Cisco IOS Quick Reference Cheat Sheet 2.1

Router Modes

R> (User-mode prompt)
R# (Privileged-mode prompt)

R(config)# (Global configuration mode)
R(config-if)# (Interface mode)
R(config-subif)# (Sub interface mode)
R(config-line)# (Line mode)
R(config-router)# (Router configuration mode)

Quick Start

R> enable
R# config terminal
R(config)# hostname [Router1]
R(config)# exit
R#
R# ? (Help with commands)

Restrict Access to Router

Privileged-mode

R(config)# enable password [password] (Plain Text)
R(config)# enable secret [password] (Hashed)

User-mode

(Select a line)
R(config)# line console 0
R(config)# line vty 0 4
R(config)# line aux 0

R(config)# password [password]
R(config)# login
R(config)# exec-timeout [10] [0] (M, S)

Perform Password Encryption Service

R(config)# service password-encryption

Setup SSH and Disable Telnet

R(config)# ip domain-name [R1.MrCambron.com]
R(config)# crypto key generate rsa general-keys modulus [1024]
R(config)# ip ssh time-out [180]
R(config)# ip ssh authentication-retries [2]
R(config)# line vty 0 4
R(config-line)# transport input ssh

Doing the do Command

(No need to be in R#)
R(config)# do show run
R(config)# do show int fa0/0
R(config)# do ping [172.16.0.1]

Configurations: View, Save, Erase

R# show running-config
R# show startup-config
R# copy run start (Copies run as startup-config)
R# write
R# erase start
R# reload (Reboots the router)

SDM Basic Setup for http, https

R(config)# int fa0/0
R(config-if)# ip address [10.10.10.1] [255.255.255.248]
R(config-if)# no shutdown
R(config)# ip http server
R(config)# ip http secure-server
R(config)# ip http authentication local

R(config)# username [cisco] privilege 15 password 0 [cisco]
R(config)# line console 0
R(config-line)# login local
R(config)# line vty 0 4
R(config-line)# privilege level 15
R(config-line)# login local
R(config-line)# transport input ssh

Configure an Interface

R(config)# interface [fa0/0]
R(config-if)# description [Sales VLAN]
R(config-if)# ip address [192.168.1.10 255.255.255.0]
R(config-if)# no shutdown
R(config-if)# clock rate [64000] (only for Serial DCE)

PPP Encapsulation (Phases: LCP, Authentication, NCP)

R(config-if)# encapsulation ppp

PPP Authentication Using chap

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

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 (View LCP is open)
R# debug ppp negotiations (PPP packets during startup phase)
R# debug ppp packet (real-time PPP packet flow)

Connectivity

R# ping [172.16.0.1]
R# traceroute [172.16.0.1]
R# telnet [172.16.0.1]
R# show interface [fa0/0]
R# show ip interface [fa0/0] (layer 3)

Telnet

R> telnet 172.16.0.1
R1# terminal monitor (Displays console messages)
R1# terminal no monitor

Default and Static Routes

R(config)# ip route [0.0.0.0 0.0.0.0 172.17.0.2]
R(config)# ip route [172.18.0.0 255.255.0.0] [172.17.0.2]
R# show ip route

DHCP Server

R(config)# ip dhcp pool [Pool_Name]
R(dhcp-config)# network [172.16.0.0 255.255.0.0]
R(dhcp-config)# dns-server [172.16.0.1 172.16.0.2]
R(dhcp-config)# default-router [172.16.0.1]
R(config)# ip dhcp excluded-address [172.16.0.1 172.16.1.99]

NAT / PAT

NAT

R(config)# ip nat inside source static [10.10.10.2 209.165.200.224]
R(config)# int [fa0/0] (Inside interface)
R(config-if)# ip nat inside
R(config)# int [serial0/0] (Outside interface)
R(config-if)# ip nat outside

Dynamic NAT

R(config)# access-list 1 permit 172.17.0.0 0.0.0.255
R(config)# ip nat pool pub-addr 209.165.202.131 209.165.202.140
R(config)# ip nate inside source list 1 pool pud-addr
R(config)# int fa0/0
R(config)# ip address 172.17.0.1 255.255.255.0
R(config)# ip nat inside
R(config)# int ser0/0/0
R(config)# ip address 209.165.202.1 255.255.255.0
R(config)# ip nat outside

