

Lab 12

Switching Configuration

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Using the **show vlan brief** command to observe current switch configurations.

```
COM5 - PuTTY
Jan 1 00:12:44.435: %STACKMGR-5-SWITCH_READY: Switch 1 is READY
Jan 1 00:12:44.435: %STACKMGR-4-STACK_LINK_CHANGE: Stack Port 1 Switch 1 has changed to state DOWN
Jan 1 00:12:44.435: %STACKMGR-4-STACK_LINK_CHANGE: Stack Port 2 Switch 1 has changed to state DOWN
Jan 1 00:12:44.753: %STACKMGR-5-MASTER_READY: Master Switch 1 is READY
Jan 1 00:12:44.760: %SYS-5-RESTART: System restarted --
Cisco IOS Software, C2960X Software (C2960X-UNIVERSALK9-M), Version 15.2(2)E5, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2016 by Cisco Systems, Inc.
Compiled Thu 02-Jun-16 01:31 by prod_rel_team
Jan 1 00:12:44.840: %SSH-5-ENABLED: SSH 1.99 has been enabled
Jan 1 00:12:46.749: %LINK-3-UPDOWN: Interface FastEthernet0, changed state to down
Jan 1 00:12:47.486: %USB_CONSOLE-6-MEDIA_RJ45: Console media-type is RJ45.
Jan 1 00:12:47.748: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0, changed state to down
Jan 1 00:14:25.724: %LINK-3-UPDOWN: Interface GigabitEthernet1/0/21, changed state to up
Jan 1 00:14:26.601: %LINK-3-UPDOWN: Interface GigabitEthernet1/0/23, changed state to up
Jan 1 00:14:26.723: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/21, changed state to up
Jan 1 00:14:27.601: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/23, changed state to up
Switch>en
Switch#show vlan

VLAN Name                Status    Ports
-----
1    default                active    Gi1/0/2, Gi1/0/3, Gi1/0/4
                                           Gi1/0/5, Gi1/0/6, Gi1/0/7
                                           Gi1/0/8, Gi1/0/9, Gi1/0/10
                                           Gi1/0/25, Gi1/0/26, Gi1/0/27
                                           Gi1/0/28
4    ECET_DEPARTMENT_TECH   active    Gi1/0/1
5    ECET_DEPARTMENT        active    Gi1/0/11, Gi1/0/12
6    ECET_DEPARTMENT_STAF   active
7    ECET_DEPARTMENT_LAB    active    Gi1/0/13, Gi1/0/14, Gi1/0/15
                                           Gi1/0/16, Gi1/0/17, Gi1/0/18
                                           Gi1/0/19, Gi1/0/20, Gi1/0/21
                                           Gi1/0/22, Gi1/0/23, Gi1/0/24
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  BrgdMode Trans1 Trans2
-----
1    enet     100001    1500    -      -      -      -      -      0      0

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrgdMode Trans1 Trans2
-----
4    enet     100004    1500    -      -      -      -      -      0      0
5    enet     100005    1500    -      -      -      -      -      0      0
6    enet     100006    1500    -      -      -      -      -      0      0
7    enet     100007    1500    -      -      -      -      -      0      0
1002 fddi    101002    1500    -      -      -      -      -      0      0
1003 tr      101003    1500    -      -      -      -      -      0      0
1004 fdnet   101004    1500    -      -      -      ieee  -      0      0
1005 trnet   101005    1500    -      -      -      ibm   -      0      0

Remote SPAN VLANs
-----

Primary Secondary Type          Ports
-----
```

Deleting the VLAN data file using the **delete flash:vlan.dat** command and reloading the switch.

```
Primary Secondary Type          Ports
-----
Switch#delete flash:vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
Switch#reload
Proceed with reload? [confirm]

Jan  1 00:16:59.784: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload command.
CPU rev: B
Image passed digital signature verification
Board rev: 33
Testing DataBus...
Testing AddressBus...
Testing Memory from 0x00000000 to 0xffffffff.../
```

