



SWITCH

Lab Guide

300-115

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SWITCH

300-115 Lab Guide



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To perform the labs referenced in this book, please download and install the necessary files (refer to your purchase receipt for the download link), navigate to the appropriate lab in the lab menu in the Boson NetSim, and load the lab; all labs should work in NetSim 11 or later. To learn more about the Boson NetSim or to purchase and download the software, please visit www.boson.com/netsim.

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Lab Solutions 490

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Module 2

Lab 2.1 – IOS Switching Initial Configuration

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Lab 2.1 – IOS Switching Initial Configuration

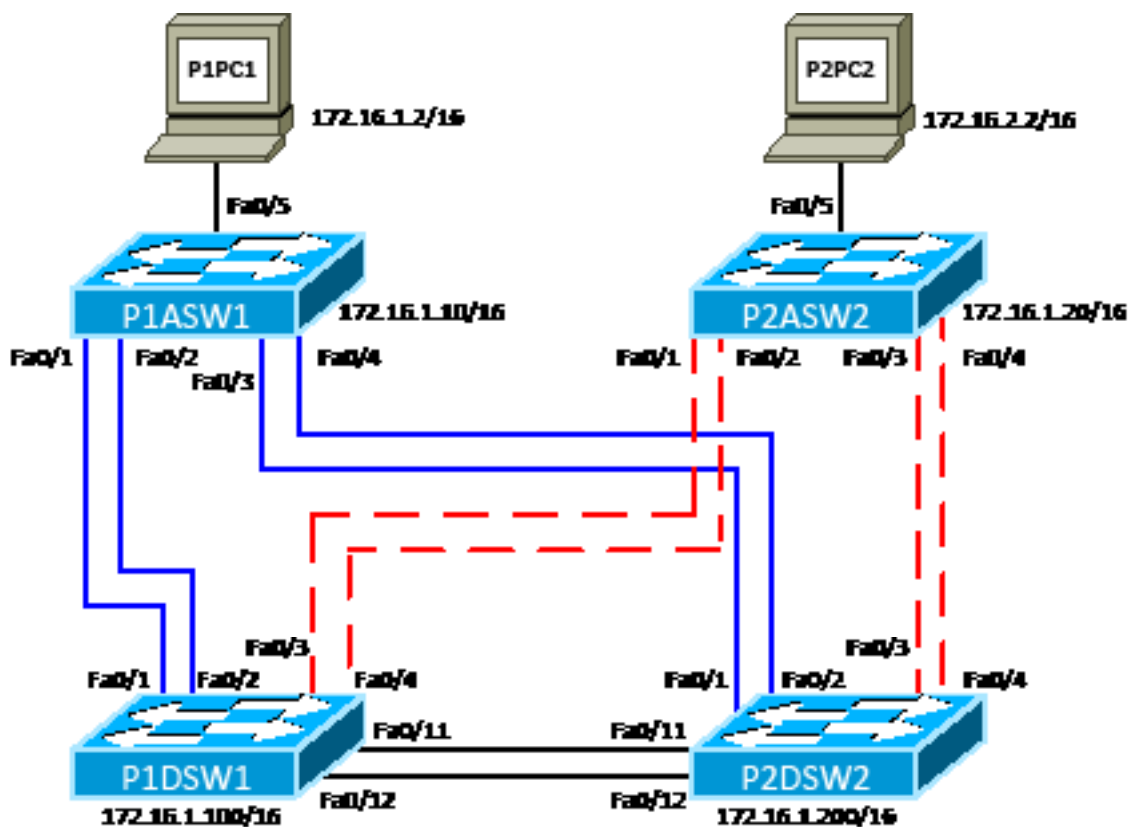
To perform this lab in Boson NetSim, please download the necessary files (refer to your purchase receipt for the download link), navigate to the appropriate lab in the lab menu in NetSim, and load the lab. You can then accomplish the tasks below.

Objective

Become familiar with the lab access menu, learn the lab topology, and complete the initial configuration of the devices on the network.

Lab Topology

For this lab, your network design will include two PC workstations, P1PC1 and P2PC2, and four switches, P1ASW1, P1DSW1, P2ASW2, and P2DSW2. P1ASW1 and P2ASW2 are Access layer switches. P1DSW1 and P2DSW2 are Distribution layer switches. The Access and Distribution layers are two of the three layers in the Cisco three-layer hierarchical network model, which also includes the Core layer. The topology diagram below represents the NetMap in the Simulator.



