the Ericsson Multi Activation system. Details such as how to perform the tasks and expected output are found later in this section.

3.1.1 Maintenance Intervals Table

The maintenance intervals are shown as below table:

Table 7   Maintenance Intervals Table

Task	Daily	Weekly	Monthly
Check FDS server status	X		
Check Crontab Jobs	X		
System health check		X	
Check X.25 communication[1]	X		
Check the UNIX error logs	X		
Check Ericsson Multi Activation logs	X		
Check event log		X	
Check current status of Sun Cluster and its Components	X		
Check RAC Status	X		
Check the SUN Cluster error log	X		
Scan the UNIX file system and delete core files		X	
Remove snapshots		X	
Check disk space	X		
Check mail	X		

Table 7   Maintenance Intervals Table

Task	Daily	Weekly	Monthly
Check alarms in System Monitor	X		
Display system diagnostic information			X
Check status for processing and resource node	X		
Remove old database backup files		X	
Check the system time		X	
Check RR status[2]		X	
Check log files of RR[2]		X	
View the failed operations of RR[2]		X	
System backup			X
Data backup	X		
Maintain ORACLE	X		

(1) Only for systems where X.25 is installed.
(2) Only for the system where IMS Multimedia Telephony (IMT) 4 solution is used.

3.2   Maintenance Tasks

This section contains tasks to maintain the Ericsson Multi Activation System.

3.2.1   Checking FDS Server Status

The `emaps` command is similar to the UNIX `ps` command. It lists the servers (here known as components) known on a given node.

Run the following commands with `sogadm` as user:

su - sogadm

sogadm> **emaps**

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Connect to `FDSServer:FDS-PL` on`ema1453`...

```
Name              OS-pid  POA       Port  Service  Status Info
FDS-PL            28948   *         *     *        *      *
FDS-PM-PL         29481   *         *     *        *      *
EVENT             4052    *         *     *        *      *
```

```
MMLENGINE          4553    *       *   *       *       *
SYSTEMMONITOR      5019    *       *   *       *       *
PROCLOG            5477    *       *   *       *       *
PROCQUEUE          6543    *       *   *       *       *
CLUSTER            7315    *       *   *       *       *
GUIDRIVER          8123    *       *   *       *       *
CAI                9187    *       *   *       *       *
TASKMANAGER        9667    *       *   *       *       *
EVENTLOG           10355   *       *   *       *       *
ESAALARM           10991   *       *   *       *       *
LOGWRITER          11375   *       *   *       *       *
CAI3GDRIVER        12026   *       *   *       *       *
EXTENSIONCLIENT    7888    *       *   *       *       *
ORDERSCHEDULER     13368   *       *   *       *       *
PROCENGINE         26114   *       *   *       *       *
SERVICEENGINE      3492    *       *   *       *       *
```

Sun Microsystems Inc.   SunOS 5.10   Generic

January 2005

Connect to `FDSServer:FDS-RL` on `ema1453`...

```
Name               OS-pid  POA     Port Service StatusInfo
FDS-RL             27025   *       *    *       *       *
FDS-PM-RL          27499   *       *    *       *       *
NOTIFY             28493   *       *    *       *       *
NS                 28591   *       *    *       *       *
LINKMANAGER        28774   *       *    *       *       *
```

If there is necessity to kill component working improperly, use the `emaps -k` command that is similar to UNIX `kill` command for the specified component. The Plug-in Manager will restart the component. For example:

```
sogadm> emaps -k LINKMANAGER
```

Connect to `FDSServer:FDS-RL` on `onema43131` ...

`4433` is killed.

3.2.2 Checking Crontab Jobs

This section describes how to check daily backup and processing log raw files backup done by crontab jobs. If the tasks are found not executed, refer to Section 12 on page 161 to verify them.

Checking Daily Backup

Check that the daily backup of Ericsson Multi Activation database files has been made. The backup is done by a crontab job daily and the backup files can be found in the `/var/sog/backups/config/` directory.

If the crontab job has the default setting, there are backups for the last 7 days. A printout of the configuration directory for January 13, 2003 looks like:

`sogconfig_backup.030113-04:45`

`sogconfig_backup.030112-04:45`

`sogconfig_backup.030111-04:45`

`sogconfig_backup.030110-04:45`

`sogconfig_backup.030109-04:45`

`sogconfig_backup.030108-04:45`

`sogconfig_backup.030107-04:45`

Each file (`sogconfig_backup.<DATETIME>`) in `/var/sog/backups/config/` is a tar file which packaged the folder `/var/sog/data/database` at that time.

Another example of Processing Log file backed up from Oracle database can look like `PROCLOG_20050228_030004.dbf` and is found in `/disk031/oradata/backup/emalog/proclog` (in HA it is `/global/disk0031/oradata/backup/emalog/proclog`).

When some processing logs of yesterday are inserted after an automatically backup, the backup can be incomplete. After the export, when the LogWriter continues inserting the logs of yesterday, an event will be raised that indicates the LogWriter tries to write logs into a read only tablespace. When this occurs, execute the `change_mod.sh` script. This enables the tablespace to read write state, see Section 5.6.3 on page 55. Restart the LogWriter component. After writing all the days logs, execute the `export_proc_log.sh` script manually.

Checking Processing Log Raw Files Backup

Check the backup of processing log raw file. The backup is done by Log writer component. The backup files are found in

`/var/sog/backups/proclog/`*`<yyyyMMdd>`*. If the crontab job has the default setting, the latest 14 days backup will be kept.

14 days backup is based on standard Ericsson Multi Activation traffic model. The traffic characteristics and setting on customer sites maybe different from the model. For example, If the log level changed from 2 to 3 in normal provisioning load or daily high peak traffic become higher, the Ericsson Multi Activation log backup volume growth will become too fast, in extreme case all processing node disk space will be full less than 14 days. In order to avoid such scenario, the following ways could be applied:

1. Change the log backup clean day configuration of crontab job `sog_dump.sh`, the possible safe clean days should be calculated regarding to one day log backup disk space. For example, If the one day log backup disk space is 3G and the total backup disk space is 30G, then the safe clean days for log backup is 30/3 - 2 = 8 days.

    Run the following command to set the clean days of the backup proclog files:

    # **/opt/sog/maint/sog_dump.sh set_proclog_day 4**

    Set the proclog clean day to 4, `sog_dump.sh` will remove the backup proclog files of 4 days ago.

    Run the following command to show the clean days of the backup proclog files:

    # **/opt/sog/maint/sog_dump.sh get_proclog_day**

2. Manually clean the log backup files by "removing the oldest files" or "moving the oldest files to extra storage media".

Caution!

Ericsson Multi Activation will reboot if disk is fully occupied by log.

3.2.3   System Health Check

Health check is a tool to perform system health inspection. To run this tool, a configuration is required. In the configuration file, some parameters used by health check tool need defining, and a configuration template below is shipped together with this tool.

`/opt/sog/system/initialdata/0/healthcheck_scripts/inspect`
`or.cfg`

Detailed description for all parameters can be found in this template. Recommend to keep and backup this template so as to change the settings.

To run health check tool, complete the following steps:

1. Make a copy of the configuration template, tune the settings if necessary. Execute the command below to backup the template:

    ```
    # cp /opt/sog/system/initialdata/0/healthcheck_scripts\
    /inspector.cfg /var/tmp/inspector.cfg
    ```

2. Set the environment variable `CONFIG_FILE`

    For example,

    If `bash` or `zsh` is used, execute the command below:

    ```
    # export CONFIG_FILE=/var/tmp/inspector.cfg
    ```

    If `csh` is used, execute the command below:

    ```
    # setenv CONFIG_FILE /var/tmp/inspector.cfg
    ```

3. Execute the main script as root, the syntax is:

    ```
    # /opt/sog/bin/inspector.sh [inspection list | -h]
    ```

    If inspection list is not specified, all the inspection defined in the configuration file will be run. Otherwise, only the specified inspections will be run. The option of `-h` will just print out inspection list. When finished running inspection, the script will generate a report in form of a HTML file, and print out the path of the report.

    For example,

    ```
    # opt/sog/bin/inspector.sh "FILESYSTEM DATABASE"
    ```

    The above command will run inspections of FILESYSTEM and DATABASE only.

4. According to the output of the script, check the report using a Web browser

3.2.4 Checking X.25 Communication

Check that the X.25 Network is operational:

```
# /etc/init.d/x25.control status
```

Note: This is only necessary for systems where X.25 is installed.

3.2.5 Checking Unix Error Log Files

To analyze the last 100 administrator messages in the file `/var/adm/messages` and `/var/log/syslog`, run the following UNIX commands:

```
# tail -100 /var/adm/messages
```

```
# tail -100 /var/log/syslog
```

3.2.6 Checking Ericsson Multi Activation Log Files

Check the Ericsson Multi Activation logs and search for unexpected output.

Check that the log files have been correctly rotated and the old log files have been removed.

- `FDS-PL.log`

  This file logs information about the plug-in states and in case of a problem regarding Processing Layer, frequently checking this file is required for users.

- `FDS-RL.log`

  This file logs information about the plug-in states and in case of a problem regarding Resource Layer, frequently checking this file is required for users.

- `pm-PL.log`

  Contains output from the plug-ins regarding Processing Layer .

- `pm-RL.log`

  Contains output from the plug-ins regarding Resource Layer .

- `access.log`

  Contains all access to the webserver. Search for entries from unknown hosts.

- `fdsweb.log`

  Contains information about the webserver status. Search for unexpected faults.

- `backup.log`

  Contains information about the Ericsson Multi Activation backups. This file is part of the Crontab and rotation and removal are automatically done. If it is removed, a new log file will be created automatically.

- Processing log raw files

  Log the processing raw data information. The raw data will be processed and loaded into the processing log database. There are four types of raw files. Their names start with "CSO_", "CSO_LOB_", "NSO_" and "NSO_LOB_", which map to the four tables in processing log database. The successfully processed raw files will be moved to the processing log backup directory. While those failed ones will be retried until they have been processed successfully or removed manually. Other raw files will not be impacted in this case. The old proclog raw files that could not be loaded into processing log database due to the relevant proclog area in database had been changed to read only were stored in old_raw path, and those files should be replayed regarding to Section 5.6.3 on page 55.

- Tomcat log file

  Contains the log for operational information of Tomcat. The default log name is `catalina.out` under `/var/sog/logs/tomcat`.

- USM GUI log file

  Contains the log for User and Subscription Management GUI. The default log name is `usm_gui.log` under `/var/sog/logs/tomcat`.

3.2.7   Checking Event Log

To view event log, execute the following command:

```
sogadm> /opt/sog/bin/evtlog.sh \
[-t <starttime-stoptime>] [-o outputfile]
```

All events will be listed on the screen.

For how to execute the command, refer to Viewing Event Log Section 5.13 on page 99.

3.2.8   Checking Current Status of Sun Cluster and its Components

The status of the Ericsson Multi Activation HA and Sun Cluster components can be checked using `scstat` command. Only one instance of the scstat utility needs to run on any machine in the Sun Cluster configuration.

The following options are available for the scstat command to specify the components that are displayed:

-D	Shows status for all disk device groups.
-W	Shows status for cluster transport path.
-g	Shows status for all resource groups.

-h node	Shows status for the specified node and status of the disk device groups there this node is primary node. Also shows status of the quorum devices. This node holds reservation of the resource groups where the node is a potential master, and of the transport paths where the node is attached.
-n	Shows status for all nodes.
-i	Shows status for all IP Network Multi-path groups and public network adapters.
-p	Shows status for all components in the cluster. Use -v [v] to display more verbose output.
-q	Shows status for all device quorums and node quorums.

If no options are specified, only the cluster state and current membership are displayed.

To clear resource error flags, see document Sun Cluster 3.1 08/05 System Administration Guide.

3.2.9 Checking RAC Status

Run following commands with `emadba` as user:

`# su - emadba`

For detailed information:

`emadba> crs_stat`

For information in brief:

`emadba> crs_stat -t`

3.2.10 Checking Sun Cluster Error Log

Sun Cluster error log can be checked either through SUNPlex Cluster GUI or in the message file in `/var/adm` directory.

To check the log file via SUNPlex Cluster GUI, do the following:

1. Input `https://<Sun Cluster server IP:6789` in web browser.

2. Click **Nodes** from the **Cluster** menu and then select **System Log** to display the logs.

The error log will be displayed.

To check the log file from command line, do the following:

1. # **`cd /var/adm`**

2. # **`cat messages`**

The error log will be displayed.

3.2.11 Scanning the UNIX File System and Deleting Core Files

On resource node Standalone Availability, the operating system has been configured to save core files into the `/var/core/` partition. Otherwise, scan the UNIX file system for core files and use the following command on each node.

Note: Other files than core files can be found.

`find / -name "core*"`

A core file is created when a problem occurs, for instance, when the system attempts to write in a restricted disc area. Core files are named with date and time. A core file from August 30, 2003 on the server kaema4 can be named as `core-kaema4-20030830-08:44` or `core-20030830-08:44`.

Detect the corresponding process and see if the process indicates an error. Use the commands `strings`, `file` and `pstack`. Delete the core files by executing the `rm` command when the root-cause is found.

3.2.12 Removing Snapshots in Processing and Resource Node Standalone Availability

During system backup, several snapshot files are created. At the end of each backup, the snapshot files are removed automatically.

1. Check that no snapshots are mounted by running the following command:

   # **`fssnap -i`**

2. Remove all snapshots files that are not mounted by running the following commands:

   # **`cd /snapstorage`**

   # **`rm snapshot*`**

3. If there are mounted snapshots that must not be mounted remove these with command:

   # **`fssnap -d <mount_point>`**

3.2.13 Checking Disk Space

Use the UNIX command `df -h` to check the used disk space.

```
# df -h
```

The printout of the command looks like below and in this case, it shows that the
root partition can use another 9.4 GB before it gets full.

```
Filessystem    size    used    avail   capacityMounted on
/dev/md/dsk/   22G     12G     9.4G    57%      /
d100
/devices       0K      0K      0K      57%      /devices
/proc          0K      0K      0K      0%       /proc
mnttab         0K      0K      0K      0%       /etc/ mnttab
swap           14G     1.2G    14G     1%       /etc/svc/volatile
objfs          0K      0K      0K      0%       /system/object
fd             0K      0K      0K      0%       /dev/fd
/dev/md/dsk/   15G     12G     2.2G    85%      /var
d120
swap           14G     144K    14G     1%       /tmp
swap           14G     616K    14G     1%       /var/run
/dev/md/dsk/   3.0G    5.6M    2.9G    1%       /global/.device/
d150                                            node@1
```

3.2.14   Checking Mail

Read all e-mails received by user `root` and `sogadm` and take the appropriate
actions in case of problems. Make sure to delete the e-mails when problems
have been solved.

3.2.15   Checking Alarms in System Monitor

Check alarms that have turned to status red or yellow in the System Monitor.
Take appropriate actions in case of problems and make sure to reset the
alarm when the problems have been solved. For more details, refer to System
Monitor in document System Administration Graphical User Interface.

3.2.16   Displaying System Diagnostic Information

Use the command `prtdiag` to display system diagnostic information.

```
# prtdiag -v
```

3.2.17 Checking Status for Processing and Resource Node

Current status of all active plug-ins, the status of resource group and the status of database is displayed. Run following commands with sogadm as user:

```
# su - sogadm
```

```
sogadm> emaserver status
```

Current status of all active plug-ins is displayed. For specific description of certain status, see Table 11 on page 65.

3.2.18 Removing Old Database Backup Files

Enable the function of removing old database backup files on disk automatically, after installation the function of removing old database backup files is disabled.

The remove_backup_file.sh script is used to remove old directories under /global/disk031/oradata/backup/emadb/backupset.

The remove_eventlog_file.sh script is used to remove old files under /global/disk031/oradata/backup/emadb/eventlog.

The remove_proclog_file.sh script is used to remove old directories under /global/disk031/oradata/backup/emalog/proclog.

Note: In stand-alone configuration, those scripts above are under the directory /disk031/oradata/backup.

1. Run the following commands as user emadba to show the current status of the automatically removing function:

```
# su - emadba
```

```
emadba> /global/oracle/oradata/emadb/admin/tools\
/remove_backup_file.sh status
```

show current remove_backup_file status , the default status is disable.

```
emadba> /global/oracle/oradata/emadb/admin/tools\
/remove_eventlog_file.sh status
```

show current remove_eventlog_file status, the default status is disable.

```
emadba> /global/oracle/oradata/emalog/admin/tools\
/remove_proclog_file.sh status
```

```
emadba exit
```

The default status of current remove_proclog_file status is disable.

2. Run the following commands to enable the automatically removing function:

   # **su - emadba**

   emadba> **/global/oracle/oradata/emadb/admin/tools\
   /remove_backup_file.sh enable**

   enable remove_backup_file

   emadba> **/global/oracle/oradata/emadb/admin/tools\
   /remove_eventlog_file.sh enable**

   enable remove_eventlog_file

   emadba> **/global/oracle/oradata/emalog/admin/tools\
   /remove_proclog_file.sh enable**

   emadba **exit**

   The remove_proclog_file is enabled

3. Run the following commands to disable the automatically removing function:

   # **su - emadba**

   emadba> **/global/oracle/oradata/emadb/admin/tools\
   /remove_backup_file.sh disable**

   disable remove_backup_file

   emadba> **/global/oracle/oradata/emadb/admin/tools\
   /remove_eventlog_file.sh disable**

   disable remove_eventlog_file

   emadba> **/global/oracle/oradata/emalog/admin/tools\
   /remove_proclog_file.sh disable**

   emadba **exit**

   The remove_proclog_file is disabled.

4. Run the following commands to set the keep days of the old database backup files:

   # **su - emadba**

   emadba> **/global/oracle/oradata/emadb/admin/tools\
   /remove_backup_file.sh enable**

   enable remove_backup_file

   emadba> **/global/oracle/oradata/emadb/admin/tools**

/remove_eventlog_file.sh enable

enable remove_eventlog_file

emadba> **/global/oracle/oradata/emalog/admin/tools\
/remove_proclog_file.sh enable**

emadba> **/global/oracle/oradata/emadb/admin/tools\
/remove_backup_file.sh setday 2**

set the keep days of remove_backup_file to 2, the default value is 7.

emadba> **/global/oracle/oradata/emadb/admin/tools\
/remove_eventlog_file.sh setday 2**

set the keep days of remove_eventlog_file to 2, the default value is 7.

emadba> **/global/oracle/oradata/emalog/admin/tools\
/remove_proclog_file.sh setday 2**

emadba **exit**

set the keep days of remove_proclog_file to 2, the default value is 7.

Note: The removing tool uses the keep days configuration to select the backup files/directories that can be removed. If the keep days is 7, the removing files/directories must fulfill the following conditions:

The removing files/directories must be created or modified 7 days ago.

There are at least 7 files/directories which are newer than the removing backup files/directories, a file/directory is newer when the date "yyyymmdd" in the file/directory name is more great.

5. Run the following commands to remove the old database backup files manually:

su - emadba

emadba> **/global/oracle/oradata/emadb/admin/tools\
/remove_backup_file.sh enable**

enable remove_backup_file

emadba> **/global/oracle/oradata/emadb/admin/tools\
/remove_eventlog_file.sh enable**

enable remove_eventlog_file

emadba> **/global/oracle/oradata/emalog/admin/tools\
/remove_proclog_file.sh enable**

```
emadba> /global/oracle/oradata/emadb/admin/tools\
/remove_backup_file.sh remove 2
```

Remove 2 days ago backup directories under /global/disk031/orada
ta/backup/emadb/backupset

```
emadba> /global/oracle/oradata/emadb/admin/tools\
/remove_eventlog_file.sh remove 2
```

Remove 2 days ago backup files under/global/disk031/oradata/ba
ckup/emadb/eventlog

```
emadba> /global/oracle/oradata/emalog/admin/tools\
/remove_proclog_file.sh remove 2
```

```
emadba exit
```

Remove 2 days ago backup directories under/global/disk031/orad
ata/backup/emalog/proclog

3.2.19 Checking the System Time

Make sure the system time of Ericsson Multi Activation is the same as the
NTP server.

3.3 RR Maintenance

This chapter describes the system administration for the Report Receiver (RR)
in IMT 4 provisioning solution. For RR in IMT3, refer to document Reporting
Receiver System Administration Guide IMT 3.0.

3.3.1 Checking RR Status

To check the status on the RR module, implement the following steps:

1. Login as sogadm and run the following command:

   ```
   sogadm> rr_monitor status
   ```

2. The status will be displayed as follows:

   ```
   RR agent is running!
   ```

   Or

   ```
   RR agent is not running!
   ```

If the status of RR agent is not running, implement the following steps:

1. Login as sogadm

2. Run the following command to check if the RR is unable to start:

```
sogadm> scstat -g | grep RES_REPORT_RECEIVER
```

Regarding how to start and stop the RR, see Start Service in Section 5.3.1 on page 48 and Stop Service in Section 5.3.2 on page 49.

3.3.2 Checking the Log Files of RR

To inspect if something is wrong, check the log files of RR daily.

If the log files are too old to keep, they will be deleted automatically. By default, the configuration parameter `RRLogLife` is set to delete a log file every seven days, but the value can be modified.

Log files are stored in the directory `/var/sog/logs/rr2`. The current log file is named `rr.log` and it will be rotated every midnight and renamed as `rr.log.YYYY-MM-DD`.

The RR logs various events which are listed in four different levels:

Level 0: All alarms are logged at level 0, also logs authentication.

Level 1: All traffic from or to Ericsson Multi Activation and level 0.

Level 2: All traffic from or to BroadSoft Application Server (BS-AS) and level 1.

Level 3: Internal RR logging, debug logging and level 2.

3.3.3 Viewing Failed Operations of RR

Failed operations are kept in Expired Order Queue of Service Order Scheduler (SOS) which is expired order queue.

Regarding how to view these operations, refer to Section Expired Order Queue in document System Administration Graphical User Interface.

3.4 System Backup

Ericsson Multi Activation does not provide full system backup solution, see document Backup and Restore Guideline, which shows how to develop the system backup procedures.

• Centralized backup using third party product

3.5 Data Backup

The crontab job does a backup every night by default.

The backup files are stored at `/var/sog/backups/` directory.

A manually backup is done by running command:

`/opt/sog/maint/sog_dump.sh`

All the files in Ericsson Multi Activation backup directory will be taken care by Ericsson Multi Activation backup scripts. It is highly recommended not to put any external files in Ericsson Multi Activation directory. To be safe, the backup files must be copied to an external tape after a re-configuration of the system. User Subscription data is saved in database, which have backup performed by database maintenance script.

For more information see document Backup and Restore Guideline and Section 5.6.1 on page 53.

Maintenance Scripts Description

The scripts are stored in `/opt/sog/maint/` directory.

1. The `sog_dump.sh` script is run by crontab nightly and it encapsulates the scripts listed below. The script can be manually run by user `root`. Information about the execution is found in `/var/sog/logs/backup/backups.log`.

   If a component configuration change is made, the script must be run after verifying the change. Finally the resulting files must be backed up on a tape.

- `SOG_Backup.sh` *`<file1>`*

file1 - **`/var/sog/backups/config/sogconfig_backup.<DATE>`**

- Cleaning the old configuration backup files

The parameter `CONFIG_BACKUP_COUNT` in file `/var/sog/config/backup/backup.cfg` shows how many backup files that is left in the respective backup directories.

2. The `rotate_all_logs` script will execute `rotate.sh` on the following files:

`/opt/sog/maint/rotate.sh /var/sog/logs/fdsserver/fdsserver-PL.log`

`/opt/sog/maint/rotate.sh /var/sog/logs/fdsserver/FDS-PL.log`

`/opt/sog/maint/rotate.sh /var/sog/logs/pm/pm-PL.log`

```
/opt/sog/maint/rotate.sh /global/var/sog/logs/fdsserver/
fdsserver-RL.log

/opt/sog/maint/rotate.sh /global/var/sog/logs/fdsserver/
FDS-RL.log

/opt/sog/maint/rotate.sh /global/var/sog/logs/pm/
pm-RL.log

/opt/sog/maint/rotate.sh /var/sog/logs/sdk/tcldist.log

/opt/sog/maint/rotate.sh /var/sog/logs/www/access.log

/opt/sog/maint/rotate.sh /var/sog/logs/www/fdsweb.log

/opt/sog/maint/rotate.sh /global/var/sog/logs/www/
fdsweb.log

/opt/sog/maint/rotate.sh /var/sog/logs/tomcat/catalina.out

/opt/sog/maint/rotate.sh /var/sog/logs/emaagentcontroller/
surpagent.log

/opt/sog/maint/rotate.sh /var/sog/logs/batch/batch.log

/opt/sog/maint/rotate.sh /var/sog/logs/backup/backup.log

rotate.sh
```

rotate.sh *<log_file>*

Note: One of above log files must be used as in parameter.

Save original file to file, **<DATE>** in the same directory and empty the original file.

```
remove_old_logs.sh
```

3. # **remove_old_logs.sh -f** *<number>*

Remove old rotated files.

<number> - shows how many files will be left after execution.

3.6 Regular Oracle Maintenance

Database is introduced into Ericsson Multi Activation product as central storage. Its main purpose is to support horizontal scalability and huge log data storage.

There are two oracle instances. One for config data storage, named as emadb. Another is dedicated for proclog data storage, named as emalog.

The specific maintenance (export/import and backup/restore) goes to **Oracle Database Configuration (Section 5.6 on page 53)**. The regular maintenance is focused on the runtime check of Ericsson Multi Activation Oracle.

3.6.1 Regular Check with Diagnostic Files

Oracle diagnostic files contain information about significant events encountered while the instance is operational. They can be used to resolve problems or to better manage the database on a day-to-day basis. All these files are text files, can be checked with system editor.

- Alert log file

  It records the commands and result of major events while the database is operational.

  Naming convention for alert log file: `alert_$SID.log` (`alert_emadb.log`).

  It is under the directory `/opt/app/oracle/admin/emadb/bdump`.

  It keeps a record of the following information, can be checked when diagnosing day-to-day operations or errors:

  ```
  . When the database was started or shut down.
  . A list of all non-default initialization parameters.
  . The startup of background processes.
  . The thread being used by the instance.
  . The log sequence number LGWR is writing to.
  . Information regarding a log switch.
  . Creationg of tabespaces and undo segments.
  . Alter statement that have been issued.
  . Information regarding error messages such as ORA-600
    and extent errors.
  ```

- Background Trace Files

  They are used to log errors that have been encountered by a background process, such as SMON, PMON, DBWn, and other background processes.

  Naming convention for background trace files: `$SID_processname_PID .trc` (`emadb_lgwr_1208.trc`).

  It is under the directory `/opt/app/oracle/admin/emadb/bdump`.

  Note: These files exist only when an error requires writing to the trace files.

- User Trace Files

  They contain statistics for traced SQL statement, which are useful for SQL tuning. In addition, they contain user error messages.

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Naming convention for user trace files: `$SID_ora_PID.trc`(emadb_ora
_23939.trc).

It is under the directory under `/opt/app/oracle/admin/udump`.

3.6.2 Checking Free Space of Disk Group

The database emalog uses ASM storage temp table to contain some temporary
operation data. This table may increase to an arbitrary large size and it will not
decrease until the database is restarted. Instead of restarting the database, the
db administrator can run the script below to free up diskspace.

