Oracle® Switch ES2-72 and Oracle Switch ES2-64 Configuration Guide

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Contents

Using This Documention

- **Overview –** Provides basic configuration steps needed to setup the Oracle Switch ES2-72 and Oracle Switch ES2-64. Basic L2/L3 examples describe how to use the Sun Ethernet Fabric Operating System (SEFOS) features
- **Audience –** Enterprise network and system administrators
- **Required knowledge –** Advanced experience working with software

Product Documentation Library

Documentation and other resources for this product are included in the documentation library at http://www.oracle.com/goto/es2-72_es2-64/docs.

Feedback

Provide feedback about this documentation at http://www.oracle.com/goto/docfeedback.

Administering the Switch

The Oracle Switch ES2-72 and ES2-64 (switch) architecture includes two CPUs, a separate SP, and a host CPU. Both the SP and the host run Oracle ILOM to provide the Oracle ILOM CLI for management. The SP and host must be configured independently.

These tasks describe how to prepare the switch for management tasks.

Description	Links
Understand how the switch uses Oracle ILOM	"Oracle ILOM Overview" on page 11
Connect to the SP and access the Oracle ILOM interface.	"Connect to the Serial Console for Initial Configuration" on page 13
Configure network management from the web interface or through the NET MGT port.	"Configure Other Network Settings (Oracle ILOM Web Interface)" on page 18
Stop, start, or restart the SEFOS Host	"Stopping, Starting, and Restarting the Host" on page 19
Log out of the Oracle ILOM CLI.	"Log Out of the Oracle ILOM CLI" on page 21

Related Information

- "Administering SEFOS"
- "Configuring the Switching Feature"
- "Configuring the Routing Feature"

Oracle ILOM Overview

The switch architecture includes two CPUs, a separate SP, and a host CPU. Both the SP and the host run Oracle ILOM to provide the Oracle ILOM CLI for management. The SP and host must be configured independently.

Oracle ILOM enables you to actively manage the switch, providing the same administrative look and feel found on Oracle servers. Oracle ILOM enables you to:

- Connect to SEFOS.
- View the current status of sensors and indicators on the system.
- Determine the hardware configuration of your system.
- Receive generated alerts about system events in advance by using IPMI PETs or SNMP traps.
- Manage SEFOS users.
- Upgrade firmware for all components on the switch through either CLI or web interface.
- Configure standard Oracle ILOM services, such as:
  - Clock/NTP
  - Serial port
  - Network
  - Syslog
  - SNMP
  - SMTP
  - Email alert notification
  - Web server
  - SSH
  - IPMI
  - CLI

Note - For details on how to configure these services, refer to the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management – CLI Procedures Guide* at: `http://www.oracle.com/pls/topic/lookup?ctx=ilom30`

Oracle ILOM does not support the following features on the switch.

- Server-oriented features, such as:
  - Power management
  - Storage redirection
  - Remote console

Related Information

-
-

▼ Connect to the Serial Console for Initial Configuration

The instructions in this topic assume that you are connecting to Oracle ILOM using a serial connection directly to the switch. For SER MGT pinout, baud rate, and parity information, refer to *Switch Installation*, SER MGT port.

1. **If the switch is not already powered on, connect the switch power supplies to a power source.**

2. **For the initial configuration of the switch, connect a serial console to the SER MGT port on the switch.**

   For more information about connecting devices to the SER MGT and NET MGT ports, refer to *Switch Installation*.

3. **Press Enter on the console keyboard to open a connection to Oracle ILOM running on the SP.**

   ```
   SUNSPnnnnnnnnnn login:
   ```

4. **Log in to Oracle ILOM running on the SP.**

   The default user is `root`. The default password is `changeme`.

   ```
   ORACLESP-AKCH444444 login: root
   Password: changeme
   Detecting screen size; please wait...done
   Oracle(R) Integrated Lights Out Manager
   Version 3.2.x rxxxx
   Copyright (c) 2015, Oracle and/or its affiliates. All rights reserved.
   Warning: password is set to factory default.
   Warning: HTTPS certificate is set to factory default.
   Hostname: xxxxxxxx
   ->
   ```

5. **Configure network management on the SP.**

   See “Configure Network Management on the SP” on page 14.

Related Information

- “Configure Network Management on the SP” on page 14
- “Configure the Host Network Management From the CLI” on page 16
- “Configure Other Network Settings (Oracle ILOM Web Interface)” on page 18
- “Log Out of the Oracle ILOM CLI” on page 21

▼ Configure Network Management on the SP

dhcp is enabled by default, so the SP can get the network configuration automatically if there is a DHCP server on the network.

The names and addresses in the following examples are only for demonstration.

Note - Management network configuration is not needed if you plan to only use a serial console to access the switch. However, configuring network management will allow multiple administrators to manage the switch remotely.

---

1. Log in to Oracle ILOM running on the SP.

```
ORACLESP-AKCH444444 login: root
Password: changeme
Detecting screen size; please wait...done
Oracle(R) Integrated Lights Out Manager
Version 3.2.5.60 r98416
Copyright (c) 2015, Oracle and/or its affiliates. All rights reserved.
Warning: password is set to factory default.
Warning: HTTPS certificate is set to factory default.
Hostname: ORACLESP-AKCH444444
->
```

2. Discover the network configuration.

```
-> cd /SP/network
/SP/network

-> show
 /SP/network
    Targets:
        ipv6
        test
    Properties:
        commitpending = (Cannot show property)
        dhcp_clientid = none
        dhcp_server_ip = 10.134.178.5
        ipaddress = 10.134.178.170
        ipdiscovery = dhcp <---------
        ipgateway = 10.134.178.1
        ipnetmask = 255.255.255.0
        macaddress = 00:21:28:79:8B:58
        pendingipaddress = 10.134.178.170
        pendingipdiscovery = dhcp
        pendingipgateway = 10.134.178.1
        pendingipnetmask = 255.255.255.0
        pendingvlan_id = (none)
        state = enabled
```

```
        vlan_id = (none)

    Commands:
        cd
        set
        show
```

3. Configure static network settings on the SP (optional).

```
-> set pendingipaddress=10.134.178.170
Set 'pendingipaddress' to '10.134.178.170'
-> set pendingipnetmask=255.255.255.0
Set 'pendingipnetmask' to '255.255.255.0'
-> set pendingipgateway=10.134.178.1
Set 'pendingipgateway' to '10.134.178.1'
-> set pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
-> set commitpending=true
Set 'commitpending' to 'true'

-> show
/SP/network
    Targets:
        ipv6
        test

    Properties:
        commitpending = (Cannot show property)
        dhcp_clientid = none
        dhcp_server_ip = none
        ipaddress = 10.134.178.170
        ipdiscovery = static <---------
        ipgateway = 10.134.178.1
        ipnetmask = 255.255.255.0
        macaddress = 00:21:28:79:8B:58
        pendingipaddress = 10.134.178.170
        pendingipdiscovery = static
        pendingipgateway = 10.134.178.1
        pendingipnetmask = 255.255.255.0
        pendingvlan_id = (none)
        state = enabled
        vlan_id = (none
```

4. Set the SP `hostname`.

```
-> set /SP/ hostname=ES2-72-swi-sp
Set 'hostname' to 'ES2-72-swi-sp'
```

Once the network configuration is done on the SP, it can be accessed and modified via `ssh`.

Note - You can also use the Oracle ILOM web interface to configure other management related settings. See “Configure Other Network Settings (Oracle ILOM Web Interface)” on page 18.

Related Information

- “Connect to the Serial Console for Initial Configuration” on page 13
- “Configure the Host Network Management From the CLI” on page 16
- “Configure Other Network Settings (Oracle ILOM Web Interface)” on page 18
- “Log Out of the Oracle ILOM CLI” on page 21

▼ Configure the Host Network Management From the CLI

Once the network configuration is done on the SP (“Configure Network Management on the SP” on page 14), it can be accessed via ssh. Host configuration can be done by logging into the SP's serial console or by ssh.

1. **`ssh` to the SP's IP address.**

```
# ssh root@10.134.178.170
Password: changeme
Oracle(R) Integrated Lights Out Manager
Version 3.2.5.60 r98416
Copyright (c) 2015, Oracle and/or its affiliates. All rights reserved.
Warning: password is set to factory default.
Warning: HTTPS certificate is set to factory default.
Hostname: ES2-72-swi-sp
->
```

2. **Power on the host and connect to the host's serial console.**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
-> start /HOST/console
Are you sure you want to start /HOST/console (y/n)? y
```

The switch host's Oracle ILOM login prompt appears.

3. **Log in to the Oracle ILOM CLI on the host.**

The default user is `root`. The default password is `changeme`.

The switch Oracle ILOM login prompt appears.

```
Detecting screen size; please wait...done
Oracle(R) Integrated Lights Out Manager
Version xxxxxxx
Copyright (c) 2015, Oracle and/or its affiliates. All rights reserved.
...
Hostname: ES2-72-primary
ES2->
```

4. Discover the network configuration for the host.

```
ES2-> cd /SP/network/
/SP/network
ES2-> show
 /SP/network
    Targets:
        ipv6
        test
    Properties:
        commitpending = (Cannot show property)
        dhcp_clientid = none
        dhcp_server_ip = 10.134.178.5
        ipaddress = 10.134.178.167
        ipdiscovery = dhcp
        ipgateway = 10.134.178.1
        ipnetmask = 255.255.255.0
        macaddress = 00:19:0F:16:D4:19
        pendingipaddress = 10.134.178.167
        pendingipdiscovery = dhcp
        pendingipgateway = 10.134.178.1
        pendingipnetmask = 255.255.255.0
        state = enabled
        vlan_id = (none)

    Commands:
        cd
        set
        show
```

5. Configure the network configuration for the host (optional).

`dhcp` is enabled by default, so the host can get the network configuration automatically if there is a `dhcp` server on the network.

The names and addresses in the following examples are only for demonstration.

Note - Management network configuration is not needed if you plan to only use a serial console to access the switch. However, configuring network management will allow multiple administrators to manage the switch remotely.