Creating VLANs 4,5,6,7 and 8 with their respective names and checking changes.

```
Switch#conf t
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 6
Switch(config-vlan)#name ECET_DEPARTMENT_STAFF
Warning: Vlan 6 name length exceeded the recommended length of 20 characters.
Switch(config-vlan)#vlan 7
Switch(config-vlan)#name ECET_DEPARTMENT_LAB
Switch(config-vlan)#vlan 8
Switch(config-vlan)#name test
Switch(config-vlan)#^Z
Switch#show
Jan  1 00:24:21.060: %SYS-5-CONFIG_I: Configured from console by console vlan brief

VLAN Name                Status    Ports
-----
1    default                active    Gi1/0/2, Gi1/0/3, Gi1/0/4
                                           Gi1/0/5, Gi1/0/6, Gi1/0/7
                                           Gi1/0/8, Gi1/0/9, Gi1/0/10
                                           Gi1/0/25, Gi1/0/26, Gi1/0/27
                                           Gi1/0/28
4    ECET_DEPARTMENT_TECH   active    Gi1/0/1
5    ECET_DEPARTMENT_FACULTY active    Gi1/0/11, Gi1/0/12
6    ECET_DEPARTMENT_STAFF  active
7    ECET_DEPARTMENT_LAB    active    Gi1/0/13, Gi1/0/14, Gi1/0/15
                                           Gi1/0/16, Gi1/0/17, Gi1/0/18
                                           Gi1/0/19, Gi1/0/20, Gi1/0/21
                                           Gi1/0/22, Gi1/0/23, Gi1/0/24
8    test                   active
1002 fddi-default          act/unsup
1003 token-ring-default    act/unsup
1004 fddinet-default        act/unsup
1005 trnet-default          act/unsup
Switch#
```

Removing VLAN 8 and checking output with the **show vlan brief** command.

```
Enter configuration commands, one per line. End with CNTRL-Z.
Switch(config)#no vlan 8
Switch(config)#^Z
Switch#
Switch#sh
Jan  1 00:26:20.419: %SYS-5-CONFIG_I: Configured from console by consolevlan brief

VLAN Name                Status    Ports
-----
1    default                active    Gil/0/2, Gil/0/3, Gil/0/4
                                           Gil/0/5, Gil/0/6, Gil/0/7
                                           Gil/0/8, Gil/0/9, Gil/0/10
                                           Gil/0/25, Gil/0/26, Gil/0/27
                                           Gil/0/28
4    ECET_DEPARTMENT_TECH   active    Gil/0/1
5    ECET_DEPARTMENT_FACULTY active    Gil/0/11, Gil/0/12
6    ECET_DEPARTMENT_STAFF  active
7    ECET_DEPARTMENT_LAB    active    Gil/0/13, Gil/0/14, Gil/0/15
                                           Gil/0/16, Gil/0/17, Gil/0/18
                                           Gil/0/19, Gil/0/20, Gil/0/21
                                           Gil/0/22, Gil/0/23, Gil/0/24
1002 fddi-default         act/unsup
1003 token-ring-default   act/unsup
1004 fddinet-default       act/unsup
1005 trnet-default         act/unsup
Switch#
```

Verifying VLAN changes.

```
% Type 'show ?' for a list of subcommands
Switch#show vlan brief

VLAN Name                Status    Ports
-----
1    default                active    Gil/0/1, Gil/0/2, Gil/0/3
                                           Gil/0/4, Gil/0/5, Gil/0/6
                                           Gil/0/7, Gil/0/8, Gil/0/9
                                           Gil/0/25, Gil/0/26, Gil/0/27
                                           Gil/0/28
4    ECET_DEPARTMENT_TECH   active    Gil/0/10
5    ECET_DEPARTMENT_FACULTY active    Gil/0/11, Gil/0/12
6    ECET_DEPARTMENT_STAFF  active
7    ECET_DEPARTMENT_LAB    active    Gil/0/13, Gil/0/14, Gil/0/15
                                           Gil/0/16, Gil/0/17, Gil/0/18
                                           Gil/0/19, Gil/0/20, Gil/0/21
                                           Gil/0/22, Gil/0/23, Gil/0/24
1002 fddi-default         act/unsup
1003 token-ring-default   act/unsup
1004 fddinet-default       act/unsup
1005 trnet-default         act/unsup
Switch#
```

Assigning an SVI to VLAN 1 with an IP address of 10.0.0.2

```
Configuring from terminal, memory, or network [terminal]?  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#int vlan 1  
Switch(config-if)#ip address 10.0.0.2 255.0.0.0  
Switch(config-if)#exit
```

