

## Cisco IOS

**Cisco Internetwork Operating System (IOS)** is a family of network operating systems used on many Cisco Systems routers and current Cisco network switches.

The **IOS** is stored in the flash memory. It is an image file having specific naming convention.

The ***show version*** command shows the version of the IOS image:

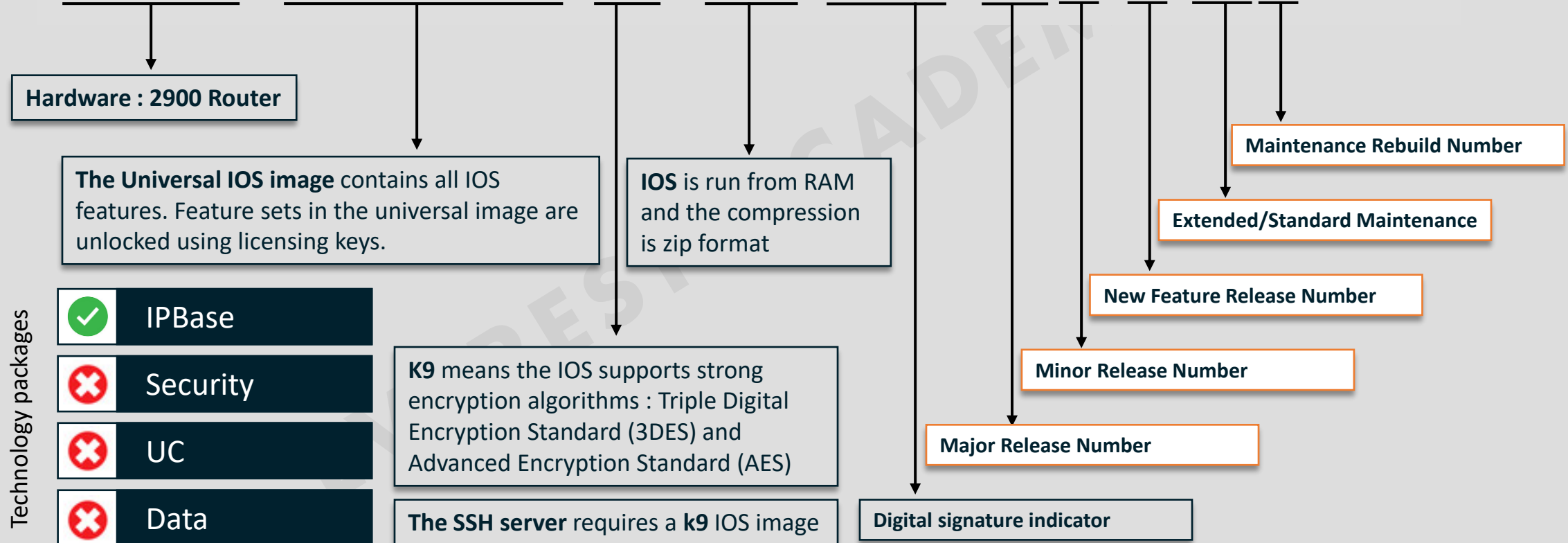
```
Router#
Router#show version
Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.1(4)M4,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Thurs 5-Jan-12 15:41 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco2911 uptime is 17 hours, 24 minutes, 41 seconds
System returned to ROM by power-on
System image file is "flash0:c2900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload
```



## Cisco IOS 15 Naming Convention

# c2900-universalk9-mz.SPA.151-1.M4.bin



## Universal IOS Image

**Universal IOS Image** Includes all the available features in a model

**IP Base Technology Package** is enabled by default.

**Four technology packages available:** IP Base, Security, UC and Data.

**Security, UC and Data Technology Package** licenses activate more features.

Technology packages



IPBase : RIP, OSPF, EIGRP, BGP, Multicast ...



Security : VPN, SSL, IPSec ...

