Godwins Bible

📖 Note

- Make sure to add +1 to the network address in putting an address to the router
- `do wr`
- accessing ftp: `ftp <ip address of ftp server>`
  - enter username (cisco)
  - enter password (cisco)
  - `put <filename>`

📝 IP Addressing in PC

1. Go to *“Network and Internet Settings”*
2. Click on *“Change Adapter Options”*
3. Go to your connection(ex. WIFI, Ethernet, Local Area Connection)
4. left click and click on *“Properties”*
5. scroll down and click on either *“Internet Protocol Version 4(TCP/IPv4)”* or *“Internet Protocaol Version 4(TCP/IPv4)”* depending on what you want to manually address

📝 To erase configuration

1. enable
2. `erase running-config`
3. write erase
4. reload

Head tag for pasting

- `!Interface Configuration`
- `!Setup the IPv6 DHCP Server`

Restart configurations

1. `copy running-config startup-config`
2. press enter
3. `reload`
4. press enter and wait

Initial Configuration

1. `ena` or `enable`
2. `config terminal` or `config t`
3. `hostname <name>` , change `<name>` to prefered name for the intermediary device
4. `banner motd <message>`, change `<message>` into a preferred warning message
5. `enable secret <password>`, change `<password>` with preferred password.
6. `service password-encryption`
7. `line con 0`
8. `password <password>` or `pass <password>`, change `<password>` with preferred password.
9. `login`
10. `exit`

To paste

```
ena
config t
hostname <hostname>
banner motd $WANRING!!, U
enable secret cisco
service password-encrypti
line con 0
password cisco
login
exit
```

Telnet Setup

Router Setup

(must have done the initial configuration, and must be in config mode: `device(config)#`)

1. `line vty 0 4`
2. `password <password>` or `pass <password>`, change `<password>` to preferred password.
3. `login`
4. `transport input telnet`
5. `exit`

To paste

```
!Router(config)#

line vty 0 4
password cisco
login
transport input telnet
exit
```

Switch Setup

To paste

```
!Router(config)#

line vty 0 4
password cisco
login
transport input telnet
exit
interface vlan 1
ip address <ip address> <subnet mask>
no shutdown
exit
```

(must have done the initial configuration, and must be in config mode: `device(config)#`)

1. `line vty 0 4`
2. `password <password>` or `pass <password>`, change `<password>` with a preferred password
3. `login`
4. `transport input telnet`
5. `exit`
6. `interface vlan <n>` or `int vlan <n>`, change `<n>` with a preferred number of the vlan, preferrably 1, `int vlan 1`.
7. `ip address <ip> <sm>` or `ip add <ip> <sm>`, change `<ip>` to an IP address, and `<sm>` to a subnet mask. ex. `ip address 192.168.10.2 255.255.255.0`.
8. `no shutdown` or `no shut`
9. `exit`

SSH Setup

Router Setup

(must have done the initial configuration, and must be in config mode: `device(config)#`)

1. `ip domain-name <name>`, replace `<name>` with a desired domain name for the intermdeiary devices being configured to.
2. `crypto key generate rsa`
3. `1024`
4. `line vty 0 15`
5. `transport input ssh`
6. `login local`
7. `ip ssh ver 2`
8. `username <name>`, replace `<name>` with the desired username of your choice
9. `password <password>`, replace `<password>` with actual password corresponding to the username.
10. `do wr`

Accessing intermdiary device using SSH:

11. `ssh -l <username> <ip>`, replace `<username>` with the configured username and replace `<ip>` to the IP address of the SSH configured intermediary device.
12. input password from last configuration

Switch Setup

To paste

```
!Router(config)#
ip domain-name <domain na
crypto key generate rsa
1024
line vty 0 15
trasnport input ssh
login local
ip ssh ver 2
username cisco
password cisco
do wr
```

```
!PC
ssh -l cisco <ip address>
cisco
```

To paste

```
ip domain-name <domain name>
username cisco privilege 15 secret cisco
interface vlan 1
ip address <ip address> <subnet mask>
no shutdown
exit
line vty 0 15
transport input ssh
login local
exit
crypto key generate rsa
1024
exit
```

```
!PC
ssh -l cisco <ip address>
cisco
```

(must have done the initial configuration, and must be in config mode: `device(config)#`)

1. `ip domain-name <name>`, replace `<name>` with a desired domain name for the intermdeiary devices being configured to.
2. ex. `username emu privilege 15 secret cisco`.
    - `username <name>`, replace `<name>` with the desired username of your choice.
    - `privilege 15`
    - `sercet <password>`, replace `<password>` with the password for the device.
3. `interface vlan 1`
4. `ip address <ip> <sm>`, replace `<ip>` with an IP address and `<sm>` for the correspinding subnet mask.

