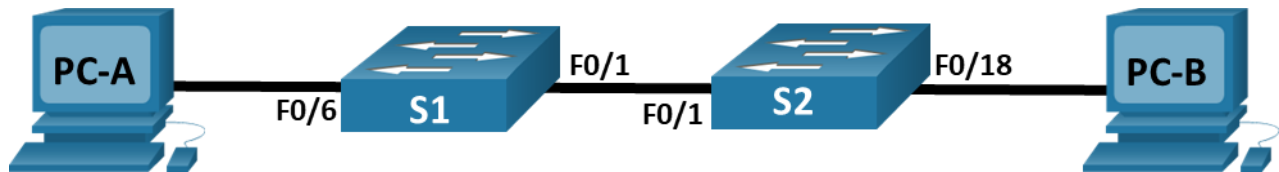


## Lab - Configure VLANs and Trunking

### Topology



### Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
S1	VLAN 1	192.168.1.11	255.255.255.0	N/A
S2	VLAN 1	192.168.1.12	255.255.255.0	N/A
PC-A	NIC	192.168.10.3	255.255.255.0	192.168.10.1
PC-B	NIC	192.168.10.4	255.255.255.0	192.168.10.1

### Objectives

**Part 1: Build the Network and Configure Basic Device Settings**

**Part 2: Create VLANs and Assign Switch Ports**

**Part 3: Maintain VLAN Port Assignments and the VLAN Database**

**Part 4: Configure an 802.1Q Trunk between the Switches**

**Part 5: Delete the VLAN Database**

### Background / Scenario

Modern switches use virtual local-area networks (VLANs) to improve network performance by separating large Layer 2 broadcast domains into smaller ones. VLANs can also be used as a security measure by controlling which hosts can communicate. In general, VLANs make it easier to design a network to support the goals of an organization.

VLAN trunks are used to span VLANs across multiple devices. Trunks allow the traffic from multiple VLANs to travel over a single link, while keeping the VLAN identification and segmentation intact.

In this lab, you will create VLANs on both switches in the topology, assign VLANs to switch access ports, verify that VLANs are working as expected, and then create a VLAN trunk between the two switches to allow hosts in the same VLAN to communicate through the trunk, regardless of which switch the host is actually attached to.

**Note:** The switches used with CCNA hands-on labs are Cisco Catalyst 2960s with Cisco IOS Release 15.2(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of the lab for the correct interface identifiers.

**Note:** Ensure that the routers and switches have been erased and have no startup configurations. If you are unsure contact your instructor.

### Required Resources

- 2 Switches (Cisco 2960 with Cisco IOS Release 15.2(2) lanbasek9 image or comparable)
- 2 PCs (Windows with a terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

### Instructions

#### Part 1: Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings on the PC hosts and switches.

##### Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

##### Step 2: Configure basic settings for each switch.

- a. Console into the switch and enable privileged EXEC mode.

```
switch> enable
```

- b. Enter configuration mode.

```
switch# config terminal
```

- c. Assign a device name to the switch.

```
switch(config)# hostname S1
```

```
switch(config)# hostname S2
```

- d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

```
S1(config)# no ip domain-lookup
```

```
S2(config)# no ip domain-lookup
```

- e. Assign **class** as the privileged EXEC encrypted password.

```
S1(config)# enable secret class
```

```
S2(config)# enable secret class
```

- f. Assign **cisco** as the console password and enable login.

```
S1(config)# line console 0
```

```
S1(config-line)# password cisco
```

```
S1(config-line)# login
```

```
S2(config)# line console 0
```

```
S2(config-line)# password cisco
```

```
S2(config-line)# login
```

- g. Assign **cisco** as the vty password and enable login.

```
S1(config)# line vty 0 4
```

```
S1(config-line)# password cisco
S1(config-line)# login
```

```
S2(config)# line vty 0 4
S2(config-line)# password cisco
S2(config-line)# login
```

- h. Encrypt the plaintext passwords.

```
S1(config)# service password-encryption
```

```
S2(config)# service password-encryption
```

- i. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

```
S1(config)# banner motd $ Authorized Users Only! $
```

```
S2(config)# banner motd $ Authorized Users Only! $
```

- j. Configure the IP address listed in the Addressing Table for VLAN 1 on the switch.

```
S1(config)# interface vlan 1
S1(config-if)# ip address 192.168.1.11 255.255.255.0
S1(config-if)# no shutdown
S1(config-if)# exit
```

```
S2(config)# interface vlan 1
S2(config-if)# ip address 192.168.1.12 255.255.255.0
S2(config-if)# no shutdown
S2(config-if)# exit
```

