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# Computer Networking

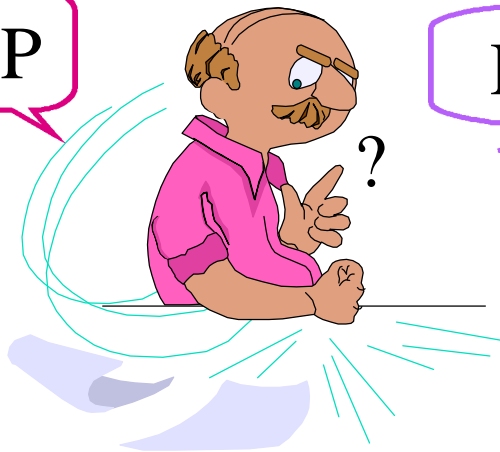
ATM

IP Switching

Gigabit Ethernet

RSVP

Differentiated Services



Raj Jain

Professor of Computer and Information Sciences

The Ohio State University

Columbus, OH 43210-1277

<http://www.cis.ohio-state.edu/~jain/>

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# Stone Age to Networking Age

Microwave ovens, stereo, VCRs, had some effect. But, Stone, iron, ..., automotive, electricity, telephone, jet plane, ..., networks caused fundamental change in our life style

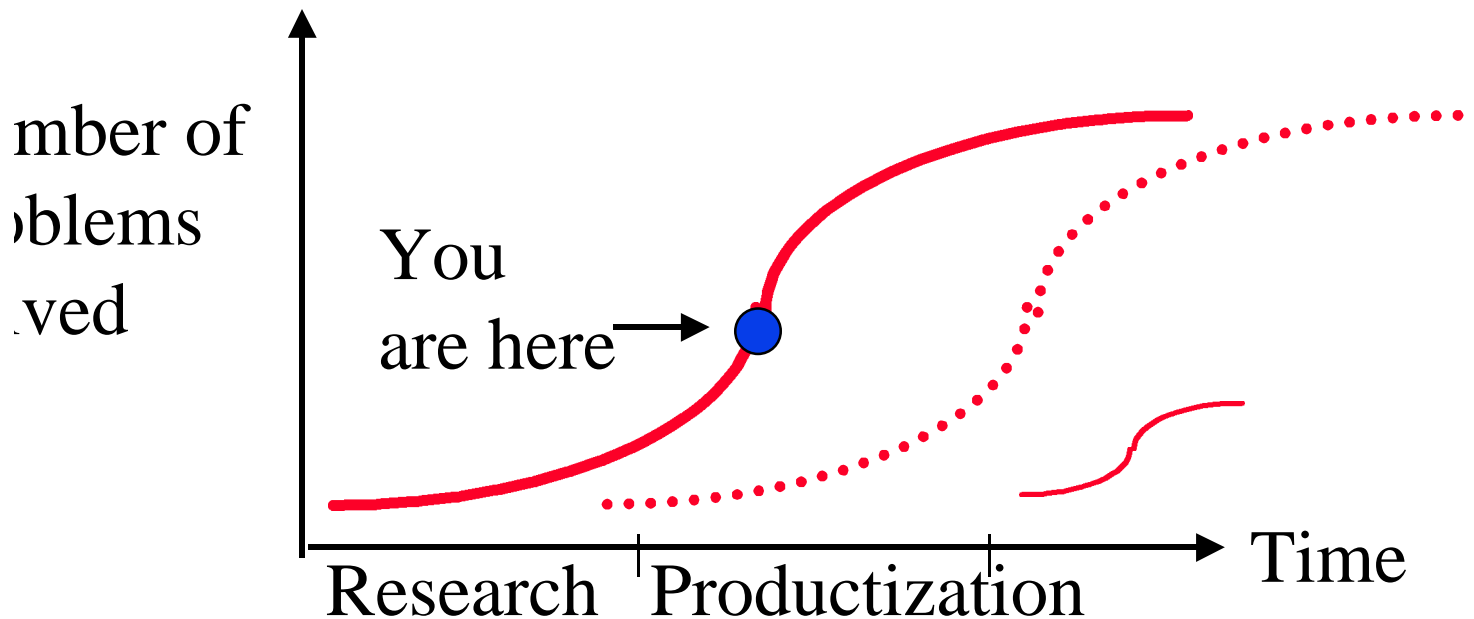
In 1994, 9% of households with PC had Internet link  
By 1997, 26%. Soon 98% ... like TV and telephone

URL is more important than a company's phone number. (54 URLs in first 20 pages of March '97 Good Housekeeping.)

