

*Networking
and
Internetworking
Devices*

Dronacharya College of Engineering

Figure 21-1

Connecting Devices

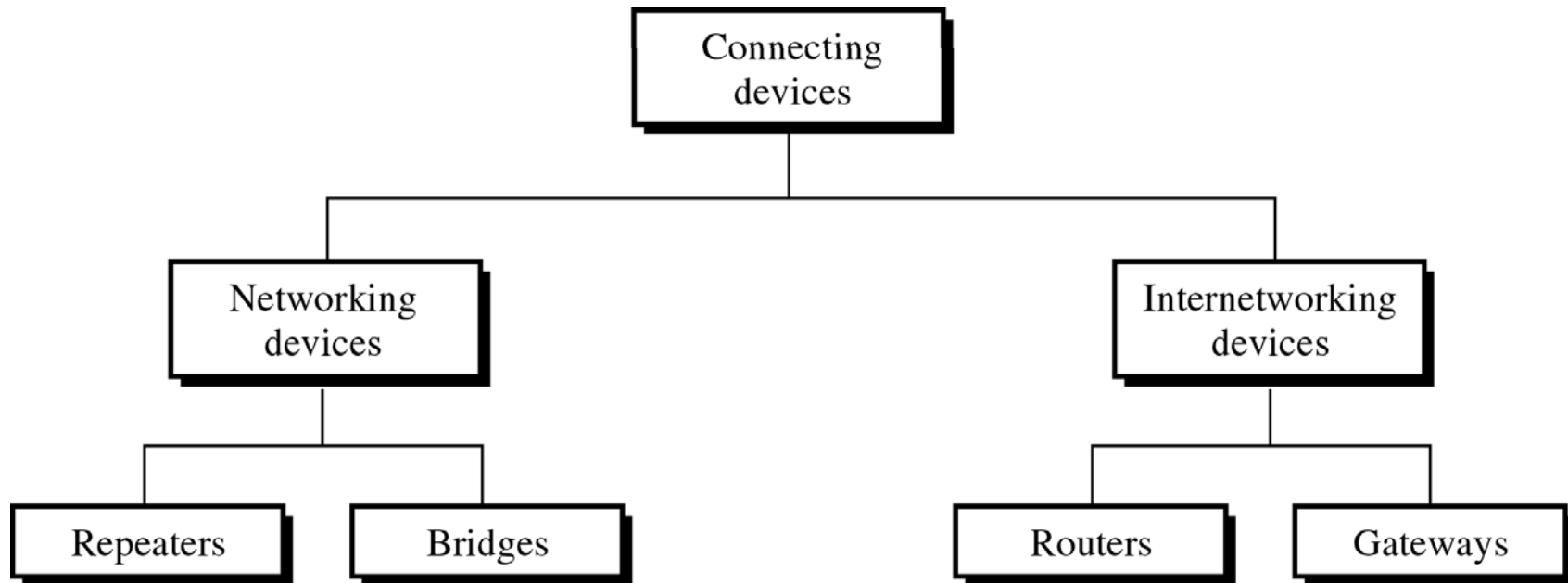


Figure 21-2

Connecting Devices and the OSI Model

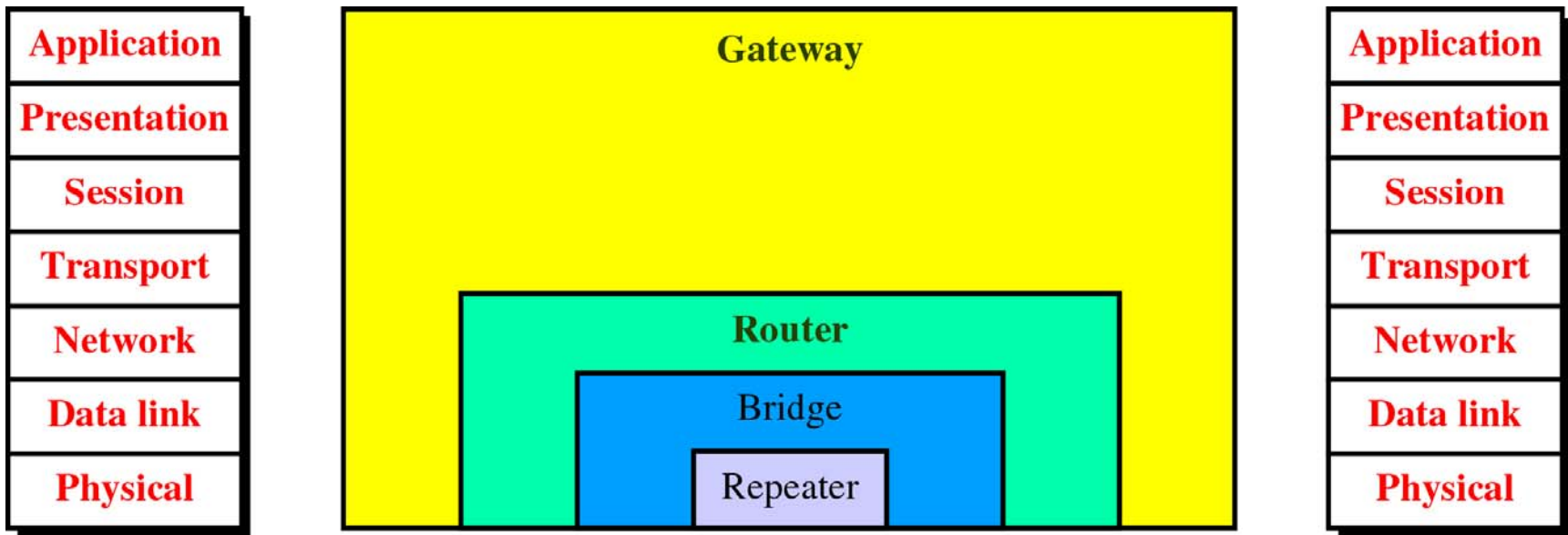


Figure 21-3

A Repeater in the OSI Model

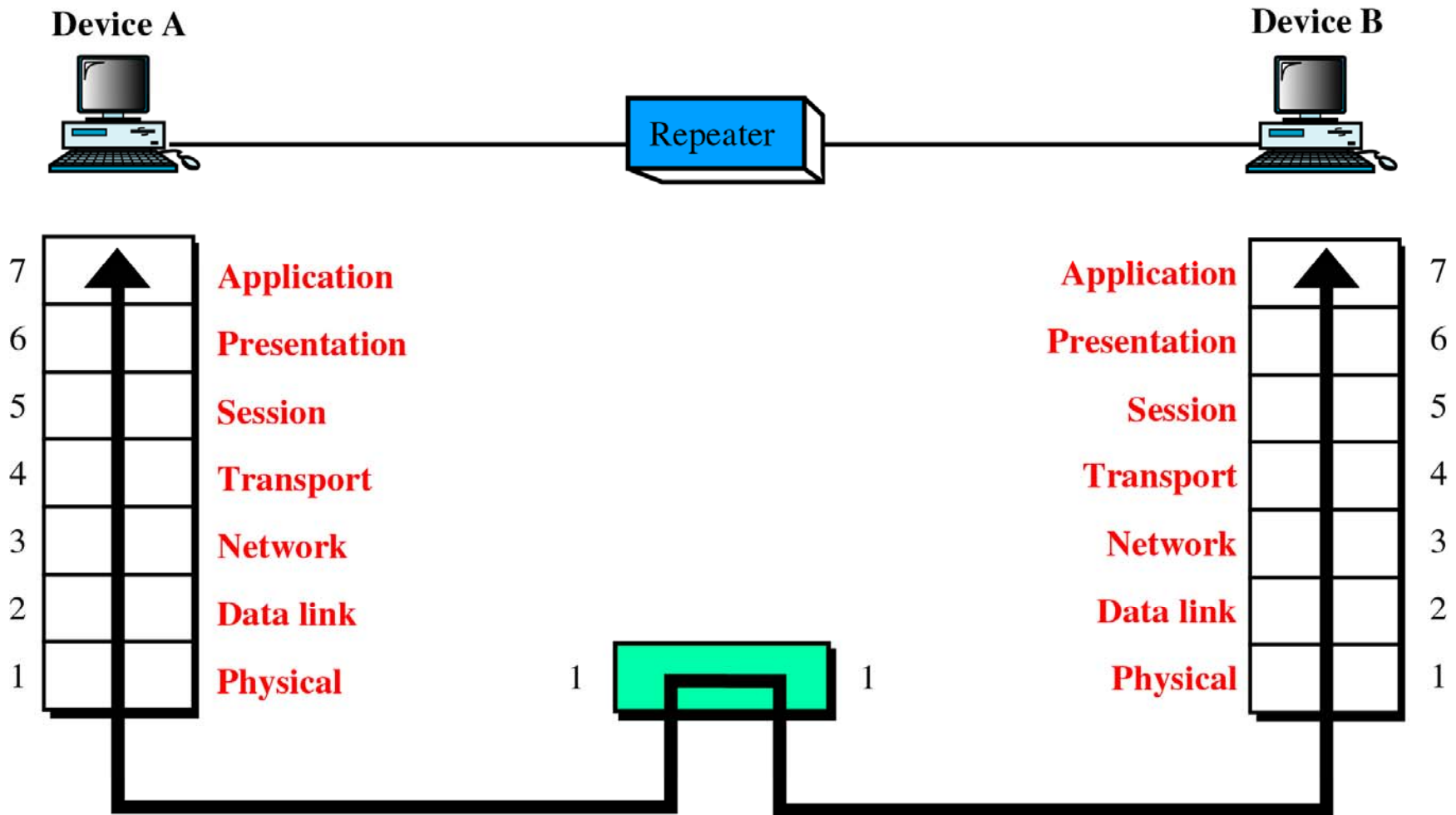


Figure 21-4

A Repeater

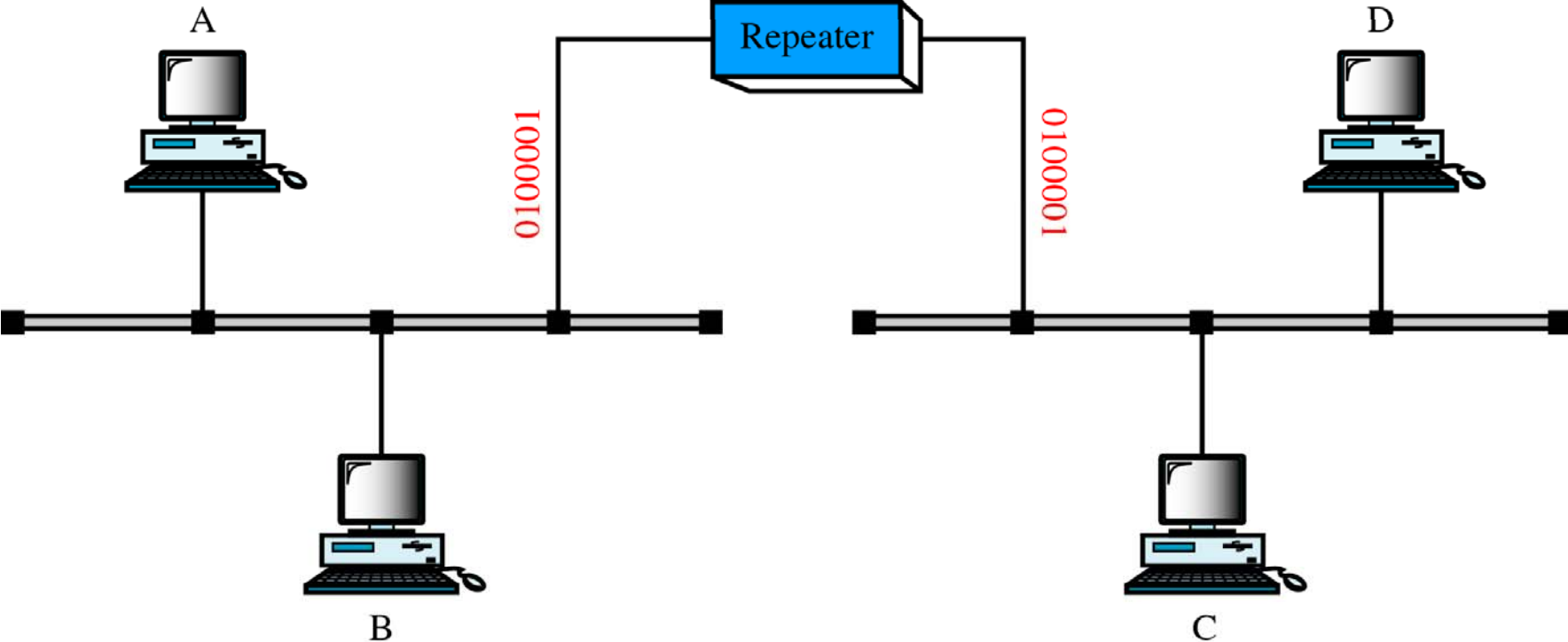
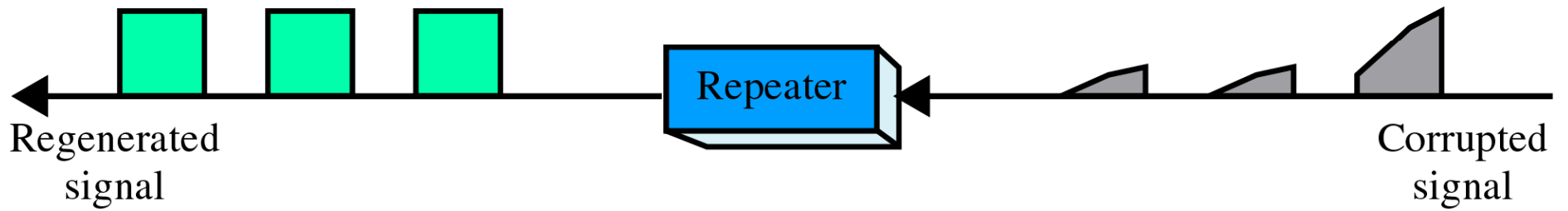
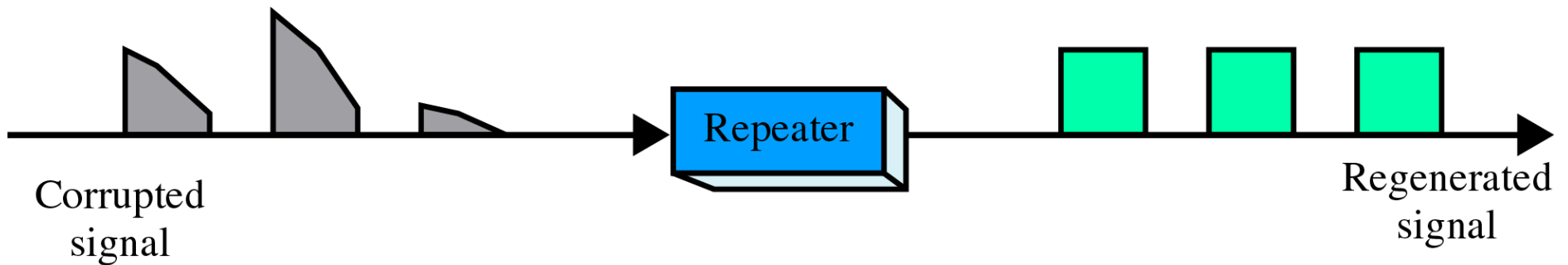


Figure 21-5

Function of a Repeater



(a) Right-to-left transmission.



(b) Left-to-right transmission.

