Connecting LANs

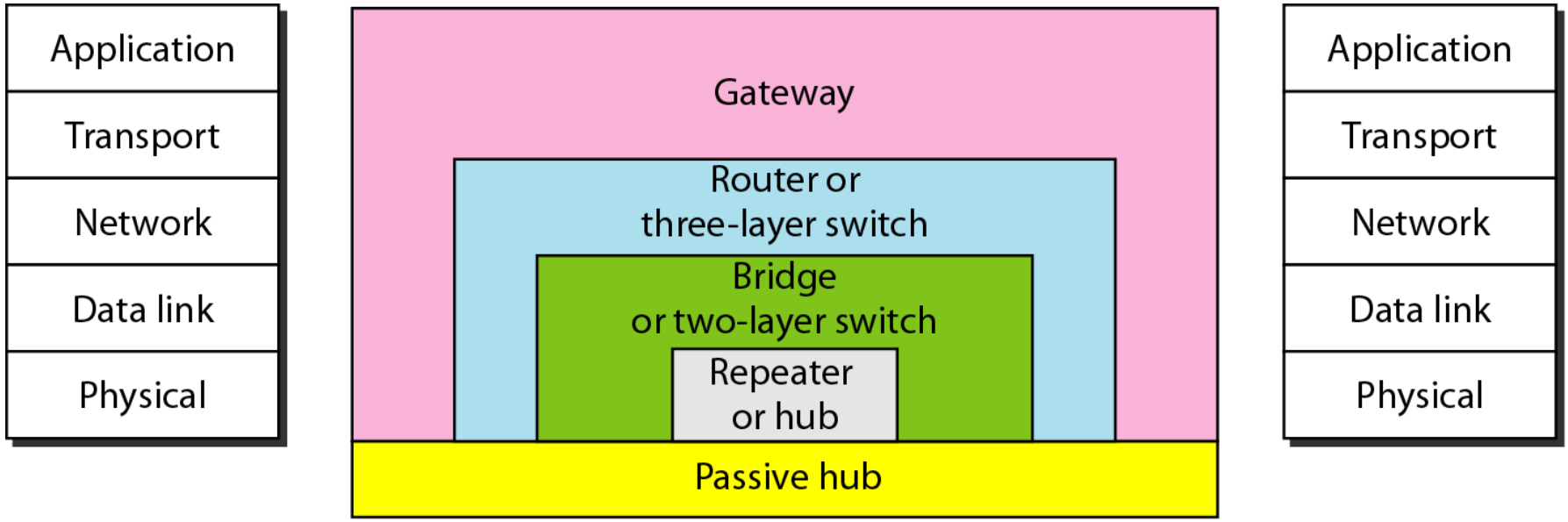
CONNECTING DEVICES

In this section, we divide connecting devices into five different categories based on the layer in which they operate in a network.

