

UNIT-3

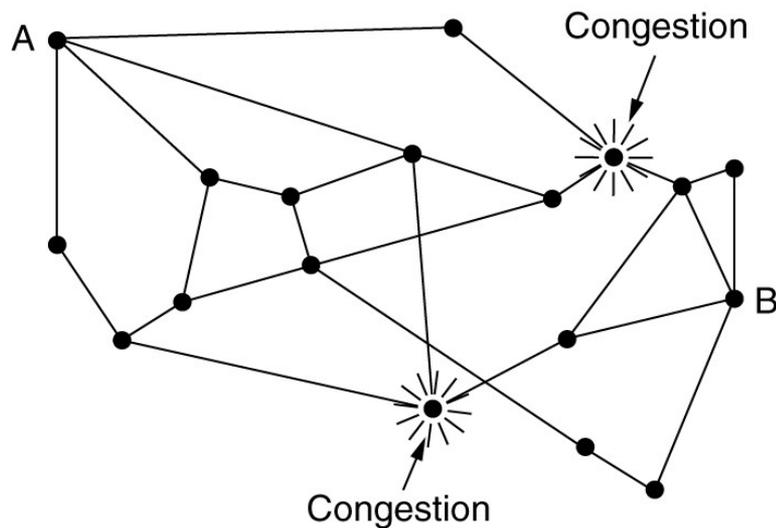
The Network Layer

Congestion Prevention Policies

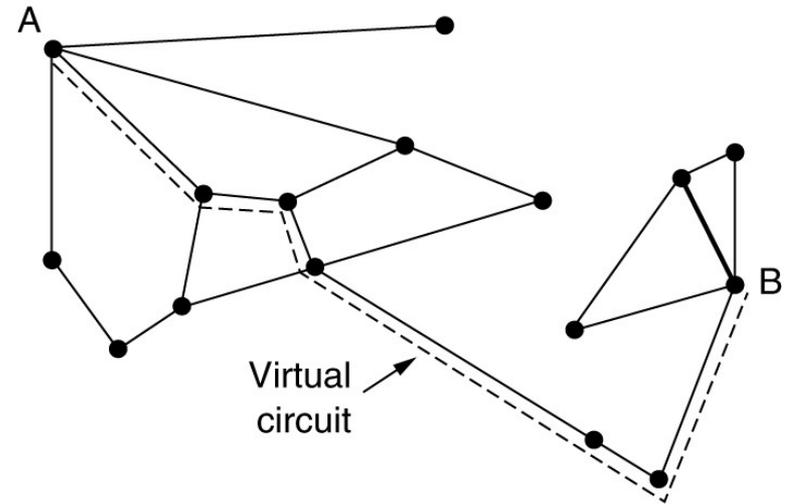
Layer	Policies
Transport	<ul style="list-style-type: none">• Retransmission policy• Out-of-order caching policy• Acknowledgement policy• Flow control policy• Timeout determination
Network	<ul style="list-style-type: none">• Virtual circuits versus datagram inside the subnet• Packet queueing and service policy• Packet discard policy• Routing algorithm• Packet lifetime management
Data link	<ul style="list-style-type: none">• Retransmission policy• Out-of-order caching policy• Acknowledgement policy• Flow control policy

Policies that affect congestion.

Congestion Control in Virtual-Circuit Subnets



(a)



(b)

(a) A congested subnet. (b) A redrawn subnet, eliminates congestion and a virtual circuit from A to B.

