

# All Transparent VTP Domain to Server–Client VTP Domain Migration Configuration Example

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## Introduction

This document provides a sample configuration on how to migrate a campus network of all VLAN Trunking Protocol (VTP) Transparent mode switches to a network with VTP server(s) and clients. This document can also be used to restructure the VTP domains that exist.

## Prerequisites

### Requirements

Ensure that you meet these requirements before you attempt this configuration:

- Basic knowledge of Catalyst Switch Administration
- Knowledge of VTP

### Components Used

The information in this document is based on Cisco IOS® Software Release 12.2(25)SEC2, and Catalyst OS (CatOS) version 8.1(2).

The information in this document is applicable to all Cisco devices that support VLAN Trunk Protocol version 2.

The information in this document was created from the devices in a specific lab environment. If your network is live, make sure that you understand the potential impact of any command.

### Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

# Background Information

VTP reduces administration in a switched network. When you configure a new VLAN on one VTP server, the VLAN is distributed through all switches in the domain. This reduces the need to configure the same VLAN everywhere. VTP is a Cisco proprietary protocol that is available on most of the Cisco Catalyst series products.

**Note:** This document does not cover VTP version 3. VTP version 3 differs from VTP version 1 (v1) and version 2 (v2). It is only available on CatOS 8.1(1) or later. VTP version 3 incorporates many changes from VTP v1 and v2. Make certain that you understand the differences between VTP version 3 and earlier versions before you alter your network configuration. Refer to one of these sections from Configuring VTP for more information:

- Understanding How VTP Version 3 Works
- Interaction with VTP Version 1 and VTP Version 2

