



CHAPTER 13

Configuring VTP

This chapter describes how to use the VLAN Trunking Protocol (VTP) and the VLAN database for managing VLANs with the switch.



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 VTP, page 13-1](#)
[Configuring VTP, page 13-6](#)
[Monitoring VTP, page 13-16](#)

Understanding VTP

VTP is a Layer 2 messaging protocol that maintains VLAN configuration consistency by managing the addition, deletion, and renaming of VLANs on a network-wide basis. VTP minimizes misconfigurations and configuration inconsistencies that can cause several problems, such as duplicate VLAN names, incorrect VLAN-type specifications, and security violations.

Before you create VLANs, you must decide whether to use VTP in your network. Using VTP, you can make configuration changes centrally on one or more switches and have those changes automatically communicated to all the other switches in the network. Without VTP, you cannot send information about VLANs to other switches.

VTP is designed to work in an environment where updates are made on a single switch and are sent through VTP to other switches in the domain. It does not work well in a situation where multiple updates to the VLAN database occur simultaneously on switches in the same domain, which would result in an inconsistency in the VLAN database.

The switch supports 1005 VLANs, but the number of routed ports, SVIs, and other configured features affects the usage of the switch hardware. If the switch is notified by VTP of a new VLAN and the switch is already using the maximum available hardware resources, it sends a message that there are not enough hardware resources available and shuts down the VLAN. The output of the **show vlan** user EXEC command shows the VLAN in a suspended state.

VTP only learns about normal-range VLANs (VLAN IDs 1 to 1005). Extended-range VLANs (VLAN IDs greater than 1005) are not supported by VTP or stored in the VTP VLAN database.

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The VTP Domain

name. A switch can be in only one VTP domain. You make global VLAN configuration changes for the domain.

By default, the switch is in the VTP no-management-domain state until it receives an advertisement for a domain over a trunk link (a link that carries the traffic of multiple VLANs) or until you configure a domain name. Until the management domain name is specified or learned, you cannot create or modify VLANs on a VTP server, and VLAN information is not propagated over the network.

If the switch receives a VTP advertisement over a trunk link, it inherits the management domain name and the VTP configuration revision number. The switch then ignores advertisements with a different domain name or an earlier configuration revision number.



Caution

lower

[“Adding a VTP Client Switch to a VTP Domain” section on page 13-14](#) for the procedure for verifying and resetting the VTP configuration revision number.

When you make a change to the VLAN configuration on a VTP server, the change is propagated to all switches in the VTP domain. VTP advertisements are sent over all IEEE trunk connections, including Inter-Switch Link (ISL) and IEEE 802.1Q. VTP dynamically maps VLANs with unique names and internal index associates across multiple LAN types. Mapping eliminates excessive device administration required from network administrators.

If you configure a switch for VTP transparent mode, you can create and modify VLANs, but the changes are not sent to other switches in the domain, and they affect only the individual switch. However, configuration changes made when the switch is in this mode are saved in the switch running configuration and can be saved to the switch startup configuration file.

For domain name and password configuration guidelines, see the [“VTP Configuration Guidelines” section on page 13-8](#).

VTP Modes

Table 13-1 VTP Modes

VTP Mode	Description
	In VTP server mode, VLAN configurations are saved in NVRAM. VTP server is the default mode.
VTP client	<p>A VTP client behaves like a VTP server and transmits and receives VTP updates on its trunks, but you cannot create, change, or delete VLANs on a VTP client. VLANs are configured on another switch in the domain that is in server mode.</p> <p>In VTP client mode, VLAN configurations are not saved in NVRAM.</p>
VTP transparent	<p>VTP transparent switches do not participate in VTP. A VTP transparent switch does not advertise its VLAN configuration and does not synchronize its VLAN configuration based on received advertisements. However, in VTP Version 2, transparent switches do forward VTP advertisements that they receive from other switches through their trunk interfaces. You can create, modify, and delete VLANs on a switch in VTP transparent mode.</p> <p>The switch must be in VTP transparent mode when you create extended-range VLANs. See the “Configuring Extended-Range VLANs” section on page 12-12.</p> <p>The switch must be in VTP transparent mode when you create private VLANs. See Chapter 15, “Configuring Private VLANs.” When private VLANs are configured, do not change the VTP mode from transparent to client or server mode.</p> <p>When the switch is in VTP transparent mode, the VTP and VLAN configurations are saved in NVRAM, but they are not advertised to other switches. In this mode, VTP mode and domain name are saved in the switch running configuration, and you can save this information in the switch startup configuration file by using the copy running-config startup-config</p>