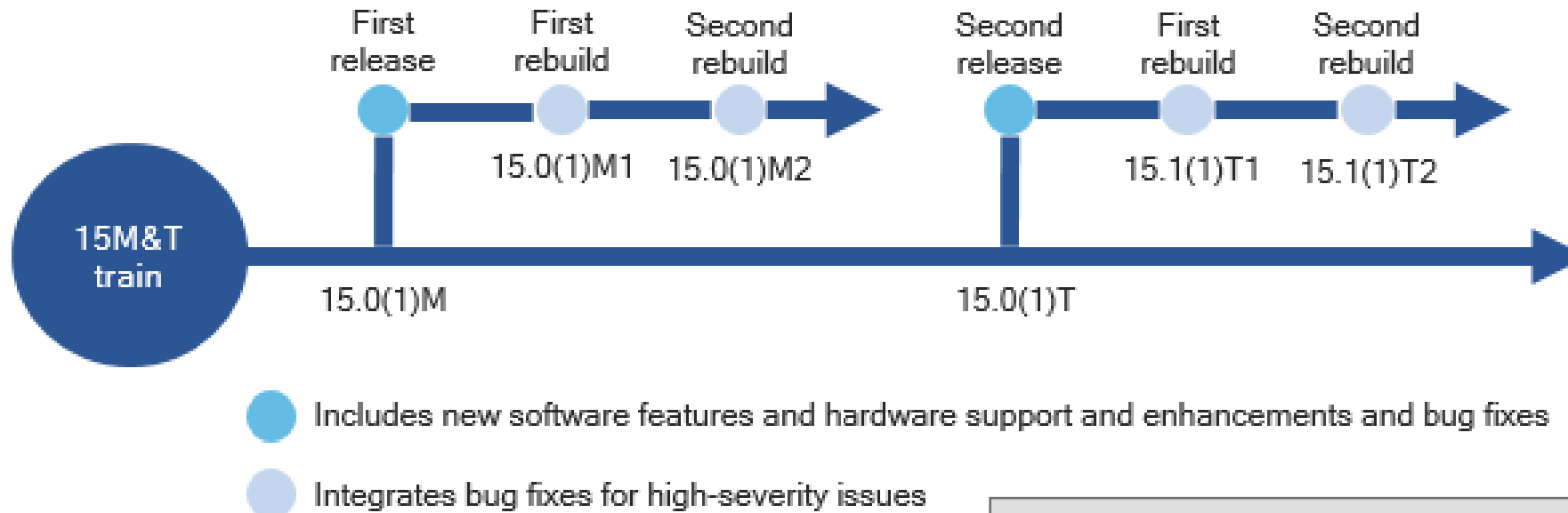


UC (Unified Communication) : Voice Gateway, DSP ...



Data : MPLS, IP SLA ...





**150-1.M1.bin**

Major Release Number

Minor Release Number

New Feature Release Number

Extended/Standard Maintenance

Maintenance Rebuild Number

## Hostname command

```
Router> enable
```

```
Router# configure terminal
```

```
Router(config)# hostname RouterA
```

```
RouterA(config)# end
```

```
RouterA#
```

```
Switch> enable
```

```
Switch# configure terminal
```

```
Switch(config)# hostname SwitchA
```

```
SwitchA(config)# end
```

```
SwitchA#
```



## Clock Timezone & Clock Set Commands

RouterA> *enable*

RouterA# *configure terminal*

RouterA(config)# *clock timezone India +5 30*

RouterA(config)# *end*

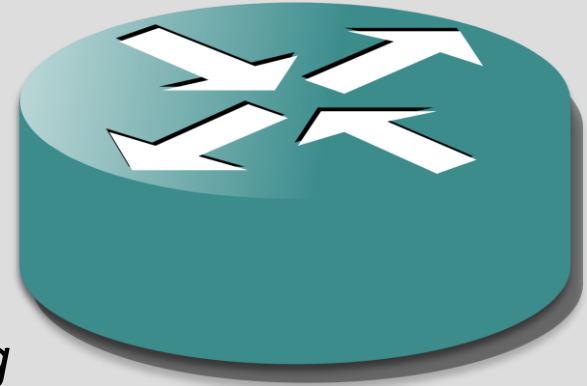
RouterA# *clock set 23:30:00 23 Feb 2021*

RouterA# *show clock*



## Cisco IOS Basic Commands

```
Router> enable
Router# configure terminal
Router(config)# hostname RouterA
RouterA(config)# enable password cisco
RouterA(config)# enable secret ccna
RouterA(config)# clock timezone India +5 30
RouterA(config)# end
RouterA# clock set 23:30:00 23 Feb 2021
RouterA# terminal history size 50
RouterA# copy running-config startup-config
RouterA# show clock
RouterA# show history
RouterA# show running-config
RouterA# show startup-config
```



