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ESS Administration and Reference, Release 18
About this Guide

This document pertains to the features and functionality that are related to the Cisco® ESS Installation and Administration Guide.
# Conventions Used

The following tables describe the conventions used throughout this documentation.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Notice Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Information Note" /></td>
<td>Information Note</td>
<td>Provides information about important features or instructions.</td>
</tr>
<tr>
<td><img src="image" alt="Caution" /></td>
<td>Caution</td>
<td>Alerts you of potential damage to a program, device, or system.</td>
</tr>
<tr>
<td><img src="image" alt="Warning" /></td>
<td>Warning</td>
<td>Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typeface Conventions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text represented as a <strong>screen display</strong></td>
<td>This typeface represents displays that appear on your terminal screen, for example: Login:</td>
</tr>
<tr>
<td>Text represented as <strong>commands</strong></td>
<td>This typeface represents commands that you enter, for example: <code>show ip access-list</code>&lt;br&gt;This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.</td>
</tr>
<tr>
<td>Text represented as a <strong>command variable</strong></td>
<td>This typeface represents a variable that is part of a command, for example: <code>show card slot_number</code>&lt;br&gt;<code>slot_number</code> is a variable representing the desired chassis slot number.</td>
</tr>
<tr>
<td>Text represented as menu or sub-menu names</td>
<td>This typeface represents menus and sub-menus that you access within a software application, for example:&lt;br&gt;Click the <strong>File</strong> menu, then click <strong>New</strong></td>
</tr>
</tbody>
</table>
Contacting Customer Support

Use the information in this section to contact customer support.

Refer to the support area of http://www.cisco.com for up-to-date product documentation or to submit a service request. A valid username and password are required to access this site. Please contact your Cisco sales or service representative for additional information.
Additional Information

Refer to the following guides for supplemental information about the system:

- Cisco ASR 5000 Installation Guide
- Cisco ASR 5000 System Administration Guide
- Cisco ASR 5x00 Command Line Interface Reference
- Cisco ASR 5x00 Thresholding Configuration Guide
- Cisco ASR 5x00 SNMP MIB Reference
- StarOS IP Security (IPSec) Reference
- Web Element Manager Installation and Administration Guide
- Cisco ASR 5x00 AAA Interface Administration and Reference
- Cisco ASR 5x00 GTPP Interface Administration and Reference
- Cisco ASR 5x00 Release Change Reference
- Cisco ASR 5x00 Statistics and Counters Reference
- Cisco ASR 5x00 Gateway GPRS Support Node Administration Guide
- Cisco ASR 5x00 HRPD Serving Gateway Administration Guide
- Cisco ASR 5000 IP Services Gateway Administration Guide
- Cisco ASR 5x00 Mobility Management Entity Administration Guide
- Cisco ASR 5x00 Packet Data Network Gateway Administration Guide
- Cisco ASR 5x00 Packet Data Serving Node Administration Guide
- Cisco ASR 5x00 System Architecture Evolution Gateway Administration Guide
- Cisco ASR 5x00 Serving GPRS Support Node Administration Guide
- Cisco ASR 5x00 Serving Gateway Administration Guide
- Cisco ASR 5000 Session Control Manager Administration Guide
- Cisco ASR 5000 Packet Data Gateway/Tunnel Termination Gateway Administration Guide
- Release notes that accompany updates and upgrades to the StarOS for your service and platform
Chapter 1
External Storage System Overview

The External Storage System (ESS) is used to collect, store, and report billing information from the Enhanced Charging Service running on the ASR 5x00 chassis. This guide contains information on installing, configuring, and maintaining the ESS.

This chapter consists of the following topics:

- ESS Overview
- System Requirements
Important: The ESS is not a part of the ASR5x00 platform or the Enhanced Charging Service (ECS) in-line service. It is an external server.

Important: For information on compatibility between ESS and StarOS releases, contact your Cisco account representative.

On the ASR 5x00 chassis, the CDR subsystem provides 512 MB of volatile memory on the packet processing card RAM on the ASR 5000 and the data processing card RAM on the ASR 5500 to store accounting information. This onboard 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 ESS, and ESS forwards these files to the required destinations. If HDD is not configured on the platform, ESS pulls the files from the system and forwards them to the destinations.

The 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 ESS 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.

Important: The procedures in this guide assume that you have already configured your chassis with ECS as described in the Enhanced Charging Services Administration Guide.

The following figure shows a typical organization of ESS and billing system with chassis having a AAA server.
The system running with ECS stores xDR files on an ESS and billing system collects the files from the 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.

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

**ESS Features and Functions**

The ESS is a storage server logically connected with the ASR 5x00 and acts as an integrated network system.

The following are some of the important features of an 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 ESS provides the following functions:

- 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 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 5x00/VPC 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.

ESS System Recommendations for Stand-alone Deployment

This section identifies the minimum system requirements recommended for the stand-alone deployment of the ESS application in 14.0 and later releases:

NEBS Requirements:

- OpenSSL must be installed
- Oracle’s Sun Netra™ X4270 M3 Server
  - 2 x Intel Xeon processor E5-2600 with 64GB RAM
  - DVD-RW drive
  - Two 100-240V AC (1+1) or two -48V DC or two -60V DC (1+1)
  - Quad Gigabit Ethernet interfaces
- Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  - 12 x 600 GB 2.5” SAS HDD
  - Two redundant AC power supplies
- Operating Environment:
  - Cisco MITG RHEL 5.5
  --or--
- Cisco UCS C240 M3
  - 2x Intel Xeon X5675 processors with 2x 16 GB DDR3 RAM
- 300GB SAS 10K RPM SFF Hard Disk Drive
- Quad Gigabit Ethernet interfaces
- Internal DVD-ROM drive
- AC or DC power supplies depending on the application
- Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  - 12 x 600 GB 2.5” SAS HDD
  - Two redundant AC power supplies
- Operating Environment:
  - Cisco MITG RHEL 5.9

**Non-NEBS Requirements:**
- Cisco UCS C210 M2 Rack Server
  - 2 x Intel Xeon X5675 processor with 64 GB DDR3 RAM
  - 300 GB 6Gb SAS 10K RPM SFF Hard Disk Drive
  - Quad Gigabit Ethernet interfaces
  - Internal DVD-ROM drive
  - AC or DC power supplies depending on the application
- Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  - 12 x 600 GB 2.5” SAS HDD
  - Two redundant AC power supplies
- Operating Environment:
  - Cisco MITG RHEL 5.5

---

**Important:** The number of discs recommended is based on the throughput of the network and data retention configuration. Please contact Cisco Advanced Service Team for data sizing, number of processors, and RAM size.

**Important:** The Cisco MITG RHEL v5.5/v5.9 OS is a custom image that contains only those software packages required to support compatible Cisco MITG external software applications. Users must not install any other applications on servers running the Cisco MITG v5.5/v5.9 OS. For detailed software compatibility information, refer to the Cisco MITG RHEL v5.5/v5.9 OS Application Note.

This section identifies the minimum system requirements recommended for the stand-alone deployment of the ESS application in 9.0 and earlier releases:
- 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.
  • Sun Solaris 10 with Solaris-SPARC patch number 126546-07 for SUN bash vulnerability fix.

• PSMON (installed through ESS installation script)
• Perl 5.8.5 (installed through ESS installation script)
  –or–
• Sun Microsystems Netra™ X4450 server for 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
  • Intel x64 core 4 socket

• Operating Environment:
  • Sun Solaris 10

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

**ESS System Recommendations for Cluster Deployment**

This section identifies the minimum system requirements recommended for the the cluster deployment of the ESS application in 14.0 and later releases:

**NEBS Requirements:**
• OpenSSL must be installed
• 2 x Oracle’s Sun Netra™ X4270 M3 Server
  • 2 x Intel Xeon processor E5-2600 with 64GB RAM
  • DVD-RW drive
  • Two 100-240V AC (1+1) or two -48V DC or two -60V DC (1+1)
  • Quad Gigabit Ethernet interfaces
• Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  • 12x600 GB 2.5” SAS HDD
  • Two redundant AC power supplies
External Storage System Overview

System Requirements

- Veritas cluster version 5.1
- Operating Environment:
  - Cisco MITG RHEL 5.5

-or-

- 2 x Cisco UCS C240 M3
  - 2x Intel Xeon X5675 processors with 2x 16 GB DDR3 RAM
  - 300GB SAS 10K RPM SFF Hard Disk Drive
  - Quad Gigabit Ethernet interfaces
  - Internal DVD-ROM drive
  - AC or DC power supplies depending on the application
- Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  - 12 x 600 GB 2.5” SAS HDD
  - Two redundant AC power supplies
- Veritas cluster version 5.1
- Operating Environment:
  - Cisco MITG RHEL 5.9

Non-NEBS Requirements:

- 2 x Cisco UCS C210 M2 Rack Server
  - 2 x Intel Xeon X5675 processor with 64 GB DDR3 RAM
  - 300GB 6Gb SAS 10K RPM SFF Hard Disk Drive
  - Quad Gigabit Ethernet interfaces
  - Internal DVD-ROM drive
  - AC or DC power supplies depending on the application
- Veritas cluster version 5.1
- Sun 2540 M2 12 Disk Array AC, Sun 2501 M2 12-Disk Expansion Tray AC
  - 12 x 600 GB 2.5” SAS HDD
  - Two redundant AC power supplies
- Operating Environment:
  - Cisco MITG RHEL 5.5

⚠️ **Important:** The number of discs recommended is based on the throughput of the network and data retention configuration. Please contact Cisco Advanced Service Team for data sizing, Number of processors, and RAM size.