The commands you will need to perform the tasks in this lab, along with their syntax and descriptions, are shown in the Command Summary table below:

Command Summary

Command	Description
configure terminal	enters global configuration mode from privileged EXEC mode
copy running-config startup-config	saves the configuration file
description <i>description-text</i>	assigns a description to an interface, a class map, or a policy map
duplex {full half auto}	sets the interface duplex configuration to full, half, or auto
enable	enters privileged EXEC mode
end	ends and exits configuration mode
exit	exits one level in the menu structure
hostname <i>host-name</i>	sets the device name
interface range fastethernet <i>slot/starting-port - ending-port</i>	configures a range of interfaces
interface <i>type number</i>	changes from global configuration mode to interface configuration mode
ip address <i>ip-address subnet-mask</i>	assigns an IP address to an interface
ipconfig /all	is used in NetSim to display the IP addresses and Media Access Control (MAC) address on a workstation
ipconfig /ip <i>ip-address subnet-mask</i>	is used in NetSim to assign an IP address and subnet mask to a workstation interface
line [aux console vty] <i>beginning-line-number</i> [<i>ending-line-number</i>]	specifies the line to be configured
login	enables password checking
password <i>password</i>	specifies the password that is required for a user to log in
show interfaces [<i>type number</i>] switchport	shows the switchport configuration
show interfaces status	displays the line status of all interfaces
show ip interface brief	displays a brief summary of interface status and configuration
show running-config	displays the active configuration file
shutdown ; no shutdown	disables an interface; enables an interface
speed {10 100 1000 auto nonegotiate}	sets the interface speed
switchport mode {access dynamic {auto desirable} trunk}	configures the virtual LAN (VLAN) membership mode of a port

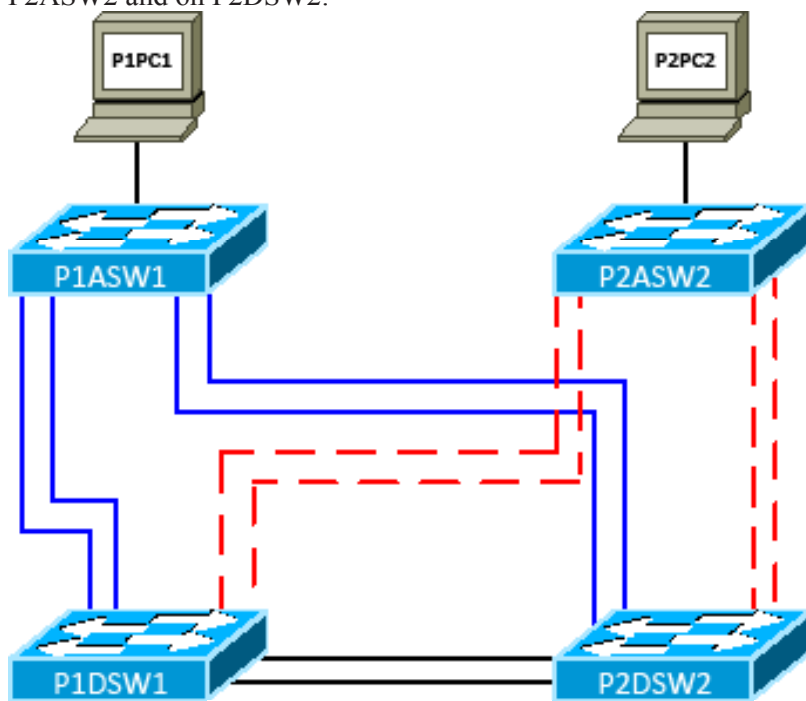
Lab Tasks

A network associate with your company began configuring the network but was unable to complete the configurations needed. A password of **cisco** has been set on P2ASW2 and on P2DSW2.

Task 1: Examine the Network Topology, and Note Existing Configuration Errors

Compare the topology diagram shown above with the actual configuration of the devices on the network. On the following diagram, note any discrepancies you find. The topology diagram is correct. In Task 2, you will correct any errors you find in the current configuration.

