14 Cisco Router and Switch Basics - Answer Key

In this lab you will complete a basic configuration on a switch, verify Cisco Discovery Protocol CDP and analyse the effects of interface speed and duplex configuration.

Cisco Router and Switch Initial Configuration

1) Configure Router 1 with the hostname 'R1'

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

2) Configure Router 2 with the hostname 'R2'

```
Router(config)#hostname R2
R2(config)#
```

3) Configure Switch 1 with the hostname 'SW1'

```
Switch(config)#hostname SW1
SW1(config)#
```

4) Configure the IP address on R1 according to the topology diagram

```
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 10.10.10.1 255.255.255.0
R1(config-if)#no shutdown
```

5) Configure the IP address on R2 according to the topology diagram

```
R2(config)#interface FastEthernet0/0
R2(config-if)#ip address 10.10.10.2 255.255.255.0
R1(config-if)#no shutdown
```

6) Give SW1 the management IP address 10.10.10.10/24

```
SW1(config)#interface vlan1
SW1(config-if)#ip address 10.10.10.10 255.255.255.0
SW1(config-if)#no shutdown
```

7) The switch should have connectivity to other IP subnets via R2

```
SW1(config)#ip default-gateway 10.10.10.2
```

8) Verify the switch can ping its default gateway

```
SW1#ping 10.10.10.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.2, timeout is 2
seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max =
1/2/8 ms
```

9) Enter suitable descriptions on the interfaces connecting the devices

```
R1(config)#interface FastEthernet 0/0
R1(config-if)#description Link to SW1

R2(config-if)#interface FastEthernet 0/0
R2(config-if)#description Link to SW1

SW1(config)#interface FastEthernet 0/1
SW1(config-if)#description Link to R1
SW1(config-if)#interface FastEthernet 0/2
SW1(config-if)#description Link to R2
```

10) On SW1, verify that speed and duplex are automatically negotiated to 100 Mbps full duplex on the link to R1

```
SW1#show interface f0/1
FastEthernet0/1 is up, line protocol is up (connected)
Hardware is Lance, address is 00e0.8fd6.8901 (bia
00e0.8fd6.8901)
Description: Link to R1
BW 100000 Kbit, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 100Mb/s
```

11) Manually configure full duplex and FastEthernet speed on the link to R2

```
SW1(config)#interface FastEthernet 0/2
SW1(config-if)#speed 100
```

```
SW1(config-if)#duplex full
```

Don't forget to configure matching settings on R2!

```
R2(config)#interface FastEthernet 0/0
R2(config-if)#speed 100
R2(config-if)#duplex full
```

12) What version of IOS is the switch running?

```
SW1#show version
Cisco IOS Software, C2960 Software (C2960-LANBASE-M),
Version 12.2(25)FX, RELEASE SOFTWARE (fc1)
```

CDP Configuration

13) Verify the directly attached Cisco neighbors using Cisco Discovery Protocol

```
SW1#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
R1          Fas 0/1          170          R           C2800  Fas 0/0
R2          Fas 0/2          134          R           C2800  Fas 0/0
```

14) Prevent R1 from discovering information about Switch 1 via CDP

```
SW1(config)#interface FastEthernet 0/1
SW1(config-if)#no cdp enable
```

15) Flush the CDP cache on R1 by entering the 'no cdp run' then 'cdp run' commands in global configuration mode

```
R1(config)#no cdp run
R1(config)#cdp run
```

16) Verify that R1 cannot see SW1 via CDP

```
R1#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
                  D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID       Local Intrfce     Holdtme     Capability  Platform  Port ID
R1#
```

Switch Troubleshooting

17) Verify the status of the switch port connected to R2 with the `show ip interface brief` command. It should show status and protocol up/up.

```
SW1#show ip interface brief
Interface            IP-Address       OK? Method Status
Protocol
Vlan1                10.10.10.10      YES manual up                       up
FastEthernet0/1      unassigned       YES unset  up                       up
FastEthernet0/2      unassigned       YES unset  up                       up
```

18) Shut down the interface connected to R2 and issue a `show ip interface brief` command again. The status and protocol should show administratively down/down.

```
SW1(config)#interface FastEthernet 0/2
SW1(config-if)#shutdown
*Mar  1 00:44:34.212: %LINK-5-CHANGED: Interface
FastEthernet0/2, changed state to administratively down
*Mar  1 00:44:35.219: %LINEPROTO-5-UPDOWN: Line protocol on
Interface FastEthernet0/2, changed state to down

SW1(config-if)#do show ip interface brief
Interface            IP-Address       OK? Method Status
Protocol
Vlan1                10.10.10.10      YES manual up                       up
FastEthernet0/1      unassigned       YES unset  up                       up
FastEthernet0/2      unassigned       YES unset  administratively down down
```

19) Bring the interface up again. Verify the speed and duplex setting.

```
SW1(config)#interface FastEthernet 0/2
SW1(config-if)#no shutdown
SW1(config-if)#
*Mar  1 00:45:52.637: %LINK-3-UPDOWN: Interface
FastEthernet0/2, changed state to up
*Mar  1 00:45:53.644: %LINEPROTO-5-UPDOWN: Line protocol on
Interface FastEthernet0/2, changed state to up
```

```
SW1#sh interface f0/2
FastEthernet0/2 is up, line protocol is up (connected)
Hardware is Lance, address is 00e0.8fd6.8902 (bia
00e0.8fd6.8902)
BW 100000 Kbit, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
```
Full-duplex, 100Mb/s

20) Set the duplex to half on Switch 1. Leave the settings as they are on R2.

```
SW1(config-if)#duplex half
SW1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state
to down

    %LINEPROTO-5-UPDOWN: Line protocol on Interface
    FastEthernet0/2, changed state to down
```

21) Verify the state of the interface.

The interface is down/down. It will not forward traffic.

```
SW1#show ip interface brief
Interface       IP-Address OK? Method Status Protocol
FastEthernet0/1 unassigned YES manual up up
```
FastEthernet0/2 unassigned YES manual down down

22) Set the duplex back to full duplex.

```
SW1(config)#int f0/2
SW1(config-if)#duplex full
SW1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state
to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/2, changed state to up
```

23) Set the speed to 10 Mbps.

```
SW1(config)#int f0/2
SW1(config-if)#speed 10
SW1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state
to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/2, changed state to down
```

24) Check if the interface is still operational.

```
SW1#show ip interface brief
Interface           IP-Address      OK? Method Status
Protocol
Vlan1               10.10.10.10     YES manual up                   up
FastEthernet0/1     unassigned      YES unset  up                   up
FastEthernet0/2     unassigned      YES unset  down                 down
```

The interface status is down/down.

25) Check if the interface is operational on R2. What is the status of the interface?

```
R2#show ip interface brief
Interface           IP-Address      OK? Method Status              Protocol
FastEthernet0/0     10.10.10.2      YES manual up                  down
```

The interface status is up/down on R2.