

Opening Address

Gignet '97 — Europe: June 12, 1997.



Nick McKeown

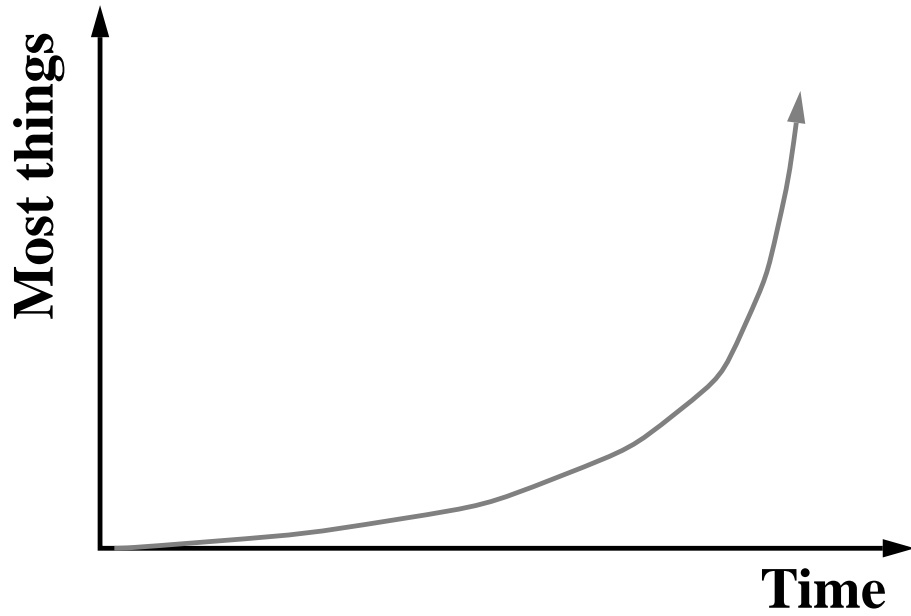
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Gigabit Networks

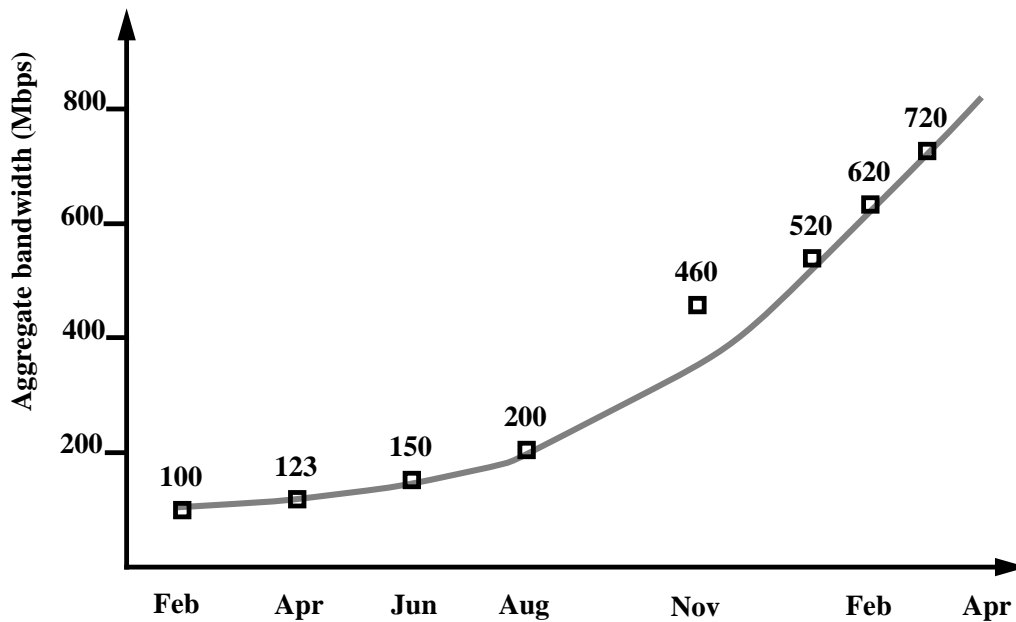
1. The demand and supply of gigabits
2. The technology:
 - Links
 - Switching and Routing

What's the Problem?