Verifying changes

```
Switch#show run int vlan 1  
Building configuration...  
  
Current configuration : 54 bytes  
!  
interface Vlan1  
  ip address 10.0.0.2 255.0.0.0  
end
```

Configuring **default gateway**, **domain name**, **duplex mode** and **speed** interface

```
Switch#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#ip default-gateway 10.0.0.1
Switch(config)#ip domain-name T24
Switch(config)#ip domain-name T24
Switch(config)#int g1/0/1
Switch(config-if)#speed 100
Switch(config-if)#duplex full
Switch(config-if)#^Z
Switch#show
Jan  1 00:39:12.881: %SYS-5-CONFIG_I: Configured from console by consoleint status

Port      Name      Status      Vlan      Duplex  Speed Type
Gil/0/1    notconnect 1          full    100 10/100/1000BaseTX
Gil/0/2    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/3    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/4    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/5    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/6    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/7    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/8    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/9    notconnect 1          auto    auto 10/100/1000BaseTX
Gil/0/10   notconnect 4          auto    auto 10/100/1000BaseTX
Gil/0/11   notconnect 5          auto    auto 10/100/1000BaseTX

Switch#show int g1/0/1 status

Port      Name      Status      Vlan      Duplex  Speed Type
Gil/0/1    notconnect 1          full    100 10/100/1000BaseTX
Switch#
```

Does the switch reflect the configured changes? Yes.

MAC address of Ryaz's workstation: **00-25-AB-94-88-58**

Applying port-security commands on the **G1/0/2** interface

```
Switch#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int g1/0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security mac-address 00-25-AB-94-88-58
Switch(config-if)#switchport port-security maximum 1
Switch(config-if)#^Z
```

Verifying switchport port-security configuration.

```
Switch#show port-security address
      Secure Mac Address Table
-----
Vlan    Mac Address      Type                               Ports    Remaining Age
-----  -
      1    0025.ab94.8858    SecureConfigured                 Gil/0/2    -
-----

Total Addresses in System (excluding one mac per port)    : 0
Max Addresses limit in System (excluding one mac per port) : 16384
Switch#show port-security interface gi1/0/2
Port Security          : Disabled
Port Status            : Secure-down
Violation Mode         : Shutdown
Aging Time             : 0 mins
Aging Type             : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses  : 1
Total MAC Addresses    : 1
Configured MAC Addresses : 1
Sticky MAC Addresses   : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Switch#
```

1 = Port Numbers in G1/0/\*

2 = VLAN

1.	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2
										0	1	2	3	4	5	6	7	8	9	0
2.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

1.	21	22	23	24
2.	7	7	7	7

Output view of the current VLAN configuration on the switch.

VLAN	Name	Status	Ports
1	default	active	Gil/0/1, Gil/0/2, Gil/0/3 Gil/0/4, Gil/0/5, Gil/0/6 Gil/0/7, Gil/0/8, Gil/0/9 Gil/0/10
4	ECET_DEPARTMENT_TECH	active	
5	ECET_DEPARTMENT_FACULTY	active	Gil/0/11, Gil/0/12
6	ECET_DEPARTMENT_STAFF	active	
7	ECET_DEPARTMENT_LAB	active	Gil/0/13, Gil/0/14, Gil/0/15 Gil/0/16, Gil/0/17, Gil/0/18 Gil/0/19, Gil/0/20, Gil/0/21 Gil/0/22, Gil/0/23, Gil/0/24 Gil/0/25, Gil/0/26, Gil/0/27 Gil/0/28
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