- k. Shut down all interfaces that will not be used.

```
S1(config)# interface range f0/2-5, f0/7-24, g0/1-2
S1(config-if-range)# shutdown
```

```
S2(config)# interface range f0/2-17, f0/18-24, g0/1-2
S2(config-if-range)# shutdown
```

- l. Set the clock on the switch.

```
S1# clock set 15:30:00 19 September 2019
```

```
S2# clock set 15:30:00 19 September 2019
```

- m. Save the running configuration to the startup configuration file.

```
S1# copy running-config startup-config
```

```
S2# copy running-config startup-config
```

### Step 3: Configure PC hosts.

Refer to the Addressing Table for PC host address information.

### Step 4: Test connectivity.

Verify that the PC hosts can ping one another.

**Note:** It may be necessary to disable the PCs firewall to ping between PCs.

Can PC-A ping PC-B?

**Yes**

Can PC-A ping S1?

**No**

Can PC-B ping S2?

**No**

Can S1 ping S2?

**Yes**

If you answered no to any of the above questions, why were the pings unsuccessful?

**Pings were unsuccessful when trying to ping a device on a different subnet. For those pings to be successful, a default gateway must exist to route traffic from one subnet to another.**

## Part 2: Create VLANs and Assign Switch Ports

In Part 2, you will create Management, Operations, Parking\_Lot, and Native VLANs on both switches. You will then assign the VLANs to the appropriate interface. The **show vlan** command is used to verify your configuration settings.

### Step 1: Create VLANs on the switches.

- a. Create the VLANs on S1.

```
S1(config)# vlan 10
S1(config-vlan)# name Operations
S1(config-vlan)# vlan 20
S1(config-vlan)# name Parking_Lot
S1(config-vlan)# vlan 99
S1(config-vlan)# name Management
S1(config-vlan)# vlan 1000
S1(config-vlan)# name Native
S1(config-vlan)# end
```

- b. Create the same VLANs on S2.

- c. Issue the **show vlan brief** command to view the list of VLANs on S1.

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gi0/1, Gi0/2
10	Operations	active	
20	Parking_Lot	active	
99	Management	active	
1000	Native	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

What is the default VLAN?

### VLAN 1

What ports are assigned to the default VLAN?

**All switch ports are assigned to VLAN 1 by default.**

## Step 2: Assign VLANs to the correct switch interfaces.

a. Assign VLANs to the interfaces on S1.

1) Assign PC-A to the Operation VLAN.

```
S1(config)# interface f0/6
S1(config-if)# switchport mode access
S1(config-if)# switchport access vlan 10
```

2) Move the switch IP address VLAN 99.

```
S1(config)# interface vlan 1
S1(config-if)# no ip address
S1(config-if)# interface vlan 99
S1(config-if)# ip address 192.168.1.11 255.255.255.0
S1(config-if)# end
```

b. Issue the **show vlan brief** command and verify that the VLANs are assigned to the correct interfaces.

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9

Fa0/10, Fa0/11, Fa0/12, Fa0/13  
 Fa0/14, Fa0/15, Fa0/16, Fa0/17  
 Fa0/18, Fa0/19, Fa0/20, Fa0/21  
 Fa0/22, Fa0/23, Fa0/24, Gi0/1  
 Gi0/2

10	Operations	active	Fa0/6
20	Faculty	active	
99	Management	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

- c. Issue the **show ip interface brief** command.

S1# **show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	unset	up	up
Vlan99	192.168.1.11	YES	manual	up	down
FastEthernet0/1	unassigned	YES	unset	up	up
FastEthernet0/2	unassigned	YES	unset	administratively down	down
FastEthernet0/3	unassigned	YES	unset	administratively down	down
FastEthernet0/4	unassigned	YES	unset	administratively down	down
FastEthernet0/5	unassigned	YES	unset	administratively down	down
FastEthernet0/6	unassigned	YES	unset	up	up
FastEthernet0/7	unassigned	YES	unset	administratively down	down

<output omitted>

What is the status of VLAN 99? Explain.