Use the necessary commands to verify the port assignments for the devices in the topology. Enter any configuration errors that you discover in the following diagram. A password of **cisco** has been set on P2ASW2 and on P2DSW2.

**Task 2: Fix Existing Errors, and Complete the Network Configuration**

In this task, you will apply a basic configuration to the lab devices and correct the configuration errors you found in Task 1.

1. On P1ASW1, assign a host name of **P1ASW1**. On P1DSW1, assign a host name of **P1DSW1**.
2. Correct any incorrect device configurations you discovered in Task 1.
3. On P1ASW1 and P1DSW1, configure the console port to process logins. Configure a console password of **cisco**.
4. Configure the virtual terminal (vty) ports on P1ASW1 and P1DSW1 to process logins. Configure a vty password of **cisco**.
5. On P1ASW1, enable the interface that connects the switch to the workstation. Configure the interface with a speed setting of **10** and a duplex setting of **half**, and configure the following description on the interface:

description student P1PC1 on P1ASW1

6. On P1ASW1, enable the interfaces that connect the Access layer switch to the Distribution layer switches, configure the interfaces with a speed setting of **100** and a duplex setting of **full**, and configure an appropriate description on each interface. For instance, set the following description on the Fa0/1 and Fa0/2 interfaces:

description P1ASW1 to P1DSW1

7. On P1DSW1, enable the interfaces that connect the Distribution layer switch to the Access layer switches, configure the interfaces with a speed setting of **100** and a duplex setting of **full**, and configure the appropriate description on each interface. For instance, set the following description on the appropriate interfaces on P1DSW1:

description P1DSW1 to P1ASW1

8. On P2DSW2, enable the interfaces that connect the Distribution layer switch to the Access layer switches, configure the interfaces with a speed setting of **100** and a duplex setting of **full**, and configure the appropriate description on each interface. For instance, set the following description on the appropriate interfaces on P2DSW2:

description P2DSW2 to P1ASW1

9. On P1DSW1, enable the interfaces that connect to P2DSW2. Configure the interfaces with a speed setting of **100** and a duplex setting of **full**, and configure the following description on each interface:

description P1DSW1 to P2DSW2

10. On P2DSW2, enable the interfaces that connect to P1DSW1. Configure the interfaces with a speed setting of **100** and a duplex setting of **full**, and configure the following description on each interface:

description P2DSW2 to P1DSW1

11. On the Access layer switches, configure the FastEthernet 0/1 through 0/5 interfaces to be access ports.
12. On the Access layer switches, verify that the interface configurations are correct.
13. On the Distribution layer switches, configure the FastEthernet 0/1 through 0/4 interfaces and 0/11 through 0/12 interfaces to be access ports.
14. On the Distribution layer switches, verify that the interface configurations are correct
15. On the Access layer switches, verify that the switchport configurations are correct.
16. On every device, save the configurations to non-volatile random access memory (NVRAM).

