



Release Notes for the Cisco Catalyst Blade Switch 3040 for FSC, Cisco IOS Release 12.2(40)SE and Later

Revised January 9, 2008

Cisco IOS Releases 12.2(40)SE and later run on the Cisco Catalyst Blade Switch 3040 for FSC, referred to as the *switch*. The switch is installed in the Fujitsu Siemens Computers (FSC) PRIMERGY BX600 system, referred to as the *BX600 system*.



Note

Before you install the switch in the BX600 system, upgrade the BX600 system management software to version 1.68 or later for the switch to operate properly.

Check for updates to this document at this URL for information about compatibility with the BX600 system software:

http://www.cisco.com/en/US/products/ps8743/prod_release_notes_list.html



Note

If you wish to use Device Manager to upgrade the switch from Cisco IOS Release 12.2(35)SE through Cisco IOS Release 12.2(40)SE1 (the LAN Base image) to Cisco IOS Release 12.2(44)SE or later (the IP base image), you must first upgrade to Cisco IOS Release 12.2(40)SE2.

These release notes include important information about Cisco IOS Release 12.2(40)SE1 and SE2 and any limitations, restrictions, and caveats that apply to them. Verify that these release notes are correct for your switch:

- If you are installing a new switch, see the Cisco IOS release label on the switch packaging.
- If your switch is on, use the **show version** privileged EXEC command. See the “[Finding the Software Version and Feature Set](#)” section on page 3.
- If you are upgrading to a new release, see the software upgrade filename for the software version. See the “[Deciding Which Files to Use](#)” section on page 4.

For the complete list of Cisco Catalyst Blade Switch 3040 for FSC documentation, see the “[Updates to the Software Configuration Guide](#)” section on page 16.



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You can download the switch software from this site (registered Cisco.com users with a login password):
<http://tools.cisco.com/support/downloads/go/MDFTree.x?butype=switches>

This software release is part of a special release of Cisco IOS software that is not released on the same 8-week maintenance cycle that is used for other platforms. As maintenance releases and future software releases become available, they will be posted to Cisco.com in the Cisco IOS software area.

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System Requirements

The system requirements are described in these sections:

- “Hardware Supported” section on page 2
- “Device Manager System Requirements” section on page 2

Hardware Supported

The hardware supported on this release is the Cisco Catalyst Blade Switch 3040 for FSC.

Device Manager System Requirements

These sections describes the hardware and software requirements for using the device manager:

- “Hardware Requirements” section on page 3
- “Software Requirements” section on page 3

Hardware Requirements

Table 1 lists the minimum hardware requirements for running the device manager.

Table 1 Minimum Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
Intel Pentium II ¹	64 MB ²	256	1024 x 768	Small

1. We recommend Intel Pentium 4.
2. We recommend 256-MB DRAM.

Software Requirements

Table 2 lists the supported operating systems and browsers for using the device manager, which does not require a plug-in. The device manager verifies the browser version when starting a session to ensure that the browser is supported.



Note

Windows NT and Windows 98 are no longer supported.

Table 2 Supported Operating Systems and Browsers

Operating System	Minimum Service Pack or Patch	Microsoft Internet Explorer ¹	Netscape Navigator
Windows 2000	None	5.5 or 6.0	7.1
Windows XP	None	5.5 or 6.0	7.1

1. Service Pack 1 or higher is required for Internet Explorer 5.5.

Upgrading the Switch Software

These are the procedures for downloading software. Before downloading software, read this section for important information:

- [“Finding the Software Version and Feature Set”](#) section on page 3
- [“Deciding Which Files to Use”](#) section on page 4
- [“Upgrading a Switch by Using the Device Manager”](#) section on page 5
- [“Upgrading a Switch by Using the CLI”](#) section on page 5
- [“Recovering from a Software Failure”](#) section on page 6

Finding the Software Version and Feature Set

The Cisco IOS image is stored as a bin file in a directory that is named with the Cisco IOS release. A subdirectory contains the files needed for web management. The image is stored on the system board flash device (flash:).

You can use the **show version** privileged EXEC command to see the software version that is running on your switch. The second line of the display shows the version.

You can also use the **dir filesystem:** privileged EXEC command to see the directory names of other software images that you might have stored in flash memory.

Deciding Which Files to Use

The upgrade procedures in these release notes describe how to perform the upgrade by using a combined tar file. This file contains the Cisco IOS image file and the files needed for the embedded device manager. You must use the combined tar file to upgrade the switch through the device manager. To upgrade the switch through the CLI, use the tar file and the **archive download-sw** privileged EXEC command.



Note

If you wish to use Device Manager to upgrade the switch from Cisco IOS Release 12.2(35)SE through Cisco IOS Release 12.2(40)SE1 (the LAN Base image) to Cisco IOS Release 12.2(44)SE or later (the IP base image), you must first upgrade to Cisco IOS Release 12.2(40)SE2.

Table 3 lists the filenames for this software release.

Table 3 Cisco IOS Software Image Files

Filename	Description
cbs40x0-lanbase-tar.122-40.SE2.tar	Cisco Catalyst Blade Switch 3040 for FSC image file and device manager files. This image has Layer 2+ features.
cbs40x0-lanbasek9-tar.122-40.SE2.tar	Cisco Catalyst Blade Switch 3040 for FSC cryptographic image file and device manager files. This image has the Kerberos and SSH features.

Archiving Software Images

Before upgrading your switch software, make sure that you have archived copies of the current Cisco IOS release and the Cisco IOS release to which you are upgrading. You should keep these archived images until you have upgraded all devices in the network to the new Cisco IOS image and until you have verified that the new Cisco IOS image works properly in your network.

Cisco routinely removes old Cisco IOS versions from Cisco.com. See *Product Bulletin 2863* for more information:

http://www.cisco.com/en/US/products/sw/iosswrel/ps5187/prod_bulletin0900aecd80281c0e.html

You can copy the bin software image file on the flash memory to the appropriate TFTP directory on a host by using the **copy flash: tftp:** privileged EXEC command.



Note

Although you can copy any file on the flash memory to the TFTP server, it is time consuming to copy all of the HTML files in the tar file. We recommend that you download the tar file from Cisco.com and archive it on an internal host in your network.

You can also configure the switch as a TFTP server to copy files from one switch to another without using an external TFTP server by using the **tftp-server** global configuration command. For more information about the **tftp-server** command, see the “Basic File Transfer Services Commands” section of the *Cisco IOS Configuration Fundamentals Command Reference, Release 12.2* at this URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_command_reference_book09186a00800811e0.html

Upgrading a Switch by Using the Device Manager

You can upgrade switch software by using the device manager. For detailed instructions, click **Help**.



Note

When using the device manager to upgrade your switch, do not use or close your browser session after the upgrade process begins. Wait until after the upgrade process completes.

Upgrading a Switch by Using the CLI

This procedure is for copying the combined tar file to the switch. You copy the file to the switch from a TFTP server and extract the files. You can download an image file and replace or keep the current image.

To download software, follow these steps:

-
- Step 1** Use [Table 3 on page 4](#) to identify the file that you want to download.
- Step 2** Download the software image file. If you have a SmartNet support contract, go to this URL, and log in to download the appropriate files:

<http://www.cisco.com/kobayashi/sw-center/sw-lan.shtml>

- Step 3** Copy the image to the appropriate TFTP directory on the workstation, and make sure that the TFTP server is properly configured.

For more information, see Appendix B in the software configuration guide for this release.

- Step 4** Log into the switch through the console port or a Telnet session.
- Step 5** (Optional) Ensure that you have IP connectivity to the TFTP server by entering this privileged EXEC command:

```
Switch# ping tftp-server-address
```

For more information about assigning an IP address and default gateway to the switch, see the software configuration guide for this release.

- Step 6** Download the image file from the TFTP server to the switch. If you are installing the same version of software that is currently on the switch, overwrite the current image by entering this privileged EXEC command:

```
Switch# archive download-sw /overwrite /reload
tftp: [ [//location]/directory]/image-name.tar
```

The **/overwrite** option overwrites the software image in flash memory with the downloaded one.

The **/reload** option reloads the system after downloading the image unless the configuration has been changed and not saved.

For *//location*, specify the IP address of the TFTP server.

For `/directory/image-name.tar`, specify the directory (optional) and the image to download. Directory and image names are case sensitive.

This example shows how to download an image from a TFTP server at 198.30.20.19 and to overwrite the image on the switch:

```
Switch# archive download-sw /overwrite  
tftp://198.30.20.19/c3750-ipservices-tar.122-35.SE.tar
```

You can also download the image file from the TFTP server to the switch and keep the current image by replacing the `/overwrite` option with the `/leave-old-sw` option.

Recovering from a Software Failure

For additional recovery procedures, see the “Troubleshooting” chapter in the software configuration guide for this release.

Installation Notes

You can assign IP information to your switch by using these methods:

- The Express Setup program or the BX600 Management Blade WEB GUI described in the getting started guide.
- The CLI-based setup program, as described in the hardware installation guide.
- The DHCP-based autoconfiguration, as described in the software configuration guide.
- Manually assigning an IP address, as described in the software configuration guide.

New Software Features

These are the new software features for this release:

- Configuration replacement and rollback to replace the running configuration on a switch with any saved Cisco IOS configuration file
- IP Service Level Agreements (IP SLAs) responder support that allows the switch to be a target device for IP SLAs active traffic monitoring
- Private VLANs to allow traffic to be segmented at the data-link layer (Layer 2), limiting the size of the broadcast domain
- Support for the Link Layer Discovery Protocol Media Extensions (LLDP-MED) location TLV that provides location information from the switch to the endpoint device
- Support for the CISCO-MAC-NOTIFICATION-MIB

Limitations and Restrictions

You should review this section before you begin working with the switch. These are known limitations that will not be fixed, and there is not always a workaround. Some features might not work as documented, and some features could be affected by recent changes to the switch hardware or software.

This section contains these limitations:

- [“Cisco IOS Limitations” section on page 7](#)
- [“Device Manager Limitations” section on page 11](#)

Cisco IOS Limitations

These limitations apply to the switch:

- [“Configuration” section on page 7](#)
- [“Dynamic ARP Inspection” section on page 8](#)
- [“Ethernet” section on page 8](#)
- [“IP” section on page 8](#)
- [“IP Telephony” section on page 9](#)
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- [“MAC Addressing Multicasting” section on page 9](#)
- [“QoS” section on page 10](#)
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- [“Trunking” section on page 11](#)
- [“VLAN” section on page 11](#)

Configuration

The workaround is to configure the burst interval to more than 1 second.

These are the configuration limitations:

- A static IP address might be removed when the previously acquired DHCP IP address lease expires.

This problem occurs under these conditions:

- When the switch is booted without a configuration (no config.text file in flash memory).
- When the switch is connected to a DHCP server that is configured to give an address to it (the dynamic IP address is assigned to VLAN 1).
- When an IP address is configured on VLAN 1 before the dynamic address lease assigned to VLAN 1 expires.

The workaround is to reconfigure the static IP address. (CSCe71176 and CSCdz11708)

- When connected to some third-party devices that send early preambles, a switch port operating at 100 Mp/s full duplex or 100 Mp/s half duplex might bounce the line protocol up and down. The problem is observed only when the switch is receiving frames.

The workaround is to configure the port for 10 Mp/s and half duplex or to connect a hub or a nonaffected device to the switch. (CSCed39091)

- When port security is enabled on an interface in restricted mode and the **switchport block unicast interface** command has been entered on that interface, MAC addresses are incorrectly forwarded when they should be blocked
The workaround is to enter the **no switchport block unicast** interface configuration command on that specific interface. (CSCee93822)
- A traceback error occurs if a crypto key is generated after an SSL client session.
There is no workaround. This is a cosmetic error and does not affect the functionality of the switch. (CSCef59331)

Dynamic ARP Inspection

- When dynamic ARP inspection is configured on a VLAN, and the ARP traffic on a port in the VLAN is within the configured rate limit, the port might go into an error-disabled state. (CSCse06827)

Ethernet

This is the Ethernet limitation:

Traffic on EtherChannel ports is not perfectly load-balanced. Egress traffic on EtherChannel ports are distributed to member ports on load balance configuration and traffic characteristics like MAC or IP address. More than one traffic stream might map to same member ports, based on hashing results calculated by the ASIC.