```
ES2-> set pendingipaddress=10.134.178.167
Set 'pendingipaddress' to '10.134.178.167'
```

```
ES2-> set pendingipnetmask=255.255.255.0
Set 'pendingipnetmask' to '255.255.255.0'
ES2-> set pendingipgateway=10.134.178.1
Set 'pendingipgateway' to '10.134.178.1'
ES2-> set pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
ES2-> set commitpending=true
Set 'commitpending' to 'true'

ES2-> show
/SP/network
    Targets:
        ipv6
        test

    Properties:
        commitpending = (Cannot show property)
        dhcp_clientid = none
        dhcp_server_ip = none
        ipaddress = 10.134.178.170
        ipdiscovery = static
        ipgateway = 10.134.178.1
        ipnetmask = 255.255.255.0
        macaddress = 00:21:28:79:8B:58
        pendingipaddress = 10.134.178.170
        pendingipdiscovery = static
        pendingipgateway = 10.134.178.1
        pendingipnetmask = 255.255.255.0
        pendingvlan_id = (none)
        state = enabled
        vlan_id = (none
```

Related Information

- “Connect to the Serial Console for Initial Configuration” on page 13
- “Configure Network Management on the SP” on page 14
- “Configure Other Network Settings (Oracle ILOM Web Interface)” on page 18
- “Log Out of the Oracle ILOM CLI” on page 21

▼ Configure Other Network Settings (Oracle ILOM Web Interface)

1. **In a web browser's location bar, type the IP address of the SP as configured earlier.**

   See “Configure Network Management on the SP” on page 14.

   The switch Oracle ILOM login screen appears. The default user name is `root`. The default password is `changeme`.

2. **Select Configuration from the first row of tabs.**
3. **Select Network from the second row of tabs.**
   The Network Settings page for the switch appears.
4. **Configure the network settings as desired.**
5. **Click Save.**

Note - When you click Save, connections to the web interface might be lost. You must reestablish connection to the web interface.

Related Information

- “Connect to the Serial Console for Initial Configuration” on page 13
- “Configure Network Management on the SP” on page 14
- “Configure the Host Network Management From the CLI” on page 16
- “Log Out of the Oracle ILOM CLI” on page 21

Stopping, Starting, and Restarting the Host

You can start, stop, or restart the host from the SP prompt.

- “Stop the Host” on page 19
- “Start the Host” on page 20
- “Restart the Host” on page 20

▼ Stop the Host

1. **If you are at the host prompt, get to the SP prompt.**

   - **You can press `Esc` and `Shift-9` to get the SP prompt.**

     ```
     ES2-72-primary SEFOS# Esc+Shift-9
     Serial console stopped.
     ->
     ```

   - **You can exit from SEFOS before returning to the SP prompt.**

     ```
     ES2-72-primary SEFOS# exit
     ```

```
Connection closed by foreign host.
cd: The session with /SYS/fs_cli has ended.
ES2-> Esc+Shift-9
Serial console stopped.
->
```

2. **Stop the host.**

   - **You can gracefully stop the host.**

     ```
     -> stop /SYS
     Are you sure you want to stop /SYS (y/n)? y
     Stopping /SYS
     ```

   - **You can forcefully the host.**

     ```
     -> stop -f /SYS
     Are you sure you want to immediately stop /SYS (y/n)? y
     Stopping /SYS immediately
     ```

Related Information

- “Start the Host” on page 20
- “Restart the Host” on page 20

Start the Host

- **Start SEFOS from the switch SP prompt.**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
->
```

Related Information

- “Stop the Host” on page 19
- “Restart the Host” on page 20

Restart the Host

- **Restart (reset) SEFOS when it is already running.**

```
-> reset /SYS
Are you sure you want to reset /SYS (y/n)? y
Performing hard reset on /SYS
->
```

Related Information

- “Stop the Host” on page 19
- “Start the Host” on page 20

▼ Log Out of the Oracle ILOM CLI

- **When you are finished with Oracle ILOM, exit the Oracle ILOM CLI.**

```
-> exit
```

Related Information

- “Connect to the Serial Console for Initial Configuration” on page 13
- “Configure Network Management on the SP” on page 14
- “Configure the Host Network Management From the CLI” on page 16
- “Configure Other Network Settings (Oracle ILOM Web Interface)” on page 18

Administering SEFOS

These topics describe how to use SEFOS for common management tasks.

Related Information

- “Administering the Switch”
- “Configuring the Switching Feature”
- “Configuring the Routing Feature”

SEFOS Setup Tasks

This table describes the tasks to prepare the SEFOS interface for subsequent management activities.

No.	Description	Links
1.	Familiarize yourself with basic SEFOS topologies and the default configuration.	“Understanding SEFOS Basics” on page 24
2.	Connect to SEFOS.	“Connect to SEFOS” on page 26
3.	(Optional) Configure the environment to give yourself more time for learning.	“Enable or Disable the Timeout for Line Connections” on page 31
4.	Create the interfaces that you will be using.	“Configure the IP Address for an Interface” on page 31
5.	Create a name for the file that will contain configuration information.	“Configure the Name of the Configuration File” on page 32

No.	Description	Links
6.	Set the default VLAN ID.	“Configure the Default VLAN ID” on page 33
7.	Configure where to display the debug file.	“Configure Debug Logging” on page 36
8.	Configure ACL filters on interfaces.	“Configure ACL Filters” on page 36
9.	Classify packets to a service based on the ACL filters.	“Configure QoS” on page 39
10.	Monitor packets from port 25 on port 26.	“Configure Port Mirroring” on page 42
11.	Limit interface traffic.	“Configure Rate Limiting” on page 44
12.	(Optional) Set up how you want save configurations, as they change (incremental) or saving them periodically (auto-save).	“Configuring Save Parameters” on page 45
13.	Save configuration information to the backup file.	“Save the Configuration to a File” on page 47
14.	Save a copy of the config file to a remote location.	“Copy a Configuration File to a Remote Location” on page 49

Related Information

- “Understanding SEFOS Basics” on page 24
- “Configuring the SEFOS Environment” on page 30
- “Managing Configuration Files” on page 47
- “Managing Log Files” on page 51

Understanding SEFOS Basics

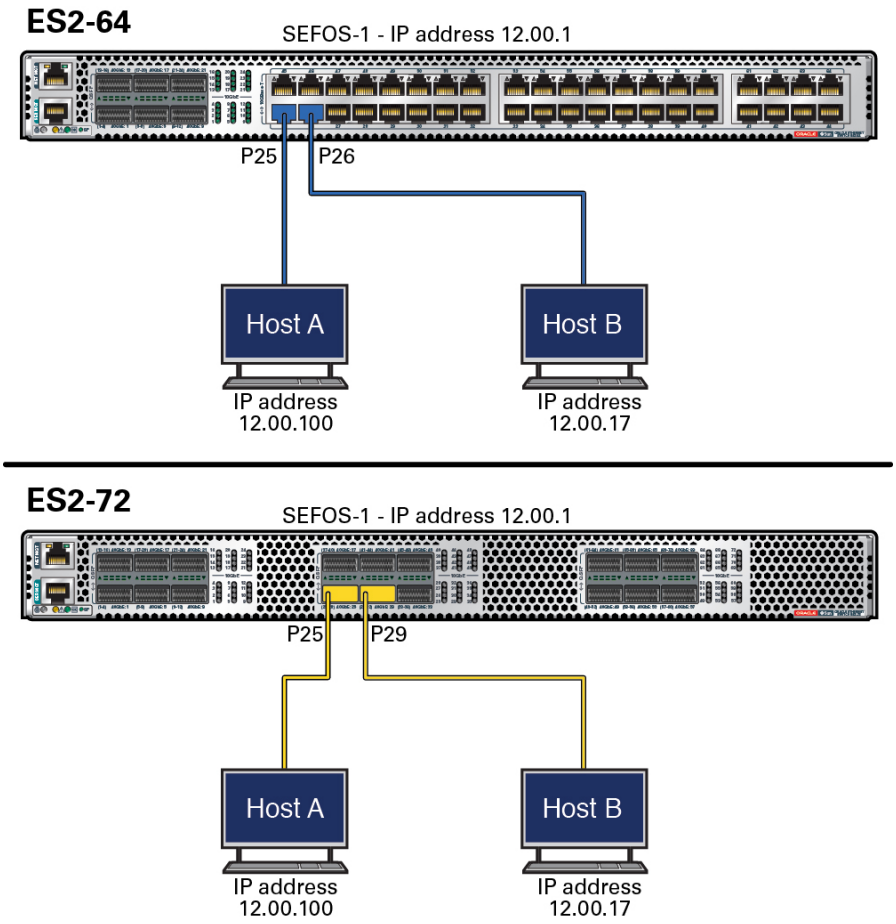
These topics describe the features of SEFOS.

- “Basic SEFOS Topology” on page 25
- “Port Terminology” on page 25
- “Stop and Start SEFOS” on page 27
- “Connect to SEFOS” on page 26
- “Disconnect From SEFOS” on page 27

Related Information

- “SEFOS Setup Tasks” on page 23
- “Configuring the SEFOS Environment” on page 30
- “Managing Configuration Files” on page 47
- “Managing Log Files” on page 51

Basic SEFOS Topology



Related Information

- “Connect to SEFOS” on page 26
- “Disconnect From SEFOS” on page 27

Port Terminology

- 40G-capable ports are labeled as XL-Ethernet (**xl**).

- 10G-capable ports are labeled extreme-ethernet (**ex**).

Oracle Switch ES2-72 has 18 QSFP+ ports that are 40G-capable. Ports on Oracle Switch ES2-72 are referred to as xl-ethernet 0/1-72.

Oracle Switch ES2-64 has 6 QSFP+ ports which are 40G-capable and 40 RJ45 ports which are 10G-capable. Ports on Oracle Switch ES2-64 are referred to as xl-ethernet 0/1-24 and extreme-ethernet 0/25-64.

▼ Connect to SEFOS

To configure the SEFOS software, you must first establish a connection to your system and then connect to SEFOS through Oracle ILOM.

1. **Log in to the Oracle ILOM CLI.**
   See "Connect to the Serial Console for Initial Configuration" on page 13.

2. **Connect to SEFOS.**

```
ES2-> cd /SYS/fs_cli
cd: connecting to Fabric Switch CLI

ES2-72-primary SEFOS#
ES2-72-primary SEFOS# show system information

Hardware Version : 3.3.11_00306215
Firmware Version : ES2-R72-2.0.0.1

Hardware Part Number : 1-0-0
Software Serial Number : 1-0-0
Software Version : 7.3.2
Switch Name : Oracle-ES2-72
System Contact :
System Location :
Logging Option : Console Logging
Device Uptime : 0 Days, 0 Hrs, 6 Mins, 51 Secs
Login Authentication Mode : Local
Config Save Status : Not Initiated
Remote Save Status : Not Initiated
Config Restore Status : Not Initiated
Traffic Separation Control : none
ES2-72-primary SEFOS#
```

You are now connected to SEFOS, and you can begin to configure the SEFOS features.

Related Information

- "Basic SEFOS Topology" on page 25

- “Disconnect From SEFOS” on page 27

Disconnect From SEFOS

1. **When you are finished using SEFOS, return to the Oracle ILOM prompt.**

```
SEFOS-1# exit
Connection closed by foreign host.
cd: The session with /SYS/fs_cli has ended.

->
```

2. **When you are finished using Oracle ILOM, exit the interface.**

```
-> exit
```

Related Information

- “Basic SEFOS Topology” on page 25
- “Connect to SEFOS” on page 26

Stop and Start SEFOS

If you are accessing the switch through ssh or the SER MGT port, return to the SP prompt to stop SEFOS on the host.

1. **Exit from SEFOS and return to the host ILOM prompt.**

```
ES2-72-primary SEFOS# exit
Connection closed by foreign host.
cd: The session with /SYS/fs_cli has ended.
ES2->
```

2. **Stop SEFOS.**

```
ES2-> stop /SYS/sefos/
Are you sure you want to stop /SYS/sefos (y/n)? y
stop: SEFOS stopped successfully.
```

3. **Start SEFOS.**

```
ES2-> start /SYS/sefos
Are you sure you want to start /SYS/sefos (y/n)? y
start: Please wait while sefos comes up, this can take anywhere from 30 seconds to 2 minutes
 depending on the configuration
.......................

start: SEFOS started successfully.
```

▼ Create a Local User

1. **Log in to the Oracle ILOM CLI on the host.**
   See "Connect to the Serial Console for Initial Configuration" on page 13.

2. **Create a user and set the user `fs_privilege` attribute upon creation.**

   ES2-> **create /SP/users/***username* **fs_privilege=***level*

   where:

   - *username* is the user name.
   - *level* is the privilege level (1 for read-only, 15 for full administrative).