⚠️ **Important:** The Cisco MITG RHEL v5.5/v5.9 OS is a custom image that contains only those software packages required to support compatible Cisco MITG external software applications. Users must not install any other applications on servers running the Cisco MITG v5.5/v5.9 OS. For detailed software compatibility information, refer to the Cisco MITG RHEL v5.5/v5.9 OS Application Note.
This section identifies the minimum system requirements recommended for the cluster deployment of the ESS application in 9.0 and earlier releases:

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

The ESS application consists of internal entities such as the ESS process and process monitor which run on a machine and communicate with the external entities such as the ASR 5x00 chassis. Whenever the machine or ESS process fails, there are chances of loss of communication between internal and external entities. To avoid downtime and ensure continuous availability of ESS application, High Availability (HA) support using Veritas Clustering has been provided.

The hardware setup for Veritas Cluster Server (VCS) solution consists of two cluster nodes connected with an external shared storage. Both the cluster nodes are connected to the external storage. Cluster nodes must be installed with the Cisco MITG RHEL OS, Veritas Storage Foundation (Veritas Volume Manager and Veritas File System), and Veritas Cluster Server (for High Availability).

The Veritas Volume Manager (VxVM) can be used to create a single disk group (DG) containing multiple disks. Separate disk/LUN from the shared storage is required for I/O fencing. I/O fencing is part of the VCS administration. It is assumed that I/O fencing is already configured on the Veritas Cluster setup before the ESS application is installed for HA.

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 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 ESS to provide this functionality:

- **ESS Cluster Node**
  
  A ESS cluster node is a ESS server that runs both the ESS Application software and Cluster Agent software. The Cluster Agent enables carrier to network two ESS nodes in a cluster. Every ESS node in the cluster is aware when another ESS node joins or leaves the cluster. Also, every 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 ESS cluster nodes.

  Each 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 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 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 ESS cluster nodes.

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

This chapter includes the following topics:

- ESS Cluster Functional Description
- Installing Hardware
- Configuring Storage Array on Solaris
- Configuring Storage using CAM
- Configuring Veritas Volume Manager and Veritas Cluster
- Tuning the VxFS File System for Better Performance
- Configuring Resources for High Availability
- Monitoring the Cluster
- Setup of rootdisk Encapsulation and Mirroring
- Testing the Cluster

Once the Veritas Volume Manager and Veritas Cluster are configured, install the ESS application on the ESS Server. For detailed instructions, refer to the ESS Installation and Configuration chapter of this guide. Then, configure the resources for high availability, and perform the cluster monitoring and rootdisk encapsulation processes.
ESS Cluster Functional Description

ESS clustering application provides the support to two discreet 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 ESS nodes (ESS1 and ESS2) are configured identically from the standpoint of the retrieval and storage of the xDRs to support the following:

- The active ESS (either ESS1 or 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 ESS1 and 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 ESS and the ECS is as follows:

- The 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 ESS uses SFTP to access the chassis and retrieve all closed xDRs for storage in the /fetched_data directory.
- Active ESS fetches xDR files for eventual retrieval by the billing system.
Installing Hardware

To install the hardware components required for the installation of 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:

```
#!/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:
pwd: password successfully changed for ssmon
Enter password for user ssadmin.
New Password:
Re-enter new Password:
pwd: password successfully changed for ssadmin
Enter password for user ssconfig.
New Password:
Re-enter new Password:
pwd: password successfully changed for ssconfig
Enter password for user essadmin.
New Password:
Re-enter new Password:
pwd: password successfully changed for essadmin
Enter password for user.
New Password:
Re-enter new Password:
pwd: 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 on Solaris

To configure the storage array using the graphical interface:

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.
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 SSCONSOLE.

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

Step 16 When prompted, enter the password for the ssadmin user that you selected earlier, and then click **OK**.
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 ssconfig 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.
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.
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 ssconsole.
Configuring Storage using CAM

Installing the Management Software (CAM)

Sun Storage Common Array Manager (CAM) provides an easy way to manage storage environment. It provides a common, simple-to-use, interface for Sun Storage arrays. It can be downloaded from www.oracle.com. Once you copy the storage software on a machine, please make sure that following directories and files have execute permissions.

- linux/util/
- linux/bin/tools/
- linux/components/lockhartLinux/
- linux/RunMe.bin

[root@intracerR CAM_linux]# ./RunMe.bin -c

Initializing Wizard........
Launching InstallShield Wizard........

-----------------------------------------------

Sun StorageTek(TM) Common Array Manager 6.2

The InstallShield Wizard will install Sun StorageTek(TM) Common Array Manager on your computer.

To continue, choose Next.

Sun StorageTek(TM) Common Array Manager 6.2
Sun Microsystems, Inc.
http://www.sun.com
Press 1 for Next, 3 to Cancel or 5 to Redisplay [1]

--------------------------------------------------------------------------

Sun StorageTek(TM) Common Array Manager 6.2

Please read the following license agreement carefully.

Sun StorageTek(TM) Common Array Manager

Copyright 2008 Sun Microsystems, Inc. All rights reserved. Sun Microsystems, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at http://www.sun.com/patents and one or more additional patents or pending patent applications in the U.S. and in other countries. U.S. Government Rights - Commercial software. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements. Use is subject to license terms. This distribution may include materials developed by third parties. Portions may be derived from Berkeley BSD systems, licensed from U. of CA. Sun, Sun Microsystems, the Sun logo, Java, Solaris and Sun StorageTek Common Array Manager are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries.

Please choose from the following options:

[ ] 1 - I accept the terms of the license agreement.

[X] 2 - I do not accept the terms of the license agreement.
To select an item enter its number, or 0 when you are finished: [0] 1

[X] 1 - I accept the terms of the license agreement.
[ ] 2 - I do not accept the terms of the license agreement.

To select an item enter its number, or 0 when you are finished: [0]

Press 1 for Next, 2 for Previous, 3 to Cancel or 5 to Redisplay [1]
-----------------------------------------------------------------------------------------------------------------
Sun StorageTek(TM) Common Array Manager 6.2

Choose the installation type that best suits your needs.

[X] 1 - Typical
   The program will be installed with the suggested configuration.
   Recommended for most users.

[ ] 2 - Custom
   The program will be installed with the features you choose.
   Recommended for advanced users.

Select the number corresponding to the type of install you would like: [0]
Press 1 for Next, 2 for Previous, 3 to Cancel or 5 to Redisplay [1]
-----------------------------------------------------------------------------------------------------------------
Checking current system ...

|-----------|-----------|-----------|------------|
Veritas Cluster Installation and Management

Configuring Storage using CAM

ESS Administration and Reference, Release 1

Sun StorageTek(TM) Common Array Manager 6.2

Software To Be Installed:

Full Install
* Browser User Interface (BUI)
* Local and Remote CLI
* Array Firmware

Press 1 for Next, 2 for Previous, 3 to Cancel or 5 to Redisplay [1] Preparing for installation ...

Pre Uninstall Old Action ...

Removing old features ...

Sun StorageTek(TM) Common Array Manager 6.2

Installing Sun StorageTek(TM) Common Array Manager 6.2. Please wait...

|-------------------|-------------------|-------------------|-------------------|-------------------|
0% 25% 50% 75% 100%

Installing Java 2 Standard Edition
Sun StorageTek(TM) Common Array Manager 6.2

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>25%</td>
<td>50%</td>
<td>75%</td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sun StorageTek(TM) Host Software Installation Summary

View results:
Info:
Installation success.
The following have been installed: Browser User Interface (BUI), Local and Remote CLI, and Array Firmware.
To access the Browser User Interface point a browser at:
https://installation_host:6789
The logs may be found in /var/opt/cam/

Press 3 to Finish or 5 to Redisplay [3]

Accessing the Storage Management GUI

Follow these steps to access the storage management GUI.

Step 1  Access the Management GUI using a browser on PC (If 65.198.111.26 is the public IP of the node on which the management software was installed)
https://65.198.111.26:6789

Step 2  The first time login to the CAM software is always through the admin user of the operating system. For example, Administrator on Windows and root on the Unix/Linux.
Installing the hardware

Connect the hardware as shown in the figure. There are two controllers, A and B, on the storage array. Connect both the controllers to each node. They can either be directly connected or they can be connected via switch as shown.

The following is a figure of the StorageTek 2540 Array Direct-Connect Configuration:

![Direct-Connect Configuration](image1)

The following is a figure of the StorageTek 2540 Array Switched Configuration:

![Switched Configuration](image2)

Also, connect the management console to the network. This console will be used to detect the storage and configure it via CAM.

Configuring the Storage System

Perform the following steps to configure the storage system:

**Step 1** Discover the storage system by either clicking **Storage Systems -> Register -> Scan the local network** or you can specify the IP address of the storage.

**Step 2** Once the storage is added to CAM, create a pool for LESS volume by selecting `<storage_name> -> Pools -> New`. 

---

ESS Administration and Reference, Release 18
Step 3  In the form, enter the following details:

   **Step a**  Name: LESSPool

   **Step b**  Description: Storage Pool for LESS

   **Step c**  Storage Profile: RAID5-256KB-ReadAhead

Click OK. If this profile is not available, add a new profile with these values.

Step 4  Create a volume and map it by selecting `<storage_name>` -> Volumes -> New.
Step 5  From the pop-up window, select LESSPool, that was created in Step 3, and click Next.

Step 6  Select Storage Selected Automatically by CAM and click Next.
Step 7 In the form, enter the following volume parameters:

Step a Volume Name: LESSVol

Step b Number to Create: 1

Step c Size: Select either Fill one Virtual Disk or Specify size.

Step d Controller: Any

Click Next.

Step 8 To limit the disk visibility to a particular set of hosts, map the volume to a particular Host Group. Otherwise, select Map to an Existing Host/Host Group or the Default Storage Domain.

Click Next.
Step 9  Select the Default Storage Domain.
    Click Next.

Step 10  Check the parameters and click Finish.
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
```


```bash
#/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/llttab, /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.

**Important:** In case of IPv6, enter virtual IPv6 address and the prefix length for virtual IPv6 address. For example: 64

**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   Prob   AutoDisabled   State
B  LAPP     less3    Y      N             OFFLINE
```
Step 18  Create the resource groups for 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 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.

