FACULTY OF INFORMATION TECHNOLOGY
DEPARTMENT OF NETWORKS AND INFORMATION SYSTEMS

CHAPTER 2 – PRACTICE 01

Basic Switch Configuration

Main Objectives

- Understand:
  - ✓ The main modes of Switch Cisco 2960

- Use basic commands on Switch 2960:
  - ✓ To switch between these modes
  - ✓ To show information on the device
  - ✓ To configure device

- Execute some commands to configure:
  - ✓ VLAN
  - ✓ Trunking

CONTENTS

Switch's Command Modes

C2960-24TT – Command Modes

Main modes of Switch

User EXEC Mode:

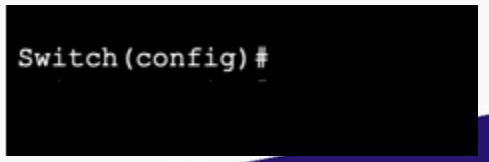
- Allows access to only a limited number of basic monitoring commands
- Identified by the CLI prompt that ends with the > symbol

Privileged EXEC Mode:

- Allows access to all commands and features
- Identified by the CLI prompt that ends with the # symbol

Global Configuration Mode:

- Used to access configuration options on the device

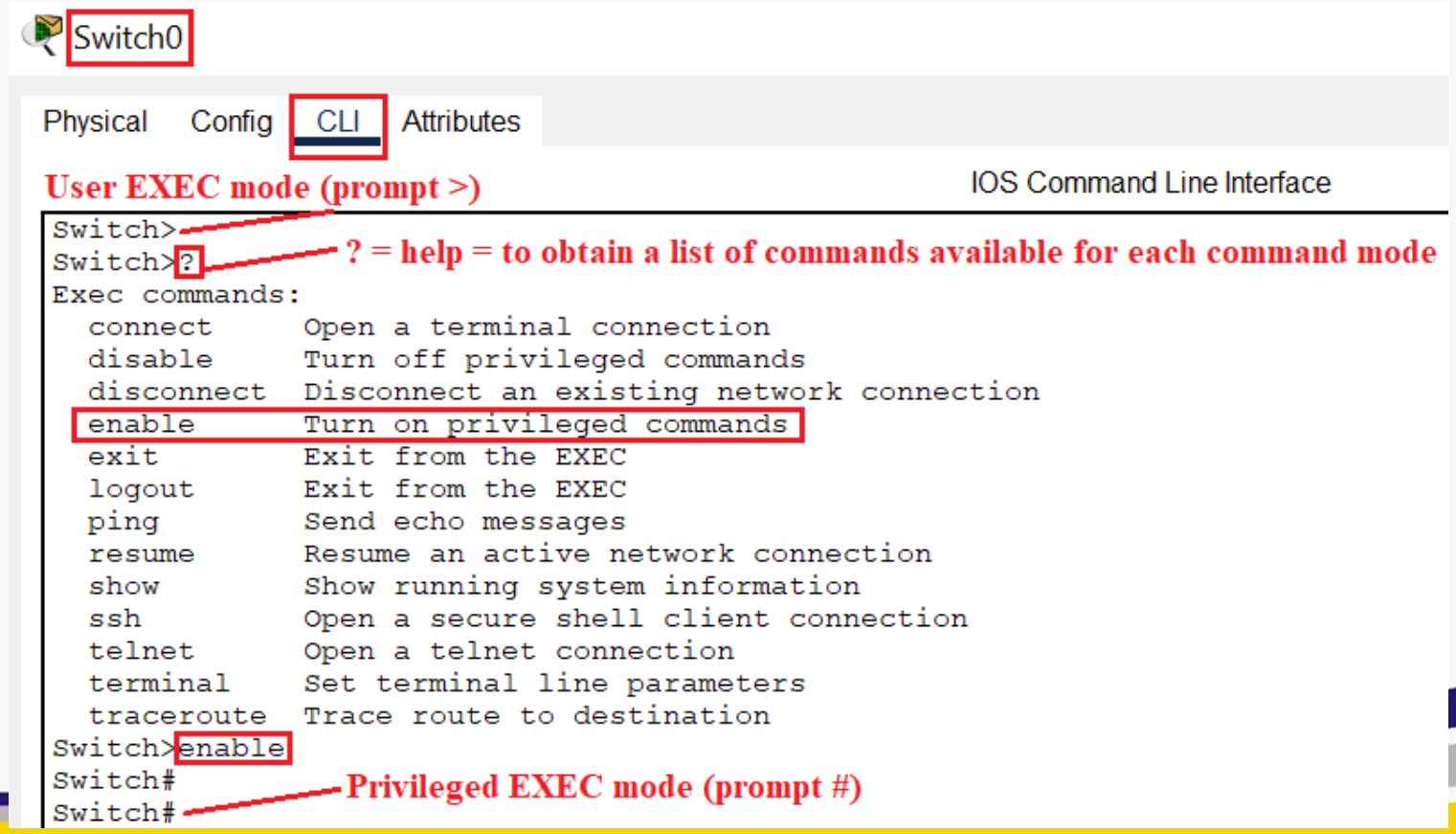


Switch's Command Modes

C2960-24TT – Common commands

Some common commands:

- *"?"* = help command
- *"enable"* command at the user EXEC mode to enter privileged EXEC mode