Note: Run the script when database is off-peak time.

1   Check disk group size:

su - emadba

emadba> **cat /global/oracle/configuration/db.cfg**

Find the disk group that has stored the temp01.dbf of emalog, for example:

db_log_sysdata_dest=H

Note: H below is just an example.

2   Get ASM instance name:

emadba> **ps -ef | grep ASM | awk '{print $9}'**

Following content will be returned:

asm_lmon_+ASM0

asm_pmon_+ASM0

asm_psp0_+ASM0

asm_lmd0_+ASM0

asm_smon_+ASM0

asm_dbw0_+ASM0

asm_lms0_+ASM0

asm_rbal_+ASM0

asm_ckpt_+ASM0

asm_mman_+ASM0

```
asm_lgwr_+ASM0

asm_gmon_+ASM0

asm_diag_+ASM0

/opt/app/oracle/product/10.2.0/db1/bin/racgimon

asm_lck0_+ASM0

oracle+ASM0

oracle+ASM0

ASM
```

3   Set the enviromet variable for ORACLE_SID

   emadba> **setenv ORACLE_SID +ASM0**

   emadba> **asmcmd**

   ASMCMD> **lsdg H**

   Following content will be returned:

State	Mounted
Type	EXTERN
Rebal	N
Unbal	N
Sector	512
Block	4096
AU	1048576
Total_MB	15331
Free_MB	13552
Req_mir_free_MB	0
Usable_file_MB	13552
Offline_disks	0
Name	H/

   ASMCMD> **du +H/EMALOG/TEMPFILE/**

Following content will be returned about used size of the `temp01.dbf` file:

Used_MB	Mirror_used_MB
102	102

```
ASMCMD> exit
```

4. Free the disk group space:

    ```
    emadba> cd /opt/sog/maint
    ```

    ```
    emadba> ./shrink_temp_tabspace.sh
    ```

    ```
    emadba> ./shrink_undo_tabspace.sh
    ```

    Note: After executing `shrink_temp_tabspace.sh`, the disk space used by the temporary table space will be decreased to 100 MB.

4   Load Balancer Administration

In order to ensure Ericsson Multi Activation Provisioning GUI correct operation under Load Balancer environment, the persistence on the Load Balancer controller needs to be configured for GUI HTTP traffic. The "source address affinity persistence" or "Cookie persistence (HTTP Cookie Insert method)" can be used. And the time-out can be configured to a few minutes.

More detailed information about Load Balancer administration, see chapter Enabling Session Persistence in document Configuration Guide for BIG-IP® Local Traffic Management version 9.3.0.

5 Node Administration (Common)

This Chapter gives information about the system configuration which applies for common part no matter whether the system is a Standalone or a HA configuration.

5.1 Starting and Stopping the Ericsson Multi Activation Processes

This section describes how to start and stop Ericsson Multi Activation process.

Table 8   Scripts Used to Control Ericsson Multi Activation Processes

User	Command	Comment
sogadm	`emaserver [-domain <ALL |PL	RL	DB>] {start	stop	restart	status }`	Start, stop, restart and check the status of all Ericsson Multi Activation related processes on all layers, processing layer, resource layer and Oracle.[1] `[-domain <ALL	PL	RL	DB>]` (for example, -domain PL) specifies the applicable scope where the command is executed on. Resource Node including Batch Handler, Tomcat and Oracle.[1]

(1) Although the script can start and stop all processes at one time, it is still recommended to start and stop processes separately.

Table 9 on page 39 shows the scripts are used to control 3PP processes.

Note: It is not applicable for Processing Node.

Table 9   Scripts Used to Control 3PP Processes

User	Command	Comment
root	`/etc/init.d/x25.control [start	stop	status]`	Start, stop the X.25 link and check the status of the link.

User	Command	Comment
emadba	• `sqlplus / as sysdba` • `[ startup | shutdown immediate ]` • `$ORACLE_HOME/bin /[dbstart|dbshut ]` (Optional)	Start and stop Oracle.
sogadm	`/opt/sog/bin/tomc at [start|stop]`	Start and stop the Tomcat server.

5.1.1 Starting and Stopping Stand-alone Configuration of Ericsson Multi Activation Application

This section describes how to start and stop Stand-alone Configuration of Ericsson Multi Activation.

Starting Stand-alone Configuration of Ericsson Multi Activation

By default, Ericsson Multi Activation system is configured to automatically start when the machine is rebooted. If not, it can be manually started by executing the following command:

`sogadm> ` **`emaserver start`**

Note: Ericsson Multi Activation application can also be started with a Secure Shell (SSH) login by executing the following command from the external system:

> `# ` **`/usr/local/bin/ssh -l root \`**
> **`<IP address of Ericsson Multi Activation server> \`**
> **`"/opt/sog/bin/emaserver start"`**

Stopping Stand-alone Configuration of Ericsson Multi Activation

Note: All provisioning must be stopped before stopping Ericsson Multi Activation application.

To stop Ericsson Multi Activation application, execute the following command:

`sogadm> ` **`emaserver stop`**

Note: Ericsson Multi Activation application can also be stopped with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver stop"
```

5.1.2 Starting and Stopping Two Nodes HA Configuration of Ericsson Multi Activation

This section describes how to start and stop Two Nodes HA configuration of Ericsson Multi Activation.

Starting Two Nodes HA Configuration of Ericsson Multi Activation

Follow the steps below to start Two Nodes HA configuration:

1. To start Resource Layer (RL) on one node, execute the following command:

```
sogadm> emaserver -domain RL start
```

Note: Ericsson Multi Activation application can also be started with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain RL start"
```

2. To start PL on both nodes, execute the following command:

```
sogadm> emaserver -domain PL start
```

Note: Ericsson Multi Activation application can also be started with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain PL start"
```

Complete these steps to start Two Nodes HA configuration successfully.

Stopping Two Nodes HA Configuration of Ericsson Multi Activation

Follow the steps below to stop Two Nodes HA configuration:

1. To stop PL on both nodes, execute the following command:

```
sogadm> emaserver -domain PL stop
```

Note: Ericsson Multi Activation application can also be stopped with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain PL stop"
```

2. To stop RL on online node, execute the following command:

```
sogadm> emaserver -domain RL stop
```

Note: Ericsson Multi Activation application can also be stopped with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain RL stop"
```

Complete these steps to stop Two Nodes HA configuration successfully.

5.1.3 Starting and Stopping Scalable HA Configuration of Ericsson Multi Activation

This section describes how to start and stop Scalable HA configuration of Ericsson Multi Activation.

Starting Scalable HA Configuration of Ericsson Multi Activation

Follow the steps below to start Scalable HA configuration when it is in Stop status:

1. To start RL on one RN, execute the following command:

```
sogadm> emaserver -domain RL start
```

Note: Ericsson Multi Activation application can also be started with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain RL start"
```

2. To start PL on all PNs, execute the following command:

```
sogadm> emaserver -domain PL start
```

Note: Ericsson Multi Activation application can also be started with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

```
# /usr/local/bin/ssh -l root \
<IP address of Ericsson Multi Activation server> \
"/opt/sog/bin/emaserver -domain PL start"
```

Complete these steps to start Scalable HA configuration successfully.

Stopping Scalable HA Configuration of Ericsson Multi Activation

Follow the steps below to stop Scalable HA configuration when it is in `Active` status:

1. To stop PL on all PNs, execute the following command:

    ```
    sogadm> emaserver -domain PL stop
    ```

    Note: Ericsson Multi Activation application can also be stopped with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

    ```
    # /usr/local/bin/ssh -l root \
    <IP address of Ericsson Multi Activation server> \
    "/opt/sog/bin/emaserver -domain PL stop"
    ```

2. To stop RL on active RN, execute the following command:

    ```
    sogadm> emaserver -domain RL stop
    ```

    Note: Ericsson Multi Activation application can also be stopped with an SSH login to the Ericsson Multi Activation server by executing the following command from the external system:

    ```
    # /usr/local/bin/ssh -l root \
    <IP address of Ericsson Multi Activation server> \
    "/opt/sog/bin/emaserver -domain RL stop"
    ```

Complete these steps to stop Scalable HA configuration successfully.

5.1.4 Automatic Start Function in Ericsson Multi Activation

Ericsson Multi Activation provides an automatic start function that is initially activated in the system. If this function is disabled, Ericsson Multi Activation will be offline after rebooting. If the user reboots the OS on a partial node instead of all the nodes, then Ericsson Multi Activation application can still be automatically started on the other nodes, even the automatic start function is disabled.

Note: This function does not control the automatic start of Oracle RAC and is only applicable for standalone system.

To disable this function, execute the following command:

```
sogadm> emaserver disable
```

To enable this function, execute the following command:

```
sogadm> emaserver enable
```

5.1.5 Shutting Down the Ericsson Multi Activation Server

Make sure there is no traffic on the system. The server can be manually shut down to the `ok` prompt by executing the following command:

```
# shutdown -i0 -y -g0
```

Note: Make sure to have a console connection through the terminal concentrator or RSC/ALOM before shutting down the Ericsson Multi Activation server.

5.1.6 Shutting Down the Sun Cluster

Note: Before shutting down the Sun Cluster, stop all provisioning and Ericsson Multi Activation.

1   See to stop all Resource Groups.

2   Run the following command:

```
# scshutdown -y -g0
```

The scshutdown command will shut down all nodes to run level 0 (the OK-prompt).

5.1.7 Starting and Stopping Oracle RAC

For detailed information about Oracle RAC, refer to Section 10 on page 151.

5.1.8 Switching Resource Group (for HA only)

To bring a resource groups online on a specified node, and take them offline on the other nodes, use the command:

```
# scswitch -z -g <resource_grp>[, <resource_grp>...]\
-h <hostname>
```

For example, switch the resource group RG_EMA_RL_LINKMANAGER to the node ckasog10:

```
# scswitch -z -g RG_EMA_RL_LINKMANAGER -h ckasog10
```

5.1.9 Putting Resource Group Offline

To place a resource group offline on all nodes:

```
# scswitch -F -g <resource_grp>[, <resource_grp>...]
```

For example, to stop the resource group RG_EMA_RL_LINKMANAGER:

```
# scswitch -F -g RG_EMA_RL_LINKMANAGER
```

This command can be applied to take a resource group offline from all of its current masters:

```
# scswitch -z -g <resource_group>[, <resource_group> ...]\
-h " "
```

5.2 License Maintenance

The License system is the way to ensure that the customer is using just the features he bought and no others.

Five parts (License installation, License configurations, License check, License rollback, License extend) are included in the maintenance of license management.

5.2.1 License Installation

Note: It is recommended to backup Ericsson Multi Activation configuration data and license file before installing license.

Ericsson Multi Activation Configuration Data Backup

Regarding how to backup the Ericsson Multi Activation configuration data, refer to Backup and Restore Guideline.

License File Backup

To backup the license file, run the following commands:

```
# su - sogadm

sogadm> mkdir -p /var/tmp/lic_bakcup

sogadm> cp /var/sog/etc/.licenses/* /var/\
tmp/lic_bakcup

sogadm> exit
```

After executing the commands above, the license file has been backuped.

Installing License

Stand-alone configuration	The Ericsson Multi Activation license contains the `hostid` for the Stand-alone server.
Two Nodes HA configuration	The Ericsson Multi Activation license is only installed on one of the node servers. The Ericsson Multi Activation license contains the `hostid` of both servers.
Scalable HA configuration	The Ericsson Multi Activation license is only installed on one of the Processing Node servers. The Ericsson Multi Activation license contains the `hostid` of all the processing Node servers.

Note: Before installing the license, Ericsson Multi Activation should be up and running.

Implement the following steps to install license:

1. Log in server as `sogadm`:

   # **su - sogadm**

2. Check the server status to make sure all Ericsson Multi Activation services are online:

   sogadm> **emaserver status**

3. Put the delivered license file *<licfile>* in `/tmp` directory.

4. Install the license with:

   sogadm> **install_sog_licence**

   The screen output may vary due to different licenses.

5. Select the required NEs and features, and input the configuration database user name and password:

   ```
   Enter the name of the new licence key file
   licencekeyfile= /tmp/<licfile>

   #######################################
   Installing new licence key......
   #######################################
   #######################################
   Changing the configuration
   #######################################
   The database flag is Database
   The user name is emauser
   The connect string is emadb
   Enter the username for database in resource layer [emauser]:
   ```

Press **Enter**.

```
Enter the password for database in resource layer []:
<emauser_db_password>

Connect string is emauser/******@emadb
Executing Sqlplus...
Install sog licence finished!
```

5.2.2   License Check

After license installation, the license information for the components can be checked one by one.

1. log on as root

2. # **su - emadba**

3. emadba> **sqlplus *<account>*/*<password>*@*<dburl>***

    Syntax

<account>	name of oracle account
<password>	password for the account
<dburl>	user alias like emadb, it is defined in /var/sog/data/database/tnsnames.ora as a SERVICE_NAME; or use connection string like //host:port/sid

    For example, sqlplus emauser/emauser@emadb0

4. SQL> **set long 50000;**

    SQL> **set pagesize 50000;**

    SQL> **select extract(data,'/System/Licence-\ Configuration') from tab_fds_cfg;**

    Note: Do not forget '**;**' at the end of the SQL-statement.

5. SQL> **exit**

    Note: Exit sqlplus explicitly.

5.2.3   License Rollback

Complete the following steps to roll back license.

1. Stop provisioning.

2. Stop Ericsson Multi Activation PN and RN.

For how to stop Ericsson Multi Activation PN and RN, refer to Section 5.1 on page 39.

3. Clear the cache in Ericsson Multi Activation:

    # **cd /var/sog/data/cache**

    # **rm -rf ***

4. Restore configuration table.

    For how to restore configuration table, refer to Configuration Table Restore in document Backup and Restore Guideline.

5. Restore license file:

    # **su - sogadm**

    sogadm> **cp /var/tmp/lic_bakcup/* /var/sog/etc/.licenses/**

    sogadm> **exit**

6. Start Ericsson Multi Activation PN and RN:

    For how to start Ericsson Multi Activation PN and RN, refer to Section 5.1 on page 39.

5.2.4   License Extend

When the Network Elements purchased is not licensed, the provision can not been done on these Network Elements in Ericsson Multi Activation System; the New license information is needed.

For Ericsson Multi Activation, the License Extend is the same as the License Installation. The user needs to get a new license file from Ericsson.

5.3   Report Receiver

RR is an application that interacts with Ericsson Multi Activation and interfaces with Broadworks CS-AS via OCI-R protocol. Regarding the detailed information, refer to the document Function Specification.

The following sections will introduce how to start and stop service, check status, check log files, and so on.

5.3.1   Start Service

RR is controlled by Ericsson Multi Activation Agent Controller.

To start the RR module, login as sogadm and run the following command:

```
# su - sogadm

sogadm> rr_monitor enable

sogadm> scswitch -Z -g RG_EMA_RL_AGENT_CONTROLLER

sogadm> exit
```

When finishing the installation of RR or if the RR has been stopped manually, the RR service should be started manually directly.

For how to check the status of RR, refer to Checking Status Section 3.3.1 on page 29.

5.3.2 Stop Service

To stop the RR, login as `sogadm` and run the following command.

```
# su - sogadm

sogadm> rr_monitor disable

sogadm> exit
```

This command is used to perform a graceful shutdown, and the graceful shutdown ensures the state of processing is known and safe, for example, no commands will be lost.

Note: Since all ongoing sessions have to finish, the graceful shutdown will take some time before the RR shutdown in completed.

The second option for stopping the RR is:

```
sogadm> rr_monitor abort
```

Note: It is not recommended to use this command because all processing will be shut down forcibly whatever the state of them is. It causes that all data of ongoing sessions will be lost.

5.4   Configuration of OTA Agent

The Over The Air Agent (OTAAgent) runs as a standalone process outside Ericsson Multi Activation. It is delivered in GemMobile Remote Manager (GMRM) CD LZY 214 2944. A separate installation is needed to have the OTAAgent in place.

To install the OTAAgent, unpack the distribution package file `19089-CXC1328307.tar` into standard Ericsson Multi Activation directory `/opt/sog`. In this chapter the OTAAgent is installed at `/opt/sog/GMRM`.

OTAAgent is monitoring a TCP port with default port number 3456.

> **Note:** There must be only one SOG-GemplusGmrm defined in Ericsson Multi Activation system. It is not necessary to configure routing for SOG-GemplusGmrm NE.

5.4.1 Starting and Stopping OTA Agent

By default the start or stop commands need to be performed manually:

To start OTAAgent, run the following command:

```
# su - sogadm

sogadm> /opt/sog/GMRM/runOTA start

sogadm> exit
```

To stop OTAAgent, run the following command:

```
# su - sogadm

sogadm> /opt/sog/GMRM/runOTA stop

sogadm> exit
```

Automatic start or stop of OTAAgent can also be achieved by executing the two following configuration commands:

```
# su - sogadm

sogadm> ln -s /opt/sog/GMRM/runOTA /etc/rc3.d\
/S99OTAAGENT

sogadm> ln -s /opt/sog/GMRM/runOTA /etc/rc2.d\
/K99OTAAGENT

sogadm> exit
```

5.4.2 Changing TCP Port

To change the TCP port for the OTAAgent, follow these steps:

1. Stop OTAAgent (see Section 5.4.1 on page 50).

2. Open file /opt/sog/GMRM/runOTA by any text editor. Then change OTAPORT to the needed value.

3. Start OTAAgent (see Section 5.4.1 on page 50).

5.4.3   Error Handling

Ericsson Multi Activation provides two levels to handle most kinds of errors between Ericsson Multi Activation and GemMobile Remote Manager (GMRM) NE.

Normal Error

This level belongs to normal situation between Ericsson Multi Activation and GMRM NE. If Ericsson Multi Activation finds the link is not available (RESP:1001), it will disconnect the link between Ericsson Multi Activation and GMRM NE by sending `SAVE_DISCONN` command to GMRM NE before destroying the link.

Abnormal Error

This level belongs to abnormal situation inside GMRM API or GMRM NE. If the error comes from GMRM API or GMRM NE, and Ericsson Multi Activation cannot handle this kind of error by normal ways. The only way to solve this problem is to stop running OTAAgent, and restart it.

If the OTAAgent still cannot work properly, run the following command to check socket status.

```
# su - sogadm

sogadm> netstat -an | grep <OTAAgent port number>

sogadm> exit
```

If there is socket in status CLOSE_WAIT, restart LinkPool by using command:

```
sogadm> emaps -k LINKMANAGER
```

5.4.4   Log File

All log files are stored in directory `/opt/sog/GMRM/log/`. The main purpose of log files is for debug. This log information is used to analyze problems. To avoid consuming too much system storage space, one log file only records the log information of one day. The seven latest log files are kept.

5.5   GGSN Agent Configuration

Subscriber Update Request Protocol (SURP) is used to send commands towards GGSN. To implement the SURP interface, a separate agent is available to manage the connection between Ericsson Multi Activation and GGSN NEs. Ericsson Multi Activation considers the GGSN Agent as an NE, and sends all necessary information to it. GGSN Agent will take care of the routing problem

(broadcast will be used instead of routing). TCP/IP protocol is used between Ericsson Multi Activation and GGSN Agent. The connection between GGSN Agent and GGSN NE is SURP protocol. SURP protocol is based on TCP/IP. The below figure shows the structure of GGSN Agent.
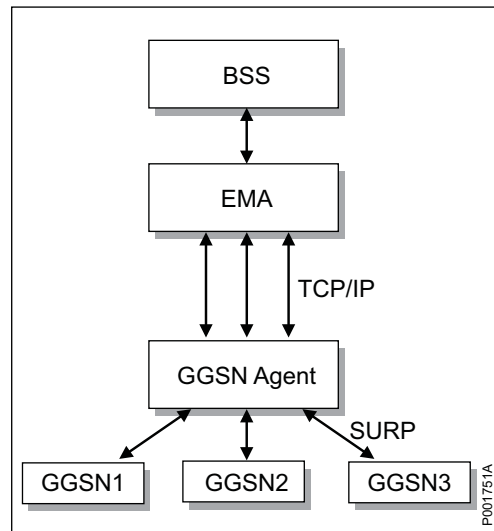
Figure 4   Structure of GGSN Agent

To implement CAI provisioning for GGSN, GGSN Agent must be started. GGSN Agent is an executable file in `/opt/sog/bin/` with the name `SURPAgent`. To start the GSSN Agent manually. There are three startup parameters:

• The port for listen at Ericsson Multi Activation link (configured when the link for GGSN is added). See document System Administration Graphical User Interface for details.

• The link that listens at GGSN link

• Debug mode that can have two values 1 or 0. 1 stands for debug and more print information and 0 for non-debug and less print information. The command is as follows:

```
sogadm> su - sogadm
```

```
sogadm> ./SURPAgent <EMA port> <GGSN port> <debug mode>
```

Use two port numbers that are not used by any other applications, for example, ./SURPAgent 3400 50012 1

```
sogadm> exit
```

5.6 Oracle Database Configuration

Note: The `db_log_admin_dest`, `db_conf_admin_dest`, and `db_log_backup_dest` are variables defined in configuration file `/home/emadba/db.cfg`. The `db.cfg` is not able to configure after installation.

All Oracle management activities must be done as user `emadba`. It is possible to use Oracle inner-built Enterprise Manager (EM) tool to configure SNMP alarm towards CNOSS.

5.6.1 Backup and Restore for emadb

Ericsson Multi Activation provides three kinds of backup methods: hot full backup, hot incremental backup and cold backup. For backup information, see document Backup and Restore Guideline.

EMADB execute automatically incremental backup when EMADB instance is created. Preliminary backup strategy:

- Execute level 0 incremental backup at 6:00 every day.

- Execute level 1 incremental backup at 14:00 every day.

- Execute level 1 incremental backup at 22:00 every day.

The Oracle database backup compresses all data files, archived logs and configuration files into specific Oracle formatted files. The archived logs will be removed automatically after a successful backup.

The backup can be done by executing the following command:

```
# su - emadba

emadba> <db_conf_admin_dest>/emadb\
/admin/tools/backup_db.sh <type> <media>
```

`<type>` - The backup method options. Possible values are cold, backup_level_0 or backup_level_1. Default is backup_level_0 backup for Oracle database in OPEN mode.

- *Cold:* create new directory (`<media>`yyyymmddhhmiss) in the backup destination location, and then execute cold full backup for Oracle database in CLOSE mode.

- *Backup_level_0:* create new directory (`<media>`/incre_yyyymmdd) in the backup destination location, and then execute level 0 incremental backup for Oracle database in OPEN mode.

- *Backup_level_1:* create new directory (`<media>`/incre_yyyymmdd) in the backup destination location, and then execute level 1 incremental backup for Oracle database in OPEN mode.

`<media>` - The backup destination location. Default location is under
`<db_conf_backup_dest>`/oradata/backup/$ORACLE_CONF_SID/back
upset.

Ensure the latest full backup or level 0 incremental backup in directory
`<db_conf_backup_dest>`/oradata/backup/$ORACLE_CONF_SID/backup
set, before executing the below restore_db.sh:

emadba> **`<db_conf_admin_dest>`/emadb/admin/\
fools/restore_db.sh `<path>`**

emadba> **exit**

- *`<path>`*: specify the location of the backupset.

For example:

If database crash due to lost a data file at 24-Feb-06 02:10:11

Ensure the latest backupset in directory./disk031/oradata/backup/$
ORACLE_CONF_SID/backupset/incre_20060223 before you execute
restore_db.sh, because database restore need incremental backupset
of level 0 at 6:00 every day.

If database crash due to lost a data file at 24-Feb-12 07:10:11

Ensure the latest backupset in directory /disk031/oradata/backup/$
ORACLE_CONF_SID/backupset/incre_20060224 before you execute
restore_db.sh, because database restore need incremental backupset
of level 0 . EMADB automatically executes incremental backup of level 0 at
6:00 every day.

Note: Executing restore_db.sh is to restore the database to the time when
it crashes, not the last backup time.

5.6.2   Import, Export, Remove Processing Log

To import Processing Log data to Oracle database, run the following command:

su - emadba

emadba> **`<db_log_admin_dest>`/oradata/emalog/admin\
/tools/import_proclog.sh `<date>` `<path>`**

emadba> **exit**

`<date>` - The date when the data is imported. Format can be YYYYMMDD (for
example 20051231) or value all. If a specific date is taken, only the logs
directly under the path will be searched. Taking value all means all the logs
under path and its subdirectories will be searched.

`<path>` - The data source location from where the Processing Log is imported. Default location is *`<db_log_backup_dest>`*`/oradata/backup/$ORACLE_LOG_SID/proclog`.

Note: This will place the data into history table, manually remove the data when they are not being used anymore.

To export Processing Log data from Oracle database, run the following command:

```
emadba> <db_log_admin_dest>/oradata/emalog/admin\
/tools/export_proclog.sh <date> <path>
```

`<date>` - The date when the data is exported. Format is `YYYYMMDD`, for example, *20051231*.

`<path>` - The data source location to where the Processing Log is exported. Default location is *`<db_log_backup_dest>`*`/oradata/backup/$ORACLE_SID`.

To remove Processing Log from Oracle database, run the following command:

```
emadba> <db_log_admin_dest>/oradata/emalog/admin\
/tools/remove_historyproclog.sh <date>
```

`<date>` - The date when the data is imported. Format can be `YYYYMMDD` (for example `20051231`) or value `all`. If a specific date is taken, only the logs imported on that date will be removed. Taking value `all` means all imported logs will be removed.

If no date is input, a list with all imported log data will be shown for you to select.

5.6.3 Replay Specified Date Processing Log Raw Files

To `replay` means the data does not exist and needs to be rebuilt, for instance some old proclog raw files failed to be loaded into processing log database due to the relevant proclog area in database had been changed to read only or the processing log database crashed and the log is lost. This differs from `restore` where the data already exists and is able to put back.

The processing log raw files can be replayed in time order from the backup directory `/var/sog/backups/proclog` or from the recovery directory `/var/sog/logs/proclog/recovery`.

Follow the steps below:

1. **Prerequisites:** Make sure the specified date log data table partition exists in the Processing log database. If not, there are two scenarios (a and b) to set up the log data table partition.

a) If the log data are lost and no backup data exist. Then, the log data table partition must be re-created manually.

b) If the specified date log data was backuped and the log data in that table partition is not complete. Then the log data table partition can be set up by importing the old backup log data into the database.

2. Modify the processing log database partition table status from `Read-Only` to `Read-Write`.

   Execute the script `change_mode.sh` `<date>` by user `emadba` where date in `YYYYMMDD` mode.

3. Move processing log raw files from `/var/sog/backups/proclog/yyyyMMdd` or `/var/sog/logs/proclog/recovery/yyyyMMdd` into processing log raw files directory `/var/sog/logs/proclog/raw`. All files will be processed by the Log Writer component and load the log data into the database.

4. Export the specified date log data and replace the old backup log data.

Note: For detailed information how to import and export the processing log data, see Section 5.6.2 on page 54.

During raw file replay (the old raw data files are copied to the raw files directory), log writer will read the old file first. As a result, the new log data produced during Ericsson Multi Activation provisioning can not be processed in time. Those data will be in a log queue, and the user will not be able to see the files in the GUI until the data is loaded in to the Processing log database.