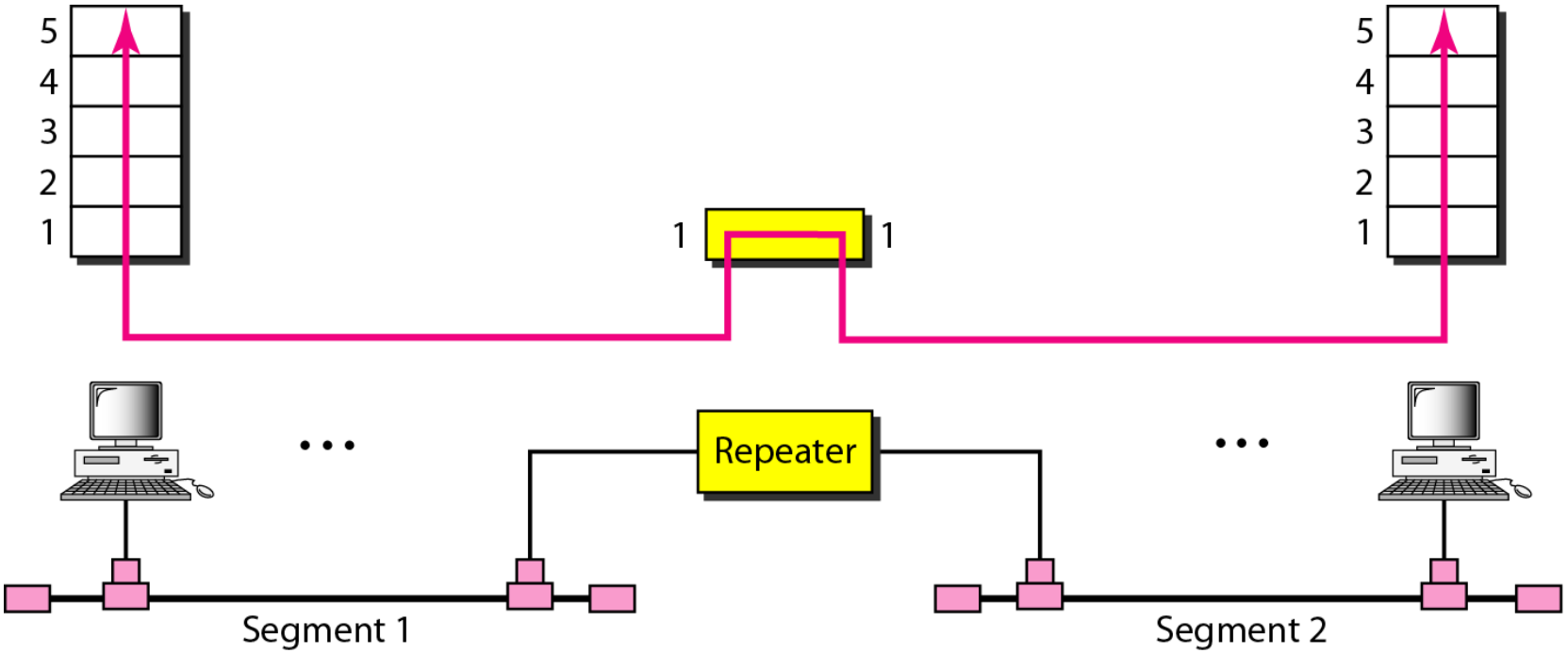
Topics discussed in this section:

Passive Hubs
Active Hubs
Bridges
Two-Layer Switches
Routers
Three-Layer Switches
Gateways

Five categories of connecting devices



A repeater connecting two segments of a LAN



Note

A repeater connects segments of a LAN.

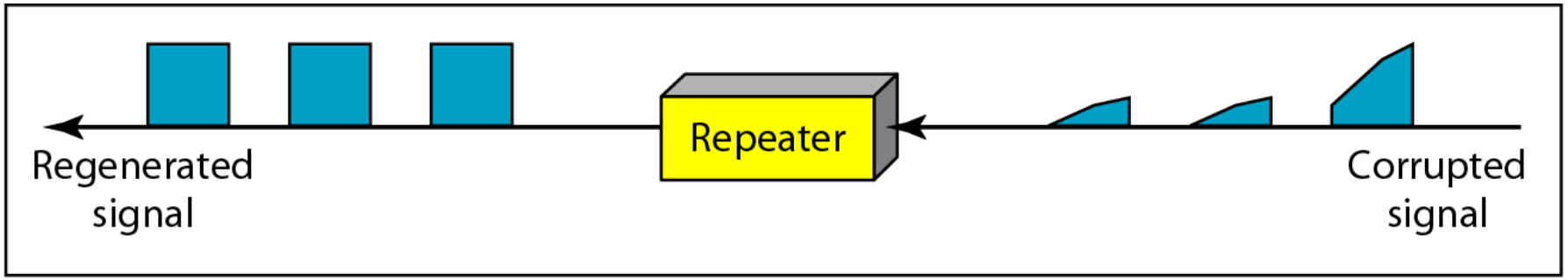
Note

A repeater forwards every frame; it has no filtering capability.