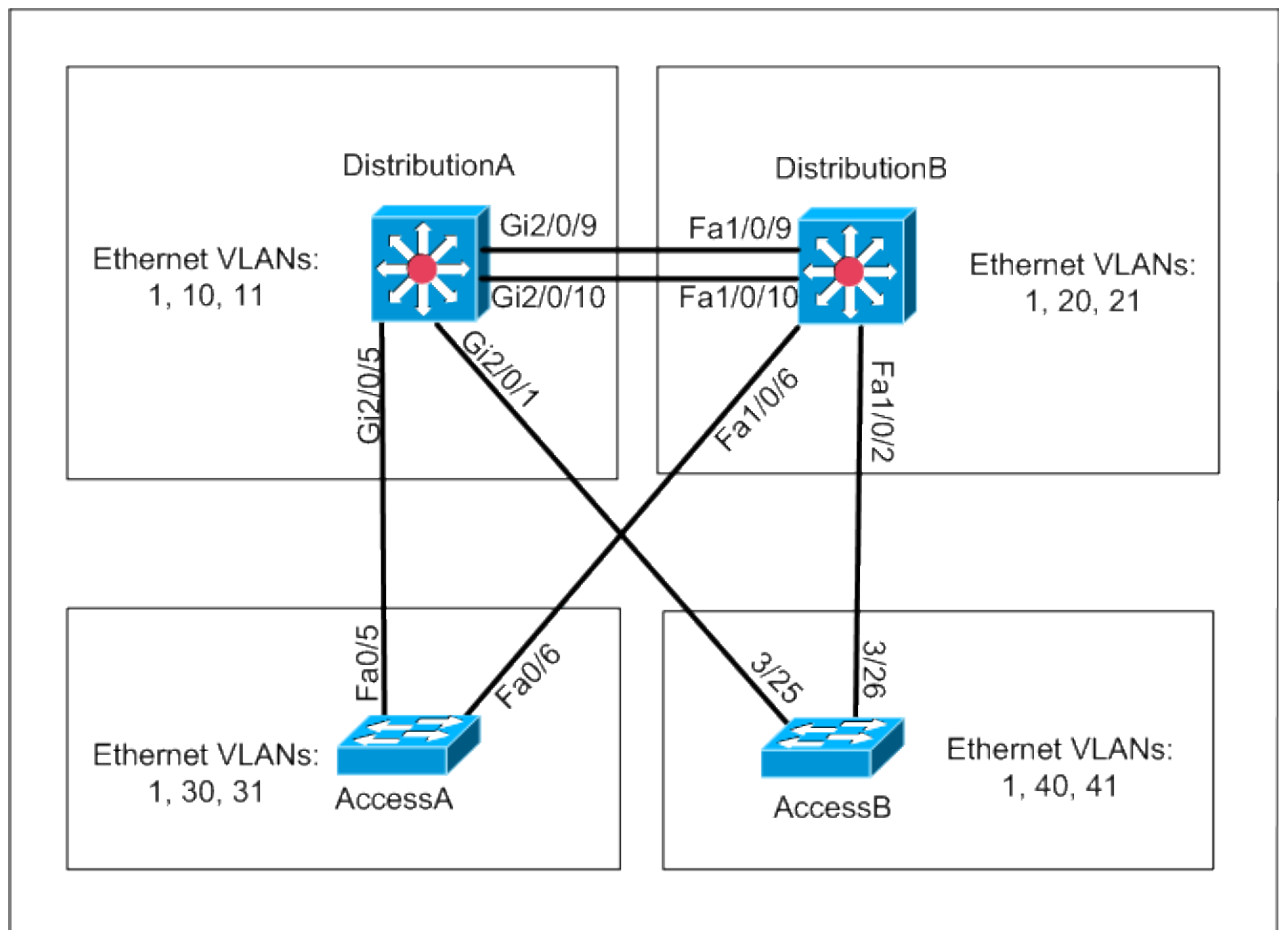
## Configure

In this section, you are presented with the information to migrate your campus network from all VTP transparent configuration to VTP server client configuration. This section also provides the quick steps used to introduce a new switch to the VTP domain that exists.

**Note:** Use the Command Lookup Tool ( registered customers only) to find more information on the commands used in this document.

## Network Diagram

This document uses this network setup:



The network includes:

- Two distribution layer switches *DistributionA* and *DistributionB* that both run Cisco IOS Software.
- Two access layer switches *AccessA* runs Cisco IOS Software and *AccessB* runs CatOS Software.

The initial VLAN database has these Ethernet VLANs:

- *DistributionA* VLANs 1, 10, and 11
- *DistributionB* VLANs 1, 20, and 21
- *AccessA* VLANs 1, 30, and 31
- *AccessB* VLANs 1, 40, and 41

## Configurations

This section consists of three sub-sections:

- Pre Migration Checks
- Migration Planning
- Migration Procedure

### Pre Migration Checks

This section provides the checklist to make sure the network is ready for the migration process. In order to receive the current status of the VTP configuration in the switch, issue the **show vtp status** command for Cisco IOS, and the **show vtp domain** command for CatOS.

## Cisco IOS

```
DistributionA#show vtp status
VTP Version                : 2
Configuration Revision     : 0
Maximum VLANs supported locally : 1005
Number of existing VLANs   : 7
VTP Operating Mode         : Transparent
VTP Domain Name            : migration
VTP Pruning Mode           : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation       : Disabled
MD5 digest                  : 0xE5 0x9F 0x80 0x70 0x73 0x62 0xC0 0x54
Configuration last modified by 0.0.0.0 at 3-1-93 04:23:21
DistributionA#
```

## Catalyst OS

```
AccessB> (enable) show vtp domain
Version      : running VTP1 (VTP3 capable)
Domain Name  : migration                      Password : not configured
Notifications: disabled                      Updater ID: 0.0.0.0

Feature      Mode      Revision
-----
VLAN         Client    0

Pruning      : disabled
VLANs prune eligible: 2-1000
AccessB> (enable)
```

1. Check if all switches are in VTP Transparent mode. Issue these commands in order to change the VTP mode:

### Cisco IOS

```
AccessA#conf t
AccessA(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode
AccessA(config)#exit
AccessA#
```

### Catalyst OS

```
AccessB> (enable) set vtp mode transparent
Changing VTP mode for all features
VTP domain migration modified
AccessB> (enable)
```

