**Lab : Static VLANS, Trunking, and VTP**

Choose the VTP version wisely based on support in Cisco Packet Tracer. Some Versions of Cisco Packet Tracer supports only Version 2 of VTP

**Topology**

A diagram of a network

Description automatically generated

**Objectives**

* Setup a VTP v2 Domain.
* Create and maintain VLANs.
* Configure 802.1Q Trunking.
* Setup a VTP v3 Domain.

**Step 1: Configure basic switch parameters.**

* Configure an IP address on the management VLAN according to the diagram. **VLAN 1** is the default management VLAN, but following best practice, we will use a different VLAN. In this case, **VLAN 99**.
* Enter basic configuration commands on each switch according to the diagram.

DLS1# configure terminal

DLS1(config)# interface vlan 99

DLS1(config-if)# ip address 10.1.99.101 255.255.255.0

DLS1(config-if)# no shutdown

* The **interface VLAN 99 will not come up immediately**, because the broadcast domain it is associated with (VLAN 99) doesn’t exist on the switch. (show it )

DSL1#sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 unassigned YES unset up up

GigabitEthernet0/1 unassigned YES unset up up

GigabitEthernet0/2 unassigned YES unset up up

GigabitEthernet0/3 unassigned YES unset up up

GigabitEthernet1/0 unassigned YES unset up up

GigabitEthernet1/1 unassigned YES unset up up

GigabitEthernet1/2 unassigned YES unset up up

GigabitEthernet1/3 unassigned YES unset up up

Vlan99 10.1.99.101 YES manual down

* On each switch, create an **enable secret password** and **configure the VTY lines** to allow remote access from other network devices.

DLS1(config)# enable secret class

DLS1(config)# line vty 0 15

DLS1(config-line)# password cisco

DLS1(config-line)# login

In this lab we will demonstrate the configuration and operation of both VTP versions 2 and 3. We will do this by first configuring VTP version 2 between DLS1 and ALS1, and then configuring DLS1, DLS2 and ALS2 with VTP version 3.

**Topology**

**Step 1: Verify VTP status**

DSL1#show vtp status

VTP Version capable : 1 to 3

VTP version running : 2

VTP Domain Name : CISCO-vIOS

VTP Pruning Mode : Disabled

VTP Traps Generation : Disabled

Device ID : 0000.ab84.2d00

Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

​

Feature VLAN:

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VTP Operating Mode : Transparent

Maximum VLANs supported locally : 1005

Number of existing VLANs : 8

Configuration Revision : 0

MD5 digest : 0x3F 0x04 0x75 0xE5 0x2B 0x03 0x29 0xBF

0x38 0x03 0x50 0xCF 0xC1 0x9B 0x79 0xAD

* Because **no VLAN configurations were made**, all settings are the **defaults**.
* This switch is capable of running **version 1, 2 or 3 of VTP** and runs **version 1 by default**.
* All switches in the VTP domain must run the **same VTP version**.
* The switch used in this lab supports a maximum of **1,005 VLANs** locally.
* Lastly, note that the **configuration revision is 0**.

**Step 2: Configure VTP on DLS1.**

* We will start off this lab by configuring DLS1 for VTP Server mode and setting the VTP domain name and **VTP version 2**.
* We will also set a VTP password, which provides some rudimentary protection against automatic VLAN database propagation.

DLS1# conf t

DLS1(config)# vtp domain SWLAB

DLS1(config)# vtp version 2

DLS1(config)# vtp mode server

DLS1(config)# vtp password cisco123

* Because this **password is set**, VTPv2 will not allow ALS1 to automatically learn the domain name once trunks are installed.

\*Apr 8 13:14:52.691: %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Gi1/0 because of VTP domain mismatch.

\*Apr 8 13:14:52.697: %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Gi1/1 because of VTP domain mismatch.

Verify these settings by using the show **vtp status** command again.

