



Cisco ASR 5000 Series External Storage Server Installation and Administration Guide

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About this Guide

This document pertains to the features and functionality that run on and/or that are related to the Cisco® ASR 5000 Chassis.

This preface includes the following sections:

- [Conventions Used](#)
- [Contacting Customer Support](#)
- [Additional Information](#)

Conventions Used

The following tables describe the conventions used throughout this documentation.

Icon	Notice Type	Description
	Information Note	Provides information about important features or instructions.
	Caution	Alerts you of potential damage to a program, device, or system.
	Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.
	Electrostatic Discharge (ESD)	Warns you to take proper grounding precautions before handling ESD sensitive components or devices.

Typeface Conventions	Description
Text represented as a <i>screen display</i>	This typeface represents text that appears on your terminal screen, for example: Login:
Text represented as commands	This typeface represents commands that you enter at the CLI, for example: show ip access-list This document always gives the full form of a command in lowercase letters. Commands are <u>not</u> case sensitive.
Text represented as a command variable	This typeface represents a variable that is part of a command, for example: show card slot_number <i>slot_number</i> is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the File menu, then click New .

Command Syntax Conventions	Description
{ keyword or <i>variable</i> }	Required keywords and variables are surrounded by braces. They must be entered as part of the command syntax.
[keyword or <i>variable</i>]	Optional keywords or variables that may or may not be used are surrounded by brackets.

Command Syntax Conventions	Description
	<p>Some commands support alternative variables. These “options” are documented within braces or brackets by separating each variable with a vertical bar.</p> <p>These variables can be used in conjunction with required or optional keywords or variables. For example:</p> <pre>{ nonce timestamp }</pre> <p>OR</p> <pre>[count <i>number_of_packets</i> size <i>number_of_bytes</i>]</pre>

Contacting Customer Support

Go to <http://www.cisco.com/cisco/support/> to submit a service request. A valid Cisco account (username and password) is required to access this site. Please contact your Cisco account representative for additional information.

For Existing Customers with support contracts through Starent Networks: Refer to the support area of <https://support.starentnetworks.com/> for up-to-date product documentation or to submit a service request. A valid username and password is required to this site. Please contact your local sales or service representative for additional information.

Additional Information

Refer to the following guides for supplemental information about the ASR 5000 chassis:

- *ASR 5000 Command Line Interface Reference*
- *Statistics and Counters Reference*
- *Thresholding Configuration Guide*
- *Cisco ASR 5000 SNMP MIB Reference*
- *Cisco Web Element Manager Installation and Administration Guide*
- Product-specific and feature-specific Administration guides
- *Release Notes* that accompany updates and upgrades to StarOS

Chapter 1

External Storage System Overview

An External Storage System (ESS) is used to collect, store, and report billing information from the Enhanced Charging Service running on the ASR 5000 platform on short term and long term storage basis. This guide contains instructions for implementing and maintaining the Local, short-term External Storage Server (L-ESS).

 **Important:** The External Storage System is not a part of the Enhanced Charging Service (ECS) and must be purchased separately. To purchase ESS, contact your designated sales or service representative.

 **Important:** The procedures in this guide assume that you have installed and configured your chassis including the ECS installation and configuration as described in the *Enhanced Charging Services Administration Guide*.

 **Important:** The 9.0 release of ESS works in conjunction with the latest embedded versions of StarOS.

Overview

The CDR subsystem, provides 512 MB of volatile memory on the packet processing card RAM to store accounting information. This on-board memory is intended as a short-term buffer for accounting information so that billing systems can periodically retrieve the buffered information for bill generation purposes. However if network outages or other failures cause billing systems to lose contact with the system, it is possible that the CDR subsystem storage area can be filled with non-retrieved accounting information. When the storage is filled the CDR subsystem starts deleting the oldest files to make sure that there is room for new billing files and non-retrieved accounting information can be lost. Using an external storage server with a large storage volume in close proximity to the chassis ensures room for storing a large amount of billing data that is not lost by any failure.

The ESS has the capability of simultaneously fetching any types of files from one or more chassis. That is, it can fetch xDRs like CDR, EDR, NBR, UDR file, etc.

In case of Hard Disk Drive (HDD) support on the chassis, the platform has the capability to push the xDR files to L-ESS, and then L-ESS forwards these files to the required destinations. If HDD is not configured on the platform, L-ESS pulls the files from the system and forwards them to the destinations. For information on the push functionality and its configuration, refer to the *xDR File Push Functionality* appendix.

The External Storage System (ESS) is designed to be used as a safe storage area. A mediation or billing server within your network must be configured to collect accounting records from the ESS once it retrieves them.

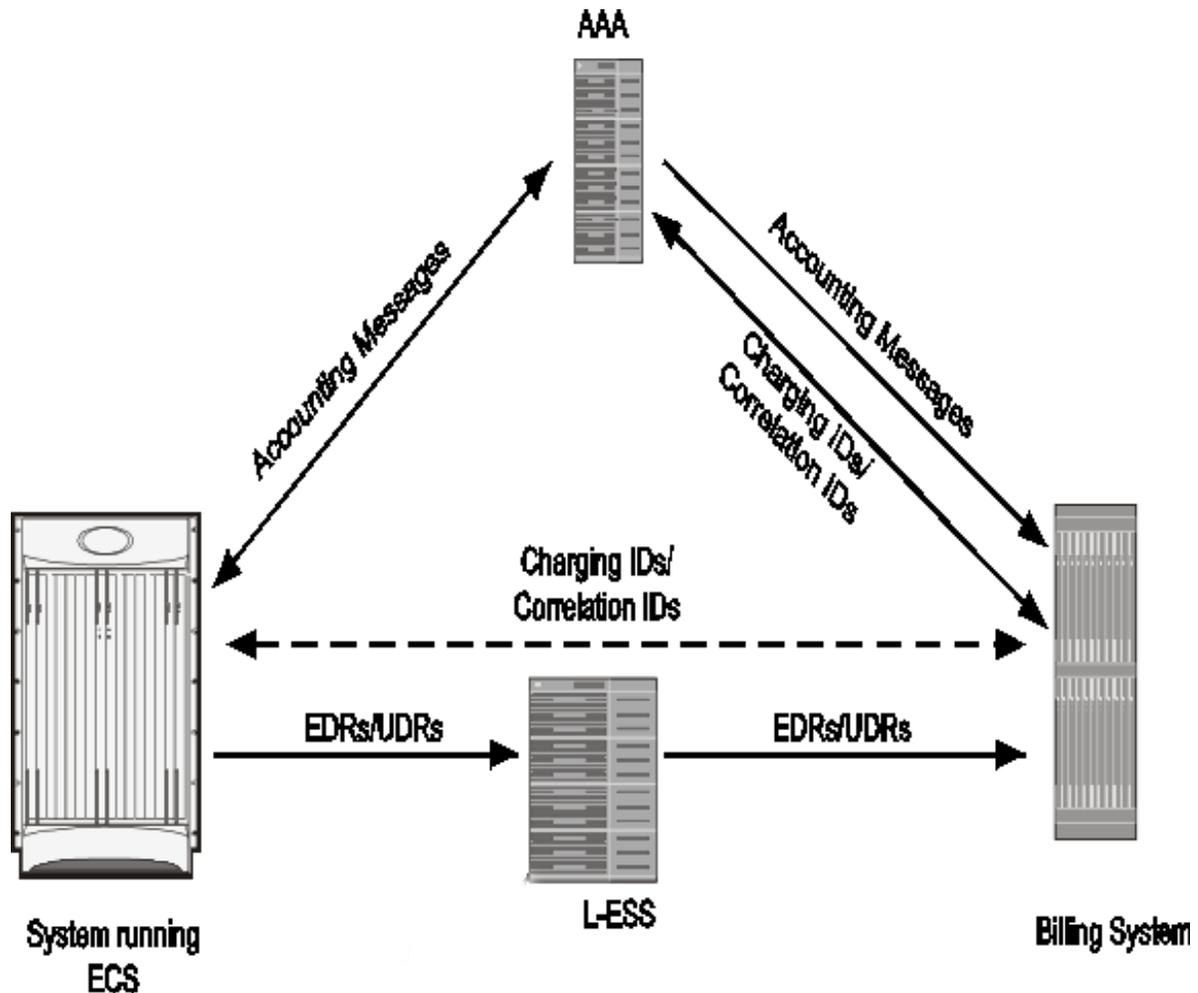
The External Storage System supports a high level of redundancy for secure charging and billing information for post-processing of xDRs. This system can store charging data of up to 30 days.

This guide discusses the following topics on External Storage System:

- Storage System Components:
 - Local, short-term external storage server (L-ESS)

The following figure shows a typical organization of External Storage System including L-ESS and billing system with chassis having a AAA server.

Figure 1. ESS Architecture with ECS



The system running with ECS stores xDR files on an L-ESS and billing system collects the files from the L-ESS, and correlates them with the AAA accounting messages using either 3GPP2-Correlation-IDs on a PDSN system or Charging IDs on a GGSN system.

L-ESS also pushes xDR files to external applications for post-processing, reporting, subscriber profiling, and trend analysis.

Local, Short-Term External Storage System

The Local, short-term storage system (L-ESS) is a storage server logically connected with the ASR 5000 and acts as an integrated network system.

The following are the requirements for the deployment of L-ESS:

- High speed dedicated redundant connections to chassis to pull xDR files.
- High-speed dedicated and redundant connection with billing system to transfer xDR files.

- Different management addresses than the management addresses of the chassis and billing system.
- Management interface with support of multiple VLANs.
- Redundancy support with two or more geographically co-located or isolated chassis to pull xDRs.

In general L-ESS provides the following functionalities:

- Stores copy of records pulled from chassis.
- Supports storage of up to 7 days worth of records.
- Supports storage capacity of carrier-class redundant.
- Provides a means of limiting the amount of bandwidth, in term of kbps, used for the file transfer between chassis and L-ESS.
- Provides a means of archiving/compression of the pulled xDR files for the purpose of extending the storage capacity.
- Provides xDR files to the billing system.

System Requirements

The requirements described in this section must be met in order to ensure proper operation of the ESS system.

ASR 5000 System Requirements

The following configurations must be implemented, as described in *Configuring Enhanced Charging Services* chapter of the *Enhanced Charging Services Administration Guide*:

- ECS must be configured for generating billing records.
- An administrator or config-administrator account that is enabled for FTP must be configured.
- SSH keys must be generated.
- The SFTP subsystem must be enabled.

ESS System Requirements

 **Important:** System requirement recommendation is dependent of different parameters including xDR generation, compression, deployment scenario, etc. Contact your sales representative for system requirements specific to your ESS deployment.

Minimum System Recommendations for Stand-alone Deployment of L-ESS

- OpenSSL must be installed
- Sun Microsystems Netra™ T5220 server
 - 1 x 1.2GHz 8 core UltraSPARC T2 processor with 8GB RAM
 - 2 x 146GB SAS hard drives
 - Internal CDROM drive
 - AC or DC power supplies depending on your application
 - PCI-based video card or Keyboard-Video-Mouse (KVM) card (optional)
 - Quad Gigabit Ethernet interfaces

 **Important:** It is recommended that you have separate interfaces (in IPMP) for mediation device and chassis. Also, for given IPMP, the two interfaces should be on different cards.

- Operating Environment:
 - Sun Solaris 9 with Solaris Patch dated January 25, 2005
 - Sun Solaris 10 with Solaris Patch number 137137-09 dated on or after July 16, 2007 to Nov 2008.
- PSMON (installed through ESS installation script)
- Perl 5.8.5 (installed through ESS installation script)

System Requirements

- or -

- Sun Microsystems Netra™ X4450 server for L-ESS
 - Quad-Core Intel Xeon E7340 (2x4MB L2, 2.40 GHz, 1066 MHz FSB)
 - 32 GB RAM
 - 12 x 300 GB 10000 RPM mirrored SAS disks
 - Four 10/100/1000 Ethernet ports, 2 PCI-X, 8 PCIe
 - 4 redundant AC power supplies
 - INtelx64 core 4 socket
- Operating Environment:
 - Sun Solaris 10



Important: For information on which server to be used for L-ESS application, contact your local sales representative.

Minimum System Recommendations for Cluster Deployment of L-ESS

- Sun Microsystems Netra™ T5220 server
 - 1 x 1.2GHz 4 core UltraSPARC T2 processor with 8GB RAM
 - 2 x 146GB SAS hard drives
 - Quad Gigabit Ethernet interfaces



Important: It is recommended that you have separate interfaces (in IPMP) for mediation device and chassis. Also, for given IPMP, the two interfaces should be on different cards.

- Internal CDROM drive
- AC or DC power supplies depending on your application
- Fiber channel (FC) based Common Storage System for Servers (Sun Storage Tek 2540)
- PCI Dual FC 4GB HBA
- Dual RAID Controllers
- 5 x 300GB 15K drives
- AC or DC power supplies depending upon your application

Chapter 2

Veritas Cluster Installation and Management

The cluster mode functionality enables L-ESS to provide high availability and critical redundancy support to retrieve CDRs in failure of any one of the systems. An L-ESS cluster comprises two L-ESS systems, or nodes, that work together as a single, continuously available system to provide applications, system resources, and data to L-ESS users. Each L-ESS node on a cluster is a fully functional, standalone system. However, in a clustered environment, the L-ESS nodes are connected by an interconnected network and work together as a single entity to provide increased data availability.

Highly available clusters provide nearly continuous access to data and applications by keeping the cluster running through failures that would normally bring down a single server system.

The cluster setup offers several advantages over traditional single-server systems. These advantages include:

- Support for failover and scalable services
- Capacity for modular growth
- Low entry price compared to traditional hardware fault-tolerant systems
- Reduce or eliminate system downtime because of software or hardware failure
- Ensure availability of data and applications to L-ESS user, regardless of the kind of failure that would normally take down a single-server system.
- Provide enhanced availability of the system by enabling you to perform maintenance without shutting down the entire cluster.

Following are the cluster components that work with L-ESS to provide this functionality:

- L-ESS Cluster Node

A L-ESS cluster node is a L-ESS server that runs both the L-ESS Application software and Cluster Agent software. The Cluster Agent enables carrier to network two L-ESS nodes in a cluster. Every L-ESS node in the cluster is aware when another L-ESS node joins or leaves the cluster. Also, every L-ESS node in the cluster is aware of the resources that are running locally as well as the resources that are running on the other L-ESS cluster nodes.

Each L-ESS cluster node is a standalone server that runs its own processes. These processes communicate with one another to form what looks like (to a network client) a single system that co-operatively provides applications, system resources, and data to L-ESS users.

- Common Storage System

A common storage system is a fiber channel (FC) -based cluster storage with FC drives for the servers in the cluster environment. It is interconnected with L-ESS cluster nodes with carrier class network connectivity to provide high level redundant storage and backup support for CDRs. It serves as common storage for all connected L-ESS cluster nodes.

This system provides high storage scalability and redundancy with RAID support.

This chapter includes the following topics:

- [L-ESS Cluster Functional Description](#)
- [Installing Hardware](#)

System Requirements

- [Configuring Storage Array](#)
- [Configuring Veritas Volume Manager and Veritas Cluster](#)
- [Monitoring the Cluster](#)
- [Setup of rootdisk Encapsulation and Mirroring](#)
- [Testing the Cluster](#)

Once the Veritas Volume Manager and Veritas Cluster are configured, proceed to the installation of L-ESS application on the L-ESS Server. For detailed instructions, refer to the *L-ESS Installation and Configuration* chapter of this guide. Then, perform the cluster monitoring and rootdisk encapsulation processes.

L-ESS Cluster Functional Description

L-ESS clustering application provides the support to two discreet L-ESS servers for retrieving and storing xDRs from the chassis at a distribution node on a single IP address/network element for the billing system.

Both the L-ESS nodes (L-ESS1 and L-ESS2) are configured identically from the standpoint of the retrieval and storage of the xDRs to support the following:

- The active L-ESS (either L-ESS1 or L-ESS2) is configured to retrieve xDRs from any and all local chassis in pre-defined intervals and the xDRs are stored on shared disk (between active and standby) by the active so that whenever active goes down and standby takes over, it has access to fetched data as data is on the shared disk.
- The directory structure of both L-ESS1 and L-ESS2 is identical and conform to the carrier standards. A */fetched_data* directory under *<less_install_dir>/ess* is used to store initial retrieval of the xDRs from the chassis.

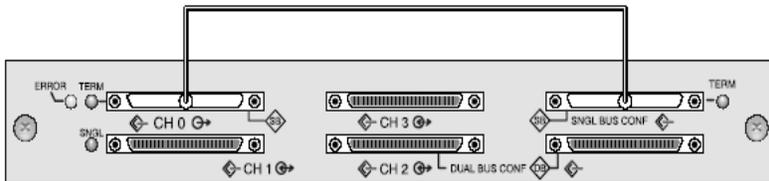
From a process flow perspective, the interaction of the clustered L-ESS and the ECS is as follows:

- The L-ESS(s) is statically configured with chassis to pull xDRs.
- The chassis continually generates and groups individual records into xDRs, which are marked as a 'closed' xDR file based on pre-defined criteria.
- The active L-ESS uses SFTP to access the chassis and retrieve all closed xDRs for storage in the */fetched_data* directory.
- Active L-ESS fetches xDR files for eventual retrieval by the billing system.