PAT

R(config)# access-list 1 permit 172.17.0.0 0.0.0.255
R(config)# ip nat inside source list 1 int ser0/0/0 overload
R(config)# int fa0/0 (inside)
R(config)# ip nat inside
R(config)# int ser0/0/0 (outside)
R(config)# ip nat outside
R# show ip nat translations (Verify NAT translation)

Privilege Level Account

R(config)# username [admin] privilege 15 password 0 [cisco]

Switch: Basics

S# erase start
S# delete vlan.dat
S# reload
S# show run
S# show ip interface

Switch: Port Security

S(config)# interface fa0/18 (use this or next line)
S(config)# interface range fa0/1 - 24
S(config-if)# switch port-security

Port Security Options

S(config-if)# switchport port-security mac-address [MAC: MAC_Address | Sticky: (Last Source MAC)]
S(config-if)# switchport port-security maximum [Max# MAC allowed]
S(config-if)# Switchport port-security violation [shutdown | restrict | protect]

Disable Port Security

S(config)# interface fa0/18
S(config-if)# no switchport port-security

Troubleshoot and View Status of Port Security

```
S# show port-security address
S# show port-security interface [fa0/1]
S# show mac-address-table
```

Switch: VLAN

```
S(config)# vlan [vlan_number]
S(config-vlan)# name[vlan_name]
```

Assign Ports to a VLAN

```
S(config)# interface fa0/1
S(config-if)# switchport access vlan [vlan_number]
```

Remove a VLAN

```
S(config)# no vlan [vlan_number]
S(config)# interface fa0/1
S(config-if)# no switchport access vlan [vlan_number]
```

Verify VLAN

```
S# show vlan ?
```

Switch: Configure port as a Trunk Port

```
S(config)# interface fa0/1
S(config-if)# switchport mode truck
S(config-if)# switchport trunk encapsulation [dot1q | ISL
  | negotiate]
```

Configure a Port to Detect Trunk Link

```
S(config-if)# switchport mode dynamic [desireable |
        auto]
```

Configure native VLAN on a Trunk Port

```
S(config-if)# dot1q native vlan [vlan_id]
```

Configure a Port back to an access port

```
S(config-if)# no switchport mode trunk (or next line)
S(config-if)# switchport mode access
```

Switch: VTP (Version 1)

```
S(config)# vtp domain [vtp_domain]
S(config)# vtp mode [server | client | transparent]
S(config)# vtp password [password]
S# show vtp [status | password | counters]
S# show vlan brief
```

Configure VTP Server and add VLANs

```
S# vlan database
S(vlan)# ?
```

Inter-VLAN Routing

```
R(config)# interface fa0/1
R(config-if)# no ip address
R(config-if)# no shutdown
R(config)# interface fa0/1.10
R(config-subif)# encapsulation dot1q10
R(config-subif)# ip address 192.168.10.1 255.255.255.0
```

RIP

```
R(config)# router rip
R(config-router)# version 2
R(config-router)# network [192.168.4.0]
R# show ip route
R# debug ip route
```

RIP: Misc Commands

```
R(config-router)# no auto-summary
R(config-router)# passive-interface [fa0/0]
R# show ip rip database
```

RIP: Troubleshoot

```
R# show ip route
R# show ip protocol
R# show running-config
R# show interfaces
R# show ip interface
R# show ip route
R# debug ip rip
```

BGP

```
R(config)# router bgp [100-AS number]
R(config-router)# neighbor [10.10.10.10] remote-as
        [100]
R(config-router)# network [172.19.0.0]
```

EIGRP

```
R(config)# router eigrp [AS_Number] (AS must match)
R(config-router)# network [172.16.0.0]
R(config-router)# network [172.19.0.0]
```

EIGRP - Passive Interface

```
R(config-router)# passive-interface serial0/1
```

EIGRP - Key Creation

```
R(config)# key chain [name_of_chain]
R(config-keychain)# key 1
R(config-keychain-key)# key-string [san_fran]
R(config)# interface [serial0/0/1]
R(config-if)# ip authentication mode eigrp [AS_num]
        md5
R(config-if)# ip authentication key-chain eigrp [100
        AS_R1]
```