## Terminal History Command

RouterA> *enable*

RouterA# *terminal history size 50*

RouterA# *show history*





## Enable Password and Enable Secret Commands

RouterA> *enable*

RouterA# *configure terminal*

RouterA(config)# *enable password cisco*

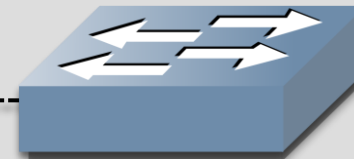
RouterA(config)# *enable secret ccna*

RouterA(config)# *end*

RouterA# *disable*

RouterA> *enable*

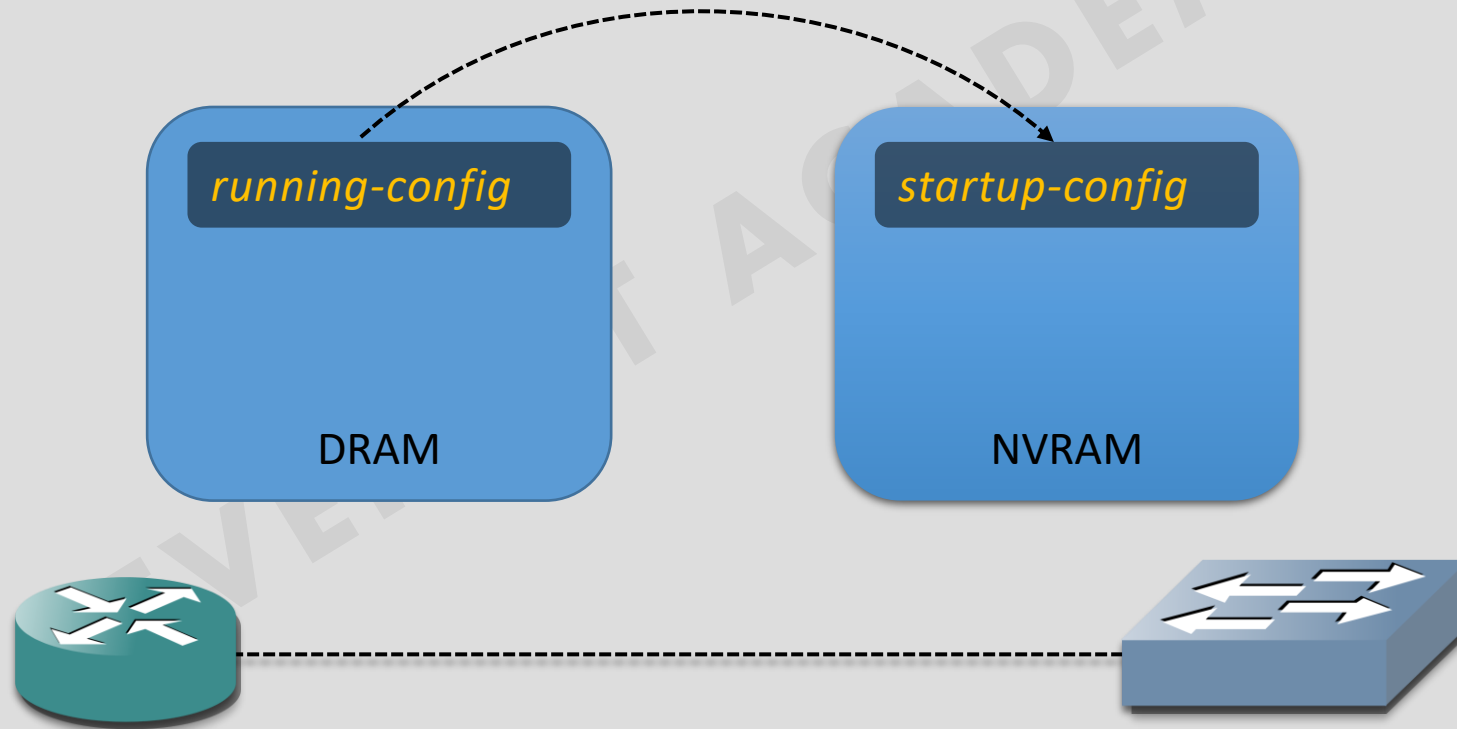
Password:



## Copy Running-config Startup-config Command

RouterA> *enable*

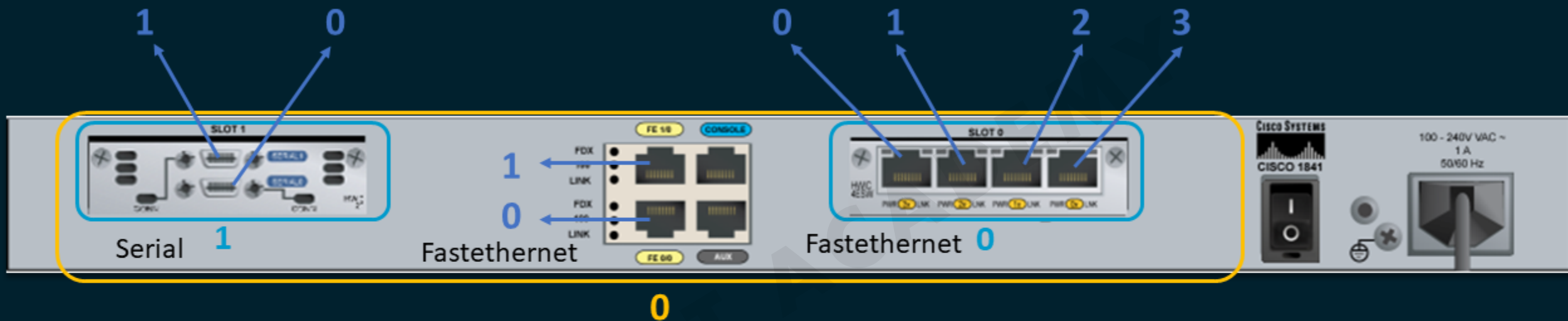
RouterA# *copy running-config startup-config*