Switch's Command Modes

C2960-24TT – Common commands

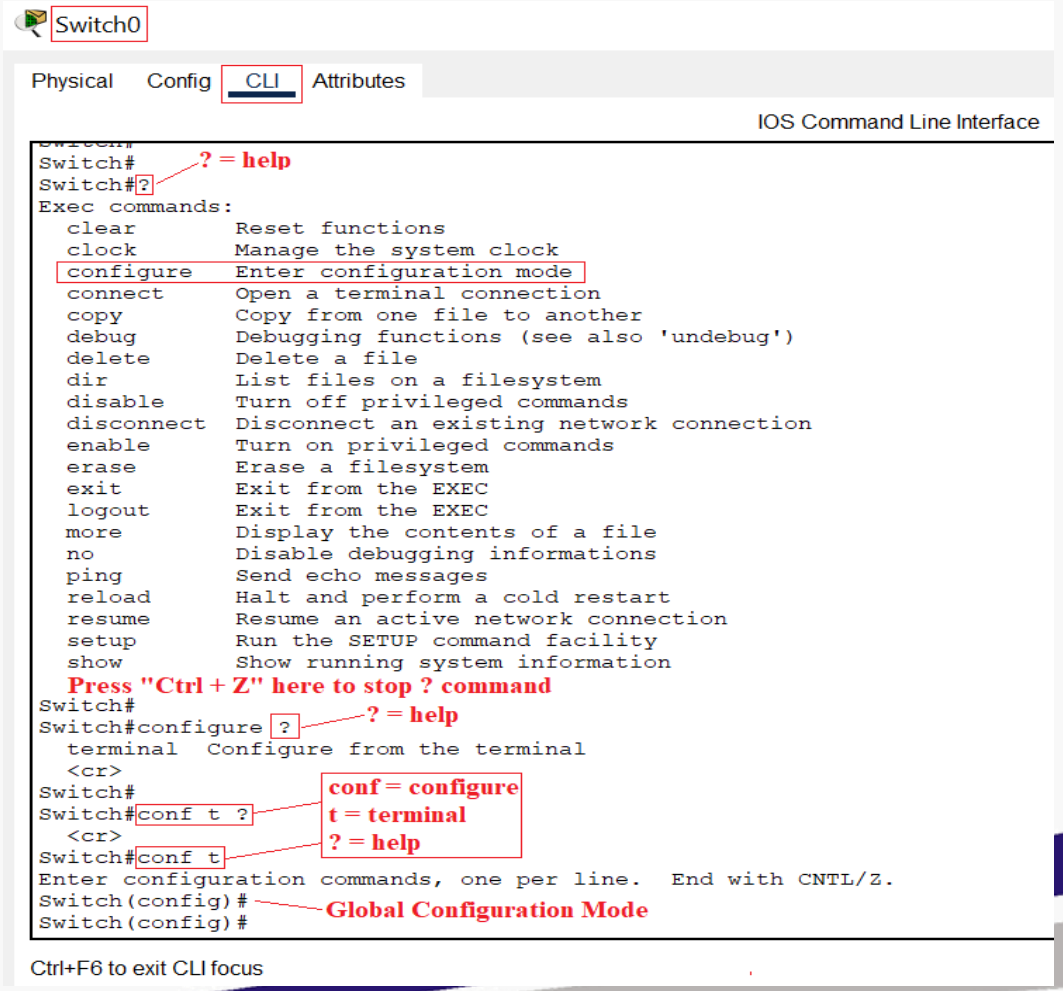
Some common commands:

- *"?"* = help command (any where)
- *"conf t"* or *"configure"* or *"configure terminal"* command at the privileged EXEC mode to enter Global Configuration mode

Note:

When use "?":

- the list of commands available for each command (or command mode) will appear
- press "*SPACE*" to continue or "*Ctrl + Z*" to exit



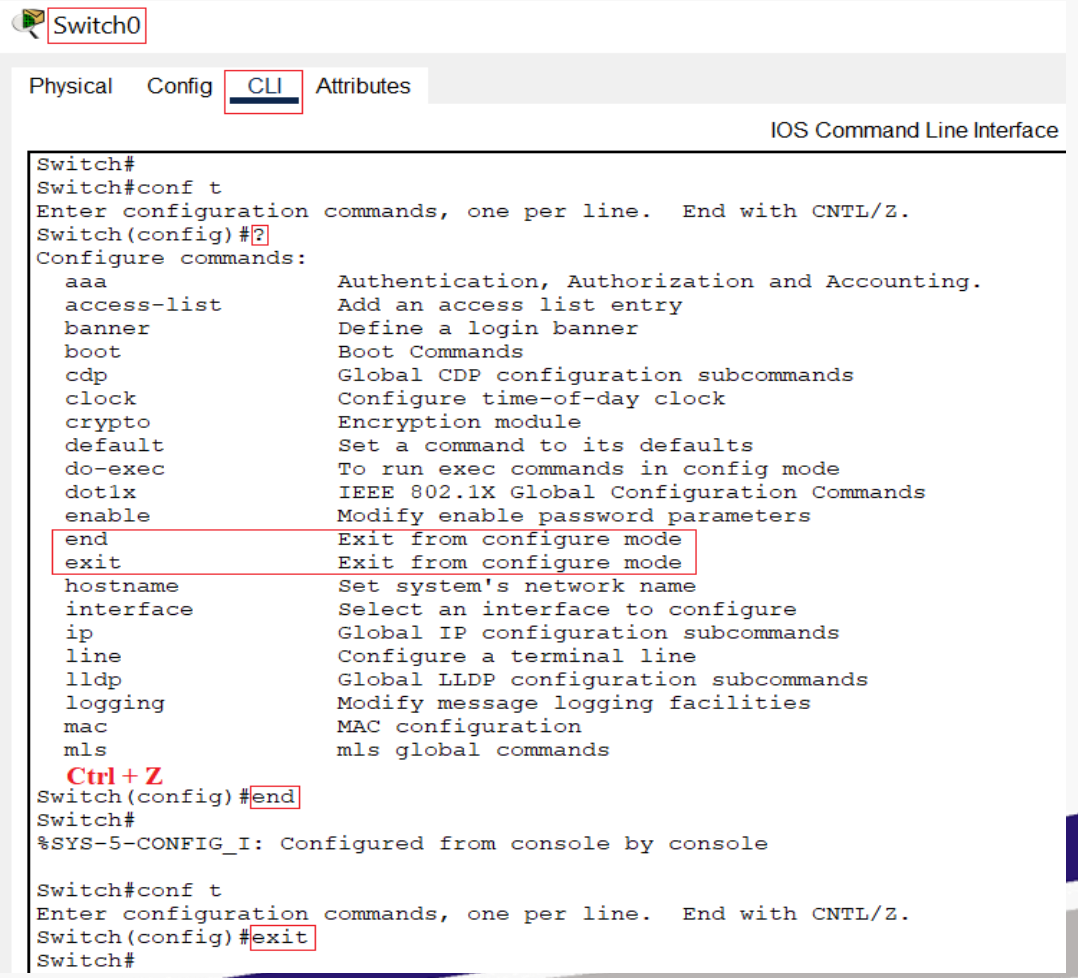
Switch's Command Modes

C2960-24TT – Common commands

Some common commands:

Use "*exit*" or "*end*" command or press "*Ctrl + Z*" to exit
- Global Configuration mode to come back privileged EXEC mode

Use "*exit*" or "*logout*" or "*disable*" command to exit
- privileged EXEC mode to come back user EXEC mode



