



**NPTEL ONLINE CERTIFICATION COURSES**

# **COMMUNICATIONS NETWORK**

**Dr. Goutam Das**

**G. S. Sanyal School of Telecommunications, IIT KHARAGPUR**

**Module 11: Bridges**

**Lecture 50: Learning Bridges**

# References

Book:  
Queuing Systems Vol. 1 – L. Kleinrock

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**Module 11: Bridges**

**Lecture 51: Learning Bridges contd.**

# References

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# **COMMUNICATIONS NETWORK**

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**Module 11: Bridges**

**Lecture 52: Distributed Spanning Tree**

# References

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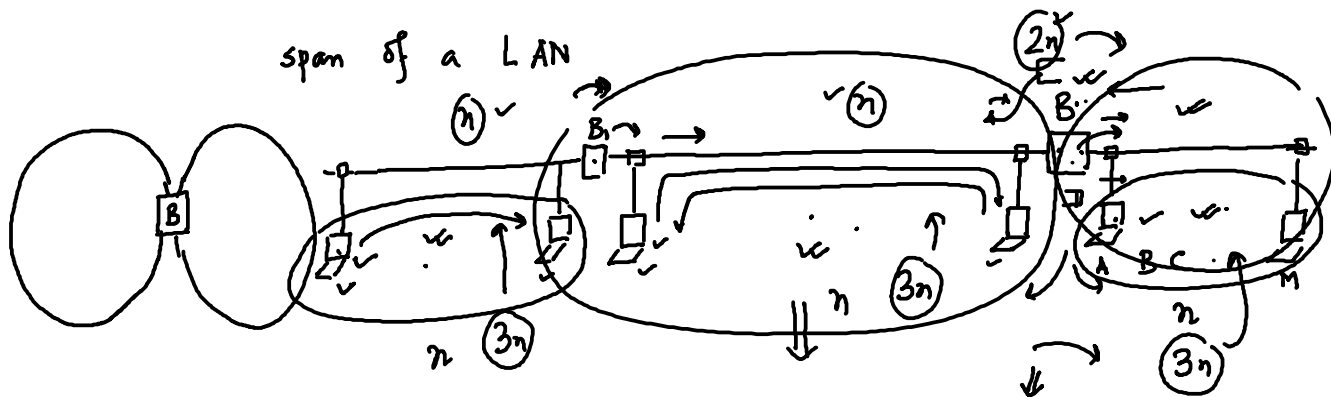
**Module 11: Bridges**

**Lecture 53: Distributed Spanning Tree contd.**

# References

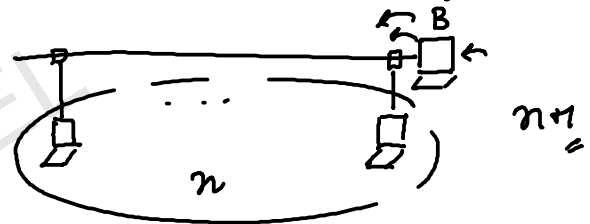
Book:  
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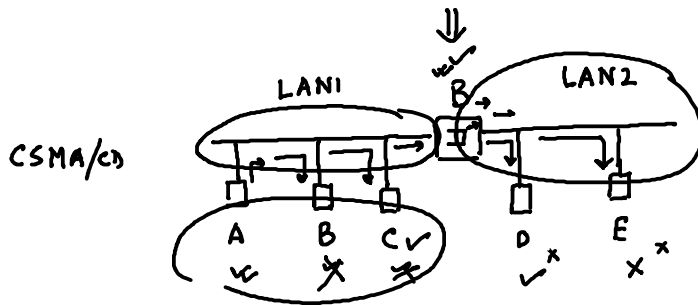
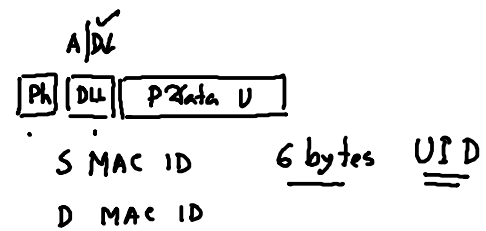
1. per user utilization  
bw share ↓

2. Delay ← ↑ unfair



No frill Bridges.