## Interface Naming Convention

### Cisco 1841 Router





Serial 0/1/0

Serial 0/1/1

FastEthernet 0/0

FastEthernet 0/1

FastEthernet 0/0/0

FastEthernet 0/0/1

FastEthernet 0/0/2

FastEthernet 0/0/3



## Interface Naming Convention

Router> *enable*

Router#*show ip interface brief*

Switch> *enable*

Switch# *show interfaces status*



## Configuring Switch Interfaces

Switch> *enable*

Switch# *show version*

Switch# *show ip interface brief*

Switch# *show interfaces status*

Switch# *configure terminal*

Switch(config)# *interface fastethernet 0/1*

Switch(config-if)# *switchport*

Switch(config-if)# *switchport mode access*

Switch(config-if)# *duplex full*

Switch(config-if)# *speed 100*

Switch(config-if)# *no shutdown*

Switch(config-if)# *end*

Switch# *show interface fastethernet 0/1*



## Configuring Switch Interfaces

```
Switch# configure terminal  
Switch(config)# interface vlan 1  
Switch(config-if)# ip address 192.168.1.253 255.255.255.0  
Switch(config-if)# no shutdown  
Switch(config-if)# end  
Switch#
```



## Interface IP Address Configuration

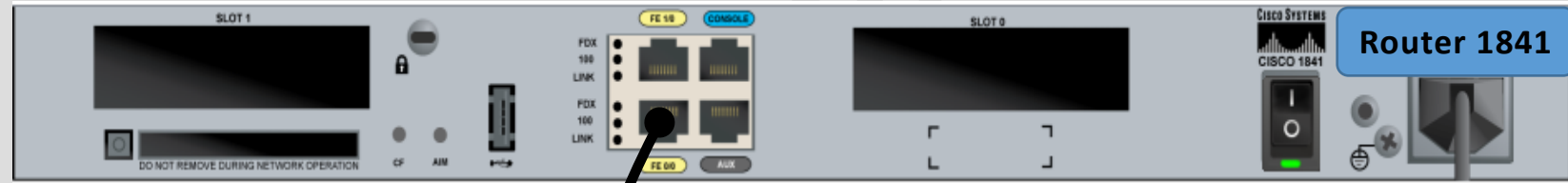
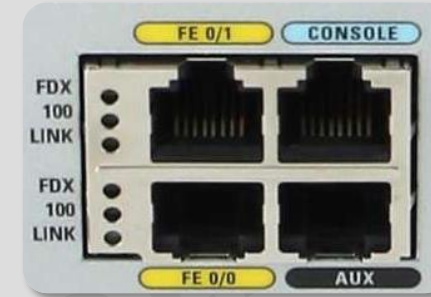
### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



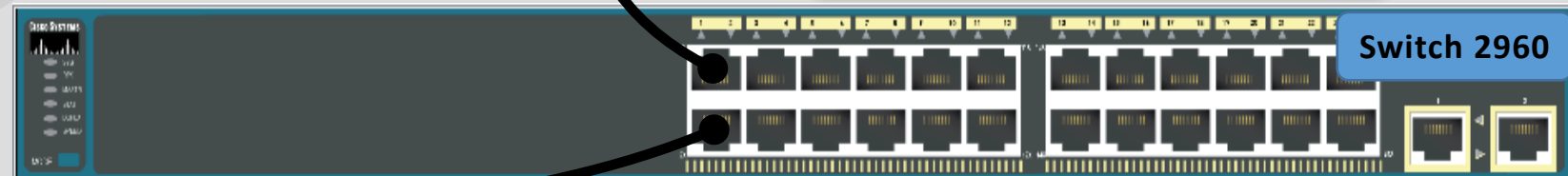
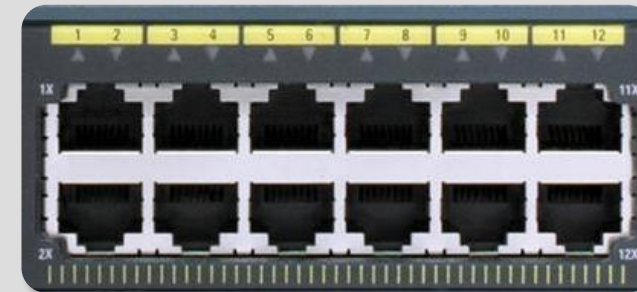
### Fastethernet 0/0