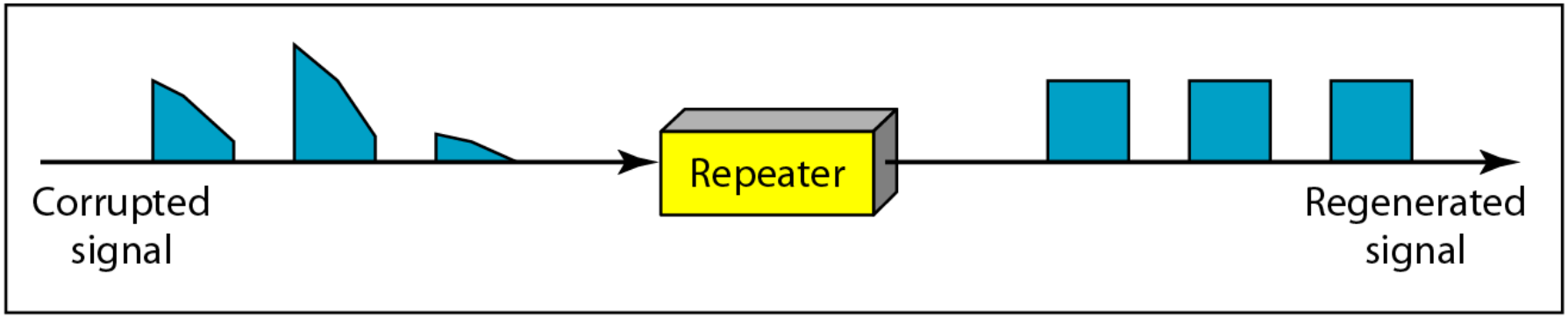
Note

A repeater is a regenerator, not an amplifier.

Function of a repeater

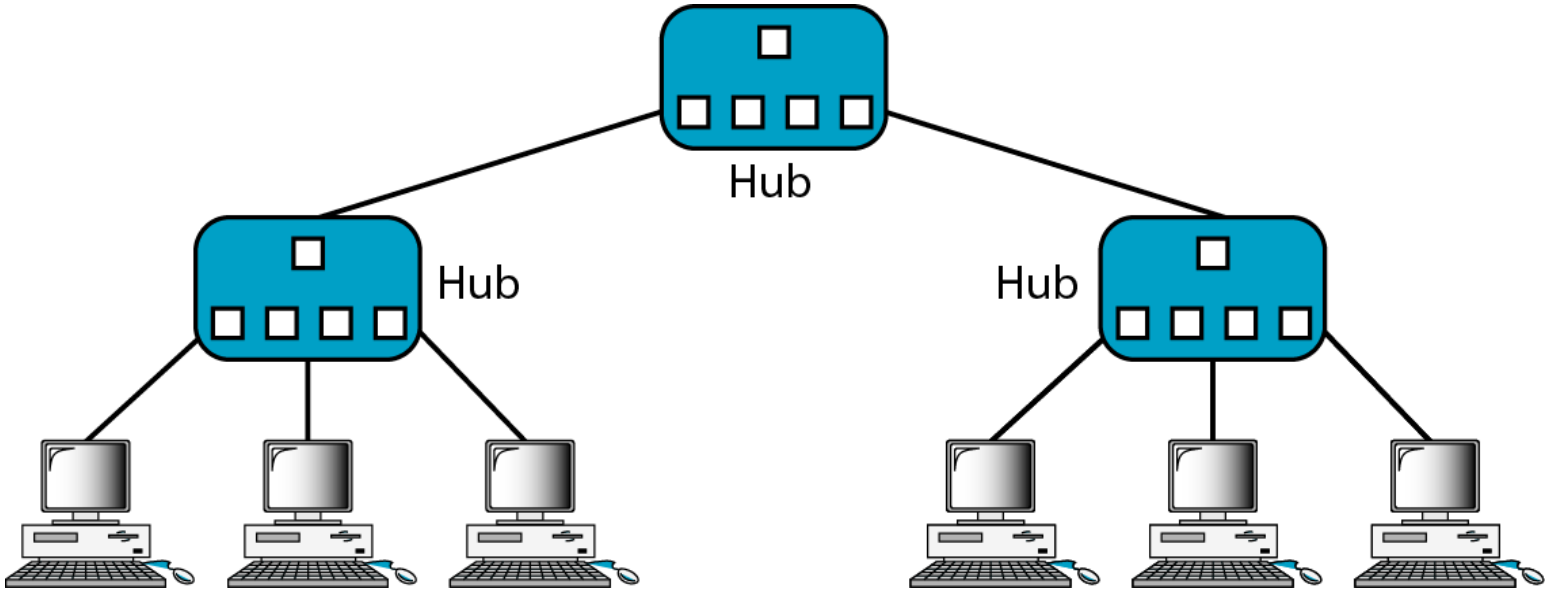


a. Right-to-left transmission.