Figure 21-6

A Bridge in the OSI Model

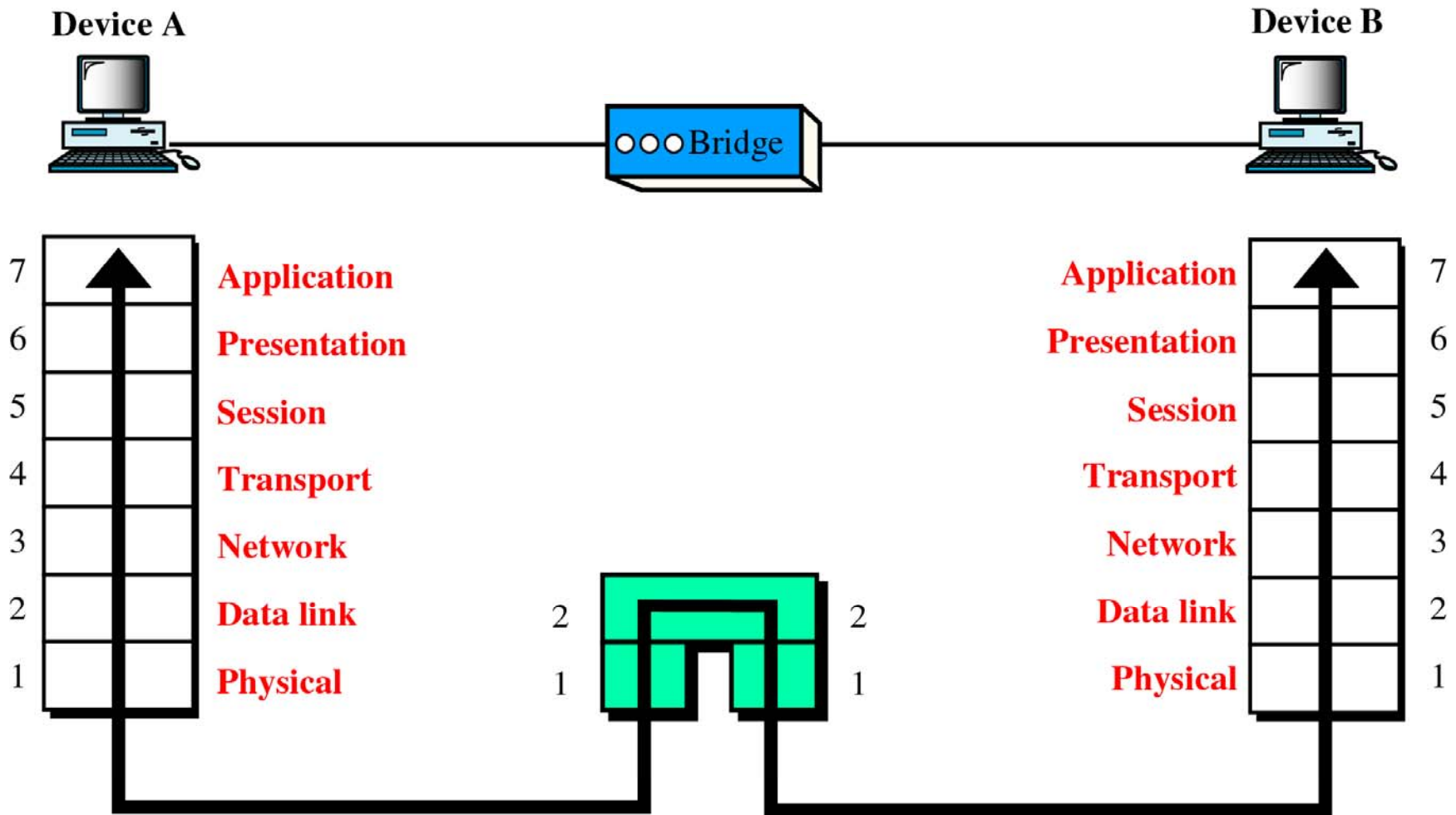


Figure 21-7

A Bridge

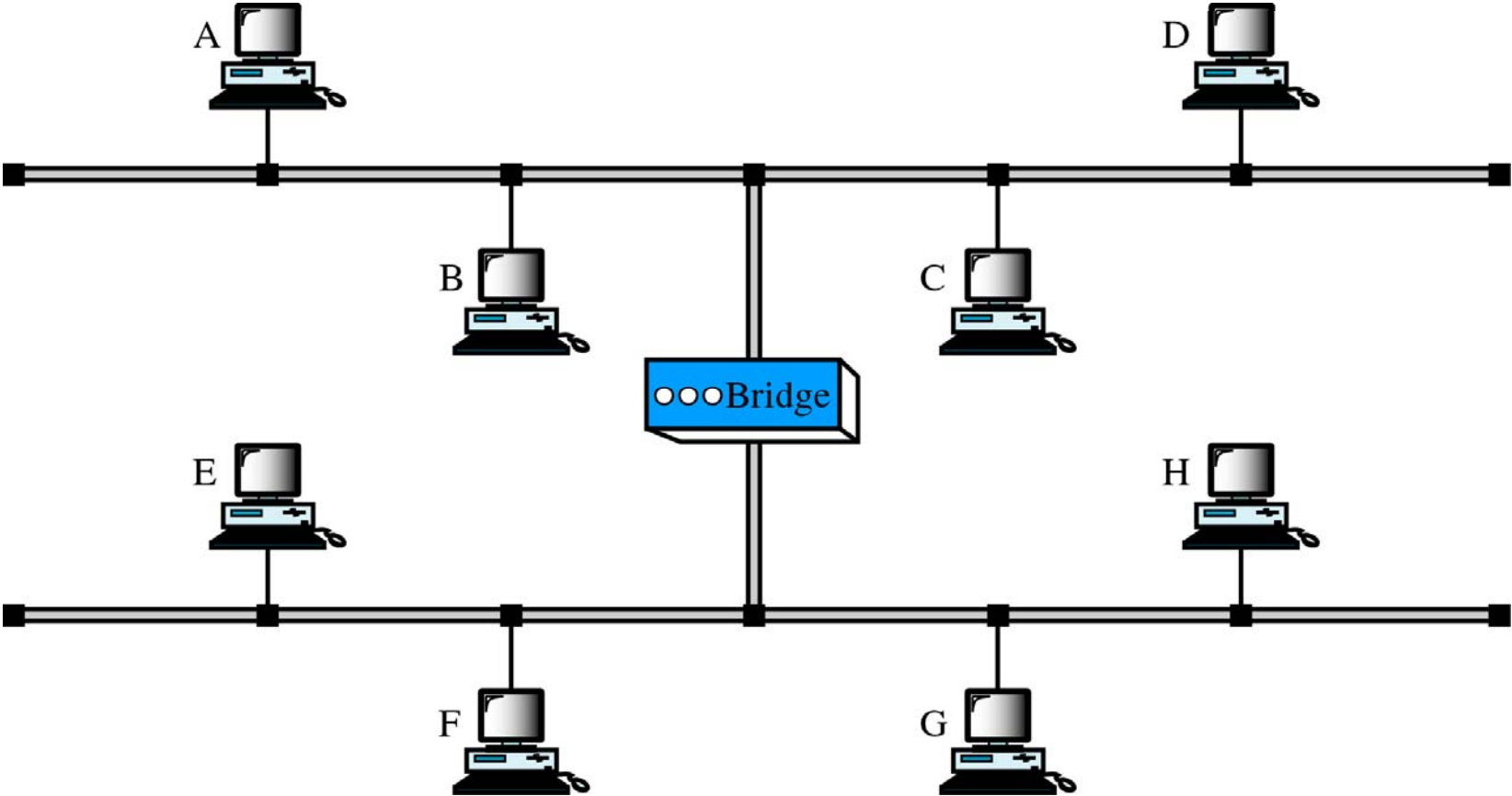


Figure 21-8

Function of a Bridge

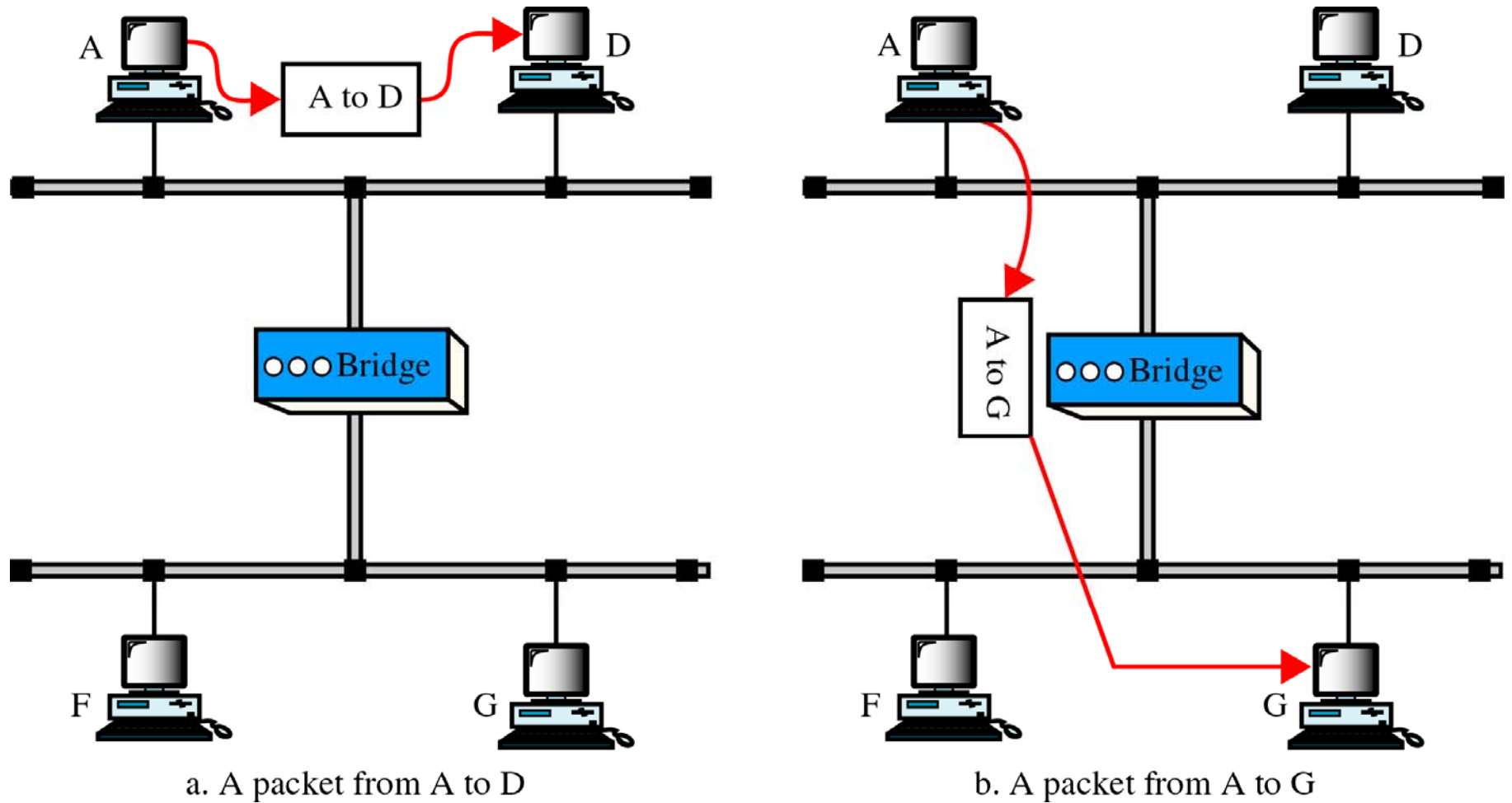


Figure 21-9

Multiport Bridge

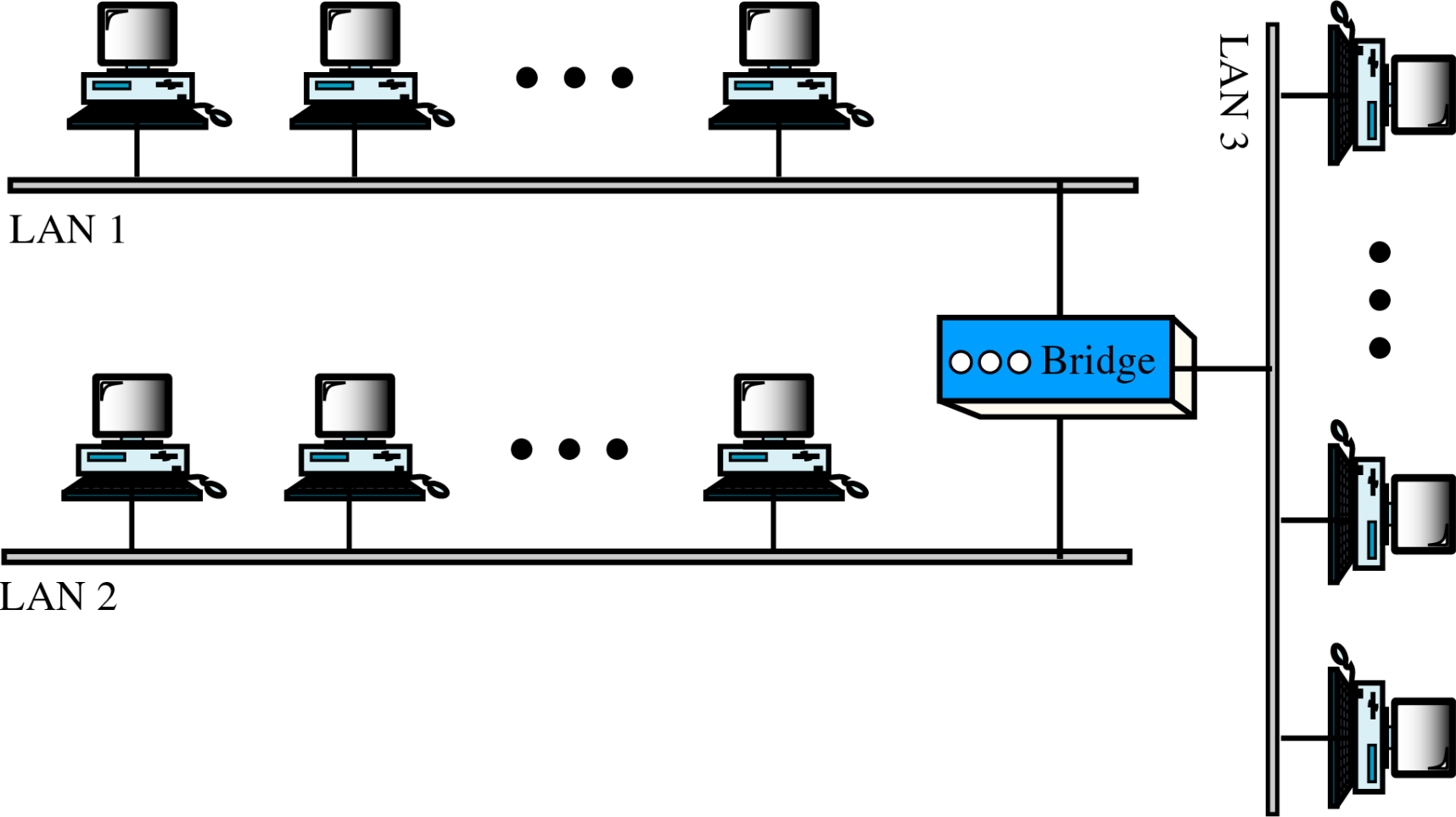


Figure 21-10

A Router in the OSI Model

