Cisco Basic Commands Help Sheet

Basic Router/Switch Configuration

To switch from User mode to Privileged Exec mode

```
Router>enable
```

To switch to Global Configuration mode

```
Router#configure terminal
```

Set the hostname

```
Router(config)#hostname R1
```

Configure a banner:

```
R1(config)#banner motd # No Unauthorized Access #
```

Configure an interface

```
R1(config)#interface gi 0/0
R1(config-if)#description Connection to xyz
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown
```

View interface configuration

```
R1#show ip interface brief
```

Configure the privileged exec password

```
R1(config)#enable secret xyz123
```

Configure the console password

```
R1(config)#line console 0
R1(config-line)#password xyz123
R1(config-line)#login
```

Configure the virtual lines password

```
R1(config)#line vty 0 4
R1(config-line)#password xyz123
R1(config-line)#login
```

Encrypt passwords

```
R1(config)#service password-encryption
```

Disable DNS lookup

```
R1(config)#no ip domain-lookup
```

Configure the switch management interface

```
S1(config)#interface vlan 99
S1(config-if)#ip address 172.17.99.11 255.255.255.0
S1(config-if)#no shut
```

Configure default gateway on switch

```
S1(config)#ip default-gateway 172.17.99.1
```

Router – Routing Configuration

Static Route

Dest. Net Add *Mask* *Next Hop*

```
R1(config)#ip route 192.168.15.0 255.255.255.0 205.105.205.2
```

-OR-

```
R1(config)#ip route 192.168.15.0 255.255.255.0 serial 0/0/0
```

Local Exit Interface

Default Static Route

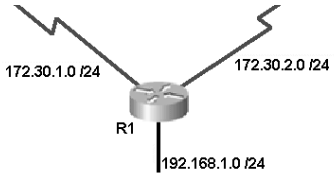
```
R1(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/1
```

RIP

Configure RIP

Local directly-connected networks

```
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 172.30.1.0
R1(config-router)#network 172.30.2.0
R1(config-router)#network 192.168.1.0
```



To distribute Static Routes with RIP updates

```
R1(config)#router rip
R1(config-router)#default-information originate
```

Viewing the Routing Table

```
R1#show ip route
```

Configuring a Passive Interface

```
R1(config)#router rip
R1(config-router)#passive-interface fastEthernet 0/0
```

Viewing Routing Protocol Information

```
R1#show ip protocols
```

Turn Off Auto Summary

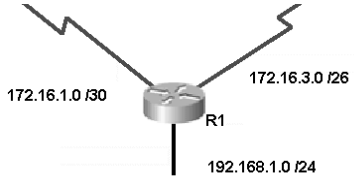
```
R2(config)#router rip
R2(config-router)#no auto-summary
```

EIGRP

Configure EIGRP

Local directly-connected networks

```
R1(config)#router eirgp 1
R2(config-router)#network 192.168.1.0
R2(config-router)#network 172.16.1.0 0.0.0.3
R2(config-router)#network 172.16.3.0 0.0.0.63
```



Viewing EIGRP Neighbors

```
R1#show ip eigrp neighbors
```

Modify the Bandwidth of a Serial interface

```
R1#configure terminal
R1(config)#interface serial 0/0/0
R1(config-if)#bandwidth 64
```

Examine the EIGRP Topology Table

```
R2#show ip eigrp topology
```

-or-

```
R2#show ip eigrp topology 192.168.1.0
```

Propagate a Static Default Route in the Outing Update

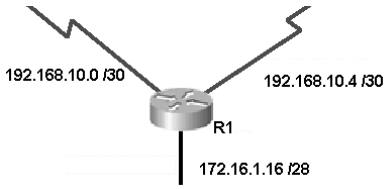
```
R1(config)#router eigrp 1
R1(config-router)#redistribute static
```

OSPF

Configure OSPF

Local directly-connected networks

```
R1(config)#router ospf 1
R1(config-router)#network 172.16.1.16 0.0.0.15 area 0
R1(config-router)#network 192.168.10.0 0.0.0.3 area 0
R1(config-router)#network 192.168.10.4 0.0.0.3 area 0
```



Configure Passive Interface

```
R1(config)#router ospf 1
R1(config-router)# passive-interface GigabitEthernet 0/0
```

Viewing OSPF Neighbors

```
R1#show ip ospf neighbor
```

Configure the OSPF cost

```
R3(config)#interface serial0/0/0
R3(config-if)#ip ospf cost 1562
```