5.6.4   Import and Export Event Log

To import or export Event Log data to or from Oracle database, run the following command:

```
# su - emadba

emadba> <db_conf_admin_dest>/oradata/emadb\
/admin/tools/eventlogmaintaince.sh <import|export>\
<LOGDATE>

emadba> exit
```

`import|export` - The selection to be made whether to import/export event log data to/from event log table.

`LOGDATE` - The single date when the data is imported/exported. Format is `YYYYMMDD`, for example, *20061231*. Default value is the 30th day before the current date. For example, default value will be *20061201* if the current date is 20061231, or *20061101* if the current date is 20061201.

5.6.5 Removing Extended Attribute Data

User can remove the extended attribute data in USD using the following command.

To remove protocol binding, run the following command:

```
# su - emadba

emadba> /global/oracle/oradata/emadb/admin/ \
tools/cleanup_serviceengine_attribute.sh -type\
[USER|EntityType] -name deleted_attribute_name

emadba> exit
```

-type   appoint an object type. The object type may be USER or a real name of a specific entity type.

-name   delete attribute name.

Note: The value of `oracle_conf_sid` can be found in file `/global/oracle/db.cfg`. Use it to replace `$oracle_conf_sid` above. In default the value is emadb.

5.7 Data Synchronization for Multiple Processing Nodes

Because of horizontal scalability of Processing Layer, data synchronization is necessary between multiple Processing Nodes. It is implemented on Resource Layer.

Four kinds of Resource Layer data used by Processing Layer need synchronization as follows:

- Oracle database server username/password

    Note: The Oracle database username/password includes:

    – Ericsson Multi Activation configuration database server username/password

    – Ericsson Multi Activation log database searcher username/password

    – Ericsson Multi Activation log database operator username/password

- Resource Layer hostname

- E-AAA port number

- Oracle database hostname

The first three kinds of data can be configured by executing script `updateRLinfo.pl`. The Oracle database hostname is changed by editing file `/var/sog/data/database/tnsnames.ora` on Resource Node.

5.7.1   updateRLinfo.pl

Run this command to `updateRLinfo.pl`, for description of the options see Table 10 on page 58.

```
# su - sogadm
```

```
sogadm> updateRLinfo.pl -p sogadm
```

Table 10   updateRLinfo.pl options

Option	Description
`-h`	Display the help information
`-u` *`<username>`*	The user name for Ericsson Multi Activation system user who handles the FDS server. Default username is `sogadm`.
`-s` *`<serverlist>`*	The Processing Nodes hostname(s) that need synchronization. Multiple hostnames are separated with comma (,). For example, `node1,node2,node3` Default is only one Processing Node.
`-o` *`<logfile>`*	Specify the log file that logs the operation. Default is `~/updateRLinfo.log`
`-p` *`<password>`*	The password for Ericsson Multi Activation system user who handles FDS server

During execution, select wanted operation. Multiple selection must be separated by comma (,).

An example aiming to update user/password for SOS in node1 and node2 is shown as follows:

```
sogadm> updateRLinfo.pl -p <password> -s node1,node2

>>>> Log file is /home/sogadm/.updateRLinfo.log

*** Main Menu ***


Please select from one of the following options:


1) list user/password for database

2) list hostname for webserver, PSEM E-AAA

3) list PSEM E-AAA port number

4) list PSEM E-AAA LoginDN
```

```
5) list PSEM E-AAA Login Password

6) update user/password for database

7) update hostname for webserver

8) update hostname for E-AAA

9) update LoginDN for E-AAA

10)update Login Password for E-AAA

a) update port number for E-AAA

b) list user/password for SOS

c) update user/password for SOS

d) list the status of schemaValidation

e) update the status of schemaValidation

f) list user/password for ServiceEngine

g) update user/password for ServiceEngine

?) Help with menu options
q) Quit

current server(s) you are operating is (are) node1 and node2,
 user is [sogadm]


Option: 8

The original EAAA hostname is [old EAAA hostname]:

Input new EAAA hostname: newEAAAhost


>>>> update host node1 successfully
>>>> update host node2 successfully

sogadm> exit
```

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5.7.2 Changing Oracle Internal Password

This section shows how to change the Oracle internal password:

1. Use `updateRLinfo.pl` with option 4 to change the password of `emauser` in `FDS.cfg`. When changing the local `FDS.cfg` of all the PNs which are using the same database, the parameter `-s` follows with other nodes name. Then it will hang until the execution in Step 2 on page 60 is finished.

2. Use `sqlplus` to connect to Oracle, and change the password of `emauser` in Oracle:

   ```
   ALTER USER emauser IDENTIFIED BY xxxxxx
   ```

3. Use `updateRLinfo.pl` to change the password of `emalogsearcher/emalogoperator` in `FDS.cfg`. When changing the local `FDS.cfg` of all the PNs which are using the same database, the parameter `-s` follows with other nodes name.

4. Use `sqlplus` to connect to Oracle, and change the password of `emalogsearcher/emalogoperator` in Oracle.

5. Restart Ericsson Multi Activation.

Note: Pay attention to the change sequence. If the password of `emauser` is changed first, the password of `emalogsearcher/emalogoperator` need to be changed only after the execution in Step 2 on page 60, because changing the password of `emalogsearcher/emalogoperator` will connect the database with the password of `emauser` which is changed in the execution of Step 1 on page 60.

It is not recommended to apply it to the customer system without the special cause. The potential risk is that some migration/upgrade/rollback scripts will fail since some of the scripts are using the fixed password to access Oracle.

5.7.3 tnsnames.ora

The `tnsnames.ora` is a configuration file of Oracle that is used to log the hostname and port number of Oracle database. The file is stored in directory `/var/sog/data/database/` and it is possible to update, using any text editor.

5.8 Export Tool for Service Order Scheduler Expired Commands

An standalone tool can be used to export expired commands from SOS expired CSO table and generate batch files, which can be executed using Ericsson Multi Activation Batch handler.

The tool, `ExpiredToBatch.sh`, is located under `/var/sog/data/cache/c ontainer/ORDERSCHEDULER/bin/` folder. See the usage below:

```
# ./ExpiredToBatch.sh [EMA host] [EMA port] [EMA user] \
[EMA user password] [DB user] [DB user password] [DB host]
\
[DB port] [DB instance] [output directory]
```

The tool can accept ten parameters. See an example below:

```
# ./ExpiredToBatch.sh 10.23.104.11 8998 \
sogadm sogadm sosuser sosuser 10.23.104.42 1521 emadb0 /\
var/tmp/batchfiles/
```

The default value for the parameters are:

Ericsson Multi Activation host	127.0.0.1
Ericsson Multi Activation port	8998
Ericsson Multi Activation user	sogadm
Ericsson Multi Activation user password	sogadm
DB user	sosuser
DB user password	sosuser
DB host	127.0.0.1
DB port	1521
DB instance	emadb0
output directory	.

The generated BatchHandler job files will be stored in the output directory folder. Some parameters in the generated batch files, such as 'url' for CAI3G batch files, may need to be modified to send by Batchhandler to Ericsson Multi Activation.

5.9 Creating New Batch User

To create a new batch user, execute the script `create_batchuser.sh`. This script will add a new UNIX user to the system and add the same user to the BatchHandler. The environment for that user is created by the script.

All processes run by `batchadm` must be closed before executing this script.

Note: All operational and stored batch jobs will be lost when proceeding this operation.

The resource group `RG_EMA_RL_BATCH_HANDLER` must be offline in SUN Cluster before running this script. For tow Nodes HA and Scalable HA, run the script on both nodes or RNs with the same arguments. The uid/gid is kept consistent by Ericsson Multi Activation automatically. uid/gid 29500 to 29999 are reserved by Ericsson Multi Activation for creating batch users.

Below is an example of adding a batch user with userid 'batchuser' and the password 'batch275':

Note: The UNIX password will be prompted with first login to the system. The first six characters of the password must contain at least two alphabetical characters and at least one numeric or special character.

```
# /opt/sog/bin/create_batchuser.sh \
batchuser batch275

**************************************************************

Batch User batchuser is created in the system

The given password should be used when accessing

batch application. The user will be prompted to

re-enter the Unix password with first login to the
system

**************************************************************
```

Note: A first time telnet login must be issued to each node, and the passwords must be defined identical on each node as were used in script execution.

5.10 Admin Tool

Admin Tool is a web-based application that manages the software components running on FDS. To open the **Admin Tool**, enter `http://<EMA Server IP>/admintool` in web browser. The management of FDS and its components through FDS must be done on a node-by-node basis. If there is more than one physical PN in the system, the **Admin Tool** must be administrated through each unique node address instead of the Load Balancer address.

Figure 5   The Admin Tool Menu

Depending on the users authority in the system, all functions in Admin Tool cannot be available to the user.

5.10.1   Component Controller

Press **Ericsson Multi Activation Admintool for Processing layer**.

Press the **Component controller** item in the menu.
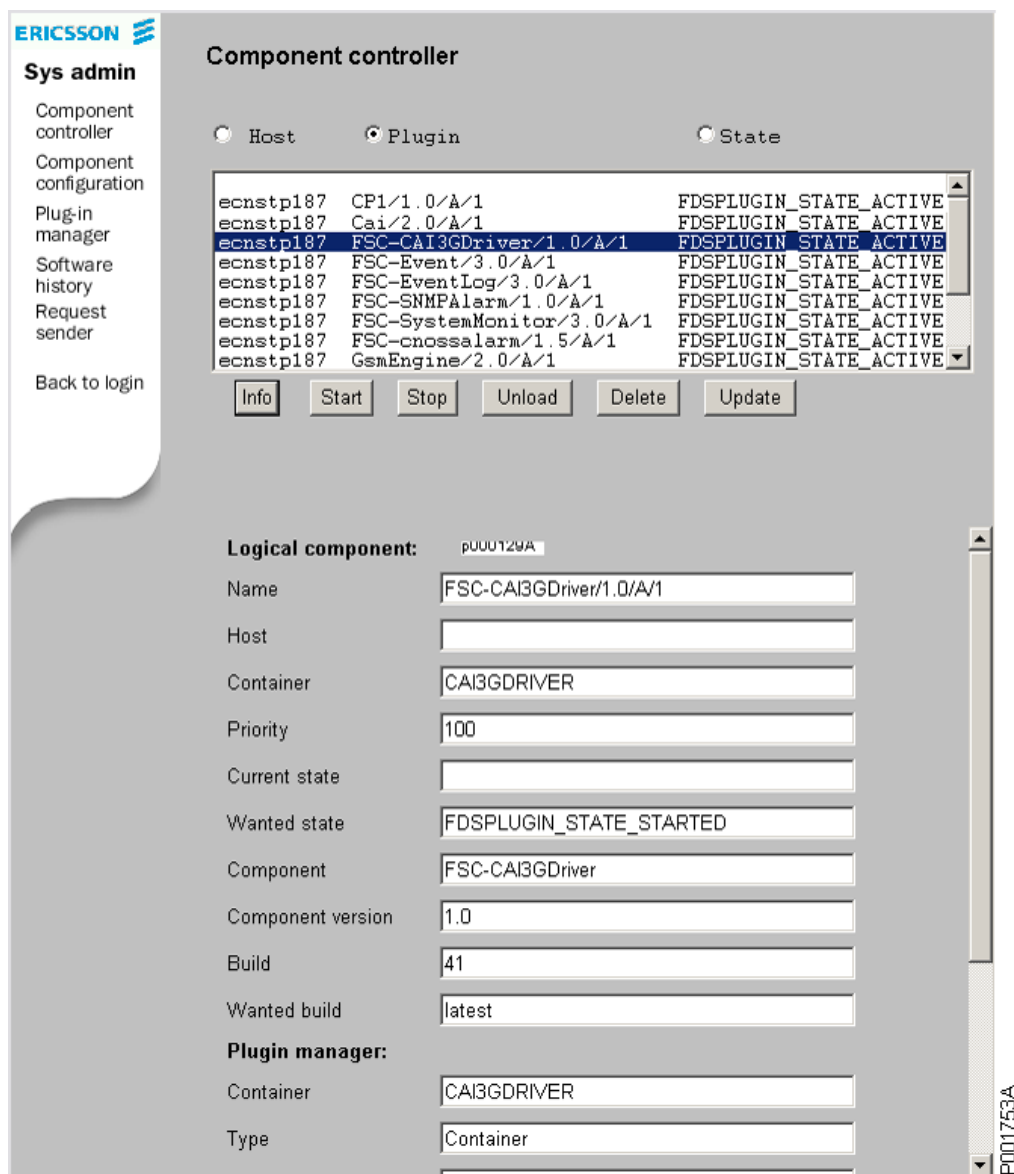
Figure 6   Component Controller Window

This window displays the current state of the plug-in on the Ericsson Multi Activation server. The user can retrieve configuration information about the logical components.

Each plug-in can have several states that can be changed in runtime. The states are defined in Table 11 on page 65.

Table 11   States for a plug-in

State	Comments
Loaded, Initialized, Prepare for unload	The plug-in has been loaded into a process and its constructor has been called. No internal structures are created.
Stopped, Prepare for Start	The plug-in constructor has been called and it has all internal structures created. No external interfaces created.
Started, Passive	The plug-in constructor has been called and it has all internal structures created. It has also opened up all its external interfaces and is ready to receive traffic.
Active	More or less the same as Started, but with the exception that this plug-in will normally receive all the traffic.
Unloaded	The plug-in has not been loaded into a process.
Recovering	If a plug-in stops, the Plug-in Manager will inform the FDS Server about the state of the plug-in. The FDS Server will then create a recovery thread and try to bring the plug-in back to its original state by invoking a number of calls to both the Plug-in Manager and the plug-in itself (after it has been loaded into a container). The recovery can be terminated (to its previous state) by unloading the plug-in. Note that it can take a while before the new state (unloaded) is shown in the GUI.

Host, **State**, **Plug-in**

These radio buttons are used for sorting the list of plug-in according to host, plug-in or current state.

The **Component controller** window contains the following buttons:

* **Info**

* **Start**

* **Stop**

* **Unload**

* **Delete**

* **Update**

Info

This button retrieves plug-in information about the currently selected plug-in. The information is shown in the text frames in the **Admin Tool** base window.

The information is divided into two lists:

Logical component parameters

- **Name**

  The full name of the plug-in.

- **Host**

  The host that runs the plug-in.

- **Container**

  The container process executing the plug-in.

- **Priority**

  The priority set for a particular plug-in instance when redundant plug-ins exist.

- **Current state**

  The current state of a plug-in (for example Active, Passive).

- **Wanted state**

  The preferred state of a plug-in (for example Started, Stopped or Unload).

- **Component**

  The component name (for example FSC-Event).

- **Component version**

  The second level, the version, of the logical component name.

- **Build**

  The current build of the plug-in.

- **Wanted build**

  The preferred build of the plug-in software (for example latest).

Plug-in Manager parameters

The following parameters contain information on how to start the plug-in container process.

General parameters that can be configured of every plug-in:

- **Component**

  The component name.

- **Component version**

  The second level, the version of the logical component name.

- **CORBA name**

  The name of the plug-in from a CORBA point of view.

- **FDS server host**

  The host name of the FDS Server.

- **FDS server marker**

  The CORBA name of the FDS Server.

Plug-in specific parameters that are only configuring for a certain plug-in:

- **Container**

  The name of the container process.

- **Class**

  The name of the class that implements the plug-in.

- **Container file**

  The name of the program that starts the container process.

- **Type**

  Specifies if the plug-in runs in a container or as a separate process.

- **File**

  The name of the shared library that contains the plug-in code.

- **Target**

  Possible values: `debug`, `fast`.

  Specifies how the code is compiled; `fast` is optimized code.

Start

This button starts the selected plug-in, enables the receiving of requests.

Stop

This button stops the selected plug-in, disables the receiving of requests.

Caution!

Stopping a plug-in directly affects the working system. This button must always be used with caution.

A stopped GUI plug-in cannot be restarted by clicking **Start** in **Admin Tool**. To start the GUI plug-in, follow the procedure "Start the GUI plug-in" in Page 69.

Unload

This button stops the selected plug-in and shuts down the plug-in process.

Caution!

Unloading a plug-in directly affects the working system. This button must always be used with caution.

Since all necessary information about the plug-in is retained in the FDS Server, the plug-in can be started again using the **Start** button.

An unloaded GUI Driver cannot be restarted by clicking **Start** in **Admin Tool**. To start the GUI plug-in, follow the procedure "Start the GUI plug-in" in Page 69.

Delete

This button stops the selected plug-in, shuts down the plug-in process, and also deletes all data concerning the plug-in from the FDS server.

Caution!

Deleting a plug-in directly affects the working system. This button must always be used with caution.

A deleted plug-in cannot be started by clicking **Start**.

Update

This button updates the information in this window.

Start the GUI Plug-in

If the GUI plug-in has been stopped or unloaded by **Admin Tool**, it cannot be started by Admin Tool GUI again. Follow the steps to restart:

1. Open a command tool as `sogadm` user and start the FDSRequestSender. Provide the password for `sogadm` user.

    ```
    # su - sogadm

    sogadm> FDSRequestSender -u sogadm -p <password> \
    -d PL /var/sog/data/xml/component_requests/\
    0521_FSC-GUIDriver.start.xml

    sogadm> exit
    ```

    The variable `FDS_SERVER_HOST` has not been defined. It will be assigned the default value: `ema1442`

    ```
    [Logged in to server FDS-PL]

    <?xml version='1.o' encoding='ISO-8859-1 standalone='no
    '?>

    <Response></Response>
    ```

    [Logged out from server FDS-PL]

    The empty response means the operation was successful.

2. Check in Admin Tool GUI that the GUI plug-in is active.

5.10.2 Component Configuration

Press the **Component Configuration** item in the menu .
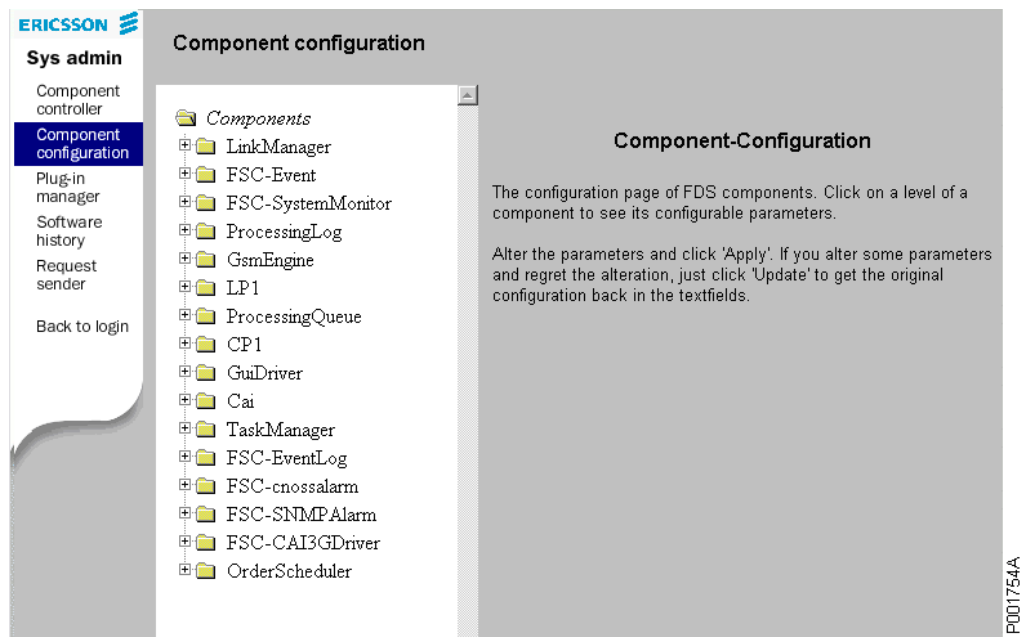
Figure 7   Component Configuration Window

This window enables viewing and modifying of component parameters that are configuring in runtime.

To display the configuring parameters, the user can expand the folders to view the four levels of an FDS component. The following list shows the levels:

• Component

• Version

• Plug-in controller

• Plug-in

To display the configuration parameters on a certain level, click on the corresponding icon in the component tree. Clicking a folder also expands it.

Caution!

Altering component parameters in runtime directly affects the working system. Modifications must always be made with caution.

To alter a configuring parameter for an FDS component, click on the appropriate level in the component tree and modify the parameter definition in the right frame.

Component Configuration Window shows an altering parameter example.
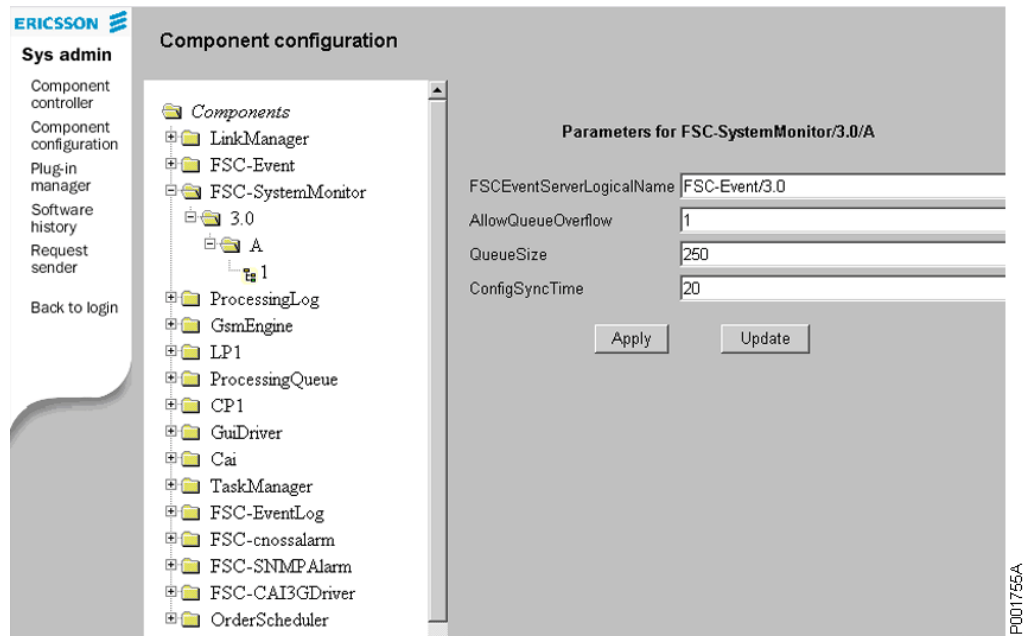
Figure 8   Component Configuration Window

Enter the modifications and click **Apply** to save changes. To revert to the last saved configuration, click **Update**.

Parameters for FSC-SystemMonitor/3.0/A

For description about **FSCEventServerLogicalName**, **AllowQueueOverflow**, **QueueSize** and **ConfigSyncTime**, refer to Table 17 on page 86.

5.10.3   Plug-in Manager

Click the **Plug-in manager** in the menu.
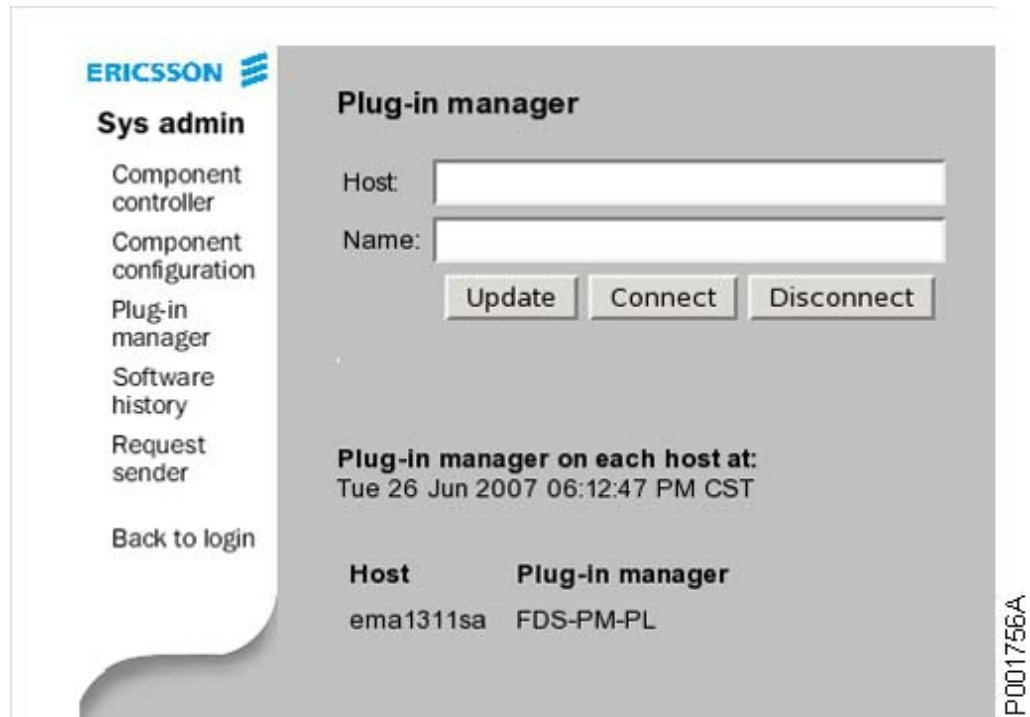
Figure 9   Plug-in Manager Window

This window contains a list of Plug-in Managers that are connected to the FDS Server.

Plug-in Manager Parameters

• **Host**

   The name of the host that the Plug-in Manager is running. Enter information here in order to create or delete.

• **Name**

   The name of the Plug-in Manager. Enter information here in order to connect.

Update

Press this button to update the information in the **Plug-in Manager** window.

Connect

Warning!

The Connect command must NOT be used for normal administration work and must ONLY be used when a host is added or removed.

Click **Update** to connect the Plug-in Manager specified in the text field. To connect another running Plug-in Manager to the FDS Server, enter the host name and the name of the Plug-in Manager in the text fields. Then click **Connect** button.

Disconnect

Warning!

The Disconnect command must NOT be used for normal administration work and must ONLY be used when a host is added or removed.

Click **Disconnect** to delete the Plug-in Manager specified in the text field. The host name is sufficient since each host only has one Plug-in Manager.

Note: All plug-ins running on the host must be removed before deleting the Plug-in Manager.

Plug-in Manager on each host at

Time stamp showing when the information in the window was last updated.

Host Plug-in Manager list

A list of the Plug-in Managers connected to the FDS Server and their respective hosts.

5.10.4   Software History

Click the **Software history** item in the menu.

Figure 10   Software History Window

This window contains a list of the actions, such as Create and Delete, that have been performed on the plug-in software. It also contains a search field with filtering options, allowing the user to apply a filter to the list with respect to components and time of occurrence.

Search field (case-sensitive)

To perform a search, enter a string in the editing field and click on **Search** button. As a result, the window is updated to contain the matching information only.

By selecting radio button **Component**, **Plug-in** or **Time**, the search is only performed in the corresponding list column. If **All** is selected, or if no search string is entered, the complete list is always displayed.

Time option

A search performed with the **Time** option returns all actions that match the time specification in the search string.

The specified search string must use the same time format as the **Time** column in the list that is, yyyymmdd hh:mm:ss. The search format can be shortened depending on the desired accuracy but must always start with the year (for example, yyyymmdd).

Time stamp showing when the information in this window was last updated. The time stamp is updated each time the user clicks **Search**.

Component

The logical name of the physical component.

Plugin

The name of the plug-in.

Action

The action affecting the plug-in (Create, Delete or NewBuild).