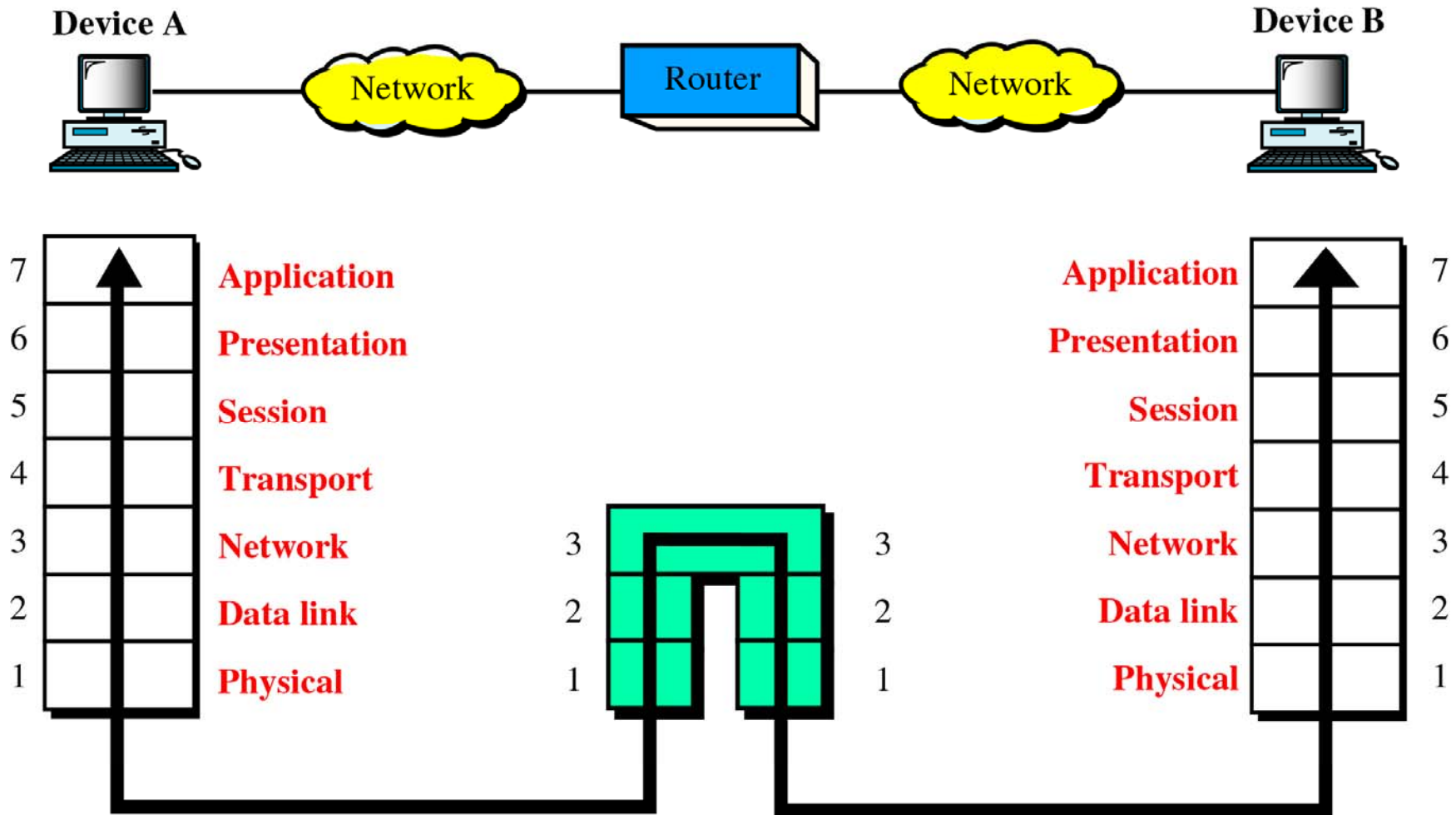


Figure 21-11

Routers in an Internet

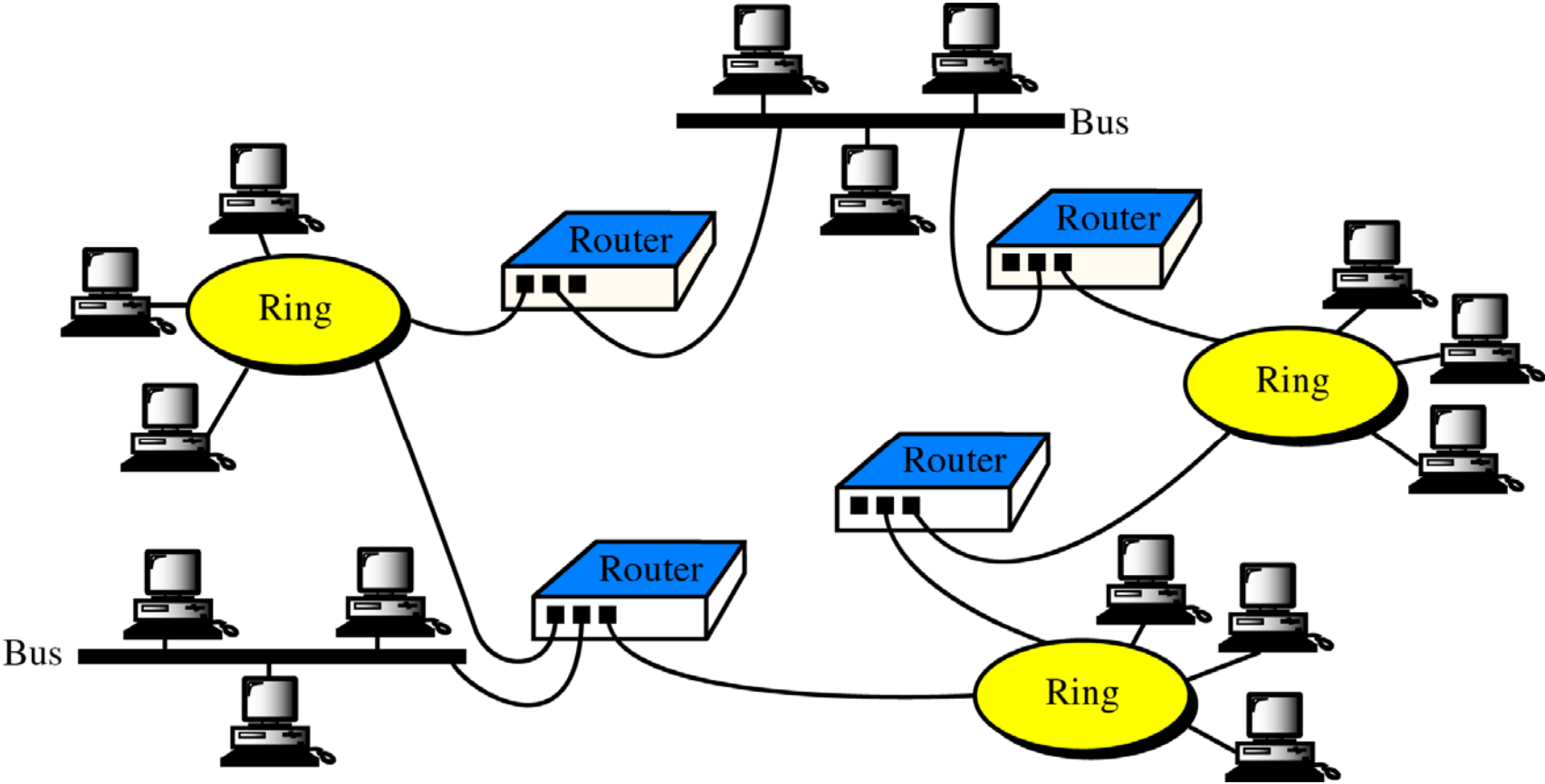


Figure 21-12

A Gateway in the OSI Model

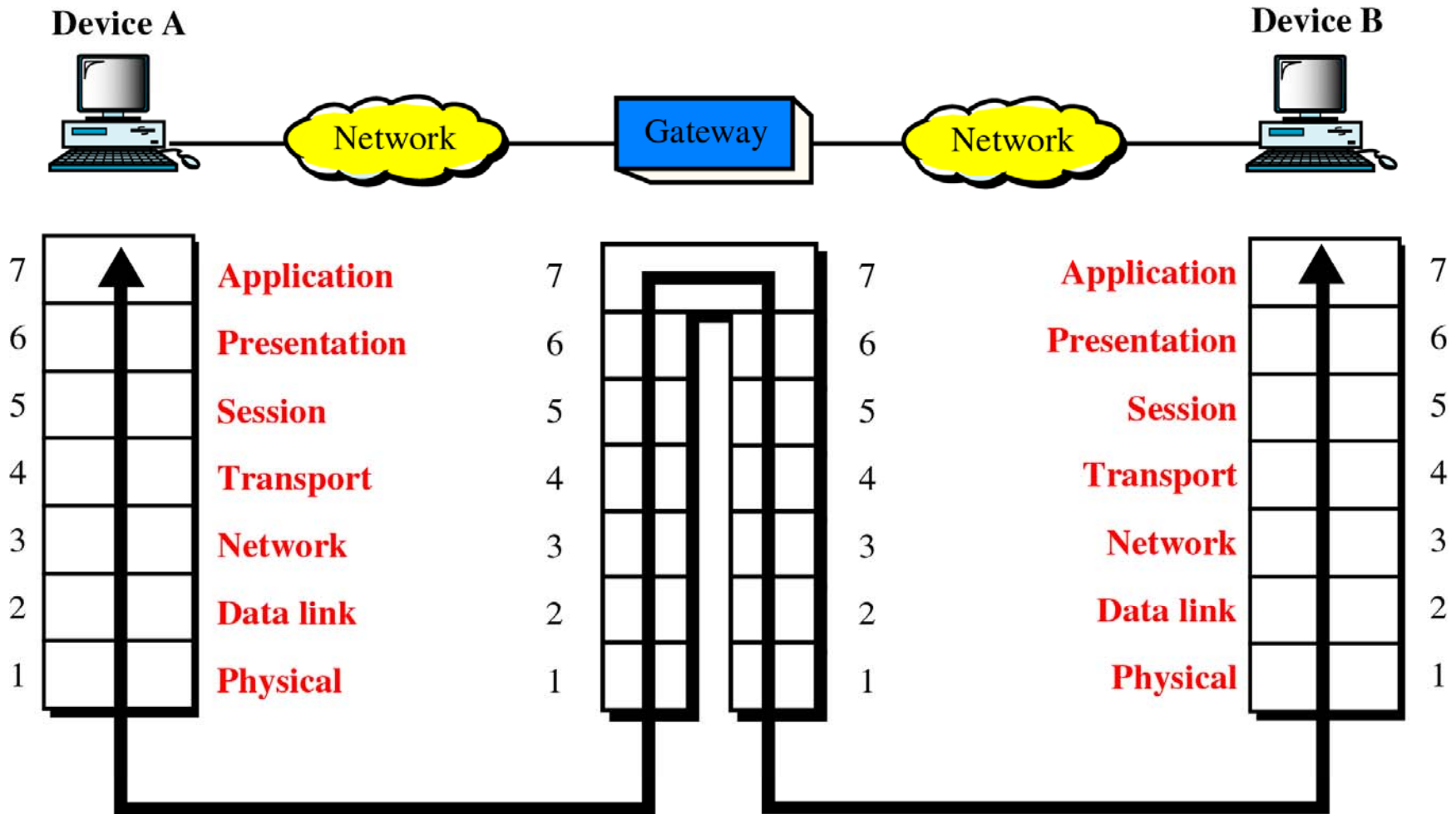


Figure 21-13

A Gateway

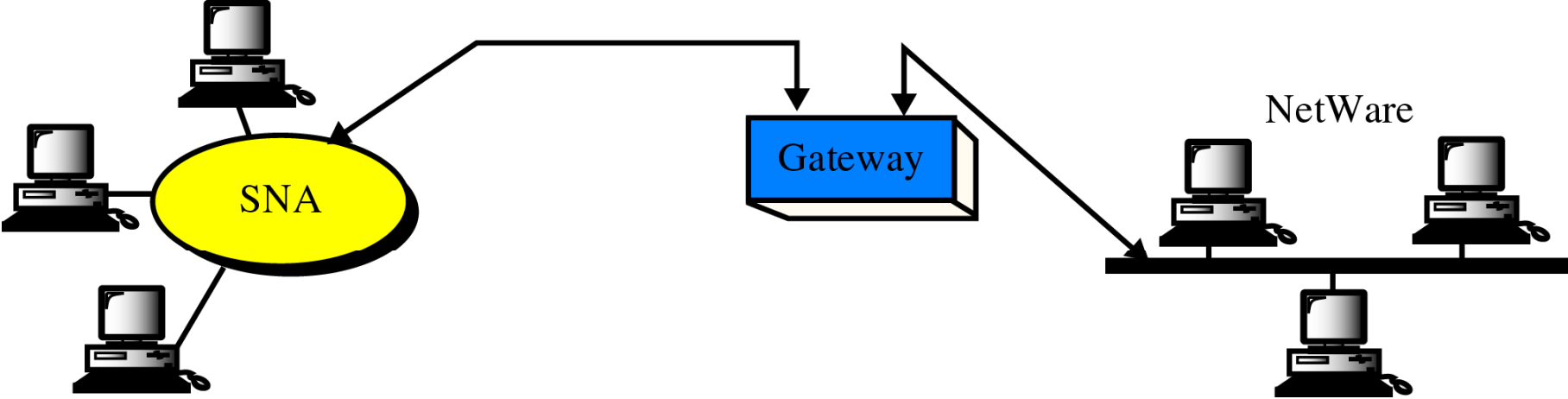
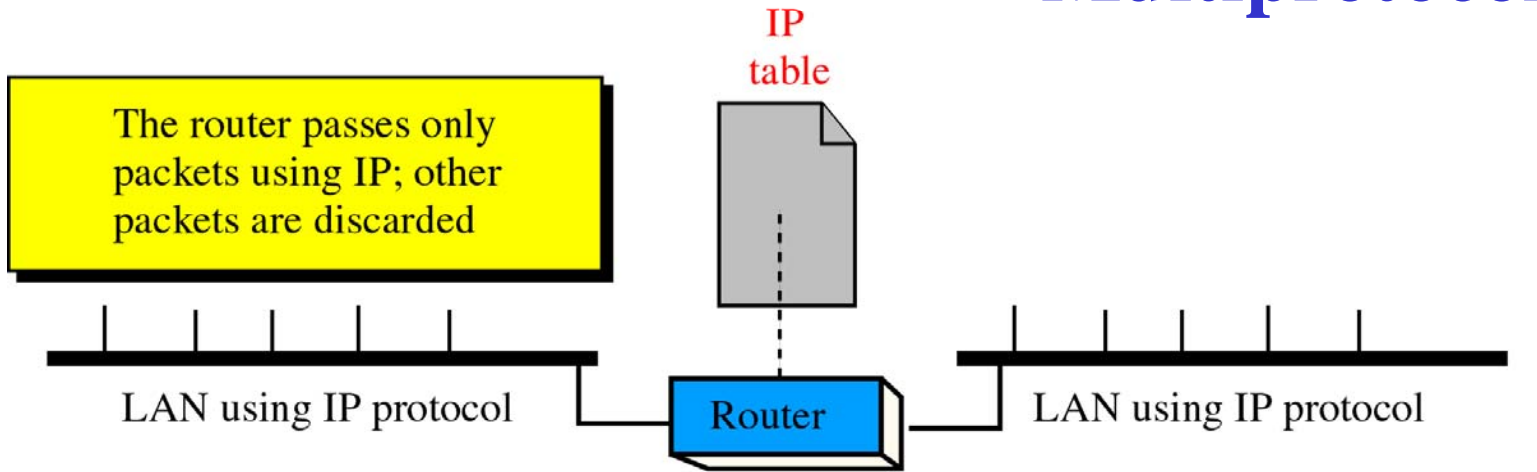
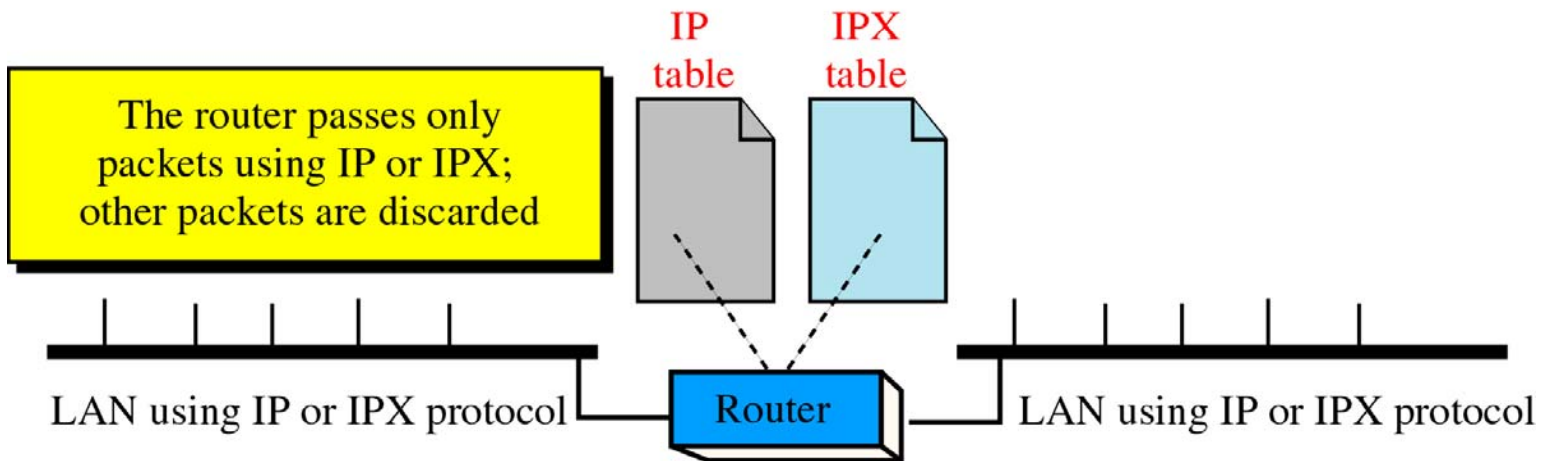