EIGRP - Manual Summarization

```
R(config-router)# no auto-summarization
R(config-if)# ip summary-address eigrp 1 172.17.0.0
        255.255.255.0
```

EIGRP - Information and Troubleshoot

```
R# show ip eigrp topology (Examine topology tables)
R# show ip eigrp traffic (Examine statistics)
R# show ip route (Examine routing tables)
R# debug ip eigrp (Observe routing activity)
R# debug ip route (Observe routing activity)
```

OSPF:

Enable and Advertise Networks

```
R(config)# router ospf [process_id] (1-65535)
R(config-router)# network 192.168.10.0 0.0.0.3 area [0]
R(config-router)# area [0] authentication message-digest
```

R(config-if)# ip address 10.0.1.1 255.255.255.0
R(config-if)# ip ospf message-digest-key 10 md5 [area_password]
R# show ip ospf ?
R# debug ip ospf ?

Tuning Priority

R(config-if)# ip ospf priority [1-255]

Tune Router ID, Loopback Address, Int Address

R(config-router)# router-id 10.1.1.1 (Router ID)
R(config-if)# ip address 10.1.1.1 255.255.255.255 (Loopback Address)
R(config-if)# ip address 192.168.1.0 255.255.255.0 (Interface Address)
(After changing int priority or router ID use next line)
R# clear ip ospf process

Tune Reference Bandwidth

R(config-router)# auto-cost reference-bandwidth [10000] (Mbit)

Configure Interface Cost Value

R(config)# ip ospf cost

Propagating a Default Router

R(config)# ip router 0.0.0.0 0.0.0.0 serial0/0/0
R(config-router)# default0information originate

Configuring OSPF Summarization

R# area 0 range 192.168.0.0 255.255.252.0

Verify and Troubleshoot

R# show ip protocols
R# show ip ospf ?
R# show ip route
R# debug ip ospf ?

Access List:

Standard (Place close to destination)

R(config)# access-list [1-99|1300-1999] remark [To servers]
R(config)# access-list 1 [deny|permit] [source] [mask]
R(config)# access-list 1 permit any
R(config)# no access-list 1

Extended (Place close to source)

R(config)# access-list [100-199|2000-2699] remark [to servers]
R(config)# access-list 100 [permit|deny] [tcp|ip|ospf] [source] [mask] host [destination] [mask] [eq|gt|lt] [tcp_port]
R(config)# access-list 100 permit ip host 192.168.1.10 host 192.168.5.10
R(config)# access-list 100 permit tcp any host 10.10.10.250 eq 80
R(config)# access-list 101 permit tcp any any established
R(config)# access-list 123 tcp host 172.16.1.2 any range ftp-data ftp

Named

R(config)# access-list [standard|extended] SALES-ONLY
R(config-ext-nacl)# permit 192.168.20.0 0.0.0.255
R(config-ext-nacl)# permit host 192.168.10.3
R(config-ext-nacl)# deny any

Assign ACL to an Interface

R(config-if)# ip access-group [100] [in|out]

Assign ACL to vty

R(config-line)# access-class 1 in

Default ACL Match Tracking

R# show access-list [1|100|name] (how many matches)

ACL Console Logging

R(config)# no access-list 100
R(config)# access-list 100 permit ip host 192.168.1.2 0.0.0.255 any log
R(config)# access-list 100 deny ip any any log
R# no logging console (turns off)

Configuring an ACL with NAT

R1(config)# int fa0/0
R1(config-if)# ip address 192.168.1.1
R1(config-if)# ip access-group 10 in
R1(config-if)# ip nat inside

R1(config)# int Ser0/0/0
R1(config-if)# ip address 209.165.201.1
R1(config-if)# ip nat outside

R(config)# ip nat inside source list 1 int ser0/0/0 overload
R(config)# access-list 10 permit 192.168.1.0 0.0.0.255

Troubleshooting and Viewing ACLs

R# show access-lists (Displays all ACLs)
R# clear access-list counters
R# debug ip packet

Send logging to syslog server

R1# clock set 15:22:00 may 17 2007
R1(config)# clock timezone cst -8
R1(config)# service timestampts
R1(config)# logging 192.168.1.6
R1(config)# no logging console

Set Clock

R# clock set 18:30:00 sep 17 2008
R# clock timezone EST -8