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FACULTY OF ENGINEERING & TECHNOLOGY

BCA-302Computer Networks

Lecture-19

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OUTLINE

- THE NETWORK LAYER PROBLEM PACKET SWITCHING
- THE NETWORK LAYER PROBLEM : CONNECTIONLESS SERVICE
- THE PROBLEM NETWORK LAYER : CONNECTION-ORIENTED SERVICE
- CONNECTIONLESS VS. CONNECTION-ORIENTED
- SHORTEST PATH ALGORITHM

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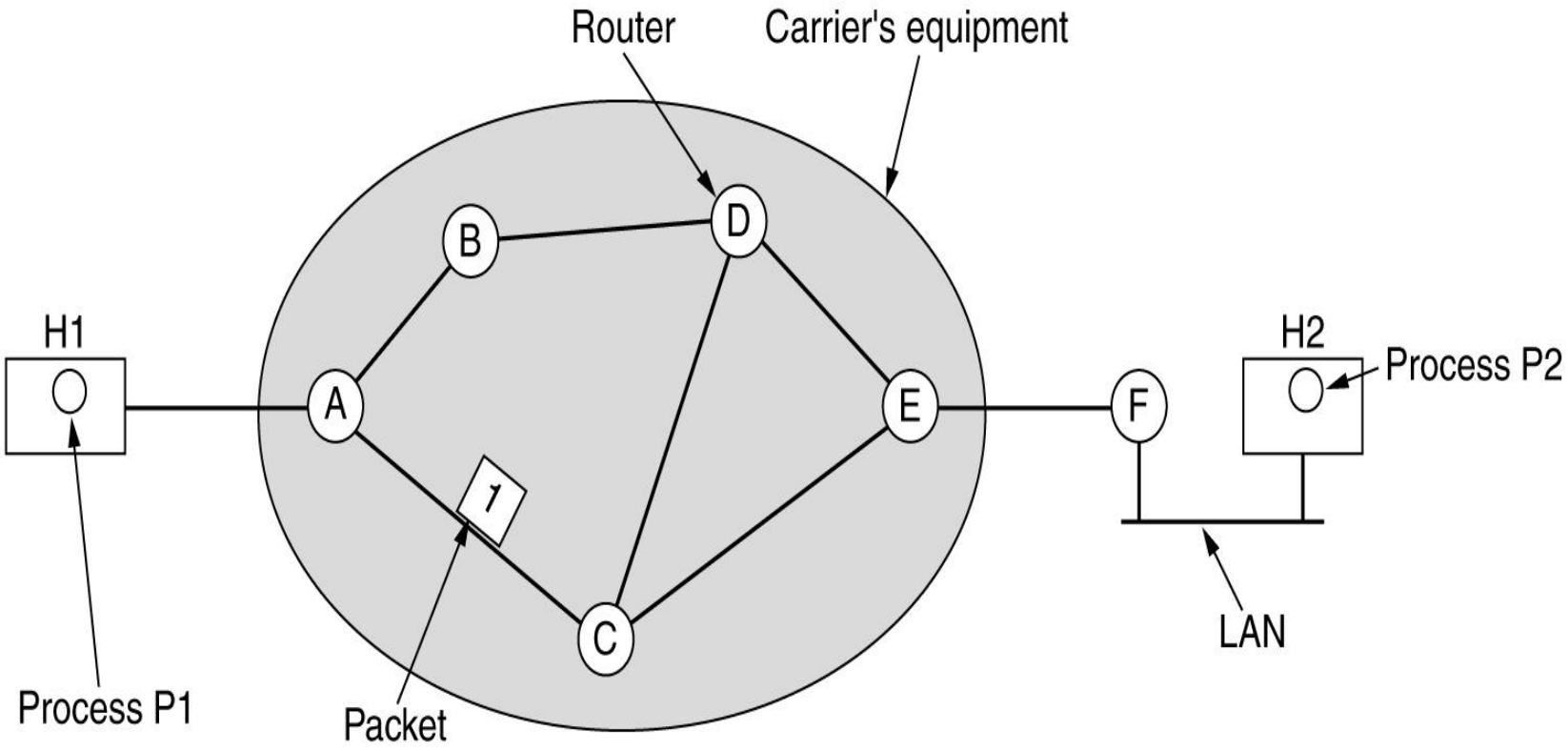
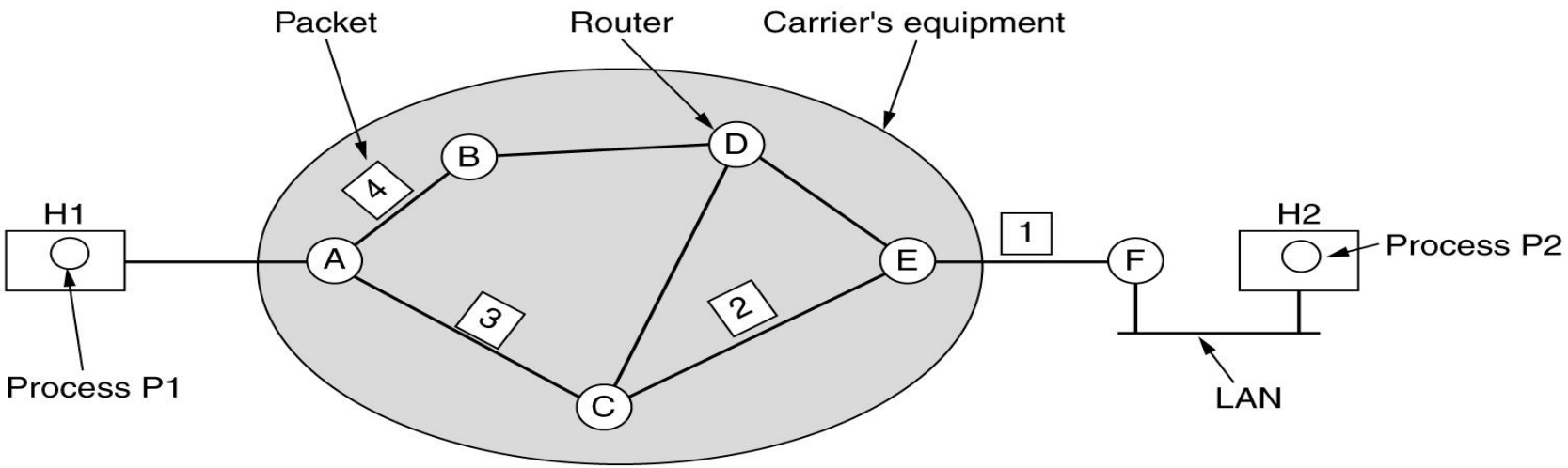
THE NETWORK LAYER PROBLEM PACKET SWITCHING