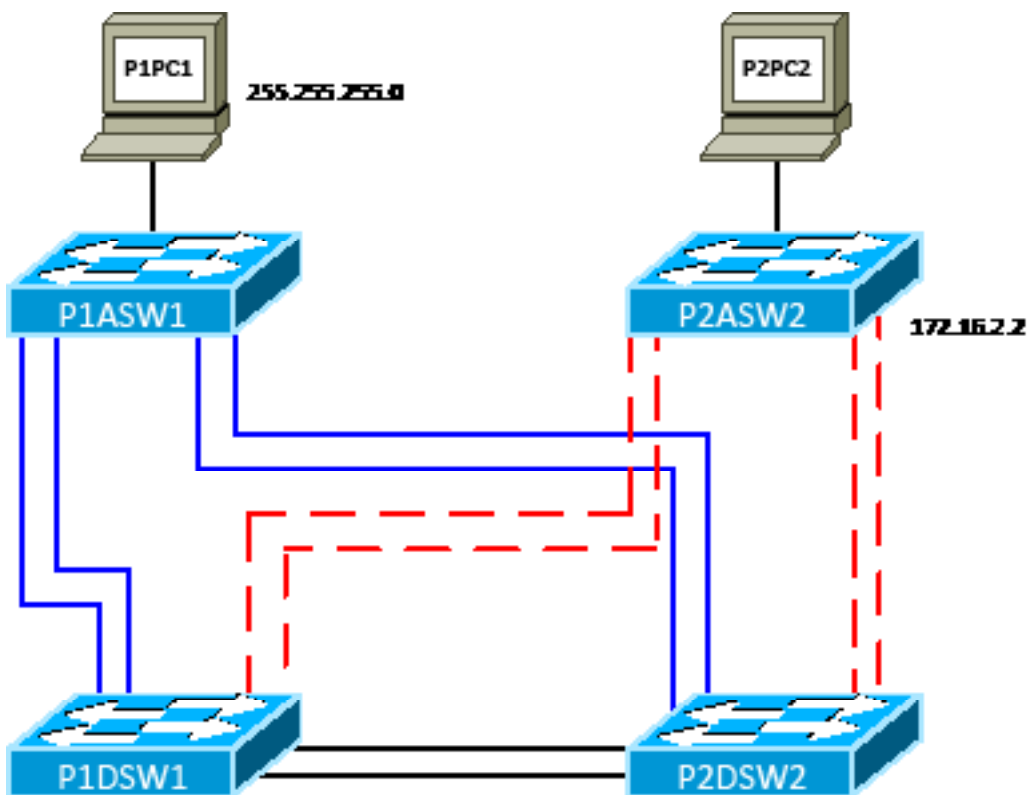
Lab Solutions

Task 1: Examine the Network Topology, and Note Existing Configuration Errors

A password of **cisco** has been set on P2ASW2 and on P2DSW2.

1. Output from the **ipconfig /all** command should enable you to determine that the 255.255.255.0 subnet mask assigned to P1PC1 is incorrect. Output from the **show ip interface brief** command or the **show running-config** command on the switches should enable you to determine that the 172.16.2.2 IP address assigned to VLAN 1 on P2ASW2 is incorrect.

The diagram below displays the incorrectly configured interfaces:



Task 2: Fix Existing Errors, and Complete the Network Configuration

1. You should issue the following commands to configure the appropriate host names on P1ASW1 and P1DSW1:

On P1ASW1:

```
Switch(config)#hostname P1ASW1
P1ASW1(config)#
```

On P1DSW1:

```
Switch(config)#hostname P1DSW1
P1DSW1(config)#
```

2. You should issue the following commands to correct the subnet mask assigned to P1PC1, to correct the IP address assigned to P2ASW2's VLAN 1 interface, and to assign the correct IP addresses to P1ASW1's and P1DSW1's VLAN 1 interfaces:

On P1PC1:

```
C:>ipconfig /ip 172.16.1.2 255.255.0.0
```

On P2ASW2:

```
Password:cisco
```

```
P2ASW2>enable
```

```
P2ASW2#configure terminal
```

```
P2ASW2(config)#interface vlan 1
```

```
P2ASW2(config-if)#ip address 172.16.1.20 255.255.0.0
```

```
P1ASW1(config)#interface vlan 1
```

```
P1ASW1(config-if)#ip address 172.16.1.10 255.255.0.0
```

```
P1DSW1(config)#interface vlan 1
```

```
P1DSW1(config-if)#ip address 172.16.1.100 255.255.0.0
```

3. You should issue the following commands on P1ASW1 and P1DSW1 to configure the console port to process logins and to configure a console password of **cisco**:

```
P1ASW1(config)#line console 0
```

```
P1ASW1(config-line)#login
```

```
P1ASW1(config-line)#password cisco
```

```
P1DSW1(config)#line console 0
```

```
P1DSW1(config-line)#login
```

```
P1DSW1(config-line)#password cisco
```

4. You should issue the following commands on P1ASW1 and P1DSW1 to configure the vty ports to process logins and to configure a vty password of **cisco**:

```
P1ASW1(config)#line vty 0 15
```

```
P1ASW1(config-line)#login
```

```
P1ASW1(config-line)#password cisco
```

```
P1DSW1(config)#line vty 0 4
```

```
P1DSW1(config-line)#login
```

```
P1DSW1(config-line)#password cisco
```

5. You should issue the following commands on P1ASW1 to enable the FastEthernet 0/5 interface, which connects the switch to the workstation, to configure the speed and duplex settings, and to configure the description:

```
P1ASW1(config)#interface fastethernet 0/5
```

```
P1ASW1(config-if)#speed 10
```

```
P1ASW1(config-if)#duplex half
```

```
P1ASW1(config-if)#description student P1PC1 on P1ASW1
```