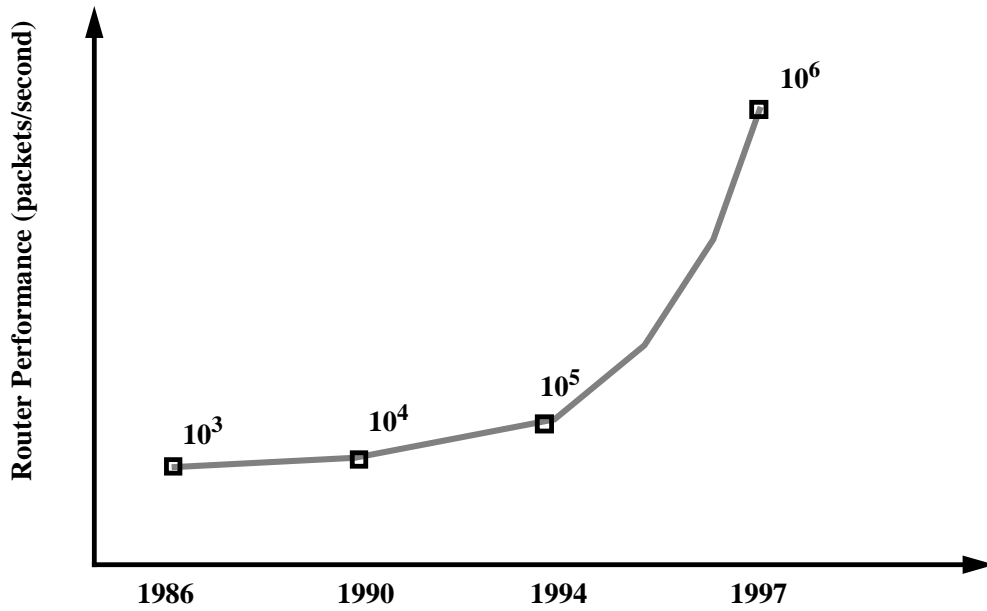
The demand

The San Jose NAP

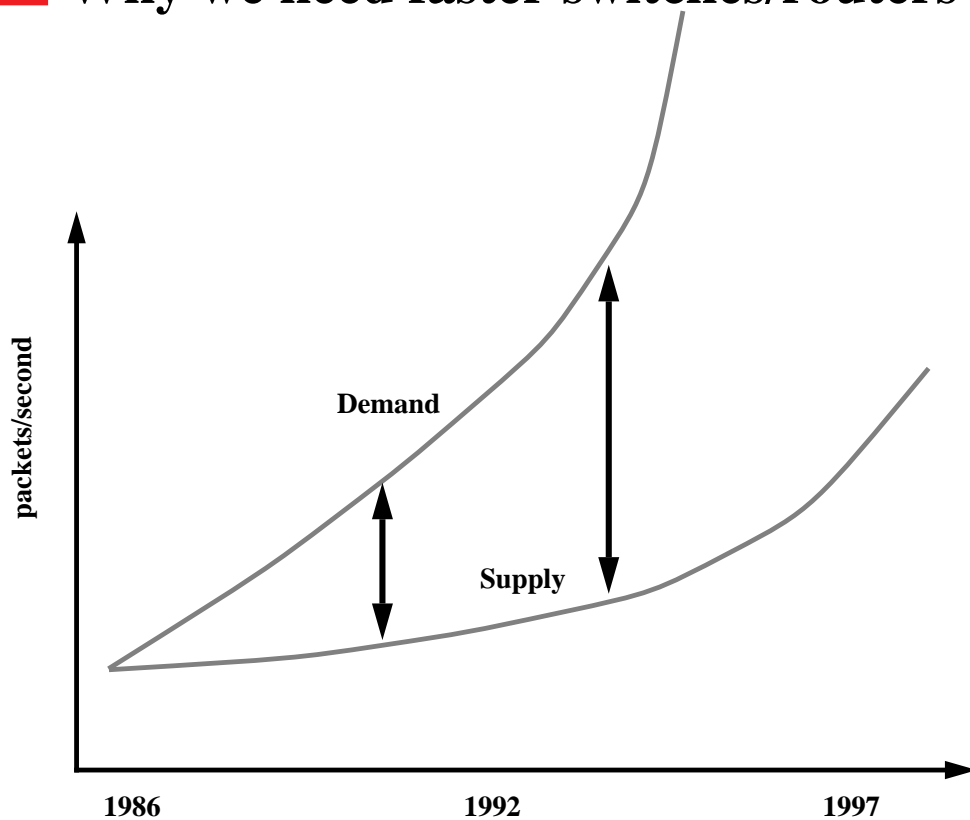


Source: <http://www.mfsdatanet.com/MAE/west.stats.html>

The supply



Why we need faster switches/routers