Email is faster than telegrams

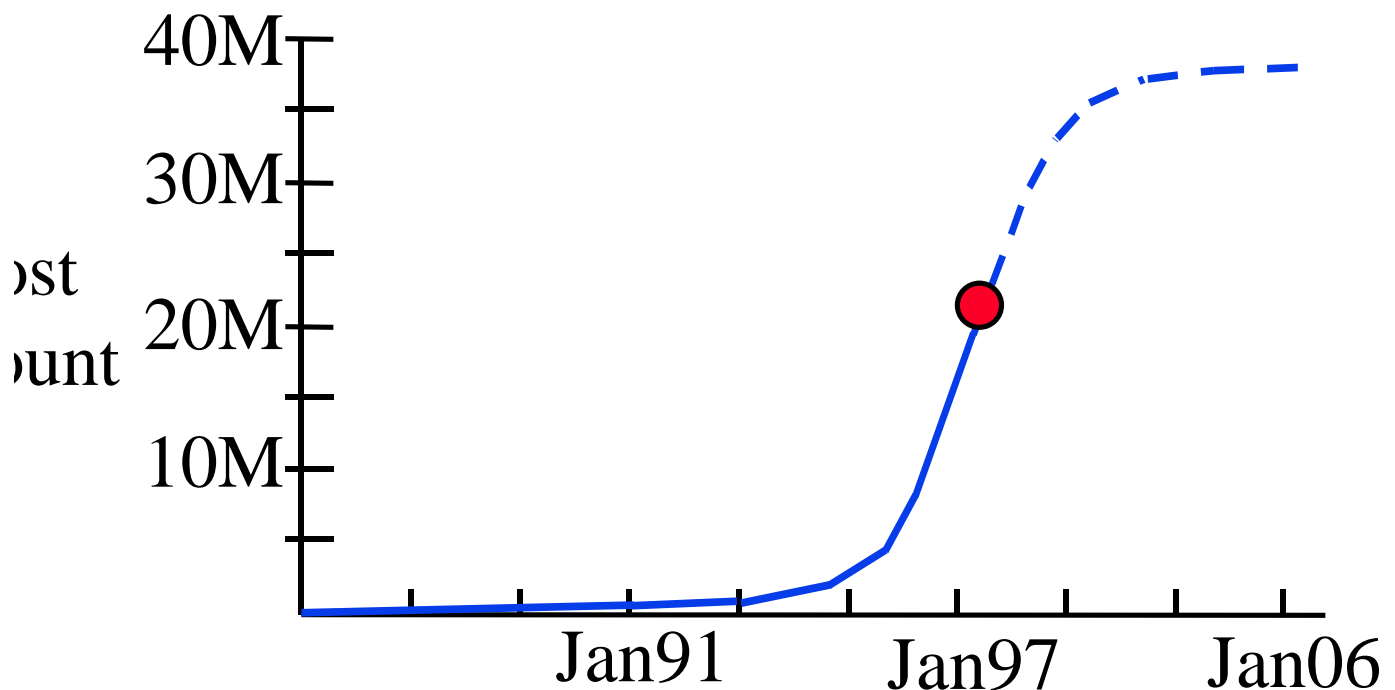
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# Life Cycles of Technologies



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# Internet Technology



**New Challenges:** Exponential growth in number of users. Exponential growth in bandwidth per user. Traffic management, Security, Usability, ...



Review of Networking: Ethernet, Bridging  
Datalink Control: Flow/Error control, HDLC, PPP  
P: Addressing, forwarding, fragmentation  
Address Resolution Protocol  
P Next Generation  
CMP  
TCP & UDP  
Domain Name System

io State University

Raj .

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# Overview (Cont)

Network Management: SNMP, MIB

Network Security: Firewalls

Mobile IP

Routing Algorithms: Dykstra and Bellman Ford

Route Discovery Protocols : RIP, OSPF, BGP

Multicasting: RPF, DVMR

ATM, Frame Relay

Multiprotocol Label Switching

Multimedia over IP: RSVP, Integrated/differentiated services

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# Day 1: Schedule (Tentative)

8:30-9:00	Course Introduction
9:30-10:15	Review of Networking: Ethernet
10:15-10:30	<i>Coffee Break</i>
10:15-12:00	Datalink Control:HDLC+PPP
12:00-1:00	<i>Lunch Break</i>
1:00-2:30	Internet Protocol (IP) + ARP
2:30-2:45	<i>Coffee Break</i>
2:45-4:30	IP Next Generation

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# Day 2: Schedule (Tentative)

8:30-9:00	ICMP
9:00-10:15	TCP and UDP
10:15-10:30	<i>Coffee Break</i>
10:15-12:00	Domain Name System
12:00-1:00	<i>Lunch Break</i>
1:00-2:30	Network Management: SNMP, MIB
2:30-2:45	<i>Coffee Break</i>
2:45-4:00	Network Security
4:00-4:30	Mobile IP

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# Day 3: Schedule (Tentative)

8:30-9:30	Route Determination Algorithms
9:30-10:15	Route Discovery Protocols
10:15-10:30	<i>Coffee Break</i>
10:30-11:00	Route Discovery Protocols (Cont)
11:00-12:00	IP Multicast
12:00-1:00	<i>Lunch Break</i>
1:00-2:30	ATM Networks + Frame Relay
2:30-2:45	<i>Coffee Break</i>
2:45-3:30	IP Switching + MPLS
3:30-4:00	Multimedia over IP: RSVP, Diffser
4:00-4:30	Final Review

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# Pre-Test

Check if you know the difference between:

CSMA/CD and Aloha

Bit stuffing and Byte Stuffing

Stop-and-Wait and Window flow control

Go-back-N and Selective Reject

MTU and MSS

Link-local and Site-local addresses

Dot-decimal vs hex-colon notation

Slow start and Fast retransmit and Recovery

Port and Sockets

Autonomous System and Area

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# Pretest (Cont)

Home agent and Foreign agent

Proxy server and Firewall

SNMP and RMON

Distance vector vs Link State

Dijkstra vs Bellman-Ford

Reverse path forwarding and core-based trees

PIM dense mode and PIM Sparse Mode

AAL5 and AAL2

Committed Information Rate and Access Rate

Integrated services and differentiated services

Number of items checked \_\_\_\_\_

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## Pre-Test (Cont)

If you checked more than 10 items,  
you may not gain much from this course.

If you checked only a few or none, don't worry. This  
course will cover all this and much more.

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# Disclaimers

This course covers a lot of topics

These topics are normally taught in 3 quarter-course

Fundamental and basics will be covered

You will need to read RFC's for detailed info

This course has been designed specifically for you.

Please feel free to ask questions, make comments, agree or disagree.

More discussion  $\Rightarrow$  More relevant topics