Installing Hardware

To install the hardware components required for the installation of L-ESS cluster:

- Step 1** Rack the Sun Netra T5220 servers and storage array and connect power to each of them.
- Step 2** Connect Ethernet port 0 on each server to an Ethernet switch.
- Step 3** Connect Ethernet port 1 on server 1 to Ethernet port 1 on server 2 with a cross-over cable.
- Step 4** Connect Ethernet port 2 on server 1 to Ethernet port 2 on server 2 with a cross-over cable.
- Step 5** Connect a terminal (pc with terminal emulation such as HyperTerm) to the console port. Settings for the console are 9600 8, 1, N. Console cable and DB9 to RJ45 adapter are included with each server.
- Step 6** Connect one SCSI cable from CH 0 on the Storage Array to Single Bus Conf as shown in the following figure. DO NOT make any connections to Sun Servers at this time.



- Step 7** Connect the Ethernet ports on each array controller to an Ethernet switch.
- Step 8** Insert install DVD into DVD-ROM in the first Sun server. Make sure the server is NOT cabled to the storage array.
- Step 9** Power on the server.
- Step 10** Wait for the ok prompt on the console.
- Step 11** To boot the machine from the DVD, enter:
- ```
ok> boot cdrom - install
```
- Step 12** The install will run for some time. After the image has been loaded, you will be prompted for the host information shown below:

```
Please enter the desired hostname for this machine.

Please enter the desired IP address for bge0.

Please enter the netmask for bge0.

Please enter the default router for bge0.
```

- Step 13** After entering hostname, IP address, netmask, and default router information, you must confirm the inputs.

```
Please verify your configuration information:
```

```
hostname:
```

```

ip:

netmask:

router:

Are these correct? (y/n)

```

**Step 14** The machine will reboot, and comes up in multi-user mode.

**Step 15** Log on as root with the corresponding password.

**Step 16** Remove the “Boot/Install DVD” from the DVD-ROM.

**Step 17** Set the Ethernet interface to full-duplex mode.

**Step a**.....Create the script `/etc/rc2.d/S68net_tune` as shown below:

```

-----cut from here-----

#!/sbin/sh

/etc/rc2.d/S68net-tune

PATH=/usr/bin:/usr/sbin

echo "Implementing Solaris ndd Tuning Changes "

bge-Interfaces

Force bge0 to 100fdx autoneg off

ndd -set /dev/bge0 adv_1000fdx_cap 0

ndd -set /dev/bge0 adv_1000hdx_cap 0

ndd -set /dev/bge0 adv_100fdx_cap 1

ndd -set /dev/bge0 adv_100hdx_cap 0

ndd -set /dev/bge0 adv_10fdx_cap 0

ndd -set /dev/bge0 adv_10hdx_cap 0

ndd -set /dev/bge0 adv_autoneg_cap 0

-----end script-----

```

**Step b** .....Make the script executable.

```
chmod 755 /etc/rc2.d/S68net_tune
```

**Step 18** Edit the file, `/etc/ssh/sshd_config`, and change the line, “#PermitRootLogin yes”, so that it reads, “PermitRootLogin yes”. This will only be a temporary change to allow remote access until user accounts are created.

**Step 19** Restart the SSH daemon to make changes take effect.

```
#/etc/init.d/sshd stop
```

```
#/etc/init.d/sshd start
```

**Step 20** Transfer the three script files to the */mnt* directory on the server using FTP.

**Step 21** Change the attributes of the scripts to allow execution.

```
#cd /mnt
```

```
#chmod 777 *.sh
```

**Step 22** Execute the script, **user\_config.sh**, and specify passwords for the users prompted.

```
./user_config.sh
```

```
Enter password for user ssmon.
```

```
New Password:
```

```
Re-enter new Password:
```

```
passwd: password successfully changed for ssmon
```

```
Enter password for user ssadmin.
```

```
New Password:
```

```
Re-enter new Password:
```

```
passwd: password successfully changed for ssadmin
```

```
Enter password for user ssconfig.
```

```
New Password:
```

```
Re-enter new Password:
```

```
passwd: password successfully changed for ssconfig
```

```
Enter password for user essadmin.
```

```
New Password:
```

```
Re-enter new Password:
```

```
passwd: password successfully changed for essadmin
```

```
Enter password for user.
```

```
New Password:
```

```
Re-enter new Password:
```

```
passwd: password successfully changed for user
```

**Step 23** Connect the storage array to server 1 only.

**Step 24** Type the following command to reboot the server and make the storage array known to the server.

```
#reboot -- -r
```

**Step 25** Repeat *Step 8* through *Step 21* on the server 2.

**Step 26** Execute the **format** command on both the servers, and verify if the drives are correctly labeled and cabled. For more detailed information, refer to the *Sun Documentation*.

## Configuring Storage Array

To configure the storage array:

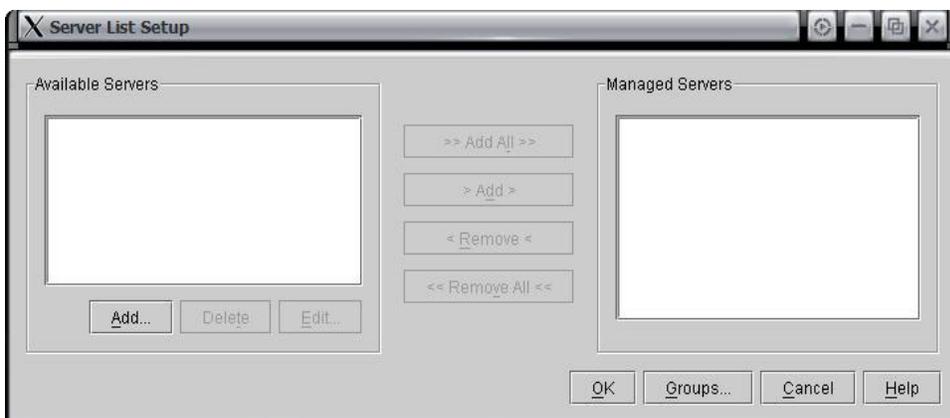
- Step 1** Log on to a workstation, with an X Window server, with access to the machine to be installed.
- Step 2** Start the X Window server. (Hummingbird Exceed)
- Step 3** Using Putty (<http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>), setup a new connection, with X11 forwarding enabled, to the server.
- Step 4** Log on as **root** user with the corresponding password.
- Step 5** Type the following commands:

```
exec bash
export DISPLAY=<local_IP_address>:0.0
/usr/openwin/bin/xhost +
```

- Step 6** Invoke the Sun Storage Configuration GUI by typing the following command:

```
#ssconsole
```

- Step 7** Click **Hide** to terminate server discovery, if necessary.
- Step 8** Click **Server List Setup** on the File menu of the Sun Storage Configuration Service Console to configure the server to monitor.
- Step 9** Click **Remove All** to remove any old data from the list.



- Step 10** Click **Add** to add a new server.
- Step 11** Enter the name of the server being configured, its IP address, and the password that you set for the **ssmon** user in the fields, then click **OK**.

Server name: less1

Properties | Mailing Lists | Grouping

Network Information

IP Address: 10.1.15.90      Socket Port: Not assigned

Get IP Addr by Name

Monitoring Login

ssmon Password: \*\*\*\*\*      Auto discovery:  Yes  No

OK    Cancel    Help

- Step 12** If you do not want to set up the mail server for event notification, click **No** when the warning message appears.
- Step 13** Select the server you just created in the Available Servers list, then click **>Add>** to add it to the **Managed Servers** list.
- Step 14** Click **Controller Assignment** on the **Array Administration** menu.

 **Important:** If array has previously been configured, quit the SSSCONSOLE.

- Step 15** Select the ID listed, then, in the pop-up at the bottom, select the name of the server, and click **Apply**.

Assign Server to Manage a RAID Controller

A Sun StorEdge 3000 family controller can only be managed by one host at a time. This function enables you to assign a server to manage the controller that has a host LUN on a LD/LV assigned to the primary controller.

Controller Serial Number List

| Unique ID | Primary SN | Secondary... | Enabled Server | Disabled Server |
|-----------|------------|--------------|----------------|-----------------|
| 0ad03e    |            |              | less1          |                 |

Select Server for Managing Controller

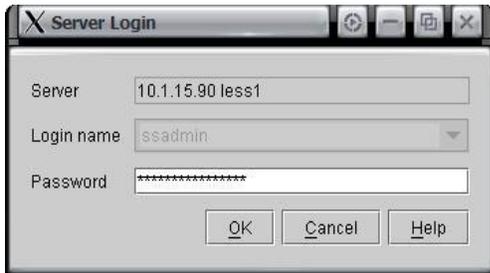
Unique ID: 0ad03e      Controller SN: \_\_\_\_\_

Server to manage this controller: less1

Apply    Close    Help

- Step 16** When prompted, enter the password for the ssadmin user that you selected earlier, and then click **OK**.

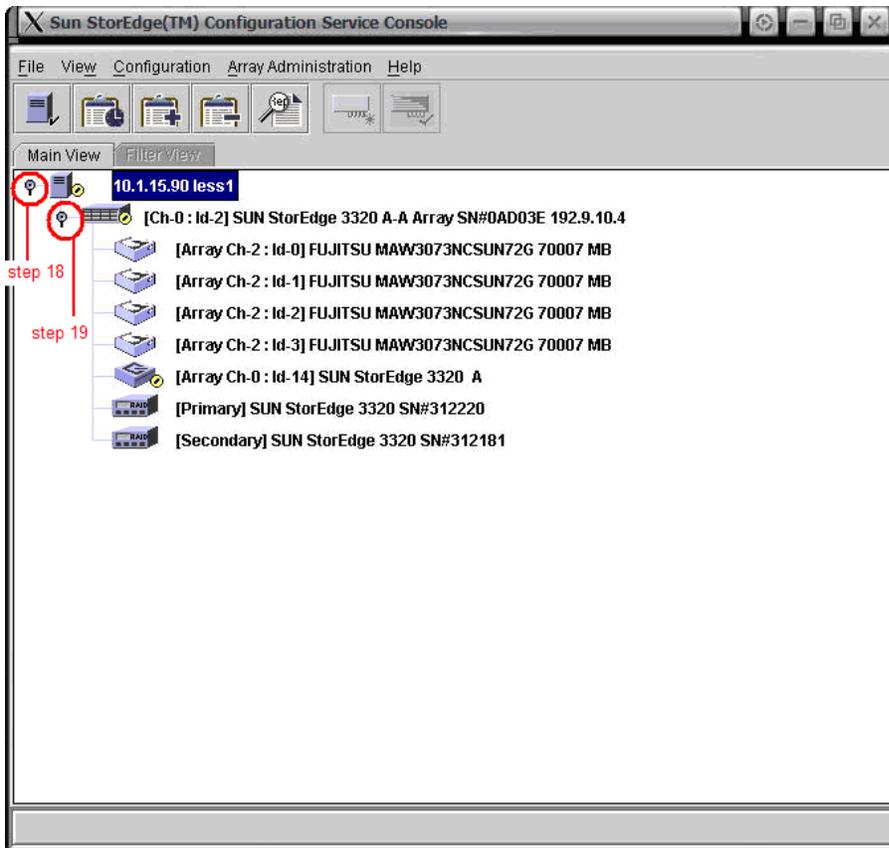
## ■ Configuring Storage Array



**Step 17** Click **Close**.

**Step 18** Double-click the server in the main dialog. Refer to the following figure for details.

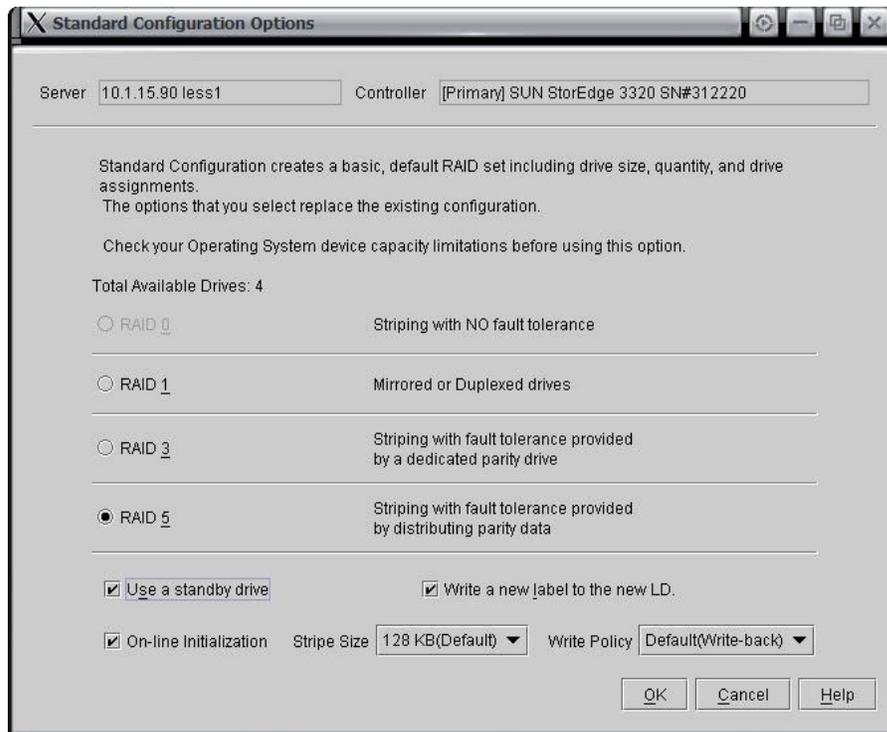
**Step 19** Double-click the array in the main dialog. Refer to the following figure for details.



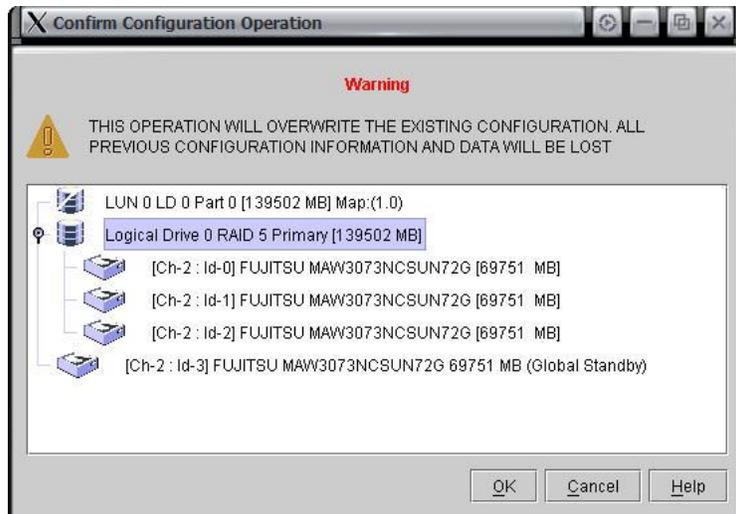
**Step 20** Select the array, and click **Standard Configure** on the **Configuration** menu.

**Step 21** Enter the password for the sconfig user that you selected earlier.

**Step 22** Select RAID 5, then select **Use a standby drive**, and **Write a new label to the new LD** check boxes.



**Step 23** Click **OK** to verify that you want to overwrite all data on the array.



**Step 24** A progress dialog appears showing you the status of the array format.

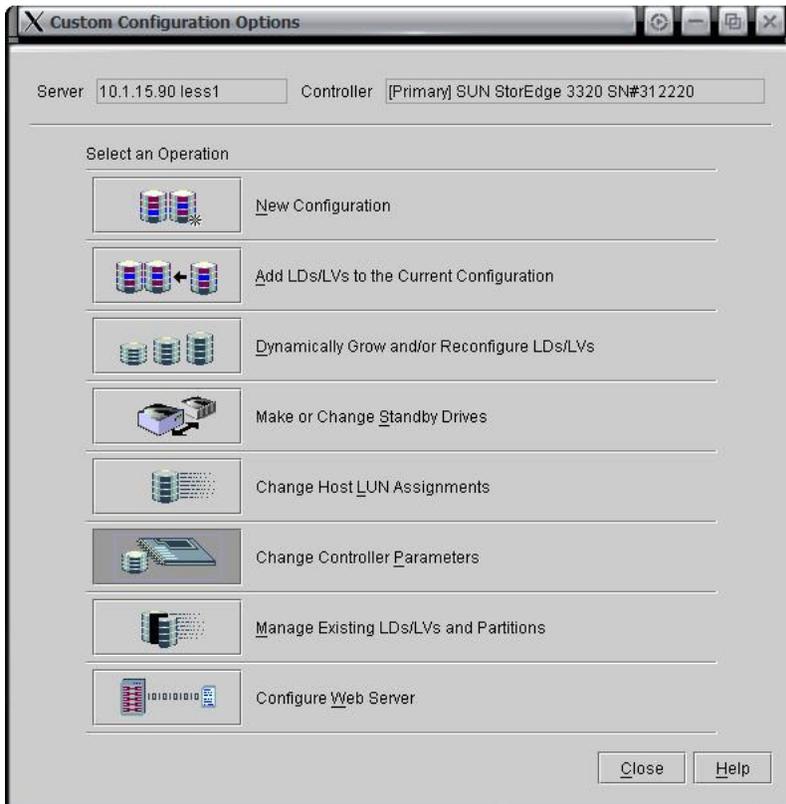
**Step 25** When complete, the below dialog appears. Click **Close**.