DSL1#show vt

\*Apr 8 13:15:44.444: %SYS-5-CONFIG\_I: Configured from console by console

DSL1#show vtp st

DSL1#show vtp status

VTP Version capable : 1 to 3

VTP version running : 2

VTP Domain Name : SWLAB

VTP Pruning Mode : Disabled

VTP Traps Generation : Disabled

Device ID : 0000.ab84.2d00

Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

Local updater ID is 0.0.0.0 (no valid interface found)

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Feature VLAN:

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VTP Operating Mode : Server

Maximum VLANs supported locally : 1005

Number of existing VLANs : 8

Configuration Revision : 0

MD5 digest : 0xC2 0x38 0x27 0x7E 0x79 0x68 0x93 0x8B

0x8B 0xDE 0xC6 0x98 0xC6 0x36 0x66 0x3D

**Step 3: Configure VLANs on DLS1**

* For now, you will create the VLANs directly on the switch. Create:
  1. 1.

VLAN 99 to enable the management interface.

* 1. 2.

VLAN 999 as a “parking lot” VLAN for unused access ports

* + - Suspend this VLAN to prevent ports in the VLAN from every communicating with each other.
  1. 3.

The VLANs required for network operations, which are VLANs 100, 110, and 120.

DLS1(config)# vlan 99

DLS1(config-vlan)# name MANAGEMENT

DLS1(config-vlan)# vlan 100

DLS1(config-vlan)# name SERVERS

DLS1(config-vlan)# vlan 110

DLS1(config-vlan)# name GUEST

DLS1(config-vlan)# vlan 120

DLS1(config-vlan)# name OFFICE

DLS1(config-vlan)# vlan 999

DLS1(config-vlan)# name PARKING\_LOT

DLS1(config-vlan)# state suspend

DLS1(config-vlan)# vlan 666

DLS1(config-vlan)# name NATIVE\_DO\_NOT\_USE

DLS1(config-vlan)# exit

* After configuring the VLANs, issue the **show vtp status** command and you will see that the all-important configuration revision number has increased based on these changes to the VLAN database.

DSL1#show vtp status | include Configuration Revision

Configuration Revision : 6

DSL1#

**Step 4: Configure trunking on DLS1**

* Configure the appropriate interfaces on DLS1 to be trunks.
  1. 1.

In the topology, **all the trunks are 802.1Q** trunks.

* 1. 2.

Change the **native VLAN** from the default of **VLAN 1** to **VLAN 666**.

* 1. 3.

Set the interfaces to be in trunking mode only, and include the **switchport nonegotiate** command.

DSL1(config)#interface range gigabitEthernet 0/0-3 , gigabitEthernet 1/0-3

DSL1(config-if-range)#switchport trunk encapsulation dot1q

DSL1(config-if-range)#switchport mode trunk

DSL1(config-if-range)#switchport trunk native vlan 666

DSL1(config-if-range)#switchport nonegotiate

DSL1(config-if-range)#no shutdown

* By default, **all VLANs are allowed on all trunks**. You can explicitly control which VLANs are allowed on a trunk.
* Common practice is to disallow **VLAN 1** and the **PARKING\_LOT vlan**. Since only these 2 VLANs are being disallowed, the except version of the command can be used:

DSL1(config-if-range)#switchport trunk allowed vlan ?

WORD VLAN IDs of the allowed VLANs when this port is in trunking mode

add add VLANs to the current list

all all VLANs

except all VLANs except the following

none no VLANs

remove remove VLANs from the current list

​

DSL1(config-if-range)#switchport trunk allowed vlan except 1,999

* Validate these settings by examining the switchport configuration for one of the trunk interfaces:

DSL1#show interfaces gigabitEthernet 0/1 switchport

Name: Gi0/1

Switchport: Enabled

Administrative Mode: trunk

Operational Mode: trunk

Administrative Trunking Encapsulation: dot1q

Operational Trunking Encapsulation: dot1q

Negotiation of Trunking: On

Access Mode VLAN: 1 (default)

Trunking Native Mode VLAN: 666 (NATIVE\_DO\_NOT\_USE)

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 associations: none

Administrative private-vlan trunk mappings: none

Operational private-vlan: none

Trunking VLANs Enabled: 2-998,1000-4094

Pruning VLANs Enabled: 2-1001

Capture Mode Disabled

Capture VLANs Allowed: ALL

​

Appliance trust: none

DSL1#

**Step 5: Configure VTP and trunking on ALS1**

* Configure ALS1 to be in **VTP Client mode** and then configure all of the appropriate trunk interfaces to use a **native VLAN** of **666** and to be in **trunking** mode only.
* Also, disallow VLANs 1 and 999.