Show information on the Switch

C2960-24TT – The user EXEC mode commands

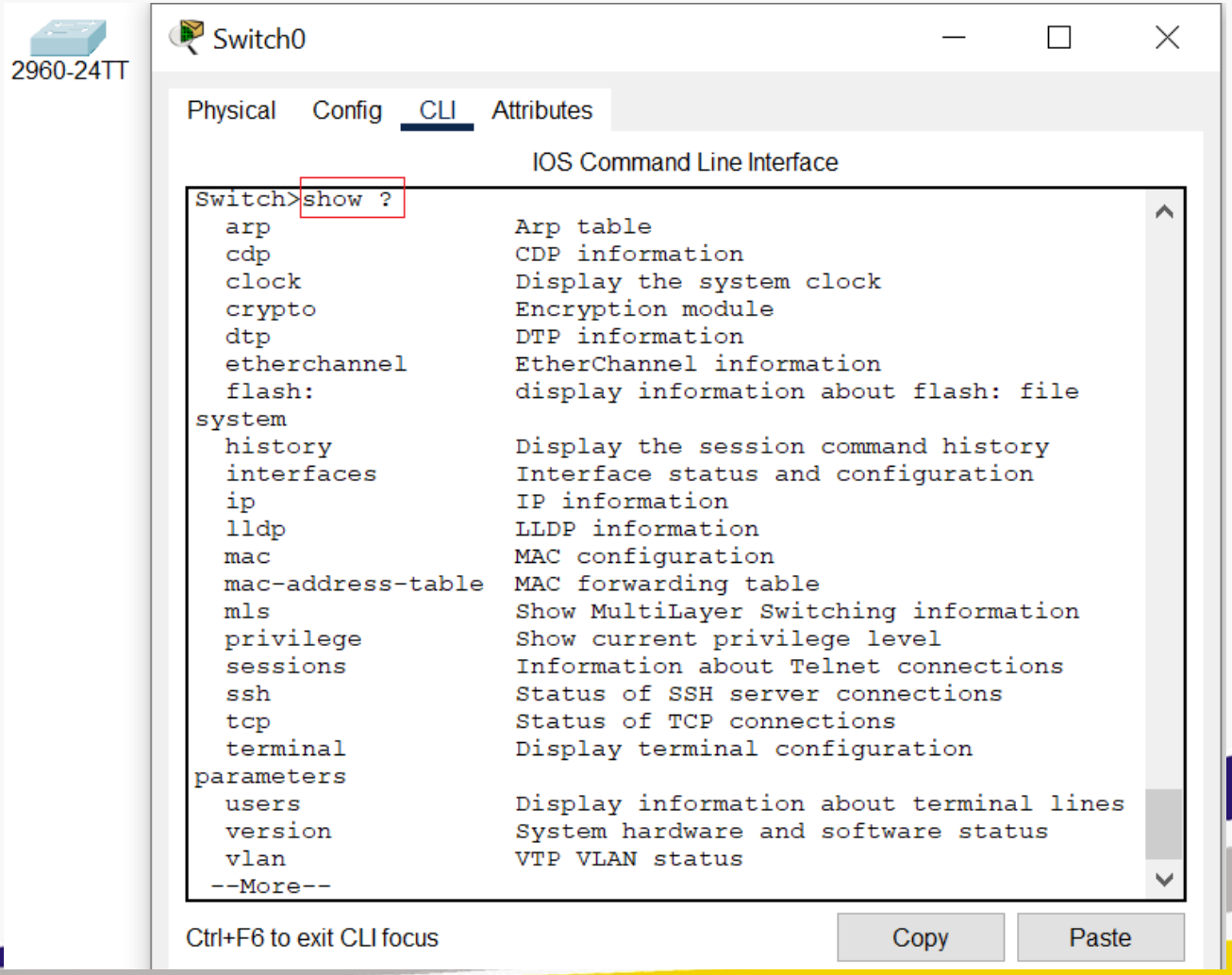
"Show" command to display running system information

In the User EXEC mode

- show arp: ARP table
- show mac: MAC configuration
- show mac-address-table: MAC forwarding table
- show interfaces: Interface status and configuration
- show vlan: VTP VLAN status
- show vlan brief: VTP all VLAN status in brief
- show vlan id a: VTP VLAN status by VLAN id (ex. a = 1)

