



Clustering Switches

This chapter provides an overview of the concepts and of the procedures used to create and manage Catalyst 2950 and 2955 switch clusters.

You can create and manage switch clusters by using the Network Assistant application, the command-line interface (CLI), or SNMP. Configuring switch clusters is more easily done from Network Assistant than through the CLI or SNMP. For complete procedures about using Network Assistant to configure switch clusters, see *Getting Started with Cisco Network Assistant*, available on Cisco.com. For the CLI cluster commands, see the switch command reference.

This chapter consists of these sections:

- [Understanding Switch Clusters, page 6-1](#)
- [Using the CLI to Manage Switch Clusters, page 6-4](#)
- [Using SNMP to Manage Switch Clusters, page 6-4](#)

Understanding Switch Clusters

These sections describe:

- [Clustering Overview, page 6-1](#)
- [Cluster Command Switch Characteristics, page 6-2](#)
- [Standby Command Switch Characteristics, page 6-2](#)
- [Candidate Switch and Member Switch Characteristics, page 6-3](#)

Clustering Overview

A *switch cluster* is a set of up to 16 connected, cluster-capable Catalyst switches that are managed as a single entity. The switches in the cluster use the switch clustering technology so that you can configure and troubleshoot a group of different Catalyst desktop switch platforms through a single IP address.

Using switch clusters simplifies the management of multiple switches, regardless of their physical location and platform families. Clustering also provides redundancy through standby cluster command switches.

In a switch cluster, 1 switch must be the *cluster command switch* and up to 15 other switches can be *cluster member switches*. The total number of switches in a cluster cannot exceed 16 switches. The cluster command switch is the single point of access used to configure, manage, and monitor the cluster member switches. Cluster members can belong to only one cluster at a time.

For more information about switch clustering, including cluster-planning considerations, see *Getting Started with Cisco Network Assistant*, available on Cisco.com. For a list of Catalyst switches eligible for switch clustering, including which ones can be cluster command switches and which ones can only be cluster member switches, and the required software versions, see the *Release Notes for Cisco Network Assistant*, available on Cisco.com.

Cluster Command Switch Characteristics

A Catalyst 2950 or Catalyst 2955 command switch must meet these requirements:

- It is running Cisco IOS Release 12.0(5.2)WC(1) or later.
- It has an IP address.
- It has Cisco Discovery Protocol (CDP) Version 2 enabled (the default).
- It is not a command or member switch of another cluster.
- A Catalyst 2955 command switch is connected to the standby command switches through the management VLAN and to the member switches through a common VLAN.
- A Catalyst 2950 Long-Reach Ethernet (LRE) command switch is connected to the standby command switches through the management VLAN and to the member switches through a common VLAN.
- If a non-LRE Catalyst 2950 command switch is running Cisco IOS Release 12.1(9)EA1 or later, it is connected to the standby command switches through the management VLAN and to the member switches through a common VLAN.
- If a non-LRE Catalyst 2950 command switch is running a release earlier than Cisco IOS Release 12.1(9)EA1, it is connected to the standby command switches and member switches through its management VLAN.



Note

The CMP-NAT-ACL access list is created when a device is configured as the command switch. Configuring any other access list on the switch can restrict access to it and affect the discovery of member and candidate switches.

We strongly recommend that the highest-end, command-capable switch in the cluster be the command switch:

- If your switch cluster has a Catalyst 3550 switch, that switch should be the command switch.
- If your switch cluster has Catalyst 2900 XL, Catalyst 2940, Catalyst 2950, Catalyst 2955, and Catalyst 3500 XL switches, the Catalyst 2950 or the Catalyst 2955 should be the command switch.

Standby Command Switch Characteristics

A Catalyst 2950 or Catalyst 2955 standby command switch must meet these requirements:

- It is running Cisco IOS Release 12.0(5.2)WC(1) or later.
- It has an IP address.
- It has CDP Version 2 enabled.
- A Catalyst 2955 standby command switch is connected to other standby switches through its management VLAN and to all member switches through a common VLAN.

- A Catalyst 2950 LRE standby command switch is connected to other standby switches through its management VLAN and to all member switches through a common VLAN.
- If a non-LRE Catalyst 2950 standby command switch is running Cisco IOS Release 12.1(9)EA1 or later, it is connected to other standby switches through its management VLAN and to all member switches through a common VLAN.
- If a non-LRE Catalyst 2950 standby command switch is running a release earlier than Cisco IOS Release 12.1(9)EA1, it is connected to the command switch and to other standby command switches and member switches through its management VLAN.



Note Non-LRE Catalyst 2950 command switches running Cisco IOS Release 12.1(9)EA1 or later can connect to standby command switches in the management VLAN.

- It is redundantly connected to the cluster so that connectivity to member switches is maintained.
- It is not a command or member switch of another cluster.



