

Cyberpatriot

Internet Operating System (IOS) Fundamentals

Agenda

- **IOS**
- **Cisco Networking Devices**
- **Interfaces**
- **Switching 101**
- **VLANs**
- **Routing 101**
- **Basic IOS Commands**

Agenda

IOS

IOS – The “Brains Behind The Magic”

Cisco IOS® Software is the world's leading network infrastructure software, delivering a seamless integration of technology innovation, business-critical services, and hardware platform support. Currently operating on millions of active systems, ranging from the small home office router to the core systems of the world's largest service provider networks, Cisco IOS Software is the most widely leveraged network infrastructure software in the world.

Cisco IOS (originally **Internetwork Operating System**) is software used on [Cisco Systems routers](#) and current Cisco [network switches](#). IOS is a software package of routing, switching, internetworking and telecommunications functions integrated into a [multitasking](#) operating system.

Agenda

Basic IOS Commands & Configuration

Basic IOS Modes and Commands

- **User EXEC Mode**

The default command mode for the CLI is user EXEC mode. The EXEC commands available at the user EXEC level are a subset of those available at the privileged EXEC level. In general, the user EXEC commands allow you to connect to remote devices, change terminal settings on a temporary basis, perform basic tests, and list system information. The prompt for user EXEC mode is the name of the device followed by an angle bracket: Router>.

- **Privileged EXEC Mode**

Privileged EXEC mode is password protected, and allows the use of all EXEC mode commands available on the system. To enter privileged EXEC mode from user EXEC mode, use the enable command. Privileged EXEC mode allows access to global configuration mode through the use of the enable command. The privileged EXEC mode prompt consists of the device's host name followed by the pound sign: Router# .

- **Global Configuration Mode**

Global configuration commands generally apply to features that affect the system as a whole, rather than just one protocol or interface. You can also enter any of the specific configuration modes listed in the following section from global configuration mode.

To enter global configuration mode, use the configure terminal privileged EXEC command. The router prompt for global configuration mode is indicated by the term config in parenthesis: Router(config)#

- ? – View available commands
- enable – Privileged EXEC Mode
- configure terminal – Global Configuration Mode
- enable password – Set privileged password
- show – View information about specific things on router
- exit – Back up one level
- end – Exit back to global command line
- write memory – Save your configurations
- logout

Switch Configuration

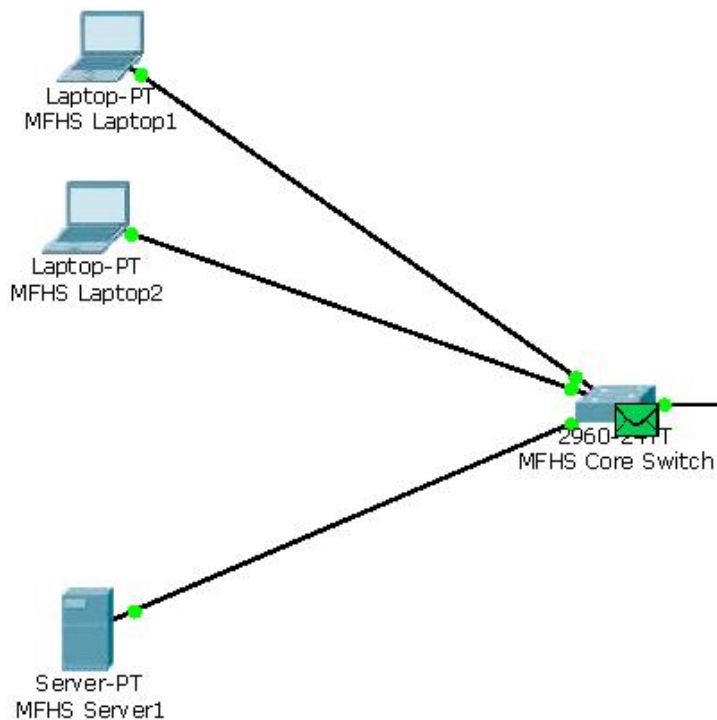
- enable Privileged EXEC Mode
- configure terminal
- enable password (ex. Cisco)
- hostname (ex. MFHS_Switch) no spaces allowed in hostname
- interface (ex. fastethernet 0/1)
- description (ex. Connection MFHS Laptop1) any description you wish
- ip address (ex. 10.1.2.2 255.255.255.0) ip address and subnet mask
- switchport access vlan 2 (ex. Sets port to access only vlan 2) or...
- switchport mode trunk (ex. Sets port to trunk all Vlans)
- end
- write memory **(ALWAYS, ALWAYS, ALWAYS SAVE YOUR WORK)**

Router Configuration

- enable Privileged EXEC Mode
- configure terminal
- hostname (ex. MFHS_Router) no spaces allowed in hostname
- interface (ex. gigabit 0/0) and/or...
- interface (ex. gigabit 0/0.2 when setting up Vlan Trunk)
- description (ex. Connection HSH Router) any description you wish
- ip address (10.1.100.1 255.255.255.0) ip address and subnet mask
- encapsulation dot1q 2 (ex. Set when trunking vlan 2)
- end
- write memory **(ALWAYS, ALWAYS, ALWAYS SAVE YOUR WORK)**

End-Point Configuration

- Name Your Device (ex. HSH iPad)
- IP Address (ex. 10.1.4.100)
- Subnet Mask (ex. 255.255.255.0)
- Default Gateway (ex. 10.1.4.1)



PDU Information at Device: MFHS Core Switch

OSI Model

Inbound PDU Details

Outbound PDU Details

At Device: MFHS Core Switch

Source: MFHS Laptop1

Destination: 10.1.2.3

In Layers

Layer7

Layer6

Layer5

Layer4

Layer3

Layer 2: Ethernet II Header

0001.42D7.320B >>

0001.63D1.814C

Layer 1: Port FastEthernet0/1

Out Layers

Layer7

Layer6

Layer5

Layer4

Layer3

Layer 2: Ethernet II Header

0001.42D7.320B >>

0001.63D1.814C

Layer 1: Port(s): FastEthernet0/2

1. FastEthernet0/1 receives the frame.

Challenge Me

<< Previous Layer

Next Layer >>

Thank you.

