CISCO IOS

STEP BY STEP CLI GUIDE

Configuration Labs

Learn to Configure and Manage Cisco Switch / Router /Firewall with CLI

Emin Yardim


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CONFIGURATION STEP BY STEP CLI GUIDE

Configure and Manage
CISCO Switch / Router /Firewall with CLI
This course book will take you from A to Z to prepare configuration for CISCO (IOS) devices.

INTRODUCTION

• Learn to Configure basic connectivity
• Commands on a switch / router
• Set a Static Route and Ip Address

• Perform basic (startup) configuration tasks on a switch / router

• CISCO Configure Command Line
• and Much More!
This will help you how configure your juniper devices % 100
****

The IOS command-line interface (CLI) is a CISCO specific command shell that runs on top of a UNIX-based operating system kernel. By leveraging industry-standard tools and utilities, the CLI provides a powerful set of commands that you can use to monitor and configure devices running IOS.

This BOOK contains information about the Junos OS CLI. There are many real configuration examples.

Erasing Switch Configuration

In the event that your switch runs Cisco IOS, it keeps up a running setup record and a startup setup record, both of which you wish to clear.

Take after these steps:

1. Log on to your switch, and enter the privileged EXEC mode by entering enable and after that entering the enable password command.

2. Enter write erase, which eradicates the NVRAM record framework and evacuates all files.
3. At the provoke, confirm simply need to delete all files.

4. Enter reload, and enter no when provoked whether to spare the setup. (otherwise, the switch will reload the current running configuration.)

5. Confirm that you simply need to reload the switch, and your switch setup is nearly clean.
Once the Switch has rebooted run the command show vlan, you will note that the vlan configurations are still there, that

is because they are stored in the flash memory in the vlan.dat file and we also need to delete this for complete removal of the configuration.

```
Switch>enable
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa1/0/5, Fa1/0/6, Fa1/0/7
                                                 Fa1/0/8, Fa1/0/9, Fa1/0/10
                                                 Fa1/0/11, Fa1/0/12, Fa1/0/13
                                                 Fa1/0/14, Fa1/0/15, Fa1/0/16
                                                 Fa1/0/17, Fa1/0/18, Fa1/0/19
                                                 Fa1/0/20, Fa1/0/21, Fa1/0/22
                                                 Fa1/0/23, Fa1/0/24, Gi1/0/1
                                                 Gi1/0/2
10   Accounting                        active    Fa1/0/1, Fa1/0/3
20   HumanResources                    active    Fa1/0/2, Fa1/0/4
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  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
 --More--
```

Caption By Following all of the above processes we can completely remove the switch configuration.

Cisco IOS installation

Following are the steps that are used to upgrade or installing the ios in both switches and routers.

- **Verify Current IOS Version**
- **Delete Old IOS**

Verify Current IOS Version

Confirm Current IOS version.

```
# show switch
Switch/Stack Mac Address : 0012.abcd.1234
                                            H/W   Current
Switch#  Role   Mac Address     Priority Version  State
-----------------------------------------------------------
*1       Master 0012.abcd.1234     10     0       Ready
 2       Member 0012.abcd.2345     1      0       Ready
```

Delete Old IOS

Since we'll be downloading the new IOS image and moving it to the flash card, we require a few space. So, erase the current old image from the flash card.

Copy the IOS image to Cisco Switch

To exchange the IOS image from your portable workstation to Cisco Switch, you should run a TFTPserver on your portable workstation (or on the framework where you've downloaded the

- **Copy the IOS image to Cisco Switch**
- **Save Config and Restart the Switch**

```
# copy tftp flash1

>Address or name of remote host? 192.168.1.10

>source filename? c3750-ipbasek9-mz-122-55.SE1.bin

>Destination filename? c3750-ipbasek9-mz-122-55.SE1.bin
```

NOW , Save Config and Restart the Switch
After restarting the switch new ios will come up and start running.

Adding Banner

Following are the steps for adding up banner on switch or router.
Switch# ena
Switch# config t

```
##################################################
#                                                #
#    YOU ARE ACCESSING A RESTRICTED SYSTEM.      #
#                                                #
##################################################


User Access Verification

Password:
```

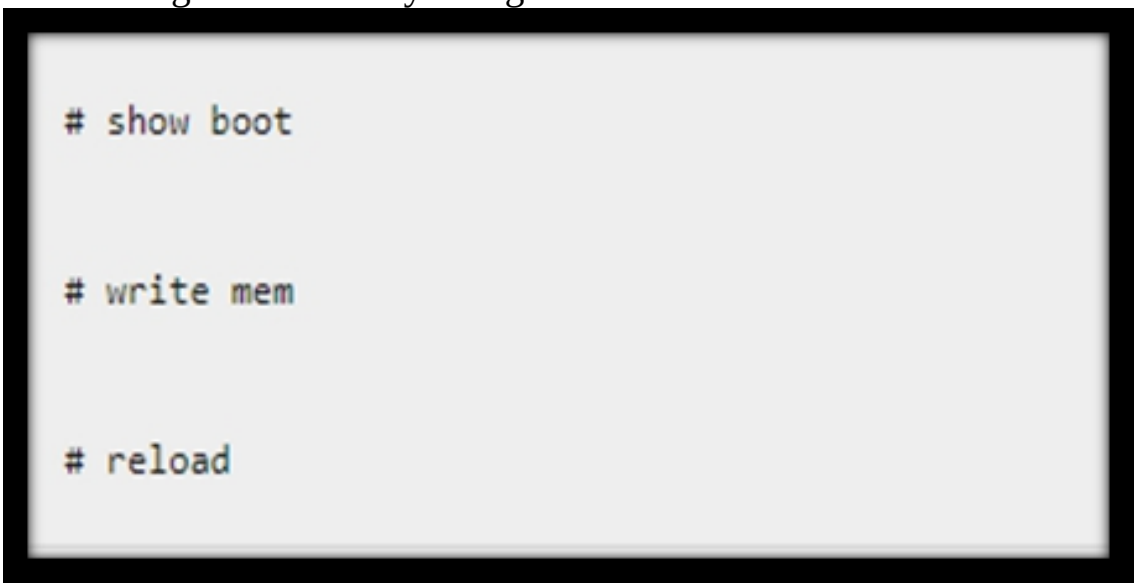
Switch# banner motd ~
Create Users Create a new user with the right privilege level.