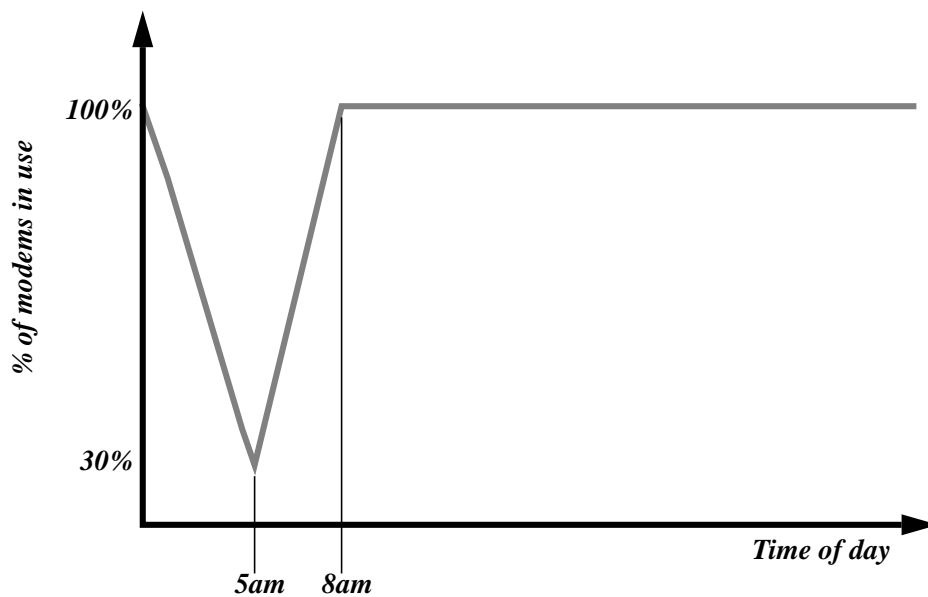


Why the growth?

- **Exponential growth in the number of users.**
- **Exponential growth in traffic per user per hour.**
- **Linear growth in hours per user per day.**