6. You should issue the following commands on P1ASW1 to enable the interfaces that connect the Access layer switch to the Distribution layer switches, to configure the speed and duplex settings, and to configure the descriptions:

```
P1ASW1(config)#interface fastethernet 0/1
P1ASW1(config-if)#speed 100
P1ASW1(config-if)#duplex full
P1ASW1(config-if)#description P1ASW1 to P1DSW1
P1ASW1(config-if)#interface fastethernet 0/2
P1ASW1(config-if)#speed 100
P1ASW1(config-if)#duplex full
P1ASW1(config-if)#description P1ASW1 to P1DSW1
P1ASW1(config-if)#interface fastethernet 0/3
P1ASW1(config-if)#speed 100
P1ASW1(config-if)#duplex full
P1ASW1(config-if)#description P1ASW1 to P2DSW2
P1ASW1(config-if)#interface fastethernet 0/4
P1ASW1(config-if)#speed 100
P1ASW1(config-if)#duplex full
P1ASW1(config-if)#description P1ASW1 to P2DSW2
```

7. You should issue the following commands on P1DSW1 to enable the interfaces that connect the Distribution layer switch to the Access layer switches, to configure the speed and duplex settings, and to configure the descriptions:

```
P1DSW1(config)#interface fastethernet 0/1
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P1ASW1
P1DSW1(config-if)#interface fastethernet 0/2
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P1ASW1
P1DSW1(config-if)#interface fastethernet 0/3
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P2ASW2
P1DSW1(config-if)#interface fastethernet 0/4
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P2ASW2
```


8. You should issue the following commands on P2DSW2 to enable the interfaces that connect the Distribution layer switch to the Access layer switches, to configure the speed and duplex settings, and to configure the descriptions:

```
Password:cisco
P2DSW2>enable
P2DSW2#configure terminal
P2DSW2(config)#interface fastethernet 0/1
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P1ASW1
P2DSW2(config-if)#interface fastethernet 0/2
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P1ASW1
P2DSW2(config-if)#interface fastethernet 0/3
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P2ASW2
P2DSW2(config-if)#interface fastethernet 0/4
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P2ASW2
```

9. You should issue the following commands on P1DSW1 to enable the interfaces that connect to P2DSW2, to configure the speed and duplex settings, and to configure the descriptions:

```
P1DSW1(config)#interface fastethernet 0/11
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P2DSW2
P1DSW1(config-if)#interface fastethernet 0/12
P1DSW1(config-if)#speed 100
P1DSW1(config-if)#duplex full
P1DSW1(config-if)#description P1DSW1 to P2DSW2
```

10. You should issue the following commands on P2DSW2 to enable the interfaces that connect to P1DSW1, to configure the speed and duplex settings, and to configure the descriptions:

```
P2DSW2(config)#interface fastethernet 0/11
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P1DSW1
P2DSW2(config-if)#interface fastethernet 0/12
P2DSW2(config-if)#speed 100
P2DSW2(config-if)#duplex full
P2DSW2(config-if)#description P2DSW2 to P1DSW1
```

11. On the Access layer switches, you should issue the following commands to configure the FastEthernet 0/1 through 0/5 interfaces to be access ports:

```
P1ASW1(config)#interface range fastethernet 0/1 - 5
P1ASW1(config-if-range)#switchport mode access
```

```
P2ASW2(config)#interface range fastethernet 0/1 - 5
P2ASW2(config-if-range)#switchport mode access
```

12. On the Access layer switches, you should issue the following command to verify that the interface configurations are correct:

```
P1ASW1#show interfaces status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
Fa0/1	P1ASW1 to P1DSW1	connected	1	full	100	10/100BaseTX
Fa0/2	P1ASW1 to P1DSW1	connected	1	full	100	10/100BaseTX
Fa0/3	P1ASW1 to P2DSW2	connected	1	full	100	10/100BaseTX
Fa0/4	P1ASW1 to P2DSW2	connected	1	full	100	10/100BaseTX
Fa0/5	student P1PC1 on P	connected	1	half	10	10/100BaseTX
Fa0/6		notconnect	1	auto	auto	10/100BaseTX
Fa0/7		notconnect	1	auto	auto	10/100BaseTX
Fa0/8		notconnect	1	auto	auto	10/100BaseTX
Fa0/9		notconnect	1	auto	auto	10/100BaseTX
Fa0/10		notconnect	1	auto	auto	10/100BaseTX
Fa0/11		notconnect	1	auto	auto	10/100BaseTX
Fa0/12		notconnect	1	auto	auto	10/100BaseTX

