Learning Process and Loop Problem

Switch learning process

- When the switch receives a frame, it compares the **source address** of the frame with each entry in the forwarding table
  - If **No match is found**, the bridge will **add** to the table the frame **source address** and the **Interface** on which the frame **was received.**
  - If a **match is found**, the bridge **updates** the **Interface number** on which the frame was received if **it is different** from the one in the table also it **updates** the **record time**
- Then, the switch compares the **destination address** of the frame with each entry in the **forwarding table (MAC table)**
  - If a match is found then
    - The bridge compares the **interface number** on which the frame was received and the interface number in the table, if they are **different** the bridge **forwards** the frame through the interface number stored in the table. Otherwise, if they are the **same** the switches **discards** (**drops**) the frame.
  - If no match is found, the switch **floods the frame** on **all interfaces** except the one on which the frame was received.

A learning switch and the process of learning

a. Original

Address	Port

b. After A sends a frame to D

Address	Port
71:2B:13:45:61:41	1

c. After D sends a frame to B

Address	Port
71:2B:13:45:61:41	1
64:2B:13:45:61:13	4

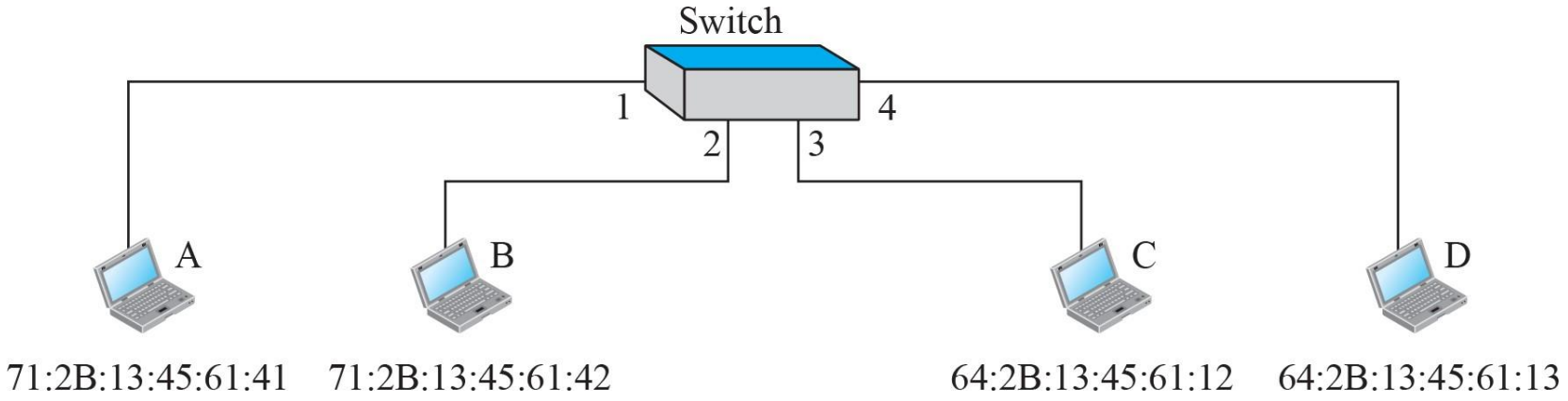
d. After B sends a frame to A

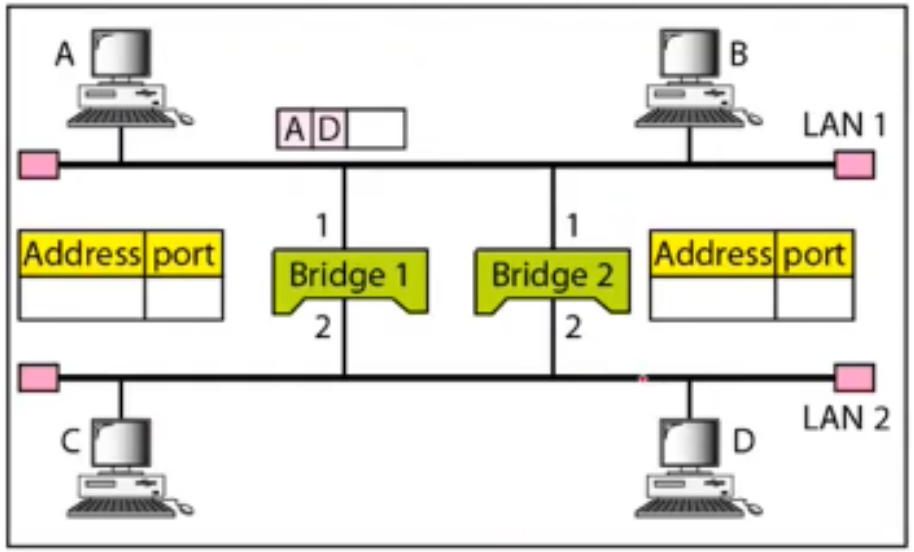
Address	Port
71:2B:13:45:61:41	1
64:2B:13:45:61:13	4
71:2B:13:45:61:42	2

e. After C sends a frame to D

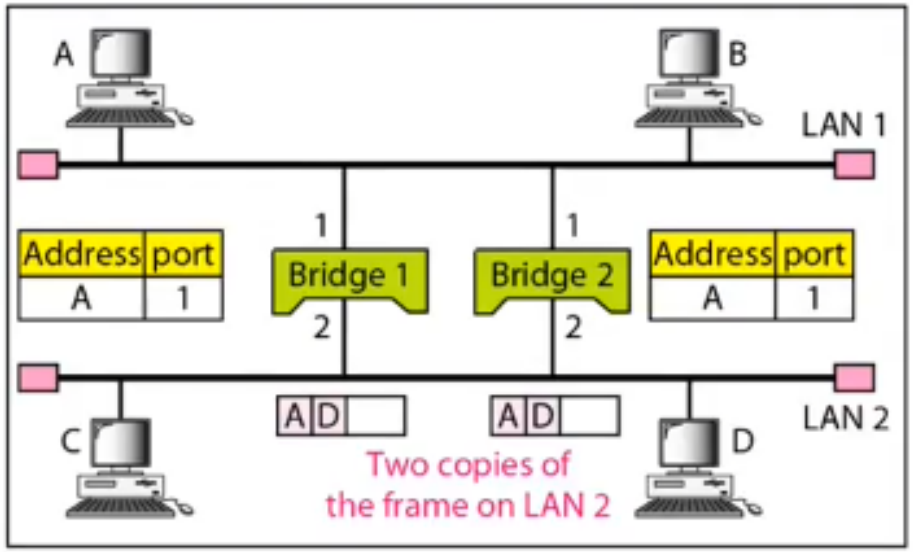
Address	Port
71:2B:13:45:61:41	1
64:2B:13:45:61:13	4
71:2B:13:45:61:42	2
64:2B:13:45:61:12	3