Dialup Demand

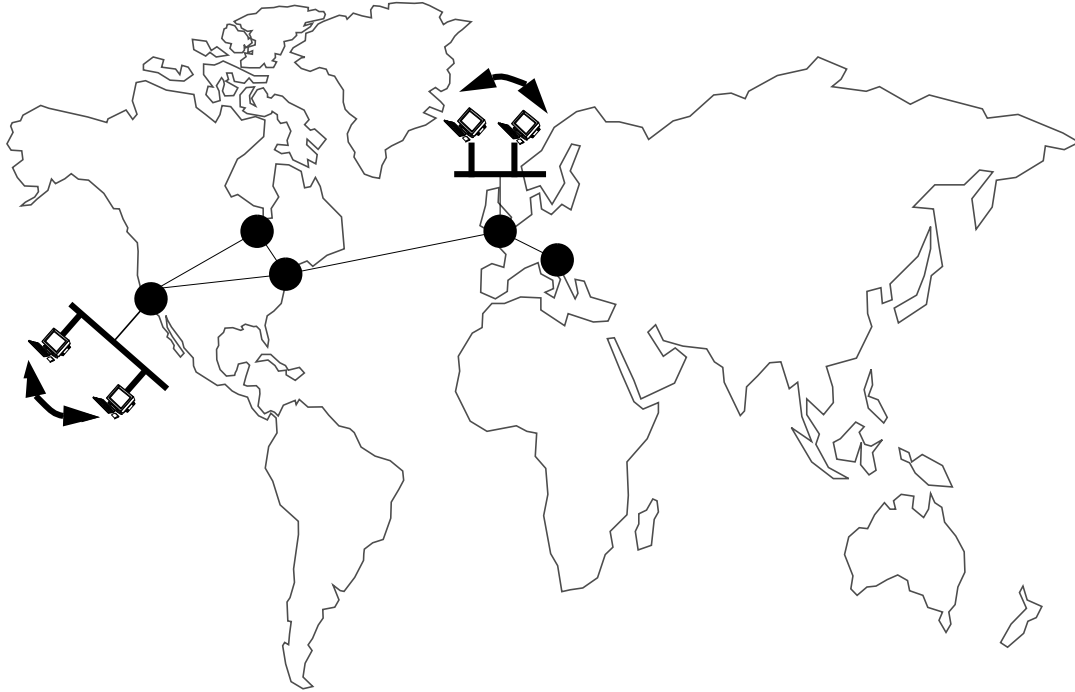
Modem usage at U.C. Berkeley



“America on Hold”