hagrp -offline <RG_name> -sys <Node1>

hagrp -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:

```
NotifierMngr 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*. 

---

**Veritas Cluster Installation and Management**

**Configuring Veritas Volume Manager and Veritas Cluster**

---

**ESS Administration and Reference, Release 18**
Tuning the VxFS File System for Better Performance

The VxFS file system can be tuned for better performance using the `vxtunefs` command to set the tuning parameters. The default values of these parameters are set when the volume is mounted.

The performance of the ESS application can improve when the following tuning parameters are changed:

- **read_pref_io**: The preferred read request size. The filesystem uses this in conjunction with the `read_nstream` value to determine how much data to read ahead. The default value is 64000. The ESS performance can improve when this value is set to 128000.

- **read_nstream**: This is the desired number of parallel read requests of the size specified in the `read_pref_io` parameter to have outstanding at one time. The file system uses the value specified in the `read_nstream` parameter multiplied by the value specified in the `read_pref_io` parameter to determine its read ahead size. The default value for the `read_nstream` parameter is 1. If you know the hardware RAID configuration on the external storage, then set the `read_nstream` parameter value to be the number of columns (disks) in the disk array.

- **write_pref_io**: The preferred write request size. The filesystem uses this in conjunction with the value specified in the `write_nstream` parameter to determine how to flush behind on writes. The default value is 64000. The ESS performance can improve when this value is set to 128K.

- **write_nstream**: This is the desired number of parallel write requests of the size specified in the `write_pref_io` parameter to have outstanding at one time. The file system uses the value specified in the `write_nstream` parameter multiplied by the value specified in the `write_pref_io` parameter to determine when to flush behind on writes. The default value for the `write_nstream` parameter is 1. For disk striping configurations, set the value of the `write_pref_io` and `write_nstream` parameters to the same values as the `read_pref_io` and `read_nstream` parameters.

Use the following command to tune Veritas file system:

```
$ /opt/VRTS/bin/vxtunefs -o
read_pref_io=131072,read_unit_io=131072,write_pref_io=131072,write_unit_io=131072
/shared_db
```

To ensure that these values are not lost after a reboot, create the file `/etc/vx/tunefstab` using the following command:

```
$ cat /etc/vx/tunefstab /dev/vx/dsk/apps_dg/apps_vol
read_pref_io=131072,read_unit_io=131072,write_pref_io=131072,write_unit_io=131072
```

Configuring Resources for High Availability

After installation of the storage array, Veritas cluster, and the ESS server, the following resources need to be configured with the Veritas cluster:

- **NIC** — To monitor an NIC (Network Interface Card)
- **IP** — To monitor an IP address
- **Disk Group, Volume, and Mount** — for shared storage
- **ESS Application** — comprising of all the ESS-related processes
- **Volume** — With apps_vol mounted on the `/shared_app` directory
- **ESS installation directory** — `/shared_apps/less`
- **ESS Administrator** — lessadmin
- **Shared/Floating IP address (on NIC eth0)**

Figure 2. Resources for high availability

To configure these resources:

**Important:** The following configurations should be performed only on the node where the ESS application is installed.

**Step 1** Log on as super user (root).

**Step 2** Make the veritas config file writable using the following command:

```
$ haconf -makerw
```

**Step 3** Create resource group using the following commands:
Veritas Cluster Installation and Management

Configuring Resources for High Availability

ESS Administration and Reference, Release 18

$hagrp -add less-ha
$hagrp -modify less-ha SystemList <Node1> 0 <Node2> 1
$hagrp -modify less-ha NumRetries 1

Where, Node1 and Node2 are the hostnames of the active and passive nodes.

Step 4 Create Disk Group resource for the ESS partition using the following commands:

$ hares -add less-apps-dg DiskGroup less-ha
$ hares -modify less-apps-dg DiskGroup apps_dg
$ hares -modify less-apps-dg Enabled 1

Step 5 Create Volume resource for the ESS partition using the following commands:

$ hares -add less-apps-vol Volume less-ha
$ hares -modify less-apps-vol DiskGroup apps_dg
$ hares -modify less-apps-vol Volume apps_vol
$ hares -modify less-apps-vol Enabled 1

Step 6 Create Mount resource for the ESS partition using the following commands:

$ hares -add less-apps-mnt Mount less-ha
$ hares -modify less-apps-mnt MountPoint /shared_apps
$ hares -modify less-apps-mnt BlockDevice /dev/vx/dsk/apps_dg/apps_vol
$ hares -modify less-apps-mnt FSType vxfs
$ hares -modify less-apps-mnt FsckOpt %-y
$ hares -modify less-apps-mnt MountOpt largefiles
$ hares -modify less-apps-mnt Enabled 1

Step 7 Create Application resource for the ESS processes using the following commands:

$ hares -add less-app Application less-ha
$ hares -modify less-app User lessadmin
$ hares -modify less-app StartProgram "/<installed dir>/ess/serv start"
$ hares -modify less-app StopProgram "/<installed dir>/ess/serv forcestop"
$ hares -modify less-app PidFiles "<installed dir>/ess/psmon.pid"
$ hares -modify less-app Enabled 1

Step 8 Create the NIC resource using the following commands:
$ hares -add less-nic NIC less-ha
$ hares -modify less-nic Device eth0
$ hares -modify less-nic Protocol IPv6

**Important:** Use the `hares -modify less-nic Protocol IPv6` command only in IPv6 setup.

$ hares -modify less-nic Enabled 1

### Step 9
Create the IP resource using the following commands:

$ hares -add less-ip IP less-ha
$ hares -modify less-ip Device eth0

- For IPv6 setup:
  
  $ hares -modify less-ip Address <ipv6-address>
  $ hares -modify less-ip PrefixLen 64

- For IPv4 setup:
  
  $ hares -modify less-ip Address <ip-address>
  $ hares -modify less-ip NetMask 255.255.255.0

**Important:** The floating or shared IP address should be a public IP in the DNS to which the client machine can successfully ping.

$ hares -modify less-ip Enabled 1

### Step 10
Set the resource dependencies using the following commands:

$ hares -link less-app less-apps-mnt
$ hares -link less-apps-mnt less-apps-vol
$ hares -link less-apps-vol less-apps-dg
$ hares -link less-app less-ip
$ hares -link less-ip less-nic

### Step 11
Dump the configuration to the Veritas config file using the following command:

$ haconf -dump -makero

### Step 12
Bring the ESS HA application online on Node 1 using the following command:

$ hagrp -online less-ha -sys <Node1>

Once the above steps are performed, the ESS HA application will start running.
Creating Disk Group for ESS

Use the following instructions to create disk groups for ESS:

**Step 1**  
Rebuild the disk lists with the new disks detected by the kernel using the following command:

```
$ vxdctl initdmp
$ vxdctl enable
```

To see the status of the new disk, use the command:

```
$ vxdisk -o alldgs list
```

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>TYPE</th>
<th>DISK</th>
<th>GROUP</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>disk_0</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>disk_1</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>disk_2</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>disk_3</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>emc_clariion0_28</td>
<td>auto:cdsdisk</td>
<td>-</td>
<td>-</td>
<td>online</td>
</tr>
<tr>
<td>emc_clariion0_29</td>
<td>auto:cdsdisk</td>
<td>-</td>
<td>-</td>
<td>online</td>
</tr>
</tbody>
</table>

**Step 2**  
To setup the disks, use the following commands:

```
$ /etc/vx/bin/vxdisksetup -i emc_clariion0_28
$ /etc/vx/bin/vxdisksetup -i emc_clariion0_29
```

To see the status of the new disk, use the command:

```
$ vxdisk -o alldgs list
```

<table>
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<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>disk_2</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
<tr>
<td>disk_3</td>
<td>auto:none</td>
<td>-</td>
<td>-</td>
<td>online invalid</td>
</tr>
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<td>auto:cdsdisk</td>
<td>-</td>
<td>-</td>
<td>online</td>
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<td>auto:cdsdisk</td>
<td>-</td>
<td>-</td>
<td>online</td>
</tr>
</tbody>
</table>

**Step 3**  
With the newly initialized disks, create disk groups for ESS using the following command:

```
$ vxdg init apps_dg apps_dg01=emc_clariion0_28
```
Important: You can specify more disks (using Step 2) and add the disk to disk groups.

VxVM will ensure that the newly created disk groups are visible from both the cluster nodes. These disk groups can be used only from one node at a time. You will have to import/deport a disk group from either node to use the disk groups and their volumes.

**Step 4** Create volumes in the disk groups using the following command:

```
$ vxassist -g apps_dg make apps_vol 299g
```

**Step 5** Initialize the volumes with the VxFS file system using the following command:

**On Solaris:**

```
$ mkfs -F vxfs -o bsize=4096,largefiles /dev/vx/rdsn/apps_dg/apps_vol
```

**On Linux:**

```
$ mkfs -t vxfs -o bsize=4096,largefiles /dev/vx/rdsn/apps_dg/apps_vol
```

For better performance, use a 4Kb block size and enable support for large files (more than 1 TB).

**Step 6** Create the mount points and mount the volumes using the following commands:

**On Solaris:**

```
$ mount -F vxfs -o largefiles /dev/vx/dsk/apps_dg/apps_vol /shared_apps
```

**On Linux**

```
$ mount -t vxfs -o largefiles /dev/vx/dsk/apps_dg/apps_vol /shared_apps
```
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.