Congestion Control in Datagram - Circuit Subnets

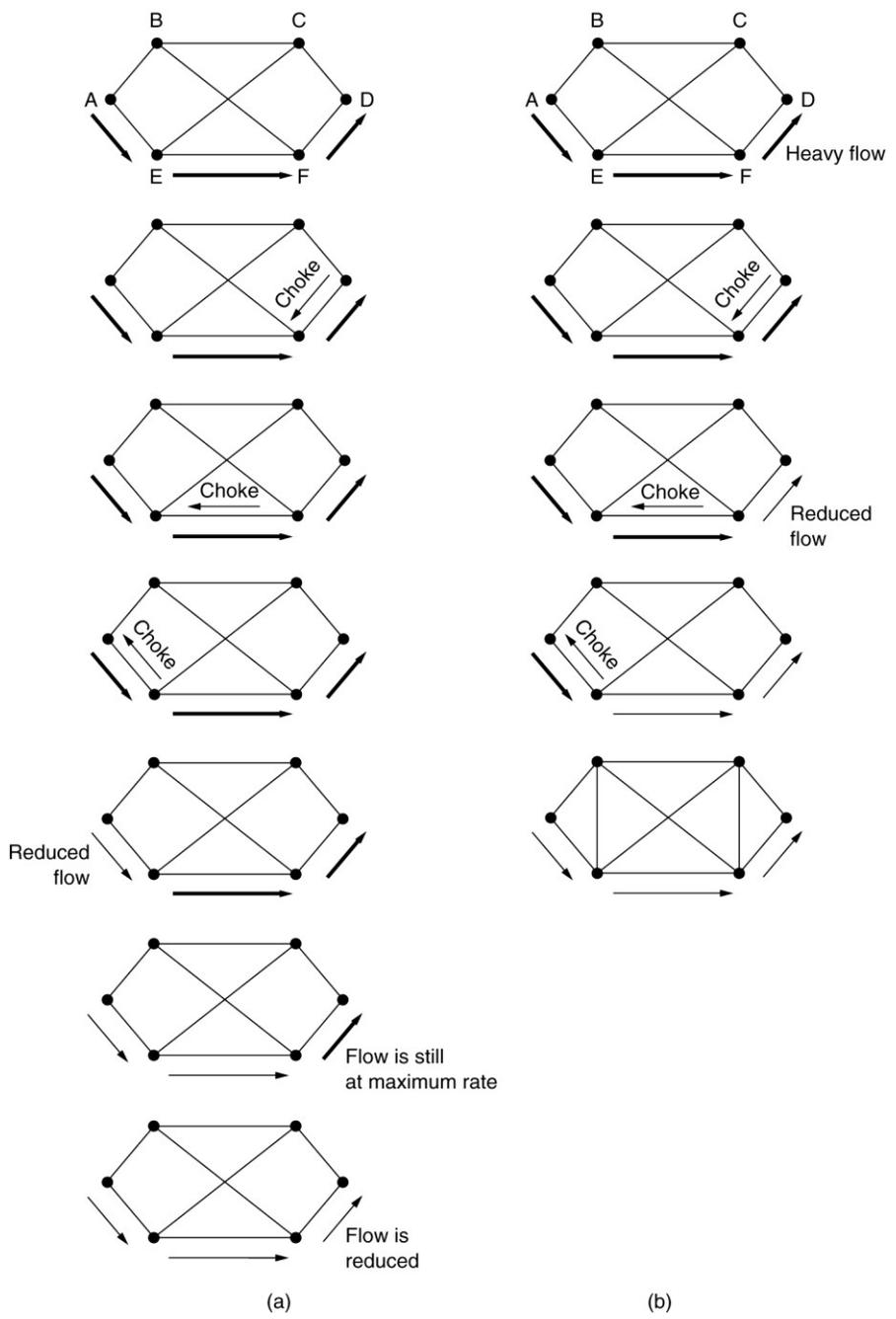
$$U_{\text{new}} = a * U_{\text{old}} + (1-a) f$$