**The status of VLAN 99 is up/down, up because the VLAN exists in the database but down because the VLAN has not been assigned to an active port yet.**

- d. Assign PC-B to the Operations VLAN on S2.

```
S2(config)# interface f0/18
S2(config-if)# switchport mode access
S2(config-if)# switchport access vlan 10
```

- e. Remove the IP address for VLAN 1 on S2.

```
S2(config)# interface vlan 1
S2(config-if)# no ip address
```

- f. Configure an IP address for VLAN 99 on S2 according to the Addressing Table.

```
S2(config-if)# interface vlan 99
S2(config-if)# ip address 192.168.1.12 255.255.255.0
```

- g. Use the **show vlan brief** command to verify that the VLANs are assigned to the correct interfaces.

S2# **show vlan brief**

VLAN Name	Status	Ports
-----------	--------	-------

```

-----
1    default                                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                           Fa0/17, Fa0/19, Fa0/20, Fa0/21
                                           Fa0/22, Fa0/23, Fa0/24, Gi0/1
                                           Gi0/2
10   Operations                            active    Fa0/18
20   Parking_Lot                          active
99   Management                           active
1000 Native                               active
1002 fddi-default                          act/unsup
1003 token-ring-default                    act/unsup
1004 fddinet-default                       act/unsup
1005 trnet-default                         act/unsup

```

Is S1 able to ping S2? Explain.

**No. The IP addresses for the switches now reside in VLAN 99. VLAN 99 traffic will not be sent over interface F0/1.**

Is PC-A able to ping PC-B? Explain.

**No. Interface F0/1 is not assigned to VLAN 10, so VLAN 10 traffic will not be sent over it.**

### Part 3: Maintain VLAN Port Assignments and the VLAN Database

In Part 3, you will change VLAN assignments to ports and remove VLANs from the VLAN database.

#### Step 1: Assign a VLAN to multiple interfaces.

- a. On S1, assign interfaces F0/11 – 24 to VLAN99.

```

S1(config)# interface range f0/11-24
S1(config-if-range)# switchport mode access
S1(config-if-range)# switchport access vlan 99
S1(config-if-range)# end

```

- b. Issue the **show vlan brief** command to verify VLAN assignments.

```
S1# show vlan brief
```

```

VLAN Name                                Status   Ports
-----
1    default                                active   Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/7, Fa0/8, Fa0/9
                                           Fa0/10, Gi0/1, Gi0/2
10   Operations                            active   Fa0/6
20   Parking_Lot                          active
99   Management                           active   Fa0/11, Fa0/12, Fa0/13, Fa0/14

```

Fa0/15, Fa0/16, Fa0/17, Fa0/18  
Fa0/19, Fa0/20, Fa0/21, Fa0/22  
Fa0/23, Fa0/24

```
1000 Native          active
1002 fddi-default    act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default   act/unsup
```

- c. Reassign F0/11 and F0/21 to VLAN 10.

```
S1(config)# interface range f0/11, f0/21
S1(config-if-range)# switchport access vlan 10
S1(config-if-range)# end
```

- d. Verify that VLAN assignments are correct.

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Gi0/1, Gi0/2
10	Operations	active	Fa0/6, Fa0/11, Fa0/21
20	Parking_Lot	active	
99	Management	active	Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/22, Fa0/23, Fa0/24
1000	Native	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

### Step 2: Remove a VLAN assignment from an interface.

- a. Use the **no switchport access vlan** command to remove the VLAN 99 assignment to F0/24.

```
S1(config)# interface f0/24
S1(config-if)# no switchport access vlan
S1(config-if)# end
```

- b. Verify that the VLAN change was made.

Which VLAN is F0/24 now associated with?

#### VLAN 1, the default VLAN.

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4



```

Fa0/5, Fa0/7, Fa0/8, Fa0/9
Fa0/10, Fa0/24, Gi0/1, Gi0/2
10   Operations          active   Fa0/6, Fa0/11, Fa0/21
20   Parking_Lot         active
99   Management          active   Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                           Fa0/20, Fa0/22, Fa0/23

1000 Native              active
1002 fddi-default         act/unsup
1003 token-ring-default   act/unsup
1004 fddinet-default       act/unsup
1005 trnet-default        act/unsup

```

### Step 3: Remove a VLAN ID from the VLAN database.

- Add VLAN 30 to interface F0/24 without issuing the global VLAN command.

```

S1(config)# interface f0/24
S1(config-if)# switchport access vlan 30
% Access VLAN does not exist. Creating vlan 30

```

**Note:** Current switch technology no longer requires that the **vlan** command be issued to add a VLAN to the database. By assigning an unknown VLAN to a port, the VLAN will be created and added to the VLAN database.

- Verify that the new VLAN is displayed in the VLAN table.