```bash
#!/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

    hagrp -clear LAPP >> /var/adm/messages
    hagrp -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.

```bash
# 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
    ! vxmksdpart -f -v -g rootdg rootmirror-01 0 0x2 0x200
    ! vxpartadd /dev/rdsk/c1t1d0s2 0 0x2 0x200 20352 62918208
! /usr/sbin/installboot /usr/platform/SUNW,Netra-T5220/lib/fs/ufs/bootblk /dev/rdsk/c1t1d0s0

! vxeeprom 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
```
ESS Cluster Failure Handling

The ESS clustering application is configured to monitor the health of both the hardware and software components of the 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 ESS
  - In this case, communication will be shifted to the redundant interface on the active ESS.

- Failure of a software process/application on the active 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 ESS will be initiated.

- Failure of the redundant private interconnect between the active and standby 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 ESS as a whole (e.g. power failure)
  - In this case, a switchover to the standby 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 ESS is always reachable with a consistent set of directory structures and contents.
Chapter 3
ESS Installation and Configuration

This chapter describes how to install and configure the ESS application on the ESS Server.
It consists of the following topics:

- ESS Installation Modes
- Installing ESS Application in Stand-alone Mode
- Installing ESS Application in Cluster Mode
- Uninstalling ESS Application
- Configuring PSMON Threshold (Optional)
ESS Installation Modes

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

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

- Stand-alone mode
- Cluster mode

In the cluster mode, ESS provides high availability and critical redundancy support to retrieve xDRs in case of failure of any one of the systems. An ESS Veritas cluster comprises of two ESS systems, or nodes, that work together as a single, continuously available system to provide applications, system resources, and data to the ESS users. Each ESS node on the Veritas cluster is a fully functional, stand-alone system. However, in a Veritas clustered environment, the 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 ESS application, refer to the Installing ESS Application in Standalone Mode section. For cluster-based installation of ESS application, refer to the Installing ESS Application in Cluster Mode section.
Installing ESS Application in Stand-alone Mode

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

To install and configure the ESS application:

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

**Important:** 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 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 ESS and PSMON.
- `l_ess.tar`: A tar archive that the installation script uses.
- `install_ess`: A shell script that performs the ESS installation.
- `platform`: A file that provides information on the platforms currently supported for ESS.
- `StarentLESS.tar`: A tar file that contains the ESS cluster agent package.
- `less_pool.cfg`: A configuration file to create 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 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 the `Configuring the 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.
## Installing ESS Application in Stand-alone Mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESS Installation Directory</td>
<td>Type the directory path where you want the ESS to be installed. The default is</td>
<td>Current directory from where the ESS installation script is executed.</td>
</tr>
<tr>
<td></td>
<td>the current directory.</td>
<td></td>
</tr>
<tr>
<td>IP Address for ESS installation</td>
<td>Type the IP address of the local machine where the ESS application is installed.</td>
<td>IP address of the local machine where ESS is installed</td>
</tr>
<tr>
<td></td>
<td>Both IPv4 and IPv6 addresses can be configured. When configuring IPv6 address, make sure that you are configuring global IPv6 address, not Link scope address like ‘fe80::8a5a:92ff:fe88:1536’.</td>
<td></td>
</tr>
<tr>
<td><strong>Important:</strong></td>
<td></td>
<td>Important: This IP address will be used to lock a socket to avoid starting of similar 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.</td>
</tr>
<tr>
<td>Base Directory Path for Fetched Data</td>
<td>Type the base directory path for the fetched data.</td>
<td>&lt;less_install_dir&gt;/ess/fetched_data</td>
</tr>
<tr>
<td>Log Directory Path</td>
<td>Type the directory path for the log files.</td>
<td>Stand-alone mode: &lt;less_install_dir&gt;/ess/log</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cluster mode: When the ESS installation is in shared path, the log files will be available at &lt;shared_path&gt;/LESS/log. When the ESS installation is in local path and the data files are on shared path, the log files will be available at &lt;shared_path&gt;/LESS/lesslog_hostname.</td>
</tr>
<tr>
<td>Install init scripts [for standalone]</td>
<td>Use this option to install init scripts for a standalone ESS installation. These scripts are required if you want to start the ESS application after a system reboot. Type (Y)es to create the init script named less in the /etc/init.d/ location.</td>
<td>n</td>
</tr>
<tr>
<td><strong>SMTP Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMTP Server Name</td>
<td>If you want Process Monitor (PSMON) alert messages automatically e-mailed to</td>
<td>Null</td>
</tr>
<tr>
<td></td>
<td>a specific person, type the host name or IP address of a valid SMTP server. Press ENTER for no SMTP server and e-mail recipient.</td>
<td></td>
</tr>
<tr>
<td>Email-ID [To ]</td>
<td>Type the e-mail address of the person who should receive the alert messages.</td>
<td>Null</td>
</tr>
<tr>
<td><strong>Miscellaneous Configuration</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ESS Installation and Configuration

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>File expiry duration</td>
<td>Type the maximum lifetime, in days, after which the EDR/NBR/UDR files should be deleted from the ESS base directory or local destinations. The value must be an integer from 0 through 30. When the parameter is set to 0, the ESS will not delete any files. The 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. 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. You can control lifetime of the data records with the cleanup script. You must start the cleanup script by providing path of ESS base directory. Refer to the Using the Cleanup Script section for more details.</td>
<td>0</td>
</tr>
<tr>
<td>Local file deletion time</td>
<td>Type the value, in hours, at which the ESS cleanup script should start deleting the older files. This can be adjusted so that cleanup script does not cause slowing down of ESS. The value must be an integer from 0 through 23.</td>
<td>0</td>
</tr>
</tbody>
</table>

---

**Important:** 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).

---

The above mentioned parameters are stored in a configuration file, `generic_ess_config`, located at `<less_install_dir>/ess/template` 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 ESS Server Configuration section in this guide.

### ESS Installation Confirmation

<table>
<thead>
<tr>
<th>Modify configuration</th>
<th>Type *(Y)*es if you want to make any modifications to the existing configuration.</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceed with installation</td>
<td>Type *(Y)*es to proceed with ESS installation.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The following prompt appears when you proceed with the ESS installation:

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

Enter your choice according to the configurations needed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory poll interval for</td>
<td>Type the pull poll interval, in seconds, for pulling the record files from</td>
<td>30</td>
</tr>
<tr>
<td>source</td>
<td>chassis or host. The value must be an integer from 10 through 3600.</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Default Value</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>File name format for source</td>
<td>Select from the currently available file formats for xDR files.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>• [1] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [2] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)_PSCNO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [3] FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_SEQUENCENO(0,999999999)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [4] FIELDSEP(_)_STR-RULEBASENAME_STR_TIMESTAMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [6] FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [7] FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,999999).EXT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [8] FIELDSEP(_)_STR_STRING_TIMESTAMP(YYYYMMDDHHMMSS).EXT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In ESS 14.0 and later releases:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [9] STR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [10] ACR_FILEFORMAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In ESS 9.0 and earlier releases:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [9] ACR_FILEFORMAT</td>
<td></td>
</tr>
</tbody>
</table>

**Important:** Modification in file format requires restart of ESS.

You can also customize your own format according to the file naming convention.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete files from source</td>
<td>Type <strong>(Y)es</strong> to delete record files from source directory after fetching.</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Type <strong>(N)o</strong> to keep record files at source directory even after fetching.</td>
<td></td>
</tr>
</tbody>
</table>

**Important:** Please set this configuration to **(Y)es** when **cdr-multi-mode** is enabled at ASR5x00. Otherwise, L-ESS might fail to identify fresh files at source and may skip pulling of fresh files.
## Installing ESS Application in Stand-alone Mode

### Parameter | Description | Default Value
--- | --- | ---
Report missed files from remote source | Type **(Y)es** to activate alarm when files are found missing while pulling them from chassis. Type **(N)o** to deactivate alarm when files are found missing while pulling them from chassis. | **y**

**Important:** This feature is to be set to **(Y)es** only if file naming format contains sequence number.

**Important:** Please set this configuration to **(N)o** if `cdr-multi-mode` is enabled at ASR5x00 as L-ESS might fail to uniquely identify sequence of files and may not report the missing files appropriately.

**Important:** 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient file prefix for source</td>
<td>Type the transient file prefix for source files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.</td>
<td><code>curr_</code></td>
</tr>
<tr>
<td>Transfer file prefix for destination</td>
<td>Type the transfer file prefix for destination files. This is a customer specific unique text prefix to distinguish the incomplete files from final files.</td>
<td><code>Null</code></td>
</tr>
<tr>
<td>Pending file threshold</td>
<td>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 &quot;starLESSThreshPendingFiles&quot; will be raised. Alarms will be raised even if the files to be pushed to destination directory is exceeding the configured limit. Clear alarm &quot;starLESSThreshClearPendingFiles&quot; 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.</td>
<td><code>0</code></td>
</tr>
<tr>
<td>Half cooked file detection threshold</td>
<td>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 ESS removes the file. The value must be an integer from 1 through 24.</td>
<td><code>1</code></td>
</tr>
<tr>
<td>Port</td>
<td>Type the port number used to create SFTP connection to remote host.</td>
<td><code>22</code></td>
</tr>
<tr>
<td>Connection retry count</td>
<td>This value is used to decide number of times ESS can try to set up connection to remote host in case of connection failure.</td>
<td><code>3</code></td>
</tr>
<tr>
<td>Connection Retry Frequency</td>
<td>This is the time interval after which ESS should reconsider connecting to remote host in case connection creation has failed earlier even after retrying configured number of times.</td>
<td><code>60</code></td>
</tr>
</tbody>
</table>
### ESS Installation and Configuration

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socket timeout value</strong></td>
<td>Use this parameter to set the socket timeout value. This socket timeout is set for a socket connection that is opened for SFTP between 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.</td>
<td>10</td>
</tr>
<tr>
<td><strong>Compressed/Decompressed required</strong></td>
<td>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.</td>
<td>c</td>
</tr>
<tr>
<td><strong>Process count</strong></td>
<td>Specify the number of processes to be spawned for each source/destination.</td>
<td>1</td>
</tr>
<tr>
<td><strong>Create hostname directory</strong></td>
<td>Type (y)es 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.</td>
<td>y</td>
</tr>
</tbody>
</table>