If this happens, traffic distribution is uneven on EtherChannel ports.

Changing the load balance distribution method or changing the number of ports in the EtherChannel can resolve this problem. Use any of these workarounds to improve EtherChannel load balancing:

- for random source-ip and dest-ip traffic, configure load balance method as **src-dst-ip**
- for incrementing source-ip traffic, configure load balance method as **src-ip**
- for incrementing dest-ip traffic, configure load balance method as **dst-ip**
- Configure the number of ports in the EtherChannel so that the number is equal to a power of 2 (for example, 2, 4, or 8)

For example, with load balance configured as **dst-ip** with 150 distinct incrementing destination IP addresses, and the number of ports in the EtherChannel set to either 2, 4, or 8, load distribution is optimal. (CSCeh81991)

IP

This is the IP limitation:

When the rate of received DHCP requests exceeds 2,000 packets per minute for a long time, the response time might be slow when you are using the console. The workaround is to use rate limiting on DHCP traffic to prevent a denial of service attack from occurring. (CSCeb59166)

IP Telephony

This is the IP telephony limitation:

After you change the access VLAN on a port that has IEEE 802.1x enabled, the IP phone address is removed. Because learning is restricted on IEEE 802.1x-capable ports, it takes approximately 30 seconds before the address is relearned. No workaround is necessary. This limitation is unlikely to affect the Cisco Catalyst Blade Switch 3040 for FSC because IP phones are not usually connected to the switch uplink ports. (CSCea85312)

MAC Addressing Multicasting

These are the multicasting limitations:

- If the number of multicast routes and Internet Group Management Protocol (IGMP) groups are more than the maximum number specified by the **show sdm prefer** global configuration command, the traffic received on unknown groups is flooded in the received VLAN even though the **show ip igmp snooping multicast-table** privileged EXEC command output shows otherwise. The workaround is to reduce the number of multicast routes and IGMP snooping groups to less than the maximum supported value. (CSCdy09008)
- IGMP filtering is applied to packets that are forwarded through hardware. It is not applied to packets that are forwarded through software. Hence, with multicast routing enabled, the first few packets are sent from a port even when IGMP filtering is set to deny those groups on that port. There is no workaround. (CSCdy82818)
- If an IGMP report packet has two multicast group records, the switch removes or adds interfaces depending on the order of the records in the packet:
 - If the **ALLOW_NEW_SOURCE** record is before the **BLOCK_OLD_SOURCE** record, the switch removes the port from the group.
 - If the **BLOCK_OLD_SOURCE** record is before the **ALLOW_NEW_SOURCE** record, the switch adds the port to the group.

There is no workaround. (CSCec20128)

- When IGMP snooping is disabled and you enter the **switchport block multicast** interface configuration command, IP multicast traffic is not blocked.

The **switchport block multicast** interface configuration command is only applicable to non-IP multicast traffic.

There is no workaround. (CSCee16865)

- Incomplete multicast traffic can be seen under either of these conditions:
 - You disable IP multicast routing or re-enable it globally on an interface.
 - A switch mroute table temporarily runs out of resources and recovers later.

The workaround is to enter the **clear ip mroute** privileged EXEC command on the interface. (CSCef42436)

After you configure a switch to join a multicast group by entering the **ip igmp join-group group-address** interface configuration command, the switch does not receive join packets from the client, and the switch port connected to the client is removed from the IGMP snooping forwarding table.

Use one of these workarounds:

- Cancel membership in the multicast group by using the **no ip igmp join-group** *group-address* interface configuration command on an SVI.
- Disable IGMP snooping on the VLAN interface by using the **no ip igmp snooping vlan** *vlan-id* global configuration command. (CSCeh90425)

QoS

These are the quality of service (QoS) limitations:

- Some switch queues are disabled if the buffer size or threshold level is set too low with the **mls qos queue-set output** global configuration command. The ratio of buffer size to threshold level should be greater than 10 to avoid disabling the queue. The workaround is to choose compatible buffer sizes and threshold levels. (CSCea76893)
- When auto-QoS is enabled on the switch, priority queuing is not enabled. Instead, the switch uses shaped round robin (SRR) as the queuing mechanism. The auto-QoS feature is designed on each platform based on the feature set and hardware limitations, and the queuing mechanism supported on each platform might be different. There is no workaround. (CSCee22591)
- A QoS service policy with a policy map containing more than 62 policers cannot be added to an interface by using the **service-policy** interface configuration command.

The workaround is to use policy maps with 62 or fewer policers. (CSCsc59418)

SPAN and RSPAN

These are the SPAN and Remote SPAN (RSPAN) limitations:

- Egress SPAN routed packets (both unicast and multicast) show the incorrect source MAC address. For remote SPAN packets, the source MAC address should be the MAC address of the egress VLAN, but instead the packet shows the MAC address of the RSPAN VLAN. For local SPAN packets with native encapsulation on the destination port, the packet shows the MAC address of VLAN 1. This problem does not appear with local SPAN when the **encapsulation replicate** option is used. This limitation does not apply to bridged packets. The workaround is to use the **encapsulate replicate** keywords in the **monitor session** global configuration command. Otherwise, there is no workaround. This is a hardware limitation. (CSCdy81521)
- During periods of very high traffic when two RSPAN source sessions are configured, the VLAN ID of packets in one RSPAN session might overwrite the VLAN ID of the other RSPAN session. If this occurs, packets intended for one RSPAN VLAN are incorrectly sent to the other RSPAN VLAN. This problem does not affect RSPAN destination sessions. The workaround is to configure only one RSPAN source session. This is a hardware limitation. (CSCea72326)
- Cisco Discovery Protocol (CDP), VLAN Trunking Protocol (VTP), and Port Aggregation Protocol (PAgP) packets received from a SPAN source are not sent to the destination interfaces of a local SPAN session. The workaround is to use the **monitor session session_number destination {interface interface-id encapsulation replicate}** global configuration command for local SPAN. (CSCed24036)
- When the **logging event-spanning-tree** interface configuration command is configured and logging to the console is enabled, a topology change might generate a large number of logging messages, causing high CPU utilization. CPU utilization can increase with the number of spanning-tree instances and the number of interfaces configured with the **logging event-spanning-tree** interface configuration command. This condition adversely affects how the switch operates and could cause problems such as STP convergence delay.

High CPU utilization can also occur with other conditions, such as when debug messages are logged at a high rate to the console.

Use one of these workarounds:

- Disable logging to the console.
- Rate-limit logging messages to the console. (CSCsg91027)
- Remove the **logging event spanning-tree** interface configuration command from the interfaces.

The workaround is to configure aggressive UDLD. (CSCsh70244)

Trunking

These are the trunking limitations:

- The switch treats frames received with mixed encapsulation (IEEE 802.1Q and Inter-Switch Link [ISL]) as frames with FCS errors, increments the error counters, and the port LED blinks amber. This happens when an ISL-unaware device receives an ISL-encapsulated packet and forwards the frame to an IEEE 802.1Q trunk interface. There is no workaround. (CSCdz33708)
- IP traffic with IP options set is sometimes leaked on a trunk port. For example, a trunk port is a member of an IP multicast group in VLAN X but is not a member in VLAN Y. If VLAN Y is the output interface for the multicast route entry assigned to the multicast group and an interface in VLAN Y belongs to the same multicast group, the IP-option traffic received on an input VLAN interface other than one in VLAN Y is sent on the trunk port in VLAN Y because the trunk port is forwarding in VLAN Y, even though the port has no group membership in VLAN Y. There is no workaround. (CSCdz42909).
- For trunk ports or access ports configured with IEEE 802.1Q tagging, inconsistent statistics might appear in the **show interfaces counters** privileged EXEC command output. Valid IEEE 802.1Q frames of 64 to 66 bytes are correctly forwarded even though the port LED blinks amber, and the frames are not counted on the interface statistics. There is no workaround. (CSCec35100).

VLAN

This is the VLAN limitation:

- If the number of VLANs times the number of trunk ports exceeds the recommended limit of 13,000, the switch can fail.

The workaround is to reduce the number of VLANs or trunks. (CSCeb31087)

Device Manager Limitations

This is the device manager limitation for this release:

When you are prompted to accept the security certificate and you click *No*, you only see a blank screen, and the device manager does not start.

The workaround is to click *Yes* when you are prompted to accept the certificate. (CSCef45718)

Important Notes

These sections describe the important notes related to this software release:

- “Cisco IOS Notes” section on page 12
- “Device Manager Notes” section on page 12

Cisco IOS Notes

These notes apply to Cisco IOS software:

- The behavior of the **no logging on** global configuration command changed in Cisco IOS Release 12.2(18)SE and later. You can only use the **logging on** and then the **no logging console** global configuration commands to disable logging to the console. (CSCec71490)
- In Cisco IOS Release 12.2(25)SEC, the implementation for multiple spanning tree (MST) changed from the previous release. Multiple STP (MSTP) complies with the IEEE 802.1s standard. Previous MSTP implementations were based on a draft of the IEEE 802.1s standard.
- If the switch requests information from the Cisco Secure Access Control Server (ACS) and the message exchange times out because the server does not respond, a message similar to this appears:

```
00:02:57: %RADIUS-4-RADIUS_DEAD: RADIUS server 172.20.246.206:1645,1646 is not responding.
```

If this message appears, make sure that there is network connectivity between the switch and the ACS. You should also make sure that the switch has been properly configured as an AAA client on the ACS.

- Cisco IOS Release 12.2(40)SE1 and later

If the switch has interfaces with automatic QoS for voice over IP (VoIP) configured and you upgrade the switch software to Cisco IOS Release 12.2(40)SE1 (or later), when you enter the **auto qos voip cisco-phone** interface configuration command on another interface, you might see this message:

```
AutoQoS Error: ciscophone input service policy was not properly applied
policy map AutoQoS-Police-CiscoPhone not configured
```

If this happens, enter the **no auto qos voip cisco-phone** interface command on all interface with this configuration to delete it. Then enter the **auto qos voip cisco-phone** command on each of these interfaces to reapply the configuration.

Device Manager Notes

These notes apply to the device manager:

- We recommend this browser setting to more quickly display the device manager from Microsoft Internet Explorer.

From Microsoft Internet Explorer:

1. Choose **Tools > Internet Options**.
2. Click **Settings** in the Temporary Internet files area.
3. From the Settings window, choose **Automatically**.
4. Click **OK**.

5. Click **OK** to exit the Internet Options window.
- The HTTP server interface must be enabled to display the device manager. By default, the HTTP server is enabled on the switch. Use the **show running-config** privileged EXEC command to see if the HTTP server is enabled or disabled.
 - If you use Internet Explorer Version 5.5 and select a URL with a nonstandard port at the end of the address (for example, *www.cisco.com:84*), you must enter *http://* as the URL prefix. Otherwise, you cannot start the device manager.

Open Caveats

This section describes the open severity 3 Cisco IOS configuration caveats with possible unexpected activity in this software release:

- CSCsb85001

If traffic is passing through VMPS ports and you perform a **shut** operation, a dynamic VLAN is not assigned and a VLAN with a null ID appears.

The workaround is to clear the MAC address table. This forces the VMPS server to correctly reassign the VLAN.

- CSCsc30733

This error message appears during authentication when a method list is used and one of the methods in the method list is removed:

```
AAA-3-BADMETHODERROR:Cannot process authentication method 218959117
```

There is no workaround. However, this is only an informational message and does not affect switch functionality.