THE NETWORK LAYER PROBLEM : CONNECTIONLESS SERVICE



A's table

Dest.	initially Line	later Line
A	–	–
B	B	B
C	C	C
D	B	B
E	C	B
F	C	B

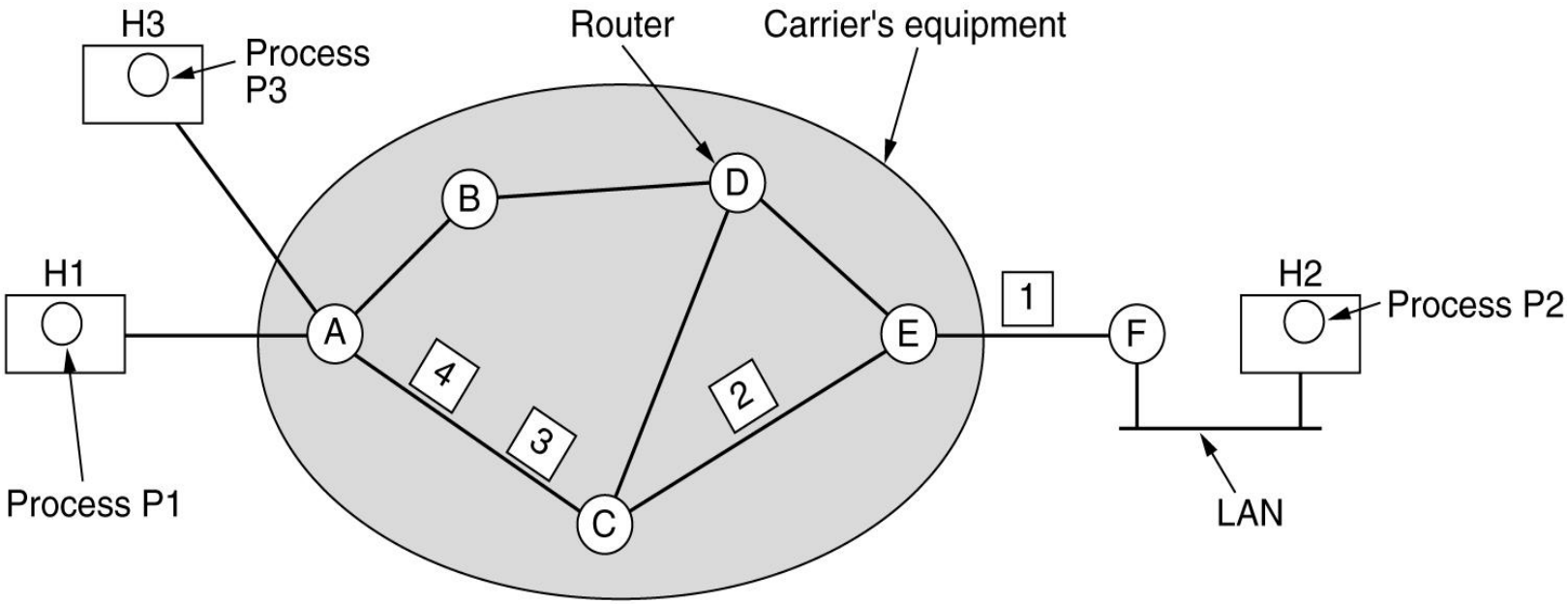
C's table

Dest.	Line
A	A
B	A
C	–
D	D
E	E
F	E

E's table

Dest.	Line
A	C
B	D
C	C
D	D
E	–
F	F

THE PROBLEM NETWORK LAYER : CONNECTION-ORIENTED SERVICE



A's table

H1	1
H3	1

In

C	1
C	2

Out

C's table

A	1
A	2

E	1
E	2

E's table

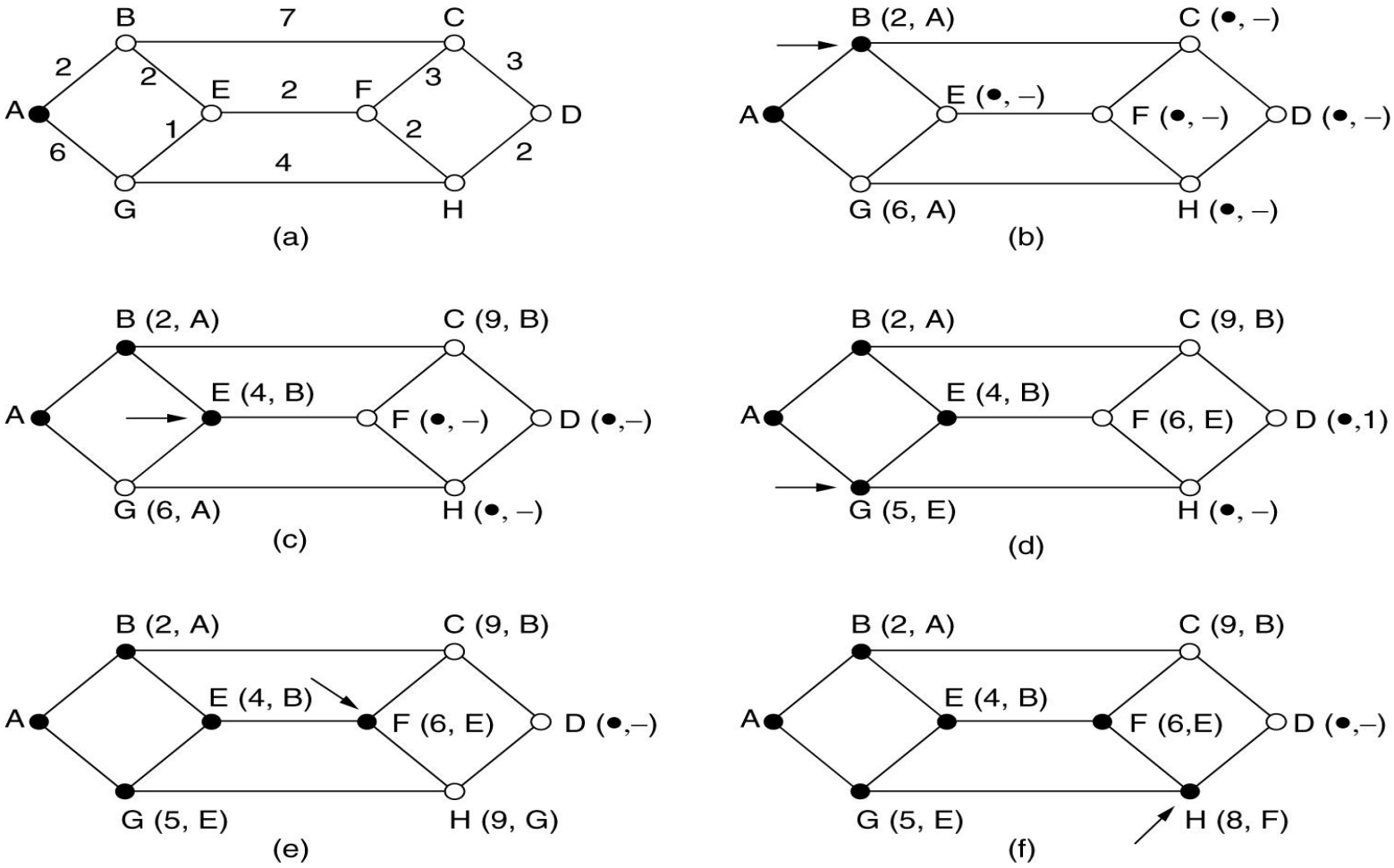
C	1
C	2

F	1
F	2

CONNECTIONLESS VS. CONNECTION-ORIENTED

Issue	Datagram subnet	Virtual-circuit subnet
Circuit setup	Not needed	Required
Addressing	Each packet contains the full source and destination address	Each packet contains a short VC number
State information	Routers do not hold state information about connections	Each VC requires router table space per connection
Routing	Each packet is routed independently	Route chosen when VC is set up; all packets follow it
Effect of router failures	None, except for packets lost during the crash	All VCs that passed through the failed router are terminated
Quality of service	Difficult	Easy if enough resources can be allocated in advance for each VC
Congestion control	Difficult	Easy if enough resources can be allocated in advance for each VC

SHORTEST PATH ALGORITHM



The first 5 steps used in computing the shortest path from A to D.
The arrows indicate the working node.

Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	Most packet switches use this principle _____	Stop and wait	Store and forward	Store and wait	Stop and forward
2	If there are N routers from source to destination, the total end to end delay in sending packet P(L-> number of bits in the packet R-> transmission rate) is equal to _____	N	(N*L)/R	(2N*L)/R	L/R
3	What are the Methods to move data through a network of links and switches?	Packet switching and Line switching	Circuit switching and Line switching	Line switching and bit switching	Packet switching and Circuit switching
4	The required resources for communication between end systems are reserved for the duration of the session between end systems in _____ method.	Packet switching	Circuit switching	Line switching	Frequency switching
5	As the resources are reserved between two communicating end systems in circuit switching, _____ is achieved.	authentication	guaranteed constant rate	reliability	store and forward

REFERENCES

- http://www.engppt.com/2009/12/networking-fourozan-ppt-slides.html