In the Privileged EXEC Mode

- show running-config: Current operating configuration

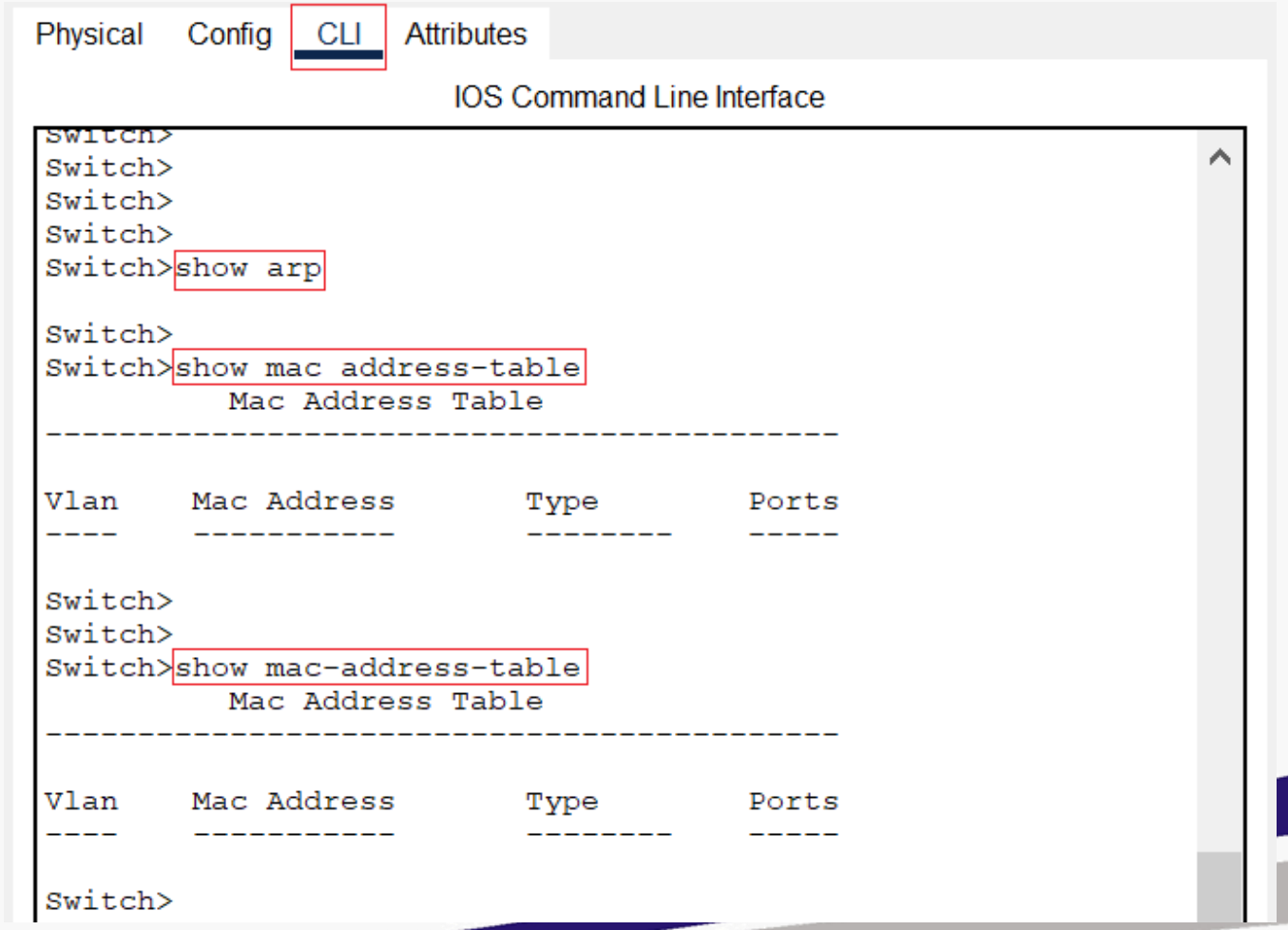


Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

- *show arp*
- *show mac address-table*
- *show mac-address-table*



Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

"show int fa0/1"
- display information about interface Fa0/1

"show int"
- display information about all interfaces

"show int fa0/3 status"
- display status, vlan, Duplex, Speed on interface Fa0/3

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>show interfa
Switch>show interfaces fa0/1
FastEthernet0/1 is down, line protocol is down (disabled)
  Hardware is Lance, address is 0001.9656.0001 (bia 0001.9656.0001)
 BW 100000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     956 packets input, 193351 bytes, 0 no buffer
     Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     2357 packets output, 263570 bytes, 0 underruns
     0 output errors, 0 collisions, 10 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out

Switch>
```

= Display information about interface FastEthernet0/1

```
Switch#
Switch#show inter fa0/3 status
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/3                        notconnect   1          auto    auto  10/100BaseTX

Switch#
```

Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

"show vlan"

- Display ID / Name / Status / Ports (in the LAN)

Physical Config CLI Attributes

IOS Command Line Interface

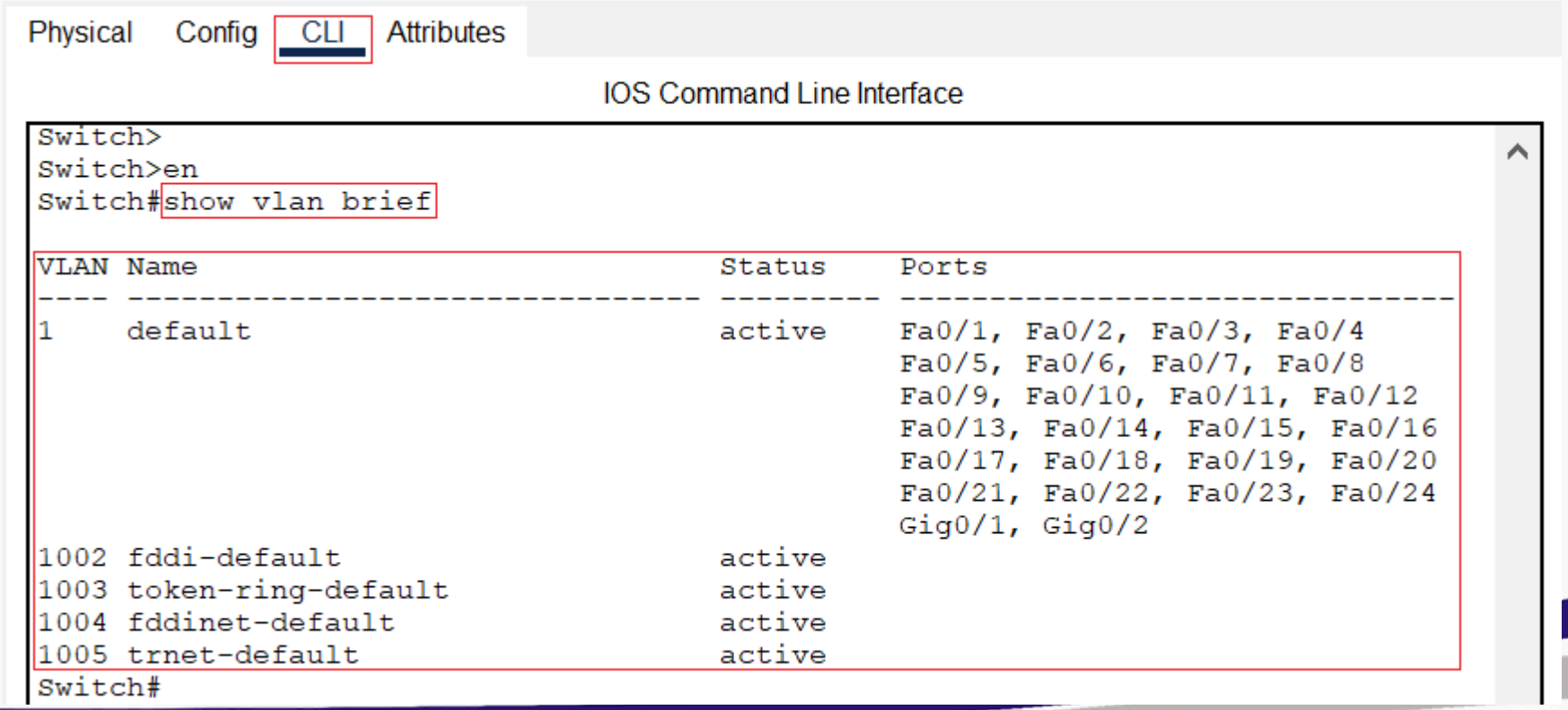
```
Switch>
Switch>show vlan

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
                                                 Gig0/1, Gig0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     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

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
Switch>
```

Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

"show vlan brief"



Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

"show vlan id 1"

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>
Switch>en
Switch#
Switch#show vlan id 1

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
                                                   Gig0/1, Gig0/2

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0

Switch#
```