## ■ Configuring Storage Array

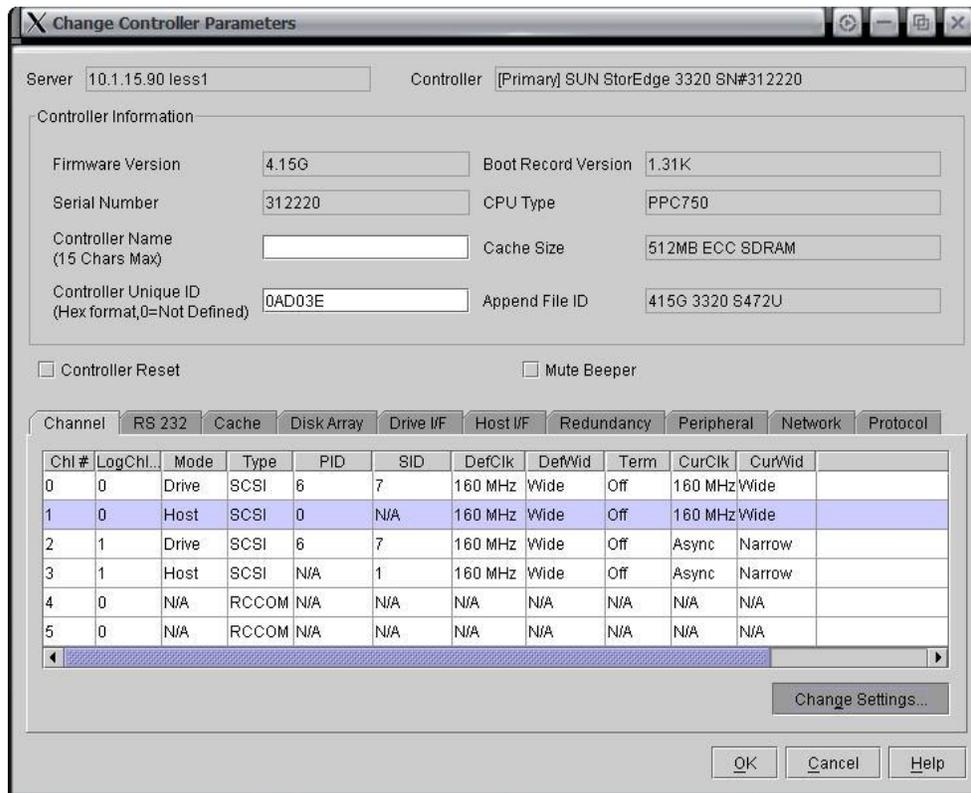


**Step 26** Click **Custom Configure** on the **Configuration** menu.

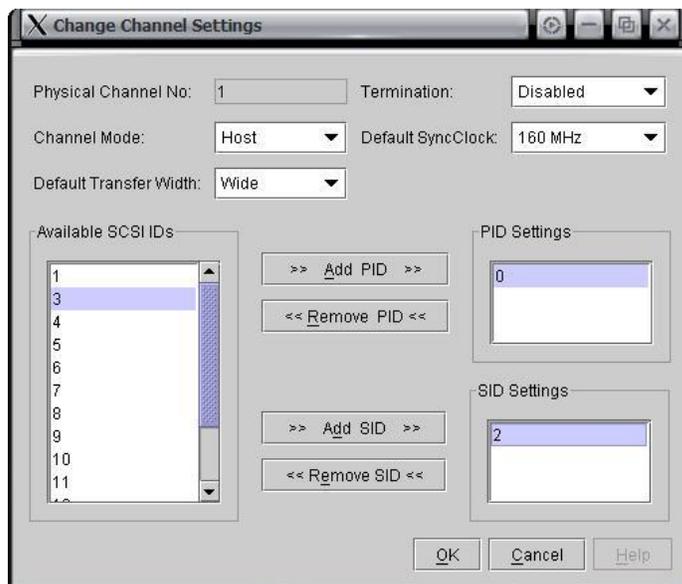
**Step 27** Select **Change Controller Parameters**.



**Step 28** Click on **Channel 1**, and then click **Change Settings**.



**Step 29** Click on **2** under **Available SCSI IDs**, then click **>> Add SID >>**, and click **OK**.



**Step 30** Click on **Channel 3**, and then click **Change Settings**.

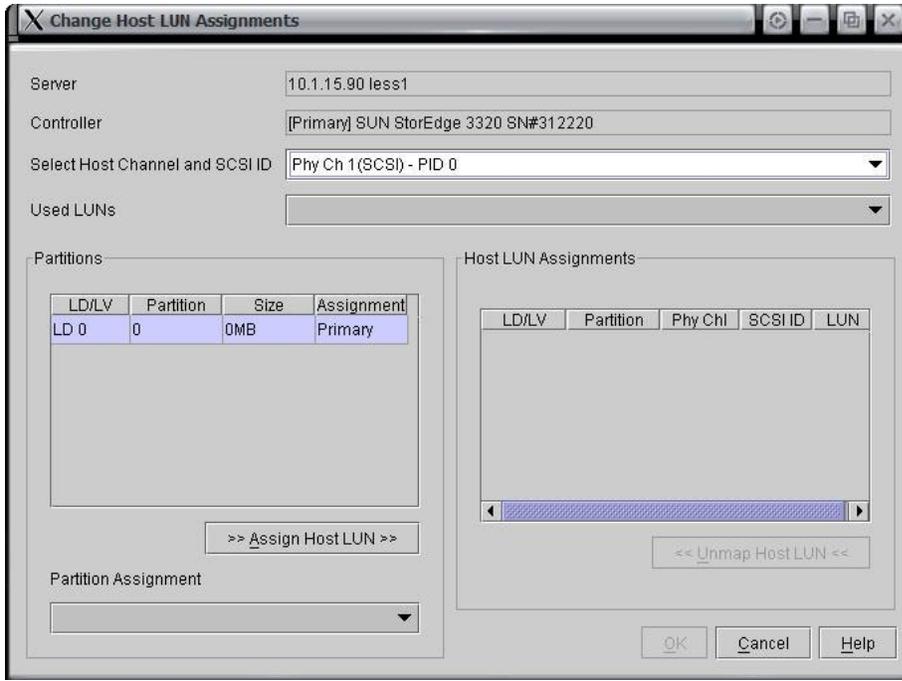
**Step 31** Select **3** under **Available SCSI IDs**, then click **>> Add PID >>**, and click **OK**.

**Step 32** Click **Custom Configure** on the **Configuration** menu.

## ■ Configuring Storage Array

**Step 33** Select **Change Host LUN Assignments**.

**Step 34** From **Select Host Channel and SCSI ID**, select **Phy Ch 1(SCSI) – PID 0**. Under **Partitions**, select **LD 0**, then click **Assign Host LUN**, and **OK**.



**Step 35** Repeat the same for **Phy Ch 3(SCSI) – PID 3**, and assign **LD 0** to it.

**Step 36** Click **Custom Configure** on the **Configuration** menu.

**Step 37** Select **Change Controller Parameters**.

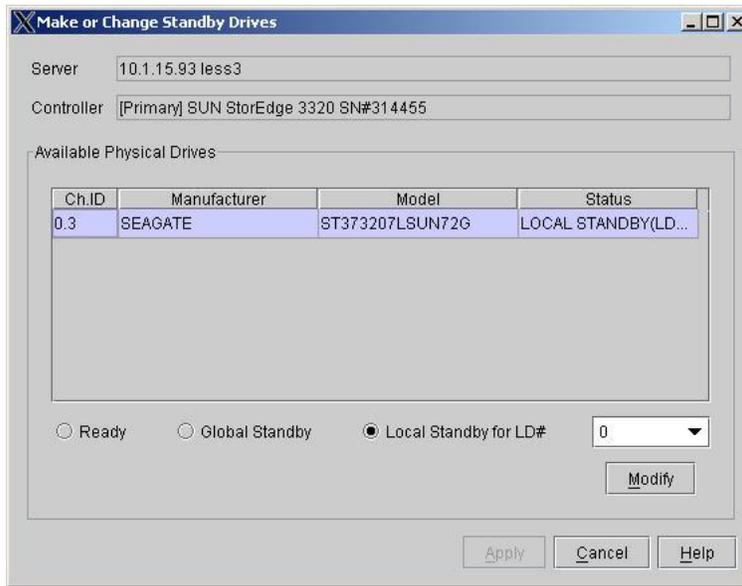
**Step 38** Click on **Network** tab of the **Change Controller Parameters** screen, and then click **Change Settings**.

**Step 39** Enter the IP address for the array, and subnet mask, then click **OK**.

**Step 40** Click **Custom Configure** on the **Configuration** menu.

**Step 41** Select **Make or Change Standby Drives**.

**Step 42** Click the radio button next to, **Local Standby for LD#**, and make sure that the popup has 0 shown, then click **Apply**.



**Step 43** Quit sconsole.

## Configuring Veritas Volume Manager and Veritas Cluster

To configure the Veritas Volume Manager:

**Step 1** Start the installation by entering the following command:

```
vxinstall
```

The following prompt appears:

```
Are you sure that you want to reinstall [y,n,q,?] (default: n)
```

Type **y** if you want to reinstall the Volume Manager.

**Step 2** Type **y** to review the licenses that are already installed when the following prompt appears:

```
Some licenses are already installed. Do you wish to review them [y,n,q] (default: y)
```

**Step 3** Type **y** when prompted for entering another license key, if necessary. Then enter the key data for this server.



**Important:** The key on the Install DVD is a demo key and will expire in 60 days.

**Step 4** Press **Enter** to accept the default of **n** in the following prompt:

```
Do you want to use enclosure based name for all disks? [y,n,q,?] (default: n)
```

**Step 5** Press **Enter** to accept the default of **y** in the following prompt:

```
Do you want to setup a system wide default disk group? [y,n,q,?] (default: y)
```

Enter a default disk group name of `rootdg`. The installation of Veritas Volume Manager is now successfully completed.

**Step 6** Repeat *Step 1* through *Step 5* on the server 2.

**Step 7** Copy the provided default LLT and GAB configuration files to configure LLT and GAB. Type the following:

```
for file in llttab gabtab llthosts; do cp /etc/$file.server1 /etc/$file; done
```

**Step 8** Edit `/etc/llttab`, if there are more than one cluster on the network. If this is the case, change the cluster ID, after set-cluster to a unique integer. If not, no changes are necessary.

**Step 9** Edit `/etc/llthosts`, and replace `less1` with the name of the first server in the pair, and `less2` with the name of the second server.

**Step 10** Restart LLT and GAB, by executing the following commands:

```
#!/etc/init.d/gab stop
```

```
#!/etc/init.d/llt.rc stop
```

```
#!/etc/init.d/llt.rc start
```

```
#/etc/init.d/gab start
```

**Step 11** Repeat *Step 7* through *Step 10* on second server.

**Step 12** Verify that both servers' cluster communication modules see each other by typing the following command:

```
gabconfig -a
```

If you see a line with membership "01", then both nodes are talking. If you see the message as membership ";1" or "0;" then the node that has the ";" (semi-colon) is misconfigured. Verify your configurations in the /etc/lltab, /etc/llthosts, and /etc/gabtab files.

**Step 13** Type **hastart** and then **hastatus**. When the last line reads "<system name> RUNNING", VCS engine has started. If you get "VCS ERROR V-16-1-10600 Cannot connect to VCS engine" repeatedly, the VCS engine has failed to start. Refer to the /var/VRTSvcs/log/engine\_A.log for possible problems.

**Step 14** Execute the first VCS configuration script, /mnt/vcs\_basic.sh, from the configuration DVD. Enter the data for cluster node names, cluster name, virtual IP address and virtual netmask. A lot of warning messages will be displayed, but there should be no errors.

**Step 15** Stop the cluster by typing the following command:

```
root@less4 # hastop -all
```

Then, copy the new types.cf from the /mnt directory to /etc/VRTSvcs/conf/config.

**Step 16** Regenerate and populate the config on both the nodes by executing the following commands:

```
root@less4 # hacf -verify /etc/VRTSvcs/conf/config/
```

```
root@less4 # hacf -generate /etc/VRTSvcs/conf/config/
```

Then execute **hastart** on both the nodes.

**Step 17** Validate that the cluster has probed all resources by waiting until the **hastatus -sum** command output looks similar to the following:

```
root@less4 # hastatus -sum

-- SYSTEM STATE

-- System State Frozen

A less3 RUNNING 0

A less4 RUNNING 0

-- GROUP STATE

-- Group System Probed AutoDisabled State

B LAPP less3 Y N OFFLINE

B LAPP less4 Y N OFFLINE
```

**Step 18** Create the resource groups for L-ESS application and define the dependencies between the resource groups as outlined below.

**Step a**.....Change the VCS configuration as rewritable.

```
haconf -makerw
```

**Step b**.....Add the application resource group and change the required attributes.

```
hares -add <APP_RES> Application lesssg
```

```
hares -modify <APP_RES> Enabled 1
```

```
hares -modify <APP_RES> PidFiles <PSMON_PID_PATH> FOR EG
/users/ess/psmon.pid
```

```
hares -modify <APP_RES> StartProgram FOR EG /users/ess/start_serv.sh
```

```
hares -modify <APP_RES> StopProgram FOR EG "/users/ess/serv forcestop"
```

```
hares -modify <APP_RES> User <USERNAME> For EG essadmin
```

**Step c**.....Now add the dependencies.

```
hares -link <APP_RES> LESS-VIP
```

```
hares -link <APP_RES> lessmount
```

**Step d**.....To verify the dependencies, enter the following command:

```
hares -disp <APP_RES>
```

The output for this command will display all the required attributes.

```
hares -dep <APP_RES>
```

This command displays the dependencies of the application.

**Step e**.....Shutdown the L-ESS.

**Step f** .....Now bring the APP\_RES online by entering the following command:

```
hares -online <APP_RES> -sys <NODE_NAME>
```

**Step g**.....Once the application is up and running, dump the configuration using the following command:

```
haconf -dump makero
```

Also, perform a cat of *main.cf* file. A sample output is shown below.

```
Application T5220-Application (
User = root
StartProgram = "/less/LESS/ess/start_serv.sh"
```

```

StopProgram = "/less/LESS/ess/serv forcestop"

PidFiles = { "/less/LESS/ess/psmon.pid" }

)

// resource dependency tree

//

// group T5220-SG

//

{

// Application T5220-Application

// {

// IP T5220-IP

// {

// NIC T5220-NIC

// }

// Mount T5220-mount

// {

// Volume T5220-Vol

// {

// DiskGroup T5220-DG

// }

// }

// }

// }

```

**Step h** .....Perform a switch over and verify that the application comes up on the other node as well.

```
hagrps -offline <RG_name> -sys <Node1>
```

```
hagrps -online <RG_name> -sys <Node2>
```

**Step 19** Validate that it is online on the first node.

```
root@less4 # hastatus -sum
```

```

-- SYSTEM STATE

-- System State Frozen

A less3 RUNNING 0

A less4 RUNNING 0

-- GROUP STATE

-- Group System Probed AutoDisabled State

B LAPP less3 Y N ONLINE

B LAPP less4 Y N OFFLINE

```

**Step 20** Enable the SNMP traps/alarms and edit the *main.cf* file under */etc/VRTSvcs/conf/config* to add the following entries:

```

NotifierMgr LAPP-Notif-Mgr (

 SnmpdTrapPort = 162

 SnmpConsoles = { "<SNMP_IP_Address>" = Information }

)

```

**Step 21** Verify and regenerate the new config.

```

root@less3 # hacf -verify /etc/VRTSvcs/conf/config/

root@less3 # hacf -generate /etc/VRTSvcs/conf/config/

```

Then, restart both the nodes by executing the following command:

```

root@less3 # hastart

root@less4 # hastart

```

For more details on the installation of Veritas Volume Manager and Veritas Cluster configuration, refer to the *Veritas Documentation*.