### 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 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, ESS will pull/push files only with matching filter string. 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

<p>| 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 (Y)es if you want to create subdirectory with host name under destination base path. | y |
| Create subdir under hostname dir | Type (Y)es if you want to create subdirectory under the host name directory if it exists. | y |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subdirectory name</td>
<td>Type the name of the subdirectory being created.</td>
<td>data</td>
</tr>
<tr>
<td>How should files be sent to destination? Compressed/Decompressed</td>
<td>Type (Y)es if file is required in compressed format at the destination side. If you type (Y)es, the file will be compressed (if it is not previously compressed) and then forwarded. If you type (N)o, the file will be uncompressed (if previously compressed) and then forwarded to destination.</td>
<td>c</td>
</tr>
<tr>
<td>Filter string</td>
<td>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, ESS will pull/push files only with matching filter string. For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].</td>
<td>Null</td>
</tr>
<tr>
<td>File prefix while transfer</td>
<td>Type the file prefix to be used while transferring the xDR files to the destination.</td>
<td>Null</td>
</tr>
</tbody>
</table>

**Miscellaneous Configuration**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start disk cleanup based on threshold</td>
<td>To enable the disk cleanup based on the disk utilization threshold level, type (Y)es. 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.</td>
<td>y</td>
</tr>
<tr>
<td>Disk threshold 1</td>
<td>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.</td>
<td>80</td>
</tr>
<tr>
<td>Disk threshold 2</td>
<td>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.</td>
<td>98</td>
</tr>
<tr>
<td>Enable SNMP</td>
<td>Type (Y)es to enable the SNMP trap notifications.</td>
<td>Yes</td>
</tr>
<tr>
<td>SNMP Version</td>
<td>Type the SNMP version of the traps that should be generated by ESS. The currently supported SNMP versions are v1 and v2c.</td>
<td>v1</td>
</tr>
</tbody>
</table>

**Important:** In case of IPv6 setup, it is recommended to use SNMP v2c. If v1 is used on IPv6 setup, the ‘agent_addr’ value in SNMP header will be ‘0.0.0.0’. In case of IPv4, either of the versions can be used.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable primary SNMP mode</td>
<td>Type (Y)es to send alarms to the primary SNMP host only. When this option is set to (Y)es, alarms will be sent only to the SNMP host that is set as primary. When this option is set to (N)o, alarms will be sent to all the hosts even if a host is configured as the primary SNMP host.</td>
<td>No</td>
</tr>
</tbody>
</table>
## ESS Installation and Configuration

### Installing ESS Application in Stand-alone Mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add SNMP host</td>
<td>Type (Y)es to add another SNMP Manager host.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> The maximum number of SNMP Manager hosts that are allowed to be configured is four.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> The default values for all the parameters except SNMP Manager Host Name will be taken from previous host configuration for the new host.</td>
<td></td>
</tr>
<tr>
<td>Remove SNMP host</td>
<td>Type (Y)es to remove the currently configured SNMP Manager host.</td>
<td>No</td>
</tr>
<tr>
<td>Log level</td>
<td>This value specifies the severity of log messages. The values can be one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 0 - Disable all logs</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>- 1 - Debug Level logs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 2 - Info Level logs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 3 - Warning Level logs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 4 - Error Level logs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 5 - Critical Level logs</td>
<td></td>
</tr>
</tbody>
</table>

### SNMP Host Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP host name</td>
<td>Type the hostname or IP address where the SNMP Manager resides.</td>
<td>Null</td>
</tr>
<tr>
<td>SNMP port</td>
<td>Type the SNMP Manager port number.</td>
<td>162</td>
</tr>
<tr>
<td>SNMP community string</td>
<td>Type the community string that should be used while sending the SNMP traps.</td>
<td>public</td>
</tr>
<tr>
<td>Primary SNMP host</td>
<td>Type (Y)es to set the current SNMP Manager host as the primary SNMP host.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> Only one SNMP host can be set as the primary SNMP host.</td>
<td></td>
</tr>
</tbody>
</table>

### Remote Host Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Name or IP Address of</td>
<td>To establish an SFTP connection, type the hostname or IP address of the chassis.</td>
<td>Null</td>
</tr>
<tr>
<td>Starent Platform</td>
<td><strong>Important:</strong> This parameter is applicable only if the source or destination is at remote location.</td>
<td></td>
</tr>
</tbody>
</table>
Installing ESS Application in Stand-alone Mode

Parameter | Description | Default Value
---|---|---
SFTP User Name | Type the user name used to log on to chassis. | Null

**Important:** This parameter is applicable only if the source or destination is at remote location.

SFTP Password | Type the password used to log on to chassis. | Null

**Important:** This parameter is applicable only if the source or destination is at remote location.

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 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 ESS application.
Installing ESS Application in Cluster Mode

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

To install and configure the ESS application in cluster mode:

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

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

**Step 4** Start the installation on ESS node1 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 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 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster Mode Installation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Installing ESS Application in Cluster Mode

### Cluster Mode Installation in cluster environment

Type **(Y)es** to install the ESS application in cluster mode.

**Important:** The 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 ESS application is installed.

### Shared directory for ESS data and log files

Type the shared directory path where the ESS stores the fetched data and log files.

<table>
<thead>
<tr>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sharedless/less</td>
</tr>
</tbody>
</table>

### Primary Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESS Installation Directory</td>
<td>Type the directory path where you want the ESS to be installed. The default is the current directory.</td>
<td>Current directory from where the ESS installation script is executed.</td>
</tr>
</tbody>
</table>

### Miscellaneous Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual IP address</td>
<td>Type the required Virtual IP address for the ESS cluster.</td>
<td>Null</td>
</tr>
<tr>
<td>Logical host name</td>
<td>Type the logical host name.</td>
<td>Null</td>
</tr>
</tbody>
</table>

**Important:** This input is specific to Veritas cluster.

### SMTP Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMTP Server Name</td>
<td>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 <strong>ENTER</strong> for no SMTP server and e-mail recipient.</td>
<td>Null</td>
</tr>
</tbody>
</table>

### Email-ID [To ]

Type the e-mail address of the person who should receive the alert messages.

<table>
<thead>
<tr>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null</td>
</tr>
</tbody>
</table>
## ESS Installation and Configuration

### Installing ESS Application in Cluster Mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File expiry duration</strong></td>
<td>Type the maximum lifetime, in days, after which the EDR/NBR/UDR files should be deleted from the ESS base directory or local destinations. The value must be an integer from 0 through 30. When the parameter is set to 0, the ESS will not delete any files. The 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. 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. You can control lifetime of the data records with the cleanup script. You must start the cleanup script by providing path of ESS base directory. Refer to the <em>Using the Cleanup Script</em> section for more details. <strong>Important</strong>: 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 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).</td>
<td>0</td>
</tr>
<tr>
<td><strong>Local file deletion time</strong></td>
<td>Type the value, in hours, at which the ESS cleanup script should start deleting the older files. This can be adjusted so that cleanup script does not cause slowing down of ESS. The value must be an integer from 0 through 23. <strong>Important</strong>: This parameter can be configured only when the File expiry duration parameter is set to a non-zero value.</td>
<td>0</td>
</tr>
</tbody>
</table>

The above mentioned parameters are stored in a configuration file, *generic_ess_config*, located at `<less_install_dir>ess/template` 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 *ESS Server Configuration* section in this guide.

### ESS Installation Confirmation

<table>
<thead>
<tr>
<th>Modify configuration</th>
<th>Type *(Y)*es if you want to make any modifications to the existing configuration.</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceed with installation</td>
<td>Type *(Y)*esto proceed with ESS installation.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The following prompt appears when you proceed with the ESS installation:

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

Enter your choice according to the configurations needed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory poll interval for source</td>
<td>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.</td>
<td>30</td>
</tr>
</tbody>
</table>
### File name format for source

Select from the currently available file formats for xDR files.

- [1] `FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)`
- [2] `FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)_PSCNO`
- [3] `FIELDSEP(_)_STR_RULEBASENAME_TIMESTAMP_SEQUENCENO(0,999999999)`
- [4] `FIELDSEP(_)_STR-RULEBASENAME_STR_TIMESTAMP`
- [6] `FIELDSEP(_)_STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,4294967295)`
- [8] `FIELDSEP(_)_STR_STR_TIMESTAMP(YYYYMMDDHHMMSS).EXT`

In ESS 14.0 and later releases:
- [9] `STR`
- [10] `ACR_FILEFORMAT`

In ESS 9.0 and earlier releases:
- [9] `ACR_FILEFORMAT`

**Important:** Modification in file format requires restart of ESS.

You can also customize your own format according to the file naming convention.