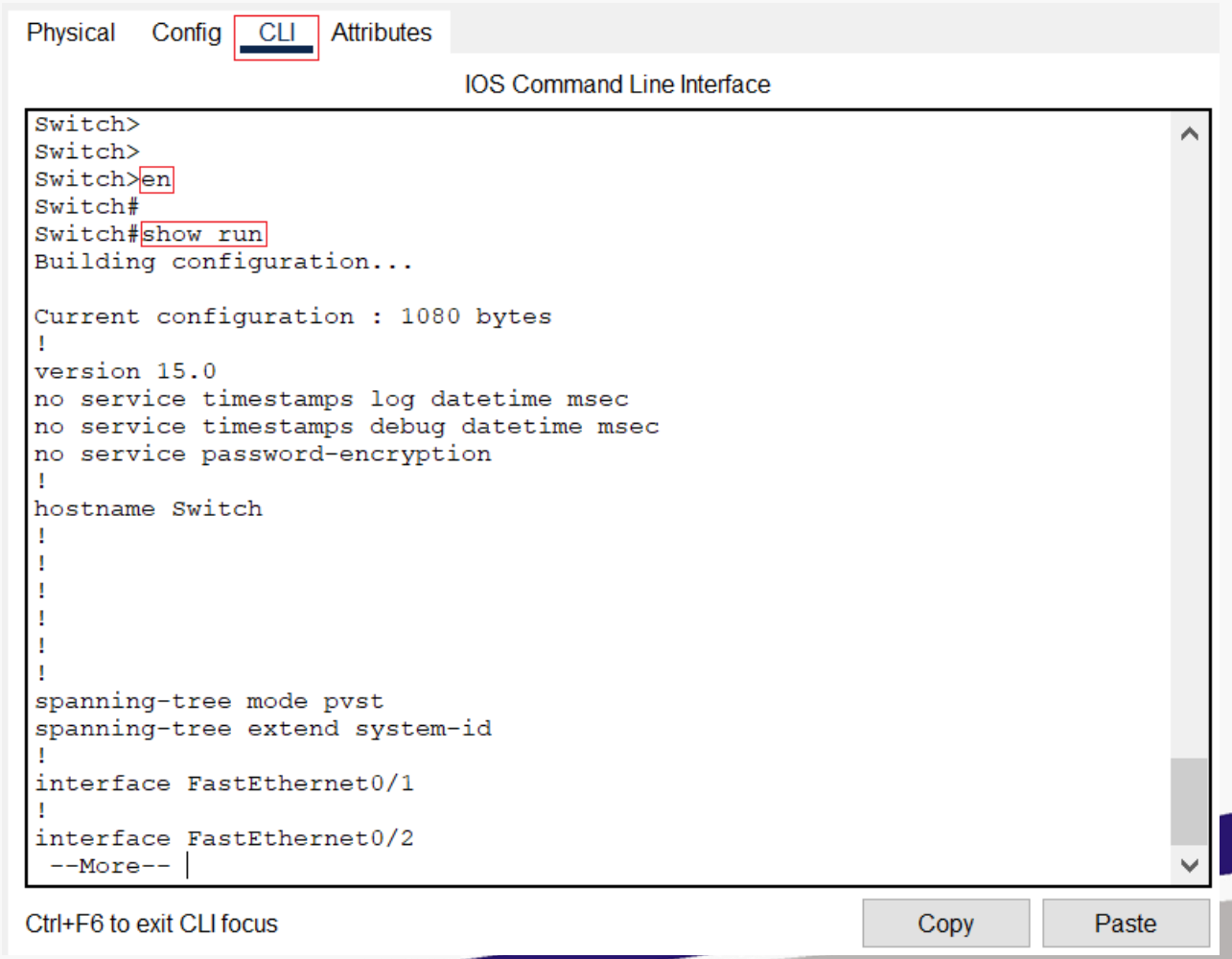
Show information on the Switch

C2960-24TT – The user EXEC mode commands

Some basic *"show"* commands:

"show running-config"

- Display current operating configuration



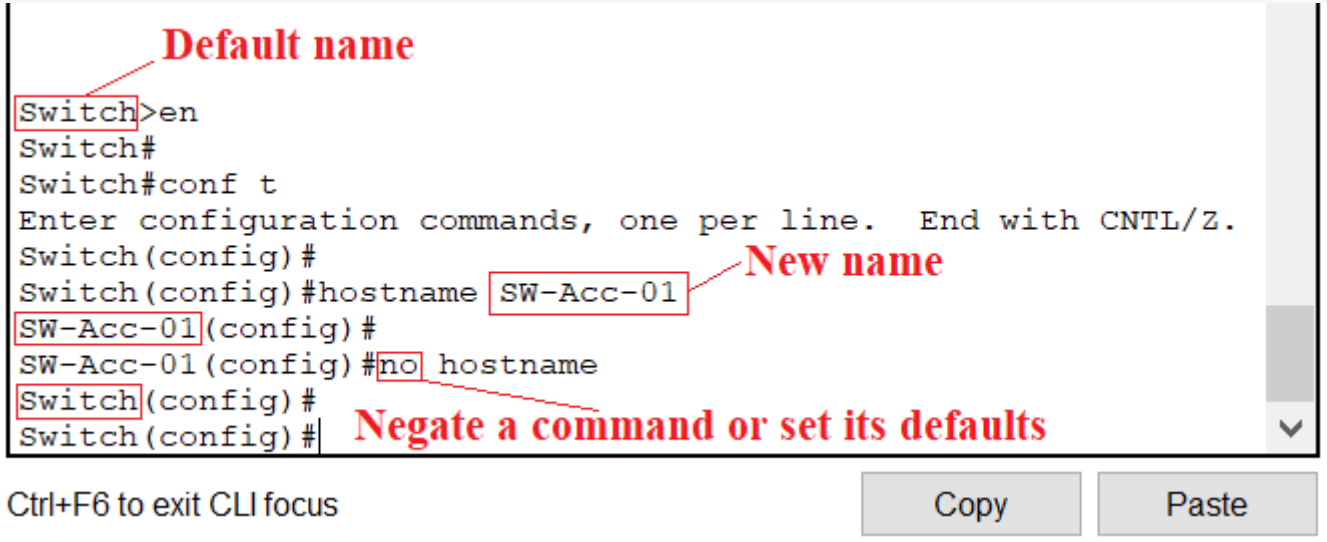
Basic Switch Configuration

C2960-24TT – Device Names

Switch's name:

- A Cisco IOS switch has a default name "Switch"
- A device should be to give it a unique hostname
- To set new name for switch, use the "*hostname*" global config command
- To return the switch to the default name, use the "*no hostname*" command

Note: Use "*write memory*" to save the configuration to NVRAM if you want



Basic Switch Configuration

C2960-24TT – Set password to access privileged EXEC mode

Configure Passwords to access privileged EXEC mode

- First enter global configuration mode.
- Next, use the "*enable secret password*" command.
- Note: Save configuration file if you want to change running-config file

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>en
Switch#show run
Building configuration...

Current configuration : 1080 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
 --More--
```

Ctrl+F6 to exit CLI focus Copy Paste

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#enable secret Utc@123
Switch(config)#
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wri mem
Building configuration...
[OK]
Switch#
```

password = Utc@123

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>en
Password:
Switch#
Switch#show run
Building configuration...