Build

The patch number for the particular plug-in software. Note that software update contained in a NewBuild does not affect the current component version.

Time

The date and time when the action occurred.

5.10.5 Request Sender

Click the **Request sender** item in the menu.
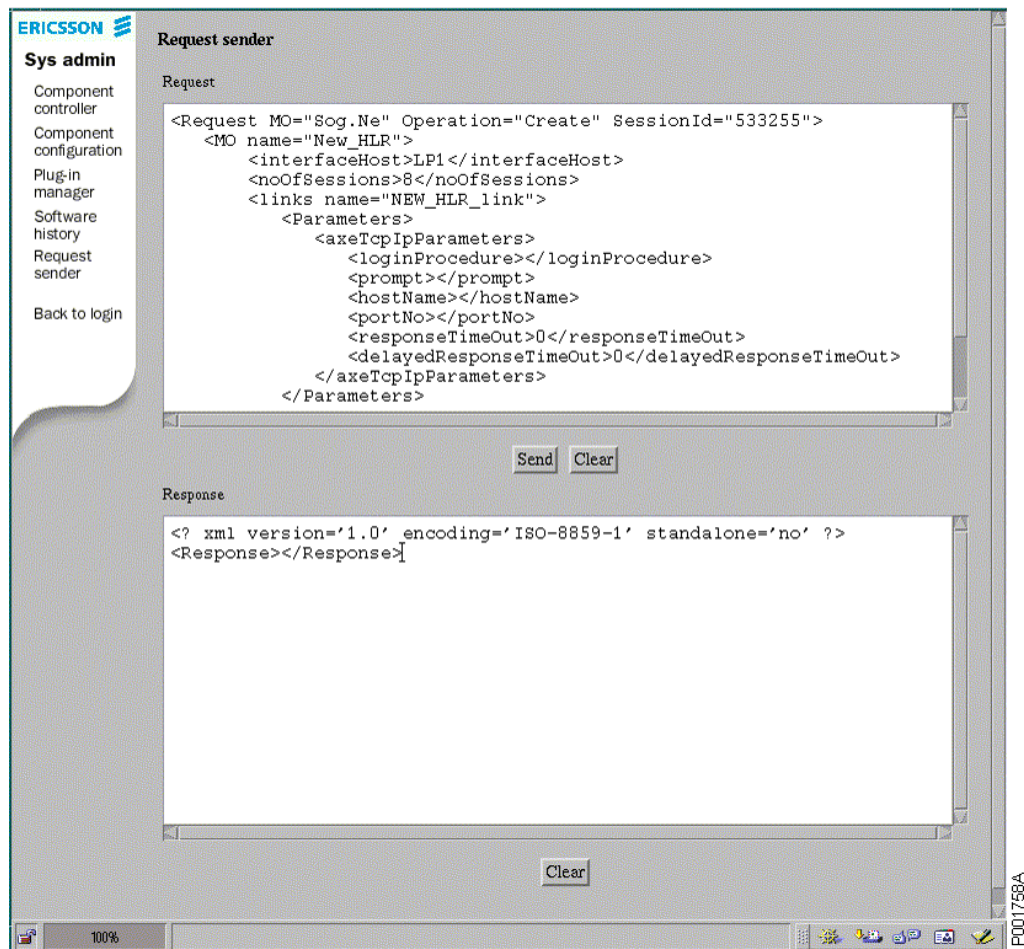
Figure 11   Request Sender Window

This window contains two text frames: one is for entering requests in extended Markup Language (XML) format, while the other is for reading the system response.

Request window

Edit text frame for writing MO requests.

Response window

Text frame containing the system response from a request.

Send

Click **Send** to send the request entered in **Request** frame.

Clear

Clear all text in the corresponding text frame.

5.10.6 Back to Login

Click **Back to login** menu to log out the **Admin Tool** and get back to the login window.

5.11 Additional System Configuration

Note: Any updates on the components in any Processing Layer node must be applied to the same components located on all the other Processing Layer nodes.

5.11.1 Component Configuration for CAI Driver

To change the CAI configuration use a SET XML request.

```
<Request MO="FSCCai" Operation="Set" SessionId="">
   <Configuration>
      [SubPlugins Configuration][CaiServerConfiguration]
   </Configuration>
</Request>
```

Note: To have the updated configuration take effect, start a new session or log out from current session and re-log in.

Note: CAI Server configuration is shared for CAI and XCAI interface.

SubPlugin Configuration

The CAI component can load the SubPlugins in Table 12 on page 77:

Table 12   SubPlugins

SubPlugins	Description
FSC-ProcLogSender	Used by default to communicate with ProcLog.
FSC-SPTcpip	Used if the communication has to be made by TCP/IP (used by default).
FSC-X25	Used if communication to CAI has to be made by X.25 (X.25 is not supported by Load Balancer, the X.25 upstream is not supported in Scalable HA configuration).

The following list shows a complete SubPlugins tag:

```
<SubPlugins>
   <Plugin>
      <Name>FSC-ProcLogSender</Name>
      <Version>1.0</Version>
      <Configuration>
         <LogLogicalAddress>ProcessingLog</LogLogicalAddress>
```

```
            <LogBuffertSize>10</LogBuffertSize>
         </Configuration>
      </Plugin>
      <Plugin>
         <Name>FSC-SPTcpip</Name>
         <Version>1.0</Version>
         <Configuration></Configuration>
      </Plugin>
      <Plugin>
         <Name>FSC-SPX25</Name>
         <Version>1.0</Version>
         <Configuration></Configuration>
      </Plugin>
</SubPlugins>
```

CAI Server Configuration

The CAI server configuration contains ProtocolServers.

ProtocolServers tag contains one or more ProtocolServer tags.

The ProtocolServers are named by the user.

The ProtocolServer contains configuration of the server that have these parts:

- `CaiSessionConfig`

  The configuration parameter for the session accepted by this server.

- `CaiServerConfig`

  The configuration of the listening server.

- `NoOfConnections`

  The number of the connection that this Protocol server can accept.

```
<Request MO="FSCCai" Operation="Set" SessionId="">
   <Configuration>
     <CaiServer>
       <ProtocolServers>
         <ProtocolServer Name="cai3300">
           <CaiSessionConfig>
             <FirstMessage>CONNECTING TO CAI...PROCESS cai3300
CONNECTED...</FirstMessage>
             <CaiPrompt>"Enter command: "</CaiPrompt>
             <CaiConfirmation>CRNL</CaiConfirmation>
             <ShowEmptyArg>0</ShowEmptyArg>
             <CaiIdleTimeout>10</CaiIdleTimeout>
             <NhfValidationSelection>0</NhfValidationSelection>
           </CaiSessionConfig>
           <CaiServerConfig>
```

```
              <Type>X25</Type>
              <port>3300</port>
              <NotAcceptMessage>Max number of connections
exceeded</NotAcceptMessage>
              <backlog>3</backlog>

          </CaiServerConfig>
          <NoOfConnections>10</NoOfConnections>
        </ProtocolServer>
      </ProtocolServers>
    </CaiServer>
  </Configuration>
</Request>
```

Table 13 on page 79 contains the CAI session configuration parameters.

Table 13   CAI Session Configuration Parameters

Parameter	Description	Values	Default
FirstMessage	The text that will be displayed first when the connection is accepted on the ProtocolServer. Must not be used if the server is using X25.	String	CONNECTING TO CAI. PROCESS <name> CONNECTED
CaiPrompt	The prompt displayed by CAI to the user. Must not be used if the server is using X25.	String	Enter command:
CaiConfirmation	The set of characters that is used by CAI to confirm sending of the response to the external system. Set the value as "NONE" if the server is using X25.	CR- uses \r, NL -uses \n, CRNL - uses \r\n, NONE	CRNL - uses \r\n
ShowEmptyArg	Display all arguments.	1-0	0
CaiIdleTimeout	If this parameter is set, the session will be closed when the timeout value has been reached since last activity. But if it is not set or set to zero the connection should be always live.	Integer (in second)	300

Parameter	Description	Values	Default
NhfValidatio nSelection	If this parameter is set to 1, NHF Validation will be invoked when receiving CAI commands or just before executing XCAI commands. To turn off NHF Validation, set this parameter to 0.	Integer (Only 0 or 1)	0 (off)
Name	The name of the ProtocolServer.	String	cai3300
Type	The type of the link to be used.	TCP/IP or X25	-
port	The port number the server is listening at. Only for TCP/IP	Integer	3300
NotAcceptMes sage	The Message sent when the maximum number of connection exceeded.	String	Max number of connections exceeded.
backlog	The backlog on the listening socket.	Integer	Not used by default.

Note: If NHF Validation is not installed or active, set `NhfValidatio nSelection` to 0. Otherwise, exceptions will be thrown. When `NhfValidationSelection` is set to 1, all CAI/XCAI commands will compulsively do NHF Validation.

Below is an example of an complete request to set up the CAI server with one ProtocolServer that accept 10 connections on port 3300.

```
<Request MO="FSCCai" Operation="Set" SessionId="">
  <Configuration>
    <CaiServer>
      <ProtocolServers>
        <ProtocolServer Name="cai3300">
          <CaiSessionConfig>
            <FirstMessage>CONNECTING TO CAI...PROCESS cai3300
CONNECTED...</FirstMessage>
            <CaiPrompt>"Enter command: "</CaiPrompt>
            <CaiConfirmation>CRNL</CaiConfirmation>
          </CaiSessionConfig>
          <CaiServerConfig>
            <Type>TCPIP</Type>
            <port>3300</port>
            <NotAcceptMessage>Max number of connections exceeded
</NotAcceptMessage>
          </CaiServerConfig>
```

```
               <NoOfConnections>10</NoOfConnections>
             </ProtocolServer>
           </ProtocolServers>
         </CaiServer>
       </Configuration>
   </Request>
```

5.11.2 Processing Log Sender Configuration

ProcLog Sender is a SubPlug-in in Ericsson Multi Activation. It is used to send the logs for the plug-ins in Ericsson Multi Activation, and can be configured by editing the `FDS-PL.cfg` and the `GsmEngine.cfg` file. The component LinkPool, Cluster, GuiDriver, CaiDriver and TaskManager are configured in `FDS-PL.cfg`, and ProcessingEngine is configured in `GsmEngine.cfg`. Edit configuration files and configure the SubPlugin as follows:

Note: Before editing the configuration file, all Ericsson Multi Activation processes must be stopped.

```
<SubPlugins>
  <Plugin>
    <Name>FSC-ProcLogSender</Name>
    <Version>2.0</Version>
    <Configuration>
       <LogLogicalAddress>ProcessingLog</LogLogicalAddress>
       <LogBuffertSize>100</LogBuffertSize>
    </Configuration>
  </Plugin>
</SubPllugins>
```

The configurable LogBuffertSize is configured to balance between the performance of Ericsson Multi Activation (CSO/s) and the interval of CAI provisioning.

LogBuffertSize is the number of the log items to be written to the disk at one time. The default value is 100.

A low value of the LogBuffertSize generates a high performance of the Ericsson Multi Activation but a long interval of CAI provisioning.

5.11.3 CAI3G Driver Configuration

To configure the CAI3G component, click **Component Configuration** in **AdminTool**, select **FSC-CAI3GDriver**. Configure the parameters as listed in Table 14 on page 82.

Table 14   CAI3G Configuration Parameters

Parameter	Description	Values	Default
`Name`	The name of the soapAdapter.	String	-
`ProgramFile`	The file location of soapAdapter.	String	`/opt/sog/bin/` `soapAdapter`
`Parameter1`	The port number.	Integer	8998, 8999
`Parameter2`	The path to the ior file that is used by soapAdapter.	String	`/var/sog/data/cach e/` CAI3GDriverBridge.ior
`SoapRecvTime Out`	The value for connection time-out when there is no data sent over it in specified time.	Integer (in second)	120
`MaxNumOfSoap Connection`	Maximum number of SOAP connections	Integer	80[1]
`ValidSwitch`	The switch to enable/disable the XML data validation against the generic CAI3G schema	0-disable, 1-enable (the other values taken as disabled)	0

(1) For two nodes HA configuration, the value of `MaxNumOfSoapConnection` defined on both nodes should be equal. Due to some limitation on the load balancing in two nodes HA configuration, CAS system should not use more than configured connections toward Ericsson Multi Activation system.

Note: CAI3G Driver configuration is shared for CAI3G and XCAI3G interface.

Click **Apply** to finish the configuration.

5.11.4   ServiceEngine Configuration

Note: If the address of Ericsson Authentication, Authorization and Accounting (E-AAA) is changed. Then the ServiceEngine configuration must also be changed and the intercommunication will be correctly. If there is more than one Processing Node, the changes of ServiceEngine must be applied to the other Processing Nodes also. Use a script to implement the synchronization see Section 5.7 on page 57.

The ServiceEngine configuration consists of the following parts:

• E-AAA configuration

To configure the ServiceEngine component, click **Component Configuration** in **AdminTool** and select **ServiceEngine**. Then configure the parameters that are listed in Table 15 on page 83.

Note: If there is no E-AAA server in the network, leave all E-AAA configuration parameters empty. Ericsson Multi Activation will then detect it and skip the access to E-AAA.

Table 15   ServiceEngine Configuration Parameters

Parameter	Description	Values	Default
KeepAliveIntern al (E-AAA)	The interval to check whether the connection to E-AAA is alive.	Integer (in second)	60
ConnectionTim eOut (E-AAA)	Set the time the system will wait for the connection attempt to be responded. If the time expires, a failure event will be reported.	Integer (in second)	5
HostName (E-AAA)	The name or IP address of the Ericsson Multi Activation server used by the application	String	-
PortNumber (E-AAA)	The port number used by the application (E-AAA)	Integer	-
BaseDN	The Distinguished Name for the root entry of an Lightweight Directory Access Protocol (LDAP) server	String	-
LoginDN (E-AAA)	The Distinguished Name for LDAP server login.	String	-
LoginPwd (E-AAA)	The password for the login	String	-
MaxConnection (E-AAA)	The maximum number of connections that can be established between ServiceEngine and LDAP server	Integer	-

Parameter	Description	Values	Default
TimeOut (E-AAA)	Set the time the system will wait for the request to be responded. If the time expired, an error message is reported.	Integer (in second)	-
SNUserRoot (E-AAA)	The root entry of user objects in E-AAA.	String	See note
SNServiceRoot (E-AAA)	The root entry of service objects in E-AAA.	String	See note
SNProfileRoot (E-AAA)	The root entry of profile objects in E-AAA.	String	See note

To finish the configuration click **Apply**.

The default values for SNUserRoot, SNServiceRoot and SNProfileRoot are:

SNUserRoot: snUserContainerName=SN_UserContainer, organisationName= aaa_MasterOrganisation, applicationName=aaa, nodeName=jambala

SNServiceRoot: snServiceContainerName=SN_ServiceContainer, appDataName=aaa, applicationName=aaa, nodeName=jambala

SNProfileRoot: snDefaultProfileContainerName=SN_DefaultProfileContainer, appDataName=aaa, applicationName=aaa, nodeName=jambala

Note: CAI3G will restart after applying the new value of maximum number of soap connections.

5.11.5   CNOSS Configuration

Note: If there are multiple PNs, the changes of CNOSS must be applied to the other PNs also. Use a script to implement it, see Section 5.7 on page 57.

The CNOSS alarm component has to be configured to send the alarms to the correct CNOSS.

Reconfigure this component to change the file or to change the place where to send the alarms.

To configure this component, click `Component configuration` in **Admintool** and select **FSC-cnossalarm**. Then type the desired values of the parameters (see Table 16 on page 85) and click **Apply**.

Table 16   CNOSS Configuration Parameters

Parameter	Description	Values	Default
`MaxListSize`	The maximum size of the alarm list.	Integer	100
`AlarmSavedPath AndFilename`	The name (full path) of the file that stores the received alarm information.	String	`/var/sog/data` `/database` `/alarmlist.tmp`
`SubscriptionSa vedPathAndFile name`	The name (full path) of the file that stores the information subscribed by OSS.	String	`/var/sog/data` `/database` `/subInfo.tmp`
`MappingTablePa thAndFilename`	The name (full path) of the file that stores the mapping rule between Ericsson Multi Activation's alarms and OSS's alarms.	String	`/var/sog/data/ database` `/AlarmServer` Mapping.xml
`NotificationIO RPathAndFilena me`	This file is used for Ericsson Multi Activation internal communication.	String	`http://[Resour ceNode]/` Notification Singleton.ior
`ManagedObjectC lass`	This parameter can be changed to a name suitable for CNOSS.	String	com.ericsson. nms.fm.SOG
`ManagedObjectI nstance`	The name that is shown in the alarms. It can be changed.	String	`SOG@Processing Node`
`SystemDN`	This parameter can be changed to a name suitable for CNOSS.	String	com.ericsson. nms.fm.SOG
`NrOfThreads`	The number of the request in parallel (threads) that the CNOSS can handle.	Integer	1

Contact the CNOSS personnel to decide suitable name for `ManagedObjectClass`, `ManagedObjectInstance` and `SystemDN` in Table 16 on page 85.

Note: The CNOSS related or files are located on the Resources Node.

5.11.6 System Monitor Configuration

To configure the System Monitor parameters, click **Component Configuration** menu item and click on the **FSC-SystemMonitor** in the component tree and modify the parameter definition in the right frame. The System Monitor parameters are listed in Table 17 on page 86.

Click the **Apply** button to save changes. To revert to the last saved configuration, click on the **Update** button.

Table 17   System Monitor Configuration Parameters

Parameter	Description	Values	Default
FSCEventServerLogicalName	The logical name of FSCEventServer.	String	FSC-Event/3.0
AllowQueueOverflow	System Monitor has a queue to store all events sent by EventServer and this parameter controls the entry of events in case of overflowing the queue.	0 or 1	1
QueueSize	Set the size of the queue.	Integer	250
ConfigSyncTime	Set the synchronize time System Monitor takes to save its internal status to FDSServer (configManager).	Time in second	20

5.11.7 Creating New Telnet User

Note: If there are multiple Processing Nodes, the same telnet users must be created on all Processing Nodes.

To make it possible to access Ericsson Multi Activation through telnet the new Unix user has to be added to the Ericsson Multi Activation server. Execute the script as follows:

```
# /opt/sog/bin/create_telnet_user

Enter the user name of telnet user ?: telcai

telcai user not exist create...

6 blocks

Enter the cai port ?: 3300

Enter the hostname ?: [HostName]
```

```
Done.
```

The CAI port must be the same as the one defined in one of the ProtocolServers in CAI. Only one port can be defined for each user.

The hostname must be the IP address of Load Balancer. If there is no Load Balancer, press **Enter** directly.

Do a telnet log on to the Ericsson Multi Activation server as the new user.

Enter the new password for the new user.

Changing Port Number for Telnet User

Edit the `.profile` file in the users home directory.

Change the argument to the `/opt/sog/bin/TCPIPAdaptor` command.

5.11.8 PPAS MML Converter Configuration

MML converter is used to convert the MML command sent from PPAS to CAI command and to provision the appropriate HLR. Follow the steps below to enable the MML converter in the system:

1. Edit the `/etc/inet/services` file:

   # **vi /etc/inet/services**

   Add the following line in the file, substitute the port number variable with a feasible port number for MML converter:

   ```
   mmlc <mmlc port number>/tcp mmlc # PPAS MML Converter
   ```

   Save the file.

2. Edit the `/etc/inet/inetd.conf` file.

   # **vi /etc/inet/inetd.conf**

   Add the following line in the file; make sure to copy the text into one line:

   ```
   mmlc stream tcp nowait root /opt/sog/bin/
   exec_mml.sh /var/sog/data/database/MMLConverter.cfg
   ```

   Save the file.

3. Copy the PPAS MML Converter template configuration file to the `/var/sog/data/database/` directory.

   ```
   sogadm> cp /opt/sog/system/initialdata/0\
   /etc/convertor_template.xml /var/sog/data/database\
   ```

/MMLConverter.cfg

4. Edit the `MMLConverter.cfg` template file to contain the intended parse definition:

    sogadm> **vi /var/sog/data/database/MMLConverter.cfg**

    Save the file.

5. Restart the inetd daemon by executing the following sequence:

    # **ps -ef | grep inetd**

    root 154   1 0 13:17:10 ?   0:00 /usr/sbin/inetd -s

    root 5308 5302 0 09:11:57 pts/4 0:00 grep inetd

    #

    Locate the PID for the inetd daemon in the list. In the example the PID is 154. Send a SIGHUP signal to the process to make it re-read the configuration files:

    # **kill -HUP** *<inetd daemon PID>*

The MML converter is then enabled, and the MML commands from PPAS will be converted to corresponding CAI commands according to the parse definition defined in `/var/sog/data/database/MMLConverter.cfg`.

5.11.9 USM GUI Configuration

Note: This whole chapter can be skipped since the concept of USM is phased out in Ericsson Multi Activation 5.0 FD3.

In case of multiple Processing Nodes, the USM GUI must be installed on each Processing Node. The USM GUI can be configured to communicate with the CAI3G Server via the Load Balancer.

The host name/IP and port name of Ericsson Multi Activation CAI3G Server is configured in `/var/sog/config/tomcat/web.xml` with the format of `http://hostname:portname`. The default port is 8998 or 8999.

All changed configuration will not be updated until the Tomcat is restarted.

See the example below:
```
<env-entry>
    <env-entry-name> usm.ema.server.url</env-entry-name>
    <env-entry-name> http://150.236.41.136:8998
        </env-entry-name>
</env-entry>
<env-entry>
    <env-entry-name> usm.ema.server.sessionControl.url
```

```
            </env-entry-name>
        <env-entry-name> http://150.236.41.136:8998
            </env-entry-name>
    </env-entry>
    <env-entry>
        <env-entry-name> usm.ema.server.provisioning.url
            </env-entry-name>
        <env-entry-name> http://150.236.41.136:8998
            </env-entry-name>
    </env-entry>
```

5.12   ESA Configuration

This section describes the configuration in ESA.

5.12.1   OSS IP Configuration

Note: If there are multiple processing nodes, the same configuration must be applied on all processing nodes.

Configuring One NMS for Trap Destination

To change one Network Management System (NMS) to which Ericsson Multi Activation sends the alarm trap, log on to UNIX as `root` and run the following command:

/opt/sog/bin/changeNMS *<host> <port> <community>*

Configuring One or More NMS for Trap Destination

To add or delete one or more NMS to which Ericsson Multi Activation sends the alarm trap, complete the following steps:

Note: This script can both support SNMP V2-V1 and SNMP V3, but it can not support SNMPv3 and SNMPv2-v1 at the same time for different NMSs (The default is SNMPv2-v1). According to the configuration of `/opt/ESA/MasterAgent/conf/esaAgentStartup.xml` when starting ESA, the script can justify the SNMP version, hence, there will be some difference in operations between the different SNMP version.

Regarding how to change the SNMP version, refer to ESA Setup and Configuration.

1.   Log into UNIX as the user `root`, and run the command:

/opt/sog/bin/configNMS

```
========================================================
No        Host           Port          Community
```

```
                  --------------------------------------------------------
                  1):     127.0.0.1      162          SNOS-PE
                  ======================================================
                  Please choose your operation :
                      [a] - add a NMS destination
                      [d] - delete a NMS destination
                      [v] - view current config
                      [r] - restart SNMP Management Agent
                      [q] - quit
```

2. If the NMS destination needs to be added, input **a**.

    -   When the version of SNMP is v1 or v2 :

        a   Input the NMS destination host name:

            ```
            Please input host []: 127.0.0.1
            ```

        b   Input the NMS destination port number:

            ```
            Please input port [162]:
            ```

            Note: Press **Enter** directly to use the acquiescence value of the
            port.

        c   Input the NMS destination community:

            ```
            Please input community [SNOS-PE]:
            ```

            Note: Press **Enter** directly to use the acquiescence value of the
            community.

        d   Confirm the adding:

            ```
            Do you want make it effect[y/n] ?
            host[NMS], port[Port],
            community[Community] y

             [Message] - NMS has been added successfully!
            ```

    -   When the version of SNMP is v3 :

        a   Input the NMS destination host name:

            ```
            Please input host []: 127.0.0.1
            ```

        b   Input the NMS destination port number:

            ```
            Please input port [162]:
            ```

            Note: Press **Enter** directly to use the acquiescence value of the
            port.

        c   Input the NMS destination community:

```
            Please input community [SNOS-PE]:
```

Note: Press **Enter** directly to use the acquiescence value of the community.

d   Input the name of the USM user which is used when the manager version is v3:

```
            Please input username[]: test_name
```

e   Input the security level of the user:

```
            Please input securitylevel[]: 1
```

Note: The security level of the user should be 1 or 2 or 3.

1: No authority and no privacy

2: Authority and no privacy

3: Authority and privacy

f   The context name of the user:

```
            Please input contextname[]: test_context
```

g   Confirm the adding:

```
            Do you want make it effect[y/n] ?
            host[NMS], port[Port], community[Community] y

            [Message] - NMS has been added successfully!
```

3. If the NMS destination needs to be deleted, input **d**.

a   Select the NMS destination to be deleted:

```
            Please choose the number you want to delete[1~2]: 2
```

b   Confirm the deletion:

```
            Do you really want to delete it [y/n] ?
            host[NMS], port[Port], community[Community] y

            [Message] - Item[2] has been removed successfully!
```

4. Input **v** to view the current configuration.

5. Input **r** to restart the SNMP management agent.

Note: If any NMS destination is added or deleted, the SNMP management agent must be restarted to make the configuration effect before quitting the NMS configuration.

6.   Input **q** to quit the NMS configuration.

The SNMP alarm has been configured.

5.12.2   ESA IP Configuration

Configure trap sender identity of ESA:

vi /opt/ESA/ESA/conf/esaIP.cfg

Restart ESA to make the new configuration take effect.

svcadm disable esa

svcadm enable esa

5.12.3   Viewing Existing Alarm Mapping and Updating Alarm Mapping

Complete following steps to view and update existing alarm mapping.

1.   Check definition of SNMP Alarm mapping on Ericsson Multi Activation server:

/opt/sog/bin/alarmmapping –d

2.   Check the default SNMP Alarm mapping:

/opt/sog/bin/alarmmapping –l

3.   Add a new SNMP Alarm mapping or update the existing one. ESA will be restarted automatically, for example,

/opt/sog/bin/alarmmapping –m

input alarmModule : **Test**

input alarmErrorCode : **1111**

Severity [3] : **2**

Event Type [2] :

ProbableCause [52] :

Note: Press **enter** directly to use the acquiescence value of type.

5.12.4   EMC Trap Configuration

Log in EMC Navisphere Manager Adminstrator GUI via browser.