5. `no shutdown` or `no shut`
6. `exit`
7. `line vty 0 15`
8. `transport input ssh`
9. `login local`
10. `exit`
11. `crypto key generate rsa`
12. `1024`
13. `exit`

DHCP, DNS, HTTP Configuration

1. Put the ff: 1 switch, multiple PCs, 1 server

DHCP

2. Click on the server
3. Go to Desktop, then go to IP configuration
4. Put the IP address for the DHCP server, it's subnet mask, it's default gateway, and the DNS server if needed.
5. Then go to the services tab in the server and go to DHCP tab in the left navbar
6. Turn the Service to ON
7. rename the Pool Name to a preferred name for the server
8. populate the IP address of Default Gateway and the DNS server for the server
9. then populate the Start IP address (this determines what the IP address the DHCP should start giving to, to the PCs)
10. then populate the subnet mask to determine which is the host address to be populated
11. then click on Add button
12. go to the serverPool then change the Maximum number of Users to "0", then click Save.

13. exit the server, and click on any of the PCs that is connected to the same network as the DHCP server
14. go to IP Configuration and change the toggle from static to DHCP, wait for the message “DHCP successful”.

DNS configuration

15. click on the server and go to “services” tab in the top navbar
16. go to the “DNS” tab in the left navbar
17. toggle the DNS Service to ON
18. then go to the “HTTP” tab in the left navbar
19. click on “(edit)” in the index.html from the table
20. change the html on the said index.html then click Save
21. go back to the “DNS” tab in the left navbar
22. put in the name of the domain name, and add IP address of the dns server(mostly the server itself)
23. put then the IP address for the corresponding domain name
24. then click on “Add”.
25. exit the server and click on one of the PCs in the same network of the DNS server
26. go to the “desktop” tab in the top navbar, and click on “Web Browser”
27. type in either the domain name or the IP address o fthe website and wait for it to load

Wireless Configuration

1. Place a wireless router and end devices in the canvas
2. connect the PC to the wireless router via ST cable, this PC will be served as your management
3. click on PC and go to the “Desktop” tab in the top navbar
4. go to “IP configuration” and toggle on the DHCP, make sure to get the Default gateway

5. exit “IP configuration” and go to the web browser and type in the url the default gateway of the wireless router, then click “Go”
6. An Authorization pops up, then type `admin` as User Name, and also `admin` as Password
7. now in the Internet Setup located in the left navbar, make sure the Internet Connection Type isn’t static but is configured to be “Automatic Configuration - DHCP”.
8. In the Network setup found in the left navbar, change IP address to your liking (make sure that when you want to go to ths configuration website again, update it to what you changed in the IP address).
9. scroll down and click “Save Settings”
10. go to “Wireless” tab in the top navbar and preferrably, disable 5GHz - 2 and 5GHz - 1 by clicking on the “Network Mode” and choose “Disabled” from the choices.
11. Now go back to 2.4 GHz and change it’s Network Name (SSID) as a name for your wireless connection.
12. scroll down and click on “Save Settings”
13. scroll back up and click on “Wireless Security” below the main top navbar
14. change the 2.4 GHz security mode into “WPA2 Personal”, then put a Passphrase (password) for the wireless connection.
15. scroll down and click “Save Settings:
16. then exit the management PC
17. click on any wireless devices, primarily those that do not have a “PC Wireless” app in them (Tablet, Smartphone, etc.)
18. go to config tab in the top navbar
19. go to wireless in the left navbar
20. toggle on WPA2-PSK and enter the PSK Pass Phrase (the password you configured in the wireless connection in the management PC).
21. next click on any possible wireless device that has a “PC Wireless” app in them (PC, Laptop, etc.)
22. go to the “Desktop” tab in top navbar and click on “PC Wireless”