   For example:

```
ES2-> create /SP/users/user15 fs_privilege=15
Creating user...
Enter new password: ********
Enter new password again: ********
Created /SP/users/user15
```

3. **View the user parameters.**

```
ES2-> show /SP/users/user15

 /SP/users/user15
   Targets:
     ssh
   Properties:
     role = o
     password = *****
     fs_privilege = 15

   Commands:
     cd
     set
     show
```

```
ES2->
```

4. **Repeat Step 2 and Step 3 for each SEFOS user.**

Note - You can perform similar steps from the Oracle ILOM CLI on the SP to create local users on SP.

---

5. **After you configure all SEFOS users, configure SEFOS.**
   See “Administering SEFOS”.

Related Information

- “SEFOS Setup Tasks” on page 23
- “Understanding SEFOS Basics” on page 24
- “Change a SEFOS User Privilege Level” on page 29
- “Configuring the SEFOS Environment” on page 30
- “Managing Configuration Files” on page 47
- “Managing Log Files” on page 51

▼ Change a SEFOS User Privilege Level

1. **Log in to the Oracle ILOM CLI.**
   See “Connect to the Serial Console for Initial Configuration” on page 13.

2. **Change into the directory for that user.**

```
ES2-> cd /SP/users/user15
```

3. **Change a user privilege level for an existing user.**
   Level 1 allows read-only, and level 15 allows full administrative privileges.
   For example:

```
ES2-> set fs_privilege=15
Set 'fs_privilege' to '15'
```

4. **Verify the user privileges.**

```
ES2-> show

 /SP/users/user15
   Targets:
        ssh
```

```
   Properties:
        role = o
        password = *****
        fs_privilege = 15

    Commands:
        cd
        set
        show

ES2->
```

Related Information

- “SEFOS Setup Tasks” on page 23
- “Understanding SEFOS Basics” on page 24
- “Create a Local User” on page 28
- “Configuring the SEFOS Environment” on page 30
- “Managing Configuration Files” on page 47
- “Managing Log Files” on page 51

Configuring the SEFOS Environment

Use these tasks to configure the SEFOS environment for the switch.

- “Enable or Disable the Timeout for Line Connections” on page 31
- “Configure the IP Address for an Interface” on page 31
- “Configure the Name of the Configuration File” on page 32
- “Configure the Default VLAN ID” on page 33
- “Enable or Disable Trap Generation on an Interface” on page 34
- “Configure Debug Logging” on page 36
- “Configure ACL Filters” on page 36
- “Configure QoS” on page 39
- “Configure Port Mirroring” on page 42
- “Configure Rate Limiting” on page 44
- “Configuring Save Parameters” on page 45

Related Information

- “SEFOS Setup Tasks” on page 23
- “Understanding SEFOS Basics” on page 24

- "Managing Configuration Files" on page 47
- "Managing Log Files" on page 51

Enable or Disable the Timeout for Line Connections

If you leave a session idle for too long, the session might get disconnected and return you to the Oracle ILOM prompt. This task clears the timeout for line connections so that idle sessions are not disconnected.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

3. **Enable or disable the timeout for line connections.**

```
SEFOS-1(config)# line vty
SEFOS-1(config-line)# no exec-timeout
SEFOS-1(config-line)# exit
```

Related Information

- "SEFOS Setup Tasks" on page 23
- "Enable or Disable Trap Generation on an Interface" on page 34
- "Disconnect From SEFOS" on page 27

Configure the IP Address for an Interface

This task describes how to configure the IP address for sending and receiving the packets.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

3. **Enter Interface Configuration mode.**

```
SEFOS-1(config)# interface vlan 1
```

4. **Shut down the VLAN interface.**

Note - You must shut down the interface before you can configure the IP address for that interface.

```
SEFOS-1(config-if)# shutdown
```

5. **Configure the IP address and subnet mask.**

```
SEFOS-1(config-if)# ip address 12.0.0.1 255.0.0.0
```

6. **Bring up the VLAN interface.**

```
SEFOS-1(config-if)# no shutdown
```

7. **Exit Interface Configuration mode.**

```
SEFOS-1(config)# end
```

8. **View the configured interface IP address.**

```
SEFOS-1# show ip interface

vlan1 is up, line protocol is up
Internet Address is 12.0.0.1/8
Broadcast Address  12.255.255.255
```

Related Information

- "SEFOS Setup Tasks" on page 23

▼ Configure the Name of the Configuration File

This task describes how to write the configuration file to flash. This file is used as the restoration configuration file.

1. **Connect to SEFOS.**
   See “Connect to SEFOS” on page 26.

2. **Configure the configuration file name.**

   a. **Enter Global Configuration mode.**

   ```
   SEFOS-1# configure terminal
   ```

   b. **Configure the restoration configuration file name for the switch.**
   For example:

   ```
   SEFOS-1(config)# default restore-file myconfig.conf
   ```

   c. **Exit Global Configuration mode.**

   ```
   SEFOS-1(config)# end
   ```

3. **View the default configuration file name.**

```
SEFOS-1# show nvram
...
Config Restore Filename                    : myconfig.conf
...
```

Related Information

- “SEFOS Setup Tasks” on page 23
- “Managing Configuration Files” on page 47

▼ Configure the Default VLAN ID

This task describes how to write the VLAN ID to the flash. This ID is used as the default VLAN ID when the switch is restarted. Do not change the default VLAN ID when some configurations are already saved.

1. **Connect to SEFOS.**
   See “Connect to SEFOS” on page 26.

2. **Configure the default VLAN identifier.**

a. Enter Global Configuration mode.

```
SEFOS-1# configure terminal
```

b. Configure the default VLAN ID as 10.

```
SEFOS-1(config)# default vlan id 10
```

c. Exit Global Configuration mode.

```
SEFOS-1(config)# end
```

3. View the default VLAN ID.

```
SEFOS-1# show nvram
...
Config Save IP Address                    : 0.0.0.0
...
Default VLAN Identifier                     : 10
...
```

Note - After you have configured the default VLAN ID, you must restart the switch before saving any configuration.

Related Information

- "SEFOS Setup Tasks" on page 23
- "Configure Initial Settings" on page 57
- "Configure VLAN Forwarding" on page 60
- "Verify VLAN Membership" on page 61

▼ Enable or Disable Trap Generation on an Interface

This task describes how to enable or disable trap generation either on the physical interface or on the port-channel interface.

Note - Refer to the *Oracle ILOM 3.0 Daily Management – CLI Procedures Guide* for information to configure the SNMP manager for trap generation.

1. Connect to SEFOS.

See “Connect to SEFOS” on page 26.

2. **Disable the SNMP trap on the interface `xl-ethernet 0/1`.**

   a. **Enter Global Configuration mode.**

   ```
   SEFOS-1# configure terminal
   ```

   b. **Enter Interface Configuration mode for `xl-ethernet 0/1`.**

   ```
   SEFOS-1(config)# interface xl-ethernet 0/1
   ```

   c. **Type one of the following commands:**

   ```
   SEFOS-1(config-if)# snmp trap link-status
   ```

   ```
   SEFOS-1(config-if)# no snmp trap link-status
   ```

   d. **Exit Interface Configuration mode.**

   ```
   SEFOS-1(config-if)# end
   ```

3. **View the trap state for the interface `xl-ethernet 0/1`.**

```
SEFOS-1# show interface xl-ethernet 0/1
...
Link Up/Down Trap is enabled
...
```

or,

```
SEFOS-1# show interface xl-ethernet 0/1
...
Link Up/Down Trap is disabled
...
```

If the trap is enabled, the switch sends trap messages to the SNMP manager on specific events such as link up, link down, and so on.

Related Information

- “SEFOS Setup Tasks” on page 23

Configure Debug Logging

This task describes how to configure where the debug logs are to be displayed (on the console or to a file).

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Modify the logging option of debug traces.**

   a. **Enter Global Configuration mode.**

   ```
   SEFOS-1# configure terminal
   ```

   b. **Log the debug traces to a file.**

   ```
   SEFOS-1(config)# debug-logging file
   ```

   c. **Exit Global Configuration mode.**

   ```
   SEFOS-1(config)# end
   ```

3. **Verify the logging option.**

   ```
   SEFOS-1# show system information
   ...
   Logging Option                    : File Logging
   ...
   ```

Related Information

- "SEFOS Setup Tasks" on page 23
- "View Debug Logs" on page 52
- "Copy a System Log to a Remote Location" on page 51

Configure ACL Filters

The example in this task shows how to block the IP traffic from a host with an IP address of `12.0.0.100`. See "Basic SEFOS Topology" on page 25 for the topology for this task.

The filter type can be extended or standard. Standard filters filter the traffic based on the source IP address and the destination IP address. Extended filters can also specify the protocol ID, TCP/UDP port numbers, DSCP values, and flow label. In this example, the IP packets with `12.0.0.100` as the source address are filtered.

ACL filters filter packets at the hardware based on certain filtering criteria configured or programmed in the switch. The switch examines each packet to determine if it should be blocked or if it should be forwarded based on the configured access lists. Type the following commands on the `SEFOS-1` switch.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Configure the IP address of the switch to `12.0.0.1`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface vlan 1
SEFOS-1(config-if)# shutdown
SEFOS-1(config-if)# ip address 12.0.0.1  255.0.0.0
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# interface xl-ethernet 0/26
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
```

3. **Create an IP filter with ID `11`.**

```
SEFOS-1(config)# ip access-list extended 11
```

4. **Deny the IP traffic from host `12.0.0.100` to any network or host.**

```
SEFOS-1(config-ext-nacl)# deny ip host 12.0.0.100 any
SEFOS-1(config-ext-nacl)# end
```

5. **`Ping` from host A to host B.**

```
# ping 12.0.0.17
12.0.0.17 is alive
```

6. **Apply the IP filter `11` to port `25`.**

```
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# ip access-group 11 in
SEFOS-1(config-if)# exit
SEFOS-1(config)# vlan 1
SEFOS-1(config-vlan)# ports xl-ethernet 0/25 xl-ethernet
0/26 untagged xl-ethernet 0/25 xl-ethernet 0/26
```

Note - You might see the following message if ports 25 and 26 are already in `VLAN 1`. If you see this message, you can ignore it.

```
% Member Ports cannot be added/deleted on Default VLAN
SEFOS-1(config-vlan)# end
```

7. **View the configuration details.**

```
SEFOS-1# show access-lists
...
IP address Type                 : IPV4
...
In Port List                    : X10/25
...
Filter Action                   : Deny
Status                          : Active
```

8. **Send the forwarding traffic from host A to host B in the same fashion as the `ping` from host A to host B in Step 5.**

   Packets sent from host A are not forwarded to port 26 because the filter action is set to `deny`. The `ping` to `12.0.0.17` from host A fails with no answer from `12.0.0.17`.

9. **Remove the IP filter from port `25`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# no ip access-group 11 in
SEFOS-1(config-if)# end
SEFOS-1# show access-lists
...
Status                          : InActive
```

10. **Send the forwarding traffic from host A to host B in the same fashion as the `ping` from host A to host B in Step 5.**

    The `ping` is answered from host B. Packets sent from host A are forwarded to port 26. The following two consecutive `ping` commands show that the `deny` filter action set in the ACL list was applied to one port and was removed from another port.

```
# ping 12.0.0.17
no answer from 12.0.0.17
# ping 12.0.0.17
12.0.0.17 is alive
```

Related Information

- “SEFOS Setup Tasks” on page 23
- “Configure QoS” on page 39
- “Configure Port Mirroring” on page 42
- “Configure Rate Limiting” on page 44

▼ Configure QoS

Packets received at the switch can be classified to a particular class of service based on the filters configured. Certain policies can be applied before forwarding the packets. The following task illustrates the classification of the TCP packets received in the switch and changing the DSCP value in the IP header of the TCP packets to 46.

