CS 4/55231
Internet Engineering

Kent State University
Dept. of Computer Science

LECT-1

A Course on Internet and

World Wide Web

Today's Topic

Unit background and administrivia

Introduction to Internetworking

General Course Information

This course will not teach you how to write HTML or Java code.   Nor will make you a Web Master!

In this course you will learn
- the design principles,
- architecture,
- protocols and algorithms
behind the components of the complex system which is known as **Internet.**


- Javed I. Khan
  - Email: javed@kent.edu
  - Phone: 672-9038
  - Office Hours: **TR 2:30 -- 4:30 p.m.**

- Web Page: **http://www.cs.kent.edu/~javed/class-IN04S/**
- Books:
  - Computer Networks & Internet, Comer, D. E., Prentice Hall, ISBN 0-13-083617-6
  - Web Server Technology, Nancy Yeager & McGarth, Morgan Kaufmann, 1996, ISBN 1-55860-376-X
  - Web Protocols & Practices, Krishnamurty & Rexford, Addison Wesley, ISBN-0-201-71088-9

Class Mechanics

- TO: JAVED@kent.edu

- SUBJECT: "IN2004S"
  - Always need to send email with subject-field set to "IN2004S" to obtain reply.

- Use Computer/Email as much as possible:
  - Reports preferably in Computer.

What is Expected Out of You?

- At least 12 hours per week (to pass)

- Learning by doing
- questions and exercises
- reading textbook & materials
- asking questions
- taking part in discussions

- Read/Listen Think Do Ask

Grading

Test Type	Frequency	Weight
Borwser Server Project	2	20%
End Term Exam	1	20%
Mid Term Exam	1	20%
Take Home Assignments	3	20%
Router Project	1	10%
Unannounced Quiz	2-5	10%

What is Internet?

A World Wide Network of Millions of Computers

Internet = Network of Computer Networks

The Internet is a global network of networks enabling computers of all kinds to directly and transparently communicate and share services throughout much of the world. Because the Internet is an enormously valuable, enabling capability for so many people and organizations, it also constitutes a shared global resource of information, knowledge, and means of collaboration, and cooperation among countless diverse communities.

-Internet Society
June 1998

The Internet is more important in what it enables than what it is; more phenomenon than fact. Yes, the Internet is networks, software, computers and other technologies; but more so, it is a catalyst of change, a new mass medium, a culture, a mind warp, new things never before imagined.

-J. Neil Weintraut
Wall Street Technologist

LECT-1, S-13
IN2004S, javed@kent.edu
Javed I. Khan@2004

Structure of Internet

<u>Click Here</u>

INTERNET
ENGINEERING

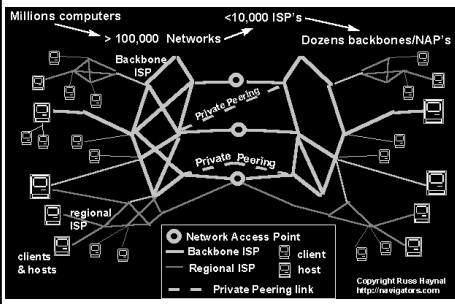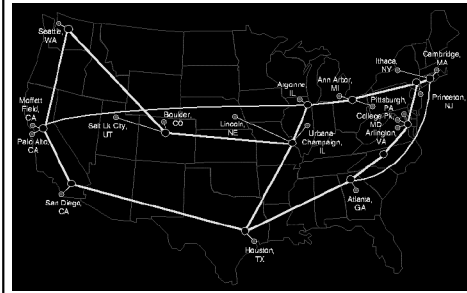LECT-1, S-14
IN2004S, javed@kent.edu
Javed I. Khan@2004

Physical Network

Millions computers
<10,000 ISP's
> 100,000 Networks
Dozens backbones/NAP's
Backbone ISP
Private Peering
Private Peering
regional ISP
clients & hosts

○ Network Access Point
— Backbone ISP
— Regional ISP
– – Private Peering link
client
host