Create Users and Login in Cisco Router Or Switch

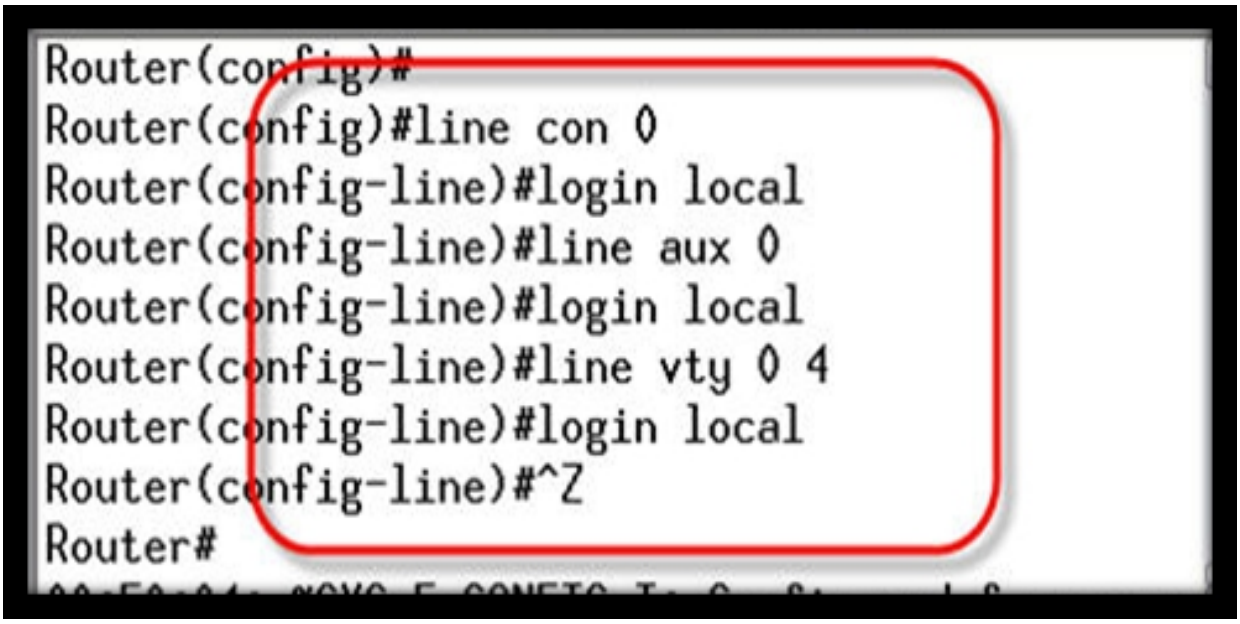
Router# service password-encryption
Router(config)# username admin priv 15 pass password.

For creating a new user account on your Cisco Router\switch we need to do the following steps.

Authentication
Router(config)# line vty 0 5
Router(config)# login local
• **Create a new account**
Router(config)# line con 0
• **Configure the device**
Router(config)# login local
Router(config)# line aux 0
Router(config)# login local
Save configuration and try to log on.



• **Allow Local USER Login**
• **Changing TimeZone**
ALLOW LOCAL USER LOGIN



Changing TimeZone

To configure the time zone offset from Coordinated Universal Time (UTC), use the clock timezone command. To revert to the default, use the no form of this command.

- **Changing Hostname**
- **Domain Look Up**
- **Domain Look Up Disabling**

Changing Hostname

In order to change the hostname of the router or switch following are the commands that we need to run.

Switch(config)# hostname MySwitch

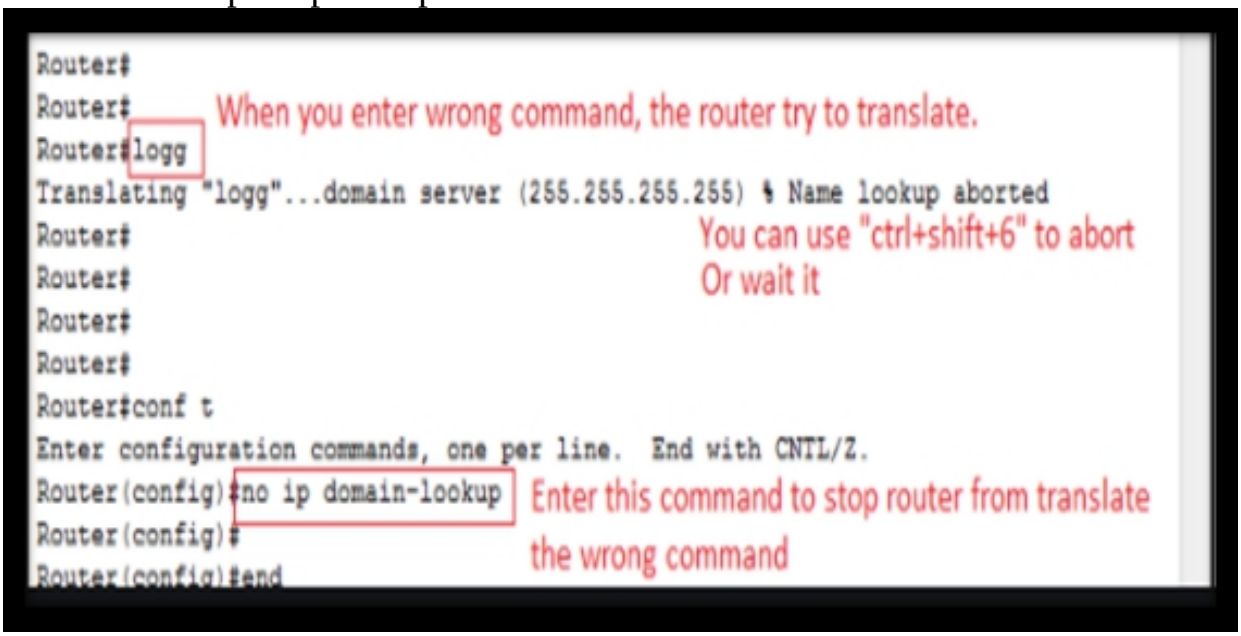
Switch(config)# end

Domain Look Up

The domain look up is basically DNS name-to-IP address translation on the router. The Internet's global naming scheme, the DNS, accomplishes this task. This service is enabled by default. Use the ip domain-lookup command to enable DNS host name-to-IP address translation on the router.

Domain Look Up Disabling

In order to disable domain lookup we need to type "no ip domain-lookup" at the command prompt and press “Enter.”



SWITCH SECURITY

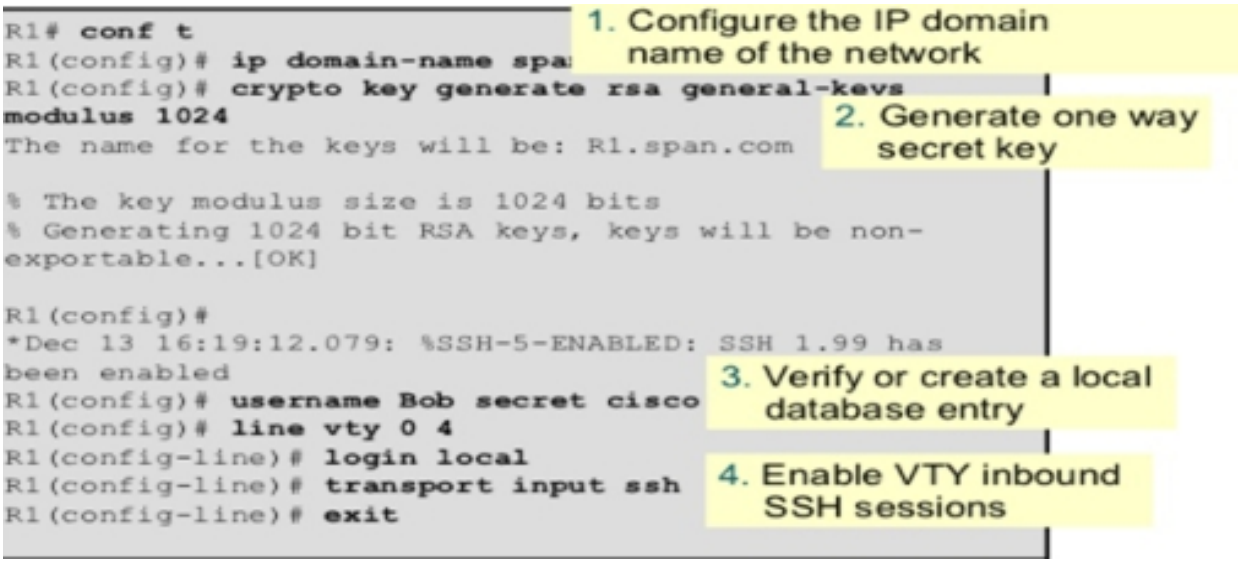
Secure Shell (SSH)

Secure Shell (SSH) is a protocol that provides a secure (encrypted) management connection to a remote device. SSH provides security for remote connections by providing strong encryption when a device is authenticated (username and password) and also for the transmitted data between the communicating devices. SSH is assigned to TCP port 22.