VTP Advertisements



Note

Otherwise, the switch cannot receive any VTP advertisements. For more information on trunk ports, see the [“Configuring VLAN Trunks”](#) section on page 12-16.

VTP advertisements distribute this global domain information:

- VTP domain name
- VTP configuration revision number
- Update identity and update timestamp

VTP Version 2

- Token Ring support—VTP Version 2 supports Token Ring Bridge Relay Function (TrBRF) and Token Ring Concentrator Relay Function (TrCRF) VLANs. For more information about Token Ring VLANs, see the [“Configuring Normal-Range VLANs” section on page 12-4](#).

Unrecognized Type-Length-Value (TLV) support—A VTP server or client propagates configuration changes to its other trunks, even for TLVs it is not able to parse. The unrecognized TLV is saved in NVRAM when the switch is operating in VTP server mode.

Version-Dependent Transparent Mode—In VTP Version 1, a VTP transparent switch inspects VTP messages for the domain name and version and forwards a message only if the version and domain name match. Because VTP Version 2 supports only one domain, it forwards VTP messages in transparent mode without inspecting the version and domain name.

Consistency Checks—In VTP Version 2, VLAN consistency checks (such as VLAN names and values) are performed only when you enter new information through the CLI or SNMP. Consistency checks are not performed when new information is obtained from a VTP message or when information is read from NVRAM. If the MD5 digest on a received VTP message is correct, its information is accepted.

VTP Pruning

Figure 13-1 Flooding Traffic without VTP Pruning

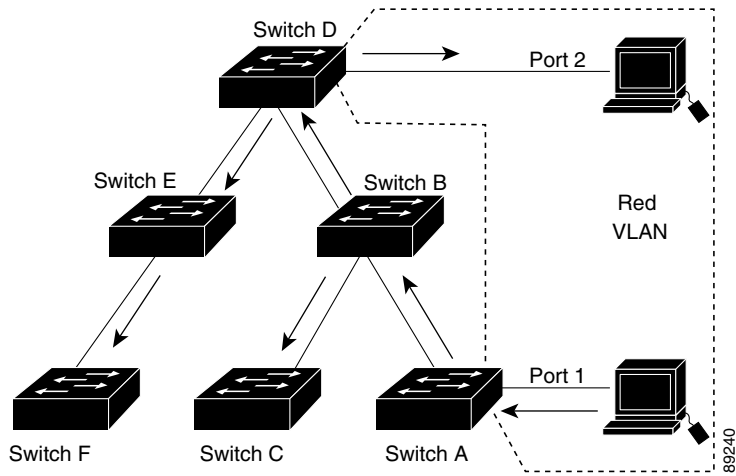
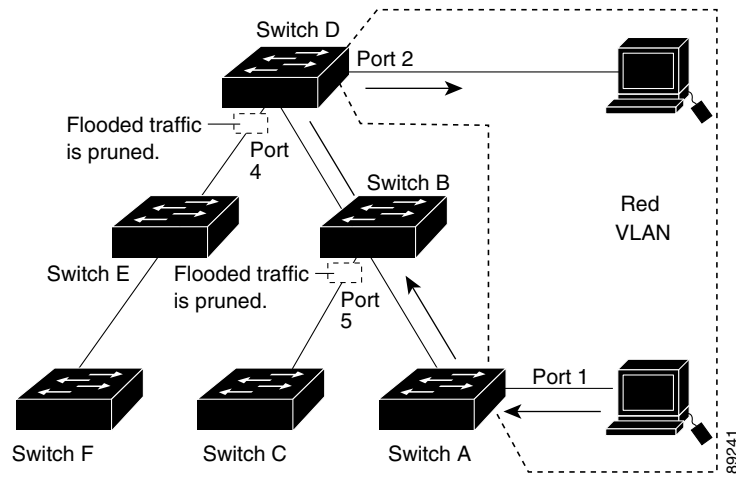