b. Left-to-right transmission.

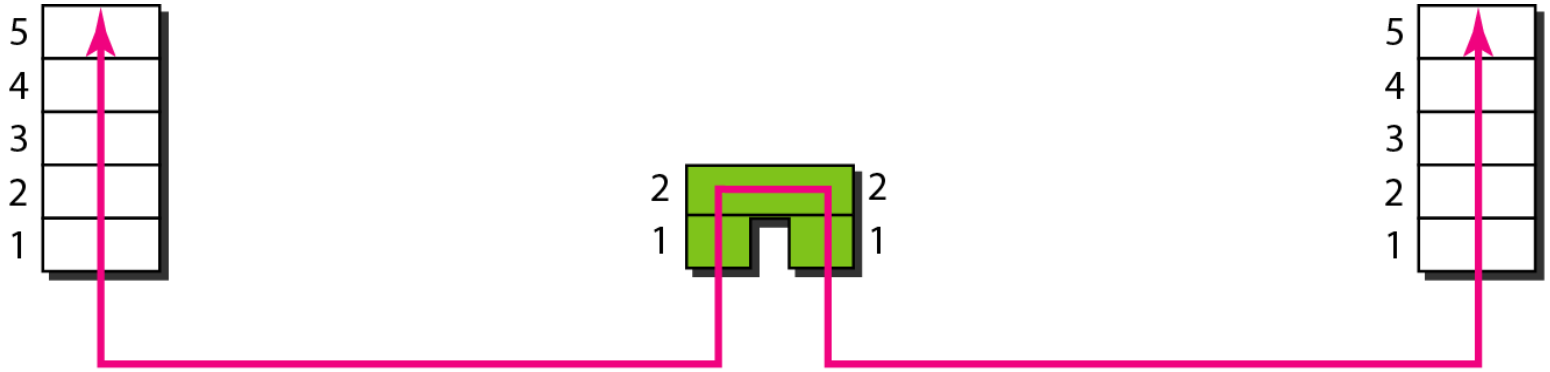
A hierarchy of hubs



Note

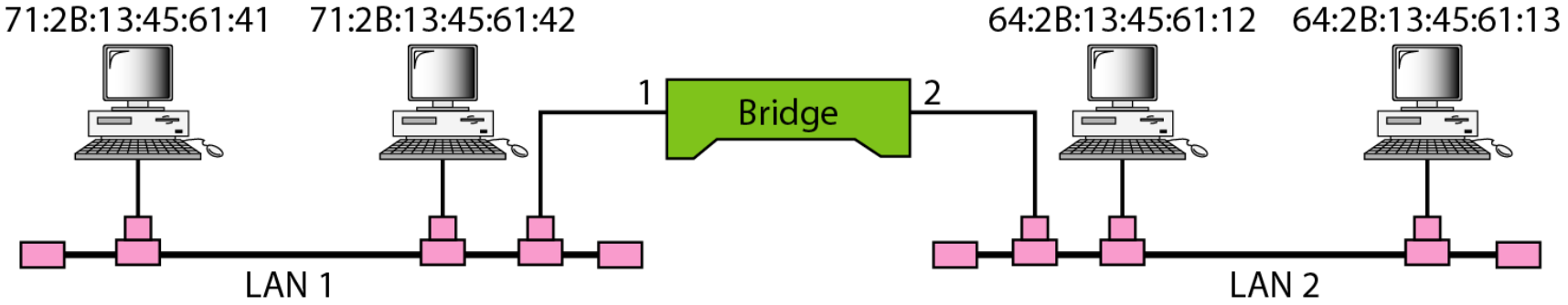
A bridge has a table used in filtering decisions.