Figure 21-14

Single-Protocol versus Multiprotocol Router



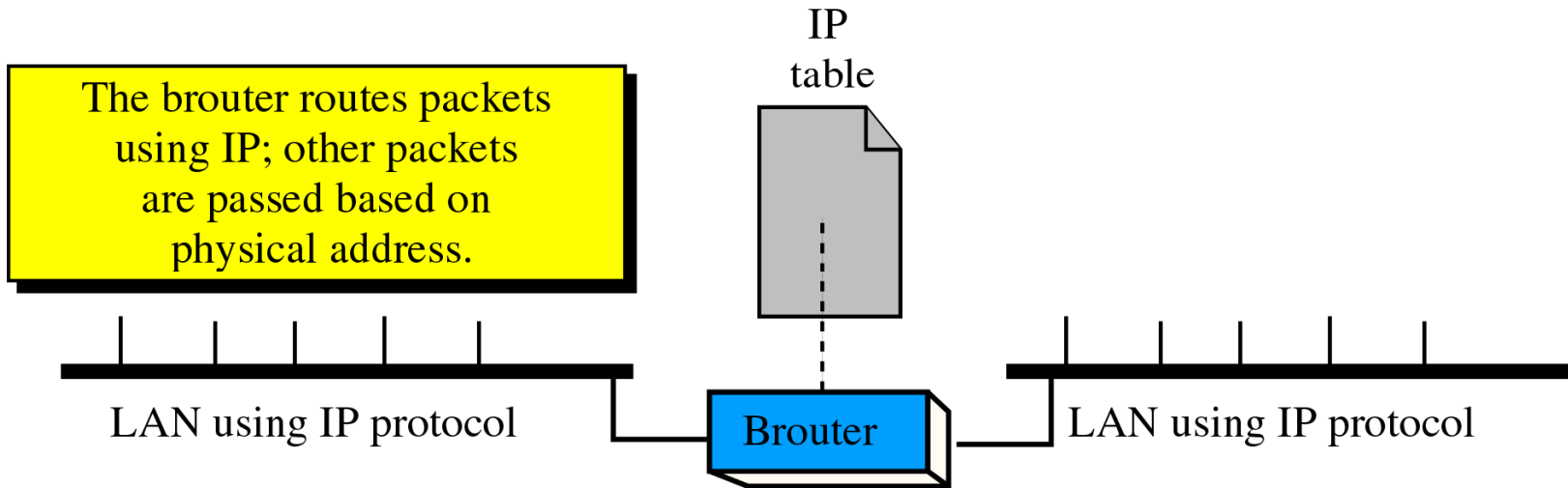
a. Single-protocol router



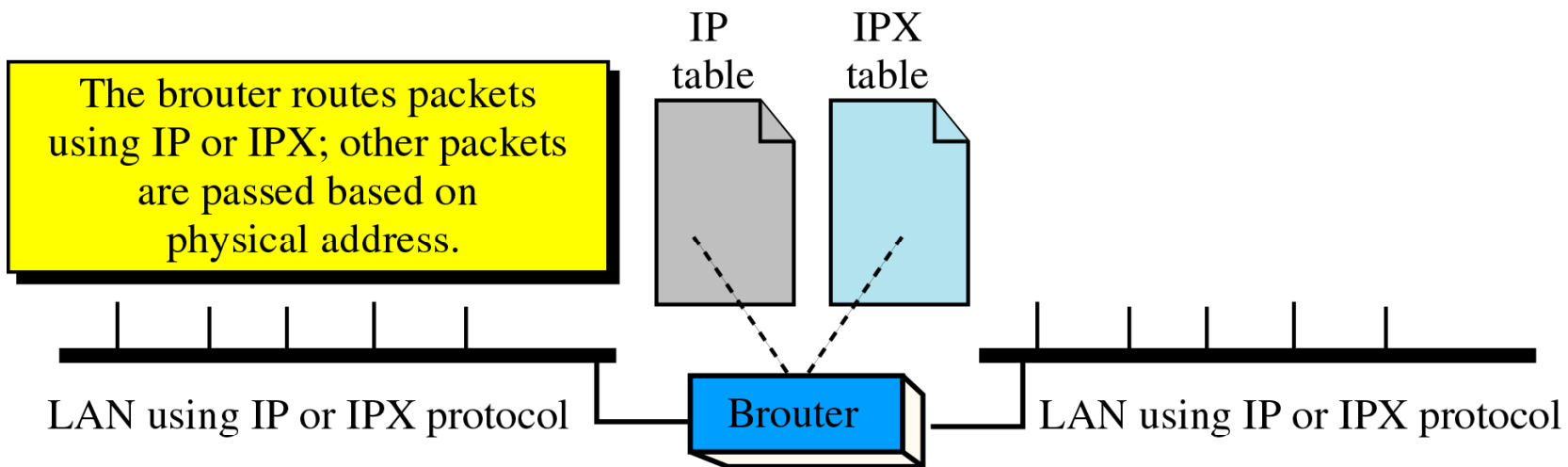
b. Multiprotocol router

Figure 21-15

Router



a. Single-protocol **brouter**



b. Multiprotocol **brouter** *Dronacharya College of Engineering*

Figure 21-16

Switch

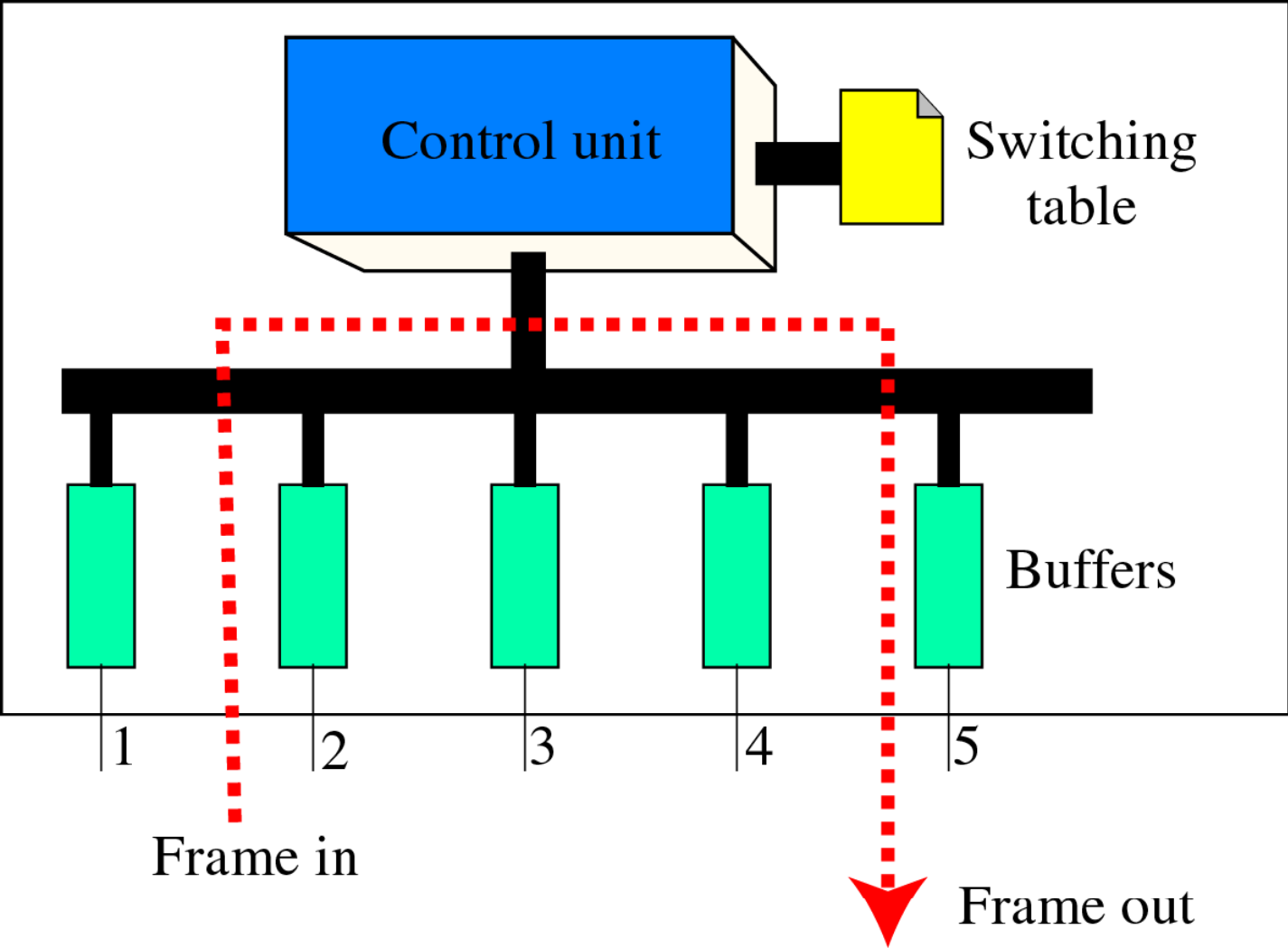


Figure 21-17

Example of an Internet

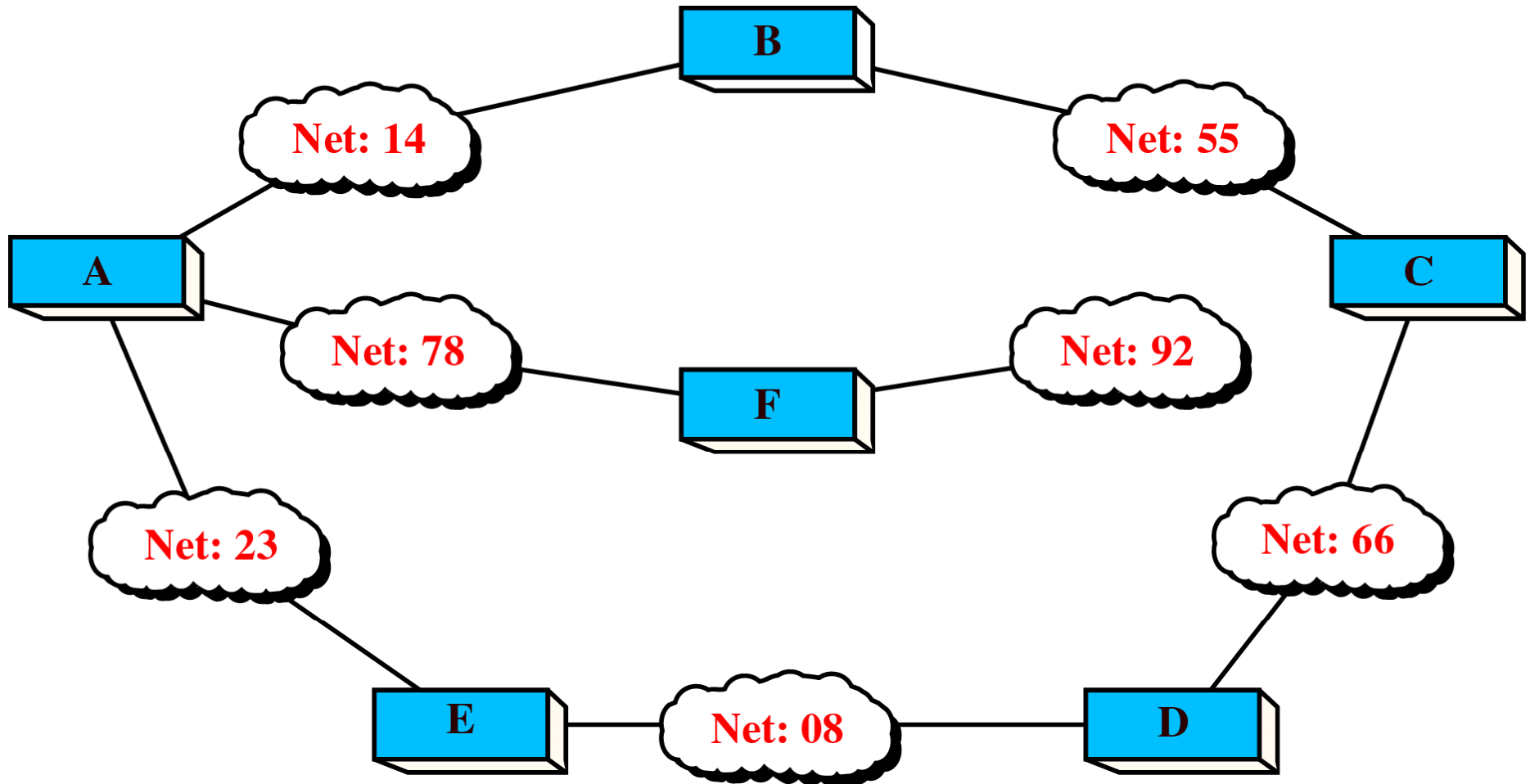


Figure 21-18

The Concept of Distance Vector Routing

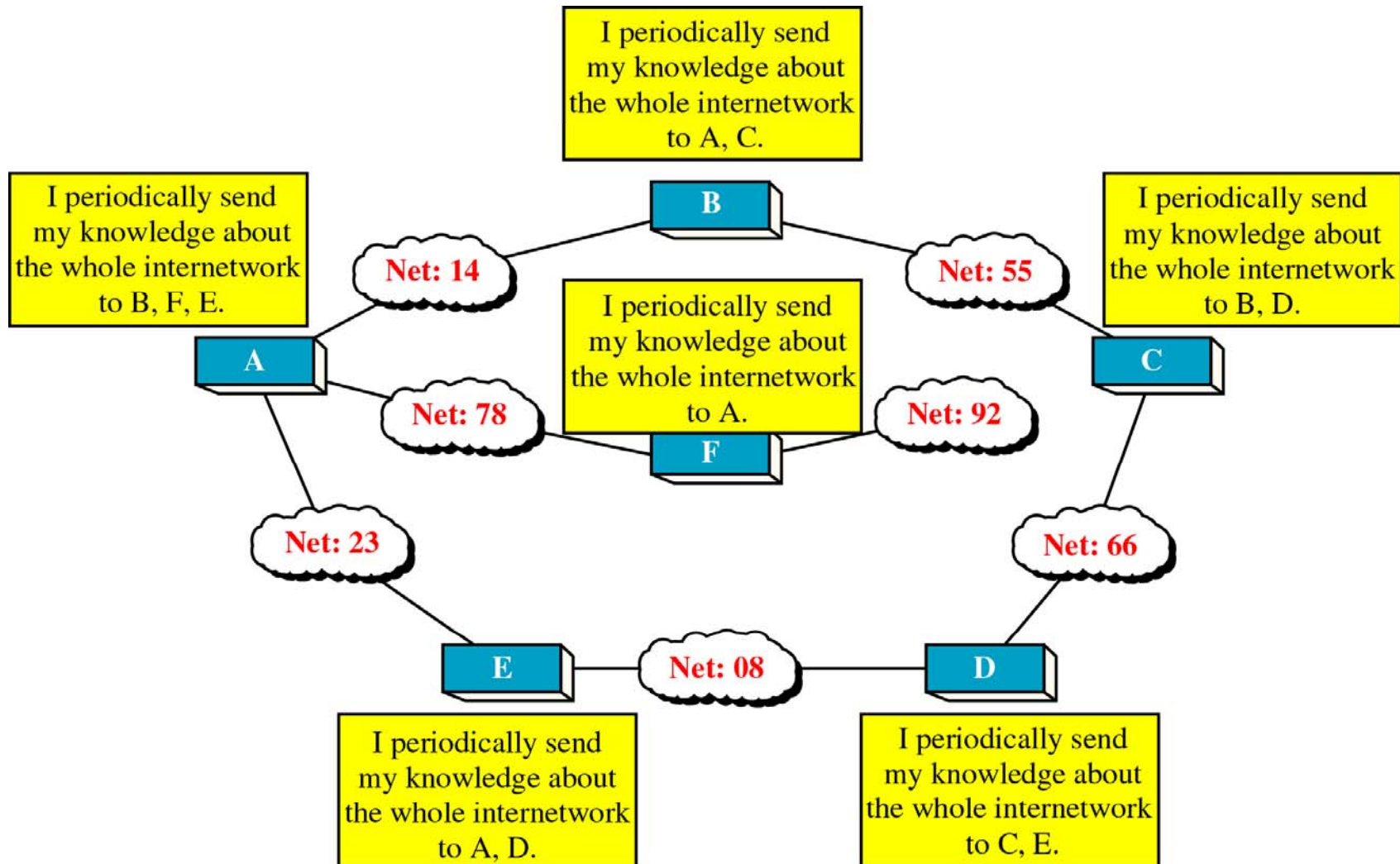


Figure 21-19

Distance Vector Routing Table

Network ID	Cost	Next Hop
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •
• • • • • • • • • •	• • • • • • • •	• • • • • • • • • •