23. click on “Connect Tab”, and click “Refresh”
24. choose the Wifi you wish to connect to, click on it, then click on the “Connect” button
25. input the Pre-shared key (password of the Wifi) and click on connect below
26. exit the device and go back to the wireless router by clicking on it
27. go to “Config” tab in top navbar and go to “LAN” on the left navbar
28. Input the desired IP address of the wireless router and it’s subnet mask
29. exit the wireless router and go to any device connected to that Wifi and go to there “IP Configuration”
30. toggle on DHCP and it should work

Router configuration

1. connect a PC to a router via console media
2. `enable`
3. `configure terminal` or `config t`
4. `interface <i>` or `int <i>`, replace `<i>` with the preferred port, specifically since we are dealing with a router, use gigabitEthernet example: `int g0/0/1`.
5. `ip address <ip> <sm>` or `ip add <ip> <sm>`, replace `<ip>` to the preferred IP address of that interface in the router, and replace <sm> with it’s corresponding subnet mask.
6. `no shutdown`

To paste

```
ena
config t
int <interface>
ip add <ip address> <subr
no shut
```

```
!Check
show ip interface brief
```

DHCP on Router Setup

To paste

```
int <interface>
!optional
ip dhcp excluded-address <ip address/s>
ip dhcp pool <pool name>
default-router <ip address of interface>
network <network adddress> <subnet mask>
dns-server <ip address of dns server>
domain name <domain name>
```

1. add corresponding IP address/s on interface/s of the router
2. exclude ip addresses that the network shouldnot use (ex. Broadcast Address) using

   `ip dhcp excluded-address <ip address/s>` exchange `<ip address/s>` with ip address/s you want to be excluded in addressing the PCs.

   Example: `ip dhcp excluded-address 198.11.192.225 198.11.192.230`
3. `ip dhcp pool <name>`, replace `<name>` with the dhcp pool name

   Note

   to remove dhcp pool just type `no ip dhcp pool <name of pool>`, replace `<name of pool>` to the name of the pool you want to delete
4. `default-router <ip address>`, replace `<ip address>` to the corresponding IP in the specified interface of the router
5. `network <network address> <subnet mask>`, replace `<network address>` with the network address for the dhcp to be used in the network, also replace `<subnet mask>` for the dhcp subnet mask. Ex. `network 192.168.1.0 255.255.255.0`
6. `dns-server <dns ip address>`, replace `<dns ip address>` with the IP address of the dns server

7. `domain name <domain name>`, exchange `<domain name>` with domain name.

   Example: `domain name www.google.com`

8. `exit`
9. continue step 1 if there are more interfaces to be used as dhcp

IP helper on Router Setup

To paste

```
int <interface>
ip helper-address <ip address of nearest dhcp router interfa
```

1. go to the interface you want to forward the dhcp from the main router, ex. `int g0/0`
2. `ip helper-address <ip address>`, exchange `<ip address>` with the ip address of the interface that is connected to, and in the router that has dhcp

*accessing in the Router0

*router that has dhcp is the Router1

*make sure the two routers can communicate with each router either via dynamically(protocols) or statically

- `int g0/0/0`
- `ip helper-address 192.168.11.2`

IPv4 Address Configuration

1. `int <interface name>`, replace `<interface name>` with the name of the interface
2. `ip address <ip> <sm>` or `ip add <ip> <sm>`, replace `<ip>` with IP address and `<sm>` with subnet mask
3. `no shut`
4. `exit`

To paste

```
int <interface>
ip add <ip address> <subr
no shut
```

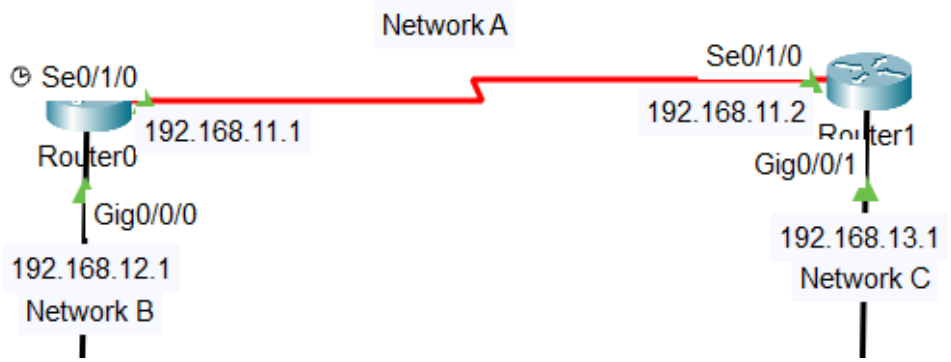
Static Routing

IPv4 Fixed Static Routing

To paste

```
ip route <network address> <subnet mask> <interface ip addre
```

`ip route <network address> <subnet mask> <interface ip address>`, replace `<network address>` ith the network address of the network it wants to go to, replace `<subnet mask>` with the subnet maks of the said network, and replace `<interface ip address>` of the nearest interface of the router connected to the network to the router being worked on. Example:



*woking on Router0, must be connected to “Network C” or “192.168.13.0”

- `ip route 192.168.13.0 255.255.255.240 192.168.11.2`

Deleteting a static route

`no ip route <network address> <subnet mask> <interface ip address>`

Ex. `no ip route 192.168.13.0 255.255.255.240 192.168.11.2`

IPv4 Default Static Routing

To paste

```
ip route 0.0.0.0 0.0.0.0 <interface ip address>
```

`ip route 0.0.0.0 0.0.0.0 <interface ip address>`, replace `<interface ip address>` with the ip address of the nearest interface of the router that is connected to the network being routed.

Example: `ip route 0.0.0.0 0.0.0.0 192.168.11.2`

IPv4 Dynamic Routing

RIP

1. `router rip`
2. `no auto-summary`
3. `network <network address>`, replace `<network address>` with the network address/s of the network/s the router is not directly connected to.
    - to delete the network: `no network <network address>`
4. `exit`

RIPv2

1. `router rip`

2. `version 2`
3. `no auto-summary`
4. `network <network address>`, replace `<network address>` with the network address/s of the network/s the router is not directly connected to.
    - to delete the network: `no network <network address>`
5. `exit`

EIGRP

1. `router eigrp`
2. `no auto-summ`
3. `network <network address>`, replace `<network address>` with the network address/s of the network/s the router is not directly connected to.
    - to delete the network: `no network <network address>`
4. `exit`

OSPF

1. `router ospf`
2. `router-id 1.1.1.1`
3. `network <network address>`, replace `<network address>` with the network address/s of the network/s the router is not directly connected to.
    - to delete the network: `no network <network address>`
4. `area 1`

IPv6 Address Configuration

To paste

```
int <interface>
ipv6 add <ipv6 address><prefix>
no shut
```

1. go to configuration mode (ex. `Router(config)#`)
2. `int <interface name>`, replace `<interface name>` with the name of the interface
3. `ipv6 add <ip><\/>` or `ip add <ip><\/>`, replace `<ip>` with the IPv6 address and `<\/>` with the subnet prefix. Ex. `ipv6 add 2001:db8:acad:10::1/64`
4. `no shut`
5. `exit`

IPv6 Static Routing

To paste

```
ipv6 route <ipv6 network address><prefix> <interface ipv6 ad
```

1. `ipv6 route <ip><\/> <interface ipv6 address>`. replace `<ip>` with the ipv6 address, replace `<\/>` with the prefix and replace `<interface ipv6 address>` with the ipv6 address of the nearest interface on the network to the router being passed on

   *the same as normal ipv4 static routing

📌 Reminder

Make sure to only include the Network address when pasting it into the terminal, example:

- IP Address = `2001:db8:acad:12:204:9aff:fe6a:7e70`
- Network Address = `2001:db8:acad::0` (since beyond that is the MAC address and the EUI-64)
- To paste: `2001:db8:acad::/64`, make sure to remove the zero at the end

2. Default Static route: `ipv6 route ::/0 <ipv6 interface address>`

IPv6 Dynamic Routing

SLAAC

📝 **To paste**

```
!Router(config)#
ipv6 unicast-routing
int <interface>
ipv6 add <ipv6 address><prefix>
ipv6 add fe80::1 link-local
no shut
ipv6 enable
```

1. go to configuration mode (ex. `Router(config)#`)
2. `ipv6 unicast-routing`
3. `int <interface name>`, replace `<interface name>` with the name of the interface
4. `ipv6 add <ip></>` or `ip add <ip></>`, replace `<ip>` with the IPv6 address and `</>` with the subnet prefix. Ex. `ipv6 add 2001:db8:acad:10::1/64`

5. `ipv6 add fe80::1 link local`
6. `no shut`
7. `ipv6 enable` or `ipv6 ena`
8. `exit`
9. go to the end devices connected to the router and click on “automatic” to the IPv6 Addressing