IP Address : 192.168.1.1  
Subnet Mask : 255.255.255.0



### Vlan 1

IP Address : 192.168.1.2  
Subnet Mask : 255.255.255.0





## Interface IP Address Configuration

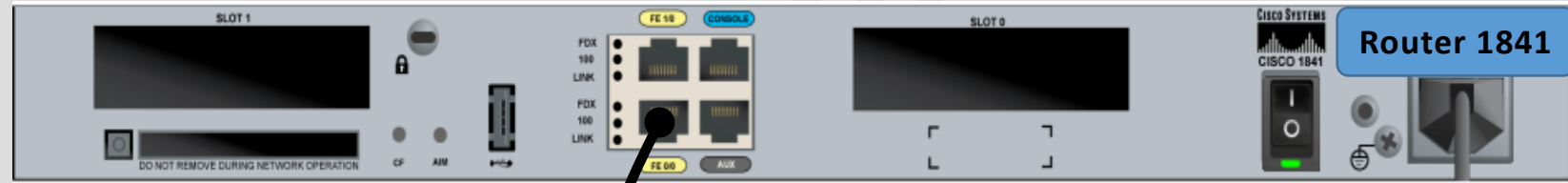
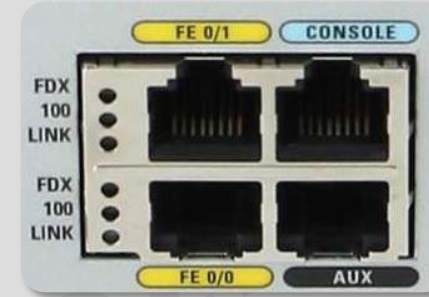
### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



### Fastethernet 0/0

IP Address : 192.168.1.1  
Subnet Mask : 255.255.255.0



```
Router> enable
Router# configure terminal
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# end
Router# copy running-config startup-config
```



## Interface IP Address Configuration

### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



```
Switch> enable
```

```
Switch #configure terminal
```

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

```
Switch(config-if)# ip address 192.168.1.2 255.255.255.0
```

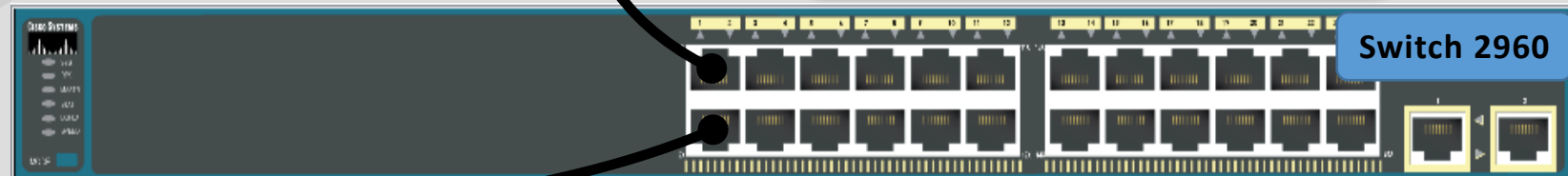
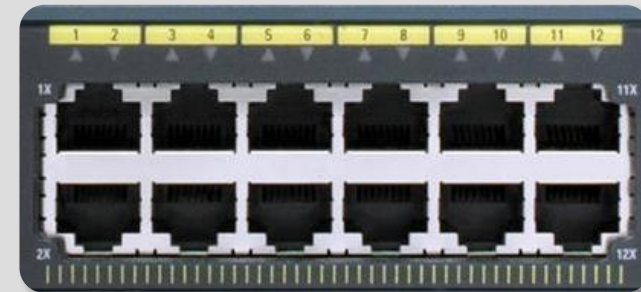
```
Switch(config-if)# no shutdown
```

```
Switch(config-if)# end
```

```
Switch #copy running-config startup-config
```