# Monitoring Veritas Cluster

To monitor the status of the Veritas cluster:

**Step 1** Create the following script under `/export/home/scripts` to monitor the status of the cluster.

```
#!/bin/sh

script to monitor the status of Veritas... if both nodes are offline, force to
start

the number one (1) node.

put this in crontab as:

0,15,30,45 * * * * /export/home/scripts/keep_vcs_active.sh
2>>/var/adm/messages

VCS=' [VCS] == '

CHECK_VCS=`hastatus -sum|grep -c ONLINE`

DATE=`date "+%m/%d/%Y %T"`

echo $DATE $VCS "Checking for Veritas started..." >> /var/adm/messages

if [${CHECK_VCS} -eq 0]

then

 DATE=`date "+%m/%d/%Y %T"`

 echo $DATE $VCS "Both nodes are offline... Making first node active" >>
/var/adm/messages

 hagrps -clear LAPP >> /var/adm/messages

 hagrps -online LAPP -sys less3

 DATE=`date "+%m/%d/%Y %T"`

 echo $DATE $VCS "First node activated. " >> /var/adm/messages

else

 DATE=`date "+%m/%d/%Y %T"`

 echo $DATE $VCS "Veritas is running normally." >> /var/adm/messages

fi
```

**Step 2** Change the permission of the script to make it executable.

```
chmod 755 /export/home/scripts/keep_vcs_active.sh
```

**Step 3** Copy the cron jobs to a file by executing the following command:

```
crontab -l > /tmp/CRON
```

**Step 4** Edit the file and add the following line:

```
0,15,30,45 * * * * /export/home/scripts/keep_vcs_active.sh
2>>/var/adm/messages
```

**Step 5** Activate the new cron jobs.

```
crontab /tmp/CRON
```

On executing the script, the status of the Veritas cluster can be verified every 15 minutes.

## Setup of rootdisk Encapsulation and Mirroring

To setup the rootdisk encapsulation and mirroring:

- Step 1** Log on as **super user** (root) on the first server. Execute **format**, and then select disk “1”.
- Step 2** Type **y** when prompted for labeling the disk.
- Step 3** Exit format, by pressing **CTRL+D**.
- Step 4** Execute **vxdiskadm**, and select option “2”.
- Step 5** Type **list** to see a list of available disks.
- Step 6** Select the rootdisk, “c1t0d0” for encapsulation.
- Step 7** Verify that the rootdisk is the desired disk to encapsulate.
- Step 8** Specify rootdg, the default, as the disk group to add the rootdisk to. Then, confirm that rootdg should be created.
- Step 9** When prompted, type **n** to specify that you do not wish to use the default disk name for the rootdisk. Then, confirm that you wish to continue with the encapsulation.
- Step 10** Enter a name for the rootdisk, and press **ENTER** to accept the default private region length.
- Step 11** The rootdisk has been configured for encapsulation. Reboot the server using the following command:

```
#shutdown -g0 -y -i6
```

- Step 12** Repeat *Step 1* through *Step 11* on the second server.
- Step 13** Initialize the second disk that was formatted in *Step 2*.

```
vxdisksetup -i c1t1d0 format=sliced
```

- Step 14** Add the disk to the rootdg disk group.

```
vxdg -g rootdg adddisk rootmirror=c1t1d0s2
```

- Step 15** Initialize the mirror process by executing the following command:

```
vxrootmir -v rootmirror
```

The output should be similar to the following:

```
! vxassist -g bootdg mirror rootvol layout=contig,diskalign rootmirror
! vxbootsetup -g bootdg -v rootmirror
! vxmkscpart -f -v -g rootdg rootmirror-01 0 0x2 0x200
! vxpartadd /dev/rdisk/c1t1d0s2 0 0x2 0x200 20352 62918208
```

## ■ Setup of rootdisk Encapsulation and Mirroring

```
! /usr/sbin/installboot /usr/platform/SUNW,Netra-T5220/lib/fs/ufs/bootblk
/dev/rdisk/c1t1d0s0
```

```
! vxeprom devalias vx-rootmirror /dev/dsk/c1t1d0s0
```

---

 **Important:** This process will take a long time. It can be monitored from another terminal by typing **vxtaskmonitor**.

---

**Step 16** Mirror the additional volumes with the following command:

```
vxmirror rootdisk rootmirror
```

The output should be as follows:

```
! vxassist -g defaultdg mirror swapvol rootmirror
```

```
! vxassist -g defaultdg mirror export rootmirror
```

---

 **Important:** This process will take a long time. It can be monitored from another terminal by typing **vxtaskmonitor**.

---

**Step 17** Eject the DVD from the drive, by typing **/usr/sbin/umount /mnt** and **eject /dev/dsk/c0t0d0s0**.

**Step 18** When complete, shut down both the nodes, by typing, **hastop -all -force**. Then, type **hacf -verify /etc/VRTSvcs/conf/config/** to verify the cluster configuration. Next, type **hastart** on node 1, then **hastatus**. On node 2, type **hastart**. The cluster should then start, and can be monitored in the **hastatus** window open on node 1. Refer to **/var/VRTSvcs/log/engine\_A.log** if you get any errors.

## Testing Veritas Cluster

There are two ways to check the status of the cluster, either interactive or by its summary. To verify the status, type the following:

```
root@LESS1 # hastatus
```

```
attempting to connect....connected
```

```
group resource system message
```

```

```

```
JPTRFLGN-LESS1 RUNNING
```

```
JPTRFLGN-LESS2 RUNNING
```

```
LAPP JPTRFLGN-LESS1 OFFLINE
```

```
LAPP JPTRFLGN-LESS2 ONLINE
```

```

```

```
LAPP JPTRFLGN-LESS1 OFFLINE
```

```
LAPP JPTRFLGN-LESS2 ONLINE
```

```
LAPP-app-ess JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-app-ess JPTRFLGN-LESS2 ONLINE
```

```
LAPP-vmdg-lessdg JPTRFLGN-LESS1 OFFLINE
```

```

```

```
LAPP-vmdg-lessdg JPTRFLGN-LESS2 ONLINE
```

```
LAPP-ip-vip_ext JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-ip-vip_ext JPTRFLGN-LESS2 ONLINE
```

```
LAPP-mnt-less JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-mnt-less JPTRFLGN-LESS2 ONLINE
```

```

```

```
LAPP-mnt-less-bk JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-mnt-less-bk JPTRFLGN-LESS2 ONLINE
```

```
LAPP-nic-bge0 JPTRFLGN-LESS1 ONLINE
```

```
LAPP-nic-bge0 JPTRFLGN-LESS2 ONLINE
```

```
LAPP-app-ess JPTRFLGN-LESS1 OFFLINE
```

```

```

```
LAPP-app-ess JPTRFLGN-LESS2 ONLINE
```

```
LAPP-vmdg-lessdg JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-vmdg-lessdg JPTRFLGN-LESS2 ONLINE
```

```
LAPP-ip-vip_ext JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-ip-vip_ext JPTRFLGN-LESS2 ONLINE
```

```

```

```
LAPP-mnt-less JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-mnt-less JPTRFLGN-LESS2 ONLINE
```

```
LAPP-mnt-less-bk JPTRFLGN-LESS1 OFFLINE
```

```
LAPP-mnt-less-bk JPTRFLGN-LESS2 ONLINE
```

```
LAPP-nic-bge0 JPTRFLGN-LESS1 ONLINE
```

```

```

```
LAPP-nic-bge0 JPTRFLGN-LESS2 ONLINE
```



**Important:** This will continue to gather the status unless interrupted by pressing **Ctrl+C** key.

```
root@LESS1 # hastatus -sum
```

```
-- SYSTEM STATE
```

```
-- System State Frozen
```

```
A JPTRFLGN-LESS1 RUNNING 0
```

```
A JPTRFLGN-LESS2 RUNNING 0
```

```
-- GROUP STATE
```

```
-- Group System Probed AutoDisabled State
```

```
B LAPP JPTRFLGN-LESS1 Y N OFFLINE
```

```
B LAPP JPTRFLGN-LESS2 Y N ONLINE
```

## L-ESS Cluster Failure Handling

The L-ESS clustering application is configured to monitor the health of both the hardware and software components of the L-ESS(s). The most typical error conditions that are accounted for, along with the expected resolution, are as follows:

- Failure of a physical interface on the active L-ESS
  - In this case, communication will be shifted to the redundant interface on the active L-ESS.
- Failure of a software process/application on the active L-ESS
  - In this case, the software process will be attempted to restart.
  - If this cannot be achieved in a reasonable time frame a switchover to the standby L-ESS will be initiated.
- Failure of the redundant private interconnect between the active and standby L-ESS
  - In this case, the node with maximum quorum votes will become active node and the other will be rebooted in the standalone mode.
- Failure of the active L-ESS as a whole (e.g. power failure)
  - In this case, a switchover to the standby L-ESS will be initiated.

Any and all failure scenarios, be it software or hardware, will be handled in a manner such that from the network/billing system perspective, the L-ESS is always reachable with a consistent set of directory structures and contents.



# Chapter 3

## L-ESS Installation and Configuration

---

This chapter describes how to install and configure the L-ESS application on the L-ESS Server.

## L-ESS Installation Modes

This section provides information on the different modes available for the installation of L-ESS application.

The L-ESS application can be installed in one of the following modes:

- Stand-alone mode
- Cluster mode

In the cluster mode, L-ESS provides high availability and critical redundancy support to retrieve xDRs in case of failure of any one of the systems. An L-ESS Sun cluster comprises two L-ESS systems, or nodes, that work together as a single, continuously available system to provide applications, system resources, and data to the L-ESS users. Each L-ESS node on the Sun cluster is a fully functional, stand-alone system. However, in a Sun clustered environment, the L-ESS nodes are connected by an interconnected network and work together as a single entity to provide increased data availability.

For more information on the Veritas cluster, refer to the *Veritas Cluster Installation and Management* chapter.

For stand-alone installation of L-ESS application, refer to the [Installing LESS Application in Standalone Mode](#) section. For cluster-based installation of L-ESS application, refer to the [Installing LESS Application in Cluster Mode](#) section.

## Installing L-ESS Application in Stand-alone Mode

 **Important:** The L-ESS application cannot be upgraded currently. Only complete re-installation is supported.

To install and configure the L-ESS application:

**Step 1** Obtain the software archive file as directed by your designated sales or service contact.

 **Important:** L-ESS supports both Solaris-Sparc and Solaris-x86 platforms. The installable tar file names help in identifying the platform. For example, `L_ess_n_n_nn_solaris_sparc.zip` indicates that this file is for Solaris-Sparc platform. `L_ess_n_n_nn_solaris_x86.zip` indicates that this file is for Solaris-x86 platform.

**Step 2** Create a directory named `ess` on the system on which you want to run the L-ESS application.

**Step 3** Change to the `/ess` directory and then enter the following command to unzip the software archive file:

```
unzip L_ess_n_n_nn_solaris_n.zip
```

The following files are extracted in the current working directory:

- `README`: A text file that gives additional information on installation and configuration procedures for L-ESS and PSMON.
- `l_ess.tar`: A tar archive that the installation script uses.
- `install_ess`: A shell script that performs the L-ESS installation.
- `platform`: A file that provides information on the platforms currently supported for L-ESS.
- `StarentLESS.tar`: A tar file that contains the L-ESS cluster agent package.
- `less_pool.cfg`: A configuration file to create L-ESS resource pool.
- `ess_sourcedest_config.cfg`: A file to configure the source and destination parameters.
- `workload_division_T5220.sh`: A shell script utility to allocate the CPU resource pools for workload division.

**Step 4** Start the installation by entering the following command:

```
./install_ess [Option] [Config File Path]
```

If no option is provided, the install script will proceed with the installation of L-ESS application without loading the source/destination config file, `ess_sourcedest_config.cfg`, present in the path where the tar ball is untarred. The option is `-l` used to validate and load the config file.

If the validation is successful, the script will cause loading of config file parameters into a database. If it fails, the installation will proceed without loading the config file.

If you want to load the source/destination configuration file after the installation is complete, use the `lessConfigUtility.sh` script. For more information on how to use this script, refer to the *Source and Destination Configuration* section in *Configuring the L-ESS Server* chapter.

**Step 5** Follow the on-screen prompts to progress through the various installation dialogs and configure the parameters as required. Refer to the following table for descriptions of the configurable parameters on each of the installation dialogs.

| Parameter                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Default Value                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Primary Configuration                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                            |
| LESS Installation Directory          | Type the directory path where you want the L-ESS to be installed. The default is the current directory.                                                                                                                                                                                                                                                                                                                                                                                        | Current directory from where the L-ESS installation script is executed.                                                                                                                                                                                                                                                                                                                                    |
| IP Address for LESS installation     | Type the IP address of the local machine where the L-ESS application is installed.<br><br> <b>Important:</b> This IP address will be used to lock a socket to avoid starting of similar L-ESS instances. In case of stand alone installation this should be machine's IP address and in case of cluster based installation this should be Logical Host's IP address. Default is current machine's IP address. | IP address of the local machine where L-ESS is installed                                                                                                                                                                                                                                                                                                                                                   |
| Base Directory Path for Fetched Data | Type the base directory path for the fetched data.                                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>&lt;less_install_dir&gt;/ess/fetched_data</code>                                                                                                                                                                                                                                                                                                                                                     |
| Log Directory Path                   | Type the directory path for the log files.                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Stand-alone mode:<br><code>&lt;less_install_dir&gt;/ess/log</code><br>Cluster mode: When the L-ESS installation is in shared path, the log files will be available at<br><code>&lt;shared_path&gt;/LESS/log</code> .<br>When the L-ESS installation is in local path and the data files are on shared path, the log files will be available at<br><code>&lt;shared_path&gt;/LESS/lesslog_hostname</code> . |
| SMTP Configuration                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                            |
| SMTP Server Name                     | If you want Process Monitor (PSMON) alert messages automatically e-mailed to a specific person, type the host name or IP address of a valid SMTP server. Press <b>ENTER</b> for no SMTP server and e-mail recipient.                                                                                                                                                                                                                                                                           | Null                                                                                                                                                                                                                                                                                                                                                                                                       |
| Email-ID [To ]                       | Type the e-mail address of the person who should receive the alert messages.                                                                                                                                                                                                                                                                                                                                                                                                                   | Null                                                                                                                                                                                                                                                                                                                                                                                                       |
| Miscellaneous Configuration          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                            |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Default Value |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| File expiry duration                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Type the maximum lifetime, in days, after which the EDR/NBR/UDR files should be deleted from the L-ESS base directory or local destinations. The value must be an integer from 0 through 30.</p> <p>When the parameter is set to 0, the L-ESS will not delete any files. The L-ESS deletes the file from base directory after it is pushed to all required destinations. If the data record file is not pushed to a destination, it will be kept in the base directory.</p> <p>Also if files are not getting deleted from local destination paths by the application that is using them, files will keep on accumulating on these paths causing unnecessary disk space utilization.</p> <p>You can control lifetime of the data records with the cleanup script. You must start the cleanup script by providing path of L-ESS base directory. Refer to the <i>Using the Cleanup Script</i> section for more details.</p> <hr/> <p> <b>Important:</b> If you are configuring the destination for a mediation device you may want to enable <b>File expiry duration</b> parameter so that the files are deleted periodically to maintain the disk space. On the other hand, if it is any other application (e.g. R-ESS) that takes care of deleting the files after processing, it is advised that the <b>File expiry duration</b> parameter is not configured (leave its value as 0 i.e. default).</p> | 0             |
| Local file deletion time                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Type the value, in hours, at which the L-ESS cleanup script should start deleting the older files. This can be adjusted so that cleanup script does not cause slowing down of L-ESS. The value must be an integer from 0 through 23.</p> <hr/> <p> <b>Important:</b> This parameter can be configured only when the <b>File expiry duration</b> parameter is set to a non-zero value.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0             |
| <p>The above mentioned parameters are stored in a configuration file, <i>generic_ess_config</i>, located at <code>&lt;less_install_dir&gt;ess/template</code> directory. The <i>ess</i> process when started by PSMON will take the configuration from this file. If you would like to change any of the existing configuration, or set additional parameters, see the <i>L-ESS Server Configuration</i> section in this guide.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |
| L-ESS Installation Confirmation                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |
| Modify configuration                                                                                                                                                                                                                                                                                                                                                                                                                | Type <b>(Y)es</b> if you want to make any modifications to the existing configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No            |
| Proceed with installation                                                                                                                                                                                                                                                                                                                                                                                                           | Type <b>(Y)es</b> to proceed with L-ESS installation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes           |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Description                                                                                                                                       | Default Value |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <p>The following prompt appears when you proceed with the L-ESS installation:</p> <pre> [1] Modify Common Configurations For Source/Destination [2] Add Source [3] Modify Source [4] Remove Source [5] Enable Source [6] Disable Source [7] Add Destination [8] Modify Destination [9] Remove Destination [10] Enable Destination [11] Disable Destination [12] Miscellaneous Configurations [13] Show All Config [e] Exit </pre> <p>Enter your choice according to the configurations needed.</p> |                                                                                                                                                   |               |
| Common Config Parameters for Source/Destination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                   |               |
| Directory poll interval for source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Type the pull poll interval, in seconds, for pulling the record files from chassis or host.<br>The value must be an integer from 10 through 3600. | 30            |