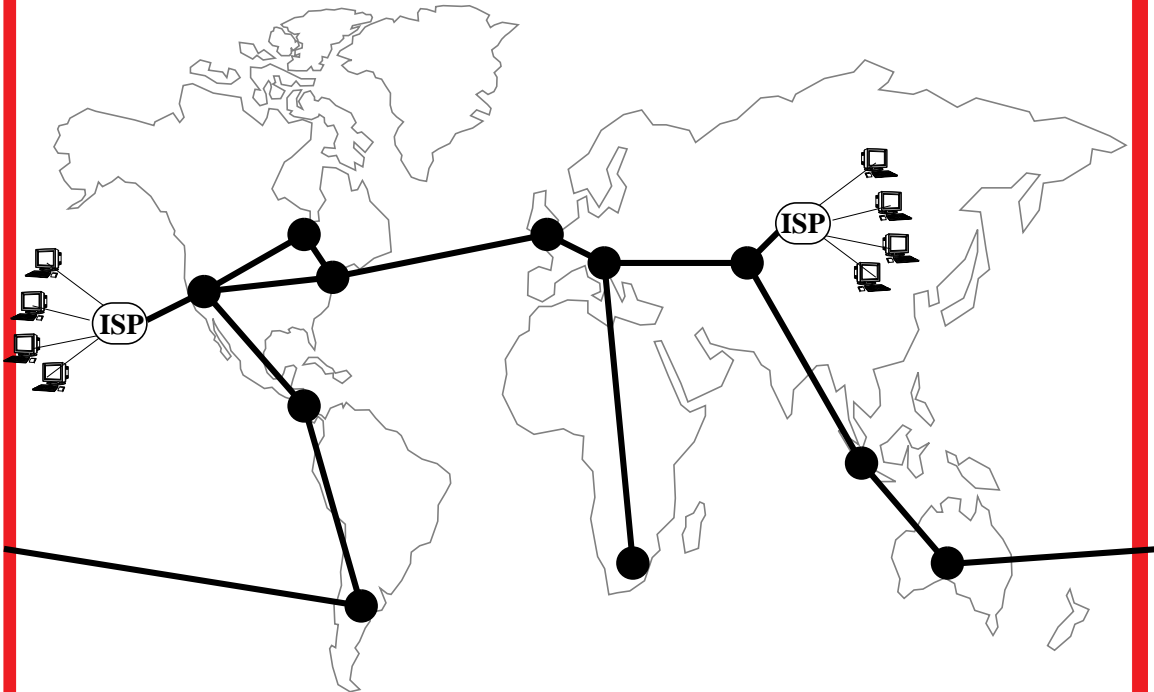
Traffic Inversion

10 years ago

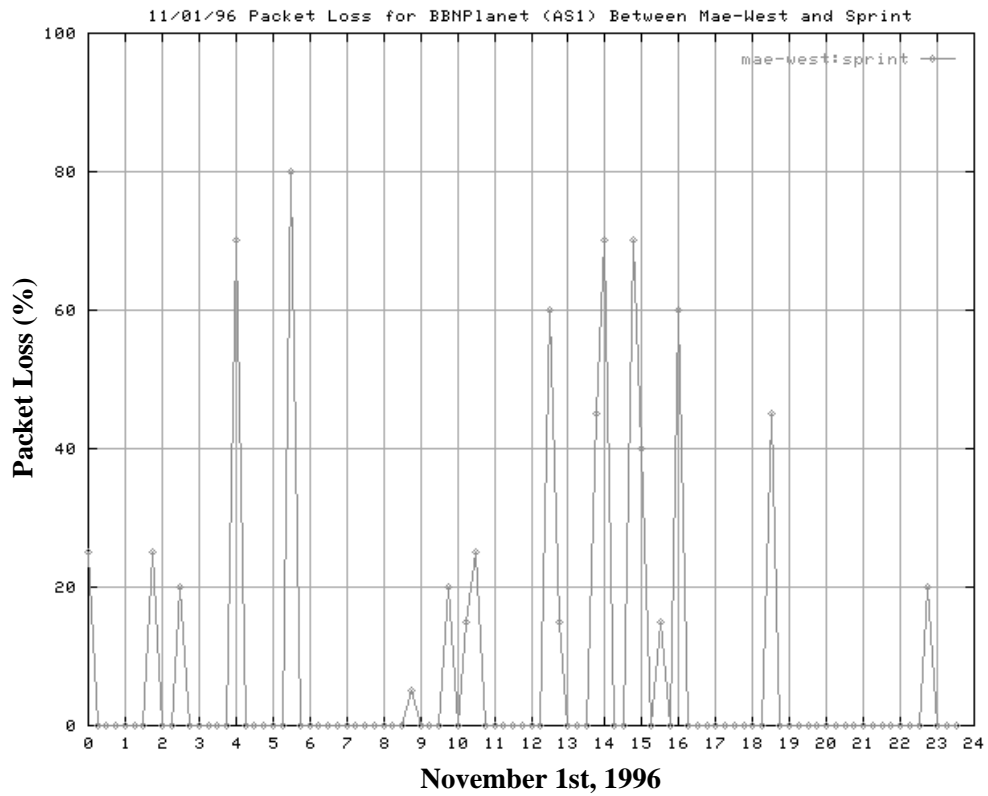


Traffic Inversion

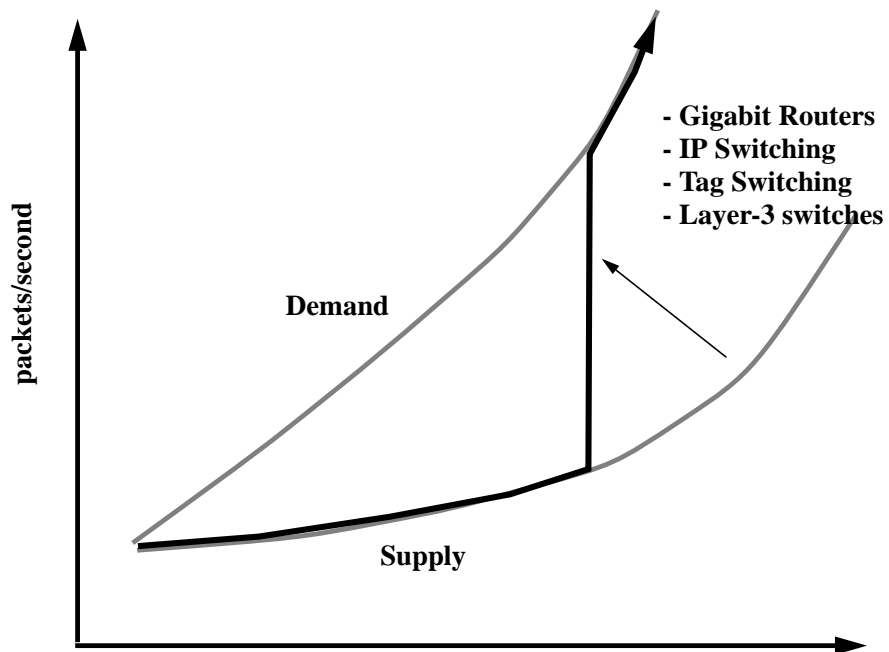
Today



Why is this a problem?



The race is on...



How will Gigabits be used?

To carry heavily aggregated traffic!

How will Gigabit Ethernet be used?

In the corporate environment:

- As a router interconnect.
- To the wiring closet, for very low congestion.
- To the desktop? Opinion: No!