- CSCsc96474

The switch might display tracebacks similar to these examples when a large number of IEEE 802.1x supplicants try to repeatedly log in and log out.

Examples:

```
Jan 3 17:54:32 L3A3 307: Jan 3 18:04:13.459: %SM-4-BADEVENT: Event 'eapReq' is invalid
for the current state 'auth_bend_idle': dot1x_auth_bend Fa9
```

```
Jan 3 17:54:32 L3A3 308: -Traceback= B37A84 18DAB0 2FF6C0 2FF260 8F2B64 8E912C Jan 3
19:06:13 L3A3 309: Jan 3 19:15:54.720: %SM-4-BADEVENT: Event 'eapReq_no_reAuthMax' is
invalid for the current ate 'auth_restart': dot1x_auth Fa4
```

```
Jan 3 19:06:13 L3A3 310: -Traceback= B37A84 18DAB0 3046F4 302C80 303228 8F2B64 8E912C
Jan 3 20:41:44 L3A3 315: .Jan 3 20:51:26.249: %SM-4-BADEVENT: Event 'eapSuccess' is
invalid for the current state 'auth_restart': dot1x_auth Fa9
```

```
Jan 3 20:41:44 L3A3 316: -Traceback= B37A84 18DAB0 304648 302C80 303228 8F2B64 8E912C
```

There is no workaround.

- CSCsd03580

When IEEE 802.1x is globally disabled on the switch by using the **no dot1x system-auth-control** global configuration command, some interface level configuration commands, including the **dot1x timeout** and **dot1x mac-auth-bypass commands**, become unavailable.

The workaround is to enable the **dot1x system-auth-control** global configuration command before attempting to configure interface level IEEE 802.1x parameters.

- CSCsg18176

When dynamic ARP inspection is enabled and IP validation is disabled, the switch drops ARP requests that have a source address of 0.0.0.0.

The workaround is to configure an ARP access control list (ACL) that permits IP packets with a source IP address of 0.0.0.0 (and any MAC) address) and apply the ARP ACL to the desired DAI VLANs.

- CSCsg21537

When MAC addresses are learned on an Etherchannel port, the addresses are incorrectly deleted from the MAC address table even when the MAC address table aging timeout value is configured to be longer than the ARP timeout value. This causes intermittent unicast packet flooding in the network.

- CSCsg30295

When you configure an IP address on a switch virtual interface (SVI) with DHCP and enable DHCP snooping on the SVI VLAN, the switch SVI cannot obtain an IP address.

The workaround is to not enable DHCP snooping on the SVI VLAN or to use a static IP address for the SVI.

- CSCsi63999

Changing the spanning tree mode from rapid STP to MSTP can cause tracebacks when the virtual port error-disable feature is enabled when the STP mode is changed.

There is no workaround.

- CSCsi70454

The configuration file used for the configuration replacement feature requires the character string *end* at the end of the file. The Windows Notepad text editor does not add the *end* string, and the configuration rollback does not work.

These are the workarounds. (You only need to do one of these.)

- Do not use a configuration file that is stored by or edited with Windows Notepad.
- Manually add the character string *end* to the end of the file.

The workaround is to configure routed IPv4 multicast and IPv6 unicast traffic in different switch ports.

- CSCsj52956

In Cisco IOS Release 12.2(37)SE or later, the TxBufferFullDropCount counter always increments even when the switch is a standalone switch.

There is no workaround.

- CSCsj53001

In Cisco IOS Release 12.2(37)SE or later, the *Total output drops* field in the **show interfaces** privileged EXEC command output displays ASIC drops.

- On some interfaces, the *Total output drops* field is always 0 even though the **show platform port-asic stats drop** privileged EXEC command output shows ASIC drops.
- The *Total output drops* value is the same for all the ports that are linked to the same ASIC.

There is no workaround.

on the subinterfaces.

- CSCsj74022
The switch does not correctly update the entPhysicalChildIndex objects from the ENTITY-MIB, and some of the entPhysicalChildIndex entries are missing from the table. This adversely affects network management applications such as CiscoWorks CiscoView because they cannot manage the switch.
There is no workaround.
- CSCsj77933
In Cisco IOS Release 12.2(35)SE and Cisco IOS Release 12.2(37)SE, if you enter a space before a comma in the **define interface-range** or the **interface range global** configuration command, the space before the comma is not saved in the switch configuration.
There is no workaround.
- CSCsj87991
A switch configured for Link Layer Discovery Protocol (LLDP) might not correctly report the enabled switch capabilities in the LLDP type, length, and value (TLV) attributes. System capabilities appear correctly, but the enabled capabilities are not identified if the switch is configured only as a Layer 2 switch.
There is no workaround.

Resolved Caveats

This section describes the caveats that have been resolved in Cisco IOS Release 12.2(40)SE1:

- CSCsg81334
If IEEE 802.1x critical authentication is not enabled and the RADIUS authentication server is unavailable during MAC authentication bypass (MAB) reauthentication, when the RADIUS server comes back up, MAB now correctly authenticates previously authenticated clients.
- CSCsi08513
MAC flap-notification no longer occurs when a switch is running VLAN bridge spanning-tree protocol (STP) and fallback bridging is configured on the VLANs running STP.
- CSCsi10584
Multiple Spanning-Tree Protocol (MSTP) convergence time has been improved for Cisco IOS Release 12.2.
- CSCsl22576
You can use Device Manager to upgrade the switch from Cisco IOS Release 12.2(35)SE through Cisco IOS Release 12.2(40)SE1 (the LAN Base image) to Cisco IOS Release 12.2(44)SE or later (the IP base image). However, to do this, you must first upgrade to Cisco IOS Release 12.2(40)SE2.
If you wish to upgrade from a LAN base image to the IP base image without first upgrading to Cisco IOS Release 12.2(40)SE2, you *must* use one of these methods to upgrade the switch:
 - Use the CLI to upgrade to Cisco IOS Release 12.2(44)SE or later.
 - Use the TFTP option in CNA to upgrade to Cisco IOS Release 12.2(44)SE or later.

Documentation Updates

This section contains these documentation updates:

- “Updates to the Software Configuration Guide” section on page 16
- “Information Updates” section on page 16
- “Updates to the Command Reference” section on page 34
- “Updates to the System Message Guide” section on page 47

Updates to the Software Configuration Guide

These are the updates to the software configuration guide:

- “Information Updates” section on page 16
- “Configuration Replacement and Rollback” section on page 17
- “LLDP-MED Location TLV” section on page 21
- “Configuring Private VLANs” section on page 25

Information Updates

- This information about the **dot1x timeout tx-period** *seconds* interface configuration command is incorrect:

The range for *seconds* is from 5 to 65535.

The correct range is from 1 to 65535 seconds.

- This information in the “MAC Address-Table Move Update” section of the “Understanding Flex Links and the MAC Address-Table Move Update” chapter is incorrect:

The switch then starts forwarding traffic from the server to the PC through port 4, which reduces the loss of traffic from the server to the PC.

This is the correct information:

Switch A does not need to wait for the MAC address-table update. The switch detects a failure on port 1 and immediately starts forwarding server traffic from port 2, the new forwarding port. This change occurs in 100 milliseconds (ms). The PC is directly connected to switch A, and the connection status does not change. Switch A does not need to update the PC entry in the MAC address table.

- This caution was added to the “Configuring System Message Logging” chapter of the software configuration guide.



Caution

Logging messages to the console at a high rate can cause high CPU utilization and adversely affect how The **private-vlan mapping** interface configuration command only affects private-VLAN traffic that is Layer 3 switched.

Configuration Replacement and Rollback

The configuration replacement and rollback feature replaces the running configuration with any saved Cisco IOS configuration file. You can use the rollback function to roll back to a previous configuration.

These sections contain this information:

- [“Understanding Configuration Replacement and Rollback” section on page 17](#)
- [“Configuration Guidelines” section on page 18](#)
- [“Configuring the Configuration Archive” section on page 19](#)
- [“Performing a Configuration Replacement or Rollback Operation” section on page 20](#)

Understanding Configuration Replacement and Rollback

To use the configuration replacement and rollback feature, you should understand these concepts:

- [“Archiving a Configuration” section on page 17](#)
- [“Replacing a Configuration” section on page 17](#)
- [“Rolling Back a Configuration” section on page 18](#)

Archiving a Configuration

The configuration archive provides a mechanism to store, organize, and manage an archive of configuration files. The **configure replace** privileged EXEC command increases the configuration rollback capability. As an alternative, you can save copies of the running configuration by using the **copy running-config destination-url** privileged EXEC command, storing the replacement file either locally or remotely. However, this method lacks any automated file management. The configuration replacement and rollback feature can automatically save copies of the running configuration to the configuration archive.

You use the **archive config** privileged EXEC command to save configurations in the configuration archive by using a standard location and filename prefix that is automatically appended with an incremental version number (and optional timestamp) as each consecutive file is saved. You can specify how many versions of the running configuration are kept in the archive. After the maximum number of files are saved, the oldest file is automatically deleted when the next, most recent file is saved. The **show archive** privileged EXEC command displays information for all the configuration files saved in the configuration archive.

The Cisco IOS configuration archive, in which the configuration files are stored and available for use with the **configure replace** command, is in any of these file systems: FTP, HTTP, RCP, TFTP.

Replacing a Configuration

The **configure replace** privileged EXEC command replaces the running configuration with any saved configuration file. When you enter the **configure replace** command, the running configuration is compared with the specified replacement configuration, and a set of configuration differences is generated. The resulting differences are used to replace the configuration. The configuration replacement operation is usually completed in no more than three passes. To prevent looping behavior no more than five passes are performed.

You can use the **copy source-url running-config** privileged EXEC command to copy a stored configuration file to the running configuration. When using this command as an alternative to the **configure replace target-url** privileged EXEC command, note these major differences:

- The **copy source-url running-config** command is a merge operation and preserves all the commands from both the source file and the running configuration. This command does not remove commands from the running configuration that are not present in the source file. In contrast, the **configure replace target-url** command removes commands from the running configuration that are not present in the replacement file and adds commands to the running configuration that are not present.
- You can use a partial configuration file as the source file for the **copy source-url running-config** command. You must use a complete configuration file as the replacement file for the **configure replace target-url** command.

Rolling Back a Configuration

You can also use the **configure replace** command to roll back changes that were made since the previous configuration was saved. Instead of basing the rollback operation on a specific set of changes that were applied, the configuration rollback capability reverts to a specific configuration based on a saved configuration file.

If you want the configuration rollback capability, you must first save the running configuration before making any configuration changes. Then, after entering configuration changes, you can use that saved configuration file to roll back the changes by using the **configure replace target-url** command.

You can specify any saved configuration file as the rollback configuration. You are not limited to a fixed number of rollbacks, as is the case in some rollback models.

Configuration Guidelines

Follow these guidelines when configuring and performing configuration replacement and rollback:

- Make sure that the switch has free memory larger than the combined size of the two configuration files (the running configuration and the saved replacement configuration). Otherwise, the configuration replacement operation fails.
- Make sure that the switch also has sufficient free memory to execute the configuration replacement or rollback configuration commands.
- Certain configuration commands, such as those pertaining to physical components of a networking device (for example, physical interfaces), cannot be added or removed from the running configuration.
 - A configuration replacement operation cannot remove the **interface interface-id** command line from the running configuration if that interface is physically present on the device.
 - The **interface interface-id** command line cannot be added to the running configuration if no such interface is physically present on the device.
- When using the **configure replace** command, you must specify a saved configuration as the replacement configuration file for the running configuration. The replacement file must be a complete configuration generated by a Cisco IOS device (for example, a configuration generated by the **copy running-config destination-url** command).



Note

If you generate the replacement configuration file externally, it must comply with the format of files generated by Cisco IOS devices.