| Parameter                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Default Value |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| File name format for source            | <p>Select from the currently available file formats for xDR files.</p> <ul style="list-style-type: none"> <li>• [1]<br/>FIELDSEP( )_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCE CENO(0,999999999)</li> <li>• [2]<br/>FIELDSEP( )_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCE CENO(0,999999999)_PSCNO</li> <li>• [3]<br/>FIELDSEP( )_STR_RULEBASENAME_TIMESTAMP_SEQUENCE NO(0,999999999)</li> <li>• [4] FIELDSEP( )_STR-RULEBASENAME_STR_TIMESTAMP</li> <li>• [5]<br/>FIELDSEP( )_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295).EXT</li> <li>• [6]<br/>FIELDSEP( )_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295)</li> <li>• [7]<br/>FIELDSEP( )_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,999999).EXT</li> <li>• [8]<br/>FIELDSEP( )_STR_STR_TIMESTAMP(YYYYMMDDHHMMSS).EXT</li> <li>• [9] ACR_FILEFORMAT</li> </ul> <hr/> <p> <b>Important:</b> Modification in file format requires restart of L-ESS.</p> <hr/> <p>You can also customize your own format according to the file naming convention.</p> | 1             |
| Delete files from source               | Type <b>(Y)es</b> to delete record files from source directory after fetching.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | y             |
| Report missed files from remote source | <p>Type <b>(Y)es</b> to activate alarm when files are found missing while pulling them from chassis.</p> <hr/> <p> <b>Important:</b> This feature is allowed only if file naming format contains sequence number.</p> <hr/> <p> <b>Important:</b> This particular alarm generation can be enabled only if the deletion of EDR or UDR files from remote host is enabled and the SNMP support is enabled.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | y             |

| Parameter                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Default Value |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Transient file prefix for source     | Type the transient file prefix for source files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                       | curr_         |
| Transfer file prefix for destination | Type the transfer file prefix for destination files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                   | Null          |
| Pending file threshold               | If SNMP feature is enabled and the number of total files to be fetched from source directory is larger than this threshold number then alarm "starLESSThreshPendingFiles" will be raised. Alarms will be raised even if the files to be pushed to destination directory is exceeding the configured limit. Clear alarm "starLESSThreshClearPendingFiles" will be raised when number of total files to be fetched falls below this threshold. The threshold value, 0 indicates do not enable this threshold. Maximum value for this threshold is 1000 files. | 0             |
| Half cooked file detection threshold | Type the threshold value, in hours, to avoid the unnecessary half cooked files being stored under chassis' base directory. If incomplete file older than this threshold is found, then L-ESS removes the file. The value must be an integer from 1 through 24.                                                                                                                                                                                                                                                                                              | 1             |
| Port                                 | Type the port number used to create SFTP connection to remote host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 22            |
| Connection retry count               | This value is used to decide number of times L-ESS can try to set up connection to remote host in case of connection failure.                                                                                                                                                                                                                                                                                                                                                                                                                               | 3             |
| Connection Retry Frequency           | This is the time interval after which L-ESS should reconsider connecting to remote host in case connection creation has failed earlier even after retrying configured number of times.                                                                                                                                                                                                                                                                                                                                                                      | 60            |
| Socket timeout value                 | Use this parameter to set the socket timeout value. This socket timeout is set for a socket connection that is opened for SFTP between L-ESS and configured host or remote destination. This is like a normal socket timeout which means maximum time for which socket can remain idle. The default value is 10 seconds.                                                                                                                                                                                                                                    | 10            |
| Compressed/Decompressed required     | This value indicates if compression or decompression is required at the destination end while sending the files. Possible values are c and d. If it is c, it means that every file received will be compressed before sending to destination, unless it is already compressed. If the value is d, it means that every file received will be decompressed before sending to destination unless it is already decompressed.                                                                                                                                   | c             |
| Process count                        | Specify the number of processes to be spawned for each source/destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1             |
| Create hostname directory            | Type <b>(y)es</b> to create a directory with hostname while pushing the files to destination. To have this feature enabled it is necessary that HostName parameter has some value for given source.                                                                                                                                                                                                                                                                                                                                                         | y             |
| Source Configuration                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
| Source Location                      | Select (L)ocal or (R)emote depending on the location of source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Local         |
| Source directory                     | Type the path for xDR base directory on chassis or on local source. This is the base directory on chassis from which L-ESS will pull xDR files.                                                                                                                                                                                                                                                                                                                                                                                                             | Null          |

| Parameter                                                        | Description                                                                                                                                                                                                                                                                                                               | Default Value |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Hostname for subdirectory                                        | Type the host name of subdirectory created at source side. This configuration is applicable only for local source. In case of remote source, remote host name is used to create directory.                                                                                                                                | Null          |
| Filter                                                           | Type the unique string that is used to identify the xDR files to be included or excluded based on filter list. If the filter string is provided, L-ESS will pull/push files only with matching filter string.<br>For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].     | Null          |
| Add destination for current source                               | Select this option if you want to add destination to the currently configured source.                                                                                                                                                                                                                                     | Null          |
| Detach destination for current source                            | Select this option if you want to remove destination from the currently configured source.                                                                                                                                                                                                                                | Null          |
| Destination Configuration                                        |                                                                                                                                                                                                                                                                                                                           |               |
| Destination Location                                             | Select (L)ocal or (R)emote depending on the location of destination.                                                                                                                                                                                                                                                      | Local         |
| Destination directory                                            | Type the destination directory path at the destination side where xDR files are to be stored. In cluster mode installation, this path should be shared path.                                                                                                                                                              | Null          |
| Create subdirectory with hostname                                | Type <b>(Y)es</b> if you want to create subdirectory with host name under destination base path.                                                                                                                                                                                                                          | y             |
| Create subdir under hostname dir                                 | Type <b>(Y)es</b> if you want to create subdirectory under the host name directory if it exists.                                                                                                                                                                                                                          | y             |
| Subdirectory name                                                | Type the name of the subdirectory being created.                                                                                                                                                                                                                                                                          | data          |
| How should files be sent to destination? Compressed/Decompressed | Type <b>(Y)es</b> if file is required in compressed format at the destination side. If you type <b>(Y)es</b> , the file will be compressed (if it is not previously compressed) and then forwarded. If you type <b>(N)o</b> , the file will be uncompressed (if previously compressed) and then forwarded to destination. | c             |
| Filter string                                                    | Type the unique string that is used to identify the xDR files to be included or excluded based on filter list. If the filter string is provided, L-ESS will pull/push files only with matching filter string.<br>For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].     | Null          |
| File prefix while transfer                                       | Type the file prefix to be used while transferring the xDR files to the destination.                                                                                                                                                                                                                                      | Null          |
| Miscellaneous Configuration                                      |                                                                                                                                                                                                                                                                                                                           |               |
| Start disk clean up based on threshold                           | To enable the disk cleanup based on the disk utilization threshold level, type <b>(Y)es</b> . This causes the deletion of older files on disk crossing the threshold of the Disk threshold 2 parameter until disk utilization drops below Disk threshold 1.                                                               | y             |

| Parameter                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Default Value |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Disk threshold 1          | Type the first level threshold value, in percentage, for monitoring disk usage. If disk utilization goes beyond this threshold an alarm is raised indicating that the disk is overutilized. The value must be an integer from 1 through 100.                                                                                                                                                                                                                                                           | 80            |
| Disk threshold 2          | Type the second level threshold value, in percentage, for monitoring disk usage. If disk utilization goes beyond this threshold an alarm is raised indicating that the disk utilization has crossed the configured second level threshold. This threshold is specifically to notify that disk is now critically low. The value must be an integer from 1 through 100.                                                                                                                                  | 98            |
| Enable SNMP               | Type <b>(Y)es</b> to enable the SNMP trap notifications.                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes           |
| SNMP Version              | Type the SNMP version of the traps that should be generated by L-ESS. The currently supported SNMP versions are v1 and v2c.                                                                                                                                                                                                                                                                                                                                                                            | v1            |
| Add SNMP host             | Type <b>(Y)es</b> to add another SNMP Manager host.<br><br> <b>Important:</b> The maximum number of SNMP Manager hosts that are allowed to be configured is four.<br><br> <b>Important:</b> The default values for all the parameters except SNMP Manager Host Name will be taken from previous host configuration for the new host. | No            |
| Remove SNMP host          | Type <b>(Y)es</b> to remove the currently configured SNMP Manager host.                                                                                                                                                                                                                                                                                                                                                                                                                                | No            |
| Log level                 | This value specifies the severity of log messages. The values can be one of the following: <ul style="list-style-type: none"> <li>• 0 - Disable all logs</li> <li>• 1 - Debug Level logs</li> <li>• 2 - Info Level logs</li> <li>• 3 - Warning Level logs</li> <li>• 4 - Error Level logs</li> <li>• 5 - Critical Level logs</li> </ul>                                                                                                                                                                | 4             |
| SNMP Host Configuration   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
| SNMP host name            | Type the hostname or IP address where the SNMP Manager resides.                                                                                                                                                                                                                                                                                                                                                                                                                                        | Null          |
| SNMP port                 | Type the SNMP Manager port number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 162           |
| SNMP community string     | Type the community string that should be used while sending the SNMP traps.                                                                                                                                                                                                                                                                                                                                                                                                                            | public        |
| Remote Host Configuration |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |

| Parameter                                   | Description                                                                                                                                                                                                                                                                       | Default Value |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Host Name or IP Address of Starent Platform | To establish an SFTP connection, type the hostname or IP address of the chassis.<br><br> <b>Important:</b> This parameter is applicable only if the source or destination is at remote location. | Null          |
| SFTP User Name                              | Type the user name used to log on to chassis.<br><br> <b>Important:</b> This parameter is applicable only if the source or destination is at remote location.                                    | Null          |
| SFTP Password                               | Type the password used to log on to chassis.<br><br> <b>Important:</b> This parameter is applicable only if the source or destination is at remote location.                                     | Null          |

The above mentioned parameters are stored in a database. These parameters can be added, removed or modified through the config utility, *lessConfigUtility.sh*, present in the */<less\_install\_dir>/ess* directory. If you would like to change any of the existing configuration, or set additional parameters, see the *L-ESS Server Configuration* section in this guide.

After providing the inputs for the parameters, the script extracts the *l\_ess.tar* file and then installs the L-ESS application.

## Installing L-ESS Application in Cluster Mode

This section describes the procedure for installing the L-ESS application on Sun/Veritas cluster node. For complete installation of the L-ESS application, you need to perform the installation process on both primary and secondary L-ESS nodes of the cluster.

To install and configure the L-ESS application in cluster mode:

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 **Important:** The L-ESS application cannot be upgraded currently. Only complete re-installation is supported.

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- Step 1** Obtain the software archive file as directed by your designated sales or service contact.
- Step 2** Create a directory named `ess` on the system on which you want to run the L-ESS.
- Step 3** Change to the `/ess` directory and then enter the following command to unzip the software archive file:

```
unzip L_ess_n_n_nn_solaris_n.zip
```

The following files are created in the current working directory:

- `README`: A text file that gives additional information on installation and configuration procedures for L-ESS and PSMON.
- `l_ess.tar`: A tar archive that the installation script uses.
- `install_ess`: A shell script that performs the L-ESS installation.
- `platform`: A file that provides information on the platforms currently supported for L-ESS.
- `ReleaseNotes`: A file that summarizes the changes made specific to each version of the L-ESS application.
- `StarentLESS.tar`: A tar file that contains the L-ESS cluster agent package.

- Step 4** Start the installation on L-ESS node1 by entering the following command:

```
./install_ess
```

- Step 5** Follow the on-screen prompts to progress through the various installation dialogs and configure the parameters as required. Refer to the following table for descriptions of the configurable parameters on each of the installation dialogs.

| Parameter                                        | Description                                                                                                                                                                                                                                                                                                                                                                                  | Default Value        |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Cluster Mode Installation                        |                                                                                                                                                                                                                                                                                                                                                                                              |                      |
| Cluster Mode Installation in cluster environment | Type <b>(Y)es</b> to install the L-ESS application in cluster mode.<br><br> <b>Important:</b> The L-ESS application can be installed in cluster mode only when the script is used in cluster environment. The prompt message varies according to the cluster in which the L-ESS application is installed. | Yes                  |
| Shared directory for L-ESS data and log files    | Type the shared directory path where the L-ESS stores the fetched data and log files.                                                                                                                                                                                                                                                                                                        | /sharedless<br>/less |

| Parameter                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Default Value                                                           |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Primary Configuration        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |
| L-ESS Installation Directory | Type the directory path where you want the L-ESS to be installed. The default is the current directory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Current directory from where the L-ESS installation script is executed. |
| Logical host IP address      | Type the required logical host IP address for the L-ESS cluster.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Null                                                                    |
| Logical host name            | Type the logical host name.<br><br> <b>Important:</b> This input is specific to Sun cluster.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Null                                                                    |
| SMTP Configuration           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |
| SMTP Server Name             | If you want Process Monitor (PSMON) alert messages automatically e-mailed to a specific person, type the host name or IP address of a valid SMTP server. Press <b>ENTER</b> for no SMTP server and e-mail recipient.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Null                                                                    |
| Email-ID [To ]               | Type the e-mail address of the person who should receive the alert messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Null                                                                    |
| Miscellaneous Configuration  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |
| File expiry duration         | Type the maximum lifetime, in days, after which the EDR/NBR/UDR files should be deleted from the L-ESS base directory or local destinations. The value must be an integer from 0 through 30.<br>When the parameter is set to 0, the L-ESS will not delete any files. The L-ESS deletes the file from base directory after it is pushed to all required destinations. If the data record file is not pushed to a destination, it will be kept in the base directory.<br>Also if files are not getting deleted from local destination paths by the application that is using them, files will keep on accumulating on these paths causing unnecessary disk space utilization.<br>You can control lifetime of the data records with the cleanup script. You must start the cleanup script by providing path of L-ESS base directory. Refer to the <i>Using the Cleanup Script</i> section for more details.<br><br> <b>Important:</b> If you are configuring the destination for a mediation device you may want to enable File expiry duration parameter so that the files are deleted periodically to maintain the disk space. On the other hand, if it is any other application (e.g. R-ESS) that takes care of deleting the files after processing, it is advised that the File expiry duration parameter is not configured (leave its value as 0 i.e. default). | 0                                                                       |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Default Value |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Local file deletion time                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type the value, in hours, at which the L-ESS cleanup script should start deleting the older files. This can be adjusted so that cleanup script does not cause slowing down of L-ESS. The value must be an integer from 0 through 23.<br><br> <b>Important:</b> This parameter can be configured only when the <b>File expiry duration</b> parameter is set to a non-zero value. | 0             |
| The above mentioned parameters are stored in a configuration file, <i>generic_ess_config</i> , located at <i>&lt;less_install_dir&gt;ess/template</i> directory. The ess process when started by PSMON will take the configuration from this file. If you would like to change any of the existing configuration, or set additional parameters, see the <i>L-ESS Server Configuration</i> section in this guide.                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
| L-ESS Installation Confirmation                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
| Modify configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Type <b>(Y)es</b> if you want to make any modifications to the existing configuration.                                                                                                                                                                                                                                                                                                                                                                           | No            |
| Proceed with installation                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type <b>(Y)es</b> to proceed with L-ESS installation.                                                                                                                                                                                                                                                                                                                                                                                                            | Yes           |
| <p>The following prompt appears when you proceed with the L-ESS installation:</p> <pre> [1] Modify Common Configurations For Source/Destination [2] Add Source [3] Modify Source [4] Remove Source [5] Enable Source [6] Disable Source [7] Add Destination [8] Modify Destination [9] Remove Destination [10] Enable Destination [11] Disable Destination [12] Miscellaneous Configurations [13] Show All Config [e] Exit </pre> <p>Enter your choice according to the configurations needed.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
| Common Config Parameters for Source/Destination                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |

| Parameter                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Default Value |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Directory poll interval for source     | Type the pull poll interval, in seconds, for pulling the record files from chassis or host. The value must be an integer from 10 through 3600.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30            |
| File name format for source            | <p>Select from the currently available file formats for xDR files.</p> <ul style="list-style-type: none"> <li>• [1]<br/>FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)</li> <li>• [2]<br/>FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)_PSCNO</li> <li>• [3]<br/>FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_SEQUENCENO(0,99999999)</li> <li>• [4] FIELDSEP(_)_STR-RULEBASENAME_STR_TIMESTAMP</li> <li>• [5]<br/>FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295).EXT</li> <li>• [6]<br/>FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295)</li> <li>• [7]<br/>FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,999999).EXT</li> <li>• [8] FIELDSEP(_)_STR_STR_TIMESTAMP(YYYYMMDDHHMMSS).EXT</li> <li>• [9] ACR_FILEFORMAT</li> </ul> <hr/> <p> <b>Important:</b> Modification in file format requires restart of L-ESS.</p> <hr/> <p>You can also customize your own format according to the file naming convention.</p> | 1             |
| Delete files from source               | Type <b>(Y)</b> es to delete record files from source directory after fetching.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | y             |
| Report missed files from remote source | <p>Type <b>(Y)</b>es to activate alarm when files are found missing while pulling them from the chassis.</p> <hr/> <p> <b>Important:</b> This feature is allowed only if file naming format contains sequence number.</p> <hr/> <p> <b>Important:</b> This particular alarm generation can be enabled only if the deletion of EDR or UDR files from remote host is enabled and the SNMP support is enabled.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | y             |