2. Check if all switches have the same VTP domain name. Issue these commands in order to change the VTP domain name:

### Cisco IOS

```
DistributionB(config)#vtp domain migration

Changing VTP domain name from aaaa to migration
DistributionB(config)#
```

### Catalyst OS

```
AccessB> (enable) set vtp domain migration
```

```
VTP domain migration modified
AccessB> (enable)
```

3. Check if all switches run the same VTP version. Issue these commands in order to change the VTP version:

### Cisco IOS

```
vtp version 2
```

### Catalyst OS

```
set vtp v2 enable
```

or

```
set vtp version 2
```

4. Check if all switches run the same VTP password (if any configured). Issue these commands in order to change the VTP password:

### Cisco IOS

```
vtp password vtp_password
```

### Catalyst OS

```
AccessB> (enable) set vtp passwd ?
  <passwd> Password (0 to clear)
AccessB> (enable) set vtp passwd vtp_password
```

```
Generating the secret associated to the password.
VTP domain migration modified
```

5. Check if all switches are connected by trunk links.

### Cisco IOS

```
DistributionA#show interfaces trunk
```

| Port     | Mode      | Encapsulation | Status   | Native vlan |
|----------|-----------|---------------|----------|-------------|
| Gi2/0/1  | auto      | n-isl         | trunking | 1           |
| Gi2/0/5  | auto      | n-802.1q      | trunking | 1           |
| Gi2/0/9  | desirable | n-isl         | trunking | 1           |
| Gi2/0/10 | desirable | n-isl         | trunking | 1           |

| Port     | Vlans allowed on trunk |
|----------|------------------------|
| Gi2/0/1  | 1-4094                 |
| Gi2/0/5  | 1-4094                 |
| Gi2/0/9  | 1-4094                 |
| Gi2/0/10 | 1-4094                 |

| Port     | Vlans allowed and active in management domain |
|----------|---|
| Gi2/0/1  | 1,10-11                                       |
| Gi2/0/5  | 1,10-11                                       |
| Gi2/0/9  | 1,10-11                                       |
| Gi2/0/10 | 1,10-11                                       |

| Port    | Vlans in spanning tree forwarding state and not pruned |
|---------|--|
| Gi2/0/1 | 1,10-11  |
| Gi2/0/5 | 1,10-11  |
| Gi2/0/9 | 1,10-11  |

!--- Rest of output elided.

## Catalyst OS

```
AccessB> (enable) show trunk
* - indicates vtp domain mismatch
# - indicates dot1q-all-tagged enabled on the port
Port      Mode           Encapsulation  Status      Native vlan
-----
3/25      desirable     n-isl          trunking    1
3/26      desirable     n-isl          trunking    1
6/1       nonegotiate   dot1q          trunking    1
6/2       nonegotiate   dot1q          trunking    1
6/3       nonegotiate   dot1q          trunking    1
6/4       nonegotiate   dot1q          trunking    1
16/1      nonegotiate   isl            trunking    1
```

```
Port      Vlans allowed on trunk
-----
```

```
3/25      1-1005,1025-4094
3/26      1-1005,1025-4094
6/1
6/2
6/3
6/4
16/1      1-1005,1025-4094
```

```
Port      Vlans allowed and active in management domain
```

!--- Rest of output elided.

## Migration Planning

- Determine the number of VLANs required for the network. The maximum number of active VLANs supported by Catalyst switches varies with models.

```
AccessA#show vtp status
VTP Version           : 2
Configuration Revision : 0
Maximum VLANs supported locally : 250
Number of existing VLANs : 7
VTP Operating Mode    : Transparent
VTP Domain Name       : migration
VTP Pruning Mode      : Disabled
VTP V2 Mode           : Disabled
VTP Traps Generation  : Disabled
MD5 digest            : 0xC8 0xB7 0x36 0xC3 0xBD 0xC6 0x56 0xB2
Configuration last modified by 0.0.0.0 at 3-1-93 04:23:21
AccessA#
```

- Determine the switches, such as *DistributionA* and *DistributionB*, which will be the VTP servers. One or more switches can be VTP servers in a domain. Choose one switch, such as *DistributionA*, in order to start the migration.