Switch#

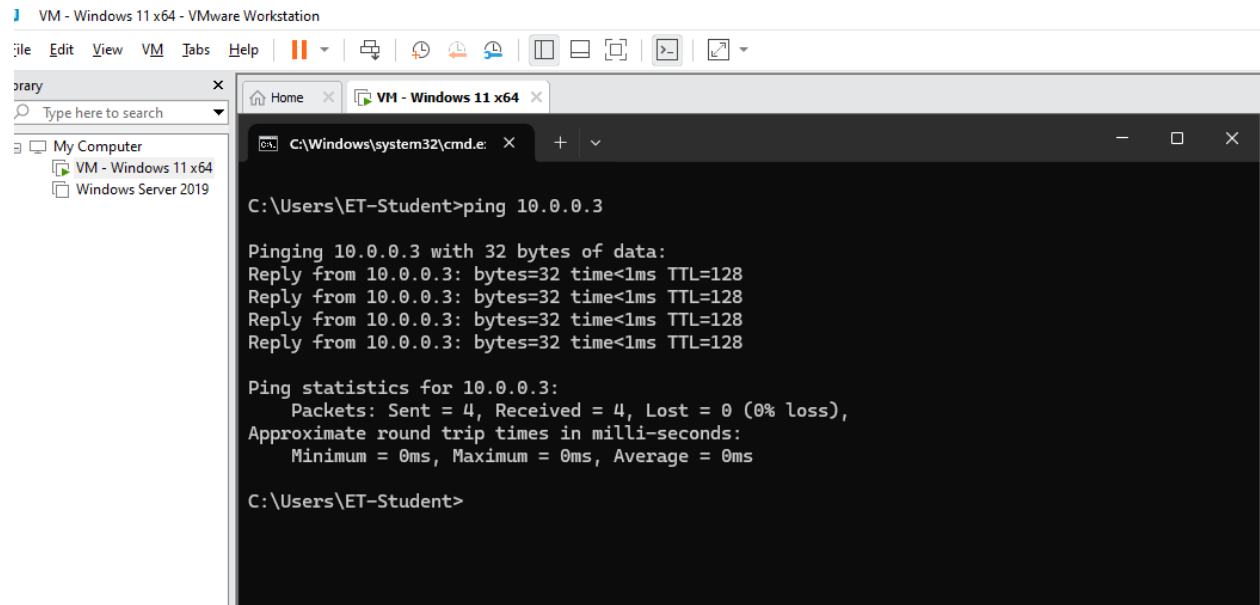
Manually assigning a class A IP address to workstation 1.

IP assignment:	Manual	
IPv4 address:	1.0.0.3	
IPv4 mask:	255.0.0.0	
IPv4 gateway:	1.0.0.1	

Edit



## Verifying IP addressing configuration on workstation 1.



Pinging the **management VLAN** from workstation 1 successfully and workstation 2 which is in the same VLAN.

```
C:\Windows\system32\cmd.exe X + v - □ X

C:\Users\ET-Student>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\ET-Student>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\ET-Student>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:
Reply from 10.0.0.4: bytes=32 time=1ms TTL=128
Reply from 10.0.0.4: bytes=32 time=2ms TTL=128
Reply from 10.0.0.4: bytes=32 time=1ms TTL=128
Reply from 10.0.0.4: bytes=32 time=2ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\Users\ET-Student>
```

Connect the workstation to any ports between 1 through 9. Verify connectivity to VLAN 1. Can both workstations ping the management IP address?

Answer: Yes, both workstations can ping the management IP 10.0.0.2

Ping from workstation 1 to workstation 2 and in reverse. Was the ping successful and why?

Answer: Yes, both workstations can ping each other because they are in the same VLAN.

Attach workstation 2 to port number 10. Using workstation 1, verify there is connectivity with workstation 2 using the PING command. Do this in reverse to check connectivity between Engineering Technology Queensborough Community College 9 workstation 2 and 1. Was it successfully? Explain?

Answer: Yes, the ping was successful because port 10 is still part of VLAN 1

Questions 1) What are the benefits of using VLANs?

Answer: The benefits of VLANs include flexibility, security and segmentation to

2) Which is the default VLAN of the switch?

Answer: The default VLAN of the switch is VLAN 1

3) When is used IEEE 802.11q?

Answer: IEEE 802.11q is used for inter-VLAN routing in trunk links

4) Which IOS command is used to grant access to a switch port based on MAC address?

Answer: The command to accomplish this function is switchport port-security mac-address [MAC]

5) Define Inter-Vlan and Intra-Vlan routing. How can Switch Virtual Interfaces (SVI) be used to route traffic in a network

Answer: Inter-vlan routing is the ability of vlans to communicate with different VLANs and intra-vlan routing means communication within a VLAN. For example, if devices in VLAN A are able to communicate with devices in VLAN B, then this is considered inter-VLAN routing. On the other hand, the ability of devices in either VLAN A or B to communicate with other devices from their same VLAN, then that is considered intra-VLAN routing