Note: IP address is Storage Processor A (SPA) or Storage Processor B (SPB) IP.
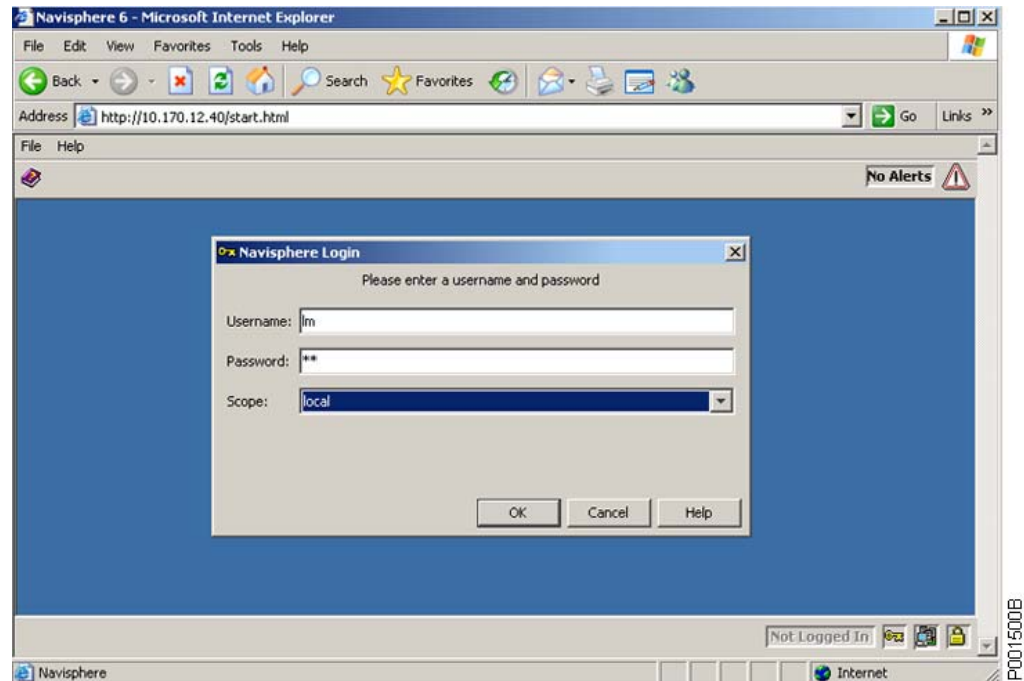
Figure 12   EMC Navisphere Login

Starting the Wizard
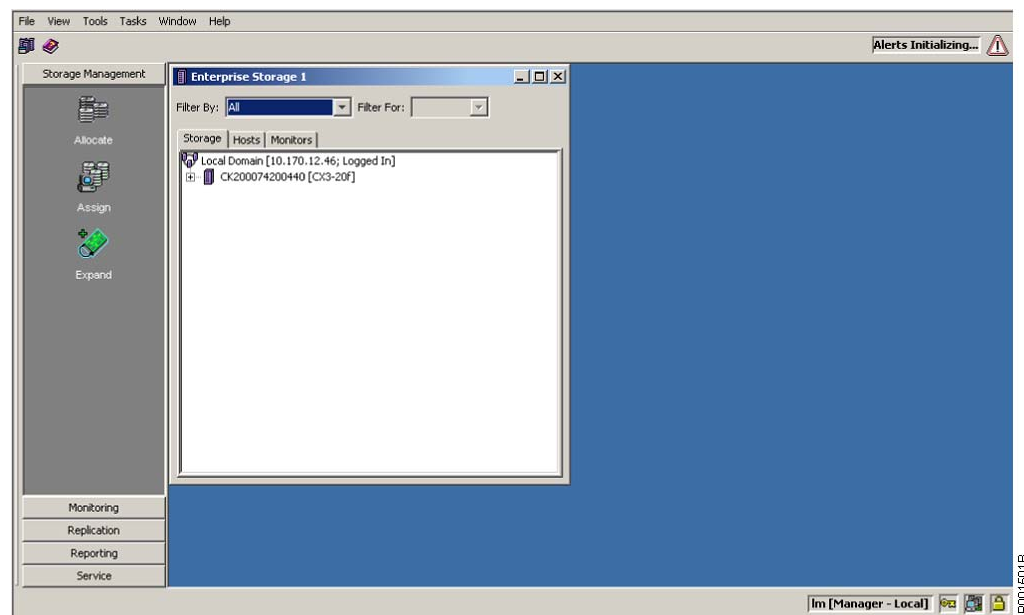
Figure 13   EMC Navisphere Manager Administrator GUI

1. On the **Tools** menu, select **Event Monitor** and then **Configuration Wizard**.

or

In the **Enterprise Storage** dialog box, click the **Monitors** tab, right-click **Templates**, and select **configuration Wizard**.

2. Read the setup steps in the **Start Wizard** and then click **Next** to continue.

Selecting the Monitoring Type
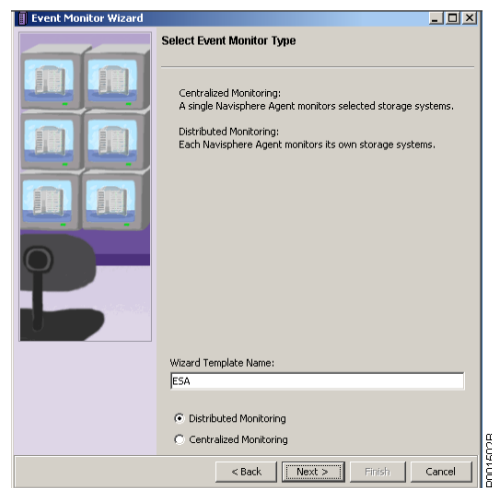
Figure 14   Select Event Monitor Type Window

3. In the **Select Event Monitor Type** enter the template name in **Wizard Template Name** field, and select the type of monitoring: **Distributed Monitoring**.

4. Click **Next** to continue.

For Distributed Monitoring
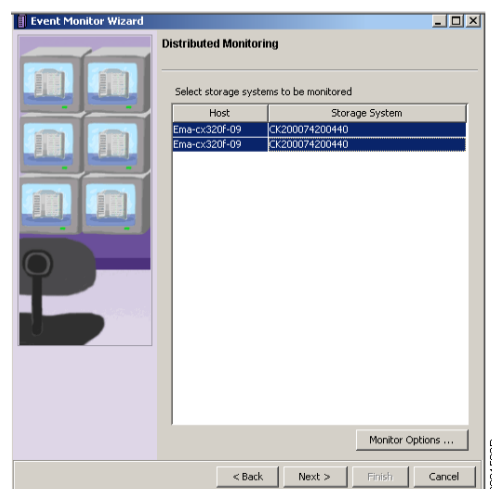
Figure 15   Distributed Monitoring Window

5. Select both items listed in **Distributed Monitoring**.

6. Click **Next** to open the **Select Events by Category**.

Selecting Events to Monitor
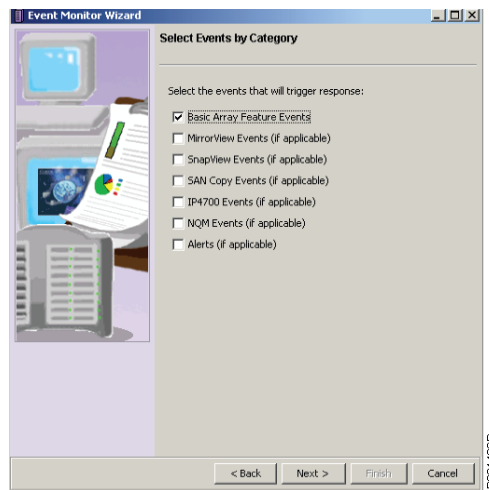
Figure 16   Select Events by Category Window

7. In the **Select Events by category**, tick off **Basic Array Feature Events** category and then click **Next**.
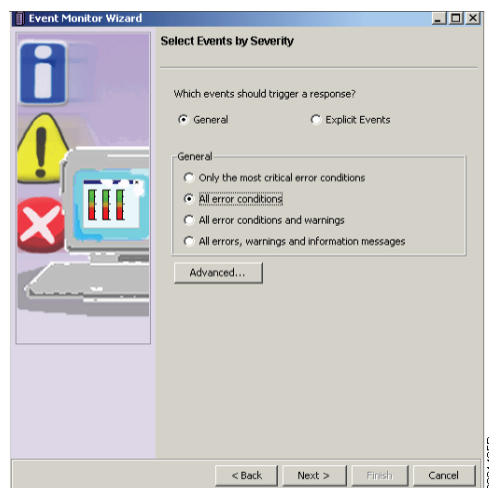
Figure 17   Select Events by Severity Window

8. In the **Select Events by Severity**, select **General**, select **All error conditions** (recommended), and then click **Next** to open the **Select Response**.

Selecting the Response Method
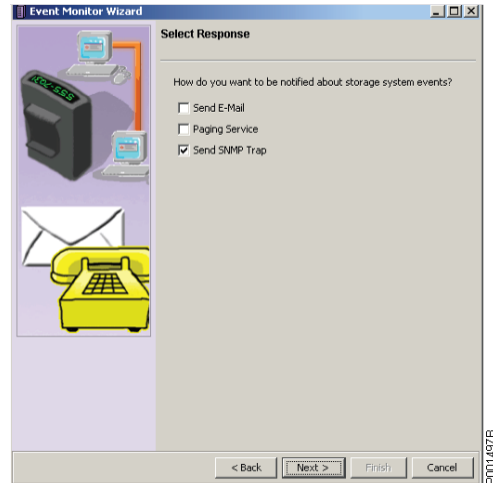
Figure 18   Select Response Window

9. In the **Select Response**, tick off **Send SNMP Trap** and then click **Next** to continue.

SNMP Response
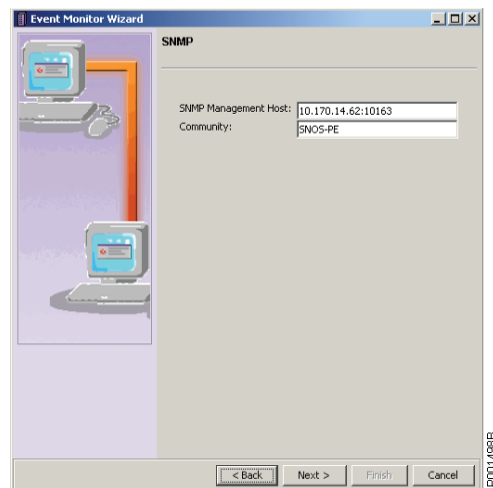
Figure 19   SNMP Window

10. In the **SNMP**, enter the `Ip_address :  port name` in the **SNMP Management Host**, `SNOS_PE` in **Community**.

    Note: RN node can only be selected under Scalable-HA scenarios.

    Input SNMP trap port of host (default 10163).

11. Click **Next** to complete the SNMP response setup and proceed to the **Summary**.
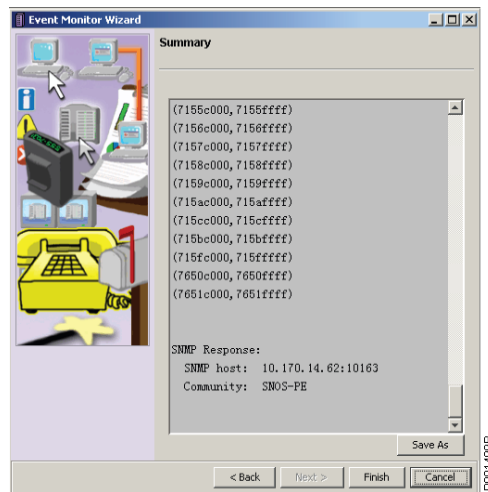
Figure 20   Summary Window

12. The wizard opens the **Summary** where the servers, event types, event severities, and defined response responses can be reviewed.

13. Review the information displayed in the current screen. If it is correct, then click **Finish** to create the template file.

    Event Monitor will apply these templates to all the selected event monitoring agents that will monitor the storages systems.

Modifying the Generated Template
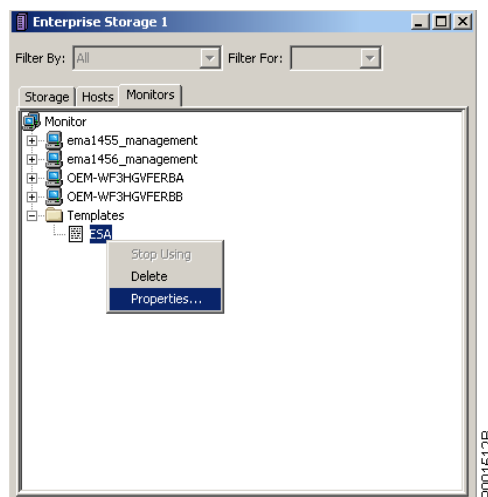
Figure 21   Modifying Template

1. In the **Enterprise Storage** dialog box, click the **Monitors** tab.

2. Press down **Templates**, right-click **ESA** and select **Properties** to modify the template.

Deleting the Generated Template
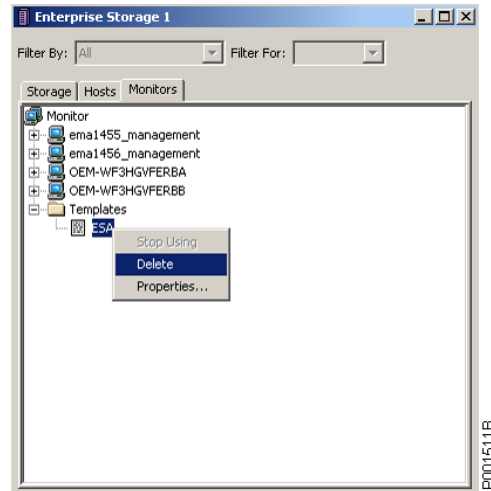
Figure 22   Deleting Template

1. In the **Enterprise Storage** dialog box, click the **Monitors** tab.

2. Press down **Templates**, right-click **ESA** and select **Delete** to delete templates.

5.12.5   Enable or Disable SNMP Alarm

This section describes how to enable or disable SNMP alarm.

For All SNMP Agent:

```
# svcadm disable ssmagent

# svcadm disable esa

# svcadm enable esa

# svcadm enable ssmagent
```

For HW Monitoring:

```
# svcadm disable ssmagent

# svcadm enable ssmagent
```

For EMC:

Regarding how to enable or disable SNMP alarm for EMC, refer to Section 5.12.4 on page 92.

5.12.6 ESA Log Files

To activate the debug mode for the ESA, complete the following steps:

- Stop the ESA

  # **svcadm disable esa**

Edit the following files to set the parameter debug to the value on to activate the debug mode, or off to inactivate it.

/opt/ESA/conf/esaMode.cfg

- Start the ESA

  # **svcadm enable esa**

Table 18   ESA log files

File Location	Comments
/var/ESA/ESA/log	Generic ESA log folder
/var/ESA/MasterAgent/log	Master Agent log folder
/var/ESA/AlarmService/log	Alarm Service log folder
/var/ESA/TrapTranslator/log	Trap Translator log folder
/var/ESA/SSM/log	SSM log folder

5.13   Viewing Event Log

To view event log, execute the following command:

```
sogadm> /opt/sog/bin/evtlog.sh \
[-t <starttime-stoptime>] [-o outputfile]
```

Below are examples of how to view event log.

- sogadm> **/opt/sog/bin/evtlog.sh**

  All events will be listed on the screen within recent one minute.

  The following screen will be displayed.

  ```
  -------------------------------------------
      [    Sending request...   ]
  -------------------------------------------
   --     GetDBLog.tmp     --
  -------------------------------------------
   The variable FDS_SERVER_HOST has not been defined.
  It will be assigned the default value: ema1451
  ```

```
[Logged in to server FDS-PL]

    [2008-05-19 11:38:25] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
    [2008-05-19 11:38:25] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:

[Logged out from server FDS-PL]
```

- sogadm> **/opt/sog/bin/evtlog.sh -t \
  <*yyyymmddhhmiss*>-**

  From the starting time to present, all events which are within the period
  will be listed on the screen.

  The following screen will be displayed.

```
-------------------------------------------
   [   Sending request...   ]
-------------------------------------------
 --     GetDBLog.tmp    --
-------------------------------------------
 The variable FDS_SERVER_HOST has not been defined.
It will be assigned the default value: ema1451

[Logged in to server FDS-PL]

    [2008-05-19 11:35:10] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
    [2008-05-19 11:35:10] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
    [2008-05-19 11:35:23] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
    [2008-05-19 11:35:23] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
    [2008-05-19 11:35:28] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
    [2008-05-19 11:35:28] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
    [2008-05-19 11:36:24] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
    [2008-05-19 11:36:24] Host: 847eafba
```

```
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
   [2008-05-19 11:36:25] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
   [2008-05-19 11:36:25] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
   [2008-05-19 11:37:25] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
   [2008-05-19 11:37:25] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
   [2008-05-19 11:38:25] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
   [2008-05-19 11:38:25] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
   [2008-05-19 11:38:55] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
   [2008-05-19 11:38:55] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:

[Logged out from server FDS-PL]
```

- sogadm> **/opt/sog/bin/evtlog.sh -t **
  <yyyymmddhhmiss>-<yyyymmddhhmiss>

  All events that are within the set period will be listed on the screen.

  The following screen will be displayed.

```
--------------------------------------------
    [    Sending request...   ]
--------------------------------------------
 --     GetDBLog.tmp     --
--------------------------------------------
 The variable FDS_SERVER_HOST has not been defined.
It will be assigned the default value: ema1451

[Logged in to server FDS-PL]

   [2008-05-19 11:35:10] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
      Aff.Obj:
   [2008-05-19 11:35:10] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
      Aff.Obj:
```

```
    [2008-05-19 11:35:23] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
    Aff.Obj:
    [2008-05-19 11:35:23] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
    Aff.Obj:
    [2008-05-19 11:35:28] Host: 847eafba
Event: FDSAuthority:UserLoggedIn
    Aff.Obj:
    [2008-05-19 11:35:28] Host: 847eafba
Event: FDSAuthority:UserLoggedOut
    Aff.Obj:

[Logged out from server FDS-PL]
```

- sogadm> **/opt/sog/bin/evtlog.sh -t **
  ***<yyyymmddhhmiss>-[<yyyymmddhhmiss>]* -o outputfile**

  All events that are within the set period will be listed in the file.

5.14   Configuration of SUNWsscs for Monitoring SUN StorEdge 3510 Disk Array

Note: This chapter is not valid for the stand-alone low-end configuration.

The package SUNWsscs must be installed to enable the monitoring of the SUN StorEdge 3510 disk array.

To configure SUNWsscs, complete the following steps:

1. Check if the package SUNWsscs is installed:

    # **pkginfo SUNWsscs**

2. Configure passwords for the users ssmon, ssadmin, and ssconfig:

    These users are created by the installed package.

    # **passwd ssmon**

    # **passwd ssadmin**

    # **passwd ssconfig**

3. Start the monitoring daemons:

    # **/etc/init.d/ssagent start**

    # **/etc/init.d/ssdgrptd start**

4. Start the SUN StorEdge Configuration Service (SSCS) console GUI:

```
# cd /opt/SUNWsscs/.sscsconsole
```

```
# /ssconsole
```

5. In the **Server List Setup** window, click **Add**, and run the following commands:

    ```
    Server Name: localhost
    ```

    ```
    SSmon Password: <SSmon password>
    ```

6. Click **Get IP Addr by Name**.

    The IP address will be updated with `127.0.0.1`.

7. In the **Auto Discovery** field, select **Yes**, and click **OK**.

8. Input *<Mail Server>* if needed.

9. In the left pane, select **Localhost**.

10. In the middle pane, click **> Add >**.

11. Click **OK**.

12. In the tree pane, select **127.0.0.1**.

13. Select the menu item **File** -> **Login**.

14. Input the user name and password of the user `ssconfig`, and click **OK**.

15. Select the menu item **View** -> **Agent Options Management**.

16. In the **IP-address** field, input the monitored SUN StorEdge 3510 IP address with the default port `58362`.

17. In the **Controller Password** and **Verify Password** fields, input the SUN StorEdge 3510 password if used.

18. Leave all other fields with the default values, and click **Add >>**.

19. Select the check boxes **Enable JBOD Support** and **Out of band management preferred over In-band**.

20. Click **OK**.

21. Select the menu item **Array Administration** -> **Controller Assignment...**.

22. Select **localhost** from the drop-down list **Server to manage this controller**, and click **Apply** for each listed controller.

    The assignment operation can take up to 2 minutes per array.

    All items in the list displays `localhost` as the enabled server.

23. Select **Yes** if the tool asks to force a controller assignment.

24. Logout the tool.

25. Enable the agents to start after reboot:

    # **/etc/init.d/ssagent enable start**

    # **/etc/init.d/ssdgrptd enable start**

26. Restart the agents:

    # **/etc/init.d/ssagent stop**

    # **/etc/init.d/ssdgrptd stop**

    # **/etc/init.d/ssagent start**

    # **/etc/init.d/ssdgrptd start**

SUNWsscs has been configured.

5.15 Configuration of NTP Server

This chapter describes two scenarios of the NTP server configuration:

- Configuring the external NTP server manually

- Configuring the internal NTP server manually

5.15.1 Configuring the External NTP Server Manually

Pre-condition: The NTP packages are installed.

To configure the external NTP server manually, complete the following steps:

Note: In Two Nodes HA, Scalable HA configuration, make sure the following steps are implemented on all nodes.

1. Check whether the NTP packages are installed:

   # **pkginfo | grep ntp**

   The packages should be installed:

   ```
   system SUNWntpr NTP, (Root)
   system SUNWntpu NTP, (Usr)
   ```

2. Stop the daemon xntpd if it is running:

   # **svcadm disable network/ntp**

3. Copy the file `ntp.conf`:

   # **cp /etc/inet/ntp.client /etc/inet/ntp.conf**

   The file `ntp.conf` will exist.

4. Edit the file `ntp.conf`:

   # **vi /etc/inet/ntp.conf**

   # **more /etc/inet/ntp.conf**

   The file `ntp.conf` will be edited correctly:

   server *<External NTP server IP address1>* prefer

   server *<External NTP server IP address2>*

5. Start the daemon `xntpd`:

   # **svcadm enable network/ntp**

6. Check whether the daemon `xntpd` is started:

   # **ps -ef | grep ntp**

   The daemon `xntpd` should be started.

7. Check the system time of Ericsson Multi Activation.

   Make sure the system time of Ericsson Multi Activation is the same as the NTP server.

The external NTP server has been configured manually.

Note: It is recommended that at least two server entries are available in the file `ntp.conf`, and all the servers listed in the file `ntp.conf` have the same clock time.

5.15.2   Configuring Internal NTP Server Manually

For Stand-alone Configuration

Pre-condition: The NTP packages are installed.

To configure the internal NTP server manually, complete the following steps:

1. Check whether the NTP packages are installed:

   # **pkginfo | grep ntp**

   The packages should be installed:

```
system SUNWntpr NTP, (Root)
system SUNWntpu NTP, (Usr)
```

2. Stop the daemon `xntpd` if it is running:

   # **svcadm disable network/ntp**

3. Copy the file `ntp.conf`:

   # **cp /etc/inet/ntp.server /etc/inet/ntp.conf**

   The file `ntp.conf` will exist.

4. Edit the file `ntp.conf`:

   # **vi /etc/inet/ntp.conf**

   # **more /etc/inet/ntp.conf**

   The file `ntp.conf` will be edited correctly:

   ```
   server 127.127.1.0 prefer
   fudge 127.127.1.0 stratum 0
   broadcast 224.0.1.1 ttl 4
   enable auth monitor
   driftfile /var/ntp/ntp.drift
   statsdir /var/ntp/ntpstats/
   filegen peerstats file peerstats type day enable
   filegen loopstats file loopstats type day enable
   filegen clockstats file clockstats type day enable
   keys /etc/inet/ntp.keys
   trustedkey 0
   requestkey 0
   controlkey 0
   ```

5. Start the daemon `xntpd`:

   # **svcadm enable network/ntp**

   The daemon `xntpd` should be started.

6. Check whether the daemon `xntpd` is started:

   # **ps –ef | grep ntp**

   The daemon `xntpd` should be started.

The internal NTP server has been configured manually.

For Two Nodes HA Configuration

Pre-condition: The NTP packages are installed.

To configure the internal NTP server manually, complete the following steps on two nodes:

1. Check whether the NTP packages are installed:

    # **pkginfo | grep ntp**

    The packages should be installed:

    ```
    system SUNWntpr NTP, (Root)
    system SUNWntpu NTP, (Usr)
    ```

2. Stop the daemon xntpd if it is running:

    # **svcadm disable network/ntp**

3. Copy the file ntp.conf:

    # **cp /etc/inet/ntp.cluster /etc/inet/ntp.conf**

    The file ntp.conf will exist.

4. Edit the file ntp.conf:

    # **vi /etc/inet/ntp.conf**

    # **more /etc/inet/ntp.conf**

    The file ntp.conf will be edited correctly:

    ```
    server 127.127.1.0
    peer clusternode1-priv prefer
    peer clusternode2-priv
    peer clusternode3-priv
    peer clusternode4-priv
    peer clusternode5-priv
    peer clusternode6-priv
    peer clusternode7-priv
    peer clusternode8-priv
    peer clusternode9-priv
    peer clusternode10-priv
    peer clusternode11-priv
    peer clusternode12-priv
    peer clusternode13-priv
    peer clusternode14-priv
    peer clusternode15-priv
    peer clusternode16-priv
    driftfile /var/ntp/ntp.drift
    filegen peerstats file peerstats type day enable
    filegen loopstats file loopstats type day enable
    filegen clockstats file clockstats type day enable
    ```

5. Start the daemon xntpd:

> # **svcadm enable network/ntp**

6. Check whether the daemon `xntpd` is started:

   > # **ps –ef | grep ntp**

   The daemon `xntpd` should be started.

7. Check the system time of the two nodes.

   Make sure the system time of the two nodes is the same.

The internal NTP server has been configured manually.

For Scalable HA Configuration

All Ericsson Multi Activation PNs will use one of the RNs as the NTP server.

Pre-condition: The NTP packages are installed.

To configure the internal NTP server manually, complete the following steps:

1. Check whether the NTP packages are installed on all nodes:

   > # **pkginfo | grep ntp**

   The packages should be installed:

   ```
   system SUNWntpr NTP, (Root)
   system SUNWntpu NTP, (Usr)
   ```

2. Stop the daemon `xntpd` if it is running on all nodes:

   > # **svcadm disable network/ntp**

3. Copy the file `ntp.conf` on all RNs:

   > # **cp /etc/inet/ntp.cluster /etc/inet/ntp.conf**

4. Copy the file `ntp.conf` on all PNs:

   > # **cp /etc/inet/ntp.client /etc/inet/ntp.conf**

   The file `ntp.conf` will exist.

5. Edit the file `ntp.conf` on all RNs:

   > # **vi /etc/inet/ntp.conf**

   > # **more /etc/inet/ntp.conf**

   The file `ntp.conf` will be edited correctly:

```
server 127.127.1.0
peer clusternode1-priv prefer
peer clusternode2-priv
peer clusternode3-priv
peer clusternode4-priv
peer clusternode5-priv
peer clusternode6-priv
peer clusternode7-priv
peer clusternode8-priv
peer clusternode9-priv
peer clusternode10-priv
peer clusternode11-priv
peer clusternode12-priv
peer clusternode13-priv
peer clusternode14-priv
peer clusternode15-priv
peer clusternode16-priv
driftfile /var/ntp/ntp.drift
filegen peerstats file peerstats type day enable
filegen loopstats file loopstats type day enable
filegen clockstats file clockstats type day enable
```

6. Edit the file `ntp.conf` on all PNs:

   # **vi /etc/inet/ntp.conf**

   # **more /etc/inet/ntp.conf**

   The file `ntp.conf` will be edited correctly:

   server *<IP address of master RN node>*

   server *<IP address of another RN node>*

7. Start the daemon `xntpd` on all nodes:

   # **svcadm enable network/ntp**

8. Check whether the daemon `xntpd` is started on all nodes:

   # **ps –ef | grep ntp**

   The daemon `xntpd` should be started on all nodes.