## Migration Procedure

Complete these steps in order to configure the campus network with VTP mode server and client:

1. Change the VTP mode of the *DistributionA* to **Server**.

```

DistributionA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DistributionA(config)#vtp mode server
Setting device to VTP SERVER mode
DistributionA(config)#exit
DistributionA#

```

## 2. Create the VLANs that are required in the domain.

*!--- Before creating VLANs*

```
DistributionA#show vlan
```

| VLAN | Name               | Status    | Ports  |
|------|--------------------|-----------|--|
| 1    | default            | active    | Gi2/0/2, Gi2/0/3, Gi2/0/4<br>Gi2/0/6, Gi2/0/7, Gi2/0/8<br>Gi2/0/11, Gi2/0/12, Gi2/0/13<br>Gi2/0/14, Gi2/0/15, Gi2/0/16<br>Gi2/0/17, Gi2/0/18, Gi2/0/19<br>Gi2/0/20, Gi2/0/21, Gi2/0/22 |
| 10   | VLAN0010           | active    | Gi2/0/23   |
| 11   | VLAN0011           | active    | Gi2/0/24   |
| 1002 | fddi-default       | act/unsup |  |
| 1003 | token-ring-default | act/unsup |  |
| 1004 | fddinet-default    | act/unsup |  |
| 1005 | trnet-default      | act/unsup |  |

| VLAN | Type | SAID   | MTU  | Parent | RingNo | BridgeNo | Stp | BrdgMode | Trans1 | Trans2 |
|------|------|--------|------|--------|--------|----------|-----|----------|--------|--------|
| 1    | enet | 100001 | 1500 | -      | -      | -        | -   | -        | 0      | 0      |
| 10   | enet | 100010 | 1500 | -      | -      | -        | -   | -        | 0      | 0      |
| 11   | enet | 100011 | 1500 | -      | -      | -        | -   | -        | 0      | 0      |
| 1002 | fddi | 101002 | 1500 | -      | -      | -        | -   | -        | 0      | 0      |
| 1003 | tr   | 101003 | 1500 | -      | -      | -        | -   | srp      | 0      | 0      |

*!--- Rest of output elided.*

*!--- Creating required VLANs*

```

DistributionA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DistributionA(config)#vlan 20-21,30-31,40-41

DistributionA(config-vlan)#exit
DistributionA(config)#exit
DistributionA#

```

*!--- After creating VLANs*

```
DistributionA#show vlan
```

| VLAN | Name     | Status | Ports  |
|------|----------|--------|--|
| 1    | default  | active | Gi2/0/2, Gi2/0/3, Gi2/0/4<br>Gi2/0/6, Gi2/0/7, Gi2/0/8<br>Gi2/0/11, Gi2/0/12, Gi2/0/13<br>Gi2/0/14, Gi2/0/15, Gi2/0/16<br>Gi2/0/17, Gi2/0/18, Gi2/0/19<br>Gi2/0/20, Gi2/0/21, Gi2/0/22 |
| 10   | VLAN0010 | active | Gi2/0/23   |
| 11   | VLAN0011 | active | Gi2/0/24   |

```

20 VLAN0020 active
21 VLAN0021 active
30 VLAN0030 active
31 VLAN0031 active
40 VLAN0040 active
41 VLAN0041 active
1002 fddi-default act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default act/unsup

```

```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2

```

*!--- Rest of output elided.*

If no new VLANs are to be configured, create a dummy VLAN.