Stateful/DHCP

To paste

```
!Router(config)#
ipv6 unicast-routing
int <interface>
ipv6 add <ipv6 address><prefix>
ipv6 add fe80::1 link local
no shut
ipv6 ena
ipv6 address autoconfig
ipv6 dhcp pool <pool name>
address prefix <ipv6 network address><prefix>
dns-server <ipv6 address of dns server>
domain name <domain name>
int <interface>
ipv6 nd managed-config-flag
```

1. go to configuration mode (ex. `Router(config)#`)
2. `ipv6 unicast-routing`
3. `int <interface name>`, replace `<interface name>` with the name of the interface
4. `ipv6 add <ip></>` or `ip add <ip></>`, replace `<ip>` with the IPv6 address and `</>` with the subnet prefix. Ex. `ipv6 add 2001:db8:acad:10::1/64`
5. `ipv6 add fe80::1 link local`

6. `no shut`
7. `ipv6 enable` or `ipv6 ena`
8. `ipv6 address autoconfig`
9. `ipv6 dhcp pool <poolname>`, replace `<poolname>` with the preferred name for your dhcp pool

   Example: `ipv6 dhcp pool DHCPSERVER`
10. `address prefix <network address>`, replace `<network address>` with the ipv6 network address for the pool, example: `address prefix 2000:ACAD:DB8:100::0/64`
11. `dns-server <ipv6 address>`, replace `<ipv6 address>` with the ipv6 address of the dns server

    *make sure the dns-ipv6 address doesnt include the prefix
12. `domain name <domain name>` example: `domain name www.sample.com`
13. `int <interface name>`, replace `<inteface name>` with the name of the interface the network is currently connecting to
14. `ipv6 nd managed-config-flag`
15. go to the end devices connected to the router and click on “automatic” to the IPv6 Addressing, and makw sure to wait for the Default gateway as takes long to load

DHCP with SLAAC

To paste

```
!Router(config)#
ipv6 unicast-routing
int <interface>
ipv6 add <ipv6 address><prefix>
ipv6 add fe80::1 link local
no shut
ipv6 ena
ipv6 address autoconfig
ipv6 dhcp pool <pool name>
address prefix <ipv6 network address><prefix>
dns-server <ipv6 addresss of dns server>
domain name <domain name>
int <interface>
ipv6 dhcp server <dhcp pool name>
ipv6 nd other-config-flag
```

1. go to configuration mode (ex. `Router(config)#`)
2. `ipv6 unicast-routing`
3. `int <interface name>`, replace `<interface name>` with the name of the interface
4. `ipv6 add <ip></>` or `ip add <ip></>`, replace `<ip>` with the IPv6 address and `</>` with the subnet prefix. Ex. `ipv6 add 2001:db8:acad:10::1/64`
5. `ipv6 add fe80::1 link local`
6. `no shut`
7. `ipv6 enable or ipv6 ena`
8. either make a dhcp pool or use a created dhcp
    a. make dhcp pool
        - `ipv6 address autoconfig`
        - `ipv6 dhcp pool <poolname>`, replace `<poolname>` with the preferred name for your dhcp pool

Example: `ipv6 dhcp pool DHCPSERVER`

- `address prefix <network address></>`, replace `<network address>` with the ipv6 network address for the pool and `</>` of it's prefix, example: `address prefix 2000:ACAD:DB8:100::0/64`
- `dns-server <ipv6 address>`, replace `<ipv6 address>` with the ipv6 address of the dns server
- `domain name <domain name>` example: `domain name www.sample.com`
- `int <interface name>`, replace `<interface name>` with the name of the interface
- `ipv6 dhcp server <dhcp pool name>`, replace `<dhcp pool name>` with the name of the created dhcp pool

b. use created dhcp pool

- `int <interface name>`, replace `<interface name>` with the name of the interface
- `ipv6 dhcp server <dhcp pool name>`, replace `<dhcp pool name>` with the name of the created dhcp pool

9. `ipv6 nd other-config-flag`

————-IPv4 DHCP————
ip dhcp excluded ip dhcp pool LAN1 network
 default-router dns-server
domain-name
[For passing DHCP]
int ip helper

————Creating a VLAN Trunking Protocol————-
vtp domain cisco.com vtp mode client|server
—————-Creating VLANs—————————-
vlan name
int range fa0/1-5 switch mode acc switch acc vlan
————-Creating Port Channel————