Current configuration : 1129 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
enable secret 5 $1$mERr$cZ6vNoRZIAiZVVsf8r0TT1
!
```

Utc@123

Basic Switch Configuration

C2960-24TT – Create, Modify, Delete an VLAN

VLAN example

- create VLAN 2, name it VLAN-Test
- and add it to the VLAN database

The commands is used:

- Switch#
- Switch#conf t
- Switch(config)#vlan 2
- Switch(config-vlan)#name VLAN-Test
- Switch(config-vlan)#end
- Switch#

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#vlan 2
Switch(config-vlan)#
Switch(config-vlan)#name VLAN-Test
Switch(config-vlan)#
Switch(config-vlan)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#
```

ID of VLAN = 2

Name of VLAN = VLAN-Test

Basic Switch Configuration

C2960-24TT – Create, Modify, Delete an VLAN

VLAN example (continue)

The result in the VLAN database:

- Switch#show vlan

Modify name of VLAN 2 to VLAN-Test-02:

- Switch#
- Switch#conf t
- Switch(config)#vlan 2
- Switch(config-vlan)#name VLAN-Test-02
- Switch(config-vlan)#end
- Switch#

Save the configuration file:

- Switch#wri mem

```
Switch#
Switch#show vlan

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
                                                Gig0/1, Gig0/2
2    VLAN-Test                        active
1002 fddi-default                     active
1003 token-ring-default               active
```

```
Switch#show vlan

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
                                                Gig0/1, Gig0/2
2    VLAN-Test-02                     active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
2    enet  100002     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0

Switch#wri mem
Building configuration...
[OK]
Switch#
```

Basic Switch Configuration

C2960-24TT – Create, Modify, Delete an VLAN

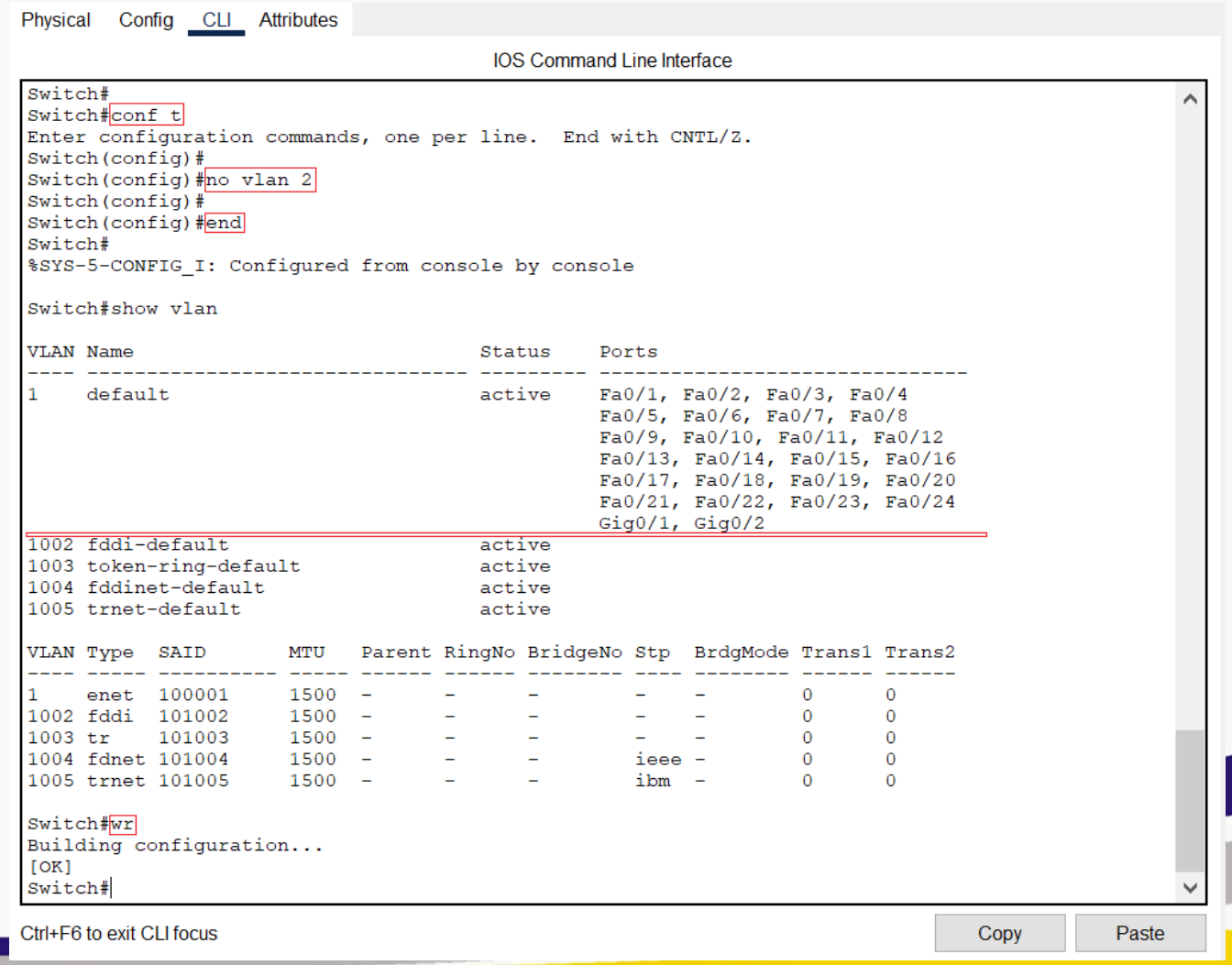
VLAN example (continue)

Delete VLAN, ex:

- Remove VLAN 2 (name VLAN-Test-02)
- Check results by *"show vlan"* command

Do it:

- Switch#conf t
- Switch(config)#no vlan 2
- Switch(config)#end
- Switch#show vlan
- Switch#wr



Basic Switch Configuration

C2960-24TT – Assigning Access Ports to a VLAN

The steps assigning ports to a VLAN

- Access the interface configuration mode
- Define access mode for the port
- Assign the port to a VLAN
- Return to privileged EXEC mode
- Verify configuration on the interface

Example 01: Assign a port to a VLAN

Assign port Fa0/20 to VLAN 20, name XYZ-20

The commands to do it:

- Switch#conf t
- Switch(config)#interface fa0/20
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport acc vlan 20
- Switch(config-if)#end
- Switch#show vlan
- Switch#show running-config

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface fa0/20
Switch(config-if)#switchport mode access
Switch(config-if)#switchport acc vlan 20
Switch(config-if)#end
Switch#
```

IOS Command Line Interface

