Chapter 2: Scaling VLANs
## VTP, Extended VLANs, and DTP

Scaling Networks

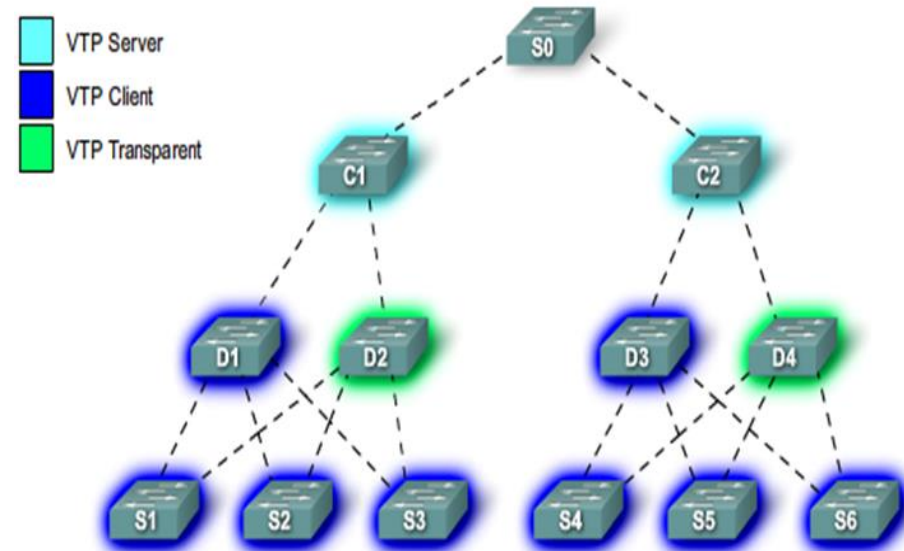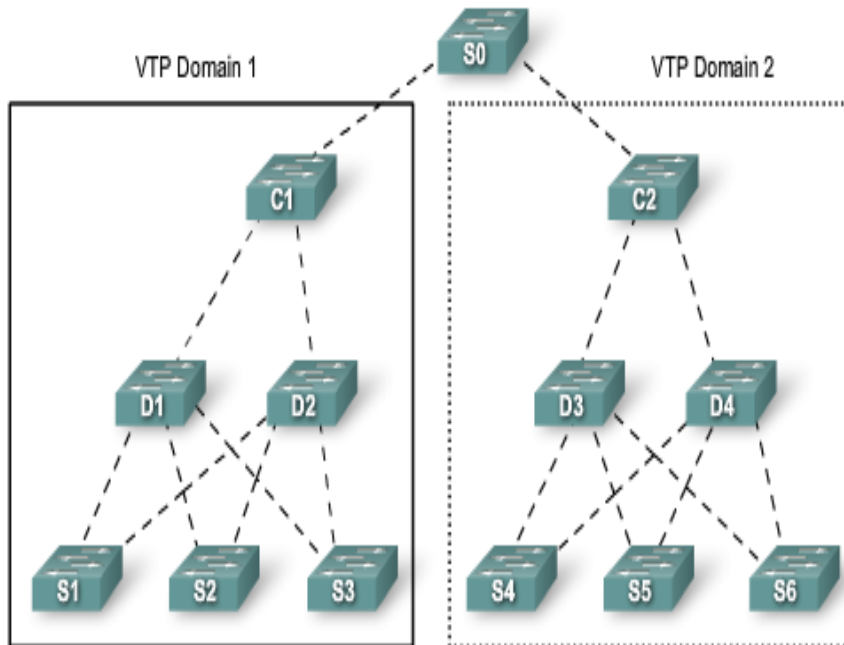Cisco | Networking Academy®
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VTP in a Switched Network

- VTP is a Cisco proprietary protocol used to exchange VLAN information across trunk links

- VLAN trunking protocol (VTP) allows a network administrator to manage VLANs on a switch configured as a VTP server.