Figure 21-20

Routing Table Distribution

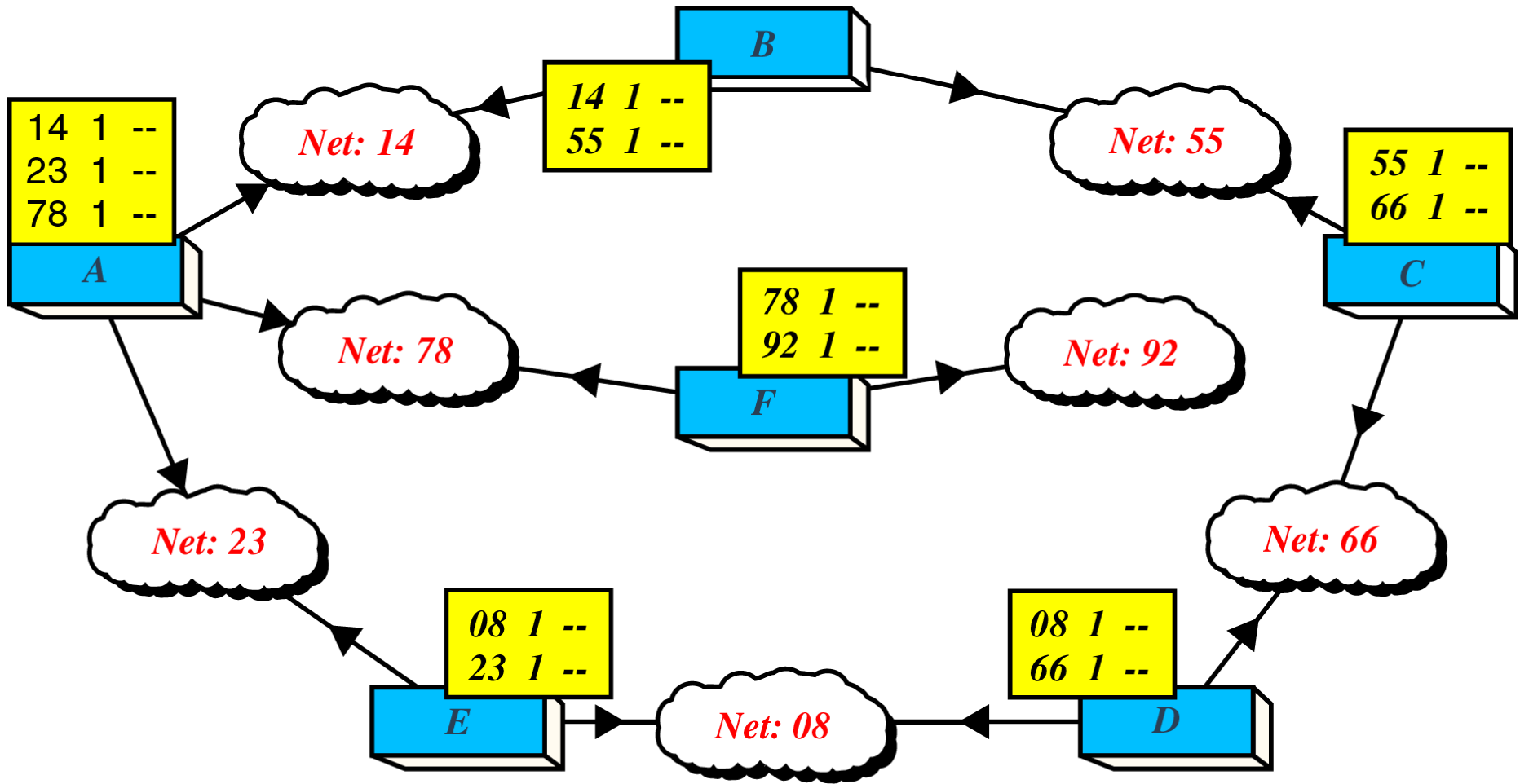


Figure 21-21

Updating Routing Table for Router A

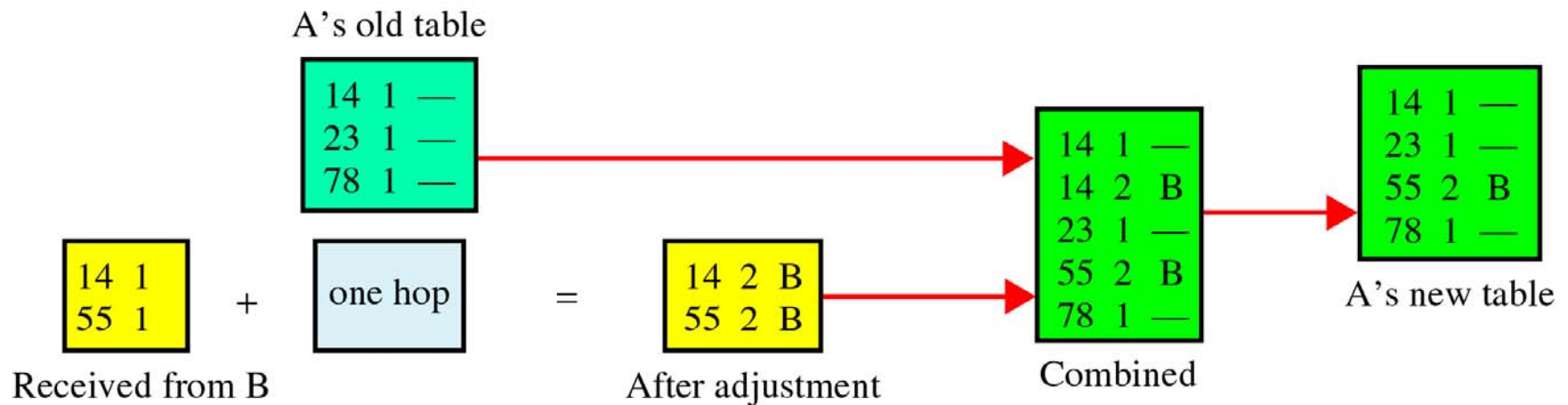


Figure 21-22

Final Routing Tables

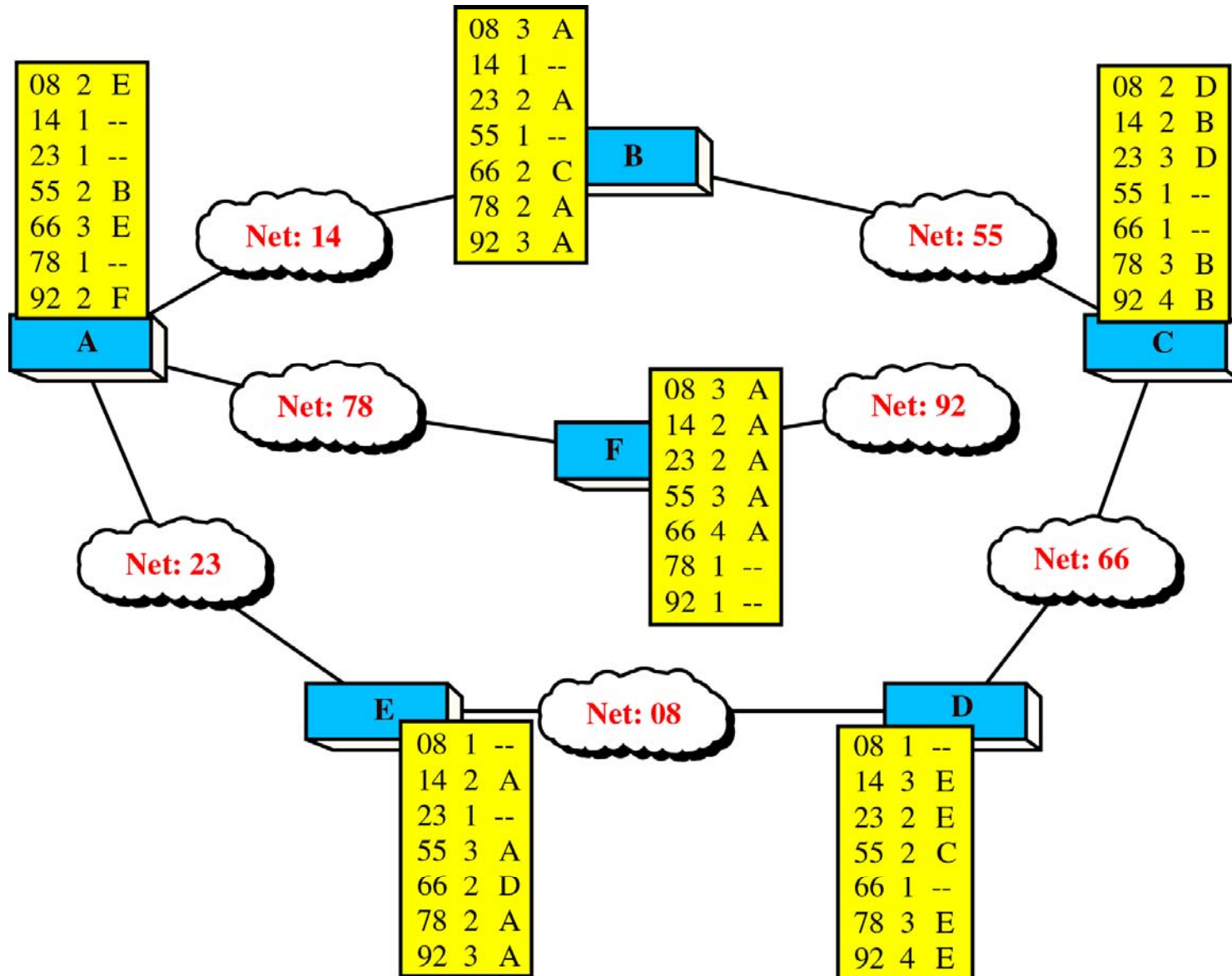
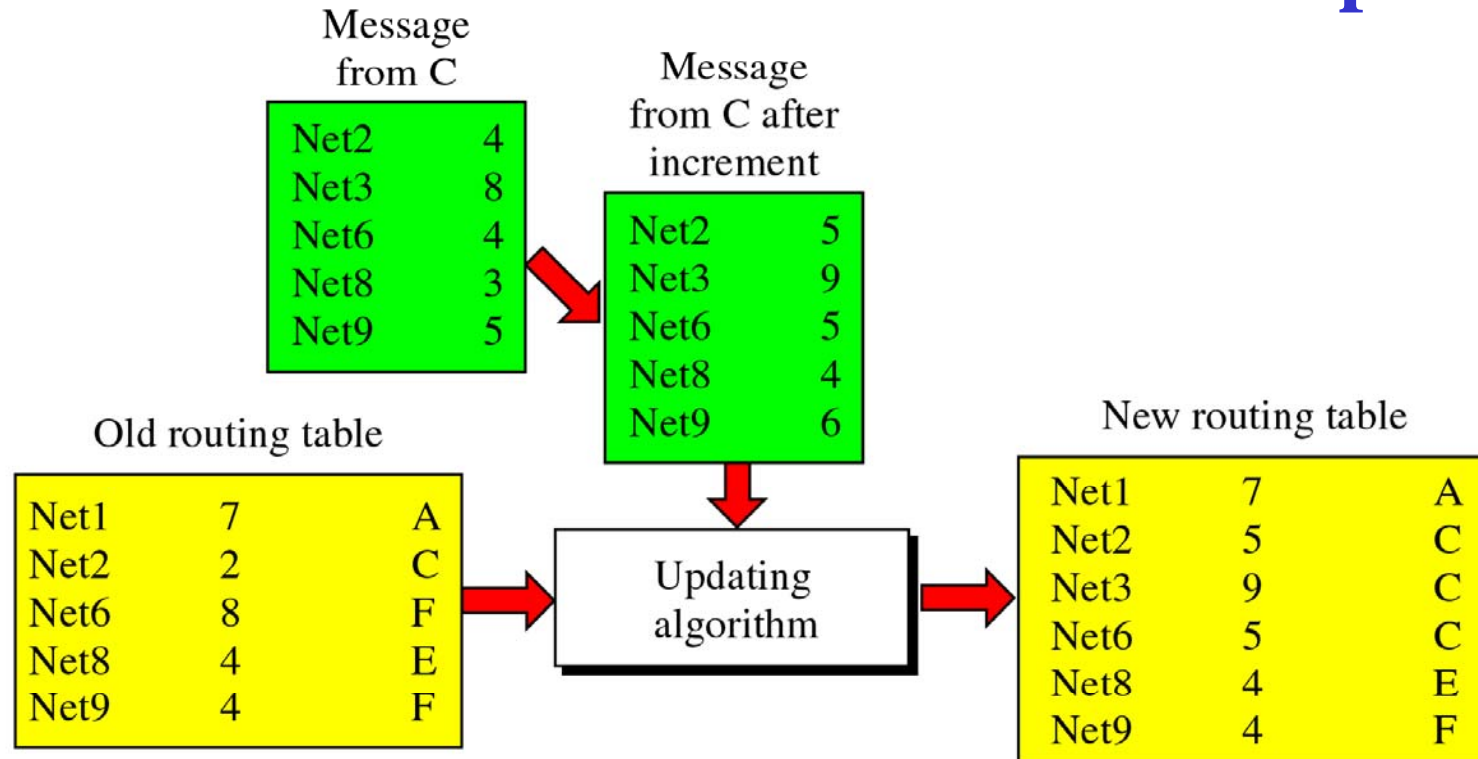


Figure 21-23

Example 21.1



Rules

Net2: Replace (**Rule 2.a**)

Net3: Add (**Rule 1**)

Net6: Replace (**Rule 2.b.i**)

Net8: No change (**Rule 2.b.ii**)

Net9: No change (**Rule 2.b.ii**)

Note that there is no news about Net1 in the advertised message, so none of the rules apply to this entry.

Figure 21-24

Concept of Link State Routing

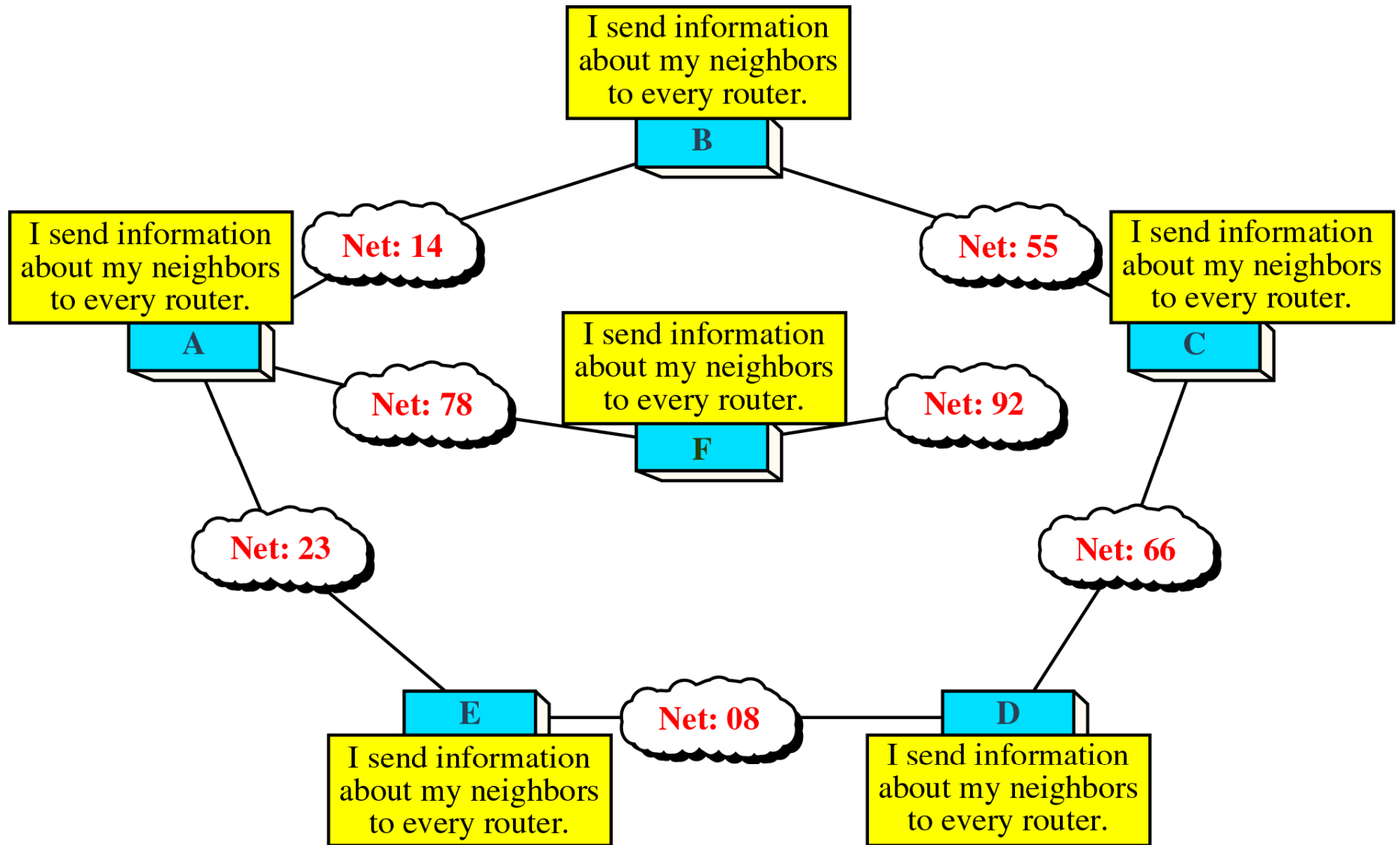


Figure 21-25

Cost in Link State Routing

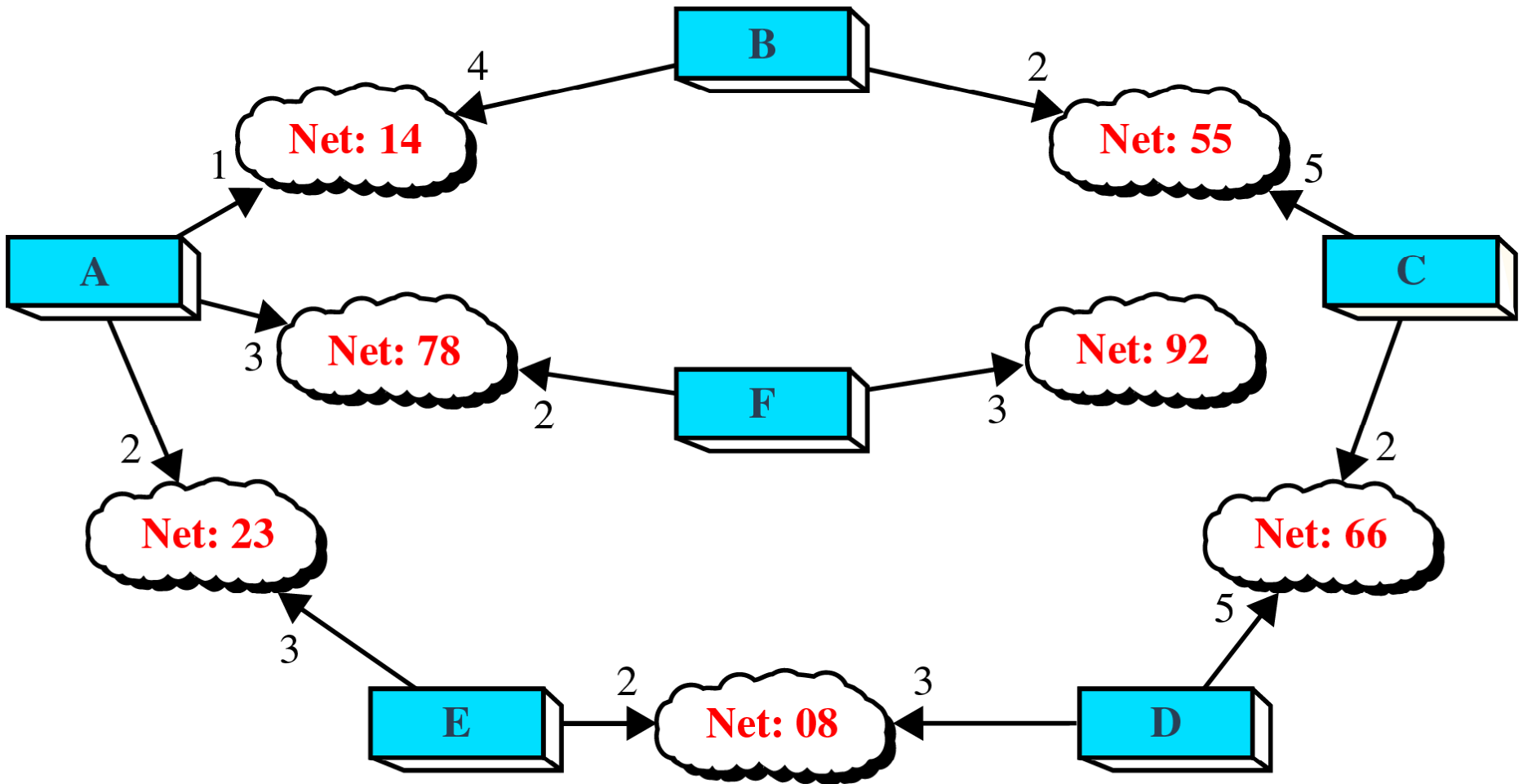


Figure 21-26

Link State Packet

Advertiser	Network	Cost	Neighbor
.
.
.