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Gi0/1, Gi0/2
10	Operations	active	Fa0/6, Fa0/11, Fa0/21
20	Parking_Lot	active	
30	VLAN0030	active	Fa0/24
99	Management	active	Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/22, Fa0/23
1000	Native	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

What is the default name of VLAN 30?

**VLAN0030**

- Use the **no vlan 30** command to remove VLAN 30 from the VLAN database.

```

S1(config)# no vlan 30
S1(config)# end

```

- d. Issue the **show vlan brief** command. F0/24 was assigned to VLAN 30.

After deleting VLAN 30 from the VLAN database, what VLAN is port F0/24 assigned to? What happens to the traffic destined to the host attached to F0/24?

**When you delete a VLAN, any ports assigned to that VLAN become inactive. So Port F0/24 is still associated to VLAN 30. However, VLAN 30 is now inactive because it does not exist in the VLAN database. Additionally, the port will not transfer any traffic.**

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Gi0/1, Gi0/2
10	Operations	active	Fa0/6, Fa0/11, Fa0/21
20	Parking_Lot	active	
99	Management	active	Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/22, Fa0/23
1000	Native	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

- e. Issue the **no switchport access vlan** command on interface F0/24.

```
S1(config)# interface f0/24
S1(config-if)# no switchport access vlan
S1(config-if)# end
```

- f. Issue the **show vlan brief** command to determine the VLAN assignment for F0/24.

To which VLAN is F0/24 assigned?

### The default VLAN, VLAN 1

```
S1# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/24, Gi0/1, Gi0/2
10	Operations	active	Fa0/6, Fa0/11, Fa0/21
20	Parking_Lot	active	
99	Management	active	Fa0/12, Fa0/13, Fa0/14, Fa0/15 Fa0/16, Fa0/17, Fa0/18, Fa0/19 Fa0/20, Fa0/22, Fa0/23
1000	Native	active	

```
1002 fddi-default          act/unsup
1003 token-ring-default    act/unsup
1004 fddinet-default       act/unsup
1005 trnet-default         act/unsup
```

**Note:** Before removing a VLAN from the database, it is recommended that you reassign all the ports assigned to that VLAN.

Why should you reassign a port to another VLAN before removing the VLAN from the VLAN database?

**The interfaces assigned to a VLAN that is removed from the VLAN database become inactive and are unavailable for use until they are reassigned to another VLAN. This can be a tricky thing to troubleshoot as trunked interfaces do not show up in the port list as well (Part 4 contains more information about trunked interfaces).**

### Part 4: Configure an 802.1Q Trunk Between the Switches

In Part 4, you will configure interface F0/1 to use the Dynamic Trunking Protocol (DTP) to allow it to negotiate the trunk mode. After this has been accomplished and verified, you will disable DTP on interface F0/1 and manually configure it as a trunk.

#### Step 1: Use DTP to initiate trunking on F0/1.

The default DTP mode of a 2960 switch port is dynamic auto. This allows the interface to convert the link to a trunk if the neighboring interface is set to trunk or dynamic desirable mode.

- a. Set F0/1 on S1 to negotiate trunk mode.

```
S1(config)# interface f0/1
S1(config-if)# switchport mode dynamic desirable
Sep 19 02:51:47.257: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
Sep 19 02:51:47.291: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up
```

You should also receive link status messages on S2.

```
S2#
Sep 19 02:42:19.424: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
Sep 19 02:42:21.454: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up
Sep 19 02:42:22.419: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
```

- b. Issue the **show vlan brief** command on S1 and S2. Interface F0/1 is no longer assigned to VLAN 1. Trunked interfaces are not listed in the VLAN table.

```
S1# show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/24, Gi0/1, Gi0/2

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```
10   Operations                active   Fa0/6, Fa0/11, Fa0/21
20   Parking_Lot              active
99   Management               active   Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                           Fa0/20, Fa0/22, Fa0/23

1000 Native                   active
1002 fddi-default             act/unsup
1003 token-ring-default       act/unsup
1004 fddinet-default          act/unsup
1005 trnet-default            act/unsup
```

- c. Issue the **show interfaces trunk** command to view trunked interfaces. Notice that the mode on S1 is set to desirable, and the mode on S2 is set to auto.