## Learning Bridges:

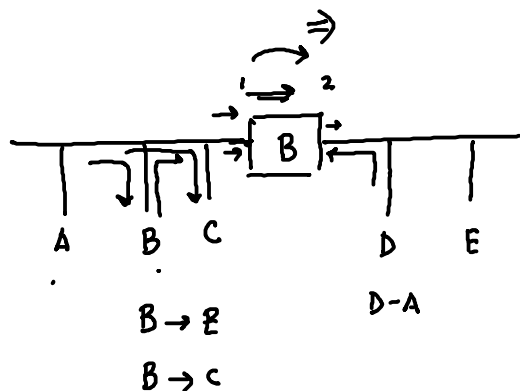


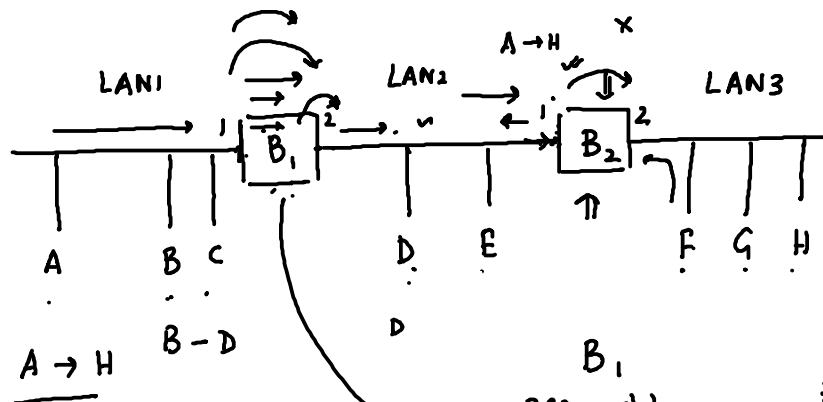
A → D

| port ID | Station |
|---------|---------|
| 1       | A, B, C |
| 2       | D, E    |

$$\left(\frac{X}{2}\right)$$

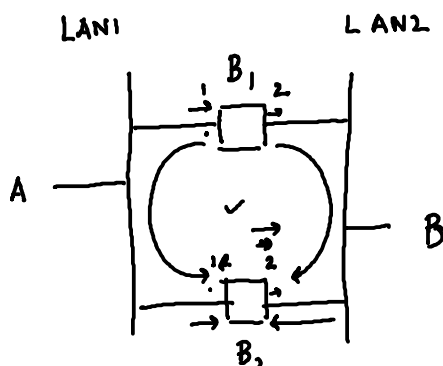
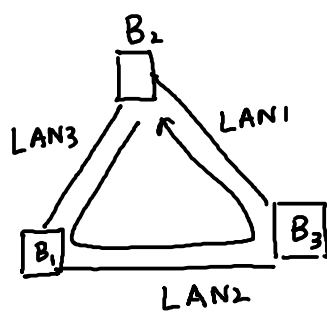
$$\left(\frac{X}{4}\right)$$





| PID | stations      |
|-----|---------------|
| 1   | A, B, C       |
| 2   | D, E, F, G, H |

| PID | stations      |
|-----|---------------|
| 1   | A, B, C, D, E |
| 2   | F, G, H       |

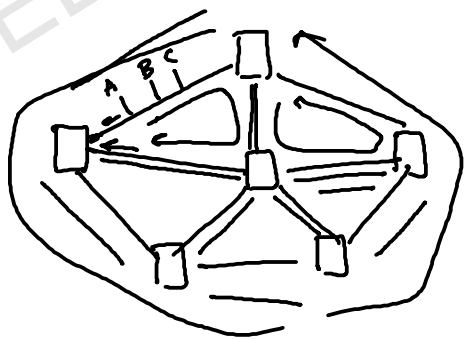
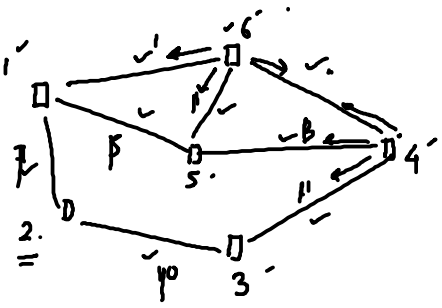