U= utilization factor($0.0 < U < 1.0$)

f= instantaneous utilization ($0.0 < U < 1.0$)

a= how fast router forget the history

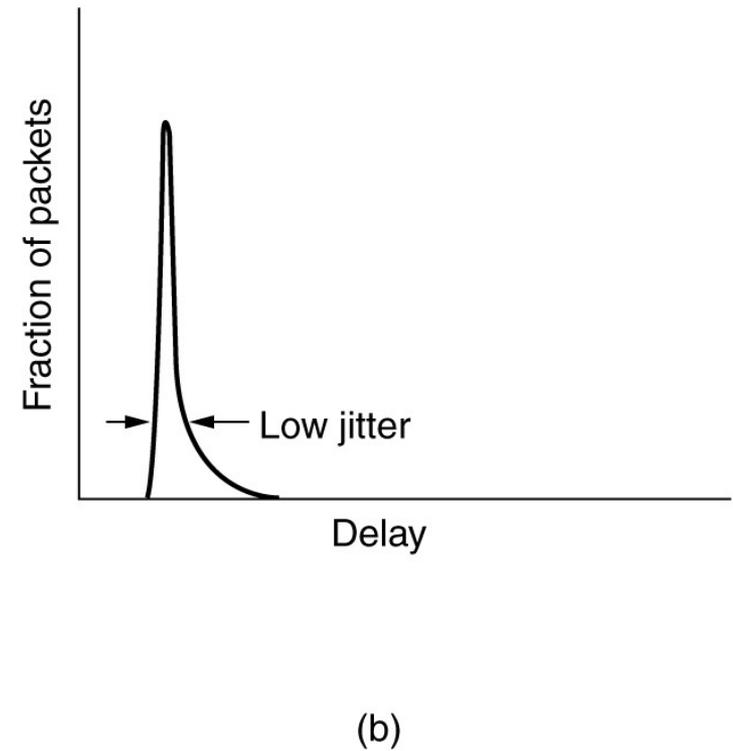
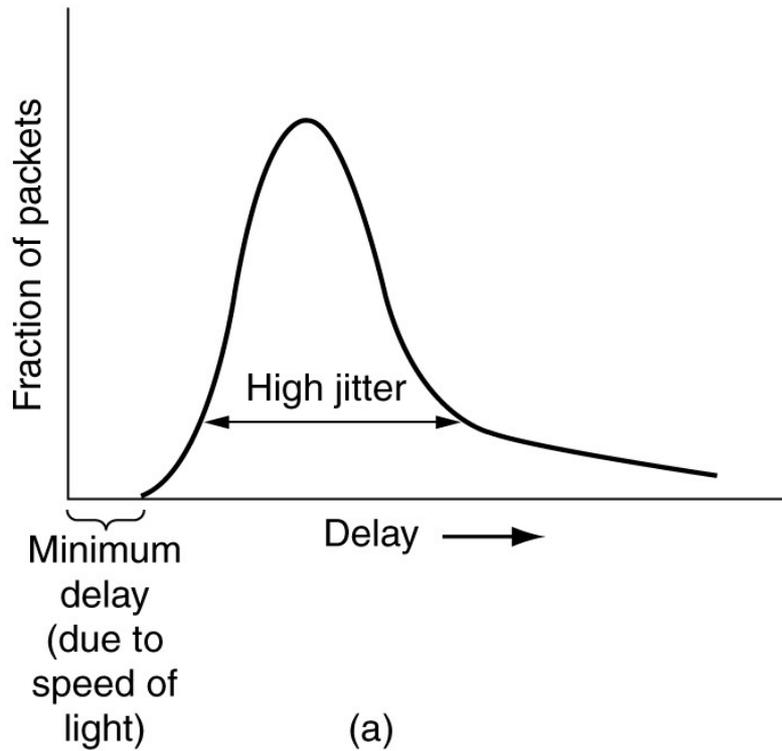
Hop-by-Hop Choke Packets



(a) A choke packet that affects only the source.

(b) A choke packet that affects each hop it passes through.