### Delete files from source

Type **(Y)es** to delete record files from source directory after fetching.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
</table>
## ESS Installation and Configuration

### Installing ESS Application in Cluster Mode

#### ESS Administration and Reference, Release 18

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Report missed files from remote source | Type **(Y)es** to activate alarm when files are found missing while pulling them from the chassis. **Important**: This feature is allowed only if file naming format contains sequence number. **Important**: 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. | 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_

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
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_

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
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. 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

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
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 ESS removes the file. The value must be an integer from 1 through 24. | 1

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Port | Type the port number used to create SFTP connection to remote host. | 22

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Connection retry count | This value is used to decide number of times ESS can try to set up connection to remote host in case of connection failure. | 3

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Connection Retry Frequency | This is the time interval after which ESS should reconsider connecting to remote host in case connection creation has failed earlier even after retrying configured number of times. | 60

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
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 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

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
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

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Process count | Specify the number of processes to be spawned for each source/destination. | 1

---

**Parameter** | **Description** | **Default Value**
--- | --- | ---
Create hostname directory | Type **(y)es** 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

---
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Location</td>
<td>Select (L)ocal or (R)emote depending on the location of source.</td>
<td>Local</td>
</tr>
<tr>
<td>Source directory</td>
<td>Type the path for xDR base directory on chassis or on local source. This is the base directory on chassis from which ESS will pull xDR files.</td>
<td>Null</td>
</tr>
<tr>
<td>Hostname for subdirectory</td>
<td>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.</td>
<td>Null</td>
</tr>
<tr>
<td>Filter</td>
<td>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, ESS will pull/push files only with matching filter string. For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].</td>
<td>Null</td>
</tr>
<tr>
<td>Add destination for current source</td>
<td>Select this option if you want to add destination to the currently configured source.</td>
<td>Null</td>
</tr>
<tr>
<td>Detach destination for current source</td>
<td>Select this option if you want to remove destination from the currently configured source.</td>
<td>Null</td>
</tr>
<tr>
<td>Destination Location</td>
<td>Select (L)ocal or (R)emote depending on the location of destination.</td>
<td>Local</td>
</tr>
<tr>
<td>Destination directory</td>
<td>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.</td>
<td>Null</td>
</tr>
<tr>
<td>Create subdirectory with hostname</td>
<td>Type (Y)es if you want to create subdirectory with host name under destination base path.</td>
<td>y</td>
</tr>
<tr>
<td>Create subdir under hostname dir</td>
<td>Type (Y)es if you want to create subdirectory under the host name directory if it exists.</td>
<td>y</td>
</tr>
<tr>
<td>Subdirectory name</td>
<td>Type the name of the subdirectory being created.</td>
<td>data</td>
</tr>
<tr>
<td>How should files be sent to destination? Compressed/Decompressed</td>
<td>Type (Y)es if file is required in compressed format at the destination side. If you type (Y)es, the file will be compressed (if it is not previously compressed) and then forwarded. If you type (N)o, the file will be uncompressed (if previously compressed) and then forwarded to destination.</td>
<td>c</td>
</tr>
<tr>
<td>Filter string</td>
<td>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, ESS will pull/push files only with matching filter string. For example, the include filter list can be [MIP,OCS] and the exclude filter list can be ![ACR,NBR].</td>
<td>Null</td>
</tr>
<tr>
<td>File prefix while transfer</td>
<td>Type the file prefix to be used while transferring the xDR files to the destination.</td>
<td>Null</td>
</tr>
<tr>
<td>Start disk clean up based on threshold</td>
<td>To enable the disk cleanup based on the disk utilization threshold level, type (Y)es. 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.</td>
<td>y</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Default Value</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Disk threshold 1</td>
<td>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.</td>
<td>80</td>
</tr>
<tr>
<td>Disk threshold 2</td>
<td>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.</td>
<td>98</td>
</tr>
<tr>
<td>Enable SNMP</td>
<td>Type (Y)es to enable the SNMP trap notifications.</td>
<td>Yes</td>
</tr>
<tr>
<td>SNMP Version</td>
<td>Type the SNMP version of the traps that should be generated by ESS. The currently supported SNMP versions are v1 and v2c.</td>
<td>v1</td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> In case of IPv6 setup, it is recommended to use SNMP v2c. If v1 is used on IPv6 setup, the ‘agent_addr’ value in SNMP header will be ‘0.0.0.0’. In case of IPv4, either of the versions can be used.</td>
<td></td>
</tr>
<tr>
<td>Enable primary SNMP mode</td>
<td>Type (Y)es to send alarms to the primary SNMP host only. When this option is set to (Y)es, alarms will be sent only to the SNMP host that is set as primary. When this option is set to (N)o, alarms will be sent to all the hosts even if a host is configured as the primary SNMP host.</td>
<td>No</td>
</tr>
<tr>
<td>Add SNMP host</td>
<td>Use this option to add SNMP Manager hosts.</td>
<td>Null</td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> The maximum number of SNMP Manager hosts that are allowed to be configured is four.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> The default values for all the parameters except SNMP Manager Host Name will be taken from previous host configuration for the new host.</td>
<td></td>
</tr>
<tr>
<td>Remove SNMP host</td>
<td>Use this option to remove the currently configured SNMP Manager hosts.</td>
<td>Null</td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> This option will be available only if at least one SNMP Manager host is configured.</td>
<td></td>
</tr>
</tbody>
</table>
## Parameter Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
</table>
| Log level             | This value specifies the severity of log messages. The values can be one of the following:  
                        | - 0 - Disable all logs  
                        | - 1 - Debug Level logs  
                        | - 2 - Info Level logs  
                        | - 3 - Warning Level logs  
                        | - 4 - Error Level logs  
                        | - 5 - Critical Level logs | 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        |
| Primary SNMP host     | Type (Y)es to set the current SNMP Manager host as the primary SNMP host.   | No            |

**Important:** Only one SNMP host can be set as the primary SNMP host.

## Remote Host Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Name or IP Address of Starent Platform</td>
<td>To establish an SFTP connection, type the hostname or IP address of the chassis.</td>
<td>Null</td>
</tr>
<tr>
<td>SFTP User Name</td>
<td>Type the user name used to log on to chassis.</td>
<td>Null</td>
</tr>
<tr>
<td>SFTP Password</td>
<td>Type the password used to log on to chassis.</td>
<td>Null</td>
</tr>
</tbody>
</table>

**Important:** This parameter is applicable only if the source or destination is at remote location.

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 *ESS Server Configuration* section in this guide.
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 ESS Server Configuration section in this guide.

**Step 6**
After completion of ESS installation on node1, please perform switchover and then execute the 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 ESS, verify the status of the ESS cluster resource group by entering the following
command:

For Veritas cluster:

```
hasstatus
```

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/rdsk/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 --

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Node Name 1</th>
<th>State 1</th>
<th>Status 1</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS-hars clustems2</td>
<td>Offline</td>
<td>Offline</td>
<td>Offline</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Node Name 2</th>
<th>State 2</th>
<th>Status 2</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS-hars clustems1</td>
<td>Online</td>
<td>Online</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Uninstalling ESS Application

This section provides instructions on how to uninstall the 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 ESS application:

**Step 1** Change to the directory in which the 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 ESS installation directory upon installation of the ESS application.

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

The script stops the ESS server, Process Monitor application, and the 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 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 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:

```bash
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 ESS* and *Using the Maintenance Utility* sections.
Chapter 4
Configuring the ESS Server

This chapter includes the following topics:

- ESS Server Configuration
- Source and Destination Configuration
- Starting and Stopping ESS
- Restarting LESS
ESS Server Configuration

This section provides information about the ESS configuration file parameters. 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 ESS server configuration parameters and the corresponding descriptions.

**Important:** Any change in the `generic_ess_config` file requires ESS server restart.

### Table 1. ESS Server Configuration Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR 5x00 Parameters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>essdellocalrecordexpirytime</td>
<td>This specifies the time period (in days) for which files can be stored locally in ESS.</td>
<td>0</td>
</tr>
<tr>
<td>essdellocalrecordsstarttime</td>
<td>This specifies the time period (in hours) at which 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.</td>
<td>0</td>
</tr>
<tr>
<td>essbasedirectorypath</td>
<td>This specifies the ESS specific base directory path.</td>
<td><code>&lt;less_install_dir&gt;/ess/fetched_data</code></td>
</tr>
<tr>
<td>Miscellaneous Parameters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>logPath</td>
<td>This specifies the directory path where ESS stores the ESS logs.</td>
<td><code>&lt;less_install_dir&gt;/ess/log</code></td>
</tr>
<tr>
<td>resetfilecontent</td>
<td>If this flag is enabled, ESS pull instance on start/restart empties the file containing the entry of the last xDR file fetched from the chassis. The ESS assumes that this is a fresh start and will refetch all the files from chassis if ESS is configured not to delete files from chassis. This parameter is also used to reset the information maintained for identifying missing files. If this flag is set, each time when ESS instance restarts ESS will also ignore the past information about missing file identification and the file contents will be reset.</td>
<td>No</td>
</tr>
<tr>
<td>maxinfotimestampdiff</td>
<td>ESS uses this configurable to test whether 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. If the difference exceeds, ESS will assume fresh restart and will restart identifying missing files ignoring previous information. Minimum value allowed is 30 minutes and maximum allowed is 1440 minutes (24 hours). Default is 60 minutes.</td>
<td>60</td>
</tr>
</tbody>
</table>
## Configuring the ESS Server

### ESS Server Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServerIpAddress</td>
<td>This specifies the IP address that is used by 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. <strong>Important:</strong> In case of IPv6 address, configure global scope IP address, and not Link scope address like ‘fe80::8a5a:92ff:fe88:1536’.</td>
<td>N/A</td>
</tr>
<tr>
<td>ServerPort</td>
<td>This port is used when creating TCP sockets to avoid starting of similar ESS instances on the same ESS machine. The default value for this parameter is 22222. The limit is within 1025 to 65535. <strong>Important:</strong> Do not change this port unless it is absolutely required.</td>
<td>22222</td>
</tr>
</tbody>
</table>
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 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.

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l</td>
<td>Load the config file.</td>
</tr>
<tr>
<td>-v</td>
<td>Validate the config file.</td>
</tr>
<tr>
<td>-c</td>
<td>Clean all configurations.</td>
</tr>
<tr>
<td>-p</td>
<td>Print all configurations.</td>
</tr>
<tr>
<td>-h</td>
<td>Display help.</td>
</tr>
</tbody>
</table>
Table 2. Source and Destination Configuration Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Parameters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DirectoryPollInterval</td>
<td>This specifies the poll interval in seconds for pulling the xDR records from ASR 5x00 platform. The value must be an integer from 30 through 3600.</td>
<td>30</td>
</tr>
<tr>
<td>fileformat</td>
<td>This specifies the file format for xDR file naming convention.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>• [1] FIELDSEP(_) STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [2] FIELDSEP(_) STR_RULEBASENAME_TIMESTAMP_RSTIND_SEQUENCENO(0,999999999)_PSCNO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [3] FIELDSEP(_) STR_RULEBASENAME_TIMESTAMP_SEQUENCENO(0,999999999)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [4] FIELDSEP(_) STR-RULEBASENAME_STR_TIMESTAMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [6] FIELDSEP(_) STR_TIMESTAMP(MM_DD_YYYY+HH:MM:SS)_STR_STR(file)SEQUENCENO(1,429467295)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [8] FIELDSEP(_) STR_STR_TIMESTAMP(YYYYMMDDHHMMSS).EXT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In ESS 14.0 and later releases:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [9] STR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [10] ACR_FILEFORMAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In ESS 9.0 and earlier releases:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• [9] ACR_FILEFORMAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Important:</strong> Modification in file format requires restart of ESS.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You can also customize your own format according to the file naming convention.</td>
<td></td>
</tr>
<tr>
<td>DeleteFilesFromSource</td>
<td>If this flag is enabled this will cause deleting data records from the source directory after fetching. The possible values are:</td>
<td>y</td>
</tr>
<tr>
<td></td>
<td>• y – enable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• n – disable</td>
<td></td>
</tr>
</tbody>
</table>
### Parameter Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
</table>
| ReportMissedFiles            | 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:  

- y – enable
- n – disable

**Important:** This feature is allowed only if file naming format contains sequence number.

**Important:** 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. | 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 |
| 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 |
| PendingFileThreshold         | 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.  

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. | 0  |
<p>| 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 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 ESS can try to set up connection to remote host in case of connection failure. | 3  |
| ConnectionRetryFrequency     | This is the time interval after which 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 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  |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CreateHostNameDir</td>
<td>Type <em>(yes)</em> to create a directory with hostname while pushing the files to destination. To have this feature enabled it is necessary that <strong>HostName</strong> parameter has some value for given source.</td>
<td>y</td>
</tr>
</tbody>
</table>

**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 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, ESS will pull files only with matching filter string. 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          |
| RemoteHostName | 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 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, ESS will pull files only with matching filter string. 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**

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**

These are similar to the source parameters and the above list of common parameters.
Starting and Stopping ESS

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