| Parameter                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Default Value |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Transient file prefix for source     | Type the transient file prefix for source files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                     | curr_         |
| Transfer file prefix for destination | Type the transfer file prefix for destination files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                 | curr_         |
| Pending file threshold               | If number of total files to be fetched from source directory is larger than this threshold number then alarm "starLESSThreshPendingFiles" will be raised if SNMP feature is enabled. Alarms will be raised even if the files to be pushed to destination directory is exceeding the configured limit.<br>Clear alarm "starLESSThreshClearPendingFiles" will be raised when number of total files to be fetched falls below this threshold. The threshold value, 0 indicates do not enable this threshold. Maximum value for this threshold is 1000 files. | 0             |
| Half cooked file detection threshold | Type the threshold value, in hours, to avoid the unnecessary half cooked files being stored under chassis' base directory. If incomplete file older than this threshold is found, then L-ESS removes the file. The value must be an integer from 1 through 24.                                                                                                                                                                                                                                                                                            | 1             |
| Port                                 | Type the port number used to create SFTP connection to remote host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 22            |
| Connection retry count               | This value is used to decide number of times L-ESS can try to set up connection to remote host in case of connection failure.                                                                                                                                                                                                                                                                                                                                                                                                                             | 3             |
| Connection Retry Frequency           | This is the time interval after which L-ESS should reconsider connecting to remote host in case connection creation has failed earlier even after retrying configured number of times.                                                                                                                                                                                                                                                                                                                                                                    | 60            |
| Socket timeout value                 | Use this parameter to set the socket timeout value. This socket timeout is set for a socket connection that is opened for SFTP between L-ESS and configured host or remote destination. This is like a normal socket timeout which means maximum time for which socket can remain idle. The default value is 10 seconds.                                                                                                                                                                                                                                  | 10            |
| Compressed/Decompressed required     | This value indicates if compression or decompression is required at the destination end while sending the files. Possible values are c and d.<br>If it is c, it means that every file received will be compressed before sending to destination, unless it is already compressed. If the value is d, it means that every file received will be decompressed before sending to destination unless it is already decompressed.                                                                                                                              | c             |
| Process count                        | Specify the number of processes to be spawned for each source/destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1             |
| Create hostname directory            | Type <b>(y)es</b> to create a directory with hostname while pushing the files to destination. To have this feature enabled it is necessary that HostName parameter has some value for given source.                                                                                                                                                                                                                                                                                                                                                       | y             |
| Source Configuration                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |
| Source Location                      | Select (L)ocal or (R)emote depending on the location of source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Local         |
| Source directory                     | Type the path for xDR base directory on chassis or on local source. This is the base directory on chassis from which L-ESS will pull xDR files.                                                                                                                                                                                                                                                                                                                                                                                                           | Null          |
| Hostname for subdirectory            | Type the host name of subdirectory created at source side. This configuration is applicable only for local source. In case of remote source, remote host name is used to create directory.                                                                                                                                                                                                                                                                                                                                                                | Null          |
| Filter                               | Type the unique string that is used to identify the xDR files to be included or excluded based on filter list. If the filter string is provided, L-ESS will pull/push files only with matching filter string.<br>For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].                                                                                                                                                                                                                                     | Null          |

| Parameter                                                           | Description                                                                                                                                                                                                                                                                                                                                                           | Default Value |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Add destination for current source                                  | Select this option if you want to add destination to the currently configured source.                                                                                                                                                                                                                                                                                 | Null          |
| Detach destination for current source                               | Select this option if you want to remove destination from the currently configured source.                                                                                                                                                                                                                                                                            | Null          |
| Destination Configuration                                           |                                                                                                                                                                                                                                                                                                                                                                       |               |
| Destination Location                                                | Select (L)ocal or (R)emote depending on the location of destination.                                                                                                                                                                                                                                                                                                  | Local         |
| Destination directory                                               | Type the destination directory path at the destination side where xDR files are to be stored. In cluster mode installation, this path should be shared path.                                                                                                                                                                                                          | Null          |
| Create subdirectory with hostname                                   | Type <b>(Y)es</b> if you want to create subdirectory with host name under destination base path.                                                                                                                                                                                                                                                                      | y             |
| Create subdir under hostname dir                                    | Type <b>(Y)es</b> if you want to create subdirectory under the host name directory if it exists.                                                                                                                                                                                                                                                                      | y             |
| Subdirectory name                                                   | Type the name of the subdirectory being created.                                                                                                                                                                                                                                                                                                                      | data          |
| How should files be sent to destination?<br>Compressed/Decompressed | Type <b>(Y)es</b> if file is required in compressed format at the destination side. If you type <b>(Y)es</b> , the file will be compressed (if it is not previously compressed) and then forwarded. If you type <b>(N)o</b> , the file will be uncompressed (if previously compressed) and then forwarded to destination.                                             | c             |
| Filter string                                                       | Type the unique string that is used to identify the xDR files to be included or excluded based on filter list. If the filter string is provided, L-ESS will pull/push files only with matching filter string.<br>For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].                                                 | Null          |
| File prefix while transfer                                          | Type the file prefix to be used while transferring the xDR files to the destination.                                                                                                                                                                                                                                                                                  | Null          |
| Miscellaneous Configuration                                         |                                                                                                                                                                                                                                                                                                                                                                       |               |
| Start disk clean up based on threshold                              | To enable the disk cleanup based on the disk utilization threshold level, type <b>(Y)es</b> . This causes the deletion of older files on disk crossing the threshold of the Disk threshold 2 parameter until disk utilization drops below Disk threshold 1.                                                                                                           | y             |
| Disk threshold 1                                                    | Type the first level threshold value, in percentage, for monitoring disk usage. If disk utilization goes beyond this threshold an alarm is raised indicating that the disk is overutilized. The value must be an integer from 1 through 100.                                                                                                                          | 80            |
| Disk threshold 2                                                    | Type the second level threshold value, in percentage, for monitoring disk usage. If disk utilization goes beyond this threshold an alarm is raised indicating that the disk utilization has crossed the configured second level threshold. This threshold is specifically to notify that disk is now critically low. The value must be an integer from 1 through 100. | 98            |
| Enable SNMP                                                         | Type <b>(Y)es</b> to enable the SNMP trap notifications.                                                                                                                                                                                                                                                                                                              | Yes           |
| SNMP Version                                                        | Type the SNMP version of the traps that should be generated by L-ESS. The currently supported SNMP versions are v1 and v2c.                                                                                                                                                                                                                                           | v1            |

| Parameter                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Default Value |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Add SNMP host                               | Type <b>(Y)es</b> to add another SNMP Manager host.<br><br> <b>Important:</b> The maximum number of SNMP Manager hosts that are allowed to be configured is four.<br><br> <b>Important:</b> The default values for all the parameters except SNMP Manager Host Name will be taken from previous host configuration for the new host. | No            |
| Remove SNMP host                            | Type <b>(Y)es</b> to remove the currently configured SNMP Manager host.                                                                                                                                                                                                                                                                                                                                                                                                                                | No            |
| Log level                                   | This value specifies the severity of log messages. The values can be one of the following: <ul style="list-style-type: none"> <li>• 0 - Disable all logs</li> <li>• 1 - Debug Level logs</li> <li>• 2 - Info Level logs</li> <li>• 3 - Warning Level logs</li> <li>• 4 - Error Level logs</li> <li>• 5 - Critical Level logs</li> </ul>                                                                                                                                                                | 4             |
| SNMP Host Configuration                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
| SNMP host name                              | Type the hostname or IP address where the SNMP Manager resides.                                                                                                                                                                                                                                                                                                                                                                                                                                        | Null          |
| SNMP port                                   | Type the SNMP Manager port number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 162           |
| SNMP community string                       | Type the community string that should be used while sending the SNMP traps.                                                                                                                                                                                                                                                                                                                                                                                                                            | public        |
| Remote Host Configuration                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
| Host Name or IP Address of Starent Platform | To establish an SFTP connection, type the hostname or IP address of the chassis.<br><br> <b>Important:</b> This parameter is applicable only if the source or destination is at remote location.                                                                                                                                                                                                                    | Null          |
| SFTP User Name                              | Type the user name used to log on to chassis.<br><br> <b>Important:</b> This parameter is applicable only if the source or destination is at remote location.                                                                                                                                                                                                                                                       | Null          |

| Parameter                                                                                                                                                                                                                                                                                                    | Description                                                                                                                                                                                                                                                                                                                                      | Default Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| SFTP Password                                                                                                                                                                                                                                                                                                | Type the password used to log on to chassis.<br><br><div style="border: 1px solid black; padding: 5px; display: inline-block;">  <b>Important:</b> This parameter is applicable only if the source or destination is at remote location.                 </div> | Null          |
| <p>The above mentioned parameters are stored in a database. These parameters can be added, removed or modified through the config utility. If you would like to change any of the existing configuration, or set additional parameters, see the <i>L-ESS Server Configuration</i> section in this guide.</p> |                                                                                                                                                                                                                                                                                                                                                  |               |

The ess process when started by PSMON will take the configuration from this file. If you would like to change any of the existing configuration, or set additional parameters, see the *L-ESS Server Configuration* section in this guide.

- Step 6** After completion of L-ESS installation on node1, execute the L-ESS installation script on node2.
- Step 7** Type **(y)es** to continue the installation. The script displays the configuration settings for node1. If you want to make changes to the existing configuration, modify the configuration as needed.
- Step 8** If you do not want to make any changes to the configurations, type **(y)es** to continue the installation.  
After successful installation of L-ESS, verify the status of the L-ESS cluster resource group by entering the following command:

For Sun cluster:

```
scstat
```

For Veritas cluster:

```
hastatus
```

The system displays the status of various cluster nodes, elements and resources. The status of the nodes must be online as displayed below:

```

----- Cluster Nodes -----
Node name Status

Cluster node: clustems2 Online
Cluster node: clustems1 Online

----- Cluster Transport Paths -----
Endpoint Endpoint Status

```

```
Transport path: clustems2:bge3 clustems1:bge3 Path online
```

```
Transport path: clustems2:bge2 clustems1:bge2 Path online
```

```

```

```
-- Quorum Summary --
```

```
Quorum votes possible: 3
```

```
Quorum votes needed: 2
```

```
Quorum votes present: 3
```

```
-- Quorum Votes by Node --
```

```
Node Name Present Possible Status
```

```

```

```
Node votes: clustems2 1 1 Online
```

```
Node votes: clustems1 1 1 Online
```

```
-- Quorum Votes by Device --
```

```
Device Name Present Possible Status
```

```

```

```
Device votes: /dev/did/rdisk/d2s2 1 1 Online
```

```

```

```
-- Device Group Servers --
```

```
Device Group Primary Secondary
```

```

```

```
-- Device Group Status --
```

```
Device Group Status
```

```

```

```
-- Multi-owner Device Groups --
```

```
Device Group Online Status
```

```

```

```

```

```
-- Resource Groups and Resources --
```

```
Group Name Resources

Resources: LESS-harg lessserver LESS-hars

-- Resource Groups --

Group Name Node Name State Suspended

Group: LESS-harg clustems2 Offline No
Group: LESS-harg clustems1 Online No

-- Resources --

Resource Name Node Name State Status Message

Resource: LESS-hars clustems2 Offline Offline
Resource: LESS-hars clustems1 Online Online

```

## Uninstalling L-ESS Application

This section provides instructions on how to uninstall the L-ESS application.

---

 **Important:** It is recommended that you manually perform a backup of all critical and historical data files before proceeding with this procedure. Uninstallation removes the directories, files and database. If backup is not taken, restoring the files would be an issue.

---

The following steps describe how to uninstall the L-ESS application:

**Step 1** Change to the directory in which the L-ESS application is installed and execute the uninstall script by entering the following command:

```
./LessUninstall.sh
```

---

 **Important:** Please note that the uninstall script gets created in the L-ESS installation directory upon installation of the L-ESS application.

---

**Step 2** Type **(y)es** to continue the uninstall.

The script stops the L-ESS server, Process Monitor application, and the L-ESS processes.

When uninstallation is finished, the system displays a message to indicate successful uninstallation and removal of the directories.

**Step 3** Remove shared directories/process manually if not removed during uninstallation.

## Configuring PSMON Threshold (Optional)

PSMON is a Perl script that runs as a stand-alone program or as a fully functional background daemon. PSMON is capable of logging to a syslog and a log file with customizable e-mail notification facilities. You can define a set of rules in the `psmon.cfg` file. These rules describe what processes must always be running on the system. PSMON scans the UNIX process table and uses the set of rules to restart any dead processes.

The following are the files/package used by PSMON:

- `psmon`: A perl script that handles monitoring processes and restarts them.
- `ess/template/psmon.cfg`: A configuration file for PSMON. Contains process information and other information like e-mail id, smtp server, poll interval (or Frequency) and threshold parameters [MemoryUsed and SwapUsed, FinalDirPath and FinalDirThreshold].
- `ess/3rdparty/perl/linux/perl5.8.7.tar`: Perl 5.8.7 used by PSMON for LINUX.
- `ess/3rdparty/perl/solaris/perl5.8.5.tar`: Perl 5.8.5 used by PSMON for SOLARIS.

The PSMON utility monitors the following thresholds for the L-ESS application:

- The percentage of total memory used (Default: 50%)
- The percentage of swap space used (Default 50%)
- The final directory size in percentage of the file system used (Default 10%)
- The percentage of memory (Default: 10 %)
- The percentage of CPU resources used. (Default: 10%)

When these thresholds are crossed, an alert message is sent to the administrator/user at E-mail ID specified during installation of L-ESS application. This alert message is also written to a log file, `watchdog.log` located in the `<less_install_dir>/ess/log` directory.



**Important:** The `watchdog.log` file will be generated by PSMON.

To edit the PSMON configuration file for changing the threshold monitoring values of PSMON:

**Step 1** Change to the directory where the `psmon.cfg` is present by entering the following command:

```
cd <less_install_dir>/ess/template
```

**Step 2** Open the `psmon.cfg` in a standard text editor.

**Step 3** Find the following lines:

```
#THRESHOLDS for total memory used and total swap used in percentage (%).

Default is 50 %

MemoryUsed 50

SwapUsed 50
```

**Step 4** Change the values for **MemoryUsed** and **SwapUsed** to the desired percentages.



**Important:** The users are advised NOT to modify any parameters other than **MemoryUsed** and **SwapUsed**.

---

**Step 5** Save and close the file.

**Step 6** Stop and restart the PSMON process to implement these changes by using the procedures in *Starting and Stopping L-ESS* and *Using the Maintenance Utility* sections.

# Chapter 4

## Configuring the L-ESS Server

---

This chapter includes the following topics:

- [LESS Server Configuration](#)
- [Source and Destination Configuration](#)
- [Starting and Stopping LESS](#)

## L-ESS Server Configuration

This section provides information about the L-ESS configuration file parameters. L-ESS server configuration file, *generic\_ess\_config*, can be modified to fine-tune the operation of the application. This file is located in the `<less_install_dir>/ess/template` directory by default.

There are a few parameters that the installation script does not prompt for. These are available in the *generic\_ess\_config* file. The following table lists the L-ESS server configuration parameters and the corresponding descriptions.

---

 **Important:** Any change in the *generic\_ess\_config* file requires L-ESS server restart.

---

**Table 1. L-ESS Server Configuration Parameters**

| Parameter                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Default Value                                          |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| ASR 5000 Parameters          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                        |
| essdellocalrecordsexpirytime | This specifies the time period (in days) for which files can be stored locally in L-ESS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                                                      |
| essdellocalrecordsstarttime  | This specifies the time period (in hours) at which L-ESS should start deleting local files stored in final directory depending on the expiry time configured. This value must be an integer from 0 through 23.                                                                                                                                                                                                                                                                                                                                                                           | 0                                                      |
| essbasedirectorypath         | This specifies the L-ESS specific base directory path.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <code>&lt;less_install_dir&gt;/ess/fetched_data</code> |
| Miscellaneous Parameters     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                        |
| logPath                      | This specifies the directory path where L-ESS stores L-ESS logs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <code>&lt;less_install_dir&gt;/ess/log</code>          |
| resetfilecontent             | If this flag is enabled, L-ESS pull instance on start/restart empties the file containing the entry of the last xDR file fetched from the chassis.<br>The L-ESS assumes that this is a fresh start and will refetch all the files from chassis if L-ESS is configured not to delete files from chassis. This parameter is also used to reset the information maintained for identifying missing files.<br>If this flag is set, each time when L-ESS instance restarts L-ESS will also ignore the past information about missing file identification and the file contents will be reset. | No                                                     |

| Parameter            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Default Value |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| maxinfotimestampdiff | <p>L-ESS uses this configurable to test whether L-ESS on startup is referring to old information about missing files. The configured value indicates the maximum allowed difference between the current time stamp and the timestamp at which information for identifying missing files was written.</p> <p>If the difference exceeds, L-ESS will assume fresh restart and will restart identifying missing files ignoring previous information.</p> <p>Minimum value allowed is 30 minutes and maximum allowed is 1440 minutes (24 hours). Default is 60 minutes.</p> | 60            |
| ServerIpAddress      | <p>This specifies the IP address that is used by L-ESS to create TCP socket. In case of stand alone installation this should be the machine's IP address and in case of cluster based installation this should be Logical Host's IP address. Default is current machine's IP address.</p>                                                                                                                                                                                                                                                                              | N/A           |
| ServerPort           | <p>This port is used when creating TCP sockets to avoid starting of similar L-ESS instances on same L-ESS machine. The default value for this parameter is 22222. The limit is within 1025 to 65535.</p> <hr/> <p> <b>Important:</b> Do not change this port unless it is absolutely required.</p> <hr/>                                                                                                                                                                             | 22222         |

## Source and Destination Configuration

This section provides information about the source and destination configuration file parameters. The source and destination configuration file, *ess\_sourcedest\_config*, is located in the directory where the installable tar file is extracted.

