

# Real Routing at Gigabit Speeds

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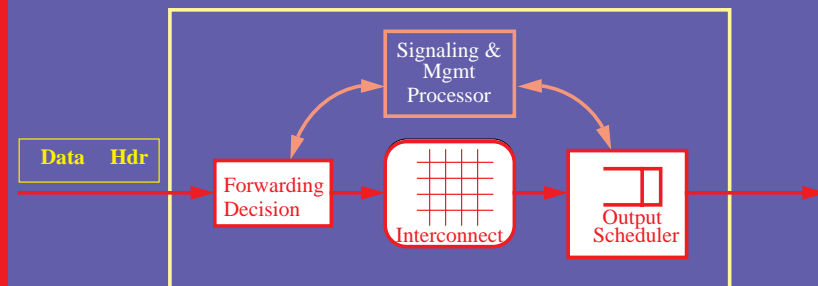
# The panel

1. Nick McKeown, *Stanford University*
2. Earl Ferguson, *Foundry Networks*
3. Debbie Deutsch, *Prominet*
4. Hemant Kanakia, *Torrent Networks*
5. Steve Haddock, *Extreme Networks*
6. Questions, Discussion, Flames, and Tomatoes....

1. The Basic Functions of an IP Router
2. The Architecture of Routers

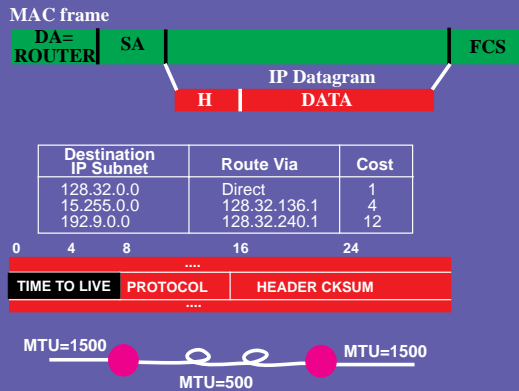
# The Architecture of Switches and Routers

Generic Packet Processor:  
(e.g. IP Router, ATM Switch, LAN Switch)

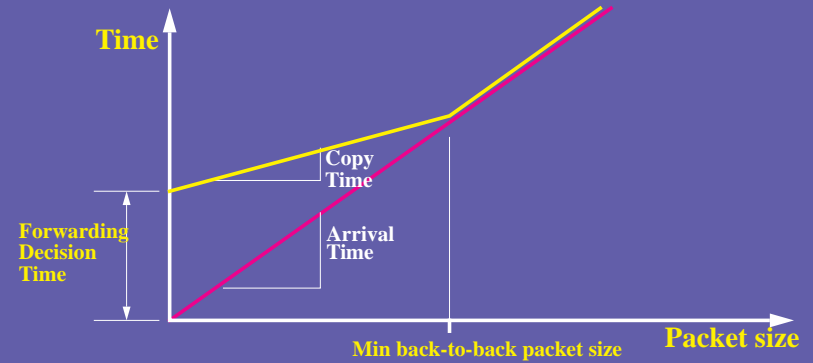


# The Primary Functions of an IP Router

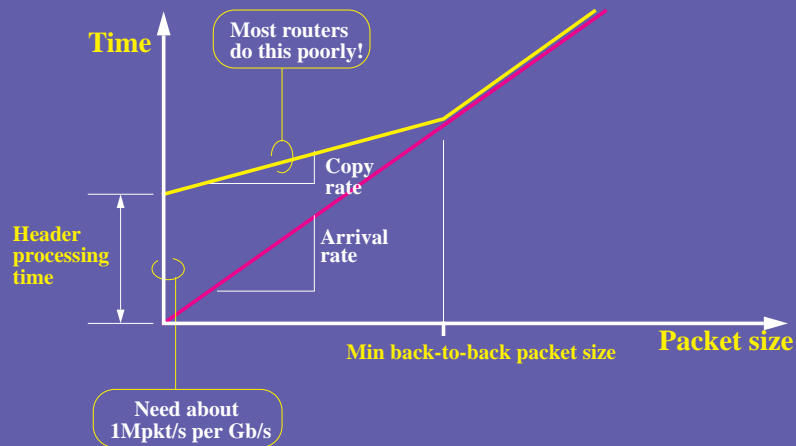
- 1 Extract incoming IP datagram
- 2 Consult IP routing tables
- 3 Decrement Time to Live
- 4 Fragmentation
- 5 Recalculate header checksum
- 6 Build outgoing datagram