Configuring the Configuration Archive

Using the **configure replace** command with the configuration archive and with the **archive config** command is optional but offers significant benefit for configuration rollback scenarios. Before using the **archive config** command, you must first configure the configuration archive. Starting in privileged EXEC mode, follow these steps to configure the configuration archive:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	archive	Enter archive configuration mode.
Step 3	path <i>url</i>	Specify the location and filename prefix for the files in the configuration archive.
Step 4	maximum <i>number</i>	(Optional) Set the maximum number of archive files of the running configuration to be saved in the configuration archive. <i>number</i> —Maximum files of the running configuration file in the configuration archive. Valid values are from 1 to 14. The default is 10. Note Before using this command, you must first enter the path archive configuration command to specify the location and filename prefix for the files in the configuration archive.
Step 5	time-period <i>minutes</i>	(Optional) Set the time increment for automatically saving an archive file of the running configuration in the configuration archive. <i>minutes</i> —Specify how often, in minutes, to automatically save an archive file of the running configuration in the configuration archive.
Step 6	end	Return to privileged EXEC mode.
Step 7	show running-config	Verify the configuration.
Step 8	copy running-config startup-config	(Optional) Save your entries in the configuration file.

Performing a Configuration Replacement or Rollback Operation

Starting in privileged EXEC mode, follow these steps to replace the running configuration file with a saved configuration file:

	Command	Purpose
Step 1	archive config	(Optional) Save the running configuration file to the configuration archive. Note Enter the path archive configuration command before using this command.
Step 2	configure terminal	Enter global configuration mode.
Step 3		Make necessary changes to the running configuration.
Step 4	exit	Return to privileged EXEC mode.
Step 5	configure replace <i>target-url</i> [list] [force] [time seconds] [nolock]	Replace the running configuration file with a saved configuration file. <i>target-url</i> —URL (accessible by the file system) of the saved configuration file that is to replace the running configuration, such as the configuration file created in Step 2 by using the archive config privileged EXEC command. list —Display a list of the command entries applied by the software parser during each pass of the configuration replacement operation. The total number of passes also appears. force — Replace the running configuration file with the specified saved configuration file without prompting you for confirmation. time seconds —Specify the time (in seconds) within which you must enter the configure confirm command to confirm replacement of the running configuration file. If you do not enter the configure confirm command within the specified time limit, the configuration replacement operation is automatically stopped. (In other words, the running configuration file is restored to the configuration that existed before you entered the configure replace command). Note You must first enable the configuration archive before you can use the time seconds command line option. nolock —Disable the locking of the running configuration file that prevents other users from changing the running configuration during a configuration replacement operation.
Step 6	configure confirm	(Optional) Confirm replacement of the running configuration with a saved configuration file. Note Use this command only if the time seconds keyword and argument of the configure replace command are specified.
Step 7	copy running-config startup-config	(Optional) Save your entries in the configuration file.

LLDP-MED Location TLV

This release supports the Link Layer Discovery Protocol Media Extensions (LLDP-MED) location TLV. The location TLV provides location information from the switch to the endpoint device. It can send this information:

- Civic location information

Provides the civic address information and postal information. Examples of civic location information are street address, road name, and postal community name information.
- ELIN location information

Provides the location information of a caller. The location is determined by the Emergency location identifier number (ELIN), which is a phone number that routes an emergency call to the local public safety answering point (PSAP) and which the PSAP can use to call back the emergency caller.

Configuring Private VLANs

This section describes how to configure private VLANs on the Cisco Catalyst Blade Switch 3040 for FSC.



Note

For complete syntax and usage information for the commands used in this chapter, see the command reference for this release.

The chapter consists of these sections:

- [“Understanding Private VLANs” section on page 21](#)
- [“Configuring Private VLANs” section on page 25](#)
- [“Monitoring Private VLANs” section on page 34](#)



Note

When you configure private VLANs, the switch must be in VTP transparent mode. For more information about VTP, see the software configuration guide.

Understanding Private VLANs

The private-VLAN feature addresses two problems that service providers face when using VLANs:

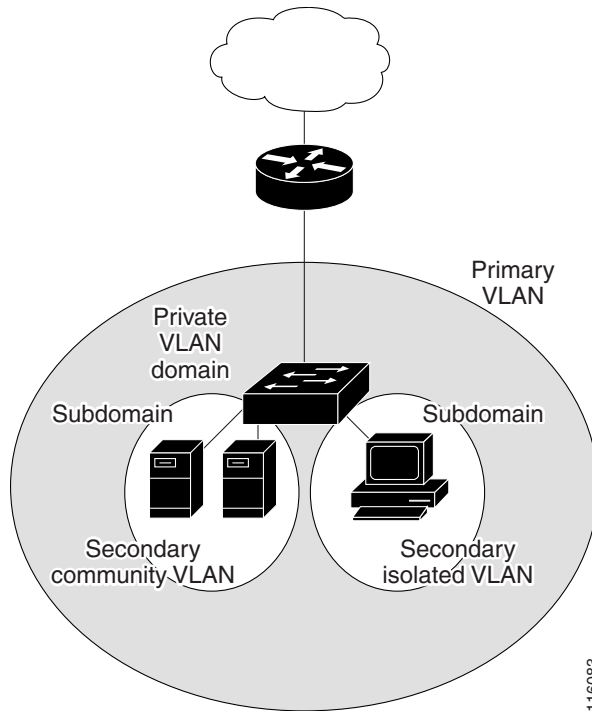
- Scalability: The switch supports up to 1005 active VLANs. If a service provider assigns one VLAN per customer, this limits the numbers of customers the service provider can support.
- To enable IP routing, each VLAN is assigned a subnet address space or a block of addresses, which can result in wasting the unused IP addresses, and cause IP address management problems.

Using private VLANs addresses the scalability problem and provides IP address management benefits for service providers and Layer 2 security for customers.

Private VLANs partition a regular VLAN domain into subdomains and can have multiple VLAN pairs—one for each subdomain. A subdomain is represented by a *primary* VLAN and a *secondary* VLAN.

All VLAN pairs in a private VLAN share the same primary VLAN. The secondary VLAN ID differentiates one subdomain from another. See [Figure 1](#).

Figure 1 Private-VLAN Domain



There are two types of secondary VLANs:

- Isolated VLANs—Ports within an isolated VLAN cannot communicate with each other at the Layer 2 level.
- Community VLANs—Ports within a community VLAN can communicate with each other but cannot communicate with ports in other communities at the Layer 2 level.

Private VLANs provide Layer 2 isolation between ports within the same private VLAN. Private-VLAN ports are access ports that are one of these types:

- Promiscuous—A promiscuous port belongs to the primary VLAN and can communicate with all interfaces, including the community and isolated host ports that belong to the secondary VLANs associated with the primary VLAN.
- Isolated—An isolated port is a host port that belongs to an isolated secondary VLAN. It has complete Layer 2 separation from other ports within the same private VLAN, except for the promiscuous ports. Private VLANs block all traffic to isolated ports except traffic from promiscuous ports. Traffic received from an isolated port is forwarded only to promiscuous ports.
- Community—A community port is a host port that belongs to a community secondary VLAN. Community ports communicate with other ports in the same community VLAN and with promiscuous ports. These interfaces are isolated at Layer 2 from all other interfaces in other communities and from isolated ports within their private VLAN.



Note

Trunk ports carry traffic from regular VLANs and also from primary, isolated, and community VLANs.

Primary and secondary VLANs have these characteristics:

- **Primary VLAN**—A private VLAN has only one primary VLAN. Every port in a private VLAN is a member of the primary VLAN. The primary VLAN carries unidirectional traffic downstream from the promiscuous ports to the (isolated and community) host ports and to other promiscuous ports.
- **Isolated VLAN**—A private VLAN has only one isolated VLAN. An isolated VLAN is a secondary VLAN that carries unidirectional traffic upstream from the hosts toward the promiscuous ports and the gateway.
- **Community VLAN**—A community VLAN is a secondary VLAN that carries upstream traffic from the community ports to the promiscuous port gateways and to other host ports in the same community. You can configure multiple community VLANs in a private VLAN.

A promiscuous port can serve only one primary VLAN, one isolated VLAN, and multiple community VLANs. Layer 3 gateways are typically connected to the switch through a promiscuous port. With a promiscuous port, you can connect a wide range of devices as access points to a private VLAN. For example, you can use a promiscuous port to monitor or back up all the private-VLAN servers from an administration workstation.

In a switched environment, you can assign an individual private VLAN and an associated IP subnet to each individual or common group of end stations. The end stations need to communicate with only a default gateway to communicate outside the private VLAN.

You can use private VLANs to control access to end stations in these ways:

- Configure selected interfaces connected to end stations as isolated ports to prevent any communication at Layer 2. For example, if the end stations are servers, this configuration prevents Layer 2 communication between the servers.
- Configure interfaces connected to default gateways and selected end stations (for example, backup servers) as promiscuous ports to allow all end stations access to a default gateway.

You can extend private VLANs across multiple devices by trunking the primary, isolated, and community VLANs to other devices that support private VLANs. To maintain the security of your private-VLAN configuration and to avoid other use of the VLANs configured as private VLANs, configure private VLANs on all intermediate devices, including devices that have no private-VLAN ports.

IP Addressing Scheme with Private VLANs

Assigning a separate VLAN to each customer creates an inefficient IP addressing scheme:

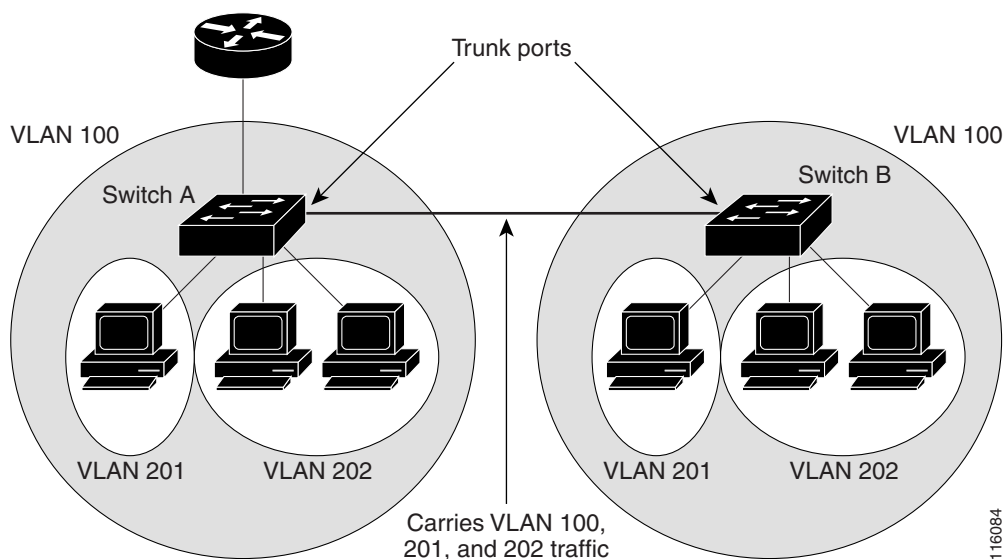
- Assigning a block of addresses to a customer VLAN can result in unused IP addresses.
- If the number of devices in the VLAN increases, the number of assigned address might not be large enough to accommodate them.

These problems are reduced by using private VLANs, where all members in the private VLAN share a common address space, which is allocated to the primary VLAN. Hosts are connected to secondary VLANs, and the DHCP server assigns them IP addresses from the block of addresses allocated to the primary VLAN. Subsequent IP addresses can be assigned to customer devices in different secondary VLANs, but in the same primary VLAN. When new devices are added, the DHCP server assigns them the next available address from a large pool of subnet addresses.

Private VLANs across Multiple Switches

As with regular VLANs, private VLANs can span multiple switches. A trunk port carries the primary VLAN and secondary VLANs to a neighboring switch. The trunk port treats the private VLAN as any other VLAN. A feature of private VLANs across multiple switches is that traffic from an isolated port in switch A does not reach an isolated port on Switch B. See [Figure 2](#).