### Vlan 1

IP Address : 192.168.1.2  
Subnet Mask : 255.255.255.0



## Interface IP Address Configuration

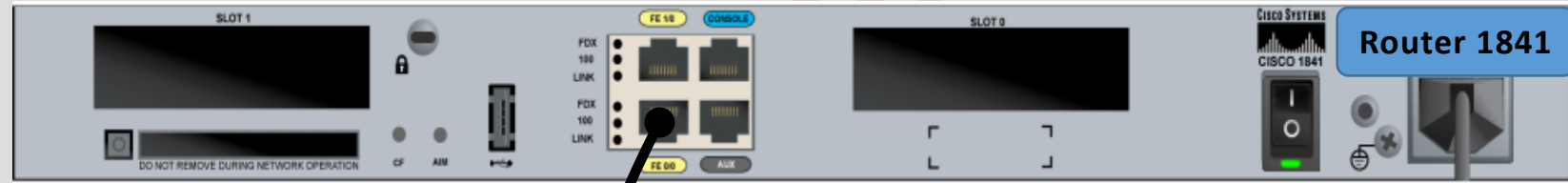
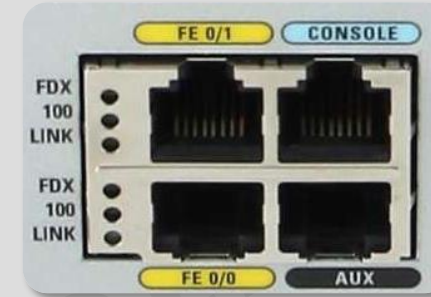
### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



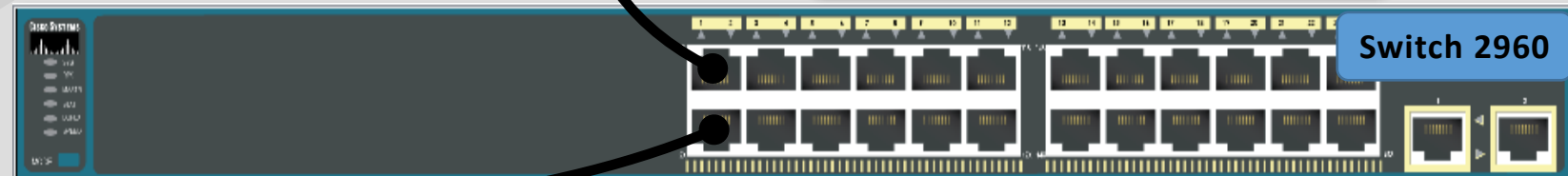
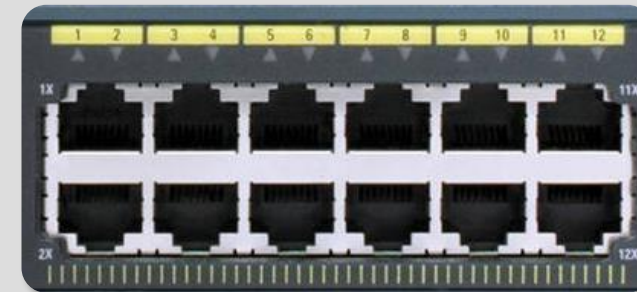
### Fastethernet 0/0

IP Address : 192.168.1.1  
Subnet Mask : 255.255.255.0



### Vlan 1

IP Address : 192.168.1.2  
Subnet Mask : 255.255.255.0



## Interface IP Address Configuration

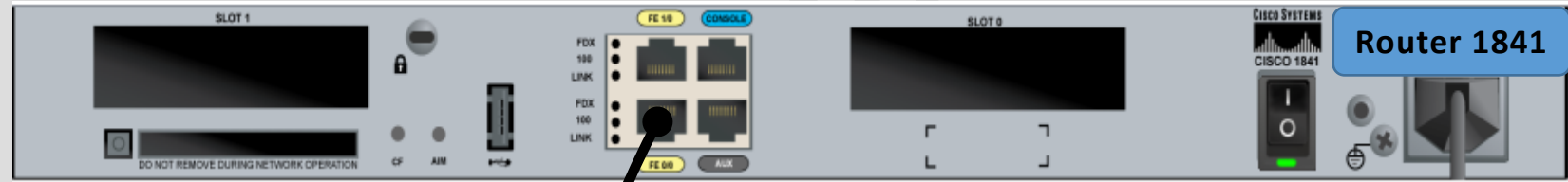
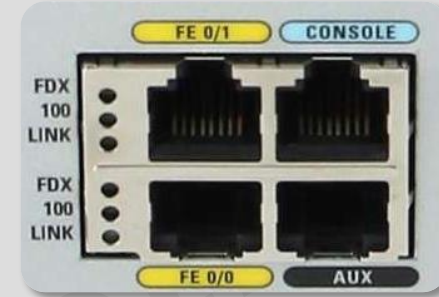
### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