See “Basic SEFOS Topology” on page 25 for the topology of this task. Connect port 25 to host A and port 26 to host B. Host B should have a command to dump traffic over a network interface such as `tcpdump` or `snoop`. If not, port 25 and port 26 can be connected to a data capturing device as shown in “Basic SEFOS Topology” on page 25.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Enable port `1` and port `2`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface xl-ethernet 0/26
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# vlan 1
SEFOS-1(config-vlan)# ports xl-ethernet 0/25 xl-ethernet
0/26 untagged xl-ethernet 0/25 xl-ethernet 0/26
```

You might see the following message if both interfaces are already in `VLAN 1`.

```
% Member Ports cannot be added/deleted on Default VLAN
SEFOS-1(config-vlan)# end
```

3. **Enable QoS.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# qos enable
SEFOS-1(config)# end
```

4. **Create an access control list filter for TCP packets.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# ip access-list extended 11
SEFOS-1(config-ext-nacl)# permit tcp any any
SEFOS-1(config-ext-nacl)# exit
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# ip access-group 11 in
SEFOS-1(config-if)# end
```

5. **Specify the class mapping for the incoming packet and policy mapping for the classified packet.**

   a. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

   b. **Create a class map and enter Class Map Configuration mode.**

```
SEFOS-1(config)# class-map 10
```

   c. **Configure the match criteria for the class map with the criteria specified by the access list 11 (configured in Step 4 as all TCP packets).**

```
SEFOS-1(config-cls-map)# match access-group ip-access-list 11
SEFOS-1(config-cls-map)# set class 100
```

   d. **Exit Class Map Configuration mode.**

```
SEFOS-1(config-cls-map)# exit
```

   e. **Create a policy map to apply to the packet before forwarding it.**

```
SEFOS-1(config)# policy-map 10
```

   f. **Create a policy map for class 100 packets and set the DSCP value in the IP header for the outgoing packets matched by this class as 46.**

```
SEFOS-1(config-ply-map)# set policy class 100 default-priority-type ipdscp 46
SEFOS-1(config-ply-map)# exit
```

46 (0x2e) is a decimal number. If an 8-bit TOS value is shown, it is shown as 0xb8 because 0x2e must be shifted left 2 bits to get the 6 bits of the DSCP value.

6. View the configuration details.

```
SEFOS-1# show access-lists
...
Filter Protocol Type            : TCP
IP address Type                 : IPV4
...
In Port List                      : X10/25
...

Filter Action                     : Permit
Status                            : Active...
L3FilterId                  : 11
PriorityMapId               : None
CLASS                       : 100
PolicyMapId                  : 10
...
SEFOS-1# show policy-map 10
QoS Policy Map Entries
----------------------
PolicyMapId  : 10IfIndex      : 0
Class        : 100
DefaultPHB   : IP DSCP 46
...
```

7. Verify the functionality of the policy configuration by generating 100 TCP packets.

From host A to host B, send TCP packets to host B and use the host-supported packet dumping command to verify the DSCP value.

```
# tcpdump -xx -n -i eth3 ip
...
16:34:27.979962 IP 12.0.0.100.905 > 12.0.0.17.shell:
...
16:34:27.980163 IP 12.0.0.17.shell > 12.0.0.100.905:
0x0000:  0014 4f6c 7de9 001b 2147 d479 0800 4500
0x0000:  001b 2147 d479 0014 4f6c 7de9 0800 45b8
...
```

These packets are received at port 26 and have a DSCP value 46. In this example, the `dump` command shows a DSCP value of 0xb8.

Related Information

- "SEFOS Setup Tasks" on page 23
- "Configure ACL Filters" on page 36
- "Configure Port Mirroring" on page 42
- "Configure Rate Limiting" on page 44

▼ Configure Port Mirroring

Port mirroring monitors the packets of a particular port on another port. The following example shows how to mirror all incoming packets on port 25 to port 26.

See "Basic SEFOS Topology" on page 25 for the topology for this task. Type the following commands on the `SEFOS-1` switch.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Configure the IP address of the switch as `12.0.0.1`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface vlan 1
SEFOS-1(config-if)# shutdown
SEFOS-1(config-if)# ip address 12.0.0.1  255.0.0.0
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# end
```

3. **View the `ping` between the host and the switch.**

```
SEFOS-1# ping 12.0.0.100

Reply Received From :12.0.0.100, TimeTaken : 60 msecs
Reply Received From :12.0.0.100, TimeTaken : 100 msecs
Reply Received From :12.0.0.100, TimeTaken : 90 msecs

--- 12.0.0.100 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss
```

The `ping` reply from host A to the switch is not captured at port 26, which is connected to the packet capturing device prior to the port-mirroring configuration.

4. **Type the following commands on the SEFOS-1 switch to enable mirroring for incoming packets at port 25 to port 26:**

   a. **Enter Global Configuration mode.**

   ```
   SEFOS-1# configure terminal
   ```

   b. **Configure the destination interface for mirroring as port 26.**

   ```
   SEFOS-1(config)# monitor session destination interface xl-ethernet 0/26
   ```

   c. **Configure the source interface for mirroring as port 25 and apply mirroring for incoming packets.**

   ```
   SEFOS-1(config)# monitor session source interface xl-ethernet 0/25 rx
   ```

   d. **Exit Global Configuration mode.**

   ```
   SEFOS-1(config-if)# end
   ```

   e. **View the configuration details.**

   ```
   SEFOS-1# show port-monitoring

   Port Monitoring  is enabled
   Monitor Port : X10/26

   Port        Ingress-Monitoring    Egress-Monitoring
   ----        ------------------    -----------------
   X10/25 Enabled                Disabled
   ...
   ```

5. **Ping 12.0.0.100 and verify that the ICMP reply was received at port 26.**

   ```
   SEFOS-1# ping 12.0.0.100
   ```

6. **Verify that the ping reply from host A to the SEFOS-1 switch is captured at host B or using the packet-capturing device, such as IXIA or SmartBits.**

   ```
   # tcpdump -xx -n -i eth3 icmp
   ...
   listening on eth3, link-type EN10MB (Ethernet), capture size 96 bytes
   17:09:58.595583 IP 12.0.0.100 > 12.0.0.1: ICMP echo reply, id 0, seq 1, length 40
   ...
   ```

```
0x0010:  003c 68e6 4000 ff01 fa75 0c00 0064 0c00
17:09:58.617899 IP 12.0.0.100 > 12.0.0.1: ICMP echo reply, id 0, seq 2, length 40...
0x0030:  a5a5 a5a5 a5a5 a5a5 a5a5 a5a5 a5a5 a5a5
17:09:58.698280 IP 12.0.0.100 > 12.0.0.1: ICMP echo reply, id 0, seq 3, length 40...
```

Related Information

- “SEFOS Setup Tasks” on page 23
- “Configure ACL Filters” on page 36
- “Configure QoS” on page 39
- “Configure Rate Limiting” on page 44

Configure Rate Limiting

SEFOS can be configured to limit the rate of traffic received on a particular interface. If the traffic is above the configured threshold level, the packet gets dropped. The following example illustrates the configuration for limiting a multicast traffic at port 25 to a rate of 50 packets per second.

See “Basic SEFOS Topology” on page 25 for the topology for this task. port 25 and port 26 are connected to IXIA/Smartbits to monitor the rate of packet forwarding. Configure the rate limiting for multicast packets on port 25 as 50 packets per second and then generate a multicast traffic from IXIA at the rate of 1 Mbps. Packets received at port 26 must be at the rate of 50 packets per second.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Type the following commands in the switch to enable port 25 and port 26:**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface xl-ethernet 0/25
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# interface xl-ethernet 0/26
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# end
```

3. **Set the rate limit to 50 packets per second.**

   a. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

b. Enter Interface Configuration mode.

```
SEFOS-1(config)# interface xl-ethernet 0/25
```

c. Set the rate limit to 50 packets per second.

```
SEFOS-1(config-if)# storm-control multicast level 50
```

d. Exit Global Configuration mode.

```
SEFOS-1(config-if)# end
```

4. View the configuration details.

```
SEFOS-1# show interface xl-ethernet 0/25 storm-control
...
Multicast Storm Control     : 50
```

5. View the functionality by generating a multicast packet from IXIA at the rate of 1 Mbps to port 25.

The packets received at the second port of IXIA are at the rate of 50 packets per second only.

Related Information

- “SEFOS Setup Tasks” on page 23
- “Configure ACL Filters” on page 36
- “Configure QoS” on page 39
- “Configure Port Mirroring” on page 42

Configuring Save Parameters

These topics describe how to enable and disable save flags.

- “Enable or Disable the Incremental Save Flag” on page 46
- “Enable or Disable the Auto Save Flag” on page 46

Related Information

- “SEFOS Setup Tasks” on page 23

- “Managing Configuration Files” on page 47

▼ Enable or Disable the Incremental Save Flag

Enabling the incremental save flag updates the in-memory database for every configuration at runtime.

1. **Connect to SEFOS.**
   See “Connect to SEFOS” on page 26.
2. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

3. **Enable or disable the incremental save flag on the switch.**

```
SEFOS-1(config)# incremental-save state
```

   where *state* is `enable` or `disable`.

4. **Exit Global Configuration mode.**

```
SEFOS-1(config)# end
```

Related Information

- “Enable or Disable the Auto Save Flag” on page 46

▼ Enable or Disable the Auto Save Flag

This task describes how to enable updates of the runtime configuration in the configuration file.

1. **Connect to SEFOS.**
   See “Connect to SEFOS” on page 26.
2. **Enter Global Configuration mode.**

```
SEFOS-1# configure terminal
```

3. **Enable the auto save flag on the switch.**

```
SEFOS-1(config)# auto-save trigger state
```

where *state* is `enable` or `disable`.

4. **Exit Global Configuration mode.**

```
SEFOS-1(config)# end
```

Related Information

- “Enable or Disable the Incremental Save Flag” on page 46

Managing Configuration Files

These topics describe how to manage configuration files.

Related Information

- “SEFOS Setup Tasks” on page 23
- “Understanding SEFOS Basics” on page 24
- “Configuring the SEFOS Environment” on page 30
- “Managing Log Files” on page 51

▼ Save the Configuration to a File

This task describes how to write the running configuration to a flash file, a startup configuration file, or a remote site.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Save the configuration that is currently running to a file.**

```
SEFOS-1# write startup-config
```

3. **View the current restoration settings.**

```
SEFOS-1# show nvram
...
Config Restore Option                 : Restore
Config Save Option                    : Startup save
...
```

4. **View the restoration status.**

```
SEFOS-1# show system information
...
Config Restore Status             : Not Initiated
```

5. **Reboot the switch to verify that the current configurations were saved properly.**
   If you do not want to reboot the switch at this time, you do not have to complete the last step in this task.

6. **View the restoration status after rebooting the switch.**
   The Config Restore Status shows `Successful` after the reboot.