This increases the Configuration Revision to '1', which enables the VLAN database to propagate throughout the network.

```

DistributionA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DistributionA(config)#vlan 100

DistributionA(config-vlan)#name dummy

DistributionA(config-vlan)#exit
DistributionA(config)#exit
DistributionA#

```

3. Change the VTP mode of *DistributionB* to **Client**, followed by *AccessA* and *AccessB*.

### Cisco IOS

```

DistributionB#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DistributionB(config)#vtp mode client
Setting device to VTP CLIENT mode.
DistributionB(config)#exit
DistributionB#

DistributionB#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 1005
Number of existing VLANs : 13
VTP Operating Mode : Client
VTP Domain Name : migration
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0xBD 0xA4 0x94 0xE6 0xE3 0xC7 0xA7 0x86
Configuration last modified by 0.0.0.0 at 3-1-93 04:23:21

```

### Catalyst OS

```

AccessB> (enable) set vtp mode client
Changing VTP mode for all features
VTP domain migration modified

```

4. Verify if all VLANs are propagated across the domain.

### Cisco IOS

DistributionB#show vlan

| VLAN | Name               | Status    | Ports  |
|------|--------------------|-----------|--|
| 1    | default            | active    | Fal/0/1, Fal/0/3, Fal/0/4<br>Fal/0/5, Fal/0/7, Fal/0/8<br>Fal/0/11, Fal/0/12, Fal/0/13<br>Fal/0/14, Fal/0/15, Fal/0/16<br>Fal/0/17, Fal/0/18, Fal/0/19<br>Fal/0/20, Fal/0/21, Fal/0/22<br>Fal/0/23, Fal/0/24 |
| 10   | VLAN0010           | active    |  |
| 11   | VLAN0011           | active    |  |
| 20   | VLAN0020           | active    | Gi1/0/1  |
| 21   | VLAN0021           | active    | Gi1/0/2  |
| 30   | VLAN0030           | active    |  |
| 31   | VLAN0031           | active    |  |
| 40   | VLAN0040           | active    |  |
| 41   | VLAN0041           | active    |  |
| 1002 | fddi-default       | act/unsup |  |
| 1003 | token-ring-default | act/unsup |  |
| 1004 | fddinet-default    | act/unsup |  |
| 1005 | trnet-default      | act/unsup |  |

!--- Rest of output elided.

## Catalyst OS

AccessB> (enable) show vlan

| VLAN | Name               | Status | IfIndex | Mod/Ports, Vlans                 |
|------|--------------------|--------|---------|----------------------------------|
| 1    | default            | active | 64      | 2/1-2<br>3/1-24,3/27-46<br>4/1-8 |
| 10   | VLAN0010           | active | 107     |                                  |
| 11   | VLAN0011           | active | 108     |                                  |
| 20   | VLAN0020           | active | 105     |                                  |
| 21   | VLAN0021           | active | 106     |                                  |
| 30   | VLAN0030           | active | 109     |                                  |
| 31   | VLAN0031           | active | 110     |                                  |
| 40   | VLAN0040           | active | 111     | 3/47                             |
| 41   | VLAN0041           | active | 112     | 3/48                             |
| 1002 | fddi-default       | active | 65      |                                  |
| 1003 | token-ring-default | active | 68      |                                  |
| 1004 | fddinet-default    | active | 66      |                                  |
| 1005 | trnet-default      | active | 67      |                                  |

| VLAN | Type  | SAID   | MTU  | Parent | RingNo | BrdgNo | Stp | BrdgMode | Trans1 | Trans2 |
|------|-------|--------|------|--------|--------|--------|-----|----------|--------|--------|
| 1002 | fddi  | 101002 | 1500 | -      | -      | -      | -   | -        | 0      | 0      |
| 1003 | trcrf | 101003 | 1500 | -      | -      | -      | -   | -        | 0      | 0      |

!--- Rest of output elided.

5. Check if any switchport is in the **Inactive** state.

A switchport can go to Inactive state if the VLAN configured for that switchport does not exist in the switch. Create appropriate VLAN(s), as required, in the VTP server switch.