For configuring the SSH we need to first verify SSH support. Use the show ip ssh command to verify that the switch supports SSH.
If the switch is not running an IOS that supports cryptographic features, this command is unrecognized. Configure the IP domain.
Configure the IP domain name of the network using the ip domain-name domainname global configuration mode command.
■ Generate RSA key pairs. Generating an RSA key pair automatically enables SSH. Use the crypto key generate rsa global configuration mode command to enable the SSH server on the switch and generate an RSA key pair.

Commands

#configure terminal
#hostname hostname
#ip domain-name domain_name
#crypto key generate rsa
#end



#show running-config

Telnet Configuration

A device can be managed either locally or remotely. There are various protocols, tools, and services (such as Telnet, Secure Shell) that are used to manage devices remotely. These tools are also referred as remote administration tools. Similar to Cisco routers, a Cisco switch can also be managed using the remote administrator tool as Telnet

Commands

```
Switch1(config)#line vty 0 4
Switch1(config-line)#password 123456
Switch1(config-line)#login
Switch1(config-line)#exit
```

Switch Configuration Modes

User EXEC Mode

After you access the device, you are automatically in user EXEC command mode. The EXEC commands available at the user level are a subset of those available at the privileged level. In general, use the user EXEC commands to temporarily change terminal settings, perform basic tests, and list system information.

Privileged Exec Mode

The privileged command set includes those commands contained in user EXEC mode, as well as the configure privileged EXEC command through which you
access the remaining command modes.
If your system administrator has set a password, you are prompted to enter it before being granted access to privileged EXEC mode. The password does not appear on the screen and is case sensitive.
The privileged EXEC mode prompt is the device name followed by the pound sign

```
Switch#
```

Enter the enable command to access privileged EXEC mode:

```
Switch> enable
Switch#
```

Global Configuration Mode

Global configuration commands apply to features that affect the device as a whole. Use the configure privileged EXEC command to enter global configuration mode. The default is to enter commands from the management

console.
When you enter the configure command, a message prompts you for the source of the configuration commands:
Switch# configure
Configuring from terminal, memory, or network [terminal]?
Switch(config)# ?
Interface Configurations
Interface configuration commands modify the operation of the interface.
Interface configuration commands always follow a global configuration command, which defines the interface type.
Use the interface interface-id command to access interface configuration mode. The new prompt means
interface configuration mode. Switch(config-if)#

Interface configuration	From global configuration mode, specify an interface by entering the **interface** command followed by an interface identification.	`Switch(config-if)#`	To exit to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**. To exit to global configuration mode, enter the **exit** command.

ROUTING

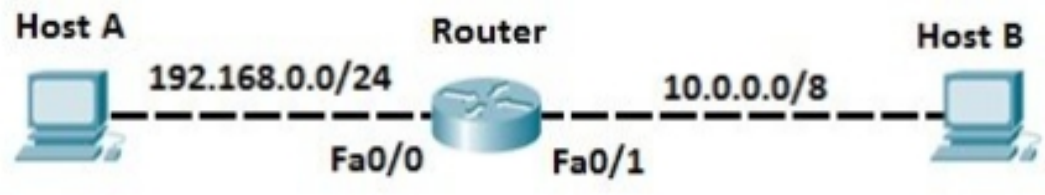
IP routing is the method of sending packets from a host on one network to another host on a different farther network.
Routers look at the destination IP address of a packet , decide the next-hop address, and forward the packet.
Routers utilize routing tables to decide the another hop address to which the packet should be sent.
•

IP Routing

Connected Routes

Subnets straight forwardly associated to a router's interface are included to the router's directing table.

Interface needs to have an IP address arranged and both interface status codes must be within the up and up state. A router will be able to course all parcels ordained for all has in subnets straightforwardly associated to its dynamic interfacing.




```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/1
C    192.168.0.0/24 is directly connected, FastEthernet0/0
Router#
Router#
```

Dynamic Routing

Dynamic routing, moreover called versatile steering, could be a handle where a router can forward information by means of a distinctive route or given goal based on the current conditions of the communication circuits inside a system.

Dynamic routing permits as numerous courses as conceivable to stay valid in reaction to the change. Systems that don't actualize energetic directing are depicted as utilizing static directing, where courses through a organize are depicted by settled ways.

- **Ut facilisis ante in dui ac suscipit turpis donec.**
- **Suspendisse, quasi luctus amet urna tempor amet sit.**
- **Cras volutpat mattis hasellus justo sed, feugiat nunc praesent.**
- **Quam ac ligula risus lectus dapibus, nunc lectus velit.**

A alter, such as the misfortune of a hub, or loss of a connection between hubs, isn't compensated for.
The foremost common dynamic routing conventions utilize exceptionally distinctive calculations for way assurance.

The separate vector based directing calculations trade data only with its quick neighbors and employments that to create jump by jump directing choices, the interface state based calculation trades full state data with all the hubs in a indicated zone, the way vector impanated for.

rip

• The hop count 0 denotes a network that is directly connected to the router.

• 16 hops denote a network that is unreachable, according to the RIP hop limit

• RIP uses the User Datagram Protocol (UDP
• For small business

VERSIONS

• Version 1
• Version 2

Router1(config)# **router rip** Router1(config-router)#	Enables the RIP routing process. This will take you to the router configuration mode.
Router1(config)# **no router rip**	Disables the RIP routing process.
Router1(config-router)# **network *ip_netaddr***	Associates network *ip_netaddr* to RIP. RIP sends updates ONLY to the interfaces with this network address. *ip_netaddr* shall not include the subnet id. More than one network can be added.
Router1(config-router)# **no network *ip_netaddr***	Disables RIP for the specified network.
Router1(config-router)# **passive-interface *interface***	Sets the specified *interface* to RIP passive mode.
Router1(config-router)# **no passive-interface *interface***	Sets the specified *interface* to RIP non-passive mode.
Router1(config-router)# **offset-list 0 in *value interface***	Increases all the incoming metrics in RIP packets received at specified *interface* by *value*.
Router1(config-router)# **offset-list 0 out *value interface***	Increases all the outgoing metrics in RIP packets sent from specified *interface* by *value*.
Router1(config-router)# **no offset-list 0 in/out *value interface***	Disables the specified offset-list.
Router1(config-router)# **version 2**	Sets the RIP version to 2.