Figure 2 Private VLANs across Switches



VLAN 100 = Primary VLAN
 VLAN 201 = Secondary isolated VLAN
 VLAN 202 = Secondary community VLAN

Because VTP does not support private VLANs, you must manually configure private VLANs on all switches in the Layer 2 network. If you do not configure the primary and secondary VLAN association in some switches in the network, the Layer 2 databases in these switches are not merged. This can result in unnecessary flooding of private-VLAN traffic on those switches.



Note

When configuring private VLANs on the switch, always use the default Switch Database Management (SDM) template to balance system resources between unicast routes and Layer 2 entries. If another SDM template is configured, use the `sdm prefer default` global configuration command to set the default template. For more information about SDM templates, see the software configuration guide.

Private-VLAN Interaction with Other Features

Private VLANs have specific interaction with some other features, described in these sections:

- [“Private VLANs and Unicast, Broadcast, and Multicast Traffic”](#) section on page 25
- [“Private VLANs and SVIs”](#) section on page 25

You should also see the [“Secondary and Primary VLAN Configuration”](#) section on page 26 under the [“Private-VLAN Configuration Guidelines”](#) section.

Private VLANs and Unicast, Broadcast, and Multicast Traffic

In regular VLANs, devices in the same VLAN can communicate with each other at the Layer 2 level, but devices connected to interfaces in different VLANs must communicate at the Layer 3 level. In private VLANs, the promiscuous ports are members of the primary VLAN, while the host ports belong to secondary VLANs. Because the secondary VLAN is associated to the primary VLAN, members of these VLANs can communicate with each other at the Layer 2 level.

In a regular VLAN, broadcasts are forwarded to all ports in that VLAN. Private VLAN broadcast forwarding depends on the port sending the broadcast:

- An isolated port sends a broadcast only to the promiscuous ports or trunk ports.
- A community port sends a broadcast to all promiscuous ports, trunk ports, and ports in the same community VLAN.
- A promiscuous port sends a broadcast to all ports in the private VLAN (other promiscuous ports, trunk ports, isolated ports, and community ports).

Multicast traffic is routed or bridged across private-VLAN boundaries and within a single community VLAN. Multicast traffic is not forwarded between ports in the same isolated VLAN or between ports in different secondary VLANs.

Private VLANs and SVIs

In a Layer 3 switch, a switch virtual interface (SVI) represents the Layer 3 interface of a VLAN. Layer 3 devices communicate with a private VLAN only through the primary VLAN and not through secondary VLANs. Configure Layer 3 VLAN interfaces (SVIs) only for primary VLANs. You cannot configure Layer 3 VLAN interfaces for secondary VLANs. SVIs for secondary VLANs are inactive while the VLAN is configured as a secondary VLAN.

- If you try to configure a VLAN with an active SVI as a secondary VLAN, the configuration is not allowed until you disable the SVI.
- If you try to create an SVI on a VLAN that is configured as a secondary VLAN and the secondary VLAN is already mapped at Layer 3, the SVI is not created, and an error is returned. If the SVI is not mapped at Layer 3, the SVI is created, but it is automatically shut down.

When the primary VLAN is associated with and mapped to the secondary VLAN, any configuration on the primary VLAN is propagated to the secondary VLAN SVIs. For example, if you assign an IP subnet to the primary VLAN SVI, this subnet is the IP subnet address of the entire private VLAN.


Configuring Private VLANs

These sections contain this configuration information:

- [“Tasks for Configuring Private VLANs” section on page 26](#)
- [“Default Private-VLAN Configuration” section on page 26](#)
- [“Private-VLAN Configuration Guidelines” section on page 26](#)
- [“Configuring and Associating VLANs in a Private VLAN” section on page 29](#)
- [“Configuring a Layer 2 Interface as a Private-VLAN Host Port” section on page 31](#)
- [“Configuring a Layer 2 Interface as a Private-VLAN Promiscuous Port” section on page 32](#)
- [“Mapping Secondary VLANs to a Primary VLAN Layer 3 VLAN Interface” section on page 32](#)

Tasks for Configuring Private VLANs

To configure a private VLAN, perform these steps:

-
- Step 1** Set VTP mode to transparent.
- Step 2** Create the primary and secondary VLANs and associate them. See the [“Configuring and Associating VLANs in a Private VLAN”](#) section on page 29.
-  **Note** If the VLAN is not created already, the private-VLAN configuration process creates it.
-
- Step 3** Configure interfaces to be isolated or community host ports, and assign VLAN membership to the host port. See the [“Configuring a Layer 2 Interface as a Private-VLAN Host Port”](#) section on page 31.
- Step 4** Configure interfaces as promiscuous ports, and map the promiscuous ports to the primary-secondary VLAN pair. See the [“Configuring a Layer 2 Interface as a Private-VLAN Promiscuous Port”](#) section on page 32.
- Step 5** If inter-VLAN routing will be used, configure the primary SVI, and map secondary VLANs to the primary. See the [“Mapping Secondary VLANs to a Primary VLAN Layer 3 VLAN Interface”](#) section on page 32.
- Step 6** Verify private-VLAN configuration.
-

Default Private-VLAN Configuration

No private VLANs are configured.

Private-VLAN Configuration Guidelines

Guidelines for configuring private VLANs fall into these categories:

- [“Secondary and Primary VLAN Configuration”](#) section on page 26
- [“Private-VLAN Port Configuration”](#) section on page 28
- [“Limitations with Other Features”](#) section on page 28

Secondary and Primary VLAN Configuration

Follow these guidelines when configuring private VLANs:

- Set VTP to transparent mode. After you configure a private VLAN, you should not change the VTP mode to client or server. For more information about VTP, see the software configuration guide.
- You must use VLAN configuration (config-vlan) mode to configure private VLANs. You cannot configure private VLANs in VLAN database configuration mode. For more information about VLAN configuration, see the software configuration guide.
- After you have configured private VLANs, use the **copy running-config startup config** privileged EXEC command to save the VTP transparent mode configuration and private-VLAN configuration in the switch startup configuration file. Otherwise, if the switch resets, it defaults to VTP server mode, which does not support private VLANs.

- VTP does not propagate private-VLAN configuration. You must configure private VLANs on each device where you want private-VLAN ports.
- You cannot configure VLAN 1 or VLANs 1002 to 1005 as primary or secondary VLANs. Extended VLANs (VLAN IDs 1006 to 4094) can belong to private VLANs
- A primary VLAN can have one isolated VLAN and multiple community VLANs associated with it. An isolated or community VLAN can have only one primary VLAN associated with it.
- Although a private VLAN contains more than one VLAN, only one Spanning Tree Protocol (STP) instance runs for the entire private VLAN. When a secondary VLAN is associated with the primary VLAN, the STP parameters of the primary VLAN are propagated to the secondary VLAN.
- You can enable DHCP snooping on private VLANs. When you enable DHCP snooping on the primary VLAN, it is propagated to the secondary VLANs. If you configure DHCP on a secondary VLAN, the configuration does not take effect if the primary VLAN is already configured.
- When you enable IP source guard on private-VLAN ports, you must enable DHCP snooping on the primary VLAN.
- We recommend that you prune the private VLANs from the trunks on devices that carry no traffic in the private VLANs.
- You can apply different quality of service (QoS) configurations to primary, isolated, and community VLANs.
- When you configure private VLANs, sticky Address Resolution Protocol (ARP) is enabled by default, and ARP entries learned on Layer 3 private VLAN interfaces are sticky ARP entries. For security reasons, private VLAN port sticky ARP entries do not age out.



Note We recommend that you display and verify private-VLAN interface ARP entries.

Connecting a device with a different MAC address but with the same IP address generates a message and the ARP entry is not created. Because the private-VLAN port sticky ARP entries do not age out, you must manually remove private-VLAN port ARP entries if a MAC address changes.

- You can remove a private-VLAN ARP entry by using the **no arp ip-address** global configuration command.
- You can add a private-VLAN ARP entry by using the **arp ip-address hardware-address type** global configuration command.
- You can configure VLAN maps on primary and secondary VLANs (see the [“Mapping Secondary VLANs to a Primary VLAN Layer 3 VLAN Interface”](#) section on page 32). However, we recommend that you configure the same VLAN maps on private-VLAN primary and secondary VLANs.
- When a frame is Layer-2 forwarded within a private VLAN, the same VLAN map is applied at the ingress side and at the egress side. When a frame is routed from inside a private VLAN to an external port, the private-VLAN map is applied at the ingress side.
 - For frames going upstream from a host port to a promiscuous port, the VLAN map configured on the secondary VLAN is applied.
 - For frames going downstream from a promiscuous port to a host port, the VLAN map configured on the primary VLAN is applied.

To filter out specific IP traffic for a private VLAN, you should apply the VLAN map to both the primary and secondary VLANs.

- You can apply router ACLs only on the primary-VLAN SVIs. The ACL is applied to both primary and secondary VLAN Layer 3 traffic.
- Although private VLANs provide host isolation at Layer 2, hosts can communicate with each other at Layer 3.
- Private VLANs support these Switched Port Analyzer (SPAN) features:
 - You can configure a private-VLAN port as a SPAN source port.
 - You can use VLAN-based SPAN (VSPAN) on primary, isolated, and community VLANs or use SPAN on only one VLAN to separately monitor egress or ingress traffic.

Private-VLAN Port Configuration

Follow these guidelines when configuring private-VLAN ports:

- Use only the private-VLAN configuration commands to assign ports to primary, isolated, or community VLANs. Layer 2 access ports assigned to the VLANs that you configure as primary, isolated, or community VLANs are inactive while the VLAN is part of the private-VLAN configuration. Layer 2 trunk interfaces remain in the STP forwarding state.
- Do not configure ports that belong to a PAgP or LACP EtherChannel as private-VLAN ports. While a port is part of the private-VLAN configuration, any EtherChannel configuration for it is inactive.
- Enable Port Fast and BPDU guard on isolated and community host ports to prevent STP loops due to misconfigurations and to speed up STP convergence. When enabled, STP applies the BPDU guard feature to all Port Fast-configured Layer 2 LAN ports. Do not enable Port Fast and BPDU guard on promiscuous ports. For more information about STP, see the software configuration guide.
- If you delete a VLAN used in the private-VLAN configuration, the private-VLAN ports associated with the VLAN become inactive.
- Private-VLAN ports can be on different network devices if the devices are trunk-connected and the primary and secondary VLANs have not been removed from the trunk.

Limitations with Other Features

When configuring private VLANs, remember these limitations with other features:



Note

In some cases, the configuration is accepted with no error messages, but the commands have no effect.

- Do not configure fallback bridging on switches with private VLANs.
- When IGMP snooping is enabled on the switch (the default), the switch supports no more than 20 private-VLAN domains.
- Do not configure a remote SPAN (RSPAN) VLAN as a private-VLAN primary or secondary VLAN. For more information about SPAN, see the software configuration guide.
- Do not configure private-VLAN ports on interfaces configured for these other features:
 - dynamic-access port VLAN membership
 - Dynamic Trunking Protocol (DTP)
 - Port Aggregation Protocol (PAgP)
 - Link Aggregation Control Protocol (LACP)
 - Multicast VLAN Registration (MVR)

- voice VLAN
- Web Cache Communication Protocol (WCCP)
- You can configure IEEE 802.1x port-based authentication on a private-VLAN port, but do not configure 802.1x with port security, voice VLAN, or per-user ACL on private-VLAN ports.
- A private-VLAN host or promiscuous port cannot be a SPAN destination port. If you configure a SPAN destination port as a private-VLAN port, the port becomes inactive.
- If you configure a static MAC address on a promiscuous port in the primary VLAN, you must add the same static address to all associated secondary VLANs. If you configure a static MAC address on a host port in a secondary VLAN, you must add the same static MAC address to the associated primary VLAN. When you delete a static MAC address from a private-VLAN port, you must remove all instances of the configured MAC address from the private VLAN.