```
Switch#
Switch#show vlan

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, Fa0/21
                                                   Fa0/22, Fa0/23, Fa0/24, Gig0/1
                                                   Gig0/2
20   XYZ-20                              active    Fa0/20
1002 fddi-default                        active
1003 token-ring-default                  active
```

```
interface FastEthernet0/19
!
interface FastEthernet0/20
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/21
```

Basic Switch Configuration

C2960-24TT – Assigning Access Ports to a VLAN

Example 02: Assign ports to a VLAN

Assign port Fa0/11, Fa0/13, Fa0/15 to VLAN 20

The commands to do it:

- Switch#conf t
- Switch(config)#interface range fa0/11,fa0/13,fa0/15
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport acc vlan 20
- Switch(config-if)#end
- Switch#show vlan

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface range fa0/11,fa0/13,fa0/15
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport acc vlan 20
Switch(config-if-range)#end
Switch#show vlan
%SYS-5-CONFIG_I: Configured from console by console

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, Fa0/12, Fa0/14
                                                Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
20   XYZ-20                           active    Fa0/11, Fa0/13, Fa0/15, Fa0/20
1002 fddi-default                     active
```

Check the configuration file

- Switch#show running-config

```
interface FastEthernet0/11
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/12
```

```
interface FastEthernet0/13
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/14
```

```
interface FastEthernet0/15
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/16
```

Basic Switch Configuration

C2960-24TT – Assigning Access Ports to a VLAN

Example 03: Assign ports to a VLAN

Assign port from Fa0/6 to Fa0/9 to VLAN 20

The commands to do it:

- Switch#conf t
- Switch(config)#interface range fa0/6-9
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport acc vlan 20
- Switch(config-if)#end
- Switch#show vlan

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface range fa0/6-9
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport acc vlan 20
Switch(config-if-range)#end
Switch#show vlan
%SYS-5-CONFIG_I: Configured from console by console

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/10, Fa0/12, Fa0/14
                                                Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
20   XYZ-20                           active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/11, Fa0/13, Fa0/15, Fa0/20
1002 fddi-default                     active
```

Basic Switch Configuration

C2960-24TT – Assigning Access Ports to a VLAN

Example 04: Move port from a VLAN to another
Create a VLAN (ID = 5, name = ABC)
Switch port Fa0/20 from VLAN 20 to VLAN 5

The commands to do it:

- Switch#
- Switch#conf t
- Switch(config)#vlan 5
- Switch(config-vlan)#name ABC
- Switch(config-vlan)#exit
- Switch(config)#interface fa0/20
- Switch(config-if)#switchport acc vlan 5
- Switch(config-if)#end
- Switch#show vlan

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 5
Switch(config-vlan)#name ABC
Switch(config-vlan)#exit
Switch(config)#interface fa0/20
Switch(config-if)#switchport acc vlan 5
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/10, Fa0/12, Fa0/14
                                                Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
5    ABC                              active    Fa0/20
20   XYZ-20                           active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/11, Fa0/13, Fa0/15
1002 fddi-default                     active
```

Basic Switch Configuration

C2960-24TT – Set the interface to VLAN default

Set the interface to VLAN default (VLAN 1)

- In the global configuration command, use command:
  default interface interface-id

- Or in the interface configuration mode, use command:
  no switchport acc vlan

Example: Set interface Fa0/11, Fa0/13 to VLAN default

- Switch#
- Switch#conf t
- Switch(config)#default interface fa0/11
- Switch(config)#interface fa0/13
- Switch(config-if)#no switchport acc vlan
- Switch(config-if)#end
- Switch#

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#default interface fa0/11
Building configuration...
Command rejected: An interface must be configured to the Access or Trunk
modes to be configured to NoNegotiate.


Interface FastEthernet0/11 set to default configuration
Switch(config)#interface fa0/13
Switch(config-if)#no switchport acc vlan
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/16, Fa0/17
                                                 Fa0/18, Fa0/19, Fa0/21, Fa0/22
                                                 Fa0/23, Fa0/24, Gig0/1, Gig0/2
5    ABC                               active    Fa0/20
20   XYZ-20                            active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                 Fa0/15
1002 fddi-default                      active
```

```
interface FastEthernet0/10
!
interface FastEthernet0/11
 switchport mode access
!
```

Basic Switch Configuration

C2960-24TT – Configure the port as a trunk port

The steps assigning port to trunk mode

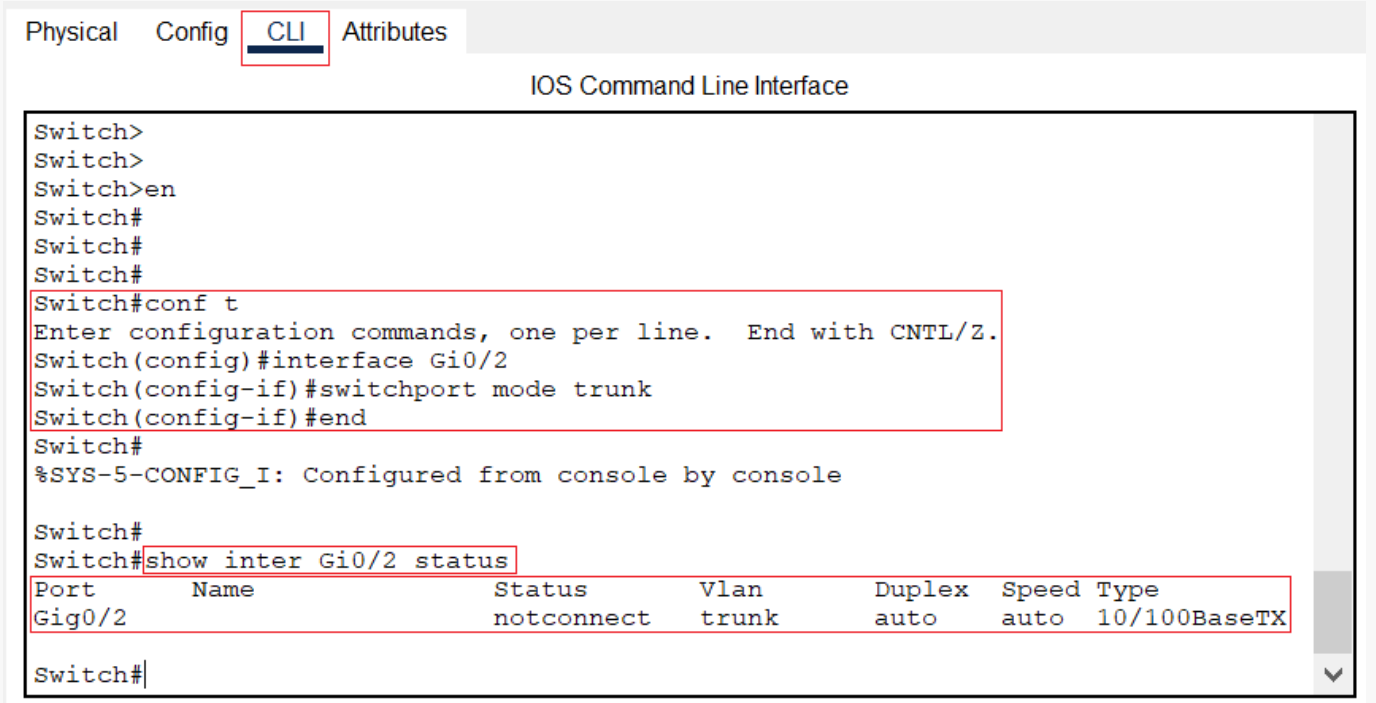
- Access the interface configuration mode
- Define trunk mode for the port

Optional:

- Determine the VLAN id that is allowed to pass through the trunk link (by default, all VLANs are passed)
- If you want to add some port-related reminders, use *"description"* command
- Change Native VLAN

Example 1: Set interface Gi0/2 as a trunk port

- Switch#conf t
- Switch(config)#interface Gi0/2
- Switch(config-if)#switchport mode trunk
- Switch(config-if)#end
- Switch#



Basic Switch Configuration

C2960-24TT – Configure the port as a trunk port

Example 2: Set interface Gi0/1 as a trunk port and allow vlan 1,3,5

- Switch#conf t
- Switch(config)#interface Gi0/1
- Switch(config-if)#description To-SW1-Gi0/1
- Switch(config-if)#switchport mode trunk
- Switch(config-if)#switchport trunk allowed vlan 1,3,5
- Switch(config-if)#end
- Switch#