CONFIGURATION

```
ripd> enable
ripd# configure terminal
ripd(config)# router rip
ripd(config-router)# version 2
ripd(config-router)# network 10.0.0.0/8
ripd(config-router)# passive-interface eth0
ripd(config-router)# redistribute connected
ripd(config-router)# end
ripd# show ip rip
ripd# exit
```

OSPF

- **Scalability**
- **Adaptability to topology changes**
- **Topology awareness within its operation area**
- **Dynamic routing**
- **For medium networks**

Router1(config)# **router ospf *process-id*** Router1(config-router)#	Enables OSPF routing process. This will take you to the router configuration mode. (Next Line) *process-id* is a numeric value local to the router. This enables one router to have multiple OSPF processes. However, in this lab, you will only use one process. Assign *1* for the *process-id*. Note that it does not have to match *process_id*s on other routers.
Router1(config)# **no router ospf *process-id***	Disables the specified OSPF process.
Router1(config-router)# **network *ip_netaddr wildcard_mask* area *area_id*** Example: Router1(config-router)# **network 10.0.0.0 0.255.255.255 area 1**	*ip_addr* is the network address on which the OSPF process runs. *Wildcard_mask* helps in reducing configuration lines. 0 is a match bit and 1 is a don't care bit. The *area_*id is the area that interfaces are in specified by the *ip_addr* and *wildcard_mask*. (From the example, all interfaces whose 1st byte equals 10 belongs to area 1). *Area 0* is reserved for Backbone area.
Router1(config-router)# **no network *ip_addr wildcard_mask* area *area_id***	Disables OSPF on the specified network area.
Router1(config-router)# **passive-interface *interface***	Sets the specified interface (eth0) to passive mode.
Router1(config-router) **no passive-interface *interface***	Sets the specified interface (eth0) to non-passive mode (actively participates in OSFP algorithm).
Router1# **show ip ospf**	Displays general information about OSPF

CONFIGURATION

```
configure terminal
config)# router ospf
config-router)# router-id 10.0.0.1
config-router)# network 10.0.0.1/32 area 0.0.0.0
config-router)# interface swp31
config-if)# ip ospf network point-to-point
config-if)# interface swp32
config-if)# ip ospf network point-to-point
config-if)# exit
config)# exit
write memory
```

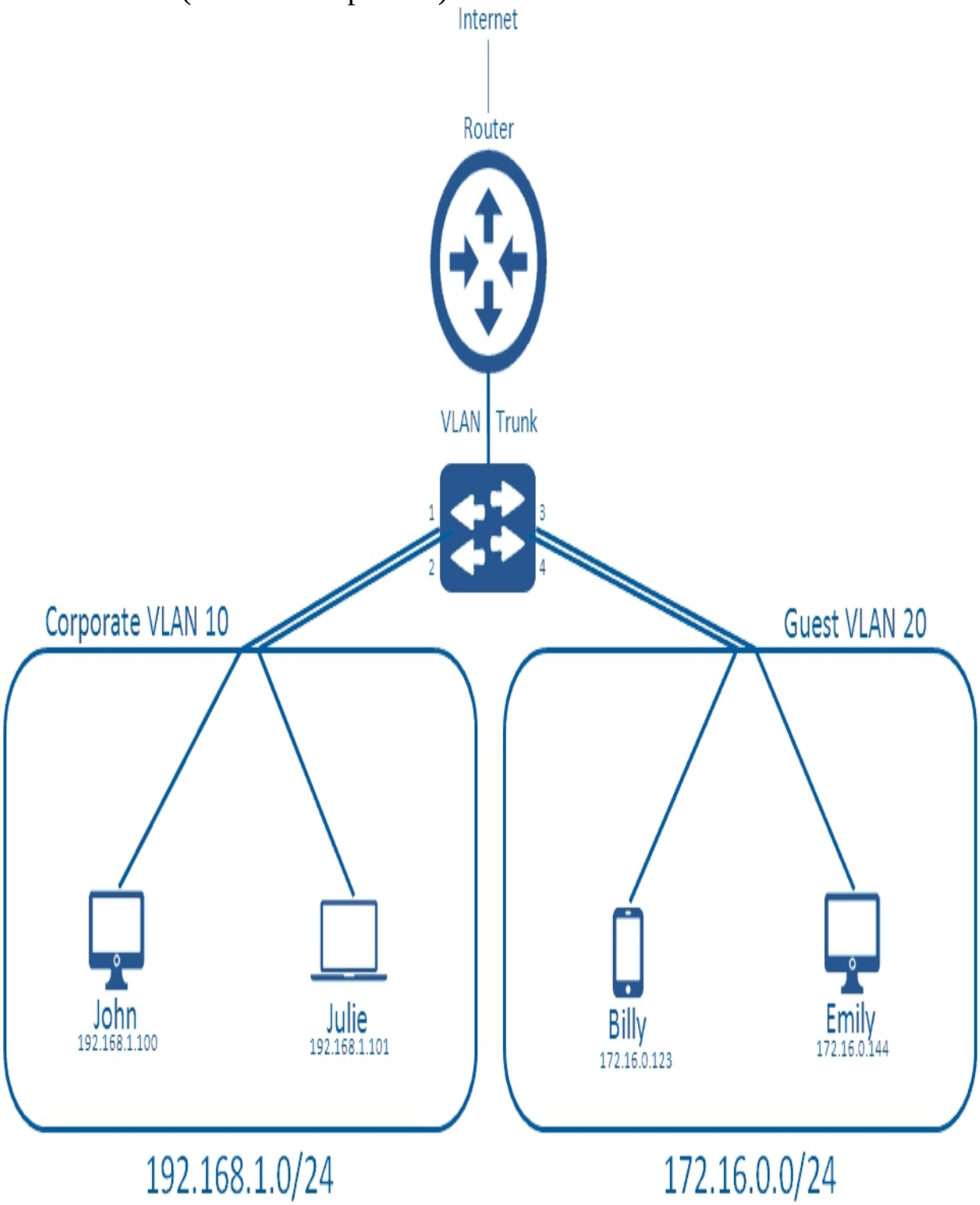
VLANS

A VLAN could be a bunch of devices on one or more LANs that are arranged to communicate as in the event that they were attached to the same wire, when in reality they are found on a number of different LAN segments. Because VLANs are based on consistent rather than physical connections, they are greatly adaptable.

Vlans Parameters:

• VLAN name
• VLAN Number
• VLAN type

• VLAN state (active or suspended)



• Maximum transmission unit (MTU) for the VLAN
• Security Association Identifier (SAID)