```
./serv start
```

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

To stop the 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 ESS Maintenance and Troubleshooting chapter.
Restarting LESS

L-ESS can be restarted using any of the following procedures:

- Using Veritas Cluster Server
- Using serv script

Using Veritas Cluster Server

The following procedure is the preferred way of restarting the L-ESS when it is installed with Veritas:

**Step 1** Find the Veritas Group configured for LESS.

If L-ESS installation guide is followed, the configured Veritas Group should be `less-ha`. Otherwise, use the following command:

```
root@pnclustless1 # hagrp -list
```

```
less-ha            pnclustless1
less-ha            pnclustless2
```

**Step 2** Find the resource configured for L-ESS Application.

Usually, it is configured to be `less-app`. It can be confirmed using the following command:

```
root@pnclustless1 # hagrp -resources less-ha
```

```
less-apps-dg
less-apps-vol
less-apps-mnt
less-app
less-nic
less-ip
```

**Step 3** Check the current status of Veritas.

```
root@pnclustless1 # hastatus
```

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

```
group resource system message
------------- ------------------ ---------------
```


### Configuring the ESS Server

#### Restarting LESS

- `pnclustless1` **RUNNING**
- `pnclustless2` **RUNNING**

- `less-ha` **OFFLINE**
- `less-ha` **ONLINE**

---

- `less-apps-dg` **OFFLINE**
- `less-apps-dg` **ONLINE**
- `less-apps-vol` **OFFLINE**
- `less-apps-vol` **ONLINE**
- `less-apps-mnt` **OFFLINE**
- `less-apps-mnt` **ONLINE**

---

- `less-apps-mnt` **ONLINE**
- `less-app` **OFFLINE**
- `less-app` **ONLINE**
- `less-nic` **ONLINE**
- `less-nic` **ONLINE**

---

- `less-ip` **OFFLINE**
- `less-ip` **ONLINE**

---

Currently, **less-app** is online on **pnclustless2**

**Step 4** Bring this resource, **less-app**, offline by using the following command:

```
root@pnclustless1 # hares -offline less-app -sys pnclustless2
```

Now, the status of Veritas will change. The **less-app** will be offline on both the nodes.

```
root@pnclustless1 # hastatus
attempting to connect....
attempting to connect....connected
```

---

<table>
<thead>
<tr>
<th>group</th>
<th>resource</th>
<th>system</th>
<th>message</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Configuring the ESS Server

Restarting LESS

This can be confirmed by checking the status of L-ESS:

```
root@pnclustless2# <less_install_dir>/ess/serv status
```

```
PID  Process                                         Status
----------------------------------------------------------------
-  PS Monitor Application                  Not running
-  Local External Storage Server           Not running
```

**Step 5**  Now bring the resource online using the following command. Status of **less-app** will change to online.

```
root@pnclustless1 # hares -online less-app -sys pnclustless2
```

**Step 6**  Confirm it using **hastatus** and see if **less-ha** and **less-app** are online on **pnclustless2**.

```
root@pnclustless1 # hastatus
```
attempting to connect ....

attempting to connect ....connected

<table>
<thead>
<tr>
<th>group</th>
<th>resource</th>
<th>system</th>
<th>message</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>pnclustless1</td>
<td>RUNNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pnclustless2</td>
<td>RUNNING</td>
</tr>
<tr>
<td>less-ha</td>
<td></td>
<td>pnclustless1</td>
<td>OFFLINE</td>
</tr>
<tr>
<td>less-ha</td>
<td></td>
<td>pnclustless2</td>
<td>ONLINE</td>
</tr>
</tbody>
</table>

|                | pnclustless1 | less-apps-dg | OFFLINE   |
|                | pnclustless2 | less-apps-dg | ONLINE    |
| less-apps-vol  | pnclustless1 | less-apps-vol | OFFLINE   |
| less-apps-vol  | pnclustless2 | less-apps-vol | ONLINE    |
| less-apps-mnt  | pnclustless1 | less-apps-mnt | OFFLINE   |
| less-apps-mnt  | pnclustless2 | less-apps-mnt | ONLINE    |
| less-app       | pnclustless1 | less-app     | OFFLINE   |
| less-app       | pnclustless2 | less-app     | ONLINE    |
| less-nic       | pnclustless1 | less-nic     | ONLINE    |
| less-nic       | pnclustless2 | less-nic     | ONLINE    |
| less-ip        | pnclustless1 | less-ip      | OFFLINE   |
| less-ip        | pnclustless2 | less-ip      | ONLINE    |

**Step 7** Re-confirm it using:

```
root@pnclustless2# <less_install_dir>/ess/serv status
```

<table>
<thead>
<tr>
<th>PID</th>
<th>Process</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>17151</td>
<td>PS Monitor Application</td>
<td>Running</td>
</tr>
</tbody>
</table>

---

**ESS Administration and Reference, Release 18**
Using serv script

Another way for restarting L-ESS is to use “serv” script bundled with L-ESS. This is not the recommended way of restarting L-ESS on a Veritas Cluster.

Important: It should only be used in a single node installation. Using this on a cluster installation may lead to node switchover and may show a node to be faulted. However, it will not cause any loss of billing files.

Enter the following commands from <less_install_dir>/ess directory:

Step 1 Check the current status of L-ESS.

```
root@pnclustless2# ./serv status

PID  Process                          Status
-----------------------------------------------
17780  PS Monitor Application           Running
17812  Local External Storage Server    Running
```

Step 2 Stop L-ESS.

```
root@pnclustless2# ./serv stop
Stopping L-ESS. Please wait...
Stopping PS Monitor Application...
Stopping Local External Storage Server...
Checking if all L-ESS processes have been stopped...
Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Local External Storage Server is stopped.
```
root@pnclustless2# ./serv start

Please Wait ...

Starting L-ESS. Please wait...

checking if L-ESS is started successfully...

checking if L-ESS is started successfully...

Local ESS Storage Server started.

Capturing status, please wait for a while...

============================================================================
  0 18345 12:32:23  TS  59      00:01 /export/home/LESS-HJ/less/less/ess/3rdparty/python/solaris//bin/python /export/  1
  0 18359 12:32:23  TS  59      00:00 /export/home/LESS-HJ/less/less/ess/3rdparty/python/solaris//bin/python /export/  18345
  0 18338 12:32:20  TS  59      00:00 /export/home/LESS-HJ/less/less/ess/3rdparty/perl/solaris//bin/perl -w /export/h  1
============================================================================

Step 4  If there is a problem in stopping, use the following command to restart the server.

root@pnclustless2# ./serv forcestart

Restarting L-ESS. Please wait...

Trying to stop already running L-ESS...

Stopping PS Monitor Application...

Stopping Local External Storage Server...

Checking if all L-ESS processes have been stopped...

Some L-ESS processes are still running.

Checking if all L-ESS processes have been stopped...

Some L-ESS processes are still running.

Checking if all L-ESS processes have been stopped...

Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Some L-ESS processes are still running.
Checking if all L-ESS processes have been stopped...
Local External Storage Server is stopped.
Starting L-ESS...
checking if L-ESS is started succesfully...
checking if L-ESS is started succesfully...
Local ESS Storage Server started.

Capturing status, please wait for a while...

================================================================================
  0 18657 12:33:01 TS  59      00:00 /export/home/LESS-HJ/less/less/ess/3rdparty/python/solaris//bin/python /export/  18656
  0 18636 12:32:58 TS  59      00:00 /export/home/LESS-HJ/less/less/ess/3rdparty/perl/solaris//bin/perl -w /export/h  1
  0 18656 12:33:01 TS  59      00:01 /export/home/LESS-HJ/less/less/ess/3rdparty/python/solaris//bin/python /export  1
================================================================================
Chapter 5
ESS Maintenance and Troubleshooting

This chapter includes the following topics:

- Using the Maintenance Utility
- Using ESS Logs
- ESS Server Scripts
- Troubleshooting the 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 script can be used to manage the following processes of ESS Server:

- PS Monitor Application (PSMON)
- ESS

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

**Important:** 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 | hoststatus | status [<resource_name | resourcegroup_name>] }
```