A bridge connecting two LANs



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

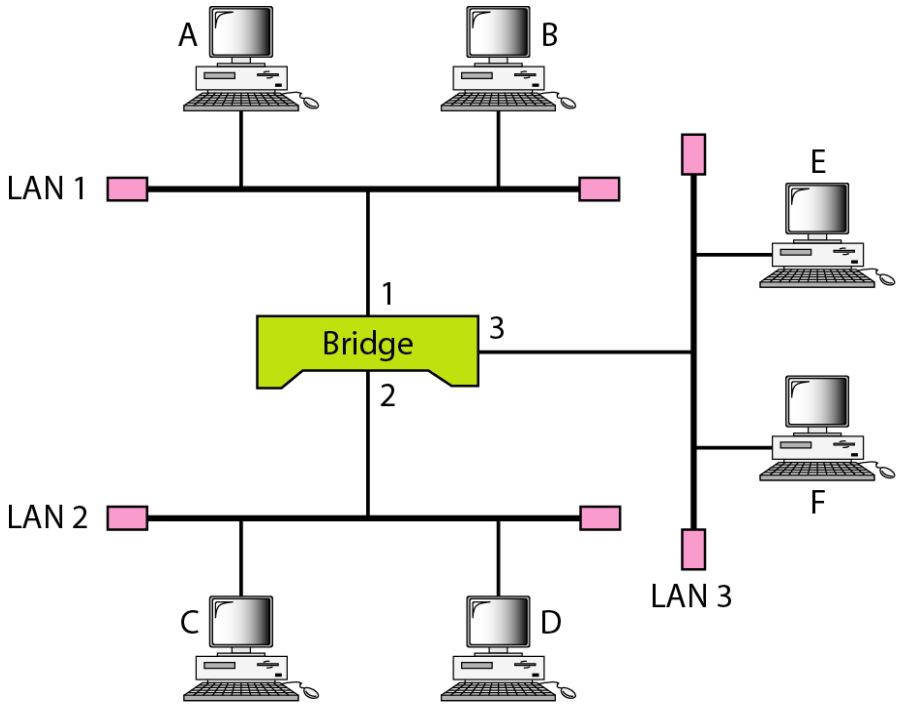
Bridge Table



Note

A bridge does not change the physical (MAC) addresses in a frame.