## Cisco IOS

From the output of the **show interfaces switchport** command, you can determine if a switchport is in Inactive mode if it has the **Inactive** keyword for the *Access Mode VLAN* attribute.

```
DistributionB#show interfaces switchport
Name: Fa1/0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: down
Administrative Trunking Encapsulation: negotiate
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
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: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
```

*!--- Part of output elided.*

```
Name: Fa1/0/24
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: down
Administrative Trunking Encapsulation: negotiate
Negotiation of Trunking: On
Access Mode VLAN: 50 (Inactive)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Administrative private-vlan host-association: none
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: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
```

```
Protected: false
Unknown unicast blocked: disabled
```

*!--- Rest of output elided.*

Create the VLAN 50 in the VTP server switch (DistributionA).

```
DistributionA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DistributionA(config)#vlan 50
```

```
DistributionA(config-vlan)#name Vlan50
```

```
DistributionA(config-vlan)#end  
DistributionA#
```

*!--- Verify the switchport status in the DistributionB switch.*

```
DistributionB#show interfaces fa1/0/24 switchport  
Name: Fa1/0/24  
Switchport: Enabled  
Administrative Mode: dynamic auto  
Operational Mode: down  
Administrative Trunking Encapsulation: negotiate  
Negotiation of Trunking: On  
Access Mode VLAN: 50 (Vlan50)  
Trunking Native Mode VLAN: 1 (default)  
Administrative Native VLAN tagging: enabled  
Voice VLAN: none  
Administrative private-vlan host-association: none  
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: none  
Trunking VLANs Enabled: ALL  
Pruning VLANs Enabled: 2-1001  
Capture Mode Disabled  
Capture VLANs Allowed: ALL
```

*!--- Rest of output elided.*

#### 6. Change the VTP mode of the *DistributionB* switch to **Server**.

The VTP server switch(es) must have the same configuration revision number, and must be the highest in the VTP domain.

## Add a Switch to the VTP Domain

A recently added switch can cause problems in the network. It can be a switch that was previously used in the lab, and a good VTP domain name was entered. The switch was configured as a VTP client and was connected to the rest of the network. Then, you brought the trunk link up to the rest of the network. In just a few seconds, the whole network can go down.

If the configuration revision number of the switch that you inserted is higher than the configuration revision number of the VTP domain, it propagates its VLAN database through the VTP domain.

This occurs whether the switch is a VTP client or a VTP server. A VTP client can erase VLAN information on a VTP server. You can tell this has occurred when many of the ports in your network go into the Inactive state but continue to assign to a nonexistent VLAN.

**Note:** Refer to Flash Animation: VTP for a demonstration of this problem.

Complete these steps in order to avoid this issue when you add a switch to the network:

1. Before you connect the new switch to the network, change the VTP mode of the switch to **Transparent**.

This resets the Configuration Revision number to zero ('0').

2. Connect the switch to the network and configure the appropriate trunk links.
3. Configure the VTP attributes:
  - a. Configure the VTP domain name to match the VTP domain name of the network.
  - b. Configure the VTP version and password (if any required).
4. Change the VTP mode to **Client**.

The Configuration Revision number is still zero ('0'). VLANs start to propagate from the VTP server(s) that exists in the network.

5. Verify if all required VLANs are available in the new switch and in the VTP servers of the network.
6. If any VLAN is missing, a quick workaround is to add it from one of the VTP servers.

Refer to [How a Recently Inserted Switch Can Cause Network Problems](#) for more information.

## Verify

There is no separate verification procedure available for this configuration. Use the verification steps provided as part of the configuration example.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

- **show vtp status** [Cisco IOS] Displays the current status of the VTP domain.
- **show vtp domain** [Catalyst OS] Displays the current status of the VTP domain.
- **show vlan** Displays the VLAN information.

## Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Refer to [VTP Troubleshooting and Caveats](#) for information on common issues with VTP.

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| Network Infrastructure: LAN Routing and Switching         |
| Network Infrastructure: Getting Started with LANs         |

## Related Information

- [Understanding VLAN Trunk Protocol \(VTP\)](#)
- [LAN Product Support](#)
- [LAN Switching Technology Support](#)

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