This config file can be loaded to a database using a config utility called **lessConfigUtility.sh**. This script can also be used to add/remove/modify the configuration for particular source/destination, and other miscellaneous configurations like changing config parameters and adding/removing/modifying SNMP host.

The config file based configuration is provided to load source/destination config in bulk. Please note the following points:

- Common configuration parameters will be applied to all source/destination configured through the config file.
- If any parameter is changed from particular source/destination configuration block then changed value will be applied to source/destination instead of the value from common config.
- Destination can be configured from "common local destination block" / "common remote destination block" / "destination block per source".
- If the source block is having corresponding destination configuration then same configuration will be used for destination.
- If the source does not have corresponding destination configuration then configuration from "common local destination block" / "common remote destination block" will be used depending on the location (R - Remote / L - Local) value.
- Source-Destination mapping
  - Source Path1,Filter1 mapped to Destination Path1,subdirectory1,Filter1
  - Source Path2,Filter2 mapped to Destination Path2,subdirectory2,Filter2
  - Source Path5,Filter5 mapped to Destination Path5,subdirectory5,Filter5

To load the source/destination config file after the L-ESS installation is complete:

1. Modify the source/destination config file template as per the requirements.
2. Use the config utility present in the `<less_install_dir>/ess` directory to validate and load the config file.

```
./lessConfigUtility.sh [Options] [Config File Path]
```

The `[Config File Path]` is the path where the config file is present.

| Options | Description               |
|---------|---------------------------|
| -l      | Load the config file.     |
| -v      | Validate the config file. |
| -c      | Clean all configurations. |
| -p      | Print all configurations. |
| -h      | Display help.             |

Table 2. Source and Destination Configuration Parameters

| Parameter             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Default Value |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Common Parameters     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |
| DirectoryPollInterval | This specifies the poll interval in seconds for pulling the xDR records from ASR 5000 platform. The value must be an integer from 30 through 3600.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30            |
| fileformat            | <p>This specifies the file format for xDR file naming convention.</p> <ul style="list-style-type: none"> <li>• [1] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)</li> <li>• [2] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)_PSCNO</li> <li>• [3] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_SEQUENCENO(0,999999999)</li> <li>• [4] FIELDSEP(_)_STR-RULEBASENAME_STR_TIMESTAMP</li> <li>• [5] FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295).EXT</li> <li>• [6] FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295)</li> <li>• [7] FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,999999).EXT</li> <li>• [8] FIELDSEP(_)_STR_STR_TIMESTAMP(YYYYMMDDHHMMSS).EXT</li> <li>• [9] ACR_FILEFORMAT</li> </ul> <hr/> <p> <b>Important:</b> Modification in file format requires restart of L-ESS.</p> <hr/> <p>You can also customize your own format according to the file naming convention.</p> | 1             |
| DeleteFilesFromSource | <p>If this flag is enabled this will cause deleting data records from the source directory after fetching. The possible values are:</p> <ul style="list-style-type: none"> <li>• y – enable</li> <li>• n – disable</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | y             |

| Parameter                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Default Value |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| ReportMissedFiles                     | <p>If this flag is enabled, SNMP notification will be sent when files are found missing while pulling them from the chassis. The possible values are:</p> <ul style="list-style-type: none"> <li>• y – enable</li> <li>• n – disable</li> </ul> <hr/> <p> <b>Important:</b> This feature is allowed only if file naming format contains sequence number.</p> <hr/> <p> <b>Important:</b> This particular alarm generation can be enabled only if the deletion of xDR files from remote host is enabled and the SNMP support is enabled.</p> | y             |
| TransientPrefix                       | This specifies the transient File Prefix for source files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | curr<br>_     |
| TransferPrefix                        | This specifies the transient File Prefix for destination files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | curr<br>_     |
| PendingFileThreshold                  | <p>If the number of total files to be fetched from source directory is larger than this threshold number then alarm "starLESSThreshPendingFiles" will be raised if SNMP feature is enabled.</p> <p>Clear alarm "starLESSThreshClearPendingFiles" will be raised when the number of total files to be fetched falls below this threshold. The threshold value, 0 indicates do not enable this threshold. Maximum value for this threshold is 1000 files.</p>                                                                                                                                                                                                                                                   | 0             |
| HalfCookedDetectionThreshold          | Type the threshold value, in hours, to avoid the unnecessary half cooked files being stored under the chassis' base directory. If incomplete file older than this threshold is found, then L-ESS removes the file. The value must be an integer from 1 through 24.                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1             |
| SFTPPort                              | Type the port number used to create SFTP connection to remote host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 22            |
| ConnectionRetryCount                  | This value is used to decide number of times L-ESS can try to set up connection to remote host in case of connection failure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3             |
| ConnectionRetryFrequency              | This is the time interval after which L-ESS should reconsider connecting to remote host in case connection creation has failed earlier even after retrying configured number of times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 60            |
| SocketTimeout                         | Use this parameter to set the socket timeout value. This socket timeout is set for a socket connection that is opened for SFTP between L-ESS and configured host or remote destination. This is like a normal socket timeout which means maximum time for which socket can remain idle. The default value is 10 seconds.                                                                                                                                                                                                                                                                                                                                                                                      | 10            |
| CompressionDecompressionAtDestination | This value indicates if compression or decompression is required at the destination end while sending the files. Possible values are c and d. If it is c, it means that every file received will be compressed before sending to destination, unless it is already compressed. If the value is d, it means that every file received will be decompressed before sending to destination unless it is already decompressed.                                                                                                                                                                                                                                                                                     | c             |
| ProcessCount                          | Specify the number of processes to be spawned for each source/destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1             |

| Parameter                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                    | Default Value |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| CreateHostNameDir                                                                                                                                  | Type (y)es to create a directory with hostname while pushing the files to destination. To have this feature enabled it is necessary that <b>HostName</b> parameter has some value for given source.                                                                                                                                                                                                                                            | y             |
| Common Local Destination Parameters                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| Path                                                                                                                                               | Type the path for xDR base directory on chassis or on local source. This is the base directory on the chassis from which L-ESS will pull xDR files.                                                                                                                                                                                                                                                                                            | Null          |
| Subdirectory                                                                                                                                       | Type the name of the subdirectory being created under destination base path.                                                                                                                                                                                                                                                                                                                                                                   |               |
| Filter                                                                                                                                             | Type the unique string that is used to identify the xDR files. If filter string is provided, L-ESS will pull files only with matching filter string.<br>Filter is the string based on which the files are to be moved to appropriate directory. If a filter is specified for certain type of record, it is must to specify for other types of records as well. Otherwise, files for that record type will not be moved to any destination.     | Null          |
| Common Remote Destination Parameters                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| HostName                                                                                                                                           | Type the host name for the remote destination.                                                                                                                                                                                                                                                                                                                                                                                                 | Null          |
| RemoteHostUserName                                                                                                                                 | Type the host user name for the remote destination.                                                                                                                                                                                                                                                                                                                                                                                            | Null          |
| RemoteHostPassword                                                                                                                                 | Type the password used for the remote destination.                                                                                                                                                                                                                                                                                                                                                                                             | Null          |
| Path                                                                                                                                               | Type the path for xDR base directory on chassis or on local source. This is the base directory on the chassis from which L-ESS will pull xDR files.                                                                                                                                                                                                                                                                                            | Null          |
| Subdirectory                                                                                                                                       | Type the name of the subdirectory being created under destination base path.                                                                                                                                                                                                                                                                                                                                                                   |               |
| Filter                                                                                                                                             | Type the unique string that is used to identify the xDR files. If the filter string is provided, L-ESS will pull files only with matching filter string.<br>Filter is the string based on which the files are to be moved to appropriate directory. If a filter is specified for certain type of record, it is must to specify for other types of records as well. Otherwise, files for that record type will not be moved to any destination. | Null          |
| Source Parameters<br>Location - This can be L or R i.e. Local or Remote respectively. Rest of the parameters are common to Common Parameters list. |                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| Destination Parameters<br>These are similar to the source parameters and the above list of common parameters.                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |

## Starting and Stopping L-ESS

To start the L-ESS Server enter the following command from `<less_install_dir>/ess` directory:

```
./serv start
```



**Important:** After L-ESS is started, only the user who started L-ESS can restart, stop, or check the status of active L-ESS using serv script. Even a superuser is not permitted to stop the L-ESS although it is started by non-superuser.

---

To stop the L-ESS Server enter the following command from `<less_install_dir>/ess` directory:

```
./serv stop
```

For additional information on the serv commands, refer to the *Using the Maintenance Utility* section in the *L-ESS Maintenance and Troubleshooting* chapter.

# Chapter 5

## L-ESS Maintenance and Troubleshooting

---

This chapter includes the following topics:

- [Using the Maintenance Utility](#)
- [Using L-ESS Logs](#)
- [L-ESS Server Scripts](#)
- [Troubleshooting the L-ESS](#)

## Using the Maintenance Utility

A shell script utility called **serv** is included with the ESS distribution at the `<less_install_dir>/ess/` directory. This **serv** script can be used to manage the following processes of L-ESS Server:

- PS Monitor Application (PSMON)
- L-ESS

This utility can report the status of the L-ESS process on the system or it can be used to stop an instance of L-ESS process.

---

 **Important:** L-ESS must always be started with the **serv** script command.

---

Following are the options available with the **serv** script:

```
./serv { start | stop | forcestart | forcestop | switch | version | status[
<resource_name | resourcegroup_name>] }
```

| Keyword           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>start</b>      | Use this command to start each L-ESS process and PSMON.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>stop</b>       | Stops the running L-ESS process and PSMON.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>forcestart</b> | Use this command to restart L-ESS and PSMON. This command will first stop already running L-ESS processes and then restart each process.                                                                                                                                                                                                                                                                                                                                                   |
| <b>forcestop</b>  | Use this command to forcibly stop L-ESS process and PSMON. If L-ESS is not stopped by <b>serv stop</b> command, this command will be used.                                                                                                                                                                                                                                                                                                                                                 |
| <b>switch</b>     | Use this command to switchover the resource group.<br><br> <b>Important:</b> This option can be used only in cluster mode installation.                                                                                                                                                                                                                                                                 |
| <b>status</b>     | Displays the status of each of process/resource/resourcegroup.<br>For stand-alone mode: <ul style="list-style-type: none"> <li>• Process monitor tool</li> <li>• Local External Storage Server</li> </ul> For Sun cluster mode: <code>&lt;resourcegroup_name&gt;/&lt;resource_name&gt;</code> <ul style="list-style-type: none"> <li>• LESS-harg LESS resource group</li> <li>• LESS-hars Failover dataservice resource</li> <li>• {Logical_Hostname} Logical hostname resource</li> </ul> |
| <b>version</b>    | This command will show the version of L-ESS build. It will also show the revision date.                                                                                                                                                                                                                                                                                                                                                                                                    |

The following is a sample output of the **serv status** command:

```
PID Process Status
```

-----

|      |                               |             |
|------|-------------------------------|-------------|
| 4270 | PS Monitor Application        | Running     |
| -    | Local External Storage Server | Not running |

## Using L-ESS Logs

The PSMON process logs memory usage threshold crossing alerts and other error and warning messages in the *watchdog.log* file located in the `<less_install_dir>/ess/log` directory.

The PSMON process also sends alerts and messages to the configured e-mail address.

L-ESS stores all logs and other error and warning messages in a directory path configurable during installation. If this path is incorrect, then logs are stored in the `<less_install_dir>/ess/log` directory. See the *Installing L-ESS Application in Stand-alone Mode* section in this guide for details.

The L-ESS creates separate log files for each L-ESS process (one file/L-ESS instance).

Each time L-ESS starts, a new directory is created under the log path directory. This directory uses the following naming conventions:

*SERVER\_LOG<Current date>\_<Current time>*

Paramiko related logs are also stored at the same location with file name **paramiko.log**.

## L-ESS Server Scripts

This section provides the function of the scripts available in the `<less_install_dir>/ess` directory, and the information on the usage of scripts. These scripts are mainly used for configuration management and maintenance purposes.

This section includes the following topics:

- [Using the addproject Script](#)
- [Using the startserv Script](#)
- [Using the Cleanup Script](#)

### Using the add\_project Script

To avoid the impact of other applications running simultaneously on L-ESS Server, L-ESS tasks can be separated by creating it as a Solaris project. This script is designed to add a dedicated project for L-ESS. The script adds project "lessPrj" with ID 1001 and for the user **essadmin**. Depending on the underlying platform this script enables workload division mechanism. On Netra 210 or Netra 245 server Fair Share Scheduler (FSS) mechanism is enabled and on T5220 server resource pool mechanism is enabled.

---

 **Important:** The script must be executed with superuser login before starting the L-ESS Server. In the cluster mode, this script must be executed on both the nodes of the cluster.

---

To use the script, enter the following command from the `<less_install_dir>/ess` directory:

```
./add_project.sh
```

### Using FSS Scheduler

The L-ESS project is allocated with two CPU shares to avoid starvation of L-ESS due to other concurrent processes that might be running on the server. These shares are considering the default configuration the system.

Avoid configuring another project on the L-ESS Server or if added allocate sufficient shares to L-ESS project. To alter the project name, project ID or user name, this script should be edited to change the required parameters.

This script also makes FSS as a default scheduler for the system and also forces all existing processes using TS scheduler to use FSS scheduler. Hence, this script should always be started if you accept FSS as a default scheduler for the system.

---

 **Important:** In case of T5220 server, Veritas cluster configuration should not be modified to start L-ESS process using FSS scheduler. Hence, the following entry must be removed from the configuration file `types.cf` located in the `/etc/VRTSvcs/conf/config` directory if available: `static str ScriptClass = FSS`

---

### Using Resource Pool Facility

Resource pools enable you to separate the workload so that the workload consumption of certain resources does not overlap. This resource reservation aids to achieve predictable performance on systems with mixed workloads. Resource pools provide a persistent configuration mechanism for processor set (pset) configuration. In case of a multi-processor

machine few CPUs can be dedicated to L-ESS and rest can be left for other processes. The configuration related to L-ESS resource pool is available in *less\_pool.cfg* file.

---

 **Important:** L-ESS must be started using `start_serv.sh` script instead of `serv` script to get the benefits of resource pool.

---

## Using the start\_serv Script

This script is specifically designed to start L-ESS Server in configured projects environment. The script assumes that "lessPrj" project is configured on the system and is allocated sufficient shares. If the project entry is not added and if the user starting L-ESS is not privileged for configured project, then script will not start L-ESS.

L-ESS must always be started using this script to get the benefits of dedicated CPU shares. Path of this script, without any argument must be configured in VCS config file, *main.cf*.

To start the L-ESS manually enter the following command from the `<less_install_dir>/ess` directory:

```
./start_serv.sh
```

## Configuring Veritas Cluster to Start L-ESS Using FSS Scheduler

In the default configuration, VCS starts application using TS scheduler. This configuration must be changed to use FSS scheduler for allocating CPU shares to L-ESS. For this "static str ScriptClass = FSS" variable must be added in Application module of VCS config file, *types.cf*.

Alternatively, this parameter can also be set using GUI client of VCS.

## Using the Cleanup Script

Use the `deleteLocalFiles.sh` script to delete files from local paths as a cleanup process. This script is required so that older files from the local destination, such as mediation, can be removed periodically. This ensures that there is no unnecessary disk space usage.

If the local destination deletes the file after picking up, then this script may not be required.

Files from L-ESS specific directories are deleted as soon as a fetched file is transferred to all of the configured destinations. However, if the file is not pushed towards the destination, these skipped files keep accumulating under the destination's local temporary directory. You can use the cleanup script to regularly remove these older files from the temporary directories.

---

 **Important:** You should run the cleanup script from the L-ESS base directory.

---

## How the Cleanup Script Works

Use this procedure to start and kill the `deletelocalfiles.sh` script manually.

**Step 1** Provide the local paths from where files should be deleted periodically.

These paths are taken as base paths and all of the older files below the base path are deleted at the configured time.

If you want to delete files from directory */home/ess/udr* and */home/ess/edr*, you can provide base path as */home/ess*. In other words if you provide path as */home/ess* all of the older files from the directories below *ess* such as *edr* or *udr* will be deleted.

**Step 2** You can provide more than one path at a time so that the script deletes the files from more than one path.

```
./deleteLocalFiles.sh /home/ess /home/mediation /home/RESS
```

---

 **WARNING:** Since all older files below the base directory are deleted, make sure that you are providing only required paths for the script.