A learning bridge and the process of learning



Address	Port

a. Original

Address	Port
A	1

b. After A sends a frame to D

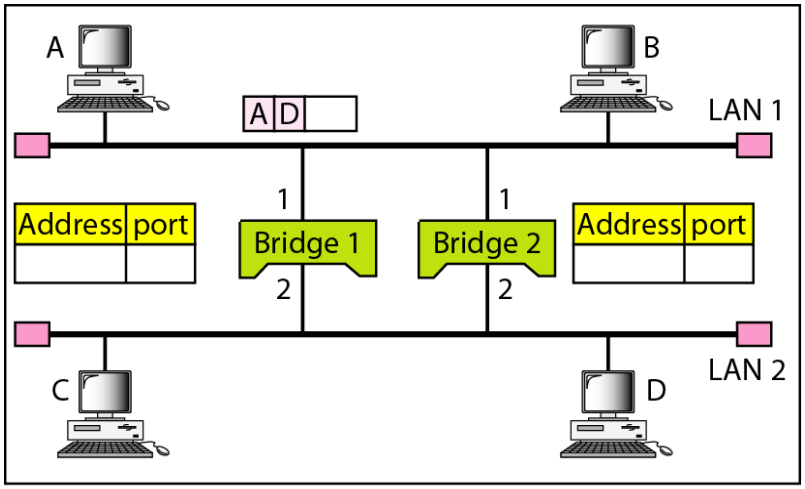
Address	Port
A	1
E	3

c. After E sends a frame to A

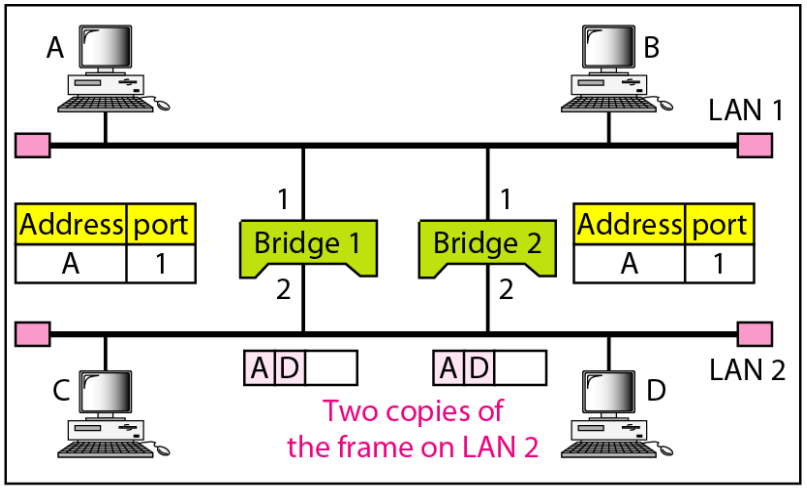
Address	Port
A	1
E	3
B	1

d. After B sends a frame to C

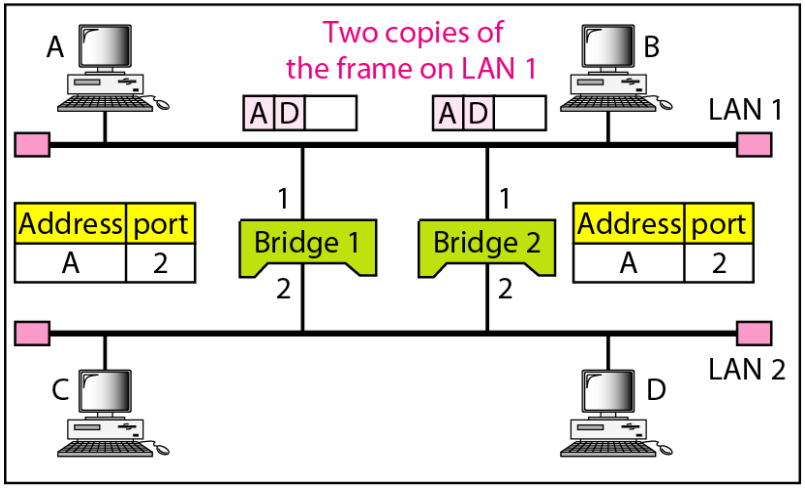
Loop problem in a learning bridge



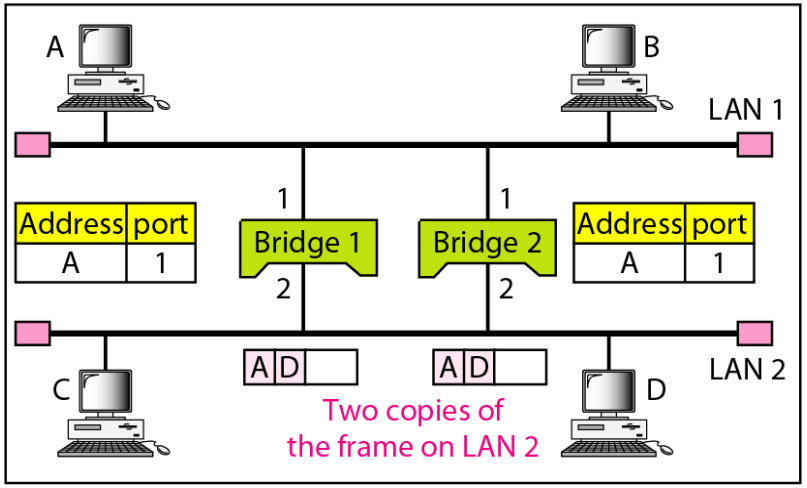
a. Station A sends a frame to station D



b. Both bridges forward the frame



c. Both bridges forward the frame



d. Both bridges forward the frame

Routers connecting independent LANs and WANs