In the core of the Internet

- As a router interconnect (replace Gigaswitch).

*Largely, Gigabit Ethernet is still a
technology looking for a market.*

Gigabit Networks

1. The demand and supply of gigabits



2. The technology:

- Link technology
- Switching and Routing

Link Technology

Right now:

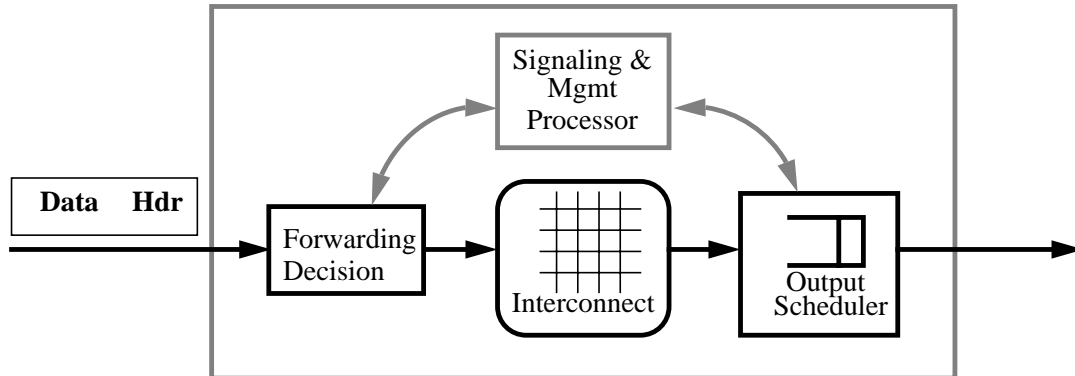
- Multimode tx-rx pair up to 500m: \$250
- Singlemode tx-rx pair up to 3km: \$1,000

The challenge:

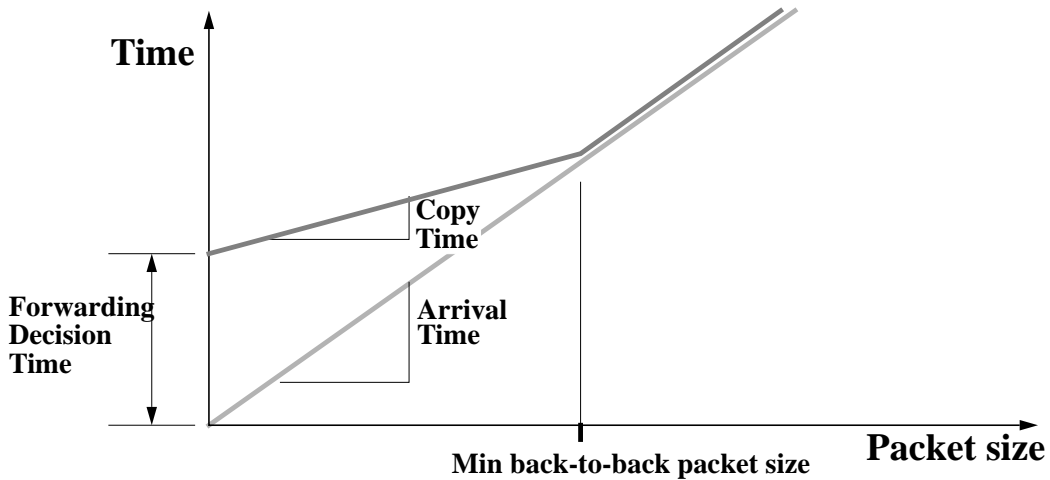
- To reduce port cost to below \$500 will require:
multimode tx-rx pair below \$50

The Architecture of Packet Processors

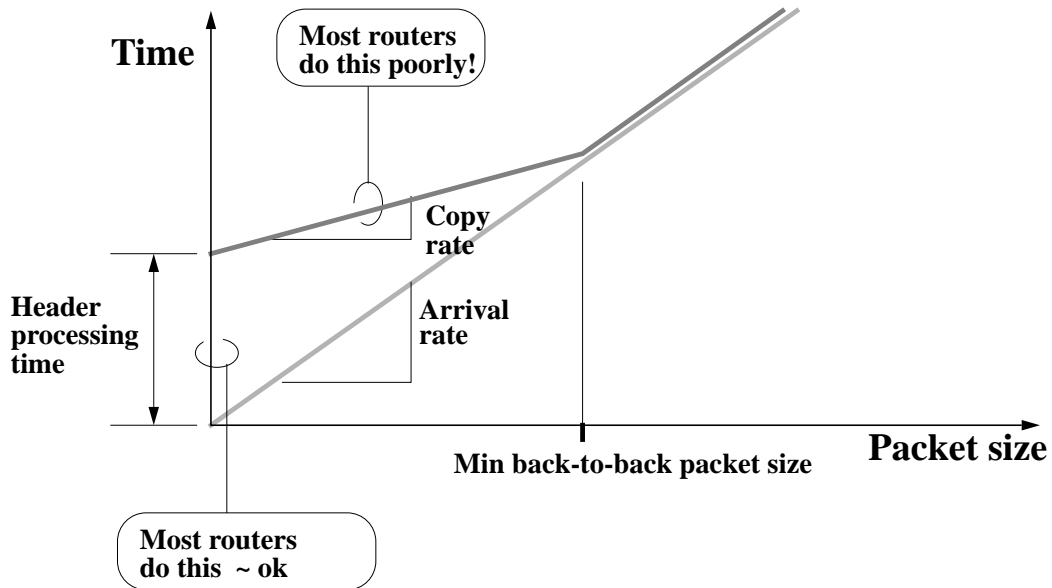
Generic Packet Processor:
(e.g. IP Router, ATM Switch, LAN Switch)



Performance of IP Routers



Performance of IP Routers



Technologies to Accelerate Switches and Routers

1. Accelerating Lookups:
 - Longest Matching Prefixes
 - Label Swapping
 2. Fast Switched Backplanes
-
3. New Memory Architectures
 - DRAM + ASIC
 4. Special purpose “streaming” processors

A Question for our Speakers

Dataquest anticipates a multi-million dollar market for Gigabit Ethernet by the year 2000.

Help us to understand who will buy this technology, and what they will be using it for.