```
SEFOS-1# show  system information
...
Config Restore Status               : Successful
```

Related Information

- “Configure the Name of the Configuration File” on page 32
- “Configuring Save Parameters” on page 45
- “Erase a Configuration File” on page 48
- “Copy a Configuration File to a Remote Location” on page 49
- “Copy a Configuration File From a Remote Location to Flash” on page 50
- “Copy a Configuration File From One Remote Location or Flash to Another Remote Location or Flash” on page 51

▼ Erase a Configuration File

This task describes how to clear the contents of the startup configuration or set the parameters in flash to their default values.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Erase the saved configuration file.**

```
SEFOS-1# erase startup-config
```

3. **View the erase status settings.**

```
SEFOS-1# show nvram
...
Config Restore Option                    : No restore
Config Save Option                       : No save
Auto Save                                : Disable
...
Config Save Filename                     : switch.conf
Config Restore Filename                  : switch.conf
...
```

The switch starts with the default configurations when you reboot the switch.

Related Information

- “Configure the Name of the Configuration File” on page 32
- “Configuring Save Parameters” on page 45
- “Save the Configuration to a File” on page 47
- “Copy a Configuration File to a Remote Location” on page 49
- “Copy a Configuration File From a Remote Location to Flash” on page 50
- “Copy a Configuration File From One Remote Location or Flash to Another Remote Location or Flash” on page 51

▼ Copy a Configuration File to a Remote Location

This task describes how to save the initial configuration file to flash or to a remote location.

See “Basic SEFOS Topology” on page 25 for the topology for this task.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **`Ping` host A from switch `SEFOS-1`.**

```
SEFOS-1# ping 12.0.0.100
```

3. **Save the configuration that is currently running to a file.**

```
SEFOS-1# write startup-config
```

4. **Copy the configuration file to host A, giving it the name `switch.conf`_*date*.**

```
SEFOS-1# copy startup-config tftp://12.0.0.100/switch.conf_date
SEFOS-1#
```

Related Information

- "Copy a Configuration File From a Remote Location to Flash" on page 50
- "Copy a Configuration File From One Remote Location or Flash to Another Remote Location or Flash" on page 51

▼ Copy a Configuration File From a Remote Location to Flash

This task describes how to copy the backup configuration file from a remote location to the location of the default configuration directory path (`/conf/sefos`) for restoration. The remote location must be on a host connected to one of the 72 or 64 ports on the switch.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Copy the startup configuration file `switch.conf` stored in the host `12.0.0.100` to the current path (`/conf/sefos`).**

```
SEFOS-1# copy tftp://12.0.0.100/switch.conf startup-config
SEFOS-1#
```

Related Information

- "Copy a Configuration File to a Remote Location" on page 49
- "Copy a Configuration File From One Remote Location or Flash to Another Remote Location or Flash" on page 51

▼ Copy a Configuration File From One Remote Location or Flash to Another Remote Location or Flash

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Copy the file `script.txt` from the remote location `12.0.0.100` to flash.**

```
SEFOS-1# copy tftp://12.0.0.100/script.txt  flash:script.txt
Copied tftp://12.0.0.100/script.txt ==> flash:script.txt
SEFOS-1#
```

Related Information

- “Copy a Configuration File to a Remote Location” on page 49
- “Copy a Configuration File From a Remote Location to Flash” on page 50

Managing Log Files

These topics describe how to manage log files.

- “Copy a System Log to a Remote Location” on page 51
- “View Debug Logs” on page 52

Related Information

- “SEFOS Setup Tasks” on page 23
- “Understanding SEFOS Basics” on page 24
- “Configuring the SEFOS Environment” on page 30
- “Managing Configuration Files” on page 47

▼ Copy a System Log to a Remote Location

This task describes how to write the system logs to a remote location. The remote location must be a host on one of the 72 or 64 ports on the switch.

In this task, you first execute several commands to customize system logs. You also clear the system buffers so that the log file can be copied over to the remote site.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Save the log file to the remote location `12.0.0.100`.**

```
SEFOS# debug npapi transmission
SEFOS# show debug-logging
...
SEFOS# configure terminal
SEFOS(config)# clear logs
SEFOS(config)# end
SEFOS#
SEFOS-1# copy logs tftp://12.0.0.100/logfile
% Log Upload Successful
SEFOS#
SEFOS# no debug npapi transmission
SEFOS#
SEFOS# show debugging
```

Note - Ensure that you type the `no debug npapi transmission` command as shown so that the debugging function is disabled.

Related Information

- "View Debug Logs" on page 52

▼ View Debug Logs

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Enable the debug trace for any of the modules, such as the PNAC module.**

```
SEFOS-1# debug dot1x all
SEFOS-1# show debugging

DOT1x :

DOT1x packet dump debugging is on
DOT1x management debugging is on
```

```
DOT1x init and shutdown debugging is on
DOT1x error debugging is on
DOT1x control path debugging is on
...
```

3. **View the debug logs in the file.**

```
SEFOS-1# show debug-logging
...
```

4. **Disable the PNAC module debug trace.**

```
SEFOS-1# no debug dot1x all
```

Related Information

- “Copy a System Log to a Remote Location” on page 51

Configuring the Switching Feature

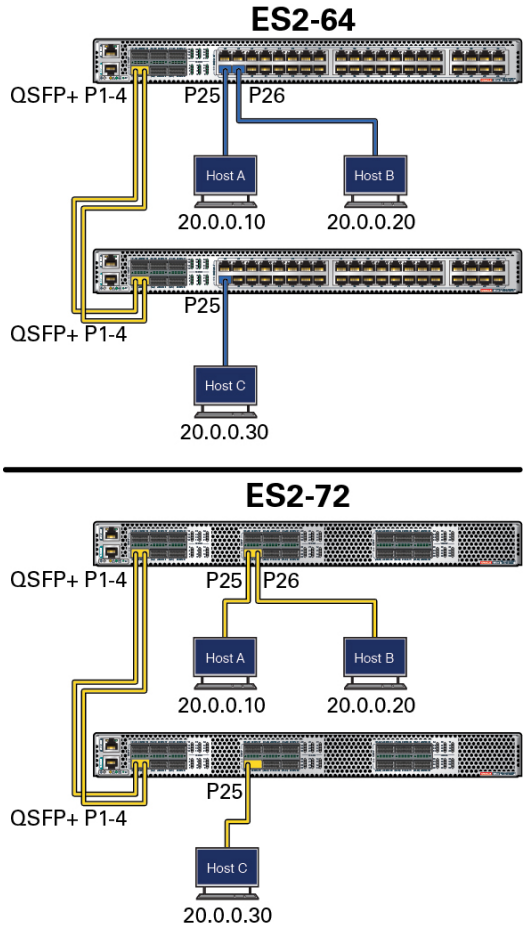
These topics describe how to configure the layer 2 switching feature using SEFOS. Review and perform these topics in order.

Related Information

- "Administering the Switch"
- "Administering SEFOS"
- "Configuring the Routing Feature"

Switching Feature Topology

Note - All ports in this topology are in `VLAN 101`.



Related Information

- “Configure Initial Settings” on page 57
- “Configure VLAN Forwarding” on page 60
- “Configure RSTP” on page 62
- “Configure LA” on page 64

Port Terminology

- 40G-capable ports are labeled as XL-Ethernet (**xl**).
- 10G-capable ports are labeled extreme-ethernet (**ex**).

Oracle Switch ES2-72 has 18 QSFP+ ports that are 40G-capable. Ports on Oracle Switch ES2-72 are referred to as xl-ethernet 0/1-72.

Oracle Switch ES2-64 has 6 QSFP+ ports which are 40G-capable and 40 RJ45 ports which are 10G-capable. Ports on Oracle Switch ES2-64 are referred to as xl-ethernet 0/1-24 and extreme-ethernet 0/25-64.

▼ Configure Initial Settings

1. **Verify the connections between the switches and hosts.**

   See "Switching Feature Topology" on page 55.

   a. **For the `SEFOS-1` switch, verify the connections:**

      - **Ports 1-4** – Connected to ports 1-4 on the SEFOS-2 switch
      - **Port 25** – Connected to host server A (IP address 20.0.0.10)
      - **Ports 26** – Connected to host server B (IP address 20.0.0.20)

   b. **For the SEFOS-2 switch, verify that port 25 is connected to host server C (IP address `20.0.0.30`).**

2. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

3. **Create a VLAN and add the host ports as member ports of the VLAN.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# vlan 101
SEFOS-1(config-vlan)# ports xl-ethernet 0/25-26 untagged xl-ethernet 0/25-26
SEFOS-1(config-vlan)# vlan active
SEFOS-1(config-vlan)# exit
```

4. **Bring up the interfaces on which the hosts are connected.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface range xl-ethernet 0/25-26
SEFOS-1(config-if-range)# switchport pvid 101
SEFOS-1(config-if-range)# no shutdown
SEFOS-1(config-if-range)# exit
```

5. **Configure the IP address on `VLAN 101` and bring up the interface.**

```
SEFOS-1# configure terminal
SEFOS-1(config-int)# interface vlan 101
SEFOS-1(config-int)# ip address 20.0.0.1 255.0.0.0
SEFOS-1(config-int)# no shutdown
SEFOS-1(config-int)# exit
```

6. **Verify that the `VLAN 101` interface is up.**

```
SEFOS-1# show ip interface
vlan1 is down, line protocol is down
Internet Address is 10.0.0.1/8
Broadcast Address 10.255.255.255
vlan101 is up, line protocol is up
Internet Address is 20.0.0.1/8
Broadcast Address 10.255.255.255
```

7. **Check the status of the interfaces.**

```
SEFOS-1# show interface status
Port Status Duplex Speed Negotiation Capability
---- ------ ------ ----- ----------- ----------
Xl0/1 not connected Full 10 Gbps Auto-Negotiation Auto-MDIX on
Xl0/2 not connected Full 10 Gbps Auto-Negotiation Auto-MDIX on
...
Xl0/25 connected Full 10 Gbps Auto-Negotiation Auto-MDIX on
Xl0/26 connected Full 10 Gbps Auto-Negotiation Auto-MDIX on
...

SEFOS-1# show interface description
Interface Status Protocol
--------- ------ --------
Xl0/1 down down
Xl0/2 down down
...
Xl0/25 up up
Xl0/26 up up
...
vlan101 up up
```

8. **`Ping` host A (`20.0.0.10`) from the `SEFOS-1` switch.**

   The `ping` should be successful.

9. **Check the MAC address entry.**

```
SEFOS-1# show mac-address-table
Vlan    Mac Address         Type     Ports
----    -----------         ----     -----
101     00:14:4f:6c:7d:e9   Learnt   Xl0/25
Total Mac Addresses displayed: 1
```

Note - The MAC address displayed must correspond to the MAC address of host A.

10. **Repeat Step 3 through Step 5 on the `SEFOS-2` switch to bring up the required ports and configure the IP address of `VLAN 101` to `20.0.0.2`.**

11. **Configure the topology.**

    To configure the topology, all of the interfaces should be up. If they are not up, use the `no shutdown` command to bring up the ports.

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface range xl 0/1-2
SEFOS-1(config-if-range)# switchport pvid 101
SEFOS-1(config-if-range)# no shutdown
SEFOS-1(config-if-range)# end
```

    In both switches, ensure that the following interfaces are up: 0/1, 0/2, 0/25, 0/26.

Related Information

- “Switching Feature Topology” on page 55
- “Verify the Configuration” on page 59
- “Configure VLAN Forwarding” on page 60
- “Configure RSTP” on page 62
- “Configure LA” on page 64

▼ Verify the Configuration

1. **From host A, `ping` the `SEFOS-1` switch.**

```
# ping 20.0.0.1
20.0.0.1 is alive
```

2. **From host B, `ping` the `SEFOS-1` switch.**

```
# ping 20.0.0.1
```

3. **From the `SEFOS-1` switch, `ping` host A.**

```
SEFOS-1# ping 20.0.0.10
```

4. **From the `SEFOS-1` switch, `ping` host B.**

```
SEFOS-1# ping 20.0.0.20
```

5. **From host C, `ping` the `SEFOS-2` switch (`20.0.0.2`).**

```
SEFOS-1# ping 20.0.0.30
```

6. **For the port connected to the switch, use a packet-capture device or dumping utility to capture packets on host A, B, and C.**

   All three hosts should receive STP, GMRP, and GVRP packets continuously, unless these protocols were disabled with SEFOS commands. By default, all the ports on a target are members of default `VLAN 1`.