Figure 21-27

Flooding of A's LSP

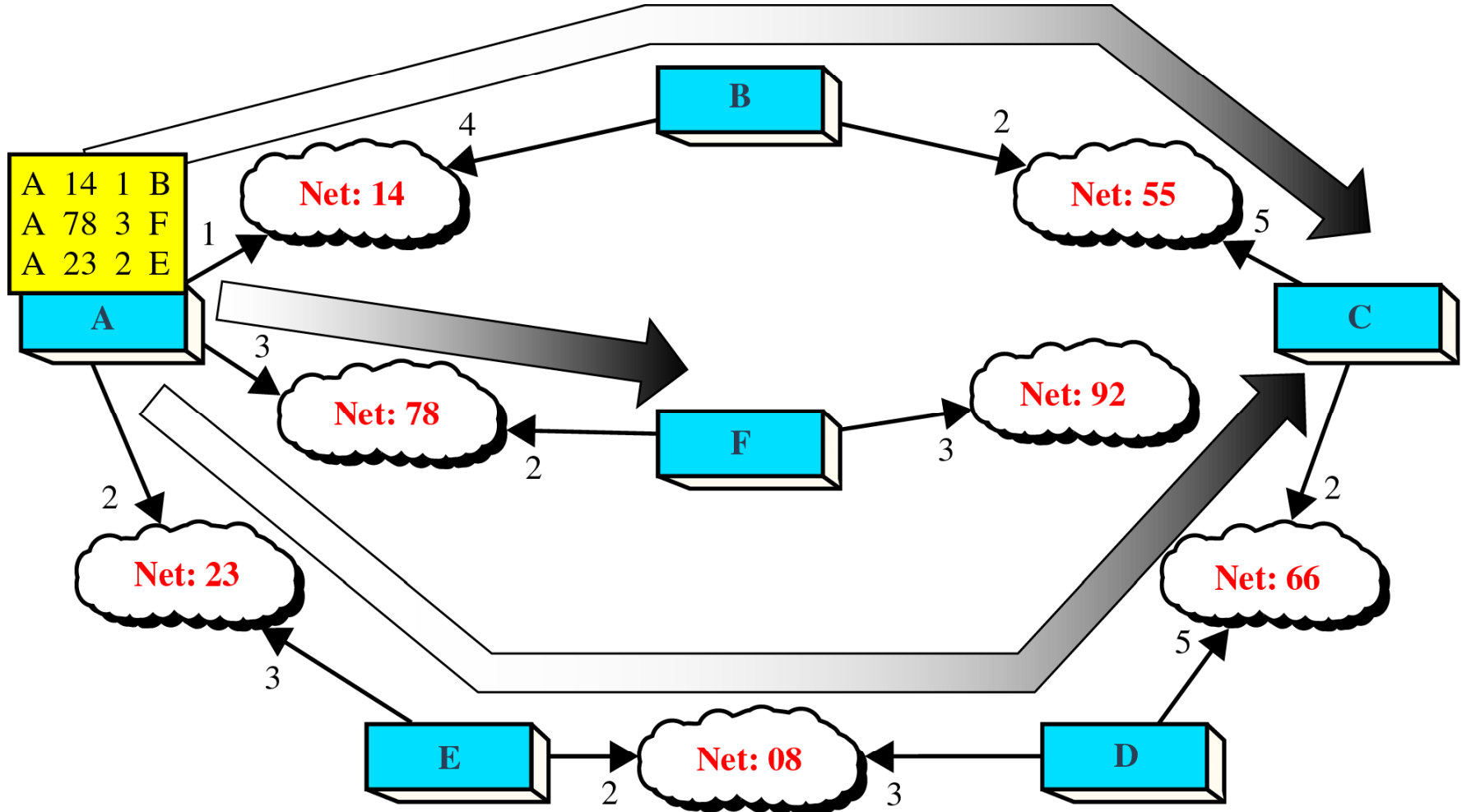


Figure 21-28

Link State Database

Advertiser	Network	Cost	Neighbor
A	14	1	B
A	78	3	F
A	23	2	E
B	14	4	A
B	55	2	C
C	55	5	B
C	66	2	D
D	66	5	C
D	08	3	E
E	23	3	A
E	08	2	D
F	78	2	A
F	92	3	—

Figure 21-29

Costs in the Dijkstra Algorithm

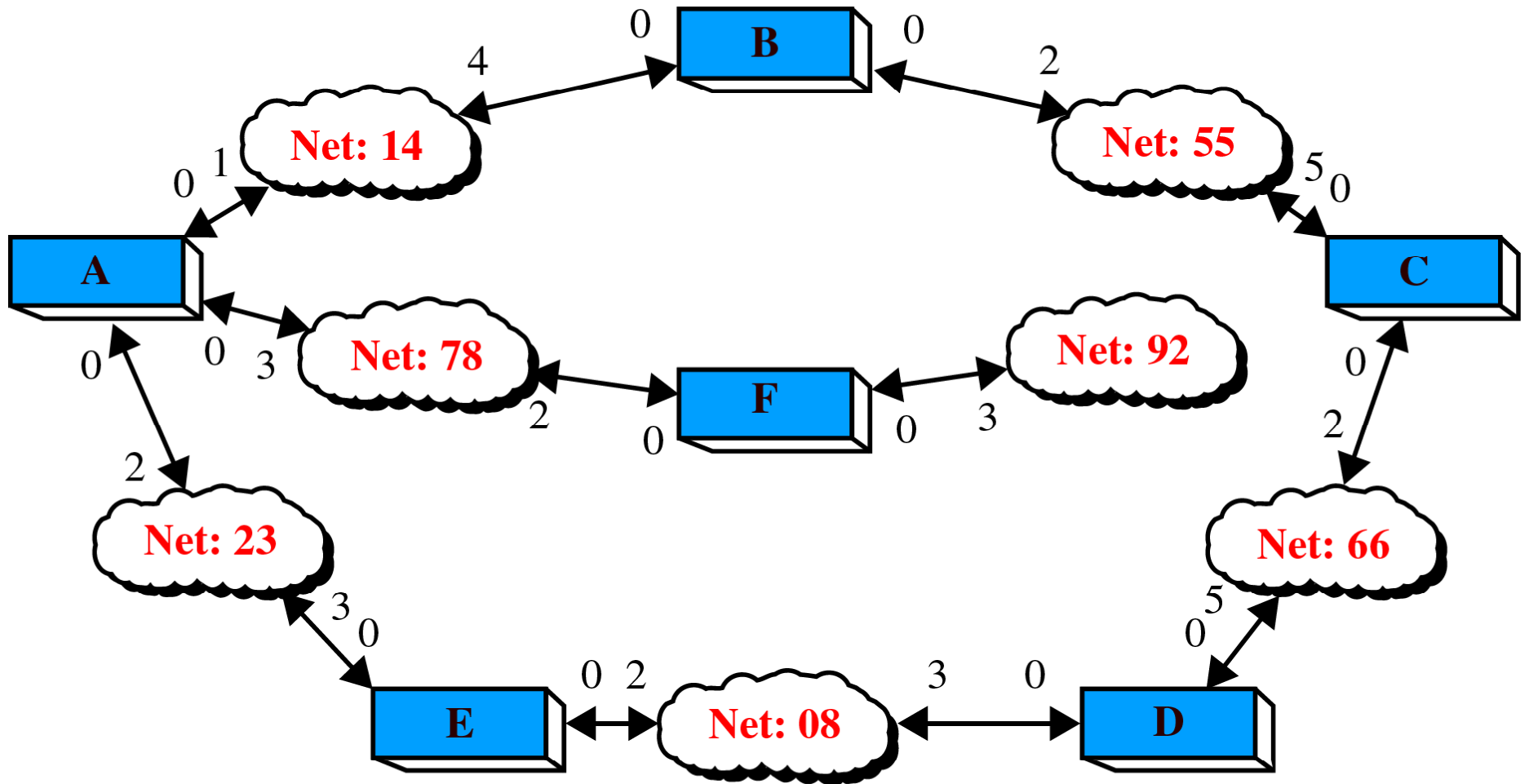
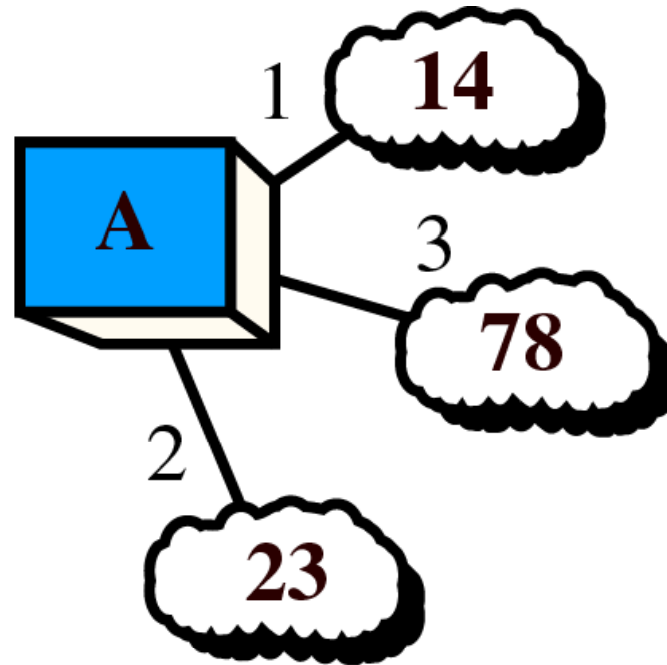


