IFT 266 Introduction to Network Information Communication Technology (ICT)

Lab 6
Switch Configuration (Speed & Duplex)

After you complete each step, put an 'x' in the completed box

1. In Packet Tracer setup the following topology. You can use two generic switches, but you will need to add in some Gigabit ports to the switch. Use a crossover cable as the transmission media.

Gig9/1 ———————————— Gig9/1

Switch2   Switch3

When adding the Gigabit ports, there are two modules that you can choose from based on copper or optical connectivity (s).

- PT-SWITCH-NM-1CGE - Single-port Cisco Gigabit Ethernet Network Module (part number PT-SWITCH-NM-1CGE) provides Gigabit Ethernet copper connectivity

- PT-SWITCH-NM-1FGE - Single-port Cisco Gigabit Ethernet Network Module (part number PT-SWITCH-NM-1FGE) provides Gigabit Ethernet optical connectivity

For this lab, we will use PT-SWITCH-NM-1CGE.

Completed ☒

2. The first aspect we will look in this lab is speed. How quickly do we want to send data between these switches? Open up the command line on either switch (as we have done in previous labs) and we will first check the status of the switch ports i.e. whether they are up and running.

3. Execute the following the commands.

```
Switch>en
Switch#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol

FastEthernet0/1        unassigned      YES manual down                  down

FastEthernet1/1        unassigned      YES manual down                  down

FastEthernet2/1        unassigned      YES manual down                  down

FastEthernet3/1        unassigned      YES manual down                  down

FastEthernet4/1        unassigned      YES manual down                  down

FastEthernet5/1        unassigned      YES manual down                  down

GigabitEthernet9/1     unassigned      YES manual up                    up

Vlan1                  unassigned      YES manual administratively down down
```

In lab 4 we mentioned that you can use various show commands to check the settings and configurations on the switch. The show ip int brief command will confirm that Gigabit port is up and running.

You can see that the port is 'up' and 'up'. The status 'up' is Layer 1 while protocol 'up' is Layer 2. This shows we have a good connection to the other switch.

Completed ☒

Follow-up Question

Can you run the show ip int brief command while in user mode? If no, why not?

No. Privileged is needed.

4. Now type the show interfaces command which will display among other things the speed and duplex used for that particular port i.e. in our case the gigabit port.

```
Switch#show interfaces gigabit 0/1
%Invalid interface type and number
Switch#show interfaces gigabit 9/1
GigabitEthernet9/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.5c99.d984 (bia 0060.5c99.d984)
  BW 1000000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
```

Completed ☒

5. Why not always set the max speed for a port?

A switch device may not support Gigabit links (only supports Fast Ethernet) so we can manually set a lower rate.

Completed ☒

6. To change the speed of a particular port, run the following commands

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int gigabit 9/1
Switch(config-if)#speed ?
  10    Force 10 Mbps operation
  100   Force 100 Mbps operation
  1000  Force 1000 Mbps operation
  auto  Enable AUTO speed configuration
Switch(config-if)#speed 100
Switch(config-if)#exit
```

7. Now run the show interfaces command to see the updated speed on the port

```
Switch#show interfaces gigabit 9/1
GigabitEthernet9/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.5c99.d984 (bia 0060.5c99.d984)
 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
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
```

Completed ☒

8. We could change the speed on multiple ports by using the range command e.g. int range fa 0/1 – 3

Completed ☒

9. Remembering back to your IFT 259 days, we had different modes of duplex.

You can have half duplex (can send or receive, one path at a time) now rarely used unless connecting older equipment, like a hub or you can have full duplex (sends and receives simultaneously).

We are now living in the age of auto negotiation where the switch automatically negotiates what kind of duplex to use).

Auto negotiation is good for end-user devices as you are not always sure what they will plug in

We normally run in full mode.

Completed ☒

10. Now set the duplex to half duplex mode

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int gigabit 9/1
Switch(config-if)#duplex ?
  auto  Enable AUTO duplex configuration
  full  Force full duplex operation
  half  Force half-duplex operation
Switch(config-if)#duplex half
Switch(config-if)#
```

Completed ☒

11. Now run the show interfaces command to see the updated speed on the port

```
Switch#show interfaces gigabit 9/1
GigabitEthernet9/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.5c99.d984 (bia 0060.5c99.d984)
 BW 100000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
```

Completed ☒