Note Dynamic MAC addresses learned in one VLAN of a private VLAN are replicated in the associated VLANs. For example, a MAC address learned in a secondary VLAN is replicated in the primary VLAN. When the original dynamic MAC address is deleted or aged out, the replicated addresses are removed from the MAC address table.

- Configure Layer 3 VLAN interfaces (SVIs) only for primary VLANs.

Configuring and Associating VLANs in a Private VLAN

Beginning in privileged EXEC mode, follow these steps to configure a private VLAN:



Note

The **private-vlan** commands do not take effect until you exit VLAN configuration mode.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	vtp mode transparent	Set VTP mode to transparent (disable VTP).
Step 3	vlan <i>vlan-id</i>	Enter VLAN configuration mode and designate or create a VLAN that will be the primary VLAN. The VLAN ID range is 2 to 1001 and 1006 to 4094.
Step 4	private-vlan primary	Designate the VLAN as the primary VLAN.
Step 5	exit	Return to global configuration mode.
Step 6	vlan <i>vlan-id</i>	(Optional) Enter VLAN configuration mode and designate or create a VLAN that will be an isolated VLAN. The VLAN ID range is 2 to 1001 and 1006 to 4094.
Step 7	private-vlan isolated	Designate the VLAN as an isolated VLAN.
Step 8	exit	Return to global configuration mode.
Step 9	vlan <i>vlan-id</i>	(Optional) Enter VLAN configuration mode and designate or create a VLAN that will be a community VLAN. The VLAN ID range is 2 to 1001 and 1006 to 4094.
Step 10	private-vlan community	Designate the VLAN as a community VLAN.
Step 11	exit	Return to global configuration mode.

	Command	Purpose
Step 12	<code>vlan <i>vlan-id</i></code>	Enter VLAN configuration mode for the primary VLAN designated in Step 2.
Step 13	<code>private-vlan association [add remove] <i>secondary_vlan_list</i></code>	Associate the secondary VLANs with the primary VLAN.
Step 14	<code>end</code>	Return to privileged EXEC mode.
Step 15	<code>show vlan private-vlan [type]</code> or <code>show interfaces status</code>	Verify the configuration.
Step 16	<code>copy running-config startup config</code>	Save your entries in the switch startup configuration file. To save the private-VLAN configuration, you need to save the VTP transparent mode configuration and private-VLAN configuration in the switch startup configuration file. Otherwise, if the switch resets, it defaults to VTP server mode, which does not support private VLANs.

When you associate secondary VLANs with a primary VLAN, note this syntax information:

- The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs.
- The *secondary_vlan_list* parameter can contain multiple community VLAN IDs but only one isolated VLAN ID.
- Enter a *secondary_vlan_list*, or use the **add** keyword with a *secondary_vlan_list* to associate secondary VLANs with a primary VLAN.
- Use the **remove** keyword with a *secondary_vlan_list* to clear the association between secondary VLANs and a primary VLAN.
- The command does not take effect until you exit VLAN configuration mode.

This example shows how to configure VLAN 20 as a primary VLAN, VLAN 501 as an isolated VLAN, and VLANs 502 and 503 as community VLANs, to associate them in a private VLAN, and to verify the configuration:

```
Switch# configure terminal
Switch(config)# vlan 20
Switch(config-vlan)# private-vlan primary
Switch(config-vlan)# exit
Switch(config)# vlan 501
Switch(config-vlan)# private-vlan isolated
Switch(config-vlan)# exit
Switch(config)# vlan 502
Switch(config-vlan)# private-vlan community
Switch(config-vlan)# exit
Switch(config)# vlan 503
Switch(config-vlan)# private-vlan community
Switch(config-vlan)# exit
Switch(config)# vlan 20
Switch(config-vlan)# private-vlan association 501-503
Switch(config-vlan)# end
Switch(config)# show vlan private vlan
Primary Secondary Type          Ports
-----
20      501      isolated
20      502      community
20      503      community
20      504      non-operational
```

Configuring a Layer 2 Interface as a Private-VLAN Host Port

Beginning in privileged EXEC mode, follow these steps to configure a Layer 2 interface as a private-VLAN host port and to associate it with primary and secondary VLANs:


Note

Isolated and community VLANs are both secondary VLANs.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface <i>interface-id</i>	Enter interface configuration mode for the Layer 2 interface to be configured.
Step 3	switchport mode private-vlan host	Configure the Layer 2 port as a private-VLAN host port.
Step 4	switchport private-vlan host-association <i>primary_vlan_id secondary_vlan_id</i>	Associate the Layer 2 port with a private VLAN.
Step 5	end	Return to privileged EXEC mode.
Step 6	show interfaces [<i>interface-id</i>] switchport	Verify the configuration.
Step 7	copy running-config startup config	(Optional) Save your entries in the switch startup configuration file.

This example shows how to configure an interface as a private-VLAN host port, associate it with a private-VLAN pair, and verify the configuration:

```
Switch# configure terminal
Switch(config)# interface gigabitethernet1/0/22
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport private-vlan host-association 20 25
Switch(config-if)# end
Switch# show interfaces gigabitethernet1/0/22 switchport
Name: Gi1/0/22
Switchport: Enabled
Administrative Mode: private-vlan host
Operational Mode: private-vlan host
Administrative Trunking Encapsulation: negotiate
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: 20 (VLAN0020) 25 (VLAN0025)
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk Native VLAN tagging: enabled
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan:
20 (VLAN0020) 25 (VLAN0025)

<output truncated>
```

Configuring a Layer 2 Interface as a Private-VLAN Promiscuous Port

Beginning in privileged EXEC mode, follow these steps to configure a Layer 2 interface as a private-VLAN promiscuous port and map it to primary and secondary VLANs:



Note

Isolated and community VLANs are both secondary VLANs.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface <i>interface-id</i>	Enter interface configuration mode for the Layer 2 interface to be configured.
Step 3	switchport mode private-vlan promiscuous	Configure the Layer 2 port as a private-VLAN promiscuous port.
Step 4	switchport private-vlan mapping <i>primary_vlan_id</i> { add remove } <i>secondary_vlan_list</i>	Map the private-VLAN promiscuous port to a primary VLAN and to selected secondary VLANs.
Step 5	end	Return to privileged EXEC mode.
Step 6	show interfaces [<i>interface-id</i>] switchport	Verify the configuration.
Step 7	copy running-config startup config	(Optional) Save your entries in the switch startup configuration file.

When you configure a Layer 2 interface as a private-VLAN promiscuous port, note this syntax information:

- The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs.
- Enter a *secondary_vlan_list*, or use the **add** keyword with a *secondary_vlan_list* to map the secondary VLANs to the private-VLAN promiscuous port.
- Use the **remove** keyword with a *secondary_vlan_list* to clear the mapping between secondary VLANs and the private-VLAN promiscuous port.

This example shows how to configure an interface as a private-VLAN promiscuous port and map it to a private VLAN. The interface is a member of primary VLAN 20 and secondary VLANs 501 to 503 are mapped to it.

```
Switch# configure terminal
Switch(config)# interface gigabitethernet1/0/2
Switch(config-if)# switchport mode private-vlan promiscuous
Switch(config-if)# switchport private-vlan mapping 20 add 501-503
Switch(config-if)# end
```

Use the **show vlan private-vlan** or the **show interface status** privileged EXEC command to display primary and secondary VLANs and private-VLAN ports on the switch.

Mapping Secondary VLANs to a Primary VLAN Layer 3 VLAN Interface

If you use the private VLAN for inter-VLAN routing, you must configure an SVI for the primary VLAN and map secondary VLANs to the SVI.

**Note**

Isolated and community VLANs are both secondary VLANs.

Beginning in privileged EXEC mode, follow these steps to map secondary VLANs to the SVI of a primary VLAN to allow Layer 3 switching of private-VLAN traffic:

	Command	Purpose
Step 1	<code>configure terminal</code>	Enter global configuration mode.
Step 2	<code>interface vlan <i>primary_vlan_id</i></code>	Enter interface configuration mode for the primary VLAN, and configure the VLAN as an SVI. The VLAN ID range is 2 to 1001 and 1006 to 4094.
Step 3	<code>private-vlan mapping [add remove] <i>secondary_vlan_list</i></code>	Map the secondary VLANs to the Layer 3 VLAN interface of a primary VLAN to allow Layer 3 switching of private-VLAN ingress traffic.
Step 4	<code>end</code>	Return to privileged EXEC mode.
Step 5	<code>show interface private-vlan mapping</code>	Verify the configuration.
Step 6	<code>copy running-config startup config</code>	(Optional) Save your entries in the switch startup configuration file.

**Note**

The **private-vlan mapping** interface configuration command only affects private-VLAN traffic that is Layer 3 switched.

When you map secondary VLANs to the Layer 3 VLAN interface of a primary VLAN, note this syntax information:

- The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs.
- Enter a *secondary_vlan_list*, or use the **add** keyword with a *secondary_vlan_list* to map the secondary VLANs to the primary VLAN.
- Use the **remove** keyword with a *secondary_vlan_list* to clear the mapping between secondary VLANs and the primary VLAN.

This example shows how to map the interfaces of VLANs 501 and 502 to primary VLAN 10, which permits routing of secondary VLAN ingress traffic from private VLANs 501 to 502:

```
Switch# configure terminal
Switch(config)# interface vlan 10
Switch(config-if)# private-vlan mapping 501-502
Switch(config-if)# end
Switch# show interfaces private-vlan mapping
Interface Secondary VLAN Type
-----
vlan10      501          isolated
vlan10      502          community
```

Monitoring Private VLANs

Table 4 shows the privileged EXEC commands for monitoring private-VLAN activity.

Table 4 Private VLAN Monitoring Commands

Command	Purpose
show interfaces status	Displays the status of interfaces, including the VLANs to which they belongs.
show vlan private-vlan [type]	Display the private-VLAN information for the switch.
show interface switchport	Display private-VLAN configuration on interfaces.
show interface private-vlan mapping	Display information about the private-VLAN mapping for VLAN SVIs.

This is an example of the output from the **show vlan private-vlan** command:

```
Switch(config)# show vlan private-vlan
Primary Secondary Type          Ports
-----
10      501      isolated   Gi2/0/1, Gi3/0/2, Gi3/0/3
10      502      community  Gi2/0/1, Gi3/0/2, Gi3/0/4
10      503      non-operational
```

Updates to the Command Reference

This section contains these updates to the command reference:

- [“Information Updates” section on page 16](#)
- [“location \(global configuration\)” section on page 35](#)
- [“location \(interface configuration\)” section on page 37](#)
- [“show location” section on page 38](#)
- [“private-vlan” section on page 40](#)
- [“private-vlan mapping” section on page 42](#)
- [“switchport mode private-vlan” section on page 43](#)
- [“switchport private-vlan” section on page 45](#)

Information Updates

These are information updates to the command reference:

- The usage guidelines for the **set** and **unset** bootloader commands in the command reference are incorrect.

These are the correct usage guidelines for the **set** command:

Environment variables are case sensitive and must be entered as documented.

Environment variables that have values are stored in flash memory outside of the flash file system.

Under normal circumstances, it is not necessary to alter the setting of the environment variables.

The `MANUAL_BOOT` environment variable can also be set by using the **boot manual** global configuration command.

The `BOOT` environment variable can also be set by using the **boot system** *filesystem:/file-url* global configuration command.

The `ENABLE_BREAK` environment variable can also be set by using the **boot enable-break** global configuration command.

The `HELPER` environment variable can also be set by using the **boot helper** *filesystem:/file-url* global configuration command.