Gradual building of Table

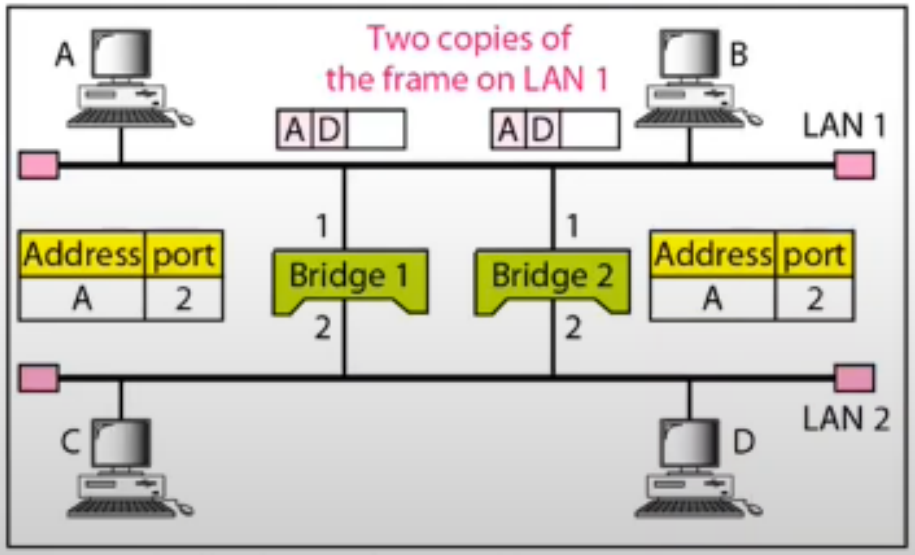




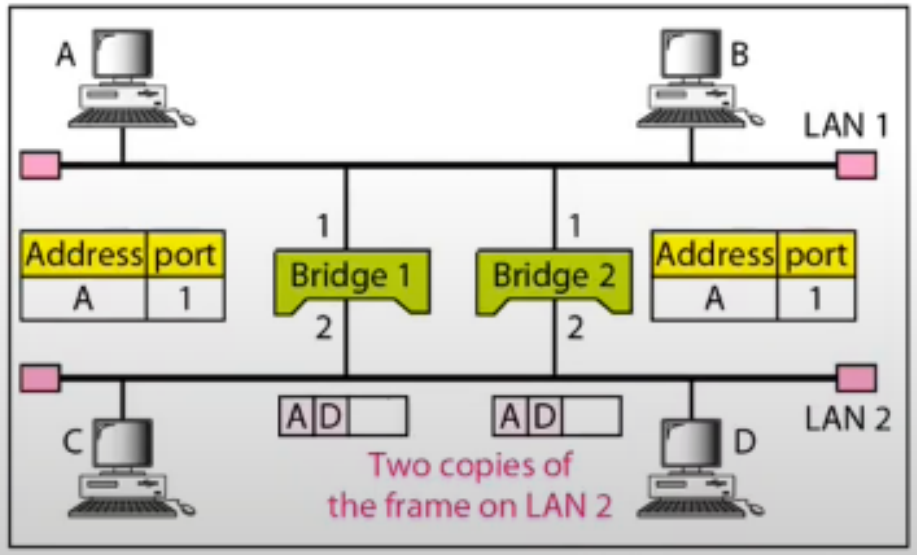
a. Station A sends a frame to station D



b. Both bridges forward the frame



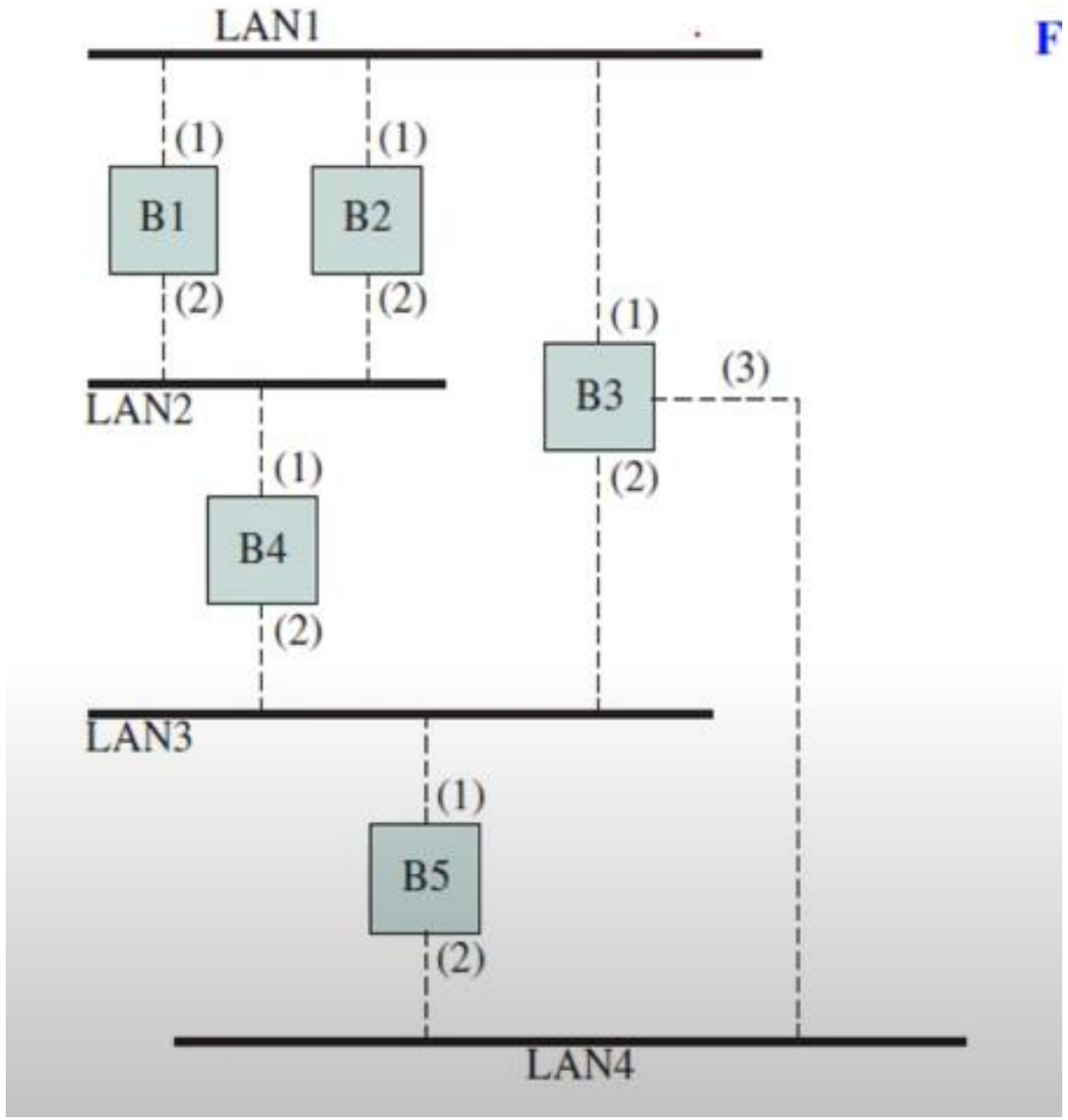
c. Both bridges forward the frame



d. Both bridges forward the frame

Spanning Tree Algorithm contd..

- **Bridge Algorithm**
  1. **Selection of Root Bridge (Lowest Bridge ID)**
  2. **Determination of Root port of Each Bridge**
     - **Except Root Bridge**
     - **Port with Least-Cost Path to the Root Bridge**
     - **TIE – Choose the one with Lowest port ID**
     - **Cost to each LAN (Ex : Higher Cost to Lower Speed LAN)**
     - **Path Cost = Sum of Cost Along path from one bridge to Another**
  3. **Selection of Designated Bridge for each LAN**
     - **Least Cost Path from LAN to Root Bridge**
     - **TIE – Choose the Lowest Bridge ID**
     - **Designated Port – Port that connects Designated Bridge and LAN**
  4. **"Forwarding State" – All Root Ports & Designated ports**
  5. **"Blocking State" – Other ports**


LAN1
(1)
(1)
B1
B2
(2)
(2)
(1)
B3
(3)
LAN2
(1)
B4
(2)
(2)
LAN3
(1)
B5
(2)
LAN4

Video Reference

- For better understanding you can watch and follow this video

https://www.youtube.com/watch?v=wQWbWUfzxpo&t=1319s