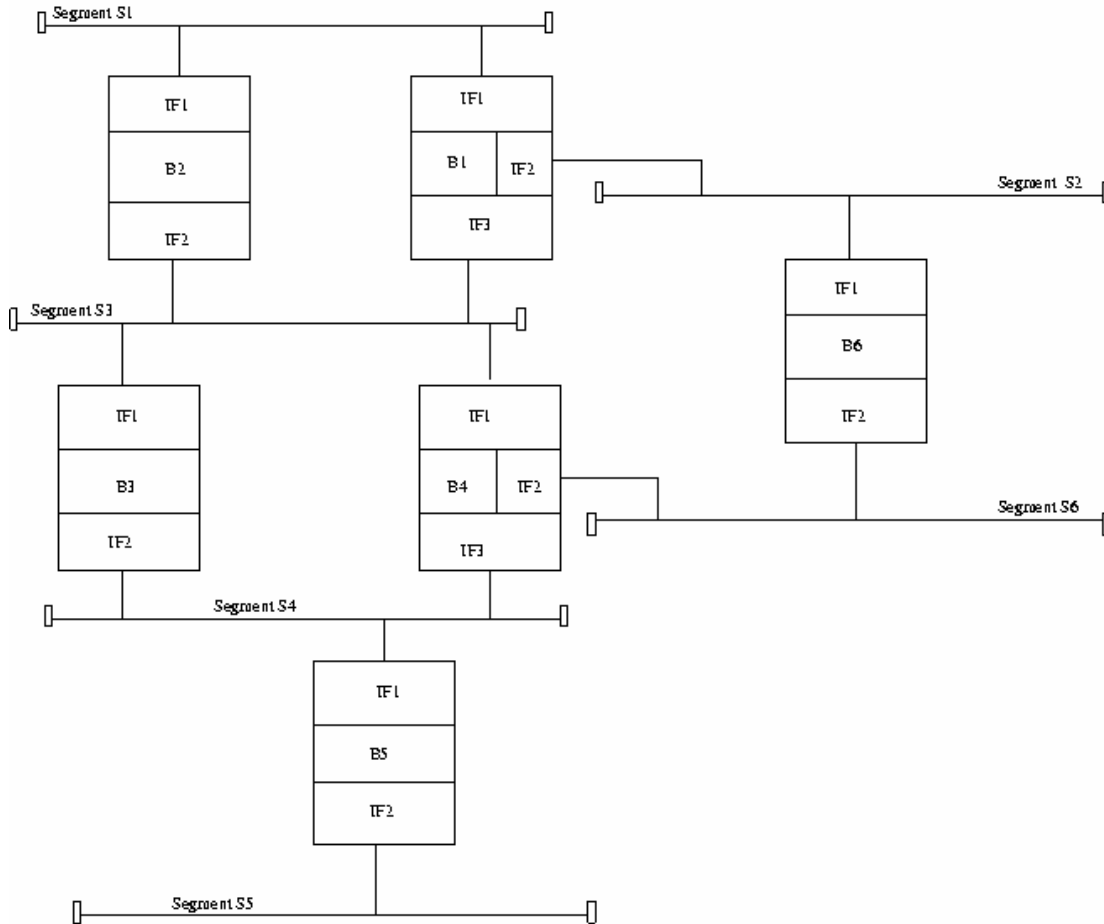


**COE 444 - Internetwork Design and Management
Spring 2004 (Term 032)**

Homework 2

Date: Tuesday, February 24, 2004

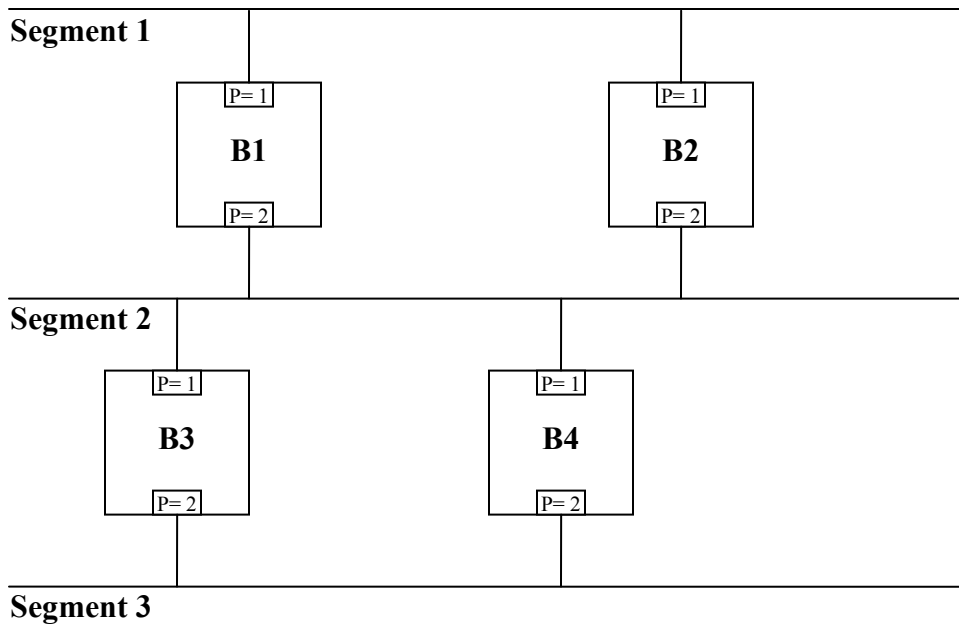
Q1. Given a LAN consisting of six Ethernet segments interconnected by 6 bridges as illustrated in the figure below. Note that the ID of each bridge is its name.