Figure 21-30, Part I

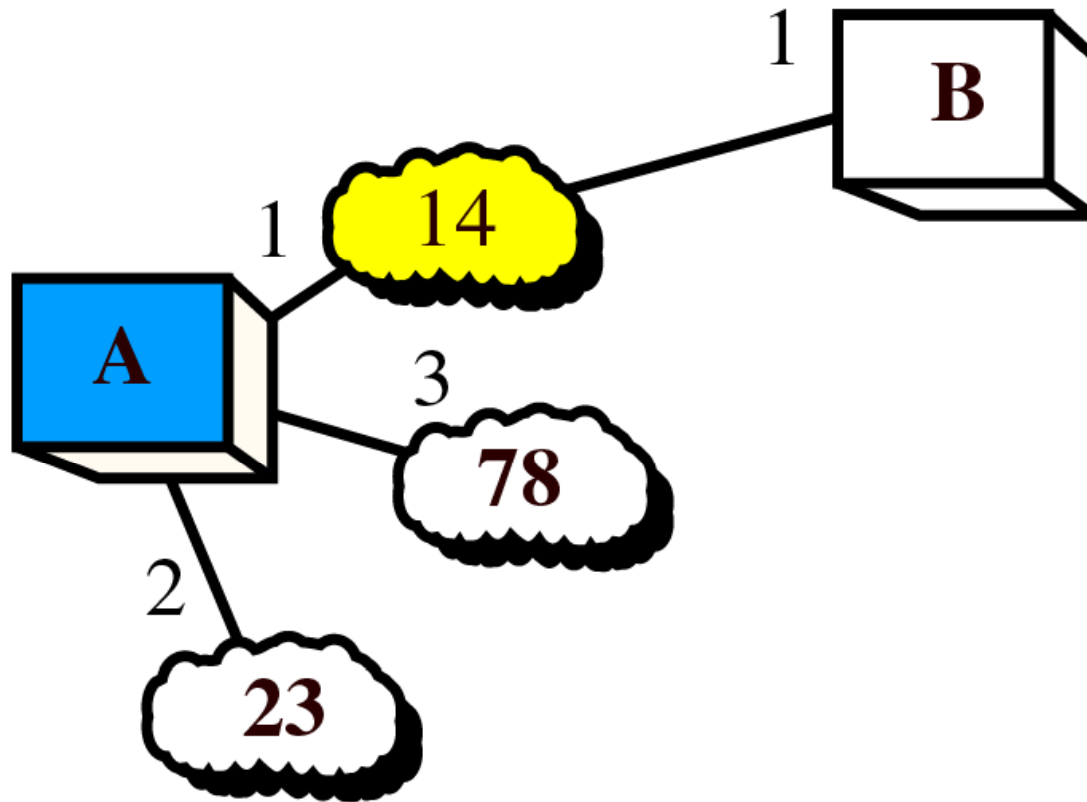
Shortest Path Calculation, Part I



Root is A, networks
14, 78, 23 added

Figure 21-30, Part II

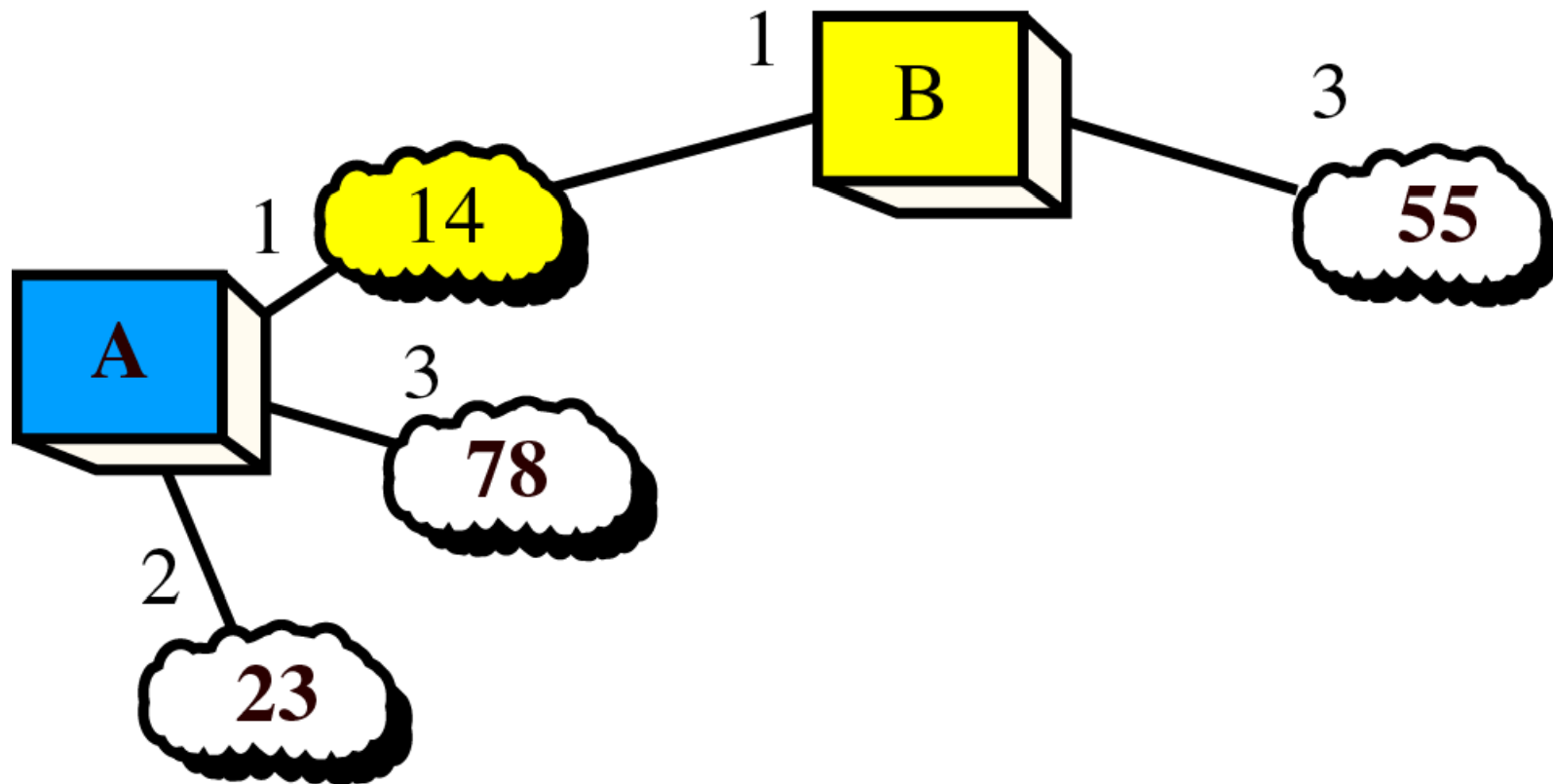
Shortest Path Calculation, Part II



14 permanent, B added

Figure 21-30, Part III

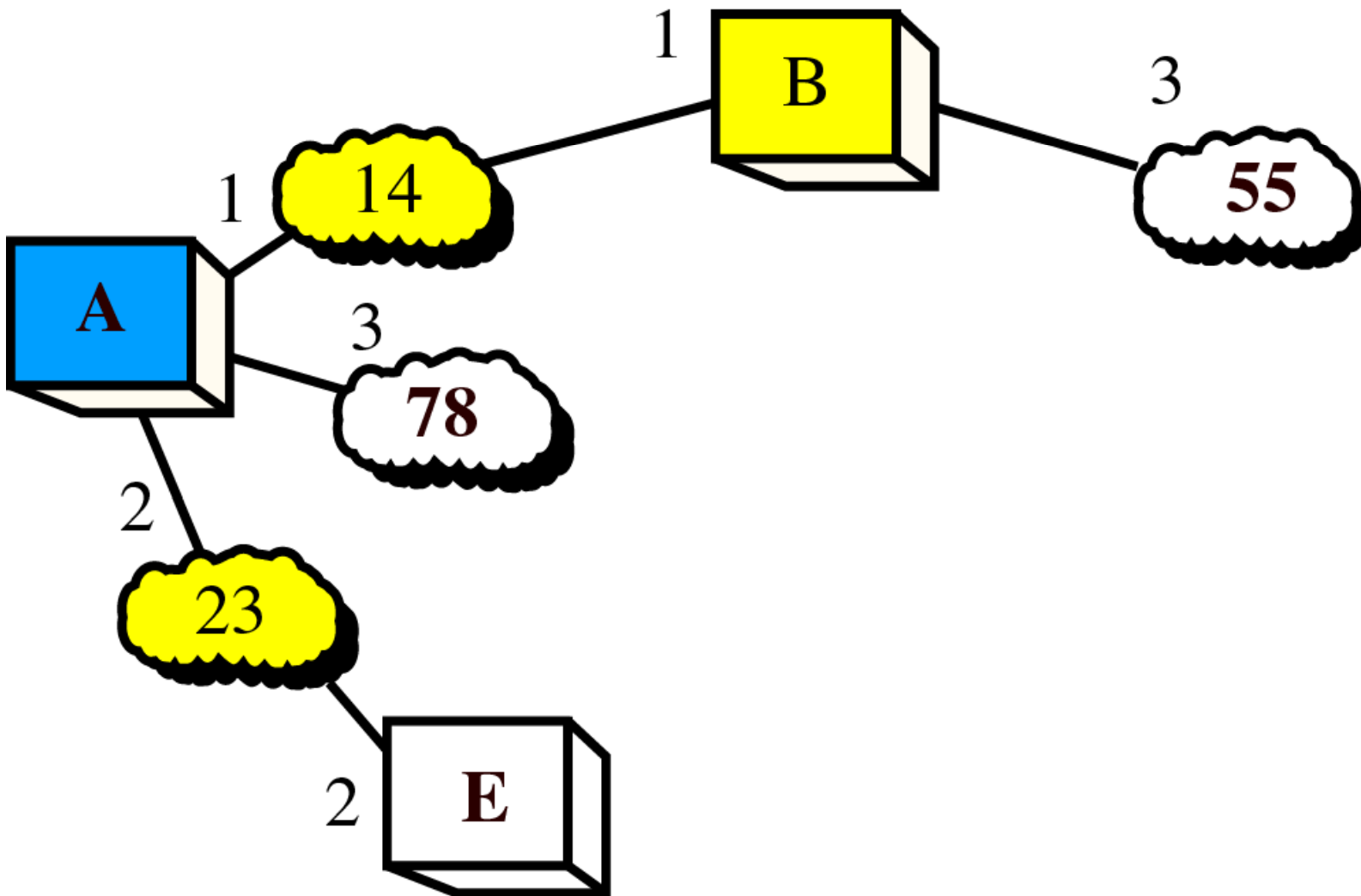
Shortest Path Calculation, Part III



B Permanent, 55 added

Figure 21-30, Part IV

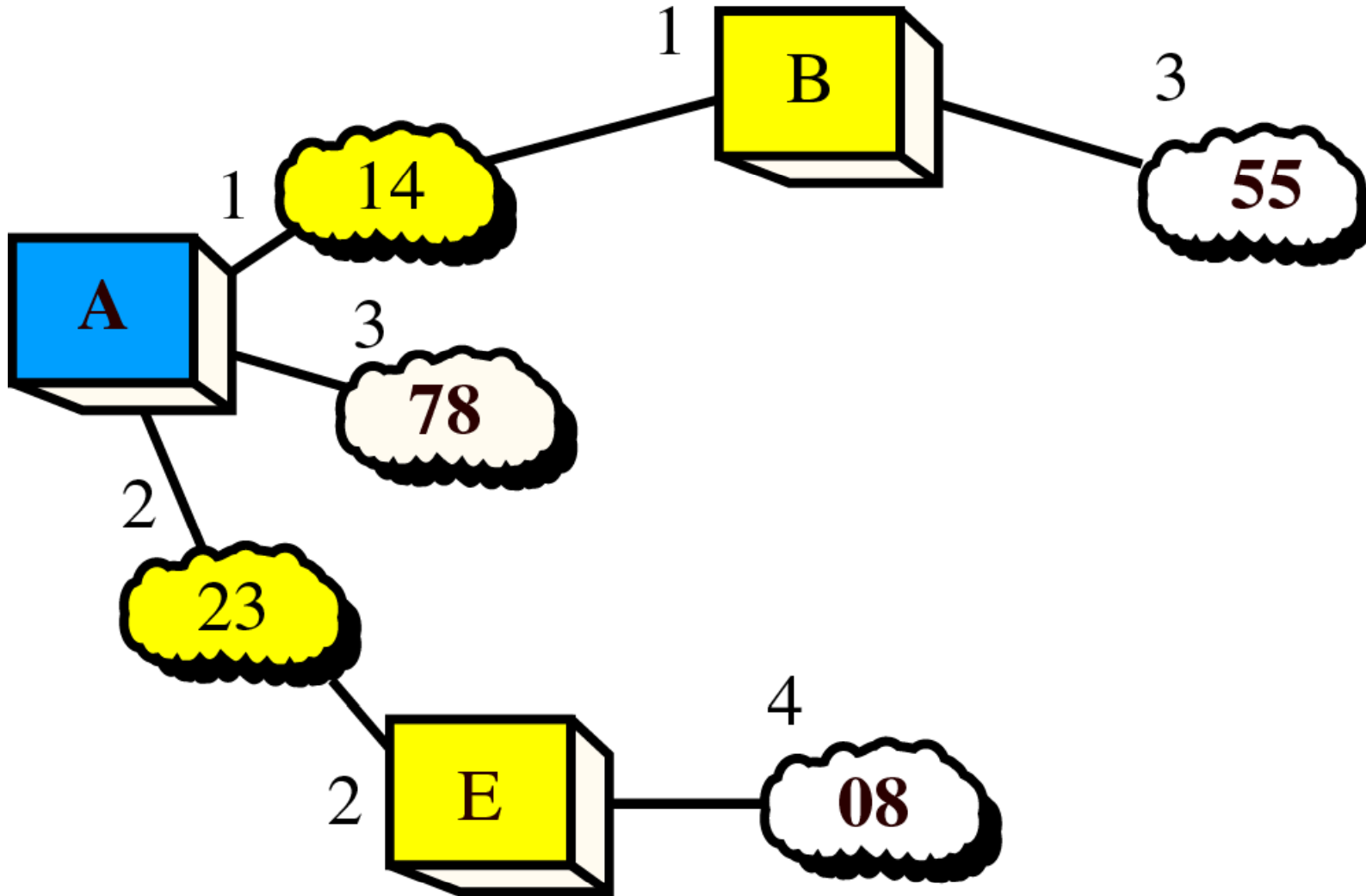
Shortest Path Calculation, Part IV



23 permanent, E added

Figure 21-30, Part V

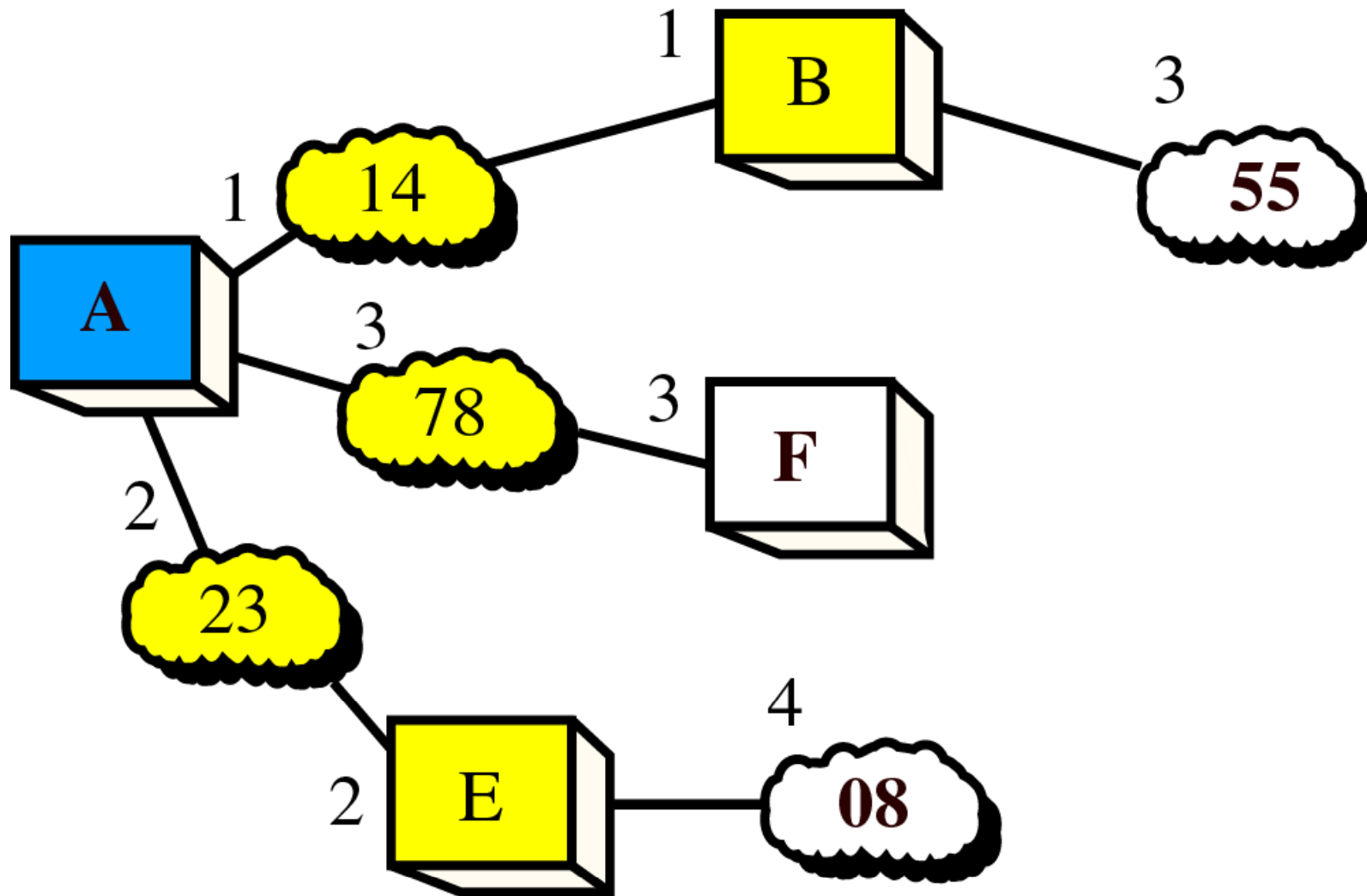
Shortest Path Calculation, Part V



E permanent, 08 added

Figure 21-30, Part VI

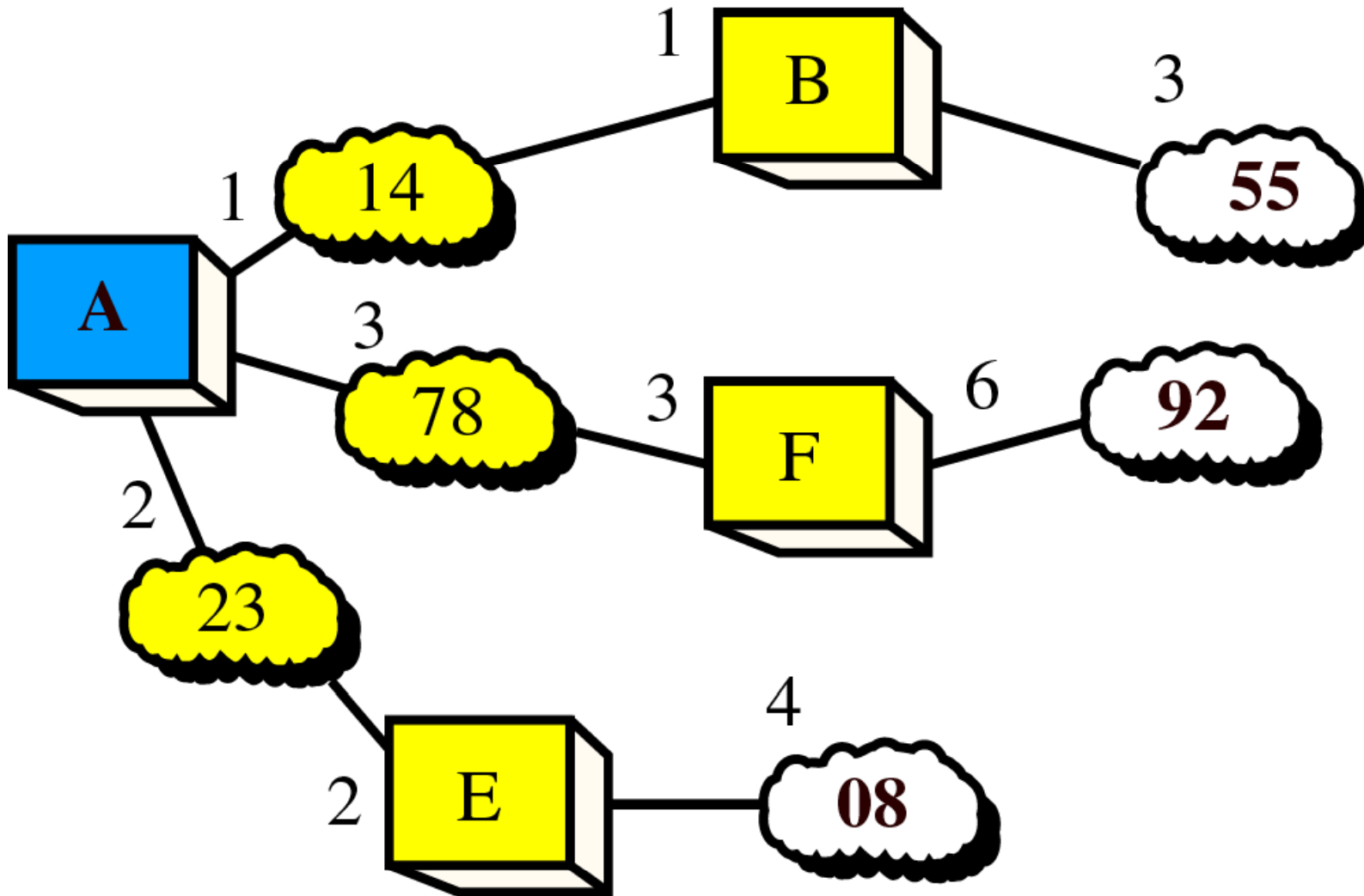
Shortest Path Calculation, Part VI



78 permanent, F added

Figure 21-31, Part VII

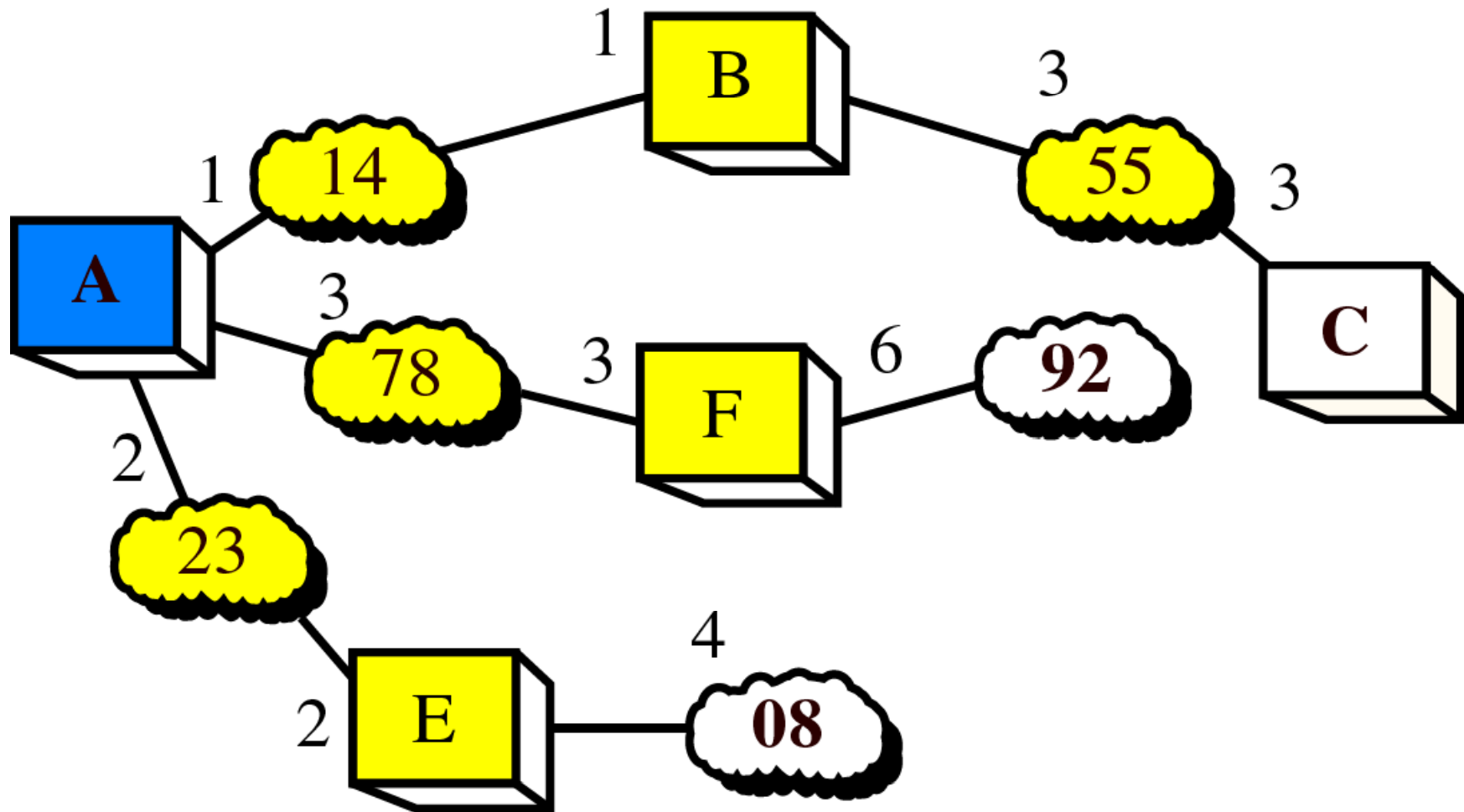
Shortest Path Calculation, Part VII



F permanent, 92 added