```
P2ASW2#show interfaces status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
Fa0/1	P2ASW2 to P1DSW1	connected	1	full	100	10/100BaseTX
Fa0/2	P2ASW2 to P1DSW1	connected	1	full	100	10/100BaseTX
Fa0/3	P2ASW2 to P2DSW2	connected	1	full	100	10/100BaseTX
Fa0/4	P2ASW2 to P2DSW2	connected	1	full	100	10/100BaseTX
Fa0/5	student P2PC2 on P	connected	1	half	10	10/100BaseTX
Fa0/6		notconnect	1	auto	auto	10/100BaseTX
Fa0/7		notconnect	1	auto	auto	10/100BaseTX
Fa0/8		notconnect	1	auto	auto	10/100BaseTX
Fa0/9		notconnect	1	auto	auto	10/100BaseTX
Fa0/10		notconnect	1	auto	auto	10/100BaseTX
Fa0/11		notconnect	1	auto	auto	10/100BaseTX
Fa0/12		notconnect	1	auto	auto	10/100BaseTX

13. On the Distribution layer switches, you should issue the following commands to configure the FastEthernet 0/1 through 0/4 and 0/11 through 0/12 interfaces to be access ports:

```
P1DSW1(config)#interface range fastethernet 0/1 - 4
P1DSW1(config-if-range)#switchport mode access
P1DSW1(config-if-range)#interface range fastethernet 0/11 - 12
P1DSW1(config-if-range)#switchport mode access

P2DSW2(config)#interface range fastethernet 0/1 - 4
P2DSW2(config-if-range)#switchport mode access
P2DSW2(config-if-range)#interface range fastethernet 0/11 - 12
P2DSW2(config-if-range)#switchport mode access
```

14. On the Distribution layer switches, you should issue the following command to verify that the interface configurations are correct:

```
P1DSW1#show interfaces status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
Fa0/1	P1DSW1 to P1ASW1	connected	1	full	100	10/100BaseTX
Fa0/2	P1DSW1 to P1ASW1	connected	1	full	100	10/100BaseTX
Fa0/3	P1DSW1 to P2ASW2	connected	1	full	100	10/100BaseTX
Fa0/4	P1DSW1 to P2ASW2	connected	1	full	100	10/100BaseTX
Fa0/5		notconnect	1	auto	auto	10/100BaseTX
Fa0/6		notconnect	1	auto	auto	10/100BaseTX
Fa0/7		notconnect	1	auto	auto	10/100BaseTX
Fa0/8		notconnect	1	auto	auto	10/100BaseTX
Fa0/9		notconnect	1	auto	auto	10/100BaseTX
Fa0/10		notconnect	1	auto	auto	10/100BaseTX
Fa0/11	P1DSW1 to P2DSW2	connected	1	full	100	10/100BaseTX
Fa0/12	P1DSW1 to P2DSW2	connected	1	full	100	10/100BaseTX
Gi0/1		notconnect	1	auto	auto	10/100BaseTX
Gi0/2		notconnect	1	auto	auto	10/100BaseTX

```
P2DSW2#show interfaces status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
Fa0/1	P2DSW2 to P1ASW1	connected	1	full	100	10/100BaseTX
Fa0/2	P2DSW2 to P1ASW1	connected	1	full	100	10/100BaseTX
Fa0/3	P2DSW2 to P2ASW2	connected	1	full	100	10/100BaseTX
Fa0/4	P2DSW2 to P2ASW2	connected	1	full	100	10/100BaseTX
Fa0/5		notconnect	1	auto	auto	10/100BaseTX
Fa0/6		notconnect	1	auto	auto	10/100BaseTX
Fa0/7		notconnect	1	auto	auto	10/100BaseTX
Fa0/8		notconnect	1	auto	auto	10/100BaseTX
Fa0/9		notconnect	1	auto	auto	10/100BaseTX
Fa0/10		notconnect	1	auto	auto	10/100BaseTX
Fa0/11	P2DSW2 to P1DSW1	connected	1	full	100	10/100BaseTX
Fa0/12	P2DSW2 to P1DSW1	connected	1	full	100	10/100BaseTX
Gi0/1		notconnect	1	auto	auto	10/100BaseTX
Gi0/2		notconnect	1	auto	auto	10/100BaseTX