a. Suppose we are using fixed routing to configure the bridges. Determine the central routing directory for all segments, and the routing tables for Bridges B1 and B3. If alternate routes are available then chose the one with the least number of hops. If they are the same than chose the one with the lowest bridge ID.

b. Suppose we are using transparent bridges. Assume that all segments are 10BaseT. Determine the active spanning tree topology. Show the elected Root Bridge, the Root Path Cost (RPC), the Root Port (R), and the Designated Port (D) on all the bridges. Show the ports that will be Blocked (B).

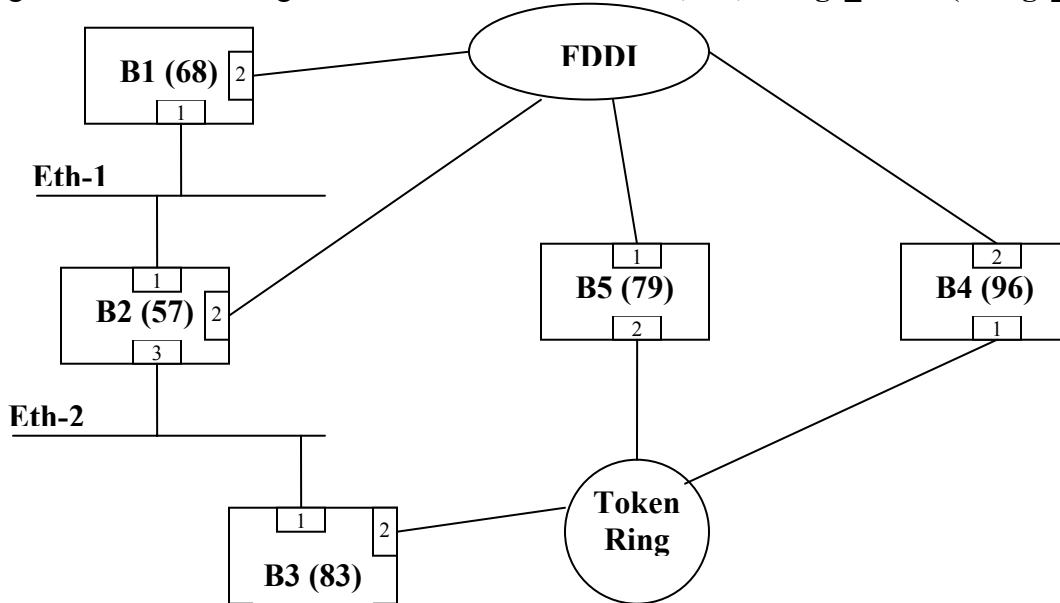
Q2. Given a LAN consisting of three 100 Mbps Ethernet segments interconnected by 4 bridges as illustrated in the figure below. Note that the ID of each bridge is its name.



a. Assume that we are using fixed routing to configure the bridges. Determine the **central routing directory** for all segments, and the **routing table for Bridge B1**. If alternate routes are available then chose the one with the least number of hops. If they are the same then choose the one with the lowest bridge ID.

b. Assume that we are using transparent bridges. Determine the **active spanning tree** topology. Show the elected **Root Bridge**, the Root Path Cost (**RPC**), the Root Port (**R**), and the Designated Port (**D**) on all the bridges. Show the ports that will be Blocked (**B**).

Q3. You are given a network interconnected by 5 transparent bridges as illustrated in the figure below. The bridge ID is shown next to its name, i.e., **Bridge_Name (Bridge_ID)**.



This network interconnects the following:

- 100 Mbps Ethernet (Eth-1)
- 10 Mbps Ethernet (Eth-2)
- 100 Mbps FDDI
- 16 Mbps Token Ring