9. Check the system time of all PNs and non-master RNs.

   Make sure the system time of all PNs and non-master RNs is the same with the time of the master RN.

The internal NTP server has been configured manually.

6 Corrective Procedures

This section describes certain procedures about Ericsson Multi Activation application, processing log replayer and Solaris Volume Manager.

6.1 Ericsson Multi Activation Application

This section contains information about configuration restore and how to clean error flags of Resource Node HA.

6.1.1 Clearing Error Flags of Resource Node HA

An error flag can be attached on the resource when some errors occur during runtime, this needs to be removed manually by the administrator.

To check the error flags, run the following command:

`scstat -g`

These error flags will be displayed on the screen.

To clear a resource error flag, run the following command:

`scswitch -c -h <node> [,<node>...]  -j \`
`<resource> [,<resource>...]  -f <flag_name>`

`<flag_name>` can be BOOT_FAILED, UPDATE_FAILED, INIT_FAILED, FINI_FAILED, or STOP_FAILED.

Note: Before clearing a STOP_FAILED flag, make sure that the data service is actually down.

The error flags can also be cleared using the Sun Plex Manager. See document Sun Cluster 3.1 08/05 System Administration Guide.

6.1.2 Configuration Restore for Resource Node

1. Put all Resource Groups in the cluster offline.

2. Remove files from cache:

    # `su - sogadm`

    sogadm> `cd /var/sog/data/cache`

    sogadm> `rm -rf 3rd FDS FSC SOG containers`

3. Restore the Configuration:

```
sogadm> /opt/sog/maint/SOG_Restore.sh \
<aConfigurationBackupFile>

sogadm> exit
```

If the configuration file is in compressed format, use `-c` option to the script above.

4. Put all Resource Groups online again.

6.1.3 SN Consistency Maintenance

Service Network (SN) Consistency tool is provided to view and correct SN data inconsistency problem between USD and AAA (EIC).

Some data is stored both in AAA and USD. There are totally five user attributes that need to be concerned between AAA and USD:

- `uId`: User Identifier in USD stored in AAA as cdsUid.

- `naIntId`: The ID of the user to access the SN from internet stored in AAA as cdsNAintid.

- `naPSId`: The MSISDN of the user stored in AAA as cdsNAPSid.

- `serviceSubscription`: Services subscribed by the user stored in AAA as cdsSSList.

- `aaaUId`: User identifier in AAA stored in AAA as uid.

There is totally one offered service attribute that need to be concerned between AAA and USD:

- `osId`: The ID of OfferedService stored in AAA as cdsOSId.

To use the SN consistency tool, run the command as follows:

- To list the data, use options like:

```
sogadm> snconsistency -a list
```

- To view the consistency information, use options like:

```
sogadm> /opt/sog/bin/snconsistency -u <username> \
-p <password> -f <idfile> | -i <idlist> \
-a view
```

- To correct the data consistency, use options like:

```
sogadm> /opt/sog/bin/snconsistency -u \
<username> -p <password> -f <idfile> \
| -i <idlist> [-o <logfile>] -a correct \
```

[-m USD|AAA] [-s <schedule time>] [errorlog]

Here are some limitations for the correct operation:

— `USD.serviceSubscriptionList` and `AAA.cdsSSList` would not be applicable to correct.

— If a user or service exists in AAA but does not in USD, this user or service will not be created in USD.

In Table 19 on page 113 is the options for `snconsistency` listed.

Table 19   Snconsistency

Option	Option Description
`-u <username>`	The Ericsson Multi Activation admin user name who handles consistency tool for service network. For example, `-u sogadm`
`-f <idfile>`	The file name that consists of the id list.
`-i <idlist>`	The list of offeredServiceId or uId, separated with commas, for example, `23,45,86,98`
`-o <logfile>`	Specify the log file that logs the operation. The default file is `~/snconsistency.log`.
`-a list|view|correct`	The action that snconsistency tool applies. The user can either list the scheduled jobs or view the consistency information of SN. If any insistency problem is raised, use the option correct to correct the inconsistency.
`-m USD|AAA`	If the user inputs USD, the consistency tool will modify the data in AAA and take USD as the reference, and vice versa. The default is USD.
`-e motype`	Specify the Managed Object (mo) type (User or OfferedService). Default is User.
`-s <schedule time>`	Schedules the command. The time format is `YYYYMMDDhhmm`. For detailed time format specification, see the main page of at command in Unix.

-h	Display the help information.
errorlog	Reserved for internal use.

An example is shown as follows:

To correct the data consistency between USD and AAA using USD as the master at a scheduled time, enter the command:

sogadm> **/opt/sog/bin/snconsistency -u sogadm -p sogadm -i 24,32 -a correct -m USD -s 200312122300**

The data in EIC is compared and corrected according to the data in USD on 2003.12.12 23:00.

Note: snconsistency.log records the log information, while snconsistency.log.trace contains debug information when error occurs.

Note: If the back slash "\" is used in either user name or password, when typing the value of parameters -u and -p, two extra "\" must be added before the "\". For example, if the password is set as sog\>adm, the command is:

sogadm> **/opt/sog/bin/snconsistency -u \ sogadm -p sog\>adm** (wrong)

sogadm> **/opt/sog/bin/snconsistency -u \ sogadm -p sog\\\>adm** (correct)

6.2 Processing Log Replayer

ProcLog Replayer is designed to retrieve logged, successful provisioning requests in the processing log (ProcLog) for a specific time span and resend these to a selected NE.

Replayer functionality is available for all NEs.

Replayer functionality requires Process Log Level 2 or higher during the specific time period.

The application runs as a separate process on an Ericsson Multi Activation processing node.

For Two Nodes HA system, it should be run on the node with RG_EMA_RL LINKMANAGER activated.

6.2.1 Configuration

The Replayer configuration is stored in the replayer_config.xml file located in the /var/sog/etc directory of the application. In the configuration

file, there is a set of checkpoints and grouppoints for each type of NE. Since Replayer uses multi-threads to speed up the replay performance, the commands replay sequences are not exactly the same as they are logged. Checkpoint and grouppoint are used to help define the replay sequences. For different kinds of NEs, checkpoint and grouppoint need to be changed.

checkpoint

If a command matches some checkpoint definition, the Replayer will send it to NE, but before that, Replayer ensures all non-checkpoint commands of which start time is earlier than that of checkpoint command have been sent and the rest of them of which start time is later than start time will be hold until finishing sending one checkpoint command. For example, in IMT 4.0 solution, Group needs to be created before User, so to ensure this, Group can be set as a checkpoint to make sure the replay is in the order that all the Users are created after Group creation

All checkpoint commands will be sent in time order.

grouppoint

All commands which match the same grouppoint definition will be put in the same group, and the Replayer will ensure that these commands will be sent in time order. If grouppoint is not configured, the commands are grouped by the attributes in MO ID by default.

How to define checkpoint and grouppoint in replayer_config.xml

The checkpoint and grouppoint need to be defined by following the example below. If there are more than one checkpoint or grouppoint, add more entries under `<checkpoints>` or `<grouppoints>` tag. For more configuration examples for user provisioning and service provisioning, see Appendix in Section 13 on page 165.

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
   <replayer>
      <noOfThreads>1</noOfThreads>
      <noOfRetries>5</noOfRetries>
      <user>replayer</user>
      <context>replayer</context>
      <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
      <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
      <logPath>/var/sog/logs/replayer/</logPath>
      <checkpoints>
         <checkpoint>groupId=.+[^:]</checkpoint>
         <checkpoint>departmentId=.+[^:]</checkpoint>
         <checkpoint>serviceproviderId=.+[^:]</checkpoint>
      </checkpoints>
      <grouppoints>
         <grouppoint>userId=.+[^:]</grouppoint>
         <grouppoint>adminId=.+[^:]</grouppoint>
      </grouppoints>
   </replayer>
   <oracle>
      <useEmaConfig>TRUE</useEmaConfig>
      <user>emalogsearcher</user>
      <encPwd>#0001pcfap_cqemj_kc</encPwd>
      <sid>emalog</sid>
      <host>localhost</host>
      <port>1521</port>
   </oracle>
</config>
```

Example 1   Defining checkpoint and grouppoint in replayer_config.xml

The content for defining checkpoint and grouppoint is MO ID with regular expression pattern. Following is the instruction to define checkpiont and grouppoint by using the MO ID from CAI and CAI3G commands.

- CAI

  If the request looks like this: `CREATE:HLRSUB:`**MSISDN,xxx:IMSI,xxx**`;`

  The MO IDs of this kind of CAI requests are `MSISDN` and `IMSI`. The checkpoint can be defined as "`<checkpoint>MSISDN=.+:IMSI=.+</checkpoint>`" if all this kind of requests should be treated as checkpoints. The grouppoint can be defined as "`<grouppoint>MSISDN=.+[^:]</grouppoint>`" if all the requests with the same `MSISDN` and different `IMSI` should be put into the same group.

- CA3G

  If the request looks like this:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/
soap/envelope/" xmlns:cai3="http://schemas.ericsson.com/
cai3g1.1/">
   <soapenv:Header>
       <cai3:SequenceId>11111111</cai3:SequenceId>
       <cai3:TransactionId/>
       <cai3:SessionId>11111111</cai3:SessionId>
   </soapenv:Header>
   <soapenv:Body>
       <cai3:Create>
           <cai3:MOType>Group@http://schemas.ericsson.com/ema/
UserProvisioning/IMT/3.0/Group/</cai3:MOType>
           <cai3:MOId>
               <groupId>xxx</groupId>
               <adminId>xxx</adminId>
           </cai3:MOId>
           ...
       </cai3:Create>
   </soapenv:Body>
</soapenv:Envelope>
```

The MO ID of this kind of CAI3G requests are `groupId`. The checkpoint can be defined checkpoint as "`<checkpoint>group Id=.+[^:]</checkpoint>`" if all this kind of requests should be treated as checkpoint. The grouppoint can be defined grouppoint as "`<grouppoint>groupId=.+[^:]</grouppoint>`" if all the requests with the same `groupId` and different `adminId` should be put into the same group.

The valid options for Replayer are listed in Table 20 on page 117.

Table 20   Replayer Options

Option	Description
-test	Turns testing mode on. If not set this parameter, testing mode turns off.
	The node is not provisioned with the commands.
	During testing mode the application outputs the first 100 commands found, but no provisioning is done.
	Default running mode is test.
	Optional parameter.
-verbose	Prints all commands to the standard output which will be resend to the node.
	Optional parameter

`-threads <no of threads>`	Number of threads to use for provisioning. Default is 1. Optional parameter
`-starttime <YYYYMMDDHH24MISS>`	Search for commands originally sent after start time. For example:`-starttime 20060504131500.` Mandatory parameter
`-stoptime <YYYYMMDDHH24MISS>`	Search for commands originally sent before stop time. Default is current time. For example: `-stoptime 20060504141500.` Optional parameter
`-target <ne name>`	The NE to re-provision when doing User Provisioning. The NE names can be found in the Ericsson Multi Activation GUI. Mandatory parameter

6.2.2 Logging

Log information is written to plain text files in the `/var/sog/logs/replayer` directory.

The following files are written:

* Legacy ProcLog Viewer file (`<NE>_proclog_<date>.log`)

* Re-provisioning log (`<NE>_reprov_<date>.log`)

* Error log (`<NE>_error_<date>.log`)

The `NE` is the network element that was re-provisioned and `date` is the date and time the replay operation began.

In Proclog - Admin GUI, you could use search function for the proclog from replayer. Please set the log type to `NSO`, set the user and context to `replayer`, and set the right time to search.

6.2.3 Usage

1. Stop all provisioning requests towards Ericsson Multi Activation which affects the node to be re-provisioned.

2. Identify the time to start the replay from.

3. Identify the NE name used by Ericsson Multi Activation. This can be found in the Ericsson Multi Activation admin GUI.

4. Log into the Ericsson Multi Activation processing node as user `sogadm`.

5. Change directory to where the application is installed.

6. Make a test run with the `-test` option to verify that the parameters are correct.

7. Run the tool again without the `-test` option to start the provisioning.

8. During re-provisioning the program will print one line of information for every 100 commands sent. The information contains the total number of sent commands and the original start time for the last command sent.

6.3 Solaris Volume Manager on Processing and Resource Node

Maintaining Metadevices

The state of the mirrored disks can be checked with the `metastat` command. Follow the steps below:

1. Execute the `metastat` command to determine that mirrors have failed, for example:

```
# metastat

d100: Mirror
Submirror 0: d101
State: Needs maintenance
Submirror 1: d102
State: Okay
Pass: 1
Read option: roundrobin (default)
Write option: parallel (default)
Size: 25175424 blocks (12 GB)

d101: Submirror of d100
State: Needs maintenance
Invoke: metareplace d100 c3t0d0s0 <new device>
Size: 25174746 blocks

Stripe 0:
```

```
Device    Start Block Dbase State         Reloc   Hot   Spare
c1t0d0s0       0     No    Maintenance Yes


d102: Submirror of d100
State: Okay
Size: 25175424 blocks (12 GB)
Stripe 0:

Device    Start Block Dbase State    Reloc   Hot   Spare
c1t1d0s0       0     No    Okay     Yes
```

There are three possible states: `Okay`, `Resyncing` and `Needs Maintenance`. For the detailed information, see document Solaris Volume Manager Administration Guide.

The mirroring ability has been stopped for some reason, it could results from disk errors or temporary cable problems.

Note: `d100` below is just an example.

2. Execute the `metadetach` command to detach metadevice from the mirror, and then execute `metattach` command to attach metadevice to the mirror again.

   # **metadetach d100 d101**

   # **metattach d100 d101**

   Verify with command `metastat` that submirror is OK.

   # **metastat**

   If the error still exists, use the command `metareplace` to replace components (slices) within a submirror.

   # **metareplace -e d100 /dev/dsk/c1t0d0s0**

   # **metareplace -e ...**

   # **metastat**

   If the error still exists, it is probably a problem with the database, see next step.

3. Use the `metadb` command to determinate that one database replicas has failed, for example, .

   # **metadb**

```
flags        first blk  block count
M  p luo     unknown    unknown      /dev/dsk/c1t0d0s7
a  p luo     8208       8192         /dev/dsk/c1t0d0s7
a  p luo     16         8192         /dev/dsk/c1t1d0s7
a  p luo     8208       8192         /dev/dsk/c1t1d0s7
a  p luo     16         8192         /dev/dsk/c1t2d0s7
a  p luo     8208       8192         /dev/dsk/c1t2d0s7
a  p luo     16         8192         /dev/dsk/c1t3d0s7
a  p luo     8208       8192         /dev/dsk/c1t3d0s7
```

Use the `metadb` command to delete the failed replicas and add them back.

```
# metadb -d /dev/dsk/c1t0d0s7

# metadb -a -c2 /dev/dsk/c1t0d0s7

# shutdown -y -g0 -i6

# metadb
```

```
flags        first blk  block count
a m  p luo   16         8192         /dev/dsk/c1t0d0s7
a    p luo   8208       8192         /dev/dsk/c1t0d0s7
a    p luo   16         8192         /dev/dsk/c1t1d0s7
a    p luo   8208       8192         /dev/dsk/c1t1d0s7
a    p luo   16         8192         /dev/dsk/c1t2d0s7
a    p luo   8208       8192         /dev/dsk/c1t2d0s7
a    p luo   16         8192         /dev/dsk/c1t3d0s7
a    p luo   8208       8192         /dev/dsk/c1t3d0s7
```

4. Use the `metareplace` command to re-enable the submirrors.

```
# metareplace -e d100 /dev/dsk/c1t0d0s0

# metareplace -e ......
```

5. Use the `metastat` command to determine that mirrors are OK.

```
# metastat
```

If the error still exists, it probably has a stale metadevice database and it needs to replace the failed disk. To do this, follow the instructions about specific hardware.

7 Node Administration (Standalone, Two nodes HA)

This chapter gives additional information about the system configuration. The agent and service configuration specific for Standalone and node of Two Nodes HA are described.

7.1 Directory Structure

This section contains the directory structure for the node in Standalone and Two Nodes HA configuration.

7.1.1 Directory Structure /var/sog

An overview of the directory structure for `/var/sog` in the node is shown in Figure 23 on page 124.
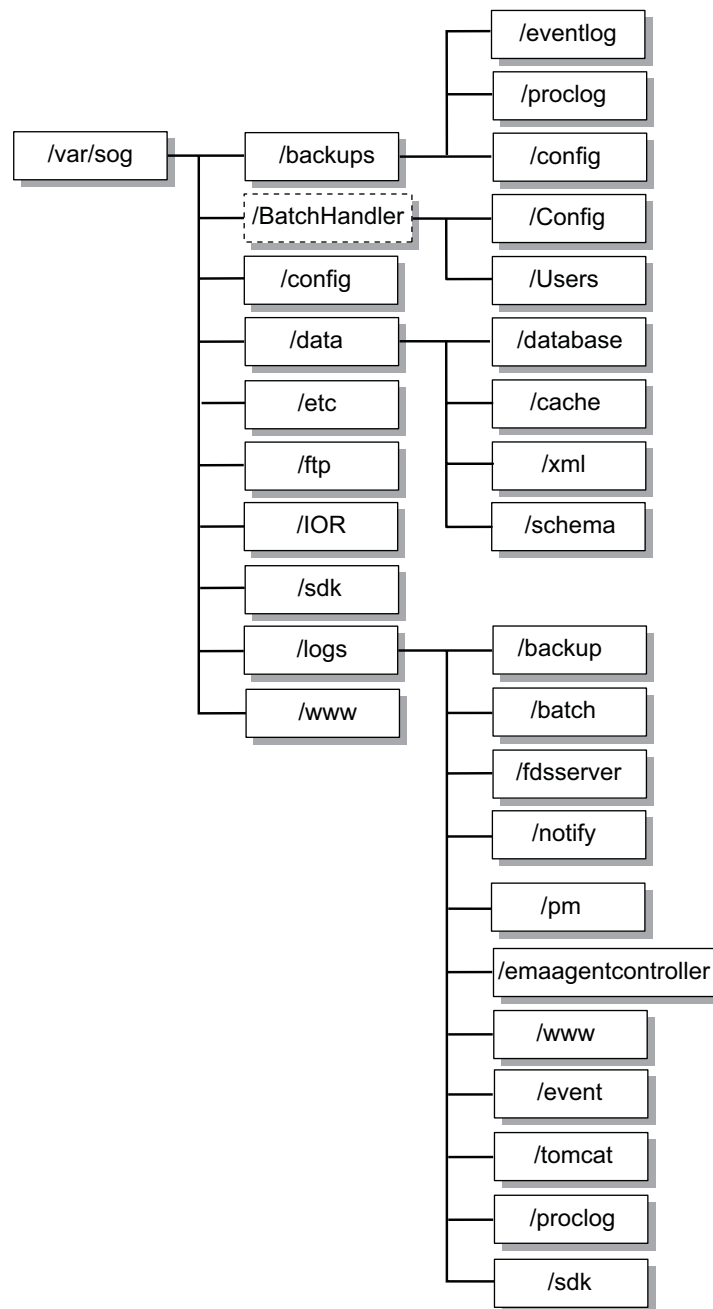
Figure 23   Directory structure in Resource Node /var/sog

Table 21 on page 125 gives information about the directory structure in directory /var/sog.

Table 21   Directory Structure /var/sog

Directory	Contains
/var/sog/backups	Ericsson Multi Activation processing and configuration backups
/var/sog/BatchHandler	Service Order Batch Handler (SOBH) user directories and a configuration file with user information. This directory is optional.
/var/sog/config	configuration files for Ericsson Multi Activation processes
/var/sog/data	cache and data for Ericsson Multi Activation processes
/var/sog/data/database	Contains Ericsson Multi Activation configuration files
/var/sog/data/cache	Contains cache for Ericsson Multi Activation components
/var/sog/data/xml	Contains Ericsson Multi Activation XML request files
/var/sog/data/schema	Contains XML schema files used in Ericsson Multi Activation
/var/sog/etc	template for Ericsson Multi Activation users
/var/sog/ftp	the components repository for Ericsson Multi Activation system
/var/sog/logs	Ericsson Multi Activation related logs
/var/sog/www	root directory for the web server

7.1.2   Directory Structure /opt/sog

An overview of the directory structure for /opt/sog in the node is shown in Figure 24 on page 126.
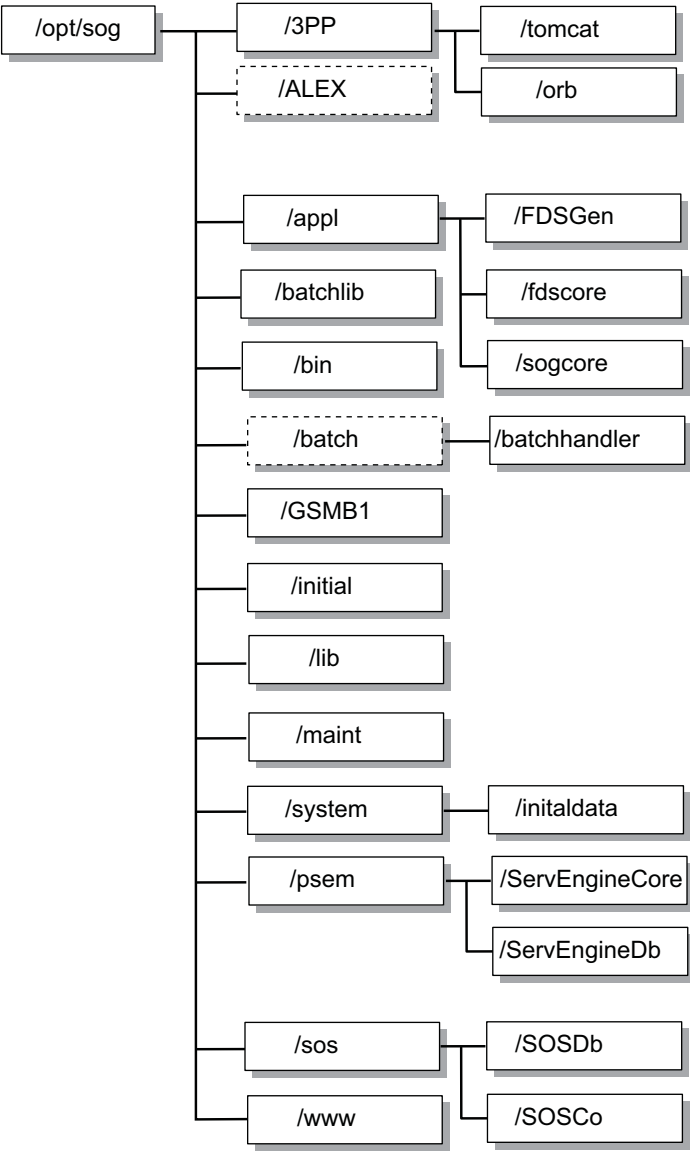
Figure 24   Directory structure in /opt/sog

Table 22 on page 126 gives information about the directory structure in
directory /opt/sog.

Table 22   Directory /opt/sog

Directory	Contains
/opt/sog/3PP	3PP packages used and installed by Ericsson Multi Activation
/opt/sog/3PP/notify	Notify packages

`/opt/sog/3PP/orb`	Visibroker packages
`/opt/sog/ALEX`	Ericsson Multi Activation documentation and Active Library Explorer™ (ALEX™). This directory is optional.
`/opt/sog/appl`	application packages
`/opt/sog/appl/FDSGen`	FDS general package
`/opt/sog/appl/fdscore`	FDS core package
`/opt/sog/appl/sogcore`	Ericsson Multi Activation core package
`/opt/sog/batch`	SOBH. This directory is optional.
`/opt/sog/batch/batchhandler`	Ericsson Multi Activation BatchHandler files
`/opt/sog/batchlib`	library files for SOBH
`/opt/sog/bin`	Ericsson Multi Activation executables
`/opt/sog/GsmBl`	Ericsson Multi Activation (Global System for Mobile communications) GSM BL packages
`/opt/sog/initial`	Ericsson Multi Activation installation dependent script
`/opt/sog/lib`	Ericsson Multi Activation library
`/opt/sog/maint`	Ericsson Multi Activation maintenance scripts
`/opt/sog/system`	Ericsson Multi Activation initial data package
`/opt/sog/system/initialdata`	Ericsson Multi Activation installation initialize information
`/opt/sog/sos`	Ericsson Multi Activation SOS database packages
`/opt/sog/sos/SOSDb`	Ericsson Multi Activation SOS database package
`/opt/sog/sos/SOSCo`	Ericsson Multi Activation SOS Core package
`/opt/sog/psem`	Ericsson Multi Activation Service Engine packages
`/opt/sog/psem/ServEngineDb`	Ericsson Multi Activation Service Engine database package

/opt/sog/psem/ServEngineCo re	Ericsson Multi Activation Service Engine Core package
/opt/sog/www	web server dependent files

7.1.3 Directory Structure for Global File System

Sun Cluster uses global devices to provide cluster-wide, highly available access to any device in the cluster, no matter where the device is physically attached. If a node fails while providing access to global device, Sun Cluster automatically discovers another path to the device and redirects the access to that path.

During the installation of Standalone Availability and 2 Nodes HA configuration, some dynamic data files will be moved to GFS that is accessible by all cluster nodes. At the old place of these dynamic files, a symbolic link is created. Figure 25 on page 128 shows an overview of the global directory structure.
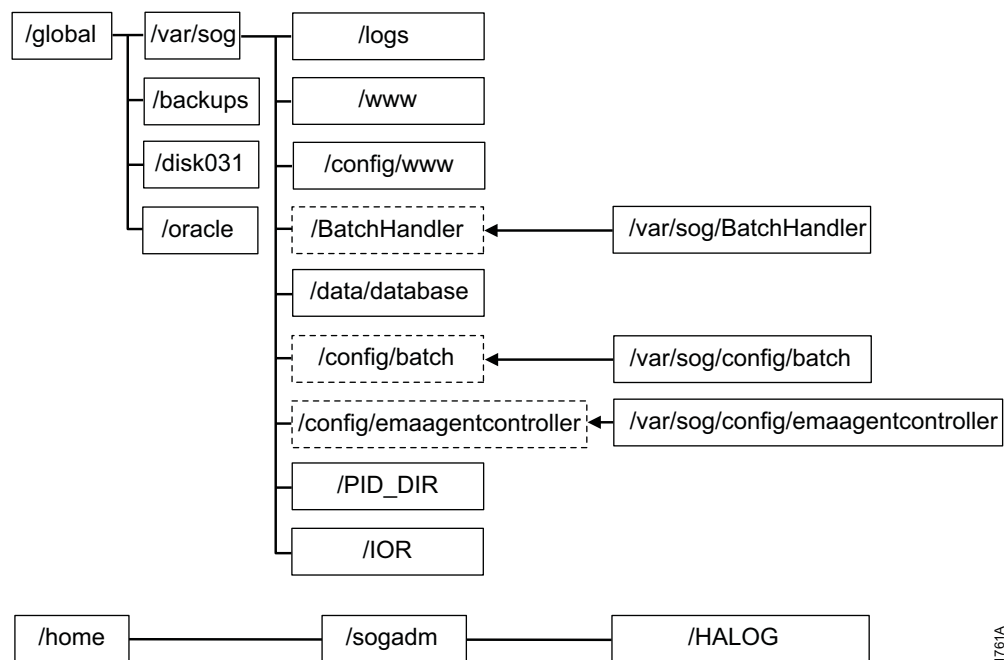
Figure 25   Global File System

Table 23 on page 128 gives information about the global directory structure.