15. You should issue the following command on P1ASW1 and P2ASW2 to verify that the switchport configurations are correct. Sample output is shown below:

```
P1ASW1#show interfaces fastethernet 0/1 switchport
Name: Fa0/1
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
```

```
Protected: false
```

```
Appliance trust: none
```

```
P2ASW2#show interfaces fastethernet 0/1 switchport
Name: Fa0/1
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
```

```
Protected: false
```

```
Appliance trust: none
```

16. You should issue the following command on all switches to save the configurations to NVRAM.

```
P1ASW1#copy running-config startup-config
```

```
P2ASW2#copy running-config startup-config
```

```
P1DSW1#copy running-config startup-config
```

```
P2DSW2#copy running-config startup-config
```

Sample Configuration Scripts

P1ASW1	P1ASW1 (continued)
<pre> P1ASW1#show running-config Building configuration... Current configuration : 1323 bytes ! Version 15.b service timestamps debug uptime service timestamps log uptime no service password-encryption ! hostname P1ASW1 ! ip subnet-zero ! ip cef no ip domain-lookup spanning-tree mode pvst spanning-tree extend system-id ! interface FastEthernet0/1 description P1ASW1 to P1DSW1 switchport mode access speed 100 duplex full ! interface FastEthernet0/2 description P1ASW1 to P1DSW1 switchport mode access speed 100 duplex full ! interface FastEthernet0/3 description P1ASW1 to P2DSW2 switchport mode access speed 100 duplex full ! interface FastEthernet0/4 description P1ASW1 to P2DSW2 switchport mode access speed 100 duplex full ! </pre>	<pre> interface FastEthernet0/5 description student P1PC1 on P1ASW1 switchport mode access speed 10 duplex half ! interface FastEthernet0/6 ! interface FastEthernet0/7 ! interface FastEthernet0/8 ! interface FastEthernet0/9 ! interface FastEthernet0/10 ! interface FastEthernet0/11 ! interface FastEthernet0/12 ! interface Vlan 1 ip address 172.16.1.10 255.255.0.0 no ip route-cache ! ip classless no ip http server ! line con 0 login password cisco line aux 0 line vty 0 15 login password cisco ! no scheduler allocate end </pre>

P1DSW1	P1DSW1 (continued)
<pre> P1DSW1#show running-config Building configuration... Current configuration : 1465 bytes ! Version 15.b service timestamps debug uptime service timestamps log uptime no service password-encryption ! hostname P1DSW1 ! ip subnet-zero ! ip cef no ip domain-lookup spanning-tree mode pvst spanning-tree extend system-id ! interface FastEthernet0/1 description P1DSW1 to P1ASW1 switchport mode access speed 100 duplex full ! interface FastEthernet0/2 description P1DSW1 to P1ASW1 switchport mode access speed 100 duplex full ! interface FastEthernet0/3 description P1DSW1 to P2ASW2 switchport mode access speed 100 duplex full ! interface FastEthernet0/4 description P1DSW1 to P2ASW2 switchport mode access speed 100 duplex full ! interface FastEthernet0/5 ! </pre>	<pre> interface FastEthernet0/6 ! interface FastEthernet0/7 ! interface FastEthernet0/8 ! interface FastEthernet0/9 ! interface FastEthernet0/10 ! interface FastEthernet0/11 description P1DSW1 to P2DSW2 switchport mode access speed 100 duplex full ! interface FastEthernet0/12 description P1DSW1 to P2DSW2 switchport mode access speed 100 duplex full ! interface GigabitEthernet0/1 ! interface GigabitEthernet0/2 ! interface Vlan 1 ip address 172.16.1.100 255.255.0.0 no ip route-cache ! ip classless no ip http server ! line con 0 login password cisco line aux 0 line vty 0 4 login password cisco ! no scheduler allocate end </pre>

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