---

The script reads the required parameters from the *ess/ess* config. The parameters and definitions are listed below:

- *essedlocalrecordsexpirytime*: Indicates the number of days after which the file is treated as an older file. If this parameter is set to 0, the files will not be deleted.
- *essedlocalrecordsstarttime*: This value in hours indicates the starting hour when the L-ESS will start deleting older files.

---

 **Important:** The above parameters read from config file are applied to all paths provided to the script.

---

**Step 3** Start this script from */ess* directory with the following command:

```
./deleteLocalFiles.sh path1 [path2 path3 .. pathn]
```

---

 **Important:** The logs for the cleanup script are generated in a file located at *ess/log/deleteLocalFiles\_%timestamp%.log*.

---

## Troubleshooting the L-ESS

In the event problems are experienced while using the L-ESS application, refer to the following table for troubleshooting information.

*Table 3. Troubleshooting L-ESS*

| Problem                                                                      | Troubleshooting Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The L-ESS application cannot connect/login to the ASR 5000 platform.</p>  | <ul style="list-style-type: none"> <li>• Make sure that you are supplying the correct user name, password and chassis' host name or IP address.</li> <li>• Make sure that you created an admin or config-admin account that is enabled for SFTP in the correct context.</li> <li>• Make sure that you have created SSH keys on the chassis.</li> <li>• Make sure that you have enabled the SFTP subsystem on the chassis.</li> <li>• Make sure that you can manually create SFTP connection from L-ESS to chassis with same configured user name, password and host name/IP address of the chassis.</li> </ul> <p>For example:</p> <pre><b>sftp drokade@qain5</b> <b>Connecting to qain5...</b> <b>drokade@qain5's</b> <b>password: sftp&gt;</b></pre> <ul style="list-style-type: none"> <li>• If SNMP support is configured trap notification raised due to connection failure may provide additional information on why L-ESS could not connect to chassis.</li> </ul> |
| <p>The L-ESS application cannot connect/login to the Remote destination.</p> | <ul style="list-style-type: none"> <li>• Make sure that you are supplying the correct user name, password and remote destination host name or IP address.</li> <li>• Make sure that the supplied user is already created on remote destination.</li> <li>• Make sure that SSH daemon / SFTP Server is running on remote destination.</li> <li>• Make sure that you can manually create SFTP connection from L-ESS to remote destination with same configured user name, password and host name/IP address of the remote destination.</li> </ul> <p>For example:</p> <pre><b>sftp drokade@qain5</b> <b>Connecting to qain5...</b> <b>drokade@qain5's</b> <b>password: sftp&gt;</b></pre> <ul style="list-style-type: none"> <li>• If SNMP support is configured trap notification raised due to connection failure may provide additional information on why L-ESS could not connect to remote destination.</li> </ul>                                                     |

| Problem                                                | Troubleshooting Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| L-ESS is not retrieving any files.                     | <ul style="list-style-type: none"> <li>• Make sure that you have specified correct source directory paths for chassis.</li> <li>• Make sure that you have specified the correct destination directory path for configured destinations.</li> <li>• Make sure that you have configured L-ESS to fetch respective files and have configured destination for respective files.</li> <li>• Make sure that you have configured ECS to generate billing files correctly. Try fetching file manually from chassis.</li> <li>• Make sure that the disk on which L-ESS directories reside and disk where destination directories reside have sufficient free space.</li> <li>• If SNMP feature is enabled then trap notification raised for L-ESS file transfer failure may provide additional information on the reasons for the failure.</li> <li>• Check if compression related parameters are in sync at L-ESS side and at the chassis side.</li> </ul> |
| L-ESS is not starting                                  | <ul style="list-style-type: none"> <li>• Make sure no L-ESS Server is already running on same machine.</li> <li>• Make sure that TCP port configured in L-ESS config file as 'ServerPort' is not blocked by any other process.</li> <li>• Make sure that disk is not full.</li> <li>• If config file is modified after installation, check if it is correctly modified.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| L-ESS is generating alarm 'starLESSPullIntervalMissed' | <ul style="list-style-type: none"> <li>• Check if network latency between chassis and L-ESS is higher than usual.</li> <li>• Check if file size is larger than expected.</li> <li>• Check if file poll interval is correctly set.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Problem                                             | Troubleshooting Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Files are accumulating on chassis                   | <ul style="list-style-type: none"> <li>• Make sure that there is no high network latency between L-ESS and chassis.</li> <li>• Make sure that file generation rate is not too high on chassis.</li> <li>• Check if L-ESS is loosing connections repeatedly.</li> <li>• Check if CPU consumption of L-ESS is higher than expected.</li> <li>• Check if SSH Daemon on chassis is busier than expected.</li> <li>• Check if any other application residing on L-ESS is causing heavy system resource consumption.</li> <li>• Make sure that L-ESS processes are running in FSS scheduler if L-ESS is started with priority based solution. This can be tested by using <b>ps -cafe</b> command. For example, all below processes are running under FSS scheduler.</li> </ul> <pre> <b>#ps -cafe   grep ess</b>  root 15154 1 FSS 1 20:12:44 ? 0:00 /less/ess/3rdparty/python/solaris/bin/python2.5 /less/ess/bin/lr_ess_push.py -i  root 15166 1 FSS 1 20:12:45 ? 0:00 /less/ess/3rdparty/python/solaris/bin/python2.5 /less/ess/bin/lr_ess_transfer.p  root 15160 1 FSS 1 20:12:44 ? 0:00 /less/ess/3rdparty/python/solaris/bin/python2.5 /less/ess/bin/lr_ess.py -i 1  root 15147 1 FSS 57 20:12:43 pts/1 0:00 /less/ess/3rdparty/perl/solaris/bin/perl -w /less/ess/template/psmon --daemon -  root 15207 14990 FSS 59 20:12:55 pts/1 0:00 grep ess </pre> |
| L-ESS is generating alarm 'starLESSThreshDiskUsage' | <ul style="list-style-type: none"> <li>• Free the local disk containing L-ESS directories if it is over utilized.</li> <li>• Check if disk threshold is properly configured.</li> <li>• Check if cleanup script is running and is periodically removing the files from intended paths.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| L-ESS is generating alarm 'connectionfail'          | <ul style="list-style-type: none"> <li>• Check if the IP/host name address is properly configured.</li> <li>• Check if the user name is properly configured.</li> <li>• Check if the password is properly configured.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

In case of any failure, check the L-ESS logs for additional information. If the problem still persists, contact your system administrator.

## Capturing Server Logs Using Script

In the event additional troubleshooting assistance is required, debugging information can be collected using a script called *getSupportDetails.pl*. This script collects different log files and captures the output of certain system commands that aid in troubleshooting issues. This script is packaged with the server in the `<less_install_dir>/ess/tools/supportdetails/` directory.

This script refers to an XML file to get the list of logs. This XML file resides in the same directory as the script. Once executed, the script retrieves the contents of logs, files, folders, and output of certain commands and prepares a zipped file (*lessupportDetails.tar.gz*), by default it is placed in `/tmp/log` directory.

### Requirements

Perl 5.8.5 and above is required for running the script.

Apart from standard Perl modules (which are included in default installation of Perl), some additional modules are required for running the script. The list is as follows:

- expat version 1.95.8
- XML::Parser version 2.34
- XML-Parser-EasyTree
- Devel-CoreStack version 1.3

These modules are installed by default by the product. Please ensure that the above mentioned modules are installed when using a different installation of Perl.

To run the script, change to the path where the script is present and type:

```
./getSupportDetails.pl [--level=...] [--xmlfile=...] [--help]
```

| Keyword/Variable | Description                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| --level          | Specifies the level of debug to run. It can have a maximum of 3 levels. The level 3 provides the most detailed information. Default: 1 |
| --xmlfile        | Specifies the xml file name to be used for collecting the log. Default: getSupportDetails.xml                                          |
| --help           | Displays the supported keywords/variables.                                                                                             |

For example, `./getSupportDetails.pl --level=3 --xmlfile=/tmp/getSupportDetails.xml`

#### Supported Levels:

The logs that can be collected for different levels are as follows:

- Level 1:
  - Current status (running / not running) of the product
  - Current version of the installed product
  - Current Config files of the product
  - Output of the following commands:

```
netstat -nr
```

**scstat**

- Level 2:
  - Logs from Level 1
  - All Log files (Including Old Logs)
  - Information of Solaris version and current patch installed
  - Output of the following commands:

```
netstat -nr
```

```
ifconfig -a
```

```
df -v
```

```
uname -a
```

```
ps -eaf
```

```
prstat 1 1
```

```
env
```

```
showrev
```

- Level 3:
  - Logs from level 2
  - Listing of directory pointed by "essbasedirectorypath" from ess\_config file
  - Output of the following commands:

```
pkginfo
```

```
prtdiag
```

# Appendix A

## xDR File Push Functionality

---

The ESS has the capability of simultaneously fetching any types of files from one or more chassis. That is, it can fetch CDR, EDR, NBR, UDR file, etc.

The chassis is configured such that the xDR files can either be pulled from chassis by L-ESS using python scripts, or the CDR files can be automatically pushed by chassis to any external server, in this case, ESS. L-ESS then forwards these files to the required destinations.

In the PUSH model, the transfer of CDR files will be done from within a context on the chassis. The files are collected from the SMC hard disk or in-memory file system and will be transferred to L-ESS. Once the file is transferred successfully, according to the configuration, the file will be either removed from the chassis or kept as is.

## Configuring HDD

To use the hard disk for storing the EDR/UDR files, the following configuration needs to be applied.

```
configure
```

```
 context <context_name>
 edr-module active-charging-service
 cdr use-harddisk
 end
```

Applying this configuration results in EDR/UDR files to be transferred from RAMFS on the PSC card to the hard disk on the SMC card. On the hard disk, the EDR/UDR files are stored in the */records/edr* and */records/udr* directories respectively.

The default value of **use-harddisk** is set to FALSE, indicating that, by default, the usage of hard disk is disabled.

This configuration can be applied either in EDR / UDR module, but it is applicable for both EDR and UDR modules. Configuring in one of the modules prevents the configuration to be done in the other module. Hence, it is must to remove the configuration from the current module to apply it in the other module.

To disable the usage of hard disk, use the following command:

```
no cdr use-harddisk
```

For more information on HDD, see the *HDD Storage* chapter in the *AAA and GTPP Interface Administration and Reference*.

## Configuring Push Functionality

Before configuring the push functionality, you must make sure that the SSH Daemon (sshd) config on the external server is ready to receive the files.

---

 **Important:** Make sure that SSH Daemon is running on L-ESS server and has appropriate configuration for receiving the files from one or more chassis.

---

Make sure the following configuration changes are done in the `/etc/ssh/sshd_config` file on the L-ESS server.

- **PasswordAuthentication** *yes*
- **UsePAM** *no*

Any changes to the `/etc/ssh/sshd_config` file needs sshd to re-read the config file. For this to happen, get the pid of the sshd process and execute this command: `kill -1 <pid of the sshd>`

Now, the sshd on the L-ESS is ready to receive the files from chassis using push mode. The push functionality can be configured on chassis.

To configure the push functionality, use the following command:

**configure**

```

context <context_name>

 edr-module active-charging-service

 cdr { transfer-mode [pull | push { primary { encrypted-url | url }
<value> [{ encrypted-secondary-url | secondary-url }]] | push-interval
<push_interval> | remove-file-after-transfer | use-harddisk }

 end

```

Notes:

- If pull mode is selected, the L-ESS server pulls the xDR files from chassis. If push mode is selected, an application process on the chassis will be responsible for pushing the xDR files as and when needed. By default, the transfer mode is set to pull.

---

 **Important:** The change in the file transfer mode does not require any reboot of the chassis and L-ESS.

---

- Please note the following points before switching between transfer modes:
  - The chassis should first remove all temporary files and directories that are created while pushing files to L-ESS.
  - Changing transfer mode from 'pull' to 'push' - You should first remove the entry of chassis' host from the list of hosts maintained in L-ESS configuration file. Then disable 'pull' from L-ESS and change the transfer mode to 'push' through the specified CLI command.



**Important:** Make sure that the push server URL specified in the CLI is accessible from the local context. Also, make sure that the base directory mentioned contains `edr` and `udr` directories created within it.

- Changing transfer mode from ‘push’ to ‘pull’ - You should first disable ‘push’ from chassis and then manually remove the host directory of the chassis’ from the base directory path.

After removing the host directory, L-ESS configuration file should be altered to have entry of corresponding chassis in pull hosts list.

Then, use the CLI command to enable ‘pull’ on L-ESS. Any of the ongoing push activity will continue till all the file transfers scheduled is completed. If there is no push activity at the time of this configuration change, all the push related configuration is nullified immediately.

- If push mode is selected, it is mandatory that you specify the L-ESS server URL to which the xDR files need to be transferred to. This allows user to configure a primary and a secondary server. Whenever a file transfer to the primary server fails for 4 times, the files will be transferred to the secondary server. The transfer will switch back to the primary server under the following conditions.
  - Transfer failures to secondary server for 4 times
  - Time elapsed for 30 minutes from the time it switched from primary server

The server can be specified in the standard URL format similar to the following:

*scheme://user:password@host*

Currently, for push, only sftp scheme is supported. Configuring a secondary server is optional.

For example:

```
cdr transfer-mode push primary url sftp://less-
user:staretn@1.1.1.1 server secondary secondary-url sftp://less-
user:starent@2.2.2.2
```

- Once the file transfer is completed, the file is removed from the disk if **remove-file** is configured through the CLI. If not, the files are kept as is on the disk. Once the disk usage reaches a threshold limit, some of the files transferred already are removed to make room for new CDR files. By default, a file is removed after its successful transfer.

## Pushing xDR Files Manually

To manually push xDR files to the configured L-ESS, in the Exec mode, enter the following command:

```
cdr-push { all | local-filename <file_name> }
```

Notes:

- Before you can use this command, in the EDR/UDR Configuration Mode, the CDR transfer mode and file locations must be set to ‘push’.
- *<file\_name>* must be absolute path of the local file to push.
- If the file push is successful, the file name will have the prefix “tx.” Also, the transferred files will be moved to the `/records/edr/TX` directory. The prefix “prog.” indicates the file transfer is in progress.

For the files that failed to transfer, “failed.” is added as a prefix to the file name.

---

 **Important:** A new temporary directory named "TX" is created within */records/edr* and */records/udr* directories during the push activity. This directory contains the successfully pushed files. Tampering of any of the directories/files within */records* file system is not allowed, and doing so may result into an unexpected behavior.

---

During the push activity, if one more push is triggered i.e., either due to a periodic timer expiry or due to a manual push, then the push request is queued. Once the first push is completed, the queued request will be processed. At any time, there can be a maximum of one periodic push and one manual push that can be queued. Once the queue is full, the subsequent push triggers are ignored / failed.

## L-ESS Directory Structure

This section describes the internal directory structure of the L-ESS server.

The chassis creates individual directories by its name under the base directory. Also, separate sub-directories are created for edr and udr under the chassis' directory. Thus, the directory structure should be similar to the following:

```
|_____ <Local data directory > e.g. /less/ess/data
```

```
 ||_____ <STX-1> e.g. /less/ess/data/stx-1
```

```
 |||_____ udr
```

```
 ||||_____ temp
```

```
 ||||_____ temp_dest1
```

```
 ||||_____ temp_dest2
```

```
 ||||_____ temp_dest3
```

```
 |||_____ edr
```

```
 ||||_____ temp
```

```
 ||||_____ temp_dest1
```

```
 ||||_____ temp_dest2
```

```
 ||||_____ temp_dest3
```

```
 ||_____ <STX-2> e.g. /less/ess/data/stx-2
```

```
 |||_____ udr
```

```
 ||||_____ temp
```

```
 ||||_____ temp_dest1
```

```
 ||||_____ temp_dest2
```

```
 ||||_____ temp_dest3
```

```
 |||_____ edr
```

```
 ||||_____ temp
```

```
 ||||_____ temp_dest1
```

```
 ||||_____ temp_dest2
```

```
 ||||_____ temp_dest3
```

The STX-*n* indicates the name of the chassis.

In case of cluster environment, the chassis is configured to push the files to central location on shared disk so that active L-ESS cluster nodes will be able to retrieve the files in case of switchover / failover.

In case of any chassis failure during file transfer, it will push the half-cooked file again. Since chassis is pushing the files to L-ESS, missing of any files is reported by chassis and if some files are deleted due to insufficient disk space, the chassis generates an alarm.

## Log Maintenance

This section provides information on the logs maintained during file transfer.

The file transfer script generates separate logs like the pull and push process under the configured log directory. The script creates separate directory for the logs as shown below:

Log directory name: *FTRANSFER\_LOG\_date\_time*

Log file name: *ftransfer.log*

The file transfer process generates logs under the following events:

- When script is started
- Detection of addition or removal of new host
- Detection of UDR or EDR files addition or removal
- Successful transfer of file (Link creation or copy operation)
- Failure during transfer of file (Link creation or copy operation)