• VLAN number to use when translating from one VLAN type to another

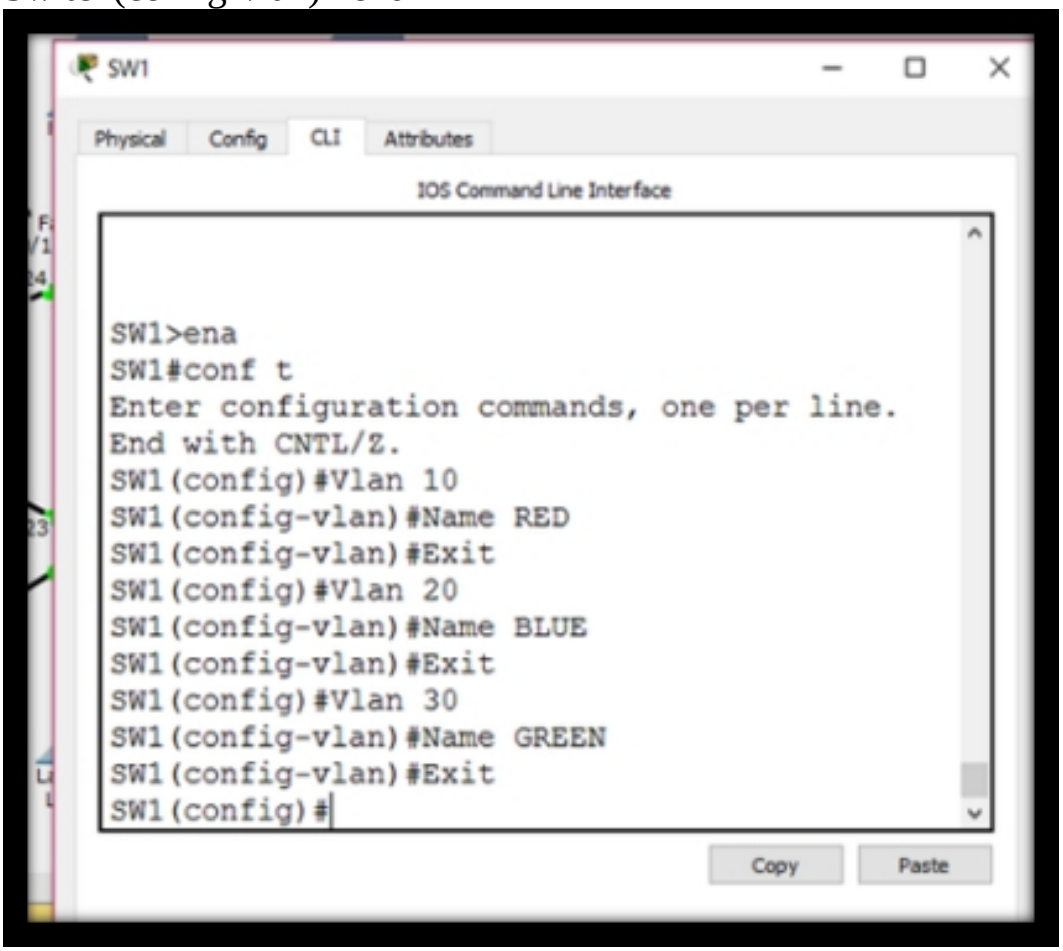
VLANS Ranges

Parameter	Default	Valid Values
VLAN ID	1	1–4094
VLAN name	VLAN*x*, where *x* is a number assigned by the software.	No range
802.10 SAID	100,001	1–4,294,967,294
MTU size	1500	1500–18,190
Translational bridge 1	1002	0–1005
Translational bridge 2	1003	0–1005
VLAN state	active	active; suspend; shutdown

VLANS Configurations

Switch# configure terminal
Switch(config)# vlan 3
Switch(config-vlan)# vlan name

Switch(config-vlan)# end



PORT SECURITY

• Ut facilisis ante in dui ac suscipit turpis donec.

Port security may be a layer two activity control highlight on Cisco Catalyst switches.
It empowers an administrator arrange person switch ports to permit as it were a indicated number of source MAC addresses ingressing the port.
Its essential utilize is to discourage the expansion by clients of "imbecilic" switches to illicitly amplify the reach of the arrange (e.g. so that two or three clients can share a single get to port).

The expansion of unmanaged gadgets complicates investigating by chairmen and is best maintained a strategic distance from.

- **Suspendisse, quasi luctus amet urna tempor amet sit.**
- **Cras volutpat mattis hasellus justo sed, feugiat nunc praesent.**
- **Quam ac ligula risus lectus dapibus, nunc lectus velit.**

Enabling Port Security

Switch(config)# interface f0/13 Switch(config-if)# switchport port-security

Verification

```
Switch# show port-security interface f0/13
Port Security              : Enabled
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        : 0
Configured MAC Addresses   : 0
Sticky MAC Addresses       : 0
Last Source Address:Vlan   : 0000.0000.0000:0
Security Violation Count   : 0
```

VERIFICATION COMMANDS

Show Version

```
Router_A#
Router_A#show version
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(1
 RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

ROM: System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)

System returned to ROM by power-on
System image file is "flash:c1841-advipservicesk9-mz.124-15.T1.bin"
```

Show Running Config
Show IP Int Brief

```
Router_A#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol

FastEthernet0/0        192.168.1.100   YES manual up                    up

FastEthernet0/1        unassigned      YES unset  administratively down down

Vlan1                  unassigned      YES unset  administratively down down
Router_A#
```