Jitter Control



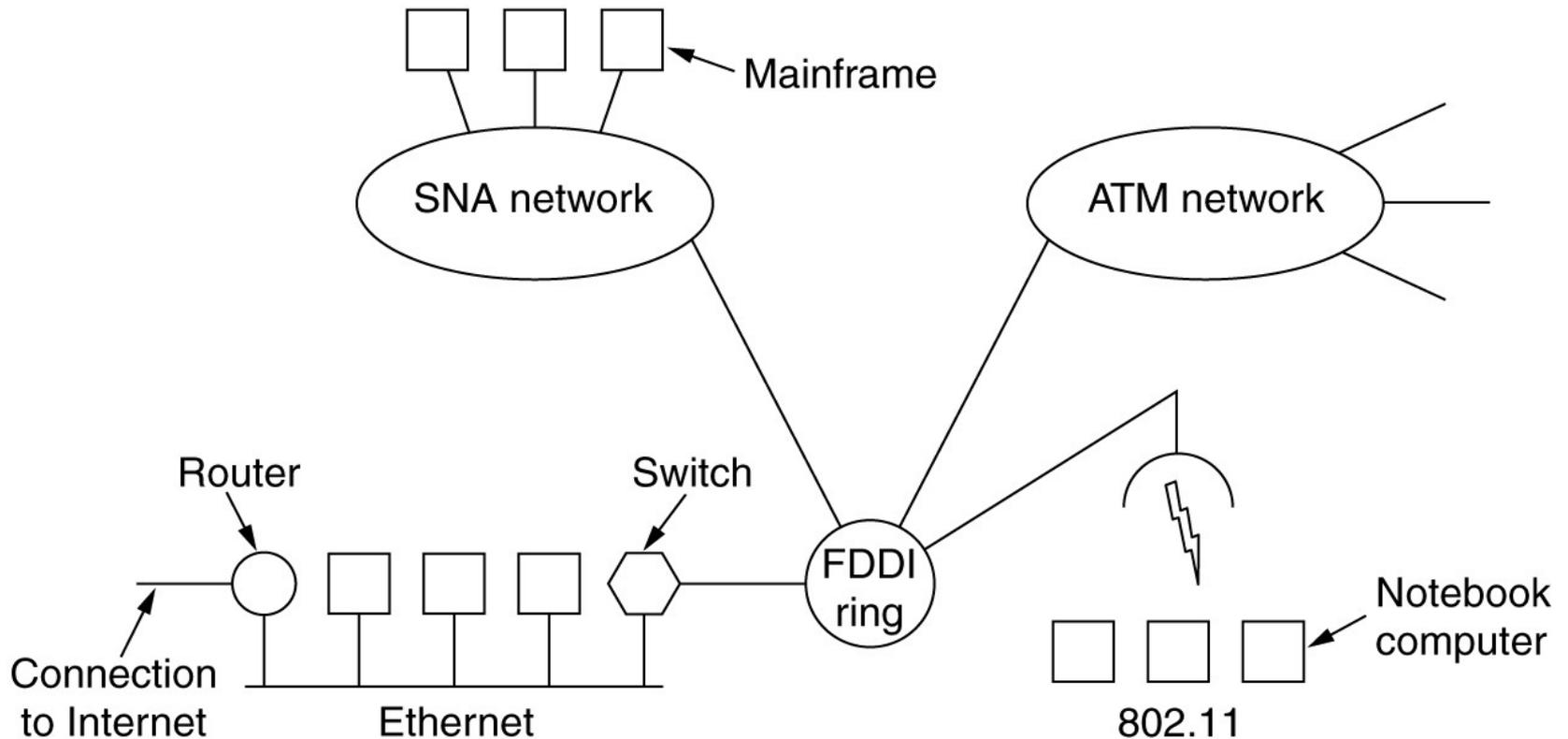
(a) High jitter.

(b) Low jitter.

Internetworking

- How Networks Differ
- How Networks Can Be Connected
- Concatenated Virtual Circuits
- Connectionless Internetworking
- Tunneling
- Internetwork Routing
- Fragmentation

Connecting Networks



A collection of interconnected networks.