```
S1# show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	desirable	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-4094

Port	Vlans allowed and active in management domain
Fa0/1	1,10,20,99,1000

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10,20,99,1000

```
S2# show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	auto	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-4094

Port	Vlans allowed and active in management domain
Fa0/1	1,10,20,99,1000

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10,20,99,1000

**Note:** By default, all VLANs are allowed on a trunk. The **switchport trunk** command allows you to control what VLANs have access to the trunk. For this lab, keep the default settings which allows all VLANs to traverse F0/1.

- d. Verify that VLAN traffic is traveling over trunk interface F0/1.

Can S1 ping S2?

**Yes**

Can PC-A ping PC-B?

**Yes**

Can PC-A ping S1?

**No**

Can PC-B ping S2?

**No**

If you answered no to any of the above questions, explain below.

**The switches are in VLAN 99 and the PCs are in VLAN 10; therefore, the pings between VLANs were unsuccessful.**

### Step 2: Manually configure trunk interface F0/1.

The **switchport mode trunk** command is used to manually configure a port as a trunk. This command should be issued on both ends of the link.

- Change the switchport mode on interface F0/1 to force trunking. Make sure to do this on both switches.

```
S1(config)# interface f0/1
S1(config-if)# switchport mode trunk
```

```
S2(config)# interface f0/1
S2(config-if)# switchport mode trunk
```

- Issue the **show interfaces trunk** command to view the trunk mode. Notice that the mode changed from **desirable** to **on**.

```
S2# show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-4094

Port	Vlans allowed and active in management domain
Fa0/1	1,10,20,99,1000

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10,20,99,1000

- Modify the trunk configuration on both switches by changing the native VLAN from VLAN 1 to VLAN 1000.

```
S1(config)# interface f0/1
S1(config-if)# switchport trunk native vlan 1000
```

```
S2(config)# interface f0/1
S2(config-if)# switchport trunk native vlan 1000
```

- d. Issue the show interfaces trunk command to view the trunk. Notice the Native VLAN information is updated.

```
S2# show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1000

Port	Vlans allowed on trunk
Fa0/1	1-4094

Port	Vlans allowed and active in management domain
Fa0/1	1,10,20,99,1000

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10,20,99,1000

Why might you want to manually configure an interface to trunk mode instead of using DTP?

**Not all equipment uses DTP. Using the switchport mode trunk command ensures that the port will become a trunk no matter what type of equipment is connected to the other end of the link.**

Why might you want to change the native VLAN on a trunk?

**Using VLAN 1, the default VLAN, as the native VLAN is a security risk. All the different control protocols that are exchanged between switches are exchanged via the native VLAN 1 untagged, and that information could be exposed if default settings are used on ports that users connect to.**

## Part 5: Delete the VLAN Database

In Part 5, you will delete the VLAN Database from the switch. It is necessary to do this when initializing a switch back to its default settings.

### Step 1: Determine if the VLAN database exists.

Issue the **show flash** command to determine if a **vlan.dat** file exists in flash.

```
S1# show flash:
```

```
Directory of flash:/
```

2	-rwx	59416	Mar 1 1993 01:20:12 +00:00	multiple-fs
3	-rwx	15186645	Mar 1 1993 00:19:23 +00:00	c2960-lanbasek9-mz.152-4.E8.bin
5	-rwx	796	Sep 19 2019 02:48:04 +00:00	vlan.dat

```
61028352 bytes total (33762304 bytes free)
```

**Note:** If there is a **vlan.dat** file located in flash, then the VLAN database does not contain its default settings.

### Step 2: Delete the VLAN database.

- a. Issue the **delete vlan.dat** command to delete the vlan.dat file from flash and reset the VLAN database back to its default settings. You will be prompted twice to confirm that you want to delete the vlan.dat file. Press Enter both times.

```
S1# delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
```

- b. Issue the **show flash** command to verify that the vlan.dat file has been deleted.

```
S1# show flash:
```

```
Directory of flash:/
```

```
 2  -rwx      59416   Mar 1 1993 01:20:12 +00:00  multiple-fs
 3  -rwx     15186645  Mar 1 1993 00:19:23 +00:00  c2960-lanbasek9-mz.152-4.E8.bin
```

```
61028352 bytes total (33763840 bytes free)
```

To initialize a switch back to its default settings, what other commands are needed?

**To get a switch back to its default settings, the erase startup-config and reload commands need to be issued after the delete vlan.dat command.**

### Reflection Questions

1. What is needed to allow hosts on VLAN 10 to communicate to hosts on VLAN 99?

**Answers will vary, but to allow Inter-VLAN routing requires a Layer 3 device is needed to route traffic between VLANs.**

2. What are some primary benefits that an organization can receive through effective use of VLANs?

**Answers will vary, but VLAN benefits include: better security, cost savings (efficient use of bandwidth and uplinks), higher performance (smaller broadcast domains), broadcast storm mitigation, improved IT staff efficiency, simpler project and application management.**

### Device Configs - Final

#### Switch S1

Building configuration...

## Lab - Configure VLANs and Trunking

---