PING COMMAND

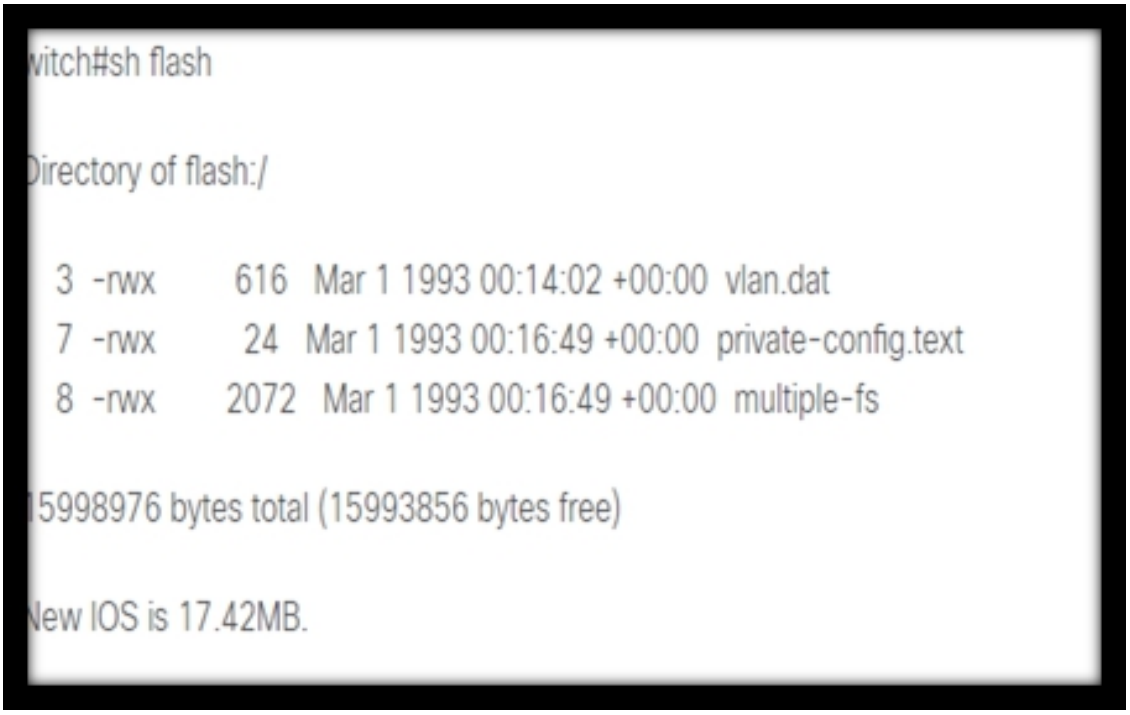
Shut Down Command

Switch(config)#inter fa0/1

Switch(config-if)#shutdown

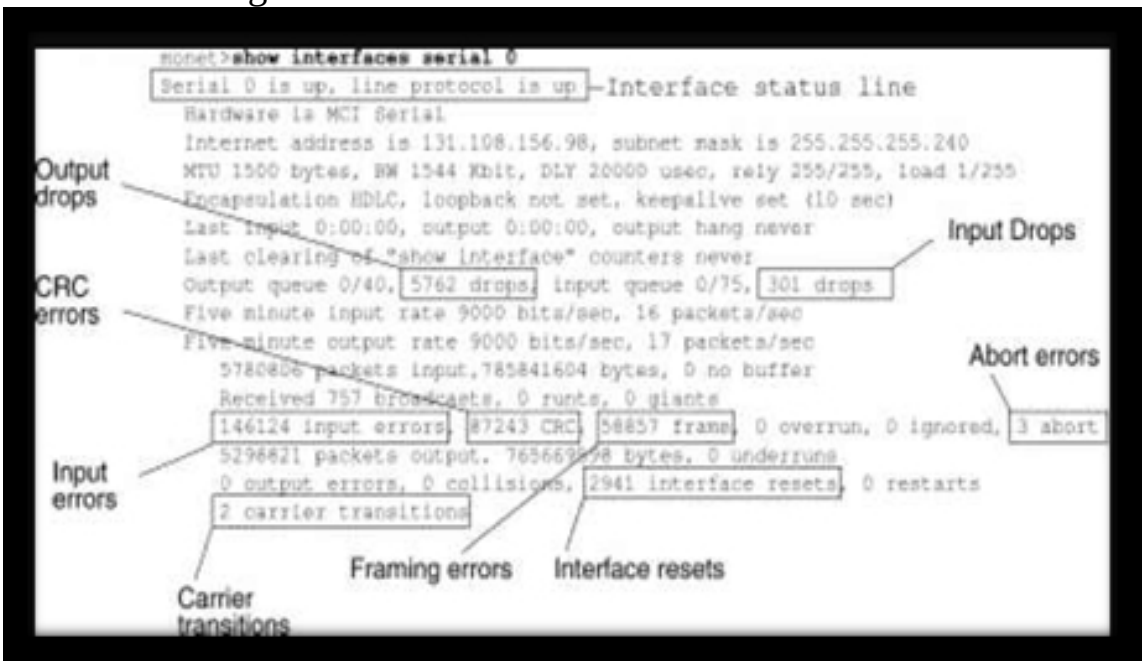
```
SW1(config)#int fa0/1
SW1(config-if)#shutdown
SW1(config-if)#
1w4d: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administrati
vely down
1w4d: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down
SW1(config-if)#
```

Check Diskspace



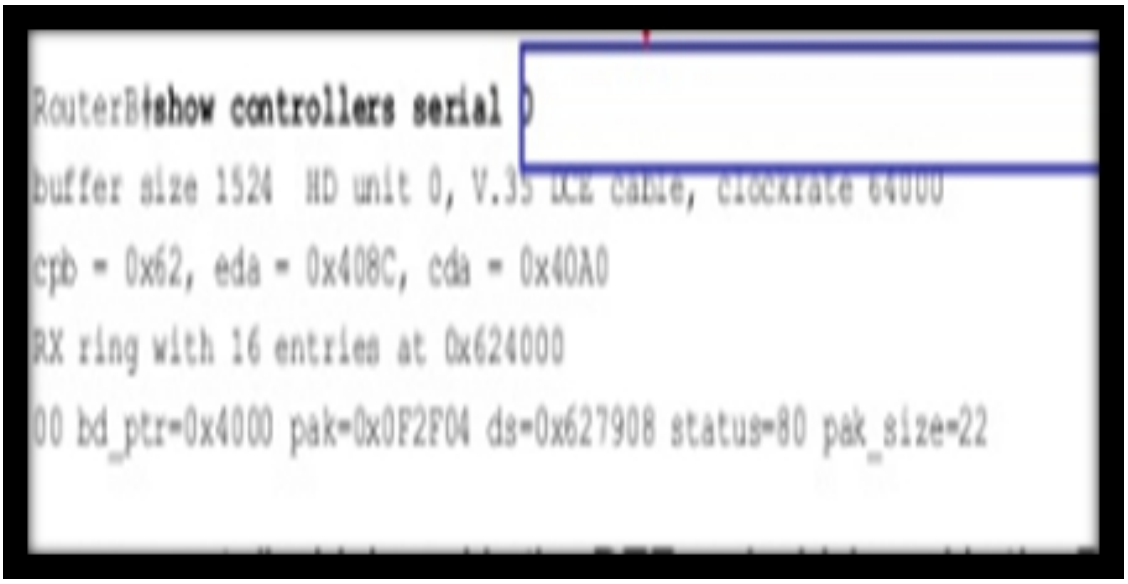
Show Interface

Use the show interfaces EXEC command to display statistics for all interfaces configured on the router or access server.

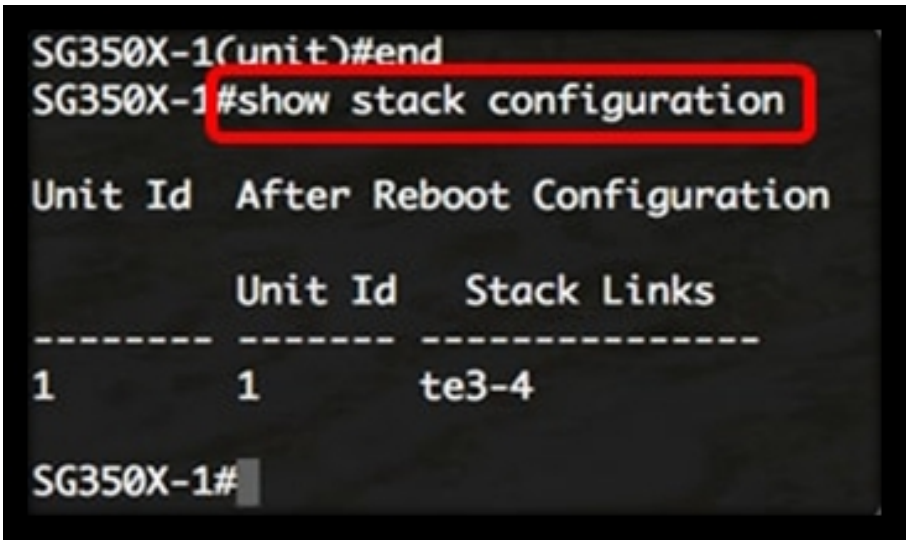


Show Controllers

The show controllers command is used to display controller information (primarily diagnostic, driver level details) for an interface. The information displayed varies widely by interface type and is extremely hardware specific.