### Fastethernet 0/0

IP Address : 192.168.1.1  
Subnet Mask : 255.255.255.0



```
Router> enable
Router# configure terminal
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# end
Router# copy running-config startup-config
```



## Interface IP Address Configuration

### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



```
Switch> enable
```

```
Switch #configure terminal
```

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

```
Switch(config-if)# ip address 192.168.1.2 255.255.255.0
```

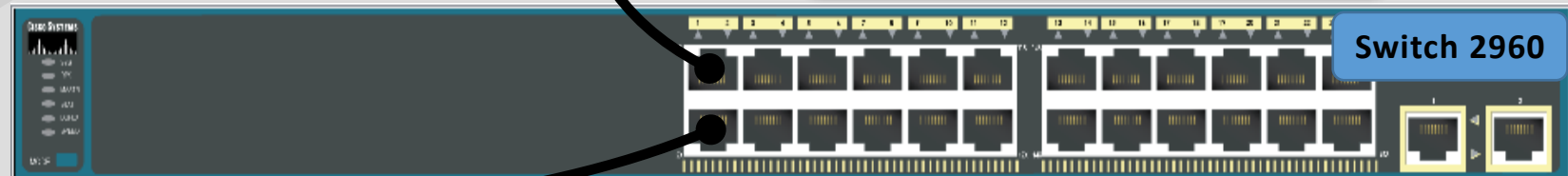
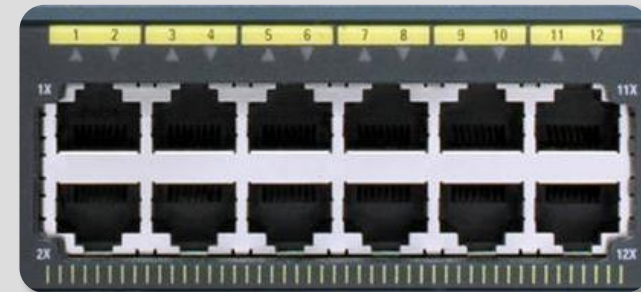
```
Switch(config-if)# no shutdown
```

```
Switch(config-if)# end
```

```
Switch #copy running-config startup-config
```

### Vlan 1

IP Address : 192.168.1.2  
Subnet Mask : 255.255.255.0





## SSH Configuration

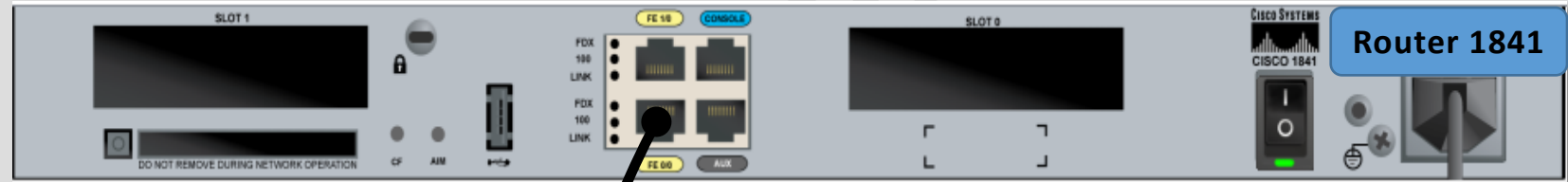
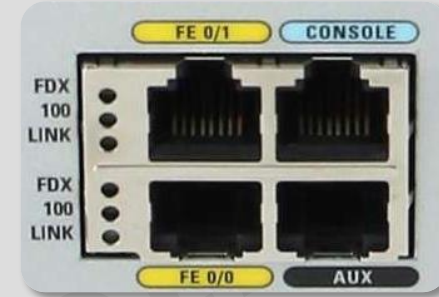
### Fastethernet 0