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>start</td>
<td>Use this command to start each ESS process and PSMON.</td>
</tr>
<tr>
<td>stop</td>
<td>Stops the running ESS process and PSMON.</td>
</tr>
<tr>
<td>forcestart</td>
<td>Use this command to restart ESS and PSMON. This command will first stop already running ESS processes and then restart each process.</td>
</tr>
<tr>
<td>forcestop</td>
<td>Use this command to forcibly stop ESS process and PSMON. If ESS is not stopped by <code>serv stop</code> command, this command will be used.</td>
</tr>
<tr>
<td>switch</td>
<td>Use this command to switch over the resource group.</td>
</tr>
<tr>
<td>hoststatus</td>
<td>Displays the status of each source and destination host.</td>
</tr>
<tr>
<td>status</td>
<td>Displays the status of each of process/resource/resourcegroup. For stand-alone mode:</td>
</tr>
<tr>
<td></td>
<td>• Process monitor tool</td>
</tr>
<tr>
<td></td>
<td>• Local External Storage Server</td>
</tr>
<tr>
<td>version</td>
<td>This command will show the version of ESS build. It will also show the revision date.</td>
</tr>
</tbody>
</table>

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
```
The following is a sample output of the `serv hoststatus` command:

```
===================================================================
Host ID        State       Status      LastListedCount  ProcessedCount  FailedCount
===================================================================
clustems2_edr_1269433964.51   Disabled   -   -    0    0
clustems1_edr_1269434568.52   Enabled   Pulling   0    294    6
10.4.4.93_edr_1269434878.55   Enabled   Pulling    0    143    35
===================================================================
```

```
===================================================================
Host ID        State       Status      LastListedCount  ProcessedCount  FailedCount
===================================================================
local_edr_1269433964.54   Enabled   Pushing   1   294    0
local_data_1269434878.62   Enabled   Pushing   1   143    0
```

where,

- **Host ID** – source or destination name
- **State** – Source enabled/disabled for pull, or destination enabled/disabled for push
- **Status** – Current status of the source or destination
- **LastListedCount** – The latest count of files listed by the source or destination
- **ProcessedCount** – The number of files pulled/pushed successfully
- **FailedCount** – The number of files failed during the push/pull process
Using 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.

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 ESS Application in Stand-alone Mode section in this guide for details.

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

In 14.0 and later releases, the log file size can be a maximum of 50 MB.

In 9.0 and earlier releases, the log file size can be a maximum of 5 MB.

Each time 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`. 
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 ESS Server, ESS tasks can be separated by creating it as a Solaris project. This script is designed to add a dedicated project for 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 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 ESS project is allocated with two CPU shares to avoid starvation of 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 ESS Server or if added allocate sufficient shares to 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 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 ESS and rest can be left for other processes. The configuration related to ESS resource pool is available in less_pool.cfg file.

**Important:** 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 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 ESS is not privileged for configured project, then script will not start ESS.

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 ESS manually enter the following command from the <less_install_dir>/ess directory:

```
./start_serv.sh
```

### Configuring Veritas Cluster to Start 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 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 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 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:

- `essdellocalrecordsexpirytime`: 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.
- `essdellocalrecordsstarttime`: This value in hours indicates the starting hour when the ESS will start deleting older files.

ℹ️ **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]
```

ℹ️ **Important**: The logs for the cleanup script are generated in a file located at `ess/log/deleteLocalFiles_%timestamp%.log`. 
## Troubleshooting the ESS

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

### Table 3. Troubleshooting ESS

<table>
<thead>
<tr>
<th>Problem</th>
<th>Troubleshooting Method</th>
</tr>
</thead>
</table>
| The ESS application cannot connect/login to the ASR 5x00 platform. | - Make sure that you are supplying the correct user name, password and chassis’ host name or IP address.  
- Make sure that you created an admin or config-admin account that is enabled for SFTP in the correct context.  
- Make sure that you have created SSH keys on the chassis.  
- Make sure that you have enabled the SFTP subsystem on the chassis.  
- Make sure that you can manually create SFTP connection from ESS to chassis with same configured user name, password and host name/IP address of the chassis.  
  For example:
  ```
sftp lessadmin@qain5  
Connecting to qain5...  
lessadmin@qain5's password: sftp>
  ```  
- If SNMP support is configured trap notification raised due to connection failure may provide additional information on why ESS could not connect to chassis. |
| The ESS application cannot connect/login to the Remote destination. | - Make sure that you are supplying the correct user name, password and remote destination host name or IP address.  
- Make sure that the supplied user is already created on remote destination.  
- Make sure that SSH daemon / SFTP Server is running on remote destination.  
- Make sure that you can manually create SFTP connection from ESS to remote destination with same configured user name, password and host name/IP address of the remote destination.  
  For example:
  ```
sftp lessadmin@qain5  
Connecting to qain5...  
lessadmin@qain5's password: sftp>
  ```  
- If SNMP support is configured trap notification raised due to connection failure may provide additional information on why ESS could not connect to remote destination. |
<table>
<thead>
<tr>
<th>Problem</th>
<th>Troubleshooting Method</th>
</tr>
</thead>
</table>
| ESS is not retrieving any files.    | • Make sure that you have specified correct source directory paths for chassis.  
• Make sure that you have specified the correct destination directory path for configured destinations.  
• Make sure that you have configured ESS to fetch respective files and have configured destination for respective files.  
• Make sure that you have configured ECS to generate billing files correctly. Try fetching file manually from chassis.  
• Make sure that the disk on which ESS directories reside and disk where destination directories reside have sufficient free space.  
• If SNMP feature is enabled then trap notification raised for ESS file transfer failure may provide additional information on the reasons for the failure.  
• Check if compression related parameters are in sync at ESS side and at the chassis side. |
| ESS is not starting                  | • Make sure no ESS Server is already running on same machine.  
• Make sure that TCP port configured in ESS config file as 'ServerPort' is not blocked by any other process.  
• Make sure that disk is not full.  
• If config file is modified after installation, check if it is correctly modified. |
| ESS is generating alarm 'starLESSPullIntervalMissed' | • Check if network latency between chassis and ESS is higher than usual.  
• Check if file size is larger than expected.  
• Check if file poll interval is correctly set. |
### Problem: Files are accumulating on chassis

- Make sure that there is no high network latency between ESS and chassis.
- Make sure that file generation rate is not too high on chassis.
- Check if ESS is loosing connections repeatedly.
- Check if CPU consumption of ESS is higher than expected.
- Check if SSH Daemon on chassis is busier than expected.
- Check if any other application residing on ESS is causing heavy system resource consumption.
- Make sure that ESS processes are running in FSS scheduler if ESS is started with priority based solution. This can be tested by using `ps -cafe` command. For example, all below processes are running under FSS scheduler.

```
# ps -cafe | grep ess
```

```
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.py

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
```

### Problem: ESS is generating alarm 'starLESSThreshDiskUsage'

- Free the local disk containing ESS directories if it is over utilized.
- Check if disk threshold is properly configured.
- Check if cleanup script is running and is periodically removing the files from intended paths.

### Problem: ESS is generating alarm 'connectionfail'

- Check if the IP/host name address is properly configured.
- Check if the user name is properly configured.
- Check if the password is properly configured.

In case of any failure, check the 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.sh`. 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 (`lesssupportDetails.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.sh [--level=...] [--xmlfile=...] [--help]
```

<table>
<thead>
<tr>
<th>Keyword/Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--level</td>
<td>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</td>
</tr>
<tr>
<td>--xmlfile</td>
<td>Specifies the xml file name to be used for collecting the log. Default: getSupportDetails.xml</td>
</tr>
<tr>
<td>--help</td>
<td>Displays the supported keywords/variables.</td>
</tr>
</tbody>
</table>

For example, `./getSupportDetails.sh --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:
    On both Solaris and Linux:
    ```
    netstat -nr
    ifconfig -a
    df -v
    uname -a
    ps -eaf
    ```
    On Solaris:
    ```
    showrev
    prstat 1 1
    ```
    On Linux:
    ```
    top -n 1 -b
    env
    ```

- Level 3:
  - Logs from level 2
  - Listing of directory pointed by "essbasedirectorypath" from ess_config file
  - Output of the following commands:
    On Linux:
    ```
    rpm -q --all --queryformat '%-30{NAME}\t%{VERSION}\t%-60{SUMMARY}\t%{GROUP}\n'
    cat /proc/cpuinfo
    cat /proc/meminfo
    ```
    On Solaris:
    ```
    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 ESS using python scripts, or the CDR files can be automatically pushed by chassis to any external server, in this case, ESS. 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 ESS. Once the file is transferred successfully, according to the configuration, the file will be either removed from the chassis or kept as is.

This Appendix includes the following topics:

- Configuring HDD
- Configuring Push Functionality
- ESS Directory Structure
- Log Maintenance
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
```

In 12.3 and earlier releases, see the `HDD Storage` chapter in the `AAA and GTPP Interface Administration and Reference` for more information on HDD. In 14.0 and later releases, refer to the `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 the SSH Daemon is running on the 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 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 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 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 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 ESS.
  - Changing transfer mode from ‘pull’ to ‘push’ - You should first remove the entry of chassis’ host from the list of hosts maintained in ESS configuration file. Then disable ‘pull’ from 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, 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 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 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:starent@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 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.
ESS Directory Structure

This section describes the internal directory structure of the 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 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 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)