Related Information

- "Configure Initial Settings" on page 57
- "Verify VLAN Membership" on page 61

▼ Configure VLAN Forwarding

This task describes how to configure and test the VLAN forwarding feature of SEFOS running on a switch target. This task tests whether the incoming packets are properly switched on the member ports of the VLAN.

See "Switching Feature Topology" on page 55 for the topology of this task.

1. **Connect to SEFOS.**

   See "Connect to SEFOS" on page 26.

2. **Change the member ports on the `SEFOS-1` switch.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# vlan 101
SEFOS-1(config-vlan)# ports xl-ethernet 0/1-2,0/25-26 untagged xl-ethernet 0/1-2,0/25-26
SEFOS-1(config-vlan)# vlan active
SEFOS-1(config-vlan)# exit
```

Related Information

- "Configure the Default VLAN ID" on page 33
- "Configure Initial Settings" on page 57
- "Configure RSTP" on page 62
- "Configure LA" on page 64

Verify VLAN Membership

This task tests whether the incoming packets are properly switched on the member ports of the VLAN.

1. **Connect to SEFOS.**

   See “Connect to SEFOS” on page 26.

2. **Display the current VLAN interface.**

```
SEFOS-1# show vlan
Vlan database
-------------
Vlan ID             : 101
Member Ports : X10/1,X10/2,X10/21,X10/22
Untagged Ports : X10/1,X10/2,X10/21,X10/22
Forbidden Ports : None
Reflective-Relay : Disabled
Name :
Status : Other
```

3. **`Ping` from host A to host B.**

```
# ping -s 20.0.0.20
```

4. **`Ping` from host B to host A.**

```
# ping 20.0.0.10
```

5. **Change the member ports of `VLAN 101` on `SEFOS-2` switch.**

```
SEFOS-2# configure terminal
SEFOS-2(config)# vlan 101
SEFOS-1(config-vlan)# ports xl-ethernet 0/25,0/1-2 untagged xl-ethernet 0/25,0/1-2
```

6. **Enable port 25, which is connected to host C.**

```
SEFOS-2# config terminal
SEFOS-2(config)# interface xl-ethernet 0/25
SEFOS-2(config-if)# no shutdown
SEFOS-2(config-if)# end
```

7. **Display the VLAN interface.**

```
SEFOS-2# show vlan
Vlan database
-------------
Vlan ID             : 101
Member Ports        : X10/1,X10/21, X10/22
Untagged Ports      : X10/1,X10/21, X10/22
Forbidden Ports     : None
Reflective-Relay    : Disabled
Name                :
Status              : Other
```

8. **`Ping` from host A to host B, or to host C.**

   The `ping` should be successful.

```
# ping -s 20.0.0.20
# ping -s 20.0.0.30
```

Related Information

- "Configure the Default VLAN ID" on page 33
- "Configure VLAN Forwarding" on page 60
- "Verify the Configuration" on page 59

▼ Configure RSTP

This task shows the traffic flow in the RSTP configuration on SEFOS running on the switch targets. This task verifies whether a loop is present in the topology, if it is detected, and if the traffic is blocked for the alternate port.

See "Switching Feature Topology" on page 55 for the topology of this task.

1. **Configure the initial settings.**

   See "Configure Initial Settings" on page 57.

2. **Configure VLAN forwarding in `SEFOS-1` and `SEFOS-2`.**

   See "Configure VLAN Forwarding" on page 60.

3. **On `SEFOS-1`, verify the port status in RSTP mode.**

```
SEFOS-1# show spanning-tree
Root Id          Priority   32768
                 Address    00:14:4f:6c:63:0f
                 Cost       0
                 Port       0 [0]
                 Max Age 20 Sec, Forward Delay 15 Sec
```

```
Spanning tree Protocol Enabled.
Bridge is executing the rstp compatible Rapid Spanning Tree Protocol
Bridge Id        Priority 32768
                   Address    00:14:4f:6c:63:0f
                   Cost       0
                   Port       0 [0]
                   Max Age 20 Sec, Forward Delay 15 Sec

Spanning tree Protocol Enabled.

Bridge is executing the rstp compatible Rapid Spanning Tree Protocol
Bridge Id          Priority 32768
                   Address 00:14:4f:6c:63:0f
                   Hello Time 2 sec, Max Age 20 sec, Forward Delay 15 sec
                   Dynamic Path Cost is Disabled
                   Dynamic Path Cost Lag-Speed Change is Disabled
Name              Role         State        Cost     Prio   Type
----              ----         -----        ----     ----   ----
X10/1              Designated   Forwarding   2000     128   P2P
X10/2              Designated   Forwarding   2000     128   P2P
X10/21             Designated   Forwarding   2000     128   P2P
X10/22             Designated   Forwarding   2000     128   P2P
...
```

4. On SEFOS-2, verify the port status in RSTP mode.

```
SEFOS-2# show spanning-tree
Root Id         Priority   32768
                Address    00:14:4f:6c:63:0f
                Cost       4000
                Port       X10/1
                Max Age 20 Sec, Forward Delay 15 Sec

Spanning tree Protocol Enabled.

Bridge is executing the rstp compatible Rapid Spanning Tree Protocol
Bridge Id       Priority 32768
                Address 00:14:4f:6c:6e:0e
                Hello Time 2 sec, Max Age 20 sec, Forward Delay 15 sec
                Dynamic Path Cost is Disabled
                Dynamic Path Cost Lag-Speed Change is Disabled
Name              Role         State        Cost     Prio   Type
----              ----         -----        ----     ----   ------
X10/1              Designated  Forwarding   2000     128   P2P
X10/21             root         Forwarding   2000     128   P2P
X10/22             Alternate   Discarding   2000     128  P2P
...
```

5. Ping from host A to host C.

```
# ping -s 20.0.0.30
```

Traffic is forwarded through the `xl-ethernet 0/21` port on `SEFOS-1` to `SEFOS-2` port `21`.

6. **Shut down the `xl-ethernet 0/21` port from `SEFOS-2` and verify the port status.**

```
SEFOS-2# configure terminal
SEFOS-2(config)# int xl 0/1
SEFOS-2(config)# shut
SEFOS-2(config)# exit
SEFOS-2# show spanning-tree
Root Id         Priority   32768
                Address    00:14:4f:6c:69:0f
                Cost       4000
                Port       Xl0/2
                Max Age 20 Sec, Forward Delay 15 Sec

Spanning tree Protocol Enabled.

Bridge is executing the rstp compatible Rapid Spanning Tree Protocol
Bridge Id       Priority 32768
                Address 00:14:4f:6c:6e:0e
                Hello Time 2 sec, Max Age 20 sec, Forward Delay 15 sec
                Dynamic Path Cost is Disabled
                Dynamic Path Cost Lag-Speed Change is Disabled
Name              Role         State        Cost     Prio   Type
----              ----         -----        ----     ----   ------
Xl0/2             root         Forwarding   2000     128    P2P
Xl0/25            root         Forwarding   2000     128    P2P
Xl0/25            root         Forwarding   2000     128    P2P
...
```

7. **`Ping` from host A to host C.**

```
# ping 20.0.0.30
```

Traffic should be forwarded through the xl-ethernet 0/2 port on SEFOS-1. If RSTP is working, there will be a change in the port state.

Related Information

- “Configure Initial Settings” on page 57
- “Configure VLAN Forwarding” on page 60
- “Configure LA” on page 64

▼ Configure LA

This task describes how to configure and test the LA feature of SEFOS running on a switch target.

See “Switching Feature Topology” on page 55 for the topology of this task.

1. **Configure the initial settings.**
   See “Configure Initial Settings” on page 57.

2. **Create a port-channel group 100 on SEFOS-1 and link the ports in the group.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# set port-channel enable
SEFOS-1(config)# interface port-channel 100
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# exit
SEFOS-1(config)# interface range xl-ethernet 0/1-2
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# channel-group 100 mode active
SEFOS-1(config-if)# exit
SEFOS-1(config)# vlan 101
SEFOS-1(config-vlan)# ports xl-ethernet 0/1-2 port-channel
SEFOS-1(config-vlan)# ports xl-ethernet 0/25-26 port-channel 100 untagged xl-ethernet
 0/25-26 port-channel 100
```

3. **Repeat Step 2 on SEFOS-2.**

4. **Verify the VLAN membership.**

```
SEFOS-1# show vlan
Vlan database
-------------
Vlan ID : 101
Member Ports : X10/25,X10/26,po100
Untagged Ports : X10/25,X10/26,po100
Forbidden Ports : None
Reflective-Relay : Disabled
Name :
Status : Other
```

5. **Verify the STP port status on SEFOS-1.**

```
SEFOS-1# show spanning-tree
Root Id         Priority   32768
                Address    00:14:4f:6c:69:ee
                Cost       0
                Port       0 [0]
                Max age 20 Sec, forward delay 15 Sec
                Hello Time 2 Sec

MST00
```

```
Spanning tree Protocol has been enabled

MST00 is executing the mstp compatible Multiple Spanning Tree Protocol
Bridge Id       Priority  32768
                Address  00:14:4f:6c:69:ee
                Max age is 20 sec, forward delay is 15 sec
                Hello Time is 2 sec
                Dynamic Path Cost is Disabled
                Dynamic Path Cost Lag-Speed Change is Disabled
Name              Role         State        Cost     Prio   Type
----              ----         -----        ----     ----   ------

X10/25             Designated      Forwarding   2000      128      P2P
X10/26             Designated     Forwarding   2000      128      P2P
po100              Designated      Forwarding   2000      128      P2P
...
```

6. **`Ping` continuously from host A to host C.**

   There should not be any data loss during traffic forwarding.

7. **Verify the port channel summary.**

```
SEFOS-1# show etherchannel summary

Port-channel Module Admin Status is enabled
Port-channel Module Oper Status is enabled
Port-channel System Identifier is  00:14:4f:6c:69:ee

Flags:
D - down             P - in port-channel
I - stand-alone      H - Hot-standby (LACP only)
AD - Admin Down      AU - Admin Up
OD - Operative Down  OU - Operative Up

Number of channel-groups in use: 1
Number of aggregators: 1

Group  Port-channel        Protocol   Ports
------------------------------------------------------------------------------
100    Po100(P)[AU,OD]     LACP       X10/1(P),X10/2(P)
...
```

8. **Shut down the port `xl-ethernet 0/1` and verify the port channel summary**

```
SEFOS-1# configure terminal
SEFOS-1(config)# int xl 0/1
SEFOS-1(config-if)# shut
SEFOS-1(config-if)# end
SEFOS-1# show etherchannel summary

Port-channel Module Admin Status is enabled
```

```
Port-channel Module Oper Status is enabled
Port-channel System Identifier is  00:14:4f:6c:69:ee

Flags:
D - down             P - in port-channel
I - stand-alone      H - Hot-standby (LACP only)
AD - Admin Down      AU - Admin Up
OD - Operative Down  OU - Operative Up

Number of channel-groups in use: 1
Number of aggregators: 1

Group  Port-channel        Protocol   Ports
------------------------------------------------------------------
100    Po100(P)[AU,OD]     LACP       X10/1(D),X10/2(P)
...
```

LA was configured properly if traffic flows through the port channel group.