The `CONFIG_FILE` environment variable can also be set by using the **boot config-file flash:/file-url** global configuration command.

The `HELPER_CONFIG_FILE` environment variable can also be set by using the **boot helper-config-file** *filesystem:/file-url* global configuration command.

The bootloader prompt string (PS1) can be up to 120 printable characters except the equal sign (=).

These are the correct guidelines for the **unset** command:

Under normal circumstances, it is not necessary to alter the setting of the environment variables.

The `MANUAL_BOOT` environment variable can also be reset by using the **no boot manual** global configuration command.

The `BOOT` environment variable can also be reset by using the **no boot system** global configuration command.

The `ENABLE_BREAK` environment variable can also be reset by using the **no boot enable-break** global configuration command.

The `HELPER` environment variable can also be reset by using the **no boot helper** global configuration command.

The `CONFIG_FILE` environment variable can also be reset by using the **no boot config-file** global configuration command.

The `HELPER_CONFIG_FILE` environment variable can also be reset by using the **no boot helper-config-file** global configuration command.

- This information about the **dot1x timeout tx-period** *seconds* interface configuration command is incorrect:

The range for *seconds* is from 5 to 65535.

The correct range is from 1 to 65535 seconds.

location (global configuration)

Use the **location** global configuration command to configure location information for an endpoint. Use the **no** form of this command to remove the location information.

location { **admin-tag** *string* | **civic-location identifier** *id* | **elin-location** *string* **identifier** *id* }

no location { **admin-tag** *string* | **civic-location identifier** *id* | **elin-location** *string* **identifier** *id* }

Syntax DescriptionS	Parameter	Description
	admin-tag	Configure administrative tag or site information.
	civic-location	Configure civic location information.
	elin-location	Configure emergency location information (ELIN).
	identifier <i>id</i>	Specify the ID for the civic location or the elin location. The ID range is 1 to 4095.
	<i>string</i>	Specify the site or location information in alphanumeric format.

Defaults This command has no default setting.

Command Modes Global Configuration

Command History	Release	Modification
	12.2(40)SE1	This command was introduced.

Usage Guidelines After entering the **location civic-location identifier** *id* global configuration command, you enter civic location configuration mode. In this mode, you can enter the civic location and the postal location information.

Use the **no lldp med-tlv-select location** information interface configuration command to disable the location TLV. The location TLV is enabled by default. For more information, see the “Configuring LLDP and LLDP-MED” chapter of the software configuration guide for this release.

Examples This example shows how to configure civic location information on the switch:

```
Switch(config)# location civic-location identifier 1
Switch(config-civic)# number 3550
Switch(config-civic)# primary-road-name "Cisco Way"
Switch(config-civic)# city "San Jose"
Switch(config-civic)# state CA
Switch(config-civic)# building 19
Switch(config-civic)# room C6
Switch(config-civic)# county "Santa Clara"
Switch(config-civic)# country US
Switch(config-civic)# end
```

You can verify your settings by entering the **show location civic-location** privileged EXEC command. This example shows how to configure the emergency location information on the switch:

```
Switch (config)# location elin-location 14085553881 identifier 1
```

You can verify your settings by entering the **show location elin** privileged EXEC command.

Related Commands	Command	Description
	location (interface configuration)	Configures the location information for an interface.
	show location	Displays the location information for an endpoint.

location (interface configuration)

Use the **location** interface command to enter location information for an interface. Use the **no** form of this command to remove the interface location information.

```
location { additional-location-information word | civic-location-id id | elin-location-id id }
```

```
no location { additional-location-information word | civic-location-id id | elin-location-id id }
```

Syntax Description

additional-location-information	Configure additional information for a location or place.
civic-location-id	Configure global civic location information for an interface.
elin-location-id	Configure emergency location information for an interface.
<i>id</i>	Specify the ID for the civic location or the elin location. The ID range is 1 to 4095.
<i>word</i>	Specify a word or phrase that provides additional location information.

Defaults

This command has no default setting.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(40)SE1	This command was introduced.

Usage Guidelines

After entering the **location civic-location-id id** interface configuration command, you enter civic location configuration mode. In this mode, you can enter the additional location information.

Examples

These examples show how to enter civic location information for an interface:

```
Switch(config-if)# int g1/0/1
Switch(config-if)# location civic-location-id 1
Switch(config-if)# end
```

```
Switch(config-if)# int g2/0/1
Switch(config-if)# location civic-location-id 1
Switch(config-if)# end
```

You can verify your settings by entering the **show location civic interface** privileged EXEC command.

This example shows how to enter emergency location information for an interface:

```
Switch(config)# int g2/0/2
Switch(config-if)# location elin-location-id 1
Switch(config-if)# end
```

You can verify your settings by entering the **show location elin interface** privileged EXEC command.

Related Commands	Command	Description
	link state group	Configures the location information for an endpoint.
	show location	Displays the location information for an endpoint.

show location

Use the **show location** user EXEC command to display location information for an endpoint.

```
show location admin-tag [ [ {begin | exclude | include} expression]
```

```
show location civic-location {identifier id number | interface interface-id | static } | {begin |
exclude | include} expression]
```

```
show location elin-location {identifier id number | interface interface-id | static } | {begin |
exclude | include} expression]
```

Syntax Description		
admin-tag		Display administrative tag or site information.
civic-location		Display civic location information.
elin-location		Display emergency location information (ELIN).
identifier id		Specify the ID for the civic location or the elin location. The id range is 1 to 4095.
interface interface-id		(Optional) Display location information for the specified interface or all interfaces. Valid interfaces include physical ports.
static		Display static configuration information.
 begin		(Optional) Display begins with the line that matches the <i>expression</i> .
 exclude		(Optional) Display excludes lines that match the <i>expression</i> .
 include		(Optional) Display includes lines that match the specified <i>expression</i> .
expression		Expression in the output to use as a reference point.

Command Modes User EXEC

Command History	Release	Modification
	12.1(40)SE1	This command was introduced.

Usage Guidelines

Use the **show location** command to display location information for an endpoint.

Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

Examples

This is an example of output from the **show location civic-location** command that displays location information for an interface:

```
Switch> show location civic interface g2/0/1
Civic location information
-----
Identifier           : 1
County              : Santa Clara
Street number       : 3550
Building            : 19
Room                : C6
Primary road name   : Cisco Way
City                : San Jose
State               : CA
Country             : US
```

This is an example of output from the **show location civic-location** command that displays all the civic location information:

```
Switch> show location civic-location static
Civic location information
-----
Identifier           : 1
County              : Santa Clara
Street number       : 3550
Building            : 19
Room                : C6
Primary road name   : Cisco Way
City                : San Jose
State               : CA
Country             : US
Ports               : Gi2/0/1
-----
Identifier           : 2
Street number       : 24568
Street number suffix : West
Landmark            : Golden Gate Bridge
Primary road name   : 19th Ave
City                : San Francisco
Country             : US
-----
```

This is an example of output from the **show location elin-location** command that displays the emergency location information:

```
Switch> show location elin-location identifier 1
Elin location information
-----
Identifier : 1
Elin      : 14085553881
Ports     : Gi2/0/2
```

This is an example of output from the **show location elin static** command that displays all emergency location information:

```
Switch> show location elin static
Elin location information
-----
Identifier : 1
Elin      : 14085553881
Ports    : Gi2/0/2
-----
Identifier : 2
Elin      : 18002228999
-----
```

Related Commands	Command	Description
	location (global configuration)	Configures the global location information for an endpoint.
	location (interface configuration)	Configures the location information for an interface.

private-vlan

Use the **private-vlan** VLAN configuration command to configure private VLANs and to configure the association between private-VLAN primary and secondary VLANs. Use the **no** form of this command to return the VLAN to normal VLAN configuration.

```
private-vlan {association [add | remove] secondary-vlan-list | community | isolated | primary}
no private-vlan {association | community | isolated | primary}
```

Syntax Description	Parameter	Description
	association	Create an association between the primary VLAN and a secondary VLAN.
	<i>secondary-vlan-list</i>	Specify one or more secondary VLANs to be associated with a primary VLAN in a private VLAN.
	add	Associate a secondary VLAN to a primary VLAN.
	remove	Clear the association between a secondary VLAN and a primary VLAN.
	community	Designate the VLAN as a community VLAN.
	isolated	Designate the VLAN as a community VLAN.
	primary	Designate the VLAN as a community VLAN.

Defaults The default is to have no private VLANs configured.

Command Modes VLAN configuration

Command History	Release	Modification
	12.2(40)SE1	This command was introduced.

Usage Guidelines

Before configuring private VLANs, you must disable VTP (VTP mode transparent). After you configure a private VLAN, you should not change the VTP mode to client or server.

VTP does not propagate private-VLAN configuration. You must manually configure private VLANs on all switches in the Layer 2 network to merge their Layer 2 databases and to prevent flooding of private-VLAN traffic.

You cannot include VLAN 1 or VLANs 1002 to 1005 in the private-VLAN configuration. Extended VLANs (VLAN IDs 1006 to 4094) can be configured in private VLANs.

You can **associate** a secondary (isolated or community) VLAN with only one primary VLAN. A primary VLAN can have one isolated VLAN and multiple community VLANs associated with it.

- A secondary VLAN cannot be configured as a primary VLAN.
- The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs. The list can contain one isolated VLAN and multiple community VLANs.
- If you delete either the primary or secondary VLANs, the ports associated with the VLAN become inactive.

A **community** VLAN carries traffic among community ports and from community ports to the promiscuous ports on the corresponding primary VLAN.

An **isolated** VLAN is used by isolated ports to communicate with promiscuous ports. It does not carry traffic to other community ports or isolated ports with the same primary vlan domain.

A **primary** VLAN is the VLAN that carries traffic from a gateway to customer end stations on private ports.

Configure Layer 3 VLAN interfaces (SVIs) only for primary VLANs. You cannot configure Layer 3 VLAN interfaces for secondary VLANs. SVIs for secondary VLANs are inactive while the VLAN is configured as a secondary VLAN.

The **private-vlan** commands do not take effect until you exit from VLAN configuration mode.

Do not configure private-VLAN ports as EtherChannels. While a port is part of the private-VLAN configuration, any EtherChannel configuration for it is inactive.

Do not configure a private VLAN as a Remote Switched Port Analyzer (RSPAN) VLAN.

Do not configure a private VLAN as a voice VLAN.

Do not configure fallback bridging on switches with private VLANs.

Although a private VLAN contains more than one VLAN, only one STP instance runs for the entire private VLAN. When a secondary VLAN is associated with the primary VLAN, the STP parameters of the primary VLAN are propagated to the secondary VLAN.

For information about configuring host ports and promiscuous ports, see the **switchport mode private-vlan** command.

For more information about private-VLAN interaction with other features, see the software configuration guide for this release.

Examples

This example shows how to configure VLAN 20 as a primary VLAN, VLAN 501 as an isolated VLAN, and VLANs 502 and 503 as community VLANs, and to associate them in a private VLAN:

```
Switch# configure terminal
Switch(config)# vlan 20
Switch(config-vlan)# private-vlan primary
Switch(config-vlan)# exit
Switch(config)# vlan 501
Switch(config-vlan)# private-vlan isolated
Switch(config-vlan)# exit
Switch(config)# vlan 502
Switch(config-vlan)# private-vlan community
Switch(config-vlan)# exit
Switch(config)# vlan 503
Switch(config-vlan)# private-vlan community
Switch(config-vlan)# exit
Switch(config)# vlan 20
Switch(config-vlan)# private-vlan association 501-503
Switch(config-vlan)# end
```

You can verify your setting by entering the **show vlan private-vlan** or **show interfaces status** privileged EXEC command.