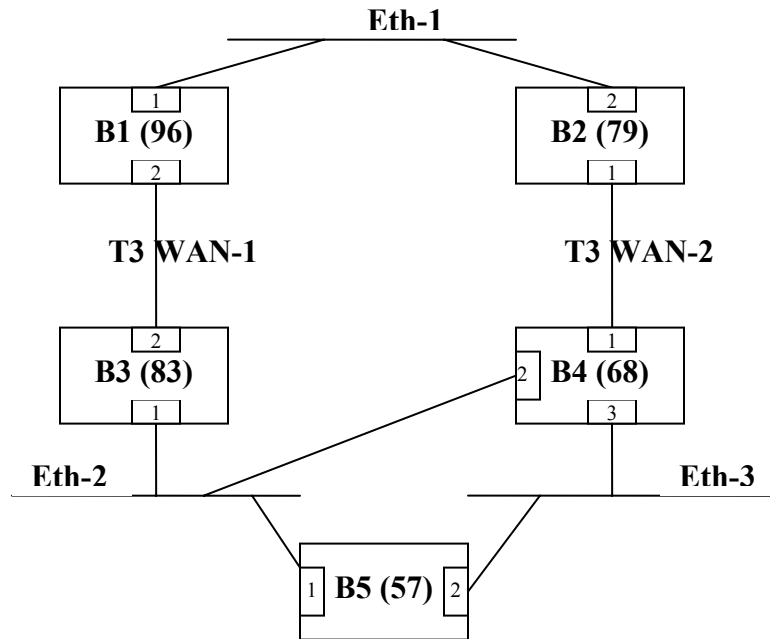
Costs used in the ports of the bridges	
Data Rate	Cost
10 Mbps	100
16 Mbps	62
100 Mbps	19

Determine the active spanning tree topology. In the figure above, show the **cost for each port**, the elected **Root Bridge**, the Root Path Cost (**RPC**), the Root Port (**R**), and the Designated Port (**D**) on all the bridges. Show the ports that will be Blocked (**B**). Then complete the following with appropriate explanations. The status should be either R, D, or B.

Root Bridge is: Explanation:

Bridge(Port)	Status	Explanation
B1 (1)		
B1 (2)		
B2 (2)		
B3 (1)		
B3 (2)		
B4 (1)		
B4 (2)		
B5 (1)		
B5 (2)		

Q4. You are given a network interconnected by 5 transparent bridges as illustrated in the figure below. The bridge ID is shown next to its name, i.e., **Bridge_Name (Bridge_ID)**.



This network interconnects the following:

- 10 Mbps Ethernet (Eth-1)
- 100 Mbps Ethernet (Eth-2 & Eth-3)
- 44 Mbps T3 (WAN-1 & WAN-2)

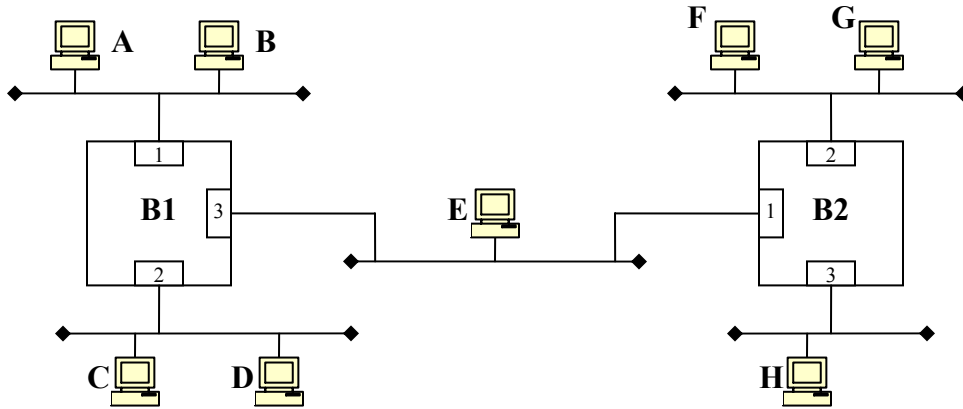
Costs used in the ports of the bridges	
Data Rate	Cost
10 Mbps	100
44 Mbps	22
100 Mbps	19

Determine the active spanning tree topology. In the figure above, show the **cost for each port**, the elected **Root Bridge**, the Root Path Cost (**RPC**), the Root Port (**R**), and the Designated Port (**D**) on all the bridges. Show the ports that will be Blocked (**B**). Then complete the following with appropriate explanations. The status should be either R, D, or B.

Root Bridge is: Explanation:

Bridge(Port)	Status	Explanation
B1 (1)		
B1 (2)		
B2 (1)		
B2 (2)		
B3 (1)		
B3 (2)		
B4 (1)		
B4 (2)		
B5 (1)		

Q2: (15 points) Given a LAN consisting of five 10 Mbps Ethernet segments interconnected by two transparent bridges as illustrated in the figure below.



B1 forwarding table has the following entries (the aging time is set initially to 300 seconds):

MAC Address	Port	Aging time
B	1	200
H	3	150

A frame is received without error by Bridge B1 with destination address (DA) and source address (SA) as stated in the following table. Fill the following table with the appropriate information

Frame transmitted	Does B1 forward this frame? If yes, then on which port(s) does B1 forward this frame?	Does B1 add/update an entry to its table? If yes, then update the above table with appropriate changes?
DA = "A", SA = "B"		
DA = "B", SA = "A"		
DA = "H", SA = "C"		
DA = "H", SA = "E"		
DA = "D", SA = "G"		