```
Current configuration : 2571 bytes
!
version 15.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname S1
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$GCQG$N33u/asvJfEWsnrIHRWjM1
!
no aaa new-model
system mtu routing 1500
!
no ip domain-lookup
!
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
interface FastEthernet0/1
  switchport trunk native vlan 1000
  switchport mode trunk
!
interface FastEthernet0/2
  shutdown
!
interface FastEthernet0/3
  shutdown
!
interface FastEthernet0/4
  shutdown
!
interface FastEthernet0/5
  shutdown
!
interface FastEthernet0/6
  switchport access vlan 10
  switchport mode access
!
interface FastEthernet0/7
  shutdown
!
interface FastEthernet0/8
  shutdown
```



## Lab - Configure VLANs and Trunking

---

```
!  
interface FastEthernet0/9  
shutdown  
!  
interface FastEthernet0/10  
shutdown  
!  
interface FastEthernet0/11  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/12  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/13  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/14  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/15  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/16  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/17  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/18  
switchport access vlan 99  
switchport mode access  
shutdown  
!  
interface FastEthernet0/19  
switchport access vlan 99  
switchport mode access
```

## Lab - Configure VLANs and Trunking

---

```
shutdown
!
interface FastEthernet0/20
switchport access vlan 99
switchport mode access
shutdown
!
interface FastEthernet0/21
switchport access vlan 99
switchport mode access
shutdown
!
interface FastEthernet0/22
switchport access vlan 99
switchport mode access
shutdown
!
interface FastEthernet0/23
switchport access vlan 99
switchport mode access
shutdown
!
interface FastEthernet0/24
switchport mode access
shutdown
!
interface GigabitEthernet0/1
shutdown
!
interface GigabitEthernet0/2
shutdown
!
interface Vlan1
no ip address
!
interface Vlan99
ip address 192.168.1.11 255.255.255.0
!
ip http server
ip http secure-server
!
banner motd ^C Authorized Users Only! ^C
!
line con 0
password cisco
logging synchronous
login
line vty 0 4
password cisco
login
```

```
line vty 5 15
password cisco
login
!
end
```

### Switch S2

Building configuration...

```
Current configuration : 1875 bytes
!
version 15.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname S2
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$jTd.$1rhSHu68akU70GYyc4Dy1
!
no aaa new-model
system mtu routing 1500
!
no ip domain-lookup
!
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
interface FastEthernet0/1
switchport trunk native vlan 1000
switchport mode trunk
!
interface FastEthernet0/2
shutdown
!
interface FastEthernet0/3
shutdown
!
interface FastEthernet0/4
shutdown
!
interface FastEthernet0/5
shutdown
```

```
!  
interface FastEthernet0/6  
shutdown  
!  
interface FastEthernet0/7  
shutdown  
!  
interface FastEthernet0/8  
shutdown  
!  
interface FastEthernet0/9  
shutdown  
!  
interface FastEthernet0/10  
shutdown  
!  
interface FastEthernet0/11  
shutdown  
!  
interface FastEthernet0/12  
shutdown  
!  
interface FastEthernet0/13  
shutdown  
!  
interface FastEthernet0/14  
shutdown  
!  
interface FastEthernet0/15  
shutdown  
!  
interface FastEthernet0/16  
shutdown  
!  
interface FastEthernet0/17  
shutdown  
!  
interface FastEthernet0/18  
switchport access vlan 10  
switchport mode access  
!  
interface FastEthernet0/19  
shutdown  
!  
interface FastEthernet0/20  
shutdown  
!  
interface FastEthernet0/21  
shutdown  
!
```

## Lab - Configure VLANs and Trunking

---

```
interface FastEthernet0/22
shutdown
!
interface FastEthernet0/23
shutdown
!
interface FastEthernet0/24
shutdown
!
interface GigabitEthernet0/1
shutdown
!
Interface GigabitEthernet0/2
shutdown
!
interface Vlan1
no ip address
!
interface Vlan99
ip address 192.168.1.12 255.255.255.0
!
ip http server
ip http secure-server
!
banner motd ^C Authorized Users Only! ^C
!
line con 0
password cisco
logging synchronous
login
line vty 0 4
password cisco
login
line vty 5 15
password cisco
login
!
end
```