Table 23   Directory Global Files

Directory	Contains
/global/var/sog/logs	Ericsson Multi Activation related logs
/global/var/sog/www	root directory for the web server

`/global/var/sog/config/www`	configuration files for the Apache web server
`/global/var/sog/BatchHandler`	SOBH user directories and a configuration file with user information. This directory is optional
`/global/var/sog/backups`	all daily backup data for Ericsson Multi Activation
`/global/var/sog/data/database`	cache and data for Ericsson Multi Activation processes
`/global/var/sog/config/batch`	configuration file for SOBH
`/global/var/sog/PID_DIR`	process ID file used in Sun Cluster resource group dependence
`/global/var/sog/IOR`	IOR files of Ericsson Multi Activation system
`/global/backups`	Resource layer backups
`/global/disk031`	Database backup
`/global/oracle`	Oracle configuration
`/home`	home directories. This `/home` partition is global although it is directly mounted on `/home` on each cluster node.

7.2 Configuration Files

Configuration files must not be edited. Table 24 on page 129 gives an overview of configuration files in Resource Node Standalone Availability.

Table 24   Configuration Files for Resource Node Standalone Availability

File	**Comments**	**Stored (on)**
`/var/sog/config/env/site.env`	csh environ variables	Local disk
`/var/sog/config/env/site.exports`	sh environ variables	Local disk
`/var/sog/config/install/site.config`	installation dependent variables	Local disk
`/var/sog/config/pm/pm-RL.cfg`	Plug-in Manager configuration file	Local disk
`/global/var/sog/config/www/config.js`	Java script configuration file	Global in GFS

File	Comments	Stored (on)
`/global/var/sog/config/www/httpd.conf`	Web server configuration file	Global in GFS
`/global/var/sog/data/database/FDS-RL.cfg`	FDS Configuration file	Global in GFS
`/var/sog/config/backup/backup.cfg`	Backup configuration file	Local disk
`/global/var/sog/config/emaagentcontroller.conf`	Ericsson Multi Activation Agent Controller Configuration file	Global in GFS
`/var/sog/config/surpagent.conf`	GGSN Super Agent Configuration file	Local disk
`/global/var/sog/var_batchhandler_host.sh`	Contains the virtual IP address/ logicalhost configuration and other information for batchhandler resource group.	Global in GFS
`/global/var/sog/var_linkmanager_host.sh`	Contains thethe virtual IP address/ logicalhost configuration and other information for linkmanager resource group.	Global in GFS
`/global/var/sog/var_sognotify_host.sh`	Contains the virtual IP address/ logicalhost configuration and other information for sognotify resource group.	Global in GFS
`/global/var/sog/var_plplugins_host.sh`	Contains the virtual IP address/ logicalhost configuration and other information for plplugins resource group.	Global in GFS
`$ORACLE_HOME/`[1]	Oracle configuration file directory	Global in GFS

(1) This directory is specified during Oracle installation. See document Installation Instruction Scalable HA Configuration - Guide for more details.

7.3   Log Files

This section contains the log files on the Ericsson Multi Activation server used in Resource Node Standalone Availability, see Table 25 on page 131.

Table 25   Log Files

File	Comments	Stored (on)
`/global/var/sog/logs/fdsserver/FDS-RL.log`	FDS system log file	Global in GFS
`/global/var/sog/logs/fdsserver/fdsserver.log`	FDS server log file	Global in GFS
`/global/var/sog/logs/pm/pm-RL.log`	Plug-in Manager log file	Global in GFS
`/global/var/sog/logs/www/access.log`	Web server access log file	Global in GFS
`/global/var/sog/logs/www/fdsweb.log`	Web server log file	Global in GFS
`/global/var/sog/logs/backup/backup.log`	Backup log file	Global in GFS
`/global/var/sog/logs/batch/batch.log`	Batch log file	Global in GFS
`/var/log/syslog`	Normal Unix log file	Local disk
`/var/adm/messages`	Normal Unix log file (including HA log file)	Local disk
`/var/cluster/spm/`	Sun Cluster log file directory	Local disk
`/var/sog/data/cache/FDS-PM_<hostname>.log`	FDS Plug-in Manager logical host log file	Local disk
`/home/sogadm/HALOG`	HA package installation log files	Global in GFS
`/global/var/sog/logs/emaagentcontroller/emaagentcontroller.log`	contains the log info when emaagentcontroller is started	Global in GFS
`/global/var/sog/logs/emaagentcontroller/surpagent.log`	contains the log info when GGSN agent script is started	Global in GFS
`$ORACLE_BASE/`[1]	ORACLE log file directory	Global in GFS

(1) This directory is specified during Oracle installation. See document Installation Instruction Stand-alone Configuration - Guide for more details.

8   Processing Node Administration (Scalable HA)

This chapter gives additional information about the Processing Node administration for Scalable HA.

8.1   Directory Structure

This section contains the directory structure for Processing Node.

8.1.1   Directory Structure /var/sog

An overview of the directory structure for `/var/sog` in Processing Node is shown in Figure 26 on page 134.
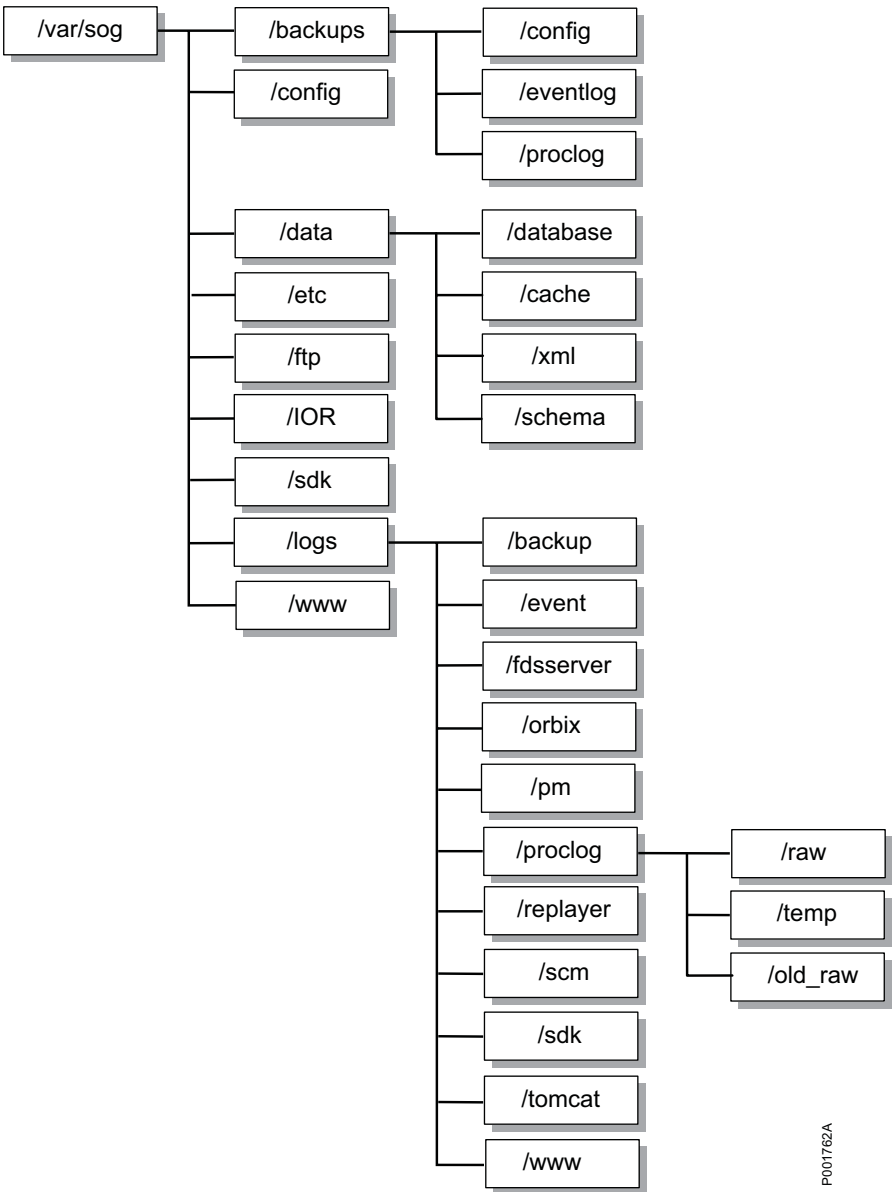
Figure 26   Directory Structure in /var/sog Processing Node

Table 26 on page 134 gives information about the directory structure in
directory /var/sog.

Table 26   Directory Structure /var/sog

Directory	Contains
/var/sog/backups	Ericsson Multi Activation processing and component configuration backups

`/var/sog/config`	configuration files for Ericsson Multi Activation processes
`/var/sog/data`	cache and data for Ericsson Multi Activation processes
`/var/sog/etc`	template for Ericsson Multi Activation users
`/var/sog/ftp`	the components repository for Ericsson Multi Activation system
`/var/sog/logs`	Ericsson Multi Activation related logs
`/var/sog/www`	root directory for web server

8.1.2 Directory Structure /opt/sog

An overview of the directory structure for `/opt/sog` in Processing Node is shown in Figure 27 on page 136.
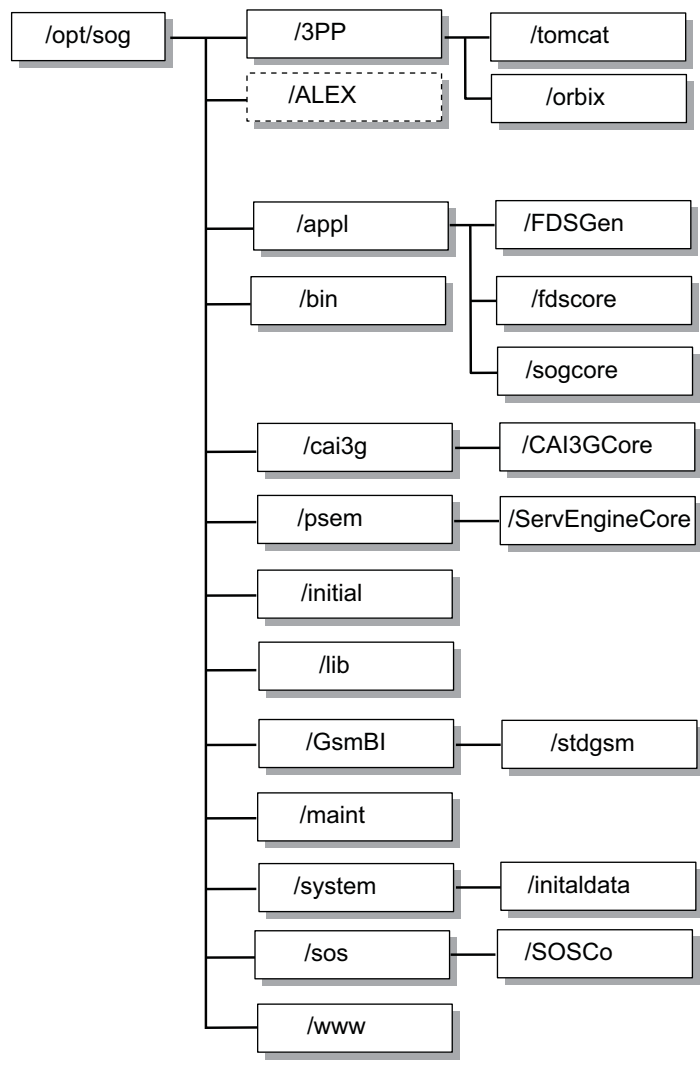
Figure 27   Directory Structure in /opt/sog Processing Node

Table 27 on page 136 gives information about the directory structure in
directory /opt/sog.

Table 27   Directory Structure /opt/sog

Directory	Contains
/opt/sog/3PP	3PP packages used and installed by Ericsson Multi Activation
/opt/sog/3PP/orb	VisiBroker packages
/opt/sog/ALEX	Ericsson Multi Activation documentation and Active Library Explorer™ (ALEX™). This directory is optional.

/opt/sog/appl	application packages
/opt/sog/appl/FDSGen	FDS general package
/opt/sog/appl/fdscore	FDS core package
/opt/sog/appl/sogcore	Ericsson Multi Activation core package
/opt/sog/bin	Ericsson Multi Activation executable
/opt/sog/cai3g	CAI3G packages
/opt/sog/cai3g/CAI3GCore	CAI3G core packages
/opt/sog/psem	Service Engine packages
/opt/sog/psem/ServEngineCore	Service Engine core package
/opt/sog/GsmBl	business logic packages
/opt/sog/GsmBl/stdgsm	standard business logic packages
/opt/sog/initial	Ericsson Multi Activation installation dependent script
/opt/sog/lib	Ericsson Multi Activation library
/opt/sog/maint	Ericsson Multi Activation maintenance scripts
/opt/sog/system	Ericsson Multi Activation initial data package
/opt/sog/system/initialdata	Ericsson Multi Activation installation initialize information
/opt/sog/sos	Ericsson Multi Activation SOS packages
/opt/sog/sos/SOSCo	Ericsson Multi Activation SOS core package
/opt/sog/www	Contains web server dependent files

8.2 Configuration Files

Configuration files must not be edited. Table 28 on page 137 gives an overview of configuration files in Processing Node.

Table 28   Configuration Files for Processing Node

File	**Comments**
/var/sog/config/env/site.env	csh environment variables
/var/sog/config/env/site.exports	sh environment variables

File	Comments
`/var/sog/config/install/site.config`	installation dependent variables
`/var/sog/config/pm/pm-PL.cfg`	Plug-in Manager configuration file
`/var/sog/config/www/config.js`	Java script configuration file
`/var/sog/config/www/httpd.conf`	Web server configuration file
`/var/sog/data/database/FDS-PL.cfg`	FDS Configuration file
`/var/sog/config/tomcat/web.xml`	Tomcat web configuration file
`/var/sog/config/emaagentcontroller.conf`	Ericsson Multi Activation agent controller configuration file
`/var/sog/config/surpagent.conf`	GGSN Agent Configuration file
`/var/sog/config/tomcat/logging.properties`	Tomcat log config file. The log file default path is `/var/sog/logs/tomcat`.

8.3　　Log Files

This section contains the log files on the Ericsson Multi Activation server used in Processing Node, see Table 29 on page 138.

Table 29　　The log Files on the Ericsson Multi Activation Server

File	Comments
`/var/sog/logs/fdsserver/FDS-PL.log`	FDS system log file
`/var/sog/data/cache/FDS-PM_<hostname>.log`	Plug-in Manager log file
`/var/sog/logs/fdsserver/fdsserver.log`	FDS server log file
`/var/sog/logs/pm/pm-PL.log`	Plug-in Manager log file
`/var/sog/logs/www/access.log`	Web server access log file
`/var/sog/logs/www/fdsweb.log`	Web server log file
`/var/sog/logs/backup/backup.log`	Backup log file
`/var/log/syslog`	Standard Unix log file
`/var/adm/messages`	Standard Unix log file

File	Comments
`/var/sog/logs/tomcat`	Tomcat log directory
`/var/sog/logs/emaagentcontroller/emaagentcontroller.log`	contains the log info when emaagentcontroller is started
`/var/sog/logs/emaagentcontroller/surpagent.log`	contains the log info when GGSN agent script is started
`/var/tmp/log_loader_yyyymmdd.log`	The logwriter log file. The logwriter produces one log file every day. Such logs are generated by sqlldr when performing log loading. The sqlldr is launched by logwriter. These log files retention is seven days and expired log files will be deleted by logwriter.
`/var/sog/logs/tomcat/usm_gui_x.log`	Contains the log for User and Subscription Management GUI. The "x" in log name is the sequence number of the log.

9 Resource Node Administration (Scalable HA)

This chapter gives additional information about the Resource Node administration for Scalable HA.

9.1 Directory Structure

This section contains the directory structure for Resource Node in the Scalable-HA configuration.

9.1.1 Directory Structure /opt/sog

An overview of the directory structure for `/opt/sog` in RN is shown in Figure 28 on page 141.
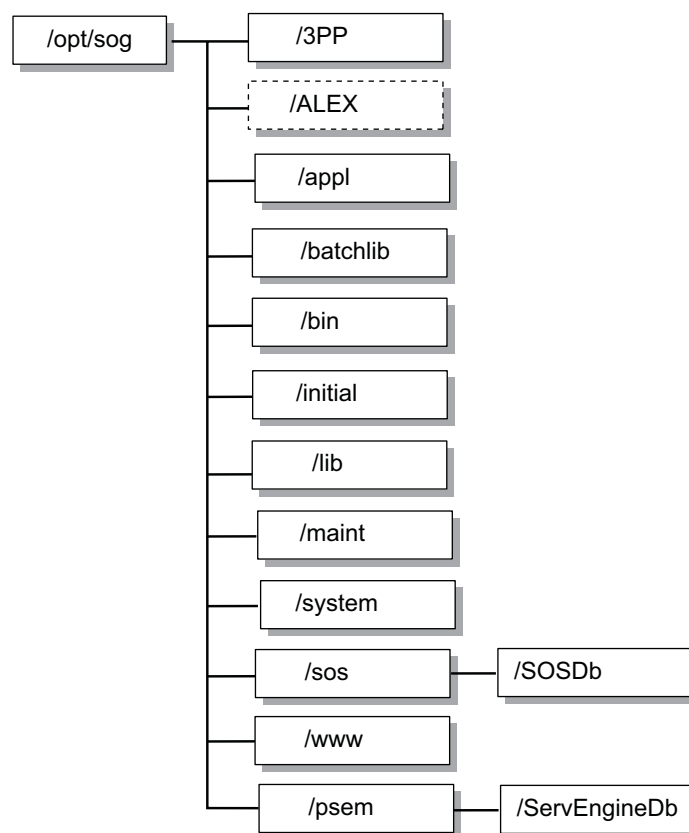
Figure 28   Directory structure in /opt/sog

Table 30 on page 142 gives information about the directory structure in directory /opt/sog.

Table 30   Directory Structure /opt/sog

Directory	Contains
/opt/sog/3PP	3PP packages used and installed by Ericsson Multi Activation
/opt/sog/ALEX	Ericsson Multi Activation documentation and Active Library Explorer™ (ALEX™). This directory is optional.
/opt/sog/appl	application packages
/opt/sog/batch	Batch Handler packages
/opt/sog/batchlib	Libraries for Batch Handler
/opt/sog/bin	Ericsson Multi Activation executable
/opt/sog/initial	Ericsson Multi Activation installation dependent script
/opt/sog/lib	Ericsson Multi Activation library
/opt/sog/maint	Ericsson Multi Activation maintenance script
/opt/sog/system	Ericsson Multi Activation initial data package
/opt/sog/sos	Ericsson Multi Activation SOS database package
/opt/sog/sos/SOSDb	Ericsson Multi Activation SOS database package
/opt/sog/psem	Ericsson Multi Activation Service Engine package
/opt/sog/psem/ServEngineDb	Ericsson Multi Activation Service Engine database package
/opt/sog/www	Web server dependent files

9.1.2   Directory Structure /var/sog

An overview of the directory structure for /var/sog in RN is shown in Figure 29 on page 143.
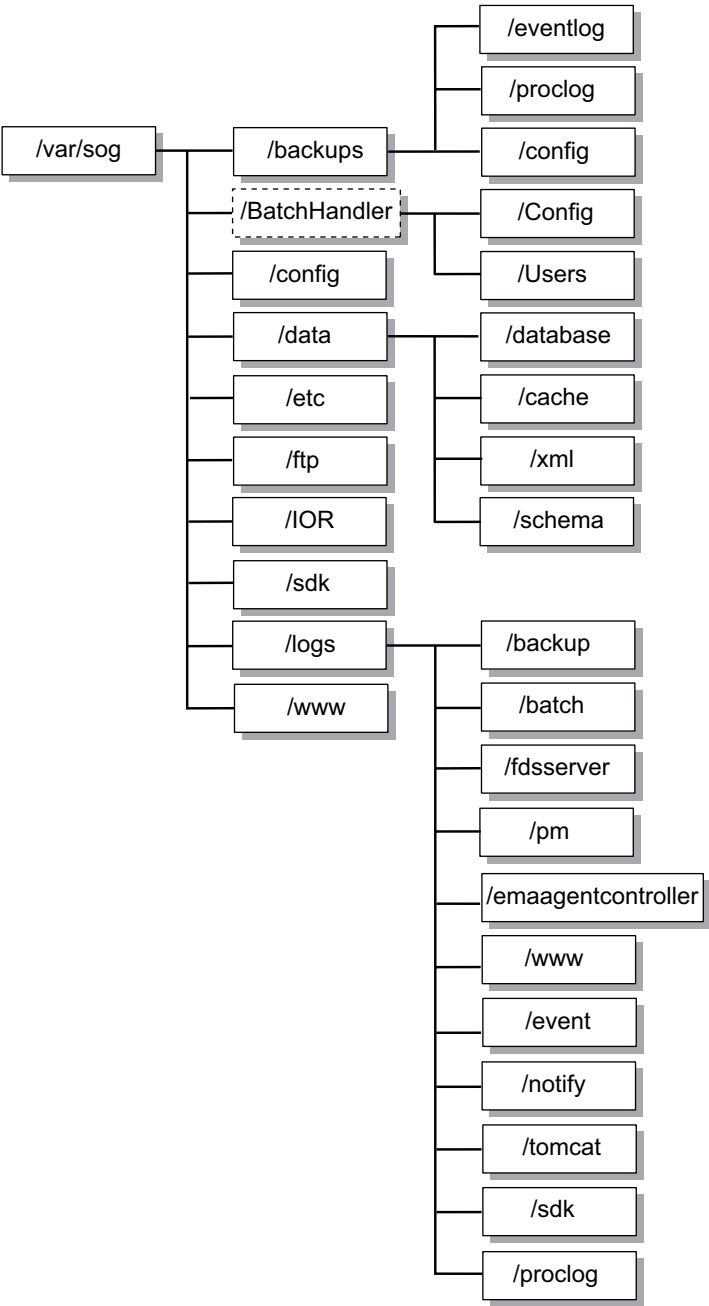
Figure 29   Directory structure in Resource Node /var/sog

Table 31 on page 144 gives information about the directory structure in
`/var/sog`.

Table 31   Directory Structure /var/sog

Directory	Contains
`/var/sog/backups`	Ericsson Multi Activation processing and configuration backups
`/var/sog/BatchHandler`	SOBH user directories and a configuration file with user information. This directory is optional
`/var/sog/config`	configuration files for Ericsson Multi Activation processes
`/var/sog/data`	cache and data for Ericsson Multi Activation processes
`/var/sog/data/database`	Contains Ericsson Multi Activation configuration files
`/var/sog/data/cache`	Contains cache for Ericsson Multi Activation components
`/var/sog/data/xml`	Contains Ericsson Multi Activation XML request files
`/var/sog/data/schema`	Contains XML schema files used in Ericsson Multi Activation
`/var/sog/etc`	template for Ericsson Multi Activation users
`/var/sog/ftp`	the components repository for Ericsson Multi Activation system
`/var/sog/logs`	Ericsson Multi Activation related logs
`/var/sog/www`	root directory for the web server

9.1.3   Directory Structure for Global File System

Sun Cluster uses global devices to provide cluster-wide, highly available access to any device in the cluster, no matter where the device is physically attached. If a node fails while providing access to global device, Sun Cluster automatically discovers another path to the device and redirects the access to that path.

During the installation of RN, some dynamic data files will be moved to GFS that is accessible by all cluster nodes. At the old place of these dynamic files, a symbolic link are created. shows an overview of RN global directory structure.
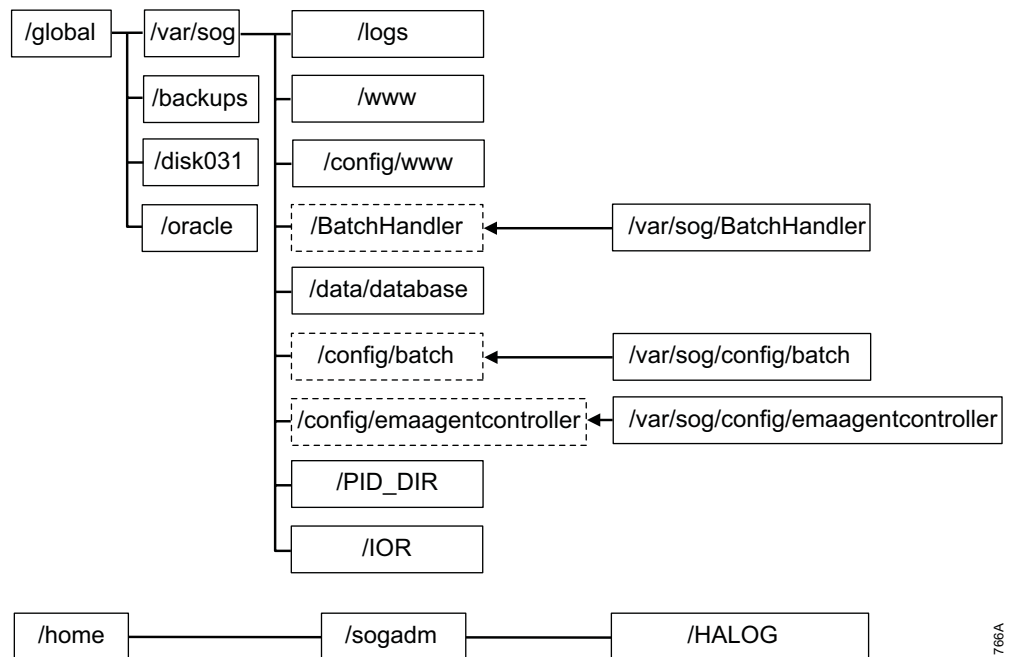
Figure 30   Global File System

Table 32 on page 145 gives information about the global directory structure.

Table 32   Directory Global Files

Directory	Contains
`/global/var/sog/logs`	Ericsson Multi Activation related logs
`/global/var/sog/www`	root directory for the web server
`/global/var/sog/config/www`	configuration files for the Apache web server
`/global/var/sog/BatchHandler`	SOBH user directories and a configuration file with user information. This directory is optional
`/global/var/sog/backups`	all daily backup data for Ericsson Multi Activation
`/global/var/sog/data/database`	cache and data for Ericsson Multi Activation processes
`/global/var/sog/config/batch`	configuration file for SOBH
`/global/var/sog/PID_DIR`	process ID file used in Sun Cluster resource group dependence

/global/var/sog/IOR	IOR files of Ericsson Multi Activation system
/global/backups	Resource layer backups
/global/disk031	Database backup
/global/oracle	Oracle configuration
/home	home directories. This /home partition is global although it is directly mounted on /home on each cluster node.

9.2 Configuration Files

Configuration files must not be edited. Table 33 on page 146 gives an overview of configuration files in RN.