Related Information

- “Configure Initial Settings” on page 57
- “Configure VLAN Forwarding” on page 60
- “Configure RSTP” on page 62

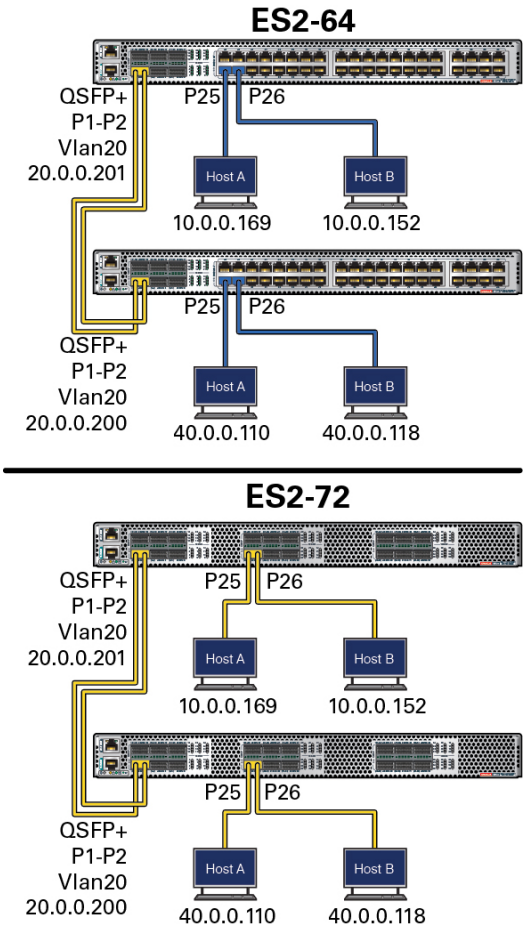
Configuring the Routing Feature

These topics describe how to configure the routing feature with SEFOS and blade servers.

Related Information

- “Administering the Switch”
- “Administering SEFOS”
- “Configuring the Switching Feature”

Routing Feature Topology



Switch or Host Name	VLAN ID	IP Address
SEFOS-1	VLAN 10	10.0.0.201
	VLAN 20	20.0.0.201
Host A connected to SEFOS-1, port 25	VLAN 10	10.0.0.169
Host A-2 connected to SEFOS-1, port 26	VLAN 10	10.0.0.152
SEFOS-2	VLAN 20	20.0.0.200
	VLAN 40	40.0.0.200

Switch or Host Name	VLAN ID	IP Address
Host B connected to SEFOS-2, port 25	VLAN 40	40.0.0.110
Host B-2 connected to SEFOS-2, port 26	VLAN 40	40.0.0.118

Related Information

- “Configuring Static Routing” on page 71
- “Configuring Dynamic Routing” on page 77
- “Disabling Routing” on page 81

Configuring Static Routing

These tasks describe how to configure static routing.

- “Configure Static Unicast Route Entries” on page 71
- “Add Static Routes” on page 76

Related Information

- “Routing Feature Topology” on page 70
- “Configuring Dynamic Routing” on page 77
- “Disabling Routing” on page 81

▼ Configure Static Unicast Route Entries

This task configures the static route entries in SEFOS and verifies that traffic is reachable across networks.

Note - Before performing this task, erase any previous configurations on the switches.

See “Routing Feature Topology” on page 70 for the topology of this task.

1. **Configure the initial settings.**
   See “Configure Initial Settings” on page 57.

2. **If GVRP and GMRP are enabled, disable them so that the VLAN creation will not be propagated.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# set gvrp disable
SEFOS-1(config)# set gmrp disable
SEFOS-1(config)# end
SEFOS-1# show vlan device info

Vlan device configurations
--------------------------
Vlan Status                     : Enabled
Vlan Oper status                : Enabled
Gvrp status                       : Disabled
Gmrp status                       : Disabled
Gvrp Oper status                  : Disabled
Gmrp Oper status                  : Disabled
```

The `set gvrp disable` and `set gmrp disable` commands disable these protocols. The `show vlan device info` command shows the VLAN configuration information.

3. Configure SEFOS-1.

See "Routing Feature Topology" on page 70.

a. Remove the IP address of VLAN 1.

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface vlan 1
SEFOS-1(config-if)# no ip address
SEFOS-1(config-if)# exit
SEFOS-1(config)# vlan 10
SEFOS-1(config-vlan)# exit
SEFOS-1(config)# interface range xl-ethernet 0/25-26
SEFOS-1(config-if-range)# switchport access vlan 10
SEFOS-1(config-if-range)# no shutdown
SEFOS-1(config-if-range)# exit
SEFOS-1(config)# interface vlan 10
SEFOS-1(config-if)# shut
SEFOS-1(config-if)# ip address 10.0.0.201 255.255.255.0
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# end
```

The default IP address of `VLAN 1` is `10.0.0.1`, and the IP address of `VLAN 10` is `10.0.0.201`. So you must remove the IP address of `VLAN 1` before you can add the IP address for `VLAN 10`.

b. Ping host A from SEFOS-1.

```
SEFOS-1# ping 10.0.0.169
```

c. Ping host A-2 from SEFOS-1.

```
SEFOS-1# ping 10.0.0.152
```

d. Ping SEFOS-1 and host A-2 from host A.

```
# ping 10.0.201
10.0.201 is alive
# ping 10.0.0.152
10.0.0.152 is alive
#
```

4. Configure the SEFOS-2 switch based on the topology.
See "Routing Feature Topology" on page 70.

```
SEFOS-2# configure terminal
SEFOS-2(config)# interface vlan 1
SEFOS-2(config-if)# no ip address
SEFOS-2(config-if)# exit
SEFOS-2(config)# vlan 40
SEFOS-2(config-vlan)# exit
SEFOS-2(config)# interface range xl-ethernet 0/25-26
SEFOS-2(config-if-range)# shutdown
SEFOS-2(config-if-range)# switchport access vlan 40
SEFOS-2(config-if-range)# no shutdown
SEFOS-2(config-if-range)# exit
SEFOS-2(config)# interface vlan 40
SEFOS-2(config-if)# shutdown
SEFOS-2(config-if)# ip address 40.0.0.200 255.255.255.0
SEFOS-2(config-if)# no shutdown
SEFOS-2(config-if)# end
SEFOS-2#
```

5. Ping host B and host B-2 from SEFOS-2.

```
SEFOS-2# ping 40.0.0.110
SEFOS-2# ping 40.0.0.118
```

6. Create VLAN 20 between the two switches.
Use ports 1 to 2 on both switches.

a. Create VLAN 20 on SEFOS-1, ports 21 to 22.

```
SEFOS-1# configure terminal
SEFOS-1(config)# interface range xl-ethernet 0/1-2
SEFOS-1(config-if-range)# switchport access vlan 20
SEFOS-1(config-if-range)# no shutdown
```

```
SEFOS-1(config-if-range)# exit
SEFOS-1(config)# interface vlan 20
SEFOS-1(config-if)# shutdown
SEFOS-1(config-if)# ip address 20.0.0.201 255.255.255.0
SEFOS-1(config-if)# no shutdown
SEFOS-1(config-if)# end
SEFOS-1#
```

b. Create `VLAN 20` on `SEFOS-2`, ports `21` to `22`.

```
SEFOS-2# configure terminal
SEFOS-2(config)# interface range xl-ethernet 0/1-2
SEFOS-2(config-if-range)# switchport access vlan 20
SEFOS-2(config-if-range)# no shutdown
SEFOS-2(config-if-range)# exit
SEFOS-2(config)# interface vlan 20
SEFOS-2(config-if)# shutdown
SEFOS-2(config-if)# ip address 20.0.0.200 255.255.255.0
SEFOS-2(config-if)# no shutdown
SEFOS-2(config-if)# end
SEFOS-2# ping 20.0.0.201
```

You can now use this configuration as a starting point for different router configurations.

7. Save the configuration.

a. On on `SEFOS-1`, type:

```
SEFOS-1# write startup-config
Building configuration _
[OK]
```

b. On `SEFOS-2`, type:

```
SEFOS-2# write startup-config
Building configuration _
[OK]
```

Switches start with the saved configuration on reboot.

8. Verify that the existing routes are available in `SEFOS-1`.

a. On `SEFOS-1`, type:

```
SEFOS-1# show ip route
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf
```

```
C 10.0.0.0/24 is directly connected, vlan10
C 20.0.0.0/24 is directly connected, vlan20
SEFOS-1#
```

b. On SEFOS-2, type:

```
SEFOS-2# show ip route
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf

C 20.0.0.0/24 is directly connected, vlan20
C 40.0.0.0/24 is directly connected, vlan40

SEFOS-2#
```

If there is no known route from SEFOS-1 to host B, the ping from host A to host B fails.

9. Configure the static route in the SEFOS-1.

```
SEFOS-1# configure terminal
SEFOS-1(config)# ip route 40.0.0.0 255.255.255.0 20.0.0.200
SEFOS-1(config)# end
```

10. Configure the static route in SEFOS-2.

```
SEFOS-2# configure terminal
SEFOS-2(config)# ip route 10.0.0.0 255.255.255.0 20.0.0.201
SEFOS-2(config)# end
```

11. Verify that the routes are known to SEFOS-1 and SEFOS-2.

a. On SEFOS-1, type:

```
SEFOS-1# show ip route
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf
C 10.0.0.0/24 is directly connected, vlan10
C 20.0.0.0/24 is directly connected, vlan20
S 40.0.0.0/24 [-1] via 20.0.0.200
```

b. On SEFOS-2, type:

```
SEFOS-2# show ip route
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf
S 10.0.0.0/24 [-1] via 20.0.0.201
C 20.0.0.0/24 is directly connected, vlan20
C 40.0.0.0/24 is directly connected, vlan40
```

Related Information

- “Add Static Routes” on page 76
- “Configure RIP Dynamic Routing” on page 77
- “Configure OSPF Dynamic Routing” on page 79
- “Remove Static Routes” on page 82

▼ Add Static Routes

Depending on how each server configures routes, you might need to add static routes with commands provided by the servers.

1. **On host A, add static routes to reach `VLAN 40` and `VLAN 20` configured on `SEFOS-2`.**

```
# route add 40.0.0.0 -netmask 255.255.255.0 10.0.0.201
# route add 20.0.0.0 -netmask 255.255.255.0 10.0.0.201
```

2. **On host B, add static routes to reach `VLAN 10` and `VLAN 20` configured on `SEFOS-1`.**

```
# route add -net 10.0.0.0 netmask 255.255.255.0 gw 40.0.0.200
# route add -net 20.0.0.0 netmask 255.255.255.0 gw 40.0.0.200
```

3. **Connect to SEFOS on `SEFOS-1`.**
   See “Connect to SEFOS” on page 26.

4. **`Ping` the `SEFOS-2` `VLAN 40` IP address from `SEFOS-1`.**

```
SEFOS-1# ping 40.0.0.200
```

5. **`Ping` host B `VLAN 40` IP address from `SEFOS-1`.**

```
SEFOS-1# ping 40.0.0.110
```

6. **`Ping` host B from host A.**

```
# ping -s 40.0.0.110
```

7. **Connect to SEFOS on `SEFOS-2`.**
   See “Connect to SEFOS” on page 26.

8. **`Ping` `SEFOS-1` `VLAN 10` IP address from `SEFOS-2`.**

```
SEFOS-2# ping 10.0.0.201
```

9. **Ping the host A IP address from SEFOS-2.**

```
SEFOS-2# ping 10.0.0.169
```

10. **Ping host A from host B.**

```
# ping 10.0.0.169
```

To reach host A from host B, packets must be routed between VLAN 40–VLAN 20 and VLAN 20–VLAN 10. With static routes configured, you can now test the routing functions with SEFOS.