LACP—
int range channel group <no.> mode passive|active
exit
int port-channel <no.> switchport mode trunk swithcport trunk
allowed vlan 1-1000
PAGP—
int range channel group <no.> mode auto|desirable
exit
int port-channel <no.> switchport mode trunk swithcport trunk
allowed vlan 1-1000
Static—
int range channel-group <no.> mode on exit
int port-channel <no.> switchport mode trunk swithcport trunk
allowed vlan 1-1000
————Router on a Stick implementation————-
*this is for diff vlan, therefore diff network addresses should be
used
int no shut
int g0/0.10 (sub-int) encapsulation dot1q ip add no shut
IPv6—
ipv6 unicast-routing
int g1/0/24 no shut ipv6 add 2001:db8:acad:100::1/64 ipv6 add fe80::1
l no shut
ipv6 unicast-routing int g0/0.200 encapsulation dot1q 200 ipv6 add
2001:db8:acad:200::1/64 ipv6 add fe80::2 l no shut
———How to secure ports in a switch?———-
int ra fa0/1-2, fa0/24 switchport mode access switchport
port-security switchport port-security max 2 switchport port-security
mac sticky switchport port-security violation r, s
————IPv6 Address Interface Router Configuration w/ Unicast———— LAN
Port
en conf t ipv6 unicast-routing int g0/0 ipv6 add fe80::1 l ipv6 add
/64 no shut exit
WAN Port
en conf t ipv6 unicast-routing int s0/0/0 ipv6 add fe80::1 l ipv6 add
/64 no shut exit
LAN Port w/ RIPng

en conf t ipv6 unicast-routing int g0/0 ipv6 add fe80::1 l ipv6 add
/64 ipv6 rip SEX en no shut exit
WAN Port w/ RIPng
en conf t ipv unicast-routing int s0/0/0 ipv6 add fe80::1 l ipv6 add
/64 ipv6 rip SEX en no shut exit
———IPv6 Static Routing———— Static Routing
ipv6 rout /64
Default Routing
ipv6 rout ::0/0
———Implement SSH to Router———
ip domain-name cisco.com crypto key generate rsa 1024 username admin
password cisco
line vty 0 4 login local transport input ssh exit
———Local AAA in router————-
username secret aaa new-model aaa
authentication login default local line con 0 login authentication
default
ip domain-name cisco.com crypto key generate rsa 1024 aaa
authentication login <name|default> local
line vty 0 4 login authentication <name|default> transport
input ssh end
————ACL Standard and Extended————
Standard—
access-list 10 deny   access-list 10 permit 0.0.0.0
255.255.255.255 (any) exit
int ip access-group 10 in|out
(NAMED) ip access-list standard deny   permit
any exit
int ip access-group in|out
(FILTER VTY TRAFFIC (telnet/ssh))
access-list 10 deny host access-list 10 permit any
line vty 0 4 access-class 10 in|out
EXTENDED—
access-list 101 deny tcp   eq 23(telnet) 22(ssh) access-list 101 permit ip 0.0.0.0
255.255.255.255 any
interface ip access-group 101 in|out
(NAMED) ip access-list extended deny tcp host eq 23(telnet) 22(ssh) permit ip any

0.0.0.0 255.255.255.255 exit
int ip access-group in|out
———Connecting between Static and Dynamic———– IPv4 Redistribute
router rip no auto-summ ver 2 redistribute static network <>
exit
IPv6 Redistribute
Method 1 (Interface Config): en conf t ipv6 unicast-routing int
s0/0/0 ipv6 add fe80::1 l ipv6 add /64 ipv6 rip SEX en redistribute
static no shut exit
Method 2 (Global Config): en config t ipv6 unicast-routing ipv6
router rip SEX redistribute static
————-Creating a Loopback———— en config t int loopback 0 ip add
 no shut exit

Commands for bverifying connectivity

1. `show ip route`
2. `show ip int brief`
3. `show ipv6 interface brief`
4. `show ipv6 route`
5. `ping <ma>`, replace `<ma>` with MAC address
6. `ssh -l cisco GATEWAY`
7. `telnet <ip>`, replace `<ip>` wih the IP address of the telnet configured device


Se0/1/0
192.168.11.1
Router0
Gig0/0/0
192.168.12.1
Se0/1/0
192.168.11.2
Gig0/0/1
192.168.13.1