Viewing the Calculated OSPF cost of an Interface

```
R1#show ip ospf interface serial0/0/0
```

Changing the Router-ID

```
R1(config)#router ospf 1
R1(config-router)#router-id 10.4.4.4
R1#clear ip ospf process
```

Note: Router ID precedence is:

1. router-id
2. Highest Loopback address
3. Highest IP Address

Include a Static Route in the OSPF Updates

```
R1(config)#router ospf 1
R1(config-router)#default-information originate
```

Changing the Reference Bandwidth from 10^8

```
R1(config-router)#auto-cost reference-bandwidth 10000
```

Configuring an Inter-Area Summary

```
R1(config)# router ospf 1
R1(config-router)# area 1 range 192.168.0.0 255.255.252.0
```

EtherChannel

Configure an EtherChannel with Cisco PAgP

```
S1(config)# interface range f0/21 – 22
S1(config-if-range)# switchport mode trunk
S1(config-if-range)# channel-group 1 mode desirable
S1(config-if-range)# no shutdown
```

Note: desirable OR auto

Configure an EtherChannel with LACP

```
S1(config)# interface range f0/21 – 22
S1(config-if-range)# switchport mode trunk
S1(config-if-range)# channel-group 1 mode active
S1(config-if-range)# no shutdown
```

Note: active OR passive

Verify EtherChannel setup

```
S1# show etherchannel summary
```

DHCP

1. **Exclude Addresses**

```
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.9
```
Start Stop

2. **Create Pool**

```
R1(config)#ip dhcp pool R1LAN
R1(dhcp-config)#network 192.168.10.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.10.1
R1(dhcp-config)#dns-server 192.168.20.254
```

3. **Troubleshooting and Viewing Information**

```
R1#show ip dhcp binding
```

NAT

1. **Define the internal addresses to be translated to public addresses by creating a named standard ACL**

```
R2(config)#ip access-list standard R2NAT
R2(config-std-nacl)#permit 192.168.10.0 0.0.0.255
R2(config-std-nacl)#permit 192.168.20.0 0.0.0.255
```

2. **E.g., define a pool of 3 public addresses that are mapped to internal addresses**

```
R2(config)#ip nat pool R2POOL 209.165.202.128 209.165.202.130 netmask
                                                        255.255.255.252
```

3. **Instruct the NAT process to map the addresses in the pool to the addresses defined in the ACL**

```
R2(config)#ip nat inside source list R2NAT pool R2POOL overload
```

4. **Specify interfaces as inside/outside**

```
R2(config-if)#ip nat inside      {ip nat outside}
```

5. **To configure static NAT** (e.g., for an inside web server that never changes address)

```
R2(config)#ip nat inside source static 192.168.20.254 209.165.202.131
```

6. **Troubleshooting and viewing information**

```
R2#show ip nat statistics
R2#show ip nat translations
```

Routers ACLs

Block Telnet to any location for all IP addresses on the 192.168.10.0/24 network

Numbered Extended ACL

Protocol Source Dest.

```
R1(config)#access-list 110 deny tcp 192.168.10.0 0.0.0.255 any eq telnet
R1(config)#access-list ip permit any any
```

Numbered Standard ACL

Source

```
R2(config)#access-list 11 deny 192.168.11.0 0.0.0.255
R2(config)#access-list 11 permit any
```

Create an ACL on R2 to deny the 192.168.11.0 network and permit all other networks

Named Extended ACL

```
R1(config)#ip access-list extended FIREWALL
R2(config-ext-nacl)#permit tcp any host 192.168.20.254 eq www
R2(config-ext-nacl)#permit tcp any any established
```

Apply the ACL to the interface

```
R3(config)#interface fa0/0
R3(config-if)#ip access-group 130 in
```

ACL number

Apply the Named ACL to the interface

```
R2(config)#interface s0/1/0
R2(config-if)#ip access-group FIREWALL in
```

ACL name

Switches

Create a VLAN and name it

```
S1(config)#vlan 10
S1(config-vlan)#name Admin
```

VTP Mode

```
S1(config)#vtp mode server
S1(config)#vtp domain CISCO
S1(config)#vtp password ccna
```

Must set domain name on server

Configure a management IP Address

```
S1(config)#interface vlan 99
S1(config-if)#ip address 10.1.99.21 255.255.255.0
S1(config-if)#no shut
S1(config)#ip default-gateway 10.1.99.1
```