Related Information

- “Configure Static Unicast Route Entries” on page 71
- “Configure RIP Dynamic Routing” on page 77
- “Configure OSPF Dynamic Routing” on page 79
- “Remove Static Routes” on page 82

Configuring Dynamic Routing

These tasks describe how to configure dynamic routing.

- “Configure RIP Dynamic Routing” on page 77
- “Configure OSPF Dynamic Routing” on page 79

Related Information

- “Routing Feature Topology” on page 70
- “Configuring Static Routing” on page 71
- “Disabling Routing” on page 81

▼ Configure RIP Dynamic Routing

This task configures dynamic routing with the redistribution feature of RIP in SEFOS. This task also verifies the accessibility of the two hosts by learning the routes dynamically through RIP.

See “Routing Feature Topology” on page 70 for the topology of this task.

1. **Verify that `SEFOS-1` and `SEFOS-2` still have the configuration information that you saved.**

   See “Configure Static Unicast Route Entries” on page 71.

   The basic VLAN configuration for dynamic routing is similar to the basic VLAN configuration for static routing. If the configuration information was not saved on `SEFOS-1` and `SEFOS-2`, follow Step 1 through Step 6 in “Configure Static Unicast Route Entries” on page 71, then return here.

2. **Enable the RIP protocol on `SEFOS-1`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# router rip
SEFOS-1(config-router)# neighbor 20.0.0.200
SEFOS-1(config-router)# network 20.0.0.201
SEFOS-1(config-router)# network 10.0.0.201
SEFOS-1(config-router)# redistribute all
SEFOS-1(config-router)# end
```

3. **Enable the RIP protocol on `SEFOS-2`.**

```
SEFOS-2# configure terminal
SEFOS-2(config)# router rip
SEFOS-2(config-router)# neighbor 20.0.0.201
SEFOS-2(config-router)# network 20.0.0.200
SEFOS-2(config-router)# network 40.0.0.200
SEFOS-2(config-router)# redistribute all
SEFOS-2(config-router)# end
```

   If `SEFOS-2` is a third-party switch, verify that the RIP is enabled on `SEFOS-2` and that related configurations are applied accordingly.

4. **Check the routing database on `SEFOS-1`.**

```
SEFOS-1# show ip rip database
Vrf default
10.0.0.0/8 [1] auto-summary
10.0.0.0/24 [1] directly connected, vlan10
20.0.0.0/8 [1] auto-summary
20.0.0.0/24 [1] directly connected, vlan20
40.0.0.0/8 [2] auto-summary
40.0.0.0/8 [2] via 20.0.0.200, vlan20
```

5. **Check the routing database on `SEFOS-2`.**

```
SEFOS-2# show ip rip database
Vrf default
10.0.0.0/8 [2] auto-summary
10.0.0.0/8 [2] via 20.0.0.201, vlan20
20.0.0.0/8 [1] auto-summary
20.0.0.0/24 [1] directly connected, vlan20
40.0.0.0/8 [1] auto-summary
40.0.0.0/24 [1] directly connected, vlan40
```

6. **Ping the VLAN interface on VLAN 10 on SEFOS-1 from blade server B.**

```
# ping 10.0.0.201
```

7. **Ping blade server A from blade server B.**

```
# ping 10.0.0.169
```

8. **Ping blade server B from blade server A.**

```
# ping 40.0.0.110
```

You can test the basic routing features of SEFOS now that SEFOS is able to dynamically learn the routing entries using the redistribution feature of RIP.

Related Information

- “Configure Static Unicast Route Entries” on page 71
- “Add Static Routes” on page 76
- “Configure OSPF Dynamic Routing” on page 79
- “Disable RIP Dynamic Routing” on page 82

▼ Configure OSPF Dynamic Routing

This task describes how to configure dynamic routing using the redistribution feature of the OSPF protocol in SEFOS. This task verifies that the reachability between two hosts is established after learning the in-between routes dynamically through OSPF.

See “Routing Feature Topology” on page 70 for the topology of this task.

1. **Verify that SEFOS-1 and SEFOS-2 still have the configuration information that you saved.**
   See “Configure Static Unicast Route Entries” on page 71.

The basic VLAN configuration for dynamic routing is similar to the basic VLAN configuration for static routing. If the configuration information was not saved on SEFOS-1 and SEFOS-2, follow Step 1 through Step 6 in "Configure Static Unicast Route Entries" on page 71.

If SEFOS-1 or SEFOS-2 is a third-party switch, configure the basic VLAN and the dynamic routing as recommended by the switch's manufacturer.

2. **Enable OSPF on SEFOS-1.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# router ospf
SEFOS-1(config-router)# asBR router
SEFOS-1(config-router)# router-id 10.0.0.201
SEFOS-1(config-router)# network 20.0.0.201 area 0.0.0.0
SEFOS-1(config-router)# network 10.0.0.201 area 0.0.0.0
SEFOS-1(config-router)# redistribute all
SEFOS-1(config-router)# end
```

3. **Enable OSPF on SEFOS-2.**

```
SEFOS-2# configure terminal
SEFOS-2(config)# router ospf
SEFOS-2(config-router)# asBR router
SEFOS-2(config-router)# router-id 40.0.0.200
SEFOS-2(config-router)# network 20.0.0.200 area 0.0.0.0
SEFOS-2(config-router)# network 40.0.0.200 area 0.0.0.0
SEFOS-2(config-router)# redistribute all
SEFOS-2(config-router)# end
```

If SEFOS-2 is a third-party switch, verify that the OSPF protocol is enabled on SEFOS-2 and that related configurations are applied accordingly.

4. **Check the neighbor router status of SEFOS-1.**

```
SEFOS-1# show ip ospf neighbor

Vrf default

Neighbor-IDPriStateDeadTimeAddress    Interface
-----------------------------------------
40.0.0.2001FULL/DR  3920.0.0.200 vlan20
SEFOS-1# show ip route
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf
C 10.0.0.0/24 is directly connected, vlan10
C 20.0.0.0/24 is directly connected, vlan20
O 40.0.0.0/24 [2] via 20.0.0.200
```

5. **Verify the neighbor router status of SEFOS-2.**

```
SEFOS-2# show ip ospf neighbor

Vrf default
Neighbor-ID Pri State DeadTime Address Interface
----------- --- ----- -------- ------- ---------
SEFOS-2# show ip route
10.0.0.201 1 FULL/BACKUP 32 20.0.0.201 vlan20
Codes: C - connected, S - static, R - rip, B - bgp, O - ospf

O 10.0.0.0/24 [2] via 20.0.0.201
C 20.0.0.0/24 is directly connected, vlan20
C 40.0.0.0/24 is directly connected, vlan40
```

If SEFOS-2 is a third-party switch, use the appropriate command to verify the neighbor router status.

6. **Verify connectivity between SEFOS-1 and SEFOS-2 with the ping command.**

Related Information

- “Configure Static Unicast Route Entries” on page 71
- “Add Static Routes” on page 76
- “Configure RIP Dynamic Routing” on page 77
- “Disable OSPF Dynamic Routing” on page 83

Disabling Routing

These tasks describe how to disable static and dynamic routing features.

- “Remove Static Routes” on page 82
- “Disable RIP Dynamic Routing” on page 82
- “Disable OSPF Dynamic Routing” on page 83

Related Information

- “Routing Feature Topology” on page 70
- “Configuring Static Routing” on page 71
- “Configuring Dynamic Routing” on page 77

Remove Static Routes

1. **Connect to SEFOS on `SEFOS-1`.**

   See “Connect to SEFOS” on page 26.

2. **Remove the static route on `SEFOS-1`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# no ip route 40.0.0.0 255.0.0.0 20.0.0.200
SEFOS-1(config)# end
```

3. **Connect to SEFOS on `SEFOS-2`.**

   See “Connect to SEFOS” on page 26.

4. **Remove the static route on `SEFOS-2`.**

```
SEFOS-2# configure terminal
SEFOS-2(config)# no ip route 10.0.0.0 255.0.0.0 20.0.0.201
SEFOS-2(config)# end
```

Related Information

- “Disable RIP Dynamic Routing” on page 82
- “Disable OSPF Dynamic Routing” on page 83
- “Configure Static Unicast Route Entries” on page 71
- “Add Static Routes” on page 76

Disable RIP Dynamic Routing

1. **Connect to SEFOS on `SEFOS-1`.**

   See “Connect to SEFOS” on page 26.

2. **Disable RIP on `SEFOS-1`.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# no router rip
SEFOS-1(config)# end
```

3. **Disable RIP on `SEFOS-2`.**

If SEFOS-2 is a third-party switch, follow the instructions that came with the switch to disable RIP. Otherwise, follow Step 1 to disable RIP on SEFOS-2.

Related Information

- “Remove Static Routes” on page 82
- “Disable OSPF Dynamic Routing” on page 83
- “Configure RIP Dynamic Routing” on page 77

▼ Disable OSPF Dynamic Routing

1. **Connect to SEFOS on SEFOS-1.**

   See “Connect to SEFOS” on page 26.

2. **Disable OSPF on SEFOS-1.**

```
SEFOS-1# configure terminal
SEFOS-1(config)# no router ospf
SEFOS-1(config)# end
```

3. **Disable OSPF on SEFOS-2.**

   If SEFOS-2 is a third-party switch, follow the instructions that came with the switch to disable OSPF. Otherwise, follow Step 1 to disable OSPF on SEFOS-2.

Related Information

- “Remove Static Routes” on page 82
- “Disable RIP Dynamic Routing” on page 82
- “Configure OSPF Dynamic Routing” on page 79

Glossary

10

10GbE 10 Gigabit Ethernet.

A

ACL Access control list.

C

CMA Cable management assembly.

D

DHCP Dynamic Host Configuration Protocol.

G

GARP Generic Attribute Registration Protocol.

GMRP GARP Multicast Registration Protocol.

GVRP GARP VLAN Registration Protocol.

L

LA Link aggregation.

O

Oracle ILOM Oracle Integrated Lights Out Manager. ILOM provides advanced server processor hardware and software to manage and monitor servers.

Oracle Switch ES2-64 An Ethernet switch by Oracle. Oracle Switch ES2-64 provides six QSFP ports and 40 10GBASE-T RJ-45 ports. See also switch.

Oracle Switch ES2-72 An Ethernet switch by Oracle. Oracle Switch ES2-72 provides 18 QSFP ports. See also switch.

OSPF Open Shortest Path First Protocol.

Q

QSFP+ Quad small form-factor pluggable. QSFP+ is a hot-pluggable transceiver that provides 40 Gb/s or 4 x 10 Gb/s of data transfer.

R

RIP Routing Information Protocol.

RSTP Rapid Spanning Tree Protocol.

S

SEFOS Sun Ethernet Fabric Operating System. A full-featured fabric and switch management software package for configuring and monitoring the switches network infrastructure.

SEL System event log. The switch includes a number of replaceable component sensors that generate entries in the SEL when the sensor crosses a threshold. Many of these readings are used to adjust the fan speeds and perform other actions, such as illuminating LEDs and powering off the switch.

SR Short range. A short range optical transceiver module.

STP Spanning-Tree Protocol.

switch Shortened name for the Oracle Switch ES2-64 and Oracle Switch ES2-72. See also Oracle Switch ES2-64 and Oracle Switch ES2-72.

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