ECET 4840 Advanced Telecommunications
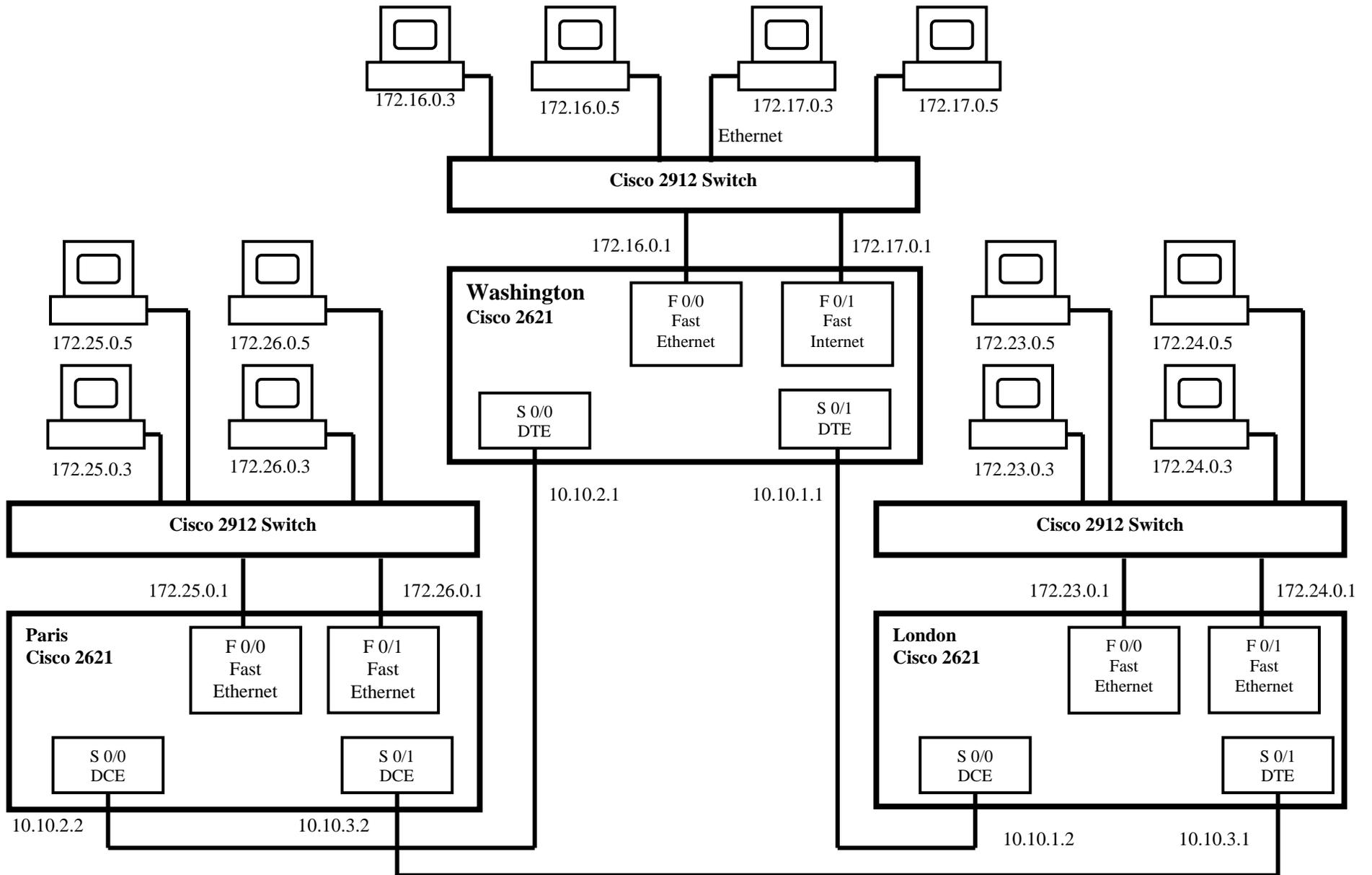# Laboratory Exercise 7

Purpose: The objective of this exercise is to 1) determine how to use the **conf** command on the CISCO_2621 router to drop/insert links on a network 2) Examine routing tables to see how they get updated with **sh ip route** and **debug ip rip** commands, and 3) to use two common diagnostic tools, **ping** and a network analyzer, to determine basic network performance, after the network has been reconfigured with the use of a hub connection.

Procedures:

Connect the terminal to the router via the administrative login.

1) Using the terminal connected to the router, check Washington's routing tables by typing the command **sh ip route** at the command prompt (#). Record the router configuration. Note that the serial connections from Washington, S 0/0 and S 0/1 are not shutdown.

2) Type **debug ip rip** at the command prompt to display the RIP routing updates as they are sent and received. Record the information displayed.

3) Isolate the connection from Paris to London by shutting down the link from Washington to London, i.e. by shutting down the DTE – DCE link over the serial port S 0/1. To do this type **sh conf** at the command prompt. This will show all the options for the **conf** command on the router. To configure from the terminal, type **conf t** at the prompt. In configure mode type **int S 0/1 shutdown**. This command will shutdown serial port S 0/1 disconnecting Washington from London. To change the routing tables on Washington at startup, type **copy run start**. This will load the changes to the configuration into the start memory of the router.

4) Hook Ethernet ports via a hub to reconnect Washington to London over the fast Ethernet connection F 0/0.

5) Connect a network analyzer to the hub to capture **ping** data.

6) Wait for a few minutes and the check the routing table on Washington again. Record the new information on the routing table.

7) Type **debug ip rip** at the command prompt to display the RIP routing updates as they are sent and received. Record the information displayed.

8) Run the network analyzer and watch the traffic during continuous pinging across the network (extreme ends). Use a fixed packet size of 100 bytes. Alternatively, do a **traceroute**. Record the information from the network analyzer and/or the **traceroute** command.

9) Repeat step 7, but this time pinging from the other end of the network. Record all data.

10) Increase the test packet size by 100 bytes until you reach approximately 1000 bytes in length. Repeat steps 8 and 9 for each packet size and record the data.

Turn in: All of the required data, an XY graphs showing response times versus packet length for each direction. Discuss your results. Each report must be an individual effort.

172.16.0.3   172.16.0.5   172.17.0.3   172.17.0.5

Ethernet

Cisco 2912 Switch

172.16.0.1   172.17.0.1

Washington
Cisco 2621

F 0/0
Fast
Ethernet

F 0/1
Fast
Internet

172.25.0.5   172.26.0.5

S 0/0
DTE

S 0/1
DTE

172.23.0.5   172.24.0.5

172.25.0.3   172.26.0.3

10.10.2.1   10.10.1.1

172.23.0.3   172.24.0.3

Cisco 2912 Switch

Cisco 2912 Switch

172.25.0.1   172.26.0.1

172.23.0.1   172.24.0.1

Paris
Cisco 2621

F 0/0
Fast
Ethernet

F 0/1
Fast
Ethernet

London
Cisco 2621

F 0/0
Fast
Ethernet

F 0/1
Fast
Ethernet

S 0/0
DCE

S 0/1
DCE

S 0/0
DCE

S 0/1
DTE

10.10.2.2   10.10.3.2

10.10.1.2   10.10.3.1

WAN network subnet mask: 255.255.255.0
LAN network subnet mask: 255.255.0.0

Fig. 1. Cisco 2621 Router Intranet Configuration