# Performance of IP Routers

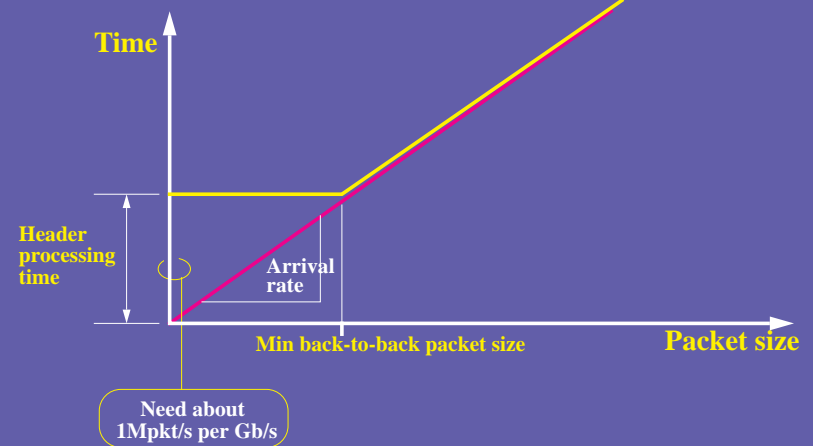


# Performance of IP Routers



# Performance of IP Routers

Assuming backplane *not* congested and pipelined design



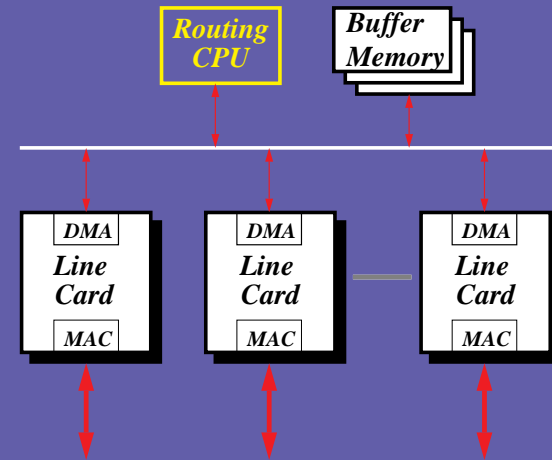
# 1. The Basic Functions of an IP Router



# 2. The Architecture of Routers

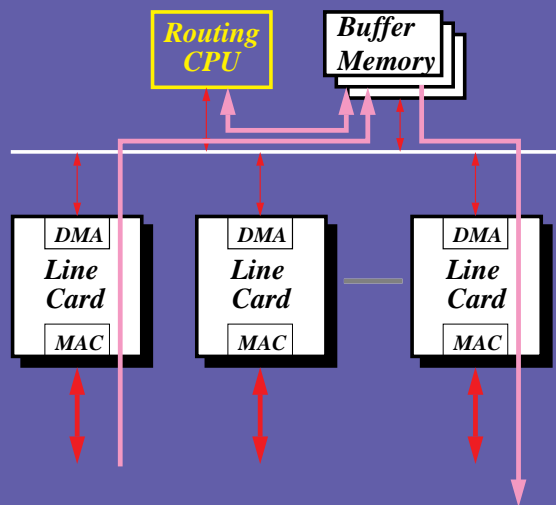
## The Evolution of Routers

*The first shared memory routers*



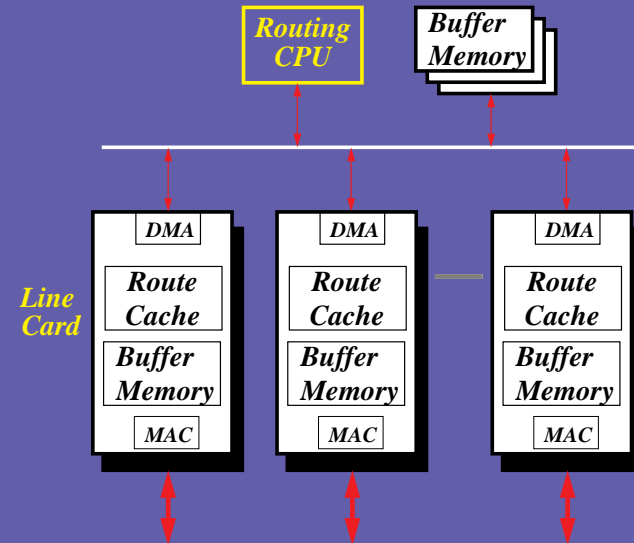
## The Evolution of Routers

*The first shared memory routers*



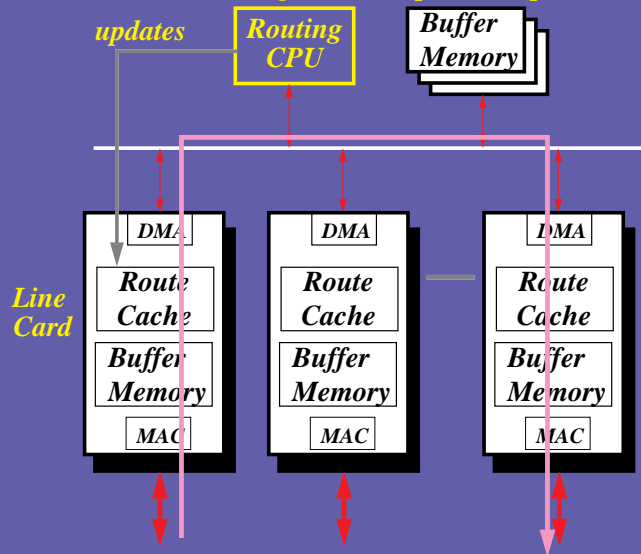
## The Evolution of Routers

*Reducing the number of bus copies*



# The Evolution of Routers

Reducing the number of bus copies  
Caching and "Fastpath-slowpath"



# The Evolution of Routers

Avoiding bus contention