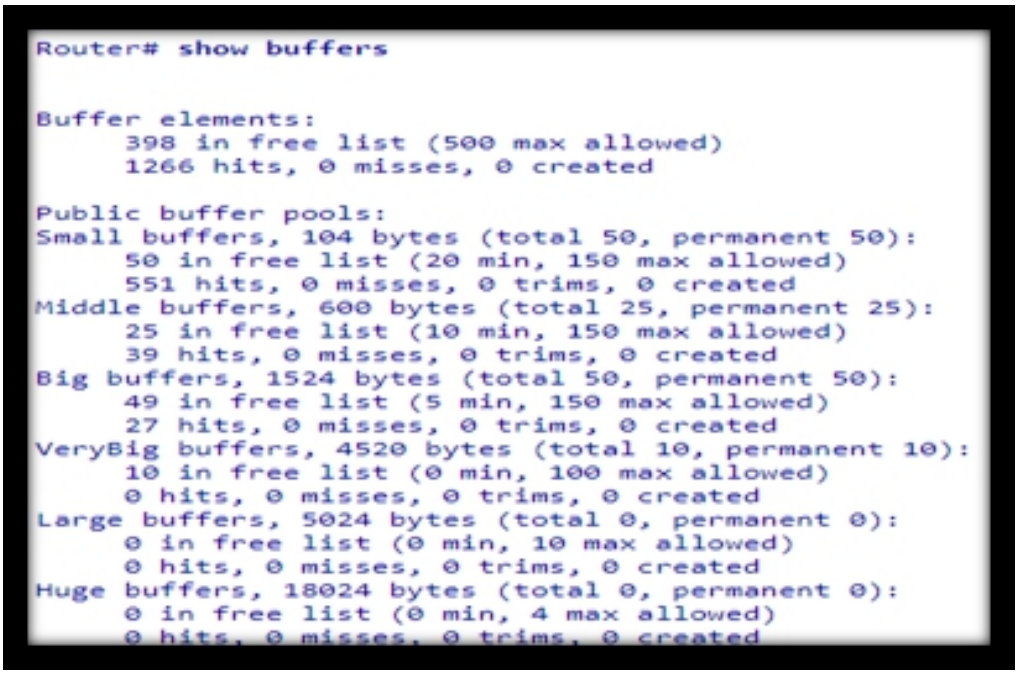


Show Stack



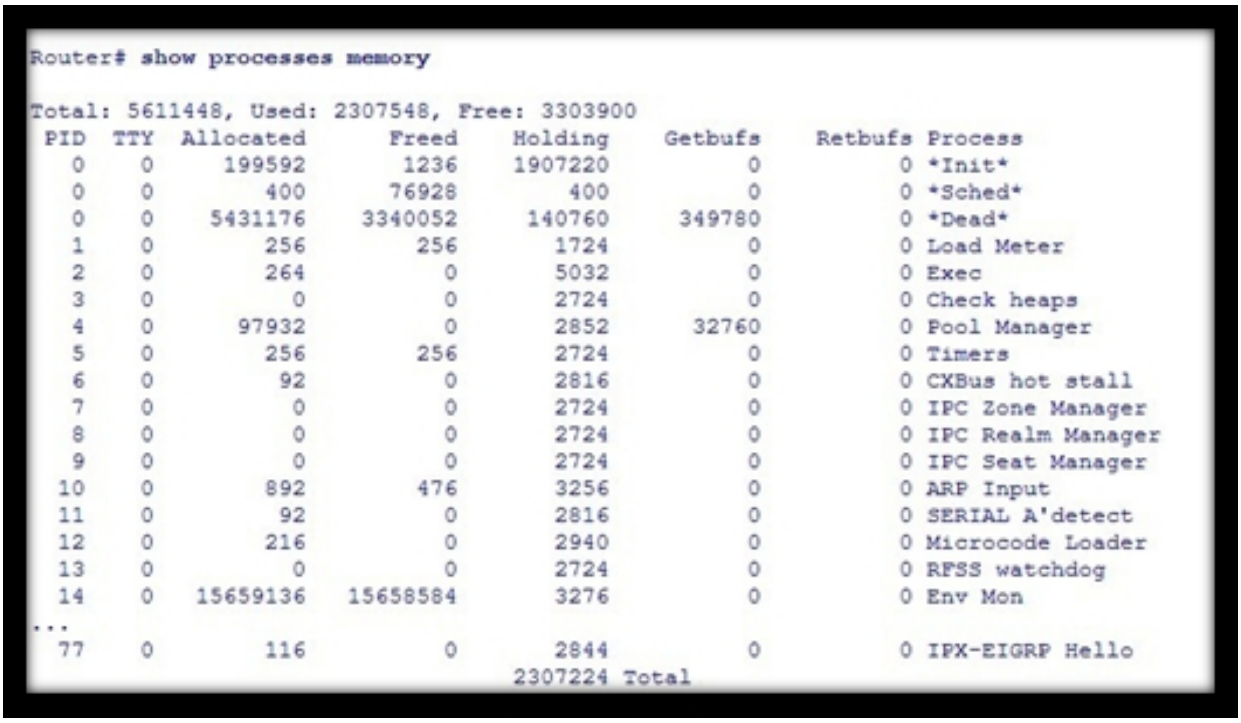
Show Buffers

To display statistics for the buffer pools on the network server, use the show buffers EXEC command.



Show Memory

The show memory exec command is often used to check the amount of a router's free memory. In troubleshooting cases where router performance is the focus, this is a major command used to see the statistics about the router's memory. To show memory used, use the show processes memory EXEC command.



```
Router# show processes memory

Total: 5611448, Used: 2307548, Free: 3303900
 PID  TTY  Allocated      Freed    Holding    Getbufs    Retbufs Process
   0    0     199592       1236    1907220          0          0 *Init*
   0    0        400      76928        400          0          0 *Sched*
   0    0    5431176    3340052     140760     349780          0 *Dead*
   1    0        256        256       1724          0          0 Load Meter
   2    0        264          0       5032          0          0 Exec
   3    0          0          0       2724          0          0 Check heaps
   4    0      97932          0       2852      32760          0 Pool Manager
   5    0        256        256       2724          0          0 Timers
   6    0         92          0       2816          0          0 CXBus hot stall
   7    0          0          0       2724          0          0 IPC Zone Manager
   8    0          0          0       2724          0          0 IPC Realm Manager
   9    0          0          0       2724          0          0 IPC Seat Manager
  10    0        892        476       3256          0          0 ARP Input
  11    0         92          0       2816          0          0 SERIAL A'detect
  12    0        216          0       2940          0          0 Microcode Loader
  13    0          0          0       2724          0          0 RFSS watchdog
  14    0   15659136   15658584       3276          0          0 Env Mon
...
  77    0        116          0       2844          0          0 IPX-EIGRP Hello
                                    2307224 Total
```