Note Standby cluster command switches must be the same type of switches as the cluster command switch. For example, if the cluster command switch is a Catalyst 2955 switch, the standby cluster command switches must also be Catalyst 2955 switches. When the command switch is a non-LRE Catalyst 2950 switch running Cisco IOS Release 12.1(6)EA2 or later, all standby command switches must be non-LRE Catalyst 2950 switches running Cisco IOS Release 12.1(6)EA2 or later.

Candidate Switch and Member Switch Characteristics

Candidate switches are cluster-capable switches that have not yet been added to a cluster. Member switches are switches that have actually been added to a switch cluster. Although not required, a candidate or member switch can have its own IP address and password.

To join a cluster, a candidate switch must meet these requirements:

- It is running cluster-capable software.
- It has CDP Version 2 enabled.
- It is not a command or member switch of another cluster.
- A Catalyst 2950 LRE or Catalyst 2955 member or candidate switch is connected to the command switch through at least one common VLAN.
- If a non-LRE Catalyst 2950 member or candidate switch is running Cisco IOS Release 12.1(9)EA1 or later, it is connected to the command switch through at least one common VLAN.
- If a non-LRE Catalyst 2950 member or candidate switch is running a release earlier than Cisco IOS Release 12.1(9)EA1, it is connected to the command switch through the command-switch management VLAN.



Note Non-LRE Catalyst 2950 standby command switches running Cisco IOS Release 12.1(9)EA1 or later can connect to candidate and member switches in VLANs different from their management VLANs.

Using the CLI to Manage Switch Clusters

You can configure member switches from the CLI by first logging into the command switch. Enter the **rcommand** user EXEC command and the member switch number to start a Telnet session (through a console or Telnet connection) and to access the member switch CLI. The command mode changes, and the CLI commands operate as usual. Enter the **exit** privileged EXEC command on the member switch to return to the command-switch CLI.

This example shows how to log into member-switch 3 from the command-switch CLI:

```
switch# rcommand 3
```

If you do not know the member-switch number, enter the **show cluster members** privileged EXEC command on the command switch. For more information about the **rcommand** command and all other cluster commands, see the switch command reference.

The Telnet session accesses the member-switch CLI at the same privilege level as on the command switch. The CLI commands then operate as usual. For instructions on configuring the switch for a Telnet session, see the [“Disabling Password Recovery” section on page 6-5](#).

Catalyst 1900 and Catalyst 2820 CLI Considerations

If your switch cluster has Catalyst 1900 and Catalyst 2820 switches running standard edition software, the Telnet session accesses the management console (a menu-driven interface) if the command switch is at privilege level 15. If the command switch is at privilege level 1 to 14, you are prompted for the password to access the menu console.

**Note**

Catalyst 1900, 2900 XL (4 MB), and 2820 switches are not supported in Network Assistant. The switches appear as *unknown members* in the Network Assistant Front Panel and Topology views.

Command-switch privilege levels map to the Catalyst 1900 and Catalyst 2820 member switches running standard and Enterprise Edition Software as follows:

- If the command-switch privilege level is 1 to 14, the member switch is accessed at privilege level 1.
- If the command-switch privilege level is 15, the member switch is accessed at privilege level 15.

**Note**

The Catalyst 1900 and Catalyst 2820 CLI is available only on switches running Enterprise Edition Software.

For more information about the Catalyst 1900 and Catalyst 2820 switches, see the installation and configuration guides for those switches.

Using SNMP to Manage Switch Clusters

When you first power on the switch, SNMP is enabled if you enter the IP information by using the setup program and accept its proposed configuration. If you did not use the setup program to enter the IP information and SNMP was not enabled, you can enable it as described in the [“Configuring SNMP” section on page 27-6](#). On Catalyst 1900 and Catalyst 2820 switches, SNMP is enabled by default.

When you create a cluster, the command switch manages the exchange of messages between member switches and an SNMP application. The cluster software on the command switch appends the member switch number (*@esN*, where *N* is the switch number) to the first configured read-write and read-only community strings on the command switch and propagates them to the member switch. The command switch uses this community string to control the forwarding of gets, sets, and get-next messages between the SNMP management station and the member switches.

**Note**

When a cluster standby group is configured, the command switch can change without your knowledge. Use the first read-write and read-only community strings to communicate with the command switch if there is a cluster standby group configured for the cluster.

If the member switch does not have an IP address, the command switch redirects traps from the member switch to the management station, as shown in [Figure 6-1](#). If a member switch has its own IP address and community strings, the member switch can send traps directly to the management station, without going through the command switch.

If a member switch has its own IP address and community strings, they can be used in addition to the access provided by the command switch. For more information about SNMP and community strings, see [Chapter 27, “Configuring SNMP.”](#)

Figure 6-1 SNMP Management for a Cluster