Configure a trunk (and include native VLAN)

```
S1(config)#interface FastEthernet0/2
S1(config-if)#switchport trunk native vlan 99
S1(config-if)#switchport mode trunk
```

Assigning a port to a VLAN

```
S1(config)#interface FastEthernet0/2
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 10
```

Setting the Switch as a Root Bridge

```
S1(config)#spanning-tree vlan 10 root primary
```

or *change the priority:*

```
S1(config)#spanning-tree vlan 10 priority 4096
```

Router-on-a-Stick

Create a subinterface, assign it to a VLAN and give it an IP address

```
R1(config)#interface fastEthernet 0/0
R1(config-if)#no shutdown
R1(config-if)#interface fastEthernet 0/0.10
R1(config-subif)#encapsulation dot1Q 10
R1(config-subif)#ip address 10.1.10.1 255.255.255.0
```

VLAN 10

PPP / CHAP

PPP Encapsulation (Phases: LCP, Authentication, NCP)

```
R(config-if)# encapsulation ppp
```

PPP Authentication Using CHAP

```
Router(config)# hostname RA
RA(config)# username RB password cisco
RA(config-if)# ppp authentication chap
```

On each router define the username and password to expect from the remote router

Troubleshooting and viewing information

```
R# show controllers serial 0/0/0     [Layer 1 and Layer 2 info]
R# show ip interface brief
R# show interface serial0/0/0        [View If LCP is open then good]
R# debug ppp negotiations            [PPP packets during startup phase]
R# debug ppp packet                  [Real-time PPP packet flow]
R# debug ppp authentication          [Displays PPP authentication sequence as it occurs]
```

Frame Relay

Hub & Spoke

1. Hub

Specifies encapsulation type

```
R1(config)#int s0/0/0
R1(config-if)#encapsulation frame-relay [cisco | ietf]
R1(config-if)# interface Serial0/0/0.100 point-to-point
R1(config-if)#ip address 10.255.255.1 255.255.255.252
R2(config-if)#frame-relay lmi-type q933a
R1(config-if)#frame-relay interface-dlci100
```

[Create as many sub interfaces as required.]

2. Spoke

```
R2(config)#interface Serial0/0/0
R2(config-if)#ip address 10.255.255.2 255.255.255.252
R2(config-if)#encapsulation frame-relay
R2(config-if)#frame-relay lmi-type q933a
R2(config-if)#no shutdown
```

Specifies LMI type used by FR

```
R1(config-if)#frame-relay lmi-type ansi |cisco | q933i
```

Assign the address to DLCI table statically

Remote IP Interface Address
Local DLCI

```
R1(config-if)#frame relay map protocol address dlci [broadcast] [ietf |
                                                                 cisco ]
R1(config-if)#frame relay map ip 10.0.0.1 201 broadcast
```

Troubleshooting and viewing information

```
R1# show frame-relay map             [Displays the route maps (static or dynamic)]
R1# show frame-relay lmi             [Displays LMI information]
R1# show frame-relay pvc             [Show end-to-end status]
```

OSPF and Frame Relay

```
R1(config-if)#ip ospf network broadcast
```

Other

```
Router(config-if)#clock rate 64000
Router(config-if)#frame-relay intf-type dce
Router(config-if)#ip address 10.0.0.1 255.255.255.0

Router(config-if)#frame-relay interface-dlci
```
[Create a DLCI on the interface]

Setting up a router to work as a Frame Relay switch

```
FR-Switch(config)#frame-relay switching
FR-Switch(config)#interface serial 0/0/0
FR-Switch(config)#clock rate 64000

FR-Switch(config-if)#ip address 10.0.0.1 255.255.255.0

FR-Switch(config-if)#encapsulation frame-relay
FR-Switch(config-if)#frame-relay intf-type dce
FR-Switch(config-if)#frame-relay route 102 interface serial 0/0/1 201

FR-Switch#show frame-relay route
```
[Changing the interface type to DCE]

[Shows any existing Frame Relay routes, their interfaces, DLCI's, and status]

Configure the router to forward incoming traffic on interface serial 0/0/0 with DLCI 102 to serial 0/0/1 with an output DLCI of 201

Create and configure a point-to-point sub-interface on R1

```
R1(config)#interface serial 0/0/1.112 point-to-point
R1(config-subif)#ip address 10.1.1.5 255.255.255.252
R1(config-subif)#frame-relay interface-dlci 112
```

Create subinterface 112 as a point-to-point interface