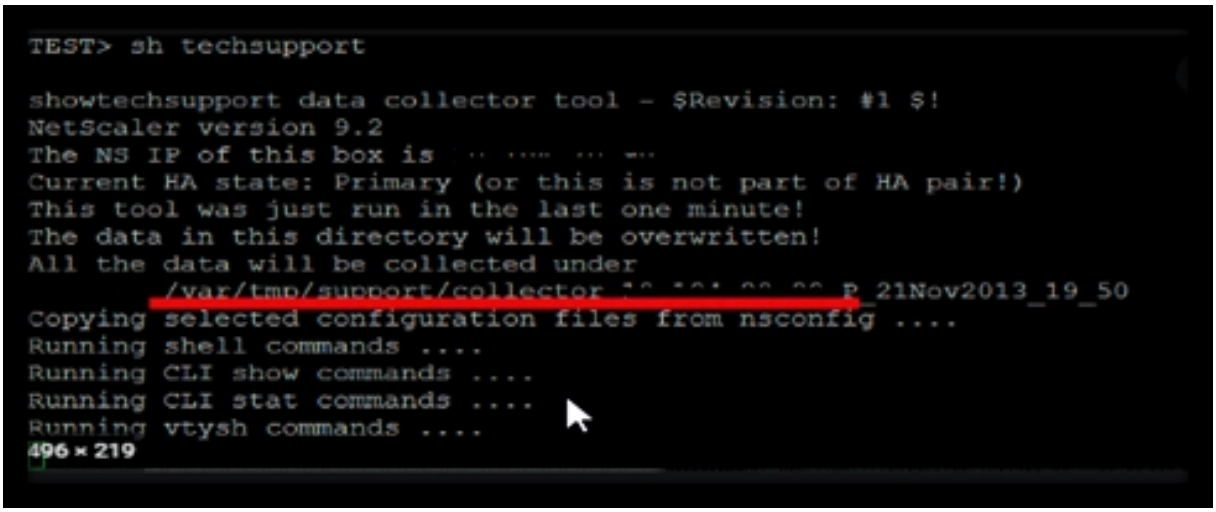
Show Logging

This command displays the state of syslog error and event logging, including host addresses, and whether console logging is enabled. This command also displays Simple Network Management Protocol (SNMP) configuration parameters and protocol activity.

```
Router# show logging
Syslog logging: enabled
     Console logging: disabled
     Monitor logging: level debugging, 266 messages logged.
     Trap logging: level informational, 266 messages logged.
     Logging to 192.180.2.238
SNMP logging: disabled, retransmission after 30 seconds
    0 messages logged
```

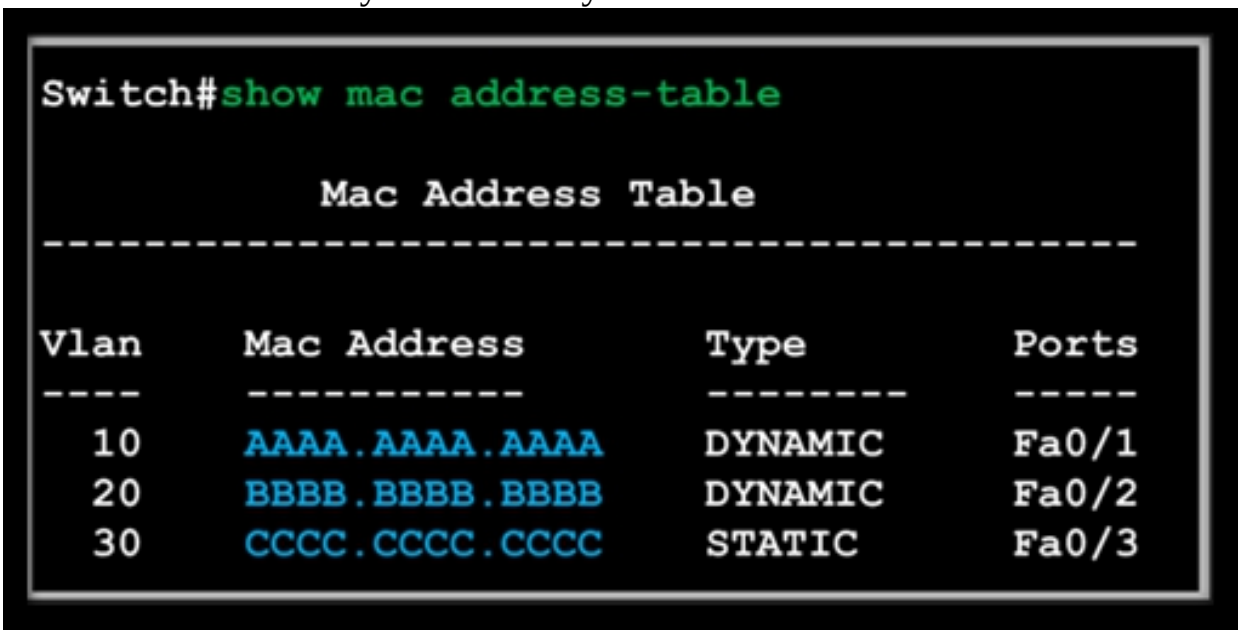
Show Tech Support

The show tech-support commands all display public data from commands such as show version . Each show tech-support command also generates and gathers relevant data for a specific area.



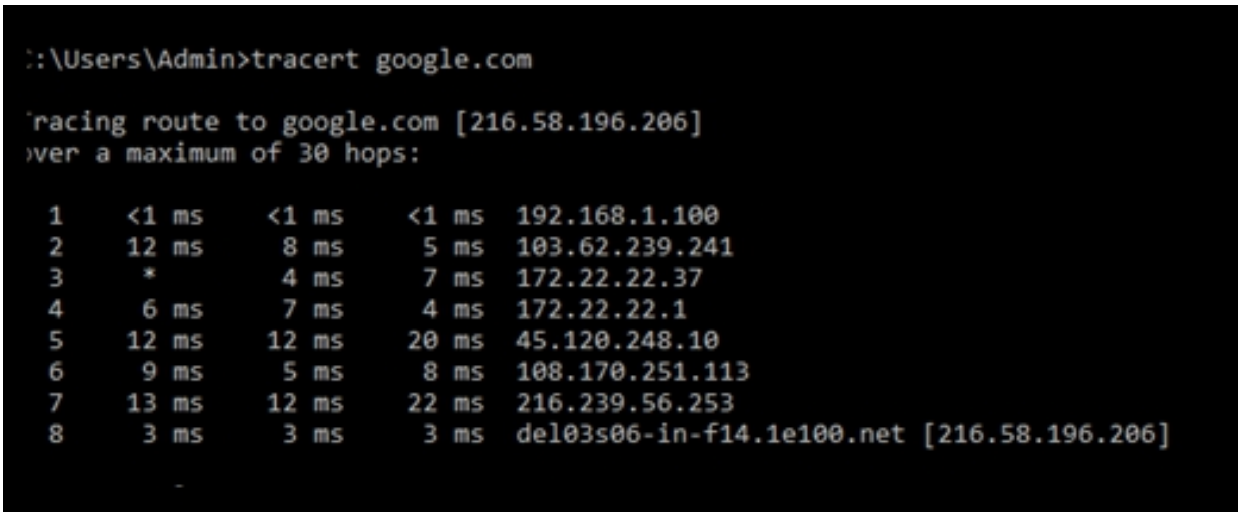
Show mac-address

To display the MAC table, enter the show mac-address command. In the output of the show mac-address command, the Type column indicates whether the MAC entry is static or dynamic.



TRACEROUTE

Traceroute is a network analytic tool used to track in real-time the pathway taken by a packet on an IP network from source to destination, reporting the IP addresses of all the routers it pinged in between. Traceroute also records the time taken for each hop the packet makes during its route to the destination.



Assigning ip Address

Enter in router global config terminal mode and then apply following commands

INTERFACES

- **Assigning ip Address**
- **Show Interface**

Router(Config)#inter serial 0/0/0
Router(Config-if)#ip address 151.136.116.22 255.255.0.0
Router(Config-if)#no shut
Router(Config-if)#exit

Show Interface

The IOS Software command show interface switching provides useful information about the switching status of the router's interfaces, either on an individual interface basis or over the whole router.

Show Interface

Thanks for reading,
If you have any questions, please comment
Have a wonderful day!