Related Commands

Command	Description
show interfaces status	Displays the status of interfaces, including the VLANs to which they belong.
show vlan private-vlan	Displays the private VLANs and VLAN associations configured on the switch or switch stack.
switchport mode private-vlan	Configures a private-VLAN port as a host port or promiscuous port.

private-vlan mapping

Use the **private-vlan mapping** interface configuration command on a switch virtual interface (SVI) to create a mapping between a private-VLAN primary and secondary VLANs so that both VLANs share the same primary VLAN SVI. Use the **no** form of this command to remove private-VLAN mappings from the SVI.

private-vlan mapping {[add | remove] *secondary-vlan-list*}

no private-vlan mapping

Syntax Description

<i>secondary-vlan-list</i>	Specify one or more secondary VLANs to be mapped to the primary VLAN SVI.
add	(Optional) Map the secondary VLAN to the primary VLAN SVI.
remove	(Optional) Remove the mapping between the secondary VLAN and the primary VLAN SVI.

Defaults

The default is to have no private VLAN SVI mapping configured.

Command Modes Interface configuration

Command History	Release	Modification
	12.2(40)SE1	This command was introduced.

Usage Guidelines

The switch must be in VTP transparent mode when you configure private VLANs. The SVI of the primary VLAN is created at Layer 3.

Configure Layer 3 VLAN interfaces (SVIs) only for primary VLANs. You cannot configure Layer 3 VLAN interfaces for secondary VLANs. SVIs for secondary VLANs are inactive while the VLAN is configured as a secondary VLAN.

The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs. The list can contain one isolated VLAN and multiple community VLANs.

Traffic that is received on the secondary VLAN is routed by the SVI of the primary VLAN.

A secondary VLAN can be mapped to only one primary SVI. If you configure the primary VLAN as a secondary VLAN, all SVIs specified in this command are brought down.

If you configure a mapping between two VLANs that do not have a valid Layer 2 private-VLAN association, the mapping configuration does not take effect.

Examples This example shows how to map the interface of VLAN 20 to the SVI of VLAN 18:

```
Switch# configure terminal
Switch# interface vlan 18
Switch(config-if)# private-vlan mapping 20
Switch(config-vlan)# end
```

This example shows how to permit routing of secondary VLAN traffic from secondary VLANs 303 to 305 and 307 through VLAN 20 SVI:

```
Switch# configure terminal
Switch# interface vlan 20
Switch(config-if)# private-vlan mapping 303-305, 307
Switch(config-vlan)# end
```

You can verify your setting by entering the **show interfaces private-vlan mapping** privileged EXEC command.

Related Commands	Command	Description
	show interfaces private-vlan mapping	Display private-VLAN mapping information for the VLAN SVIs.

switchport mode private-vlan

Use the **switchport mode private-vlan** interface configuration command to configure a port as a promiscuous or host private VLAN port. Use the **no** form of this command to reset the mode to the appropriate default for the device.

switchport mode private-vlan {host | promiscuous}

no switchport mode private-vlan

Syntax Description

host	Configure the interface as a private-VLAN host port. Host ports belong to private-VLAN secondary VLANs and are either community ports or isolated ports, depending on the VLAN that they belong to.
promiscuous	Configure the interface as a private-VLAN promiscuous port. Promiscuous ports are members of private-VLAN primary VLANs.

Defaults

The default private-VLAN mode is neither host nor promiscuous.

The default switchport mode is **dynamic auto**.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(40)SE1	This command was introduced.

Usage Guidelines

A private-VLAN host or promiscuous port cannot be a Switched Port Analyzer (SPAN) destination port. If you configure a SPAN destination port as a private-VLAN host or promiscuous port, the port becomes inactive.

Do not configure private VLAN on ports with these other features:

- Dynamic-access port VLAN membership
- Dynamic Trunking Protocol (DTP)
- Port Aggregation Protocol (PAgP)
- Link Aggregation Control Protocol (LACP)
- Multicast VLAN Registration (MVR)
- Voice VLAN

A private-VLAN port cannot be a SPAN destination port.

While a port is part of the private-VLAN configuration, any EtherChannel configuration for it is inactive.

A private-VLAN port cannot be a secure port and should not be configured as a protected port.

For more information about private-VLAN interaction with other features, see the software configuration guide for this release.

We strongly recommend that you enable spanning tree Port Fast and bridge-protocol-data-unit (BPDU) guard on isolated and community host ports to prevent STP loops due to misconfigurations and to speed up STP convergence.

If you configure a port as a private-VLAN host port and you do not configure a valid private-VLAN association by using the **switchport private-vlan host-association** interface configuration command, the interface becomes inactive.

If you configure a port as a private-VLAN promiscuous port and you do not configure a valid private VLAN mapping by using the **switchport private-vlan mapping** interface configuration command, the interface becomes inactive.

Examples



Note

This example shows how to configure an interface as a private-VLAN host port and associate it to primary VLAN 20. The interface is a member of secondary isolated VLAN 501 and primary VLAN 20.

When you configure a port as a private VLAN host port, you should also enable BPDU guard and Port Fast by using the **spanning-tree portfast bpduguard default** global configuration command and the **spanning-tree portfast** interface configuration command.

```
Switch# configure terminal
Switch(config)# interface fastethernet 1/0/1
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport private-vlan host-association 20 501
Switch(config-if)# end
```

This example shows how to configure an interface as a private VLAN promiscuous port and map it to a private VLAN. The interface is a member of primary VLAN 20 and secondary VLANs 501 to 503 are mapped to it.

```
Switch# configure terminal
Switch(config)# interface fastethernet 1/0/2
Switch(config-if)# switchport mode private-vlan promiscuous
Switch(config-if)# switchport private-vlan mapping 20 501-503
Switch(config-if)# end
```

You can verify private VLAN switchport mode by using the **show interfaces interface-id switchport** privileged EXEC command.

Related Commands

Command	Description
private-vlan	Configures a VLAN as a community, isolated, or primary VLAN or associates a primary VLAN with secondary VLANs.
show interfaces switchport	Displays the administrative and operational status of a switching (nonrouting) port, including private VLAN configuration.
show vlan private-vlan	Displays all private VLAN relationships or types configured on the switch.
switchport private-vlan	Configures private VLAN associations and mappings between primary and secondary VLANs on an interface.

switchport private-vlan

Use the **switchport private-vlan** interface configuration command on the switch stack or on a standalone switch to define a private-VLAN association for an isolated or community port or a mapping for a promiscuous port. Use the **no** form of this command to remove the private-VLAN association or mapping from the port.

switchport private-vlan { **association** { **host** *primary-vlan-id* *secondary-vlan-id* | **mapping** *primary-vlan-id* { **add** | **remove** } *secondary-vlan-list* } | **host-association** *primary-vlan-id* *secondary-vlan-id* | **mapping** *primary-vlan-id* { **add** | **remove** } *secondary-vlan-list* }

no switchport private-vlan { **association** { **host** | **mapping** } | **host-association** | **mapping** }

Syntax Description

association	Define a private-VLAN association for a port.
host	Define a private-VLAN association for a community or isolated host port.
<i>primary-vlan-id</i>	The VLAN ID of the private-VLAN primary VLAN. The range is from 2 to 1001 and 1006 to 4094.
<i>secondary-vlan-id</i>	The VLAN ID of the private-VLAN secondary (isolated or community) VLAN. The range is from 2 to 1001 and 1006 to 4094.
mapping	Define private-VLAN mapping for a promiscuous port.
add	Associate secondary VLANs to the primary VLAN.
remove	Clear the association between secondary VLANs and the primary VLAN.
<i>secondary-vlan-list</i>	One or more secondary (isolated or community) VLANs to be mapped to the primary VLAN.
host-association	Define a private-VLAN association for a community or isolated host port.

Defaults

The default is to have no private-VLAN association or mapping configured.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(40)SE1	This command was introduced.

Usage Guidelines

Private-VLAN association or mapping has no effect on the port unless the port has been configured as a private-VLAN host or promiscuous port by using the **switchport mode private-vlan** { **host** | **promiscuous** } interface configuration command.

If the port is in private-VLAN host or promiscuous mode but the VLANs do not exist, the command is allowed, but the port is made inactive.

The *secondary_vlan_list* parameter cannot contain spaces. It can contain multiple comma-separated items. Each item can be a single private-VLAN ID or a hyphenated range of private-VLAN IDs. The list can contain one isolated VLAN and multiple community VLANs.

You can map a promiscuous port to only one primary VLAN. If you enter the **switchport private-vlan mapping** command on a promiscuous port that is already mapped to a primary and secondary VLAN, the primary VLAN mapping is overwritten.

You can add or remove secondary VLANs from promiscuous port private-VLAN mappings by using the **add** and **remove** keywords.

Entering the **switchport private-vlan association host** command has the same effect as entering the **switchport private-vlan host-association** interface configuration command.

Entering the **switchport private-vlan association mapping** command has the same effect as entering the **switchport private-vlan mapping** interface configuration command.

Examples

This example shows how to configure an interface as a private VLAN host port and associate it with primary VLAN 20 and secondary VLAN 501:

```
Switch# configure terminal
Switch(config)# interface fastethernet 0/1
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport private-vlan host-association 20 501
Switch(config-if)# end
```

This example shows how to configure an interface as a private-VLAN promiscuous port and map it to a primary VLAN and secondary VLANs:

```
Switch# configure terminal
Switch(config)# interface fastethernet 0/2
Switch(config-if)# switchport mode private-vlan promiscuous
Switch(config-if)# switchport private-vlan mapping 20 501-502
Switch(config-if)# end
```

You can verify private-VLAN mapping by using the **show interfaces private-vlan mapping** privileged EXEC command. You can verify private VLANs and interfaces configured on the switch by using the **show vlan private-vlan** privileged EXEC command.

Related Commands

Command	Description
show interfaces private-vlan mapping	Displays private VLAN mapping information for VLAN SVIs.
show vlan private-vlan	Displays all private VLAN relationships or types configured on the switch.

Updates to the System Message Guide

This are the updates to the system message guide:

Error Message DOT1X_SWITCH-5-ERR_ADDING_ADDRESS: Unable to add address [enet] on [chars]

Explanation The client MAC address could not be added to the MAC address table because the hardware memory is full or the address is a secure address on another port. [enet] is the supplicant MAC address, and [chars] is the interface. This message might appear if the IEEE 802.1x feature is enabled.

Recommended Action If the hardware memory is full, remove some of the dynamic MAC addresses. If the client address is on another port, manually remove it from that port.

Error Message SPANTREE-6-PORTADD_ALL_VLANS: [chars] added to all Vlans

Explanation The interface has been added to all VLANs. [chars] is the added interface.

Recommended Action No action is required.

Error Message SPANTREE-6-PORTDEL_ALL_VLANS: [chars] deleted from all Vlans

Explanation The interface has been deleted from all VLANs. [chars] is the deleted interface.

Recommended Action No action is required.

Error Message SW_VLAN-6-VTP_DOMAIN_NAME_CHG: VTP domain name changed to [chars].

Explanation The VLAN Trunking Protocol (VTP) domain name was changed through the configuration to the name specified in the message. [chars] is the changed domain name.

Recommended Action No action is required.

Related Documentation

These documents provide complete information about the Cisco Catalyst Blade Switch 3040 for FSC and are available at Cisco.com:

http://www.cisco.com/en/US/products/ps8743/tsd_products_support_series_home.html

These documents provide complete information about the Cisco Catalyst Blade Switch 3040 for FSC:

- *Cisco Catalyst Blade Switch 3040 for FSC Getting Started Guide*
- *Regulatory Compliance and Safety Information for the Cisco Catalyst Blade Switch 3040 for FSC*
- *Release Notes for the Cisco Catalyst Blade Switch 3040 for FSC, Cisco IOS Release 12.2(40)SE*
- *Cisco Catalyst Blade Switch 3040 for FSC Software Configuration Guide*
- *Cisco Catalyst Blade Switch 3040 for FSC Command Reference*
- *Cisco Catalyst Blade Switch 3040 for FSC System Message Guide*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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