Table 33   Configuration Files for RN

File	**Comments**	**Stored (on)**
/var/sog/config/env/site.env	csh environ variables	Local disk
/var/sog/config/env/site.exports	sh environ variables	Local disk
/var/sog/config/install/site.config	installation dependent variables	Local disk
/var/sog/config/pm/pm-RL.cfg	Plug-in Manager configuration file	Local disk
/global/var/sog/config/www/config.js	Java script configuration file	Global in GFS
/global/var/sog/config/www/httpd.conf	Web server configuration file	Global in GFS
/global/var/sog/data/database/FDS-RL.cfg	FDS Configuration file	Global in GFS
/var/sog/config/backup/backup.cfg	Backup configuration file	Local disk
/global/var/sog/config/emaagentcontroller.conf	Ericsson Multi Activation Agent Controller Configuration file	Global in GFS
/var/sog/config/surpagent.conf	GGSN Super Agent Configuration file	Local disk

File	Comments	Stored (on)
`/global/var/sog/var_batc hhandler_host.sh`	Contains the sharedaddress/logica lhost configuration and other information for batchhandler resource group.	Global in GFS
`/global/var/sog/var_link manager_host.sh`	Contains the sharedaddress/logica lhost configuration and other information for linkmanager resource group.	Global in GFS
`/global/var/sog/var_sogn otify_host.sh`	Contains the sharedaddress/logic alhost configuration and other information for sognotify resource group.	Global in GFS
`/global/var/sog/var_plpl ugins_host.sh`	Contains the sharedaddress/logic alhost configuration and other information for plplugins resource group.	Global in GFS
`$ORACLE_HOME/`[(1)]	Oracle configuration file directory	Global in GFS

(1) This directory is specified during Oracle installation. See document Installation Instruction Scalable HA Configuration - Guide for more details.

9.3   Log Files

This section contains the log files on the Ericsson Multi Activation server used in RN, see Table 34 on page 147.

Table 34   Log Files

File	Comments	Stored (on)
`/global/var/sog/logs/fdsse rver/FDS-RL.log`	FDS system log file	Global in GFS
`/global/var/sog/logs/fdsse rver/fdsserver.log`	FDS server log file	Global in GFS
`/global/var/sog/logs/pm/pm -RL.log`	Plug-in Manager log file	Global in GFS

File	Comments	Stored (on)
`/global/var/sog/logs/www/access.log`	Web server access log file	Global in GFS
`/global/var/sog/logs/www/fdsweb.log`	Web server log file	Global in GFS
`/global/var/sog/logs/backup/backup.log`	Backup log file	Global in GFS
`/global/var/sog/logs/batch/batch.log`	Batch log file	Global in GFS
`/var/log/syslog`	Normal Unix log file	Local disk
`/var/adm/messages`	Normal Unix log file (including HA log file)	Local disk
`/var/cluster/spm/`	Sun Cluster log file directory	Local disk
`/var/sog/data/cache/FDS-PM_<hostname>.log`	FDS Plug-in Manager logical host log file	Local disk
`/home/sogadm/HALOG`	HA package installation log files	Global in GFS
`/global/var/sog/logs/emaagentcontroller/emaagentcontroller.log`	contains the log info when emaagentcontroller is started	Global in GFS
`/global/var/sog/logs/emaagentcontroller/surpagent.log`	contains the log info when GGSN agent script is started	Global in GFS
`$ORACLE_BASE/`[1]	ORACLE log file directory	Global in GFS

(1) This directory is specified during Oracle installation. See document Installation Instruction Scalable HA Configuration - Guide for more details.

9.4 Resource Group Structure

To list the resource and resource group, run the following command:

```
# scstat -g
```

For the Resource and Resource Group structure, see the figure below.

```
RG_EMA_RL_LINKMANAGER

LOGICAL_HOSTNAME_LINKMANAGER
RES_EMA_RL_LINKMANAGER_HASTORAGE
RES_EMA_RL_LINKMANAGER_FDSSERVER
RES_EMA_RL_LINKMANAGER_FDSPM
RES_EMA_RL_WEB_SERVER


RG_RAC_FRAMEWORK_S

RES_RAC_FRAMEWORK_S
RES_RAC_UDLM_S
RES_RAC_SVM_S


RG_EMA_RL_NOTIFY

LOGICAL HOSTNAME_NOTIFY
RES_EMA_RL_NOTIFY_HASTORAGE
RES_EMA_RL_NOTIFY_OPEN


RG_EMA_RL_AGENT_CONTROLLER

LOGICAL_HOSTNAME_AGENT_CONTROLLER
RES_EMA_RL_HASTORAGE_EMA_AGENT_CONTROLLER


RG_EMA_RL_BATCH_HANDLER

LOGICAL_HOSTNAME_BATCH_HANDLER
RES_EMA_RL_BATCH_HASTORAGE
RES_EMA_RL_BATCH_HANDLER_BATCH
```

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Figure 31   Resource and Resource Group Structure

RES_EMA_RL_LINKMANAGER_FDSPM contains Plug-in Manager (FDS_PM):

Table 35 on page 149 contains a list of the group names, resources and resource group mode for RN.

Table 35   Resource List

Group Name	Resources	Resource Group mode	Node
RG_EMA_RL_LINKMA NAGER	LOGICAL_HOSTNAME_LINK MANAGER, RES_EMA_RL_LI NKMANAGER_HASTORAGE, RES_EMA_RL_LINKMANAG ER_FDSSERVER,RES_EMA_ RL_LINKMANAGER_FDSPM, RES_EMA_RL_WEB_SERVER	Failover	RL

RG_RAC_FRAMEWORK_S	RES_RAC_FRAMEWORK_S, RES_RAC_UDLM_S, RES_RAC_HARAID_S	Scalable	RL
RG_EMA_RL_NOTIFY	LOGICAL_HOSTNAME_N OTIFY, RES_EMA_RL_N OTIFY_HASTORAGE, RES_EMA_RL_NOTIFY_OPEN	Failover	RL
RG_EMA_RL_AGENT_ CONTROLLER	LOGICAL_HOSTNAME_ AGENT_CONTROLLER, RES_EMA_RL_HASTORAG E_EMA_AGENT_CONTROLLER	Failover	RL
RG_EMA_RL_BATCH_ HANDLER	LOGICAL_HOSTNAME_BATC H_HANDLER, RES_EMA_RL_B ATCH_HASTORAGE, RES_EMA_RL_BATCH_HA NDLER_BATCH	Failover	RL

To clear Resource error flags, see Section 6.1.1 on page 111.

10 RAC Resource Administration

Note: Run following commands by emadba.

10.1 Put RAC Resource Offline

Note: The operation should follow the chapter order.

10.1.1 Check RAC Status

For detailed information:

```
emadba> crs_stat
```

For information in brief:

```
emadba> crs_stat -t
```

10.1.2 Put Database Instance Offline

Description of command:
```
srvctl stop instance -d [dbname] -i [dbinstance]
```

```
emadba> srvctl stop instance -d emadb -i emadb0
```

10.1.3 Put the Ericsson Multi Activation SOS service Offline

Note: If Ericsson Multi Activation is installed with the ServiceOrderScheduler component, do the following commands to stop service

Description of command:
```
srvctl stop service -d [dbname] -s [servicename]
```

```
emadba> srvctl stop service -d emadb -s emasos
```

10.1.4 Put ASM Offline

Note: This step will put all databases and instances which depend on the ASM offline.

Description of command:
```
srvctl stop asm -n [hostname]
```

```
emadba> srvctl stop asm -n <hostname>
```

10.1.5 Put Node Applications Offline

Description of command:
```
srvctl stop nodeapps -n [hostname]
```

emadba> **srvctl stop nodeapps -n <hostname>**

10.2 Put RAC Resource Online

Note: The operation should follow the chapter order.

10.2.1 Put Node Applications Online

Description of command:
```
srvctl start nodeapps -n [hostname]
```

emadba> **srvctl start nodeapps -n emarl0**

10.2.2 Put ASM Online

Description of command:
```
srvctl start asm -n [hostname]
```

emadba> **srvctl start asm -n <hostname>**

10.2.3 Put Database Instance Online

Description of command:
```
srvctl start instance -d [dbname] -i [dbinstance]
```

emadba> **srvctl start instance -d emadb -i emadb0**

10.2.4 Put the EMASOS service Online

Note: If Ericsson Multi Activation is installed with the ServiceOrderScheduler component, do the following commands to start service

Description of command:
```
srvctl start service -d [dbname] -s [servicename]
```

emadba> **srvctl start service -d emadb -s emasos**

10.3 RAC Daemon Service Administration

Note: Run following commands by root.

10.3.1   Stop RAC Daemon Service

```
# /etc/init.d/init.crs stop
```

10.3.2   Start RAC Daemon Service

```
# /etc/init.d/init.crs start
```

11 Appendix A: System Diagnostic Information Examples

11.1 Example for T2000 Eight Cores

```
System Configuration: Sun Microsystems
sun4u Sun Fire T200

System clock frequency: 200 MHz

Memory size: 16376 Megabytes

======================= CPUs =======================

 Location    CPU    Freq        CPU Impl.            CPU
                                                     Mask

 MB/CMP0/P0  0     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P1  1     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P2  2     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P3  3     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P4  4     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P5  5     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P6  6     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P7  7     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P8  8     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P9  9     1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P10 10    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P11 11    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P12 12    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P13 13    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P14 14    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P15 15    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P16 16    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P17 17    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P18 18    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P19 19    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P20 20    1000 MHz     SUNW,UltraSPARC-T1
 MB/CMP0/P21 21    1000 MHz     SUNW,UltraSPARC-T1
```

Location	CPU	Freq	CPU Impl.	CPU Mask
MB/CMP0/P22	22	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P23	23	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P24	24	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P25	25	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P26	26	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P27	27	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P28	28	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P29	29	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P30	30	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P31	31	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P32	32	1000 MHz	SUNW,UltraSPARC-T1	

```
=============== IO Configuration ================
```

Location	IO Type + Slot + Path +Name	Model
IOBD/NET0	PCIE, IOBD, /pci@780/pci@0/pci@1/network@0, network-pciex8086,105e	
IOBD/NET1	PCIE, IOBD, /pci@780/pci@0/pci@1/network@0,1, scsi-pciex1000,56 LSI	1064E
IOBD/PCIE	PCIE, IOBD, /pci@780/pci@0/pci@9/scsi@0, isa	
IOBD/PCIX	PCIX, IOBD, /pci@7c0/pci@0/pci@1/pci@0/isa@2, SUNW,pci-qge	
IOBD/PCIX	PCIX, IOBD, /pci@7c0/pci@0/pci@1/pci@0/usb@5, usb-pciclass,0c0310	
IOBD/PCIX	PCIX, IOBD, /pci@7c0/pci@0/pci@1/pci@0/usb@6, usb-pciclass,0c0310	
IOBD/PCIX	PCIX, IOBD, /pci@7c0/pci@0/pci@1/pci@0/ide, ide-pci10b9,5229	
IOBD/PCIX	PCIX, PCIX, /pci@7c0/pci@0/pci@1/pci@0,2/SUNW,qlc@1, SUNW,qlc-pci1077,2422	QLA2460

```
 Location      IO                                             Model
               Type + Slot + Path +Name
 IOBD/PCIX     PCIX, PCIX,                                     QLA2460
               /pci@7c0/pci@0/pci@1/pci@0,2/SUNW,qlc@2,
               SUNW,qlc-pci1077,2422
 IOBD/NET-1    PCIE, IOBD,
               /pci@7c0/pci@0/pci/network,
               network-pciex8086,105e
 IOBD/NET-1    PCIE, IOBD,
               /pci@7c0/pci@0/pci/network,
               network-pciex8086,105e
```

================================ HW Revisions
================================

System PROM Revisions:

```
------------------------------------------------------------
---

OBP 4.23.4 2006/08/04 20:46
```

IO ASIC revisions:

```
------------------------------

 Location            Path + Device                    Revision

 IOBD/SAS-SATA-HBA /pci@780,                           0
                   SUNW,sun4v-pci
 IOBD/SAS-SATA-HBA /pci@780/pci@0,                     170
                   pciex10b5,8532.aa
 IOBD/SAS-SATA-HBA /pci@780/pci@0/pci@9,               170
                   pciex10b5,8532.aa
 IOBD/IO-BRIDGE    /pci@7c0,                           0
                   SUNW,sun4v-pci
 IOBD/PCI-SWITCH1  /pci@7c0/pci@0,                     170
                   pciex10b5,8532.aa
 IOBD/PCI-BRIDGE   /pci@7c0/pci@0/pci@1/pci@0,2,       9
                   pciex8086,341.9
 IOBD/GBE0         /pci@780/pci@0/pci@1/network@0,     6
                   pciex8086,105e.108e.105e.6
 IOBD/GBE0         /pci@780/pci@0/pci@1/network@0,1,64
                   pciex8086,105e.108e.105e.6
 IOBD/SAS-SATA-HBA /pci@780/pci@0/pci@9/scsi@0,        2
                   pciex1000,56.1000.1000.2
```

11.2　Example for T2000 Four Cores

```
System Configuration: Sun Microsystems sun4u Sun Fire
T200

System clock frequency: 200 MHZ

Memory size: 8184 Megabytes
```

```
======================= CPUs =========================
```

Location	CPU	Freq	CPU Impl.	CPU Mask
MB/CMP0/P0	0	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P1	1	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P2	2	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P3	3	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P4	4	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P5	5	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P6	6	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P7	7	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P8	8	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P9	9	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P10	10	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P11	11	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P12	12	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P13	13	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P14	14	1000 MHz	SUNW,UltraSPARC-T1	
MB/CMP0/P15	15	1000 MHz	SUNW,UltraSPARC-T1	

```
=============== IO Devices ===============
```

Location	IO Type + Path + Slot + Name	Model
IOBD/NET0	PCIE, IOBD, /pci@780/pci@0/pci@1/network@0, network-pciex8086,105e	
IOBD/NET1	PCIE, IOBD, /pci@780/pci@0/pci@1/network@0,1, network-pciex8086,105e	
IOBD/PCIE	PCIE, IOBD, /pci@780/pci@0/pci@9/scsi@0, scsi-pciex1000,56 LSI	1064E

```
Location     IO                                    Model
             Type + Path + Slot + Name
IOBD/PCIX    PCIX, IOBD,
             /pci@7c0/pci@0/pci@1/pci@0/isa@2,
             isa
IOBD/PCIX    PCIX, IOBD,
             /pci@7c0/pci@0/pci@1/pci@0/usb@5,
             usb-pciclass,0c0310
IOBD/PCIX    PCIX, IOBD,
             /pci@7c0/pci@0/pci@1/pci@0/usb@6,
             usb-pciclass,0c0310
IOBD/PCIX    PCIX, IOBD,
             /pci@7c0/pci@0/pci@1/pci@0/ide@8,
             ide-pci10b9,5229
IOBD/NET2    PCIE, IOBD,
             /pci@7c0/pci@0/pci@2/network@0,
             network-pciex8086,105e
IOBD/NET3    PCIE, IOBD,
             /pci@7c0/pci@0/pci@2/network@0,1,
             network-pciex8086,105e
```

================================ HW Revisions

================================System PROM Revisions:

```
OBP 4.23.4 2006/08/04 20:46

IO ASIC revisions:

Location          Path + Device                    Revision

IOBD/SAS-SATA-HBA /pci@780,                         0
                  SUNW,sun4v-pci
IOBD/SAS-SATA-HBA /pci@780/pci@0,                   170
                  pciex10b5,8532.aa
IOBD/SAS-SATA-HBA /pci@780/pci@0/pci@9,             170
                  pciex10b5,8532.aa
IOBD/IO-BRIDGE    /pci@7c0,                         0
                  SUNW,sun4v-pci
IOBD/PCI-SWITCH1  /pci@7c0/pci@0,                   170
                  pciex10b5,8532.aa
IOBD/PCI-BRIDGE   /pci@7c0/pci@0/pci@1/pci@0,2,     9
                  pciex8086,341.9
IOBD/GBE0         /pci@780/pci@0/pci@1/network@0,   6
                  pciex8086,105e.108e.105e.6
```

```
          Location          Path + Device                    Revision

          IOBD/GBE0         /pci@780/pci@0/pci@1/network@0,1,6
                            pciex8086,105e.108e.105e.6

          IOBD/GBE1         /pci@7c0/pci@0/pci@2/network@0,   6
                            pciex8086,105e.108e.105e.6

          IOBD/GBE1         /pci@7c0/pci@0/pci@2/network@0,1,6
                            pciex8086,105e.108e.105e.6

          IOBD/SAS-SATA-HBA /pci@780/pci@0/pci@9/scsi@0,      2
                            pciex1000,56.1000.1000.2
```

12   Appendix B: Verifying Crontab Jobs

Make sure that the default crontab jobs for the user `root` are active and working.

Example 2   Example for a Processing Layer node in the Scalable HA Ericsson Multi Activation.

```
# crontab -l

# ident "@(#)root 1.21 04/03/23 SMI"

#

# The root crontab should be used to perform accounting
data collection.

#

#

10 3 * * * /usr/sbin/logadm
15 3 * * 0 /usr/lib/fs/nfs/nfsfind
30 3 * * * [ -x /usr/lib/gss/gsscred_clean ] &&
/usr/lib/gss/gsscred_clean

# 10 3 * * * /usr/lib/krb5/kprop_script ___slave_kdcs___
# Start of lines added by SUNWscu
20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/eventlog

20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/DS

# End   of lines added by SUNWscu
# Start of lines added by SUNWscu
20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/eventlog

20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/DS

# End   of lines added by SUNWscu
##
##
40 04 * * * /opt/sog/maint/rotate_all_logs
42 04 * * * /opt/sog/maint/remove_old_logs.sh -f 7
```

```
45 04 * * * /opt/sog/maint/sog_dump.sh
```

Example 3   Example for a Resource Layer in Scalable HA or Two node HA in Ericsson Multi Activation.

crontab -l

```
#ident "@(#)root 1.21 04/03/23 SMI"
#
# The root crontab should be used to perform accounting
data collection.
#
#
10 3 * * * /usr/sbin/logadm
15 3 * * 0 /usr/lib/fs/nfs/nfsfind
30 3 * * * [ -x /usr/lib/gss/gsscred_clean ] &&
/usr/lib/gss/gsscred_clean

#10 3 * * * /usr/lib/krb5/kprop_script ___slave_kdcs___
# Start of lines added by SUNWscu

20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/eventlog

20 4 * * 0 /usr/cluster/lib/sc/newcleventlog
/var/cluster/logs/DS

# End   of lines added by SUNWscu
##
##
00 03 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba eventlog

00 06 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba backup_level_0

00 14 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba backup_level_1

00 22 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba backup_level_1

20 03 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba rotate_dump_log

30 01 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba remove_backup_file >/dev/null 2>&1

35 01 * * * /global/oracle/oradata/emadb/admin/tools/
db_maint_tool.sh emadba remove_eventlog_file >/dev/null 2>&1
```

```
00 03 * * * /global/oracle/oradata/emalog/admin/tools/
log_maint_tool.sh emadba proclog

40 03 * * * /global/oracle/oradata/emalog/admin/tools/
log_maint_tool.sh emadba rotate_dump_log

00 21 * * * /global/oracle/oradata/emalog/admin/tools/
log_maint_tool.sh emadba add_partition

40 01 * * * /global/oracle/oradata/emalog/admin/tools/
log_maint_tool.sh emadba remove_proclog_file >/dev/null 2>&1

##
## SOG APPLICATION LINE
##
40 04 * * * /global/var/sog/config/crontab/cron_1
```

13 Appendix C: Configuration Files of Replayer

This section defines the configuration files for user provisioning and service provisioning respectively.

13.1 Configuration Files of Replayer for User Provisioning

For BroadWorks

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
   <replayer>
      <noOfThreads>1</noOfThreads>
      <noOfRetries>5</noOfRetries>
      <user>replayer</user>
      <context>replayer</context>
      <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
      <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
      <logPath>/var/sog/logs/replayer/</logPath>
      <checkpoints>
         <checkpoint>groupid=.+[^:]</checkpoint>
         <checkpoint>departmentid=.+[^:]</checkpoint>
         <checkpoint>serviceproviderid=.+[^:]</checkpoint>
      </checkpoints>
      <grouppoints>
         <grouppoint>userid=.+[^:]</grouppoint>
      </grouppoints>
   </replayer>
   <oracle>
      <useEmaConfig>TRUE</useEmaConfig>
      <user>emalogsearcher</user>
      <encPwd>#0001pcfap_cqemj_kc</encPwd>
      <sid>emalog</sid>
      <host>localhost</host>
      <port>1521</port>
   </oracle>
</config>
```

For HSS

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
   <replayer>
      <noOfThreads>1</noOfThreads>
      <noOfRetries>5</noOfRetries>
```

```
        <user>replayer</user>
        <context>replayer</context>
        <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
        <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
        <logPath>/var/sog/logs/replayer/</logPath>
        <checkpoints>
            <checkpoint>serviceproviderid=.+[^:]</checkpoint>
        </checkpoints>
        <grouppoints>
            <grouppoint>subscriberid=.+[^:]</grouppoint>
        </grouppoints>
    </replayer>
    <oracle>
        <useEmaConfig>TRUE</useEmaConfig>
        <user>emalogsearcher</user>
        <encPwd>#0001pcfap_cqemj_kc</encPwd>
        <sid>emalog</sid>
        <host>localhost</host>
        <port>1521</port>
    </oracle>
</config>
```

For IPWorks

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
    <replayer>
        <noOfThreads>1</noOfThreads>
        <noOfRetries>5</noOfRetries>
        <user>replayer</user>
        <context>replayer</context>
        <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
        <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
        <logPath>/var/sog/logs/replayer/</logPath>
        <checkpoints>
        </checkpoints>
        <grouppoints>
            <grouppoint>subscriberid=.+[^:]</grouppoint>
        </grouppoints>
    </replayer>
    <oracle>
        <useEmaConfig>TRUE</useEmaConfig>
        <user>emalogsearcher</user>
        <encPwd>#0001pcfap_cqemj_kc</encPwd>
        <sid>emalog</sid>
        <host>localhost</host>
        <port>1521</port>
    </oracle>
</config>
```

For SLF

```xml
<?xml version="1.0" encoding="UTF-8"?>
<config>
   <replayer>
      <noOfThreads>1</noOfThreads>
      <noOfRetries>5</noOfRetries>
      <user>replayer</user>
      <context>replayer</context>
      <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
      <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
      <logPath>/var/sog/logs/replayer/</logPath>
      <checkpoints>
      </checkpoints>
      <grouppoints>
      </grouppoints>
   </replayer>
   <oracle>
      <useEmaConfig>TRUE</useEmaConfig>
      <user>emalogsearcher</user>
      <encPwd>#0001pcfap_cqemj_kc</encPwd>
      <sid>emalog</sid>
      <host>localhost</host>
      <port>1521</port>
   </oracle>
</config>
```

For SRD

```xml
<?xml version="1.0" encoding="UTF-8"?>
<config>
   <replayer>
      <noOfThreads>1</noOfThreads>
      <noOfRetries>5</noOfRetries>
      <user>replayer</user>
      <context>replayer</context>
      <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
      <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
      <logPath>/var/sog/logs/replayer/</logPath>
      <checkpoints>
         <checkpoint>groupid=.+[^:]</checkpoint>
         <checkpoint>serviceproviderid=.+[^:]</checkpoint>
      </checkpoints>
      <grouppoints>
         <grouppoint>username=.+[^:]</grouppoint>
      </grouppoints>
   </replayer>
   <oracle>
      <useEmaConfig>TRUE</useEmaConfig>
      <user>emalogsearcher</user>
```

```
            <encPwd>#0001pcfap_cqemj_kc</encPwd>
            <sid>emalog</sid>
            <host>localhost</host>
            <port>1521</port>
        </oracle>
</config>
```

For PTT, PGM and WUIGM

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
    <replayer>
        <noOfThreads>1</noOfThreads>
        <noOfRetries>5</noOfRetries>
        <user>replayer</user>
        <context>replayer</context>
        <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
        <oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
        <logPath>/var/sog/logs/replayer/</logPath>
        <checkpoints>
        </checkpoints>
        <grouppoints>
            <grouppoint>subscriberid=.+[^:]</grouppoint>
        </grouppoints>
    </replayer>
    <oracle>
        <useEmaConfig>TRUE</useEmaConfig>
        <user>emalogsearcher</user>
        <encPwd>#0001pcfap_cqemj_kc</encPwd>
        <sid>emalog</sid>
        <host>localhost</host>
        <port>1521</port>
    </oracle>
</config>
```

13.2   Configuration Files of Replayer for Service Provisioning

For Service Provisioning

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
    <replayer>
        <noOfThreads>1</noOfThreads>
        <noOfRetries>5</noOfRetries>
        <user>replayer</user>
        <context>replayer</context>
        <fdsFile>/var/sog/data/database/FDS-PL.cfg</fdsFile>
```

```
<oraFile>/var/sog/data/database/tnsnames.ora</oraFile>
<logPath>/var/sog/logs/replayer/</logPath>
<checkpoints>
    <checkpoint>enid=.+[^:]</checkpoint>
</checkpoints>
<grouppoints>
    <grouppoint>uid=.+[^:]</grouppoint>
</grouppoints>
</replayer>
<oracle>
<useEmaConfig>TRUE</useEmaConfig>
<user>emalogsearcher</user>
<encPwd>#0001pcfap_cqemj_kc</encPwd>
<sid>emalog</sid>
<host>localhost</host>
<port>1521</port>
</oracle>
</config>
```

Glossary

3PP
Third Party Product

BS-AS
BroadSoft Application Server

CAI
Customer Administration Interface

CAI3G
Customer Administration Interface 3rd Generation

CAS
Customer Administration System

CNOSS
Core Network - Operation Support System

CORBA
Common Object Request Broker Architecture

E-AAA
Ericsson Authentication, Authorization and Accounting

EM
Enterprise Manager

ESA
Ericsson SNMP Agent

FDS
Flexible Distributed System

FSC
FDS Service Component

GFS
Global File System

GMRM
GemMobile Remote Manager

GSM
Global System for Mobile communications

GUI
Graphical User Interface

HA
High Availability

IMT
IMS Multimedia Telephony

LDAP
Lightweight Directory Access Protocol

MO
Managed Object

NE
Network Element

NMS
Network Management System

OTA
Over The Air

PL
Processing Layer

PN
Processing Node

ProcLog
Processing Log

RL
Resource Layer

RN
Resource Node

RR
Report Receiver

SN
Service Network

SNMP
Simple Network Management Protocol

SOBH
Service Order Batch Handler

SOS
Service Order Scheduler

SPA
Storage Processor A

SPB
Storage Processor B

SSCS
SUN StorEdge Configuration Service

SSH
Secure Shell

SURP
Subscriber Update Request Protocol

SVM
Solaris Volume Manager

TCP/IP
Transmission Control Protocol/Internet
Protocol

USD
User and Service Database

USM
User and Subscription Management

XCAI
eXtended Customer Administration Interface

XCAI3G
eXtended Customer Administration Interface
Third Generation

XML
Extensible Markup Language

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[5] *Installation Instruction Stand-alone Configuration - Guide*, 4/1531-CSH 150 82 Uen

[6] *Installation Instruction Scalable HA Configuration - Guide*, 7/1531-CSH 150 82 Uen

[7] *Reporting Receiver System Administration Guide IMT 3.0*, 5/1543-CSH 150 82 Uen

[8] *ESA Setup and Configuration*, 1/1543-CSH 150 024 Uen

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[10] *Sun Cluster 3.1 08/05 System Administration Guide*, http://docs.sun.com/app/docs/doc/817-0516

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