ICT1010 Computer Networks

2021-2022 Trimester 2

Laboratory 3c:
Investigating Spanning Tree Protocol (STP)

LEARNING OUTCOMES

Upon completion of this laboratory exercise, you should be able to:

- Understand the operation of Spanning Tree Protocol (STP)
- Derive the result of Spanning Tree Protocol (STP)

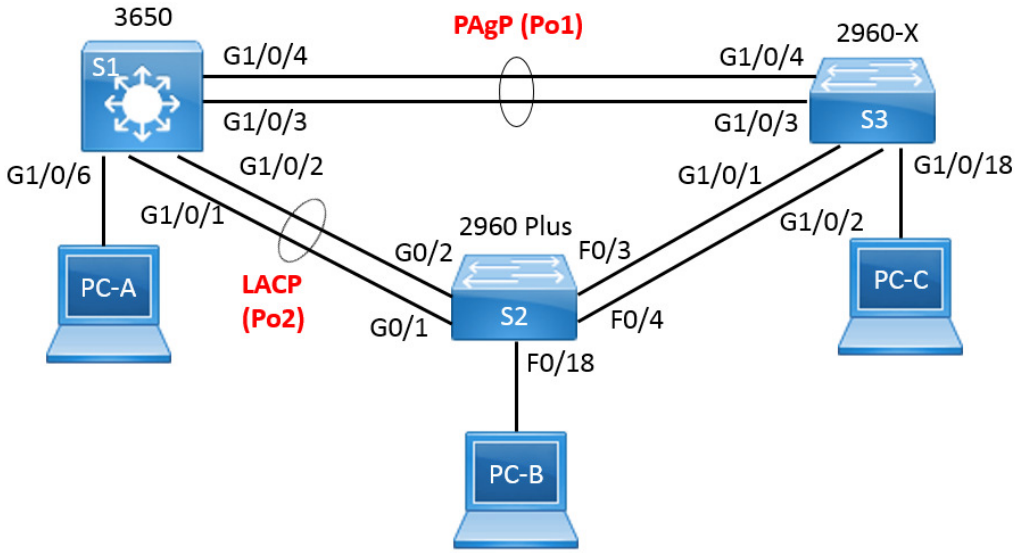
REQUIRED HARDWARE

- 1 x Rack of Cisco network devices
- 1 x Box of Cables containing
  - USB-to-DB9/DB9-to-RJ45 console cables
  - Ethernet cables
- 3 x Laptops

REQUIRED SOFTWARE

- Tera Term 4.105 https://ttssh2.osdn.jp/
- Driver for USB-Serial (USB-to-DB9/DB9-to-RJ45) console cable if needed

TOPOLOGY



PART 1: DETERMINE ROOT BRIDGE/SWITCH

1.1 Extend the network topology in Lab 3b by connecting two additional Ethernet cables between switches S2 and S3 as shown in the topology. Do not configure link aggregation for these two cables.

1.2 Enter the **show spanning-tree** command on all three switches S1, S2 and S3. What are their BIDs?

S1 : _____

S2 : _____

S3 : _____

1.3 Which switch is the root bridge/switch? Why?

1.4 Configure the **root primary** command on switch S1. What is its new BID? Which switch is the root bridge/switch now? (Note: You may need to wait for a while for STP to re-run and converge.)

PART 2: DETERMINE ROOT PORT OF NON-ROOT SWITCHES

2.1 Enter the **show spanning-tree** command on switch S2. Which is the root port and what is its port cost?

S2 root port : _____

S2 root port cost : _____

Why is this port the root port?

2.2 Similarly for switch S3, which is the root port and what is its port cost?

S3 root port : _____

S3 root port cost : _____

2.3 Unplug the Ethernet cable connected to switch S3 G1/0/4 to simulate a failure of one of the links of port channel 1 connected to switch S1. Is there a change of the root port and what is its port cost? Why? (Note: You may need to wait for a while for STP to re-run and converge.)

S3 root port : _____

S3 root port cost : _____

Do not reconnect the Ethernet cable back to switch S3 G1/0/4.

PART 3: DETERMINE DESIGNATED AND BLOCKED PORTS OF NON-ROOT SWITCHES

3.1 Enter the **show spanning-tree** command on switch S2 again. Which are the designated ports and blocked ports?

S2 designated ports : _____

S2 blocked ports : _____

Why are these ports designated or blocked?

3.2 Similarly for switch S3, which are the designated ports and blocked ports?

S3 designated ports : _____

S3 blocked ports : _____

3.3 Observe the LED status lights on the ports of switches S2 and S3. Are there any lights that are amble? Why?

PART 4: OBSERVE STP BEHAVIOUR AFTER CHANGE OF PORT COST

4.1 Connect to the switch with blocked ports. Lower the port cost of the root port to a cost of 2.

4.2 Observe the LED status lights on the ports of switches S2 and S3. Are there any changes? Why?