$B_1 \rightarrow$  Broadcast (A-B) on LAN2

| P | Sta |
|---|-----|
| 1 | X   |
| 2 | A   |

| P | St |
|---|----|
| 1 | X  |
| 2 | A  |

Spanning tree protocol:



$$G = (N, A)$$

$$N = \{1, 2, 3, 4, 5, 6\}$$

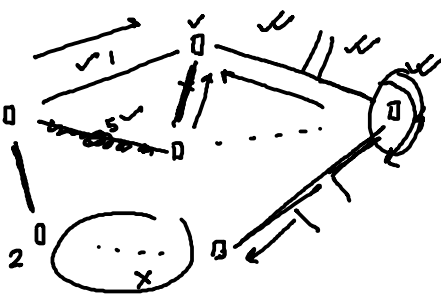
$$A = \{(1, 6), (6, 1), \dots\}$$

$$G_s = (N, A')$$

no loops

$$A' \subset A$$

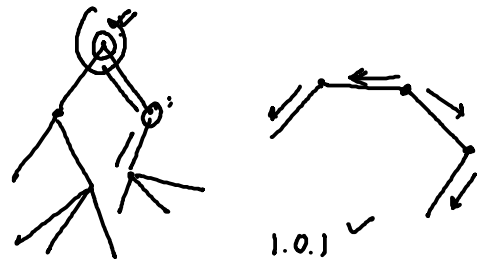
MST



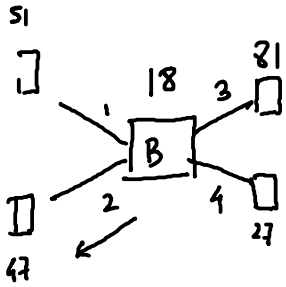
R. Perlman

Interconnections :

{ Root ID:  
Bridge ID:  
 cost to the root. 0

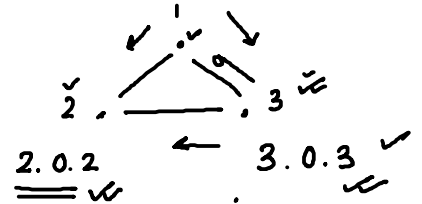


RID. cost. Bridge Id.  
 ↓  
 RID. cost. Bridge Id.



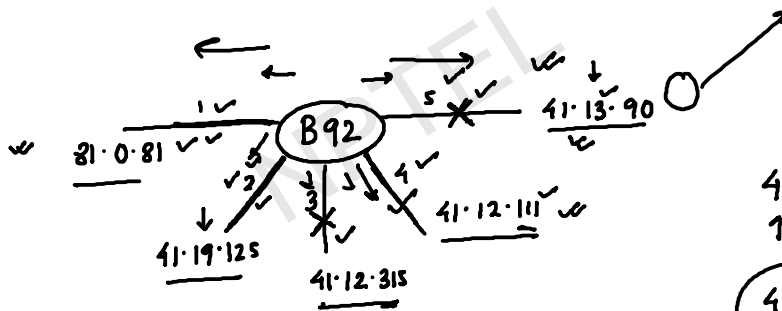
|          | RID    | Cost | Bridge Id |
|----------|--------|------|-----------|
| Port 1   | ✓ 12   | 93   | 51 ✓      |
| x Port 2 | ✓ 12 ✓ | 85   | 47 ⇒      |
| x Port 3 | 81     | 0    | 81 ✓      |
| x Port 4 | 15     | 31   | 27 ✓      |

✓ 1.0.1  
 ✓ 2.0.2  
 ✓ 3.0.3



2.0.2  
 1.0.1  
 3.0.3  
 18.0.18

✓ 12.86.18 //



41.12.111  
 ↑ ↑  
 41.13.92

41.13.92

Designated root port → port 4 A.

port 1 & 2 → Active.

4 & 5 → X