IP Address : 192.168.1.3  
Subnet Mask : 255.255.255.0



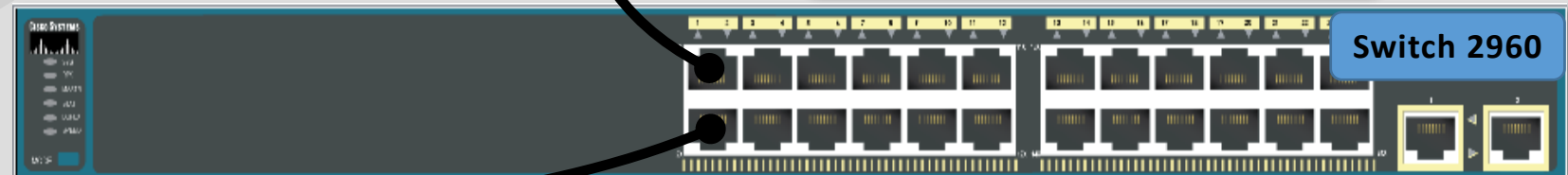
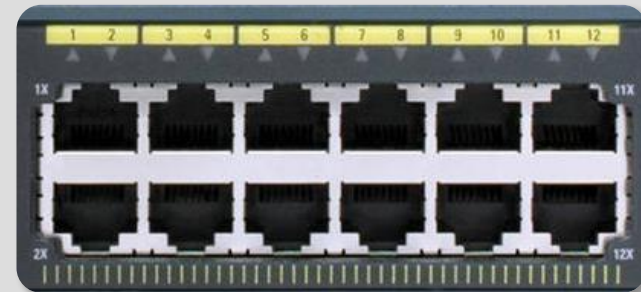
### Fastethernet 0/0

IP Address : 192.168.1.1  
Subnet Mask : 255.255.255.0

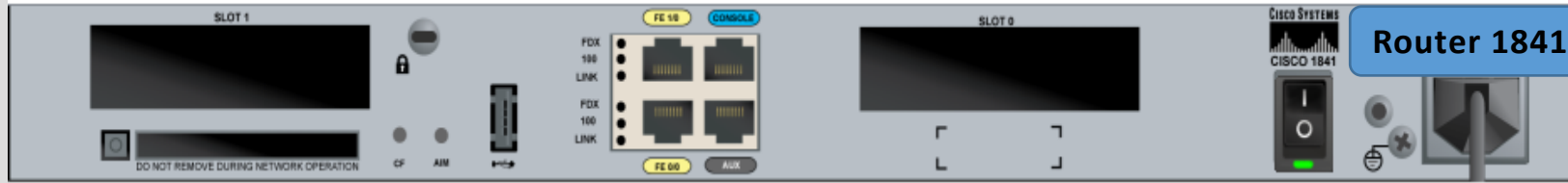


### Vlan 1

IP Address : 192.168.1.2  
Subnet Mask : 255.255.255.0



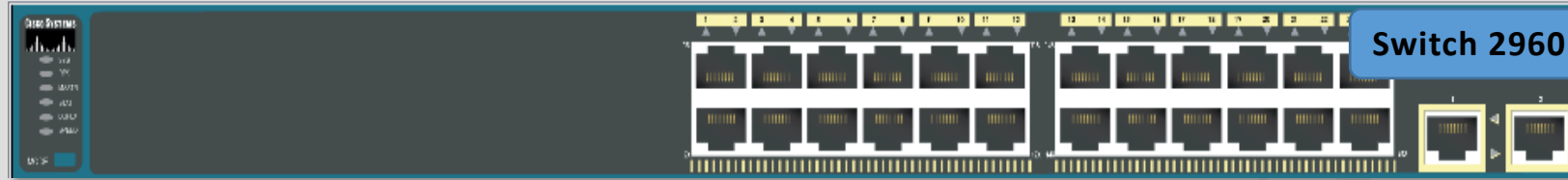
## SSH Configuration



```
Router> enable
Router# configure terminal
Router(config)# hostname RouterA
RouterA(config)# enable secret cisco
RouterA(config)# interface fastethernet 0/0
RouterA(config-if)# ip address 192.168.1.1 255.255.255.0
RouterA(config-if)# no shutdown
RouterA(config-if)# exit
RouterA(config)# username admin password ccna
RouterA(config)# ip domain-name everestacademy.in
RouterA(config)# crypto key generate rsa
How many bits in the modulus [512]: 1024
RouterA(config)# line vty 0 4
RouterA(config-line)# transport input ssh
RouterA(config-line)# login local
RouterA(config-line)# end
RouterA# copy running-config startup-config
```



## SSH Configuration



```
Switch> enable
Switch# configure terminal
Switch(config)# hostname SwitchA
SwitchA(config)# enable secret cisco
SwitchA(config)# interface vlan 1
SwitchA(config-if)# ip address 192.168.1.2 255.255.255.0
SwitchA(config-if)# no shutdown
SwitchA(config-if)# exit
SwitchA(config)# username admin password ccna
SwitchA(config)# ip domain-name everestacademy.in
SwitchA(config)# crypto key generate rsa
How many bits in the modulus [512]: 1024
SwitchA(config)# line vty 0 4
SwitchA(config-line)# transport input ssh
SwitchA(config-line)# login local
SwitchA(config-line)# end
SwitchA #copy running-config startup-config
```





## Cisco Router Booting Process