Figure 21-31, Part I

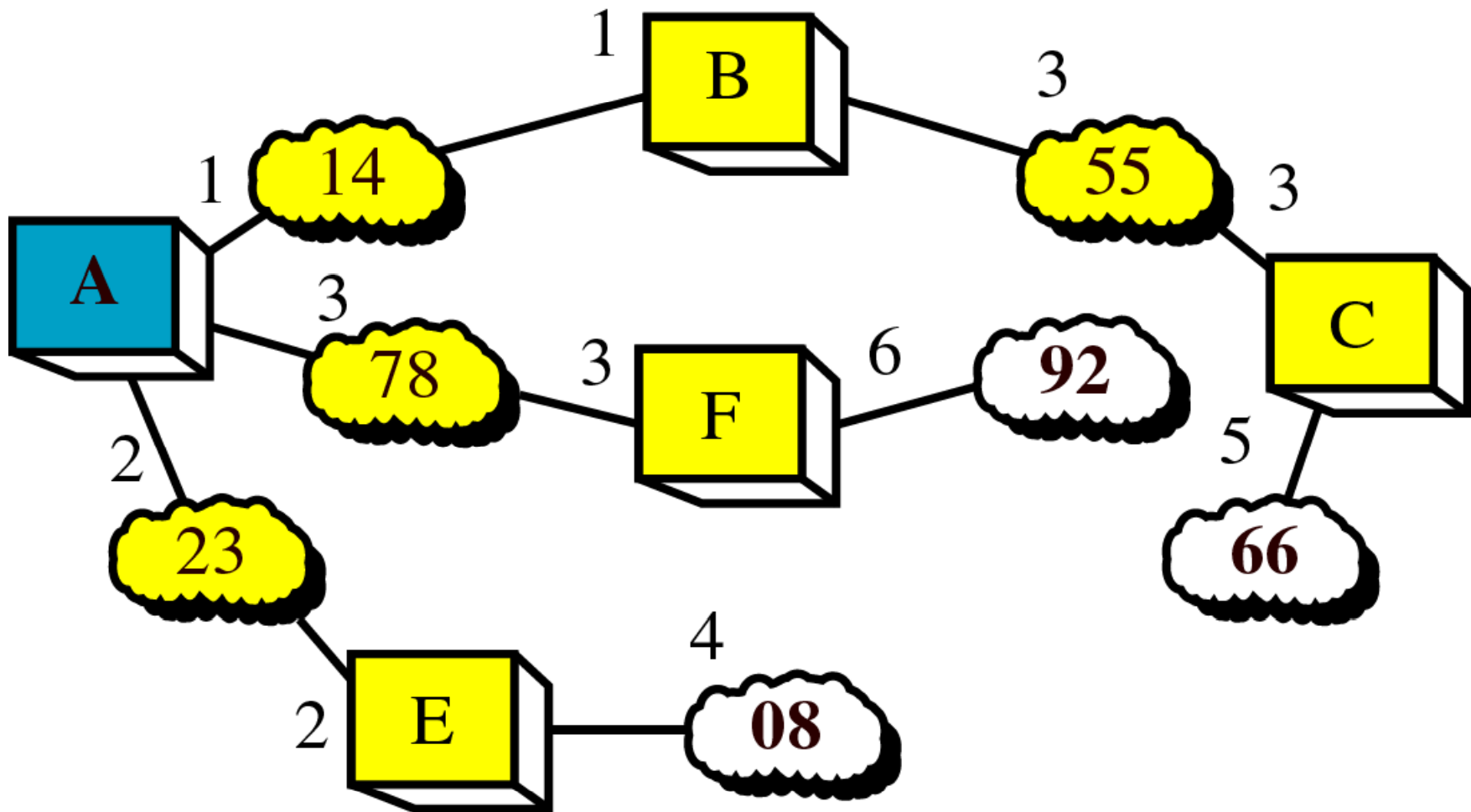
Shortest Path Calculation, Part VIII



55 permanent, C added

Figure 21-31, Part II

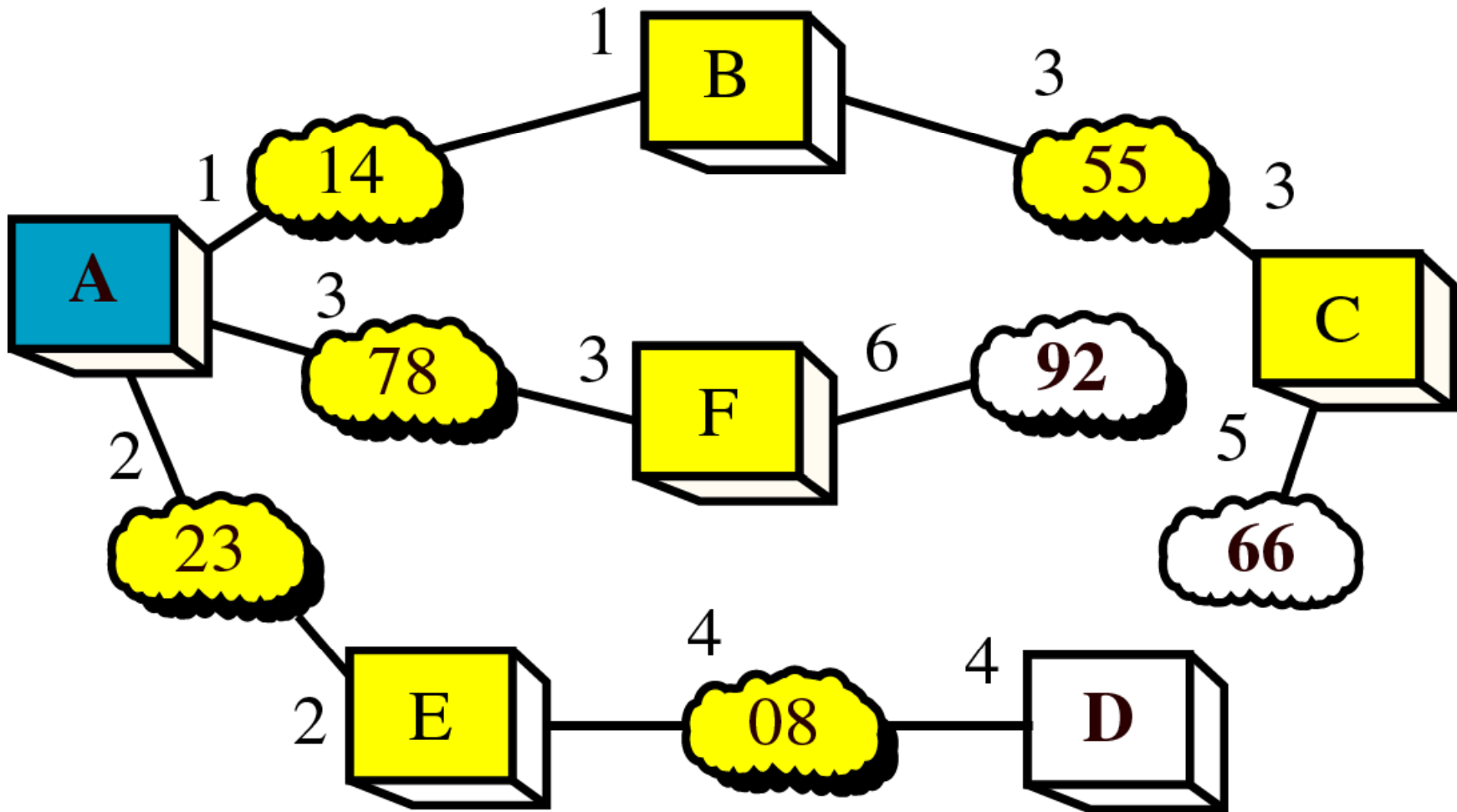
Shortest Path Calculation, Part IX



C permanent, 66 added

Figure 21-31, Part III

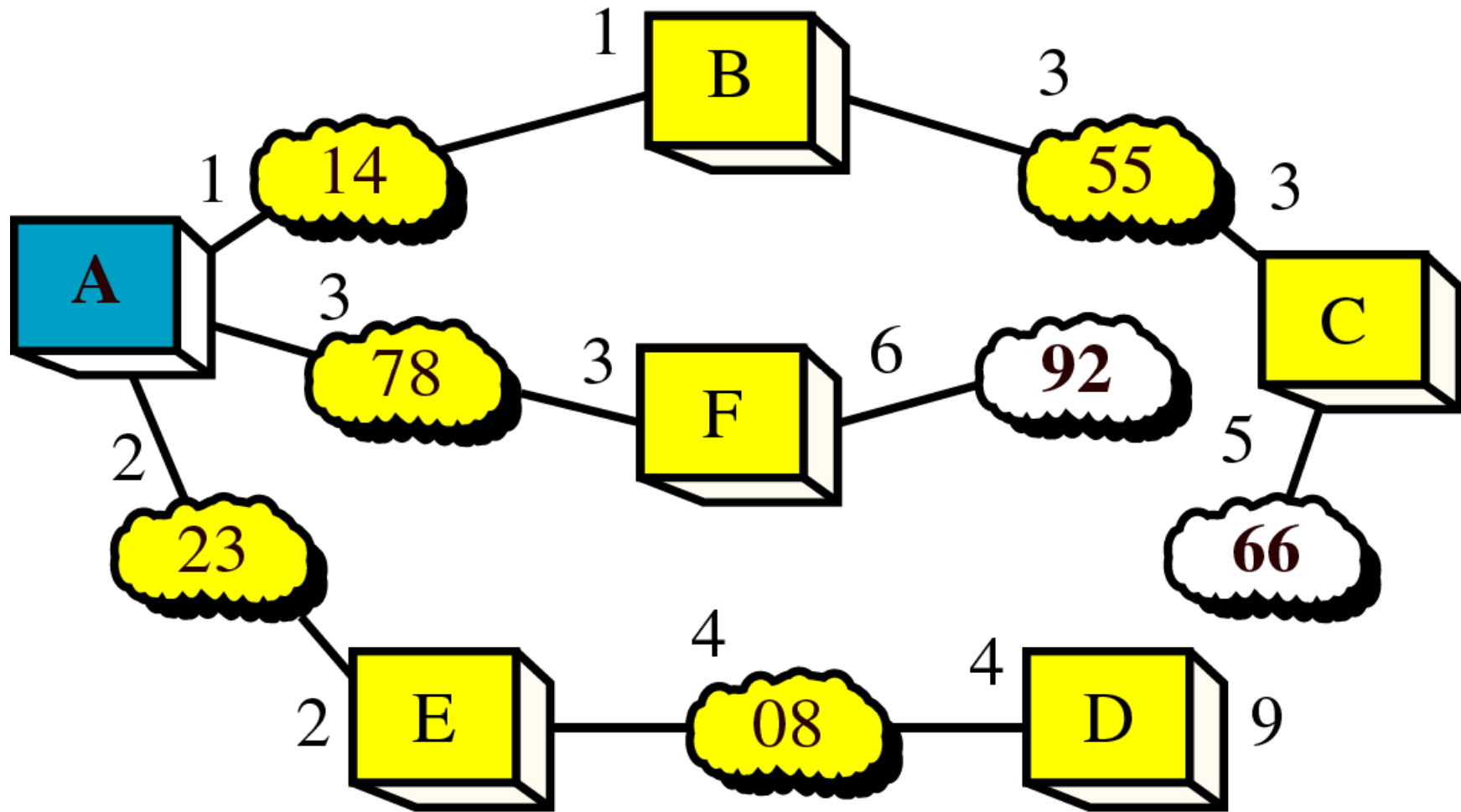
Shortest Path Calculation, Part X



08 permanent, D added
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Figure 21-31, Part IV

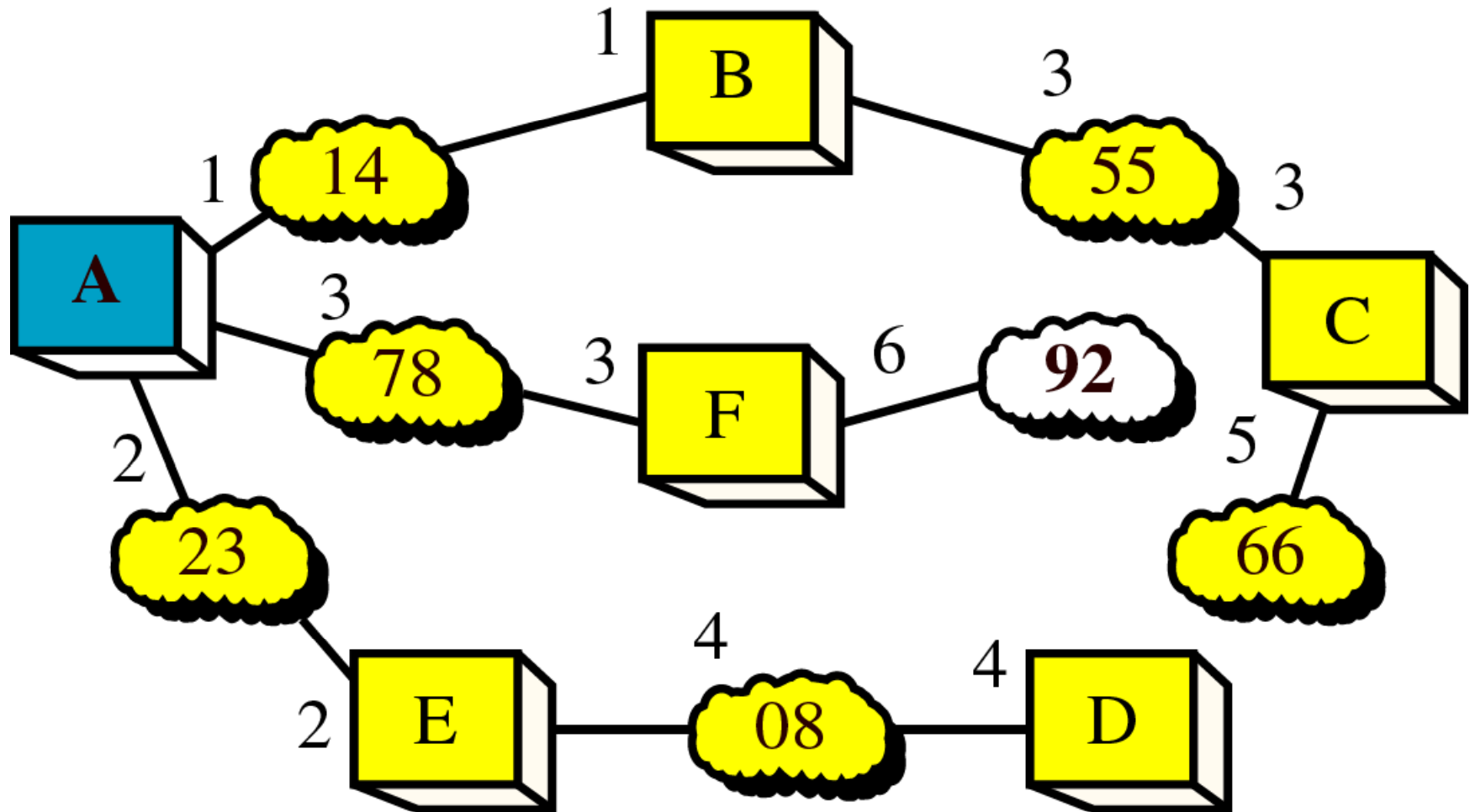
Shortest Path Calculation, Part XI



D permanent, 66 added.
But $9 > 5$, so that link deleted.

Figure 21-31, Part V

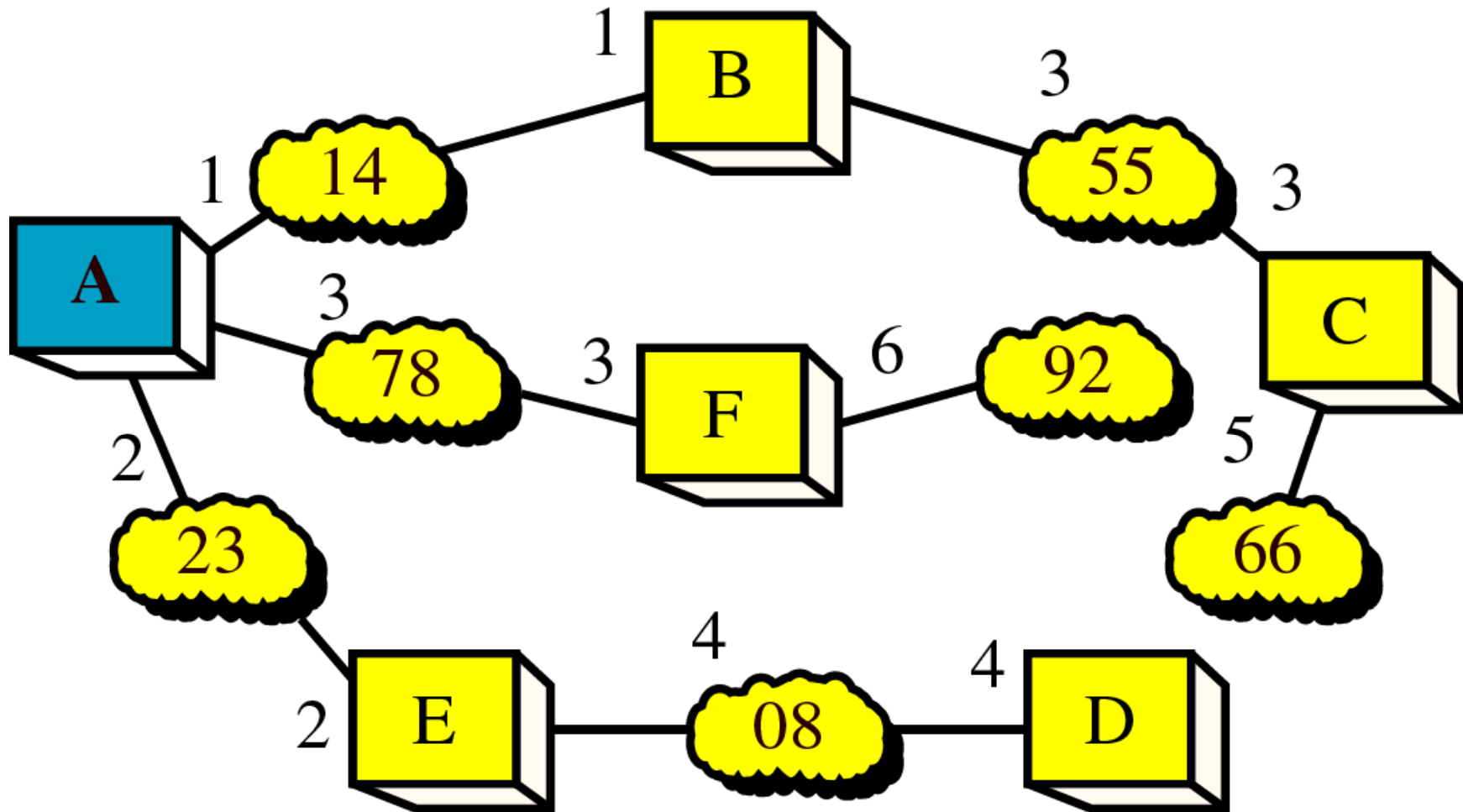
Shortest Path Calculation, Part XII



66 permanent

Figure 21-31, Part VI

Shortest Path Calculation, Part XIII



92 permanent

Figure 21-32

Routing Table for Router A

Net	Cost	Next router
08	4	E
14	1	--
23	2	--
55	3	B
66	5	B
78	3	--
92	6	F