ASL1(config)#interface range gigabitEthernet 0/0-3, gigabitEthernet 1/0-3

ASL1(config-if-range)#switchport trunk encapsulation dot1q

ASL1(config-if-range)#switchport mode trunk

ASL1(config-if-range)#switchport nonegotiate

ASL1(config-if-range)#switchport trunk native vlan 666

ASL1(config-if-range)#switchport trunk allowed vlan except 1,999

ASL1(config-if-range)#no shut

ASL1(config-if-range)#

* After activating the interfaces, use the **show interface trunk** command to see the status of the trunks.

ASL1#show int trunk

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Port Mode Encapsulation Status Native vlan

Gi0/0 on 802.1q trunking 666

Gi0/1 on 802.1q trunking 666

Gi0/2 on 802.1q trunking 666

Gi0/3 on 802.1q trunking 666

Gi1/0 on 802.1q trunking 666

Gi1/1 on 802.1q trunking 666

Gi1/2 on 802.1q trunking 666

Gi1/3 on 802.1q trunking 666

​

Port Vlans allowed on trunk

Gi0/0 2-998,1000-4094

Gi0/1 2-998,1000-4094

Gi0/2 2-998,1000-4094

Gi0/3 2-998,1000-4094

Gi1/0 2-998,1000-4094

Gi1/1 2-998,1000-4094

Gi1/2 2-998,1000-4094

Gi1/3 2-998,1000-4094

​

Port Vlans allowed and active in management domain

Gi0/0 100,200,300

​

Port Vlans allowed and active in management domain

Gi0/1 100,200,300

Gi0/2 100,200,300

Gi0/3 100,200,300

Gi1/0 100,200,300

Gi1/1 100,200,300

Gi1/2 100,200,300

Gi1/3 100,200,300

​

Port Vlans in spanning tree forwarding state and not pruned

Gi0/0 100,200,300

Gi0/1 100,200,300

Gi0/2 100,200,300

Gi0/3 100,200,300

Gi1/0 100,200,300

Gi1/1 none

Gi1/2 100,200,300

Gi1/3 100,200,300

ASL1#

* Now if you look at the VTP status on ALS1, you will see the values are at their defaults, even though the trunk is operational. This is because of the **VTP password**.

ASL1#show vtp status

VTP Version capable : 1 to 3

VTP version running : 2

VTP Domain Name : CISCO-vIOS

VTP Pruning Mode : Disabled

VTP Traps Generation : Disabled

Device ID : 0000.abb0.f600

Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

​

Feature VLAN:

--------------

VTP Operating Mode : Client

Maximum VLANs supported locally : 1005

Number of existing VLANs : 8

Configuration Revision : 0

MD5 digest : 0x3F 0x04 0x75 0xE5 0x2B 0x03 0x29 0xBF

0x38 0x03 0x50 0xCF 0xC1 0x9B 0x79 0xAD

* Set the VTP password on ALS1 and the VLAN database will be synchronized. However before you can set the password, the **VTP domain** name must be manually configured.

ASL1(config)#vtp domain SWLAB

ASL1(config)#vtp password cisco123

Setting device VTP password to cisco123

ASL1(config)#end

ASL1#

* Now check the **VTP status** and you will see a **revision number** matching that of DLS1, and that VLANs **99**, **100**, **110**, **120**, **666** and **999** are all in the local VLAN database.

ASL1#show vtp status

VTP Version capable : 1 to 3

VTP version running : 2

VTP Domain Name : SWLAB

VTP Pruning Mode : Disabled

VTP Traps Generation : Disabled

Device ID : 0000.abb0.f600

Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

​

Feature VLAN:

--------------

VTP Operating Mode : Client

Maximum VLANs supported locally : 1005

Number of existing VLANs : 8

Configuration Revision : 0

MD5 digest : 0xC2 0x38 0x27 0x7E 0x79 0x68 0x93 0x8B

0x8B 0xDE 0xC6 0x98 0xC6 0x36 0x66 0x3D

**Step 6: Park unused interfaces**

* On **DLS1** and **ALS1**, place **all of interfaces that will not be used** into the PARKING\_LOT VLAN and shut them down.

ASL1(config)#interface range gigabitEthernet 1/0-3

ASL1(config-if-range)#switchport mode access

ASL1(config-if-range)#switchport access vlan 999

ASL1(config-if-range)#shutdown

ASL1(config-if-range)#end