- VTP stores VLAN configurations in a database called **vlan.dat**.
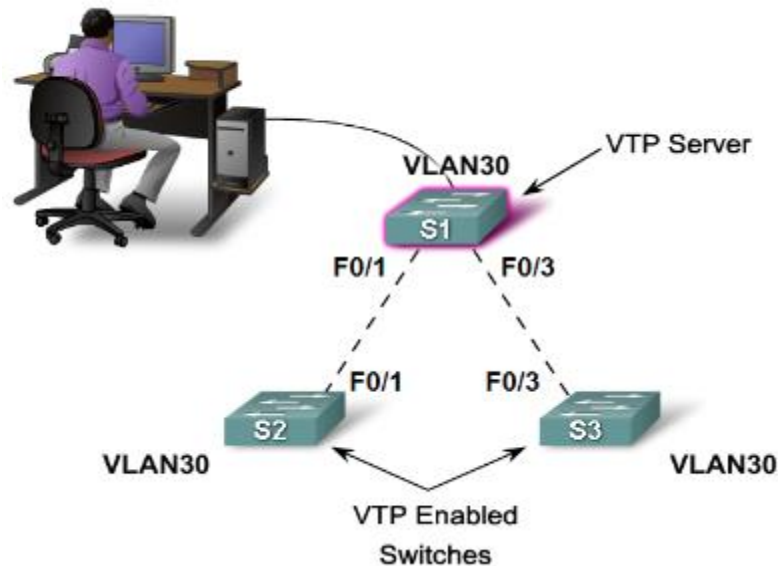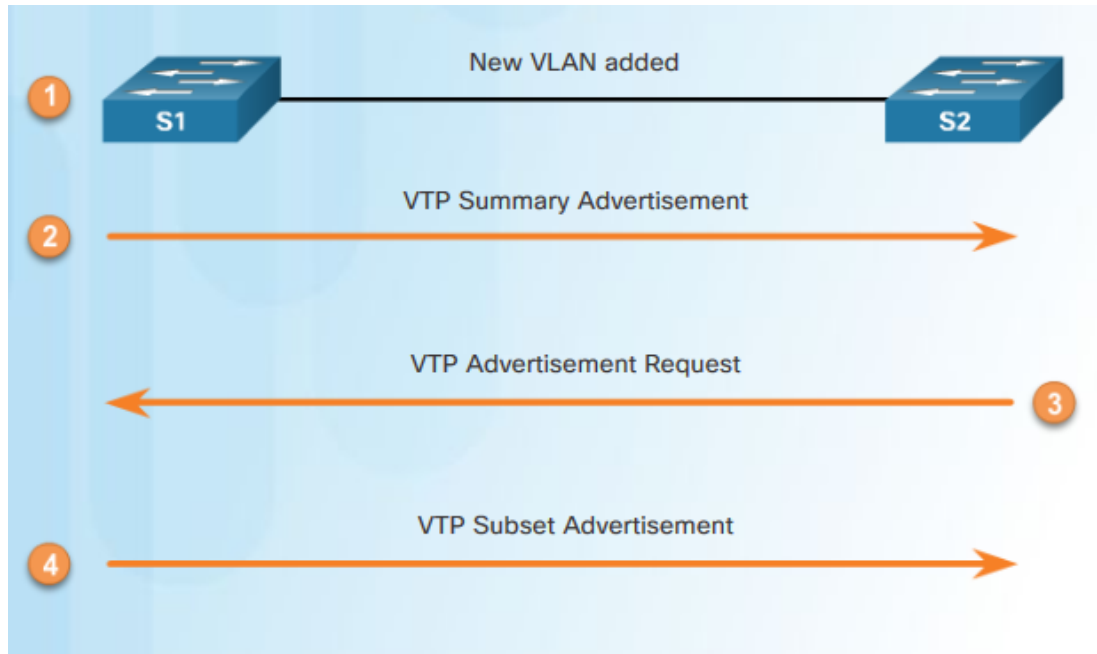
VTP domain and modes

Server: Can create, modify & delete VLAN

Client: Cannot create, modify or delete VLAN

Transparent: Can create, modify, & delete LOCAL VLAN & Forwards VTP dvertisements.

VTP advertisements

VTP includes three types of advertisements:

- Summary advertisements - These inform adjacent switches of VTP domain name and configuration revision number. (every five minutes)

- Advertisement request - These are in response to a summary advertisement message when the summary advertisement contains a higher configuration revision number than the current value.

- Subset advertisements - These contain VLAN information including any changes.

Operation of VTP

- ## VTP Status

  - The configuration revision number is used when determining whether a switch should keep its existing VLAN database, or overwrite it with the VTP update sent by another switch.