```
Switch#
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface Gi0/1
Switch(config-if)#description To-SW1-Gi0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 1,3,5
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#
Switch#
```

Interface specific description

Let vlan 1,3,5 pass through the trunk link

If all VLANs want to go through the link, do not use this command

Two optional commands:

- *"description To-SW1-Gi0/1"* add some information for this port
- *"switchport trunk allowed vlan 1,3,5":* allow VLAN 1,3,5 to pass through the trunk link

```
Switch#show inter Gi0/1 status
Port      Name               Status       Vlan       Duplex  Speed Type
Gig0/1    To-SW1-Gi0/1       notconnect   trunk      auto    auto  10/100BaseTX
```

Note:

- encapsulation dot1q: default on trunk port of Cisco 2960

Basic Switch Configuration

C2960-24TT – Configure the port as a trunk port

Example 3:

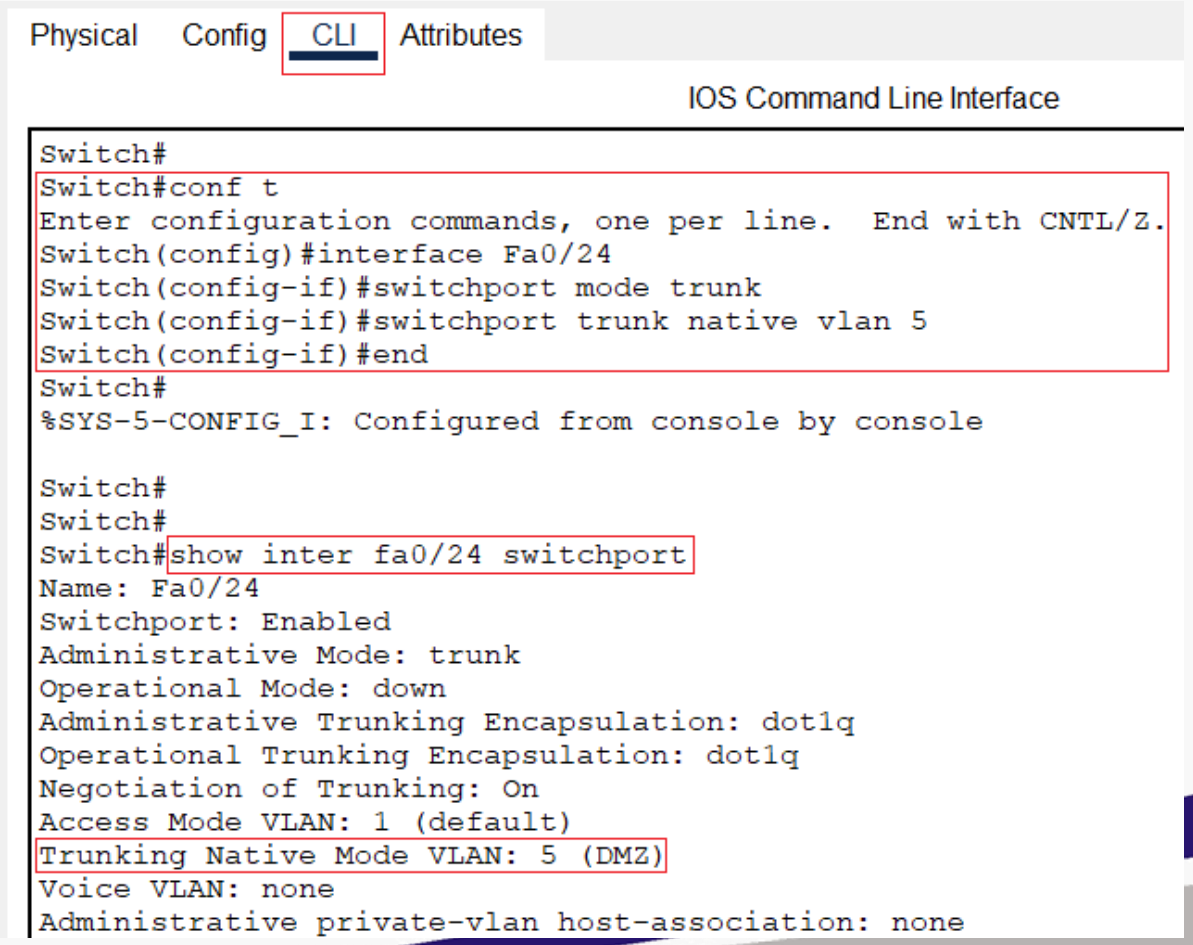
- Set interface Fa0/24 as a trunk port
- and set Native VLAN to VLAN 5 (name DMZ)

The Native VLAN on a trunk port/link:

- allow to remain untagged.
- By default, Native VLAN is VLAN 1

Configuration commands:

- Switch#
- Switch#conf t
- Switch(config)#interface Fa0/24
- Switch(config-if)#switchport mode trunk
- Switch(config-if)#switchport trunk native vlan 5
- Switch(config-if)#end
- Switch#



Questions and Answers