Figure 13-2 Optimized Flooded Traffic with VTP Pruning



VLANs 1002 to 1005 are always pruning-ineligible; traffic from these VLANs cannot be pruned. Extended-range VLANs (VLAN IDs higher than 1005) are also pruning-ineligible.

VTP pruning is not designed to function in VTP transparent mode. If one or more switches in the network are in VTP transparent mode, you should do one of these:

- Turn off VTP pruning in the entire network.

- Turn off VTP pruning by making all VLANs on the trunk of the switch upstream to the VTP transparent switch pruning ineligible.

To configure VTP pruning on an interface, use the **switchport trunk pruning vlan**

Configuring VTP

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- [Configuring a VTP Server](#), page 13-9
- [Configuring a VTP Client](#), page 13-11
- [Disabling VTP \(VTP Transparent Mode\)](#), page 13-12
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Default VTP Configuration

Default VTP Configuration

Feature	Default Setting

VTP Configuration Options

-
-

vlan database

vtp

VTP Configuration in Global Configuration Mode

-
-

VTP Configuration in VLAN Database Configuration Mode

exit

copy running-config startup-config

VTP Configuration Guidelines

Domain Names



Note



Caution

Passwords

each switch in the management domain. Switches without a password or with the wrong password reject VTP advertisements.

If you configure a VTP password for a domain, a switch that is booted without a VTP configuration does not accept VTP advertisements until you configure it with the correct password. After the configuration, the switch accepts the next VTP advertisement that uses the same password and domain name in the advertisement.

If you are adding a new switch to an existing network with VTP capability, the new switch learns the domain name only after the applicable password has been configured on it.



Caution

When you configure a VTP domain password, the management domain does not function properly if you do not assign a management domain password to each switch in the domain.

VTP Version

Follow these guidelines when deciding which VTP version to implement:

- All switches in a VTP domain must run the same VTP version.
- A VTP Version 2-capable switch can operate in the same VTP domain as a switch running VTP Version 1 if Version 2 is disabled on the Version 2-capable switch (Version 2 is disabled by default).

Configuration Requirements

Configuring a VTP Server



Note

	Command	Purpose
Step 1	configure terminal	
Step 2		
Step 3	<i>domain-name</i>	
Step 4	<i>password</i>	
Step 5		
Step 6		<i>VTP Operating Mode</i> <i>VTP Domain Name</i>

```
Switch# config terminal
Switch(config)# vtp mode server
                vtp domain eng_group
                vtp password mypassword
                end
```




Disabling VTP (VTP Transparent Mode)



Note

	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4		
Step 5		Note



Note



```

vlan database
vtp transparent
transparent
no vtp

```

Enabling VTP Version 2



Caution

```


```



Note

```


```

configure terminal	
vtp version 2	
end	
show vtp status	VTP V2 Mode

no vtp version .



```

vlan database
vtp v2-mode
no vtp v2-mode

```



	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4		

no vtp pruning



vlan database
vtp pruning

no vtp pruning
vtp pruning

Adding a VTP Client Switch to a VTP Domain



before

	a. b. c.
Step 2	
Step 3	
Step 4	
Step 5	
Step 6	
Step 7	
Step 8	
Step 9	

domain-name



Monitoring VTP

Command	Purpose