  - When a switch is added to a network, ensure that it has a default VTP configuration.

```
S4#show vtp status
VTP Version                     : 1
Configuration Revision          : 3
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Server
VTP Domain Name                 : cisco2
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x3F 0x37 0x45 0x9A 0x37 0x53 0xA6 0xDE
Configuration last modified by 192.168.0.99 at 3-9-93 05:20:38
S4#
```

VTP Configuration

- There are 5 steps to VTP configuration:
    1. Configure the VTP Server.
    2. Configure the VTP Domain Name and Password.
    3. Configure the VTP Clients.
    4. Configure VLANs on the VTP Server.
    5. Verify the VTP Clients have received the new VLAN information.
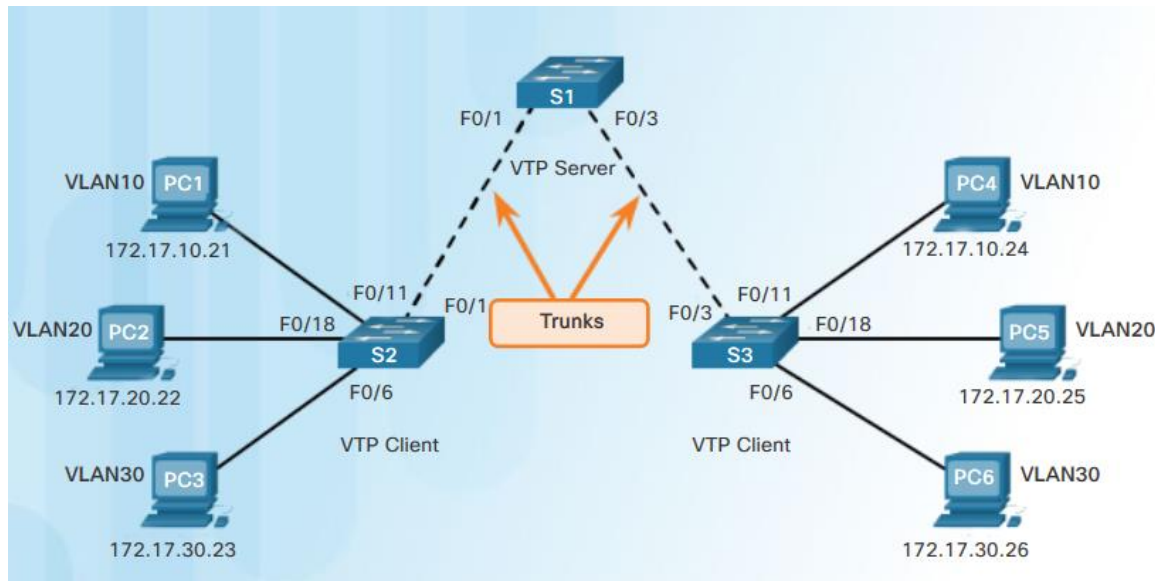
Extended VLANs

- Normal range VLANs are identified by a VLAN ID between 1 and 1005.

- Extended range VLANs are identified by a VLAN ID between 1006 and 4094.

- VTP does not learn extended range VLANs.

- To configure an extended VLAN on a 2960 switch it must be set to VTP transparent mode.

```
S1# conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)# vlan 2000
S1(config-vlan)# exit
% Failed to create VLANs 2000
Extended VLAN(s) not allowed in current VTP mode.
%Failed to commit extended VLAN(s) changes.
```

Dynamic Trunking Protocol

- DTP manages trunk negotiation only if the port on the neighbor switch is configured in a trunk mode that supports DTP.

- Turn off DTP on interfaces on a Cisco switch that is connected to devices that do not support DTP.

- To enable trunking from a Cisco switch to a device that does not support DTP, use the **switchport mode trunk** and **switchport nonegotiate** interface configuration mode commands.

■ There are 5 commands to support different trunking modes:

- **switchport mode access**

- **switchport mode dynamic auto**

- **switchport mode dynamic desirable**

- **switchport mode trunk**

- **switchport nonegotiate**

	Dynamic Auto	Dynamic Desirable	Trunk	Access
Dynamic Auto	Access	Trunk	Trunk	Access
Dynamic Desirable	Trunk	Trunk	Trunk	Access
Trunk	Trunk	Trunk	Trunk	Limited Connectivity
Access	Access	Access	Limited Connectivity	Access

Layer 3 Switching

Layer 3 Switching Operation

- Modern enterprise networks use multilayer switches to achieve high-packet processing rates using hardware-based switching.

- Catalyst multilayer switches support the following types of Layer 3 interfaces:
  - Routed port
    - A pure Layer 3 interface similar to a physical interface on a Cisco IOS router.
  - Switch virtual interface (SVI)
    - A virtual VLAN interface for inter-VLAN routing. In other words, SVIs are the virtual-routed VLAN interfaces.