Copyright Russ Haynal
http://navigators.com

INTERNET
ENGINEERING

LECT-1, S-15
IN2004S, javed@kent.edu
Javed I. Khan@2004

The Wide Area Network that formed the backbone of the Internet before 1992. Funding came from NSF, IBM, MCI, and MERIT
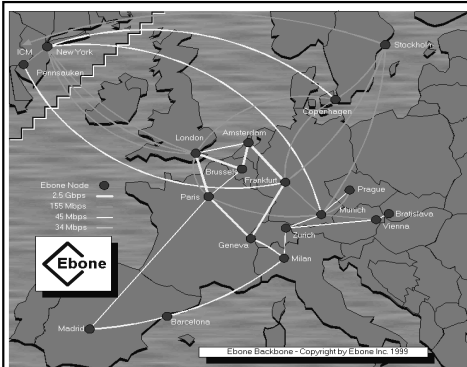
INTERNET
ENGINEERING

LECT-1, S-16
IN2004S, javed@kent.edu
Javed I. Khan@2004

THE INTERNET

MAJOR U.S. PEER INTERCONNECT POINTS

INTERNET
ENGINEERING

LECT-1, S-17
IN2004S, javed@kent.edu
Javed I. Khan@2004

European Backbone: EBONE MAP Nov, 1999

Ebone Backbone – Copyright by Ebone Inc. 1999
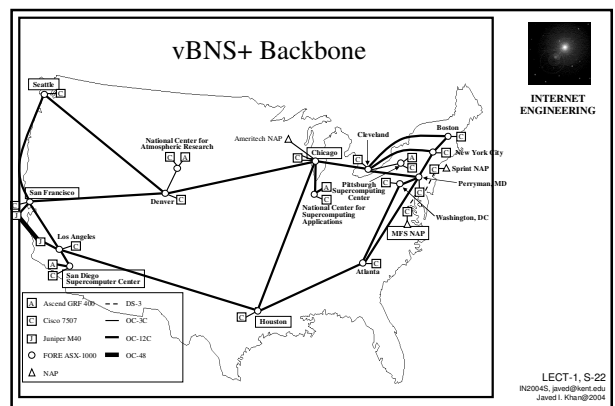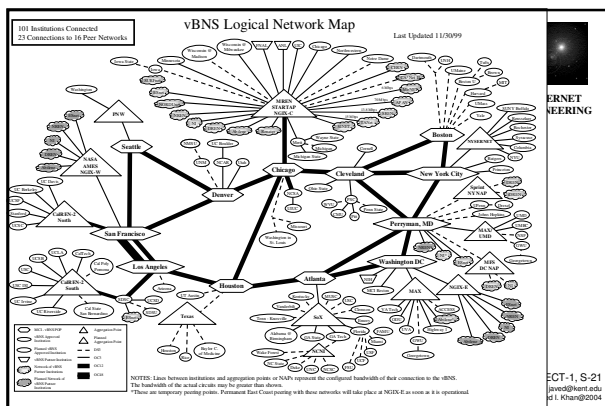
INTERNET
ENGINEERING

LECT-1, S-18
IN2004S, javed@kent.edu
Javed I. Khan@2004
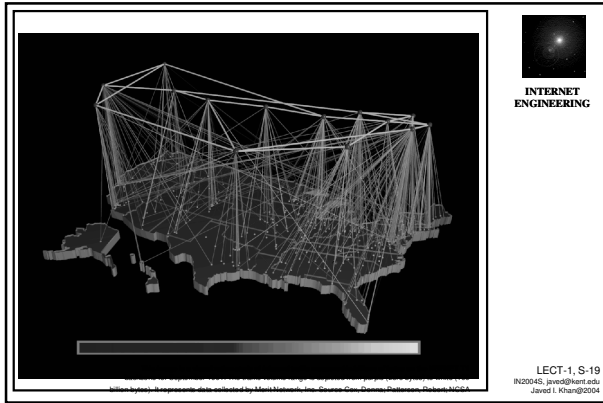
Next Generation Internet….

- A network always "one step ahead"
  - HPCC in1993
  - vBNS lunched in 1995.

---

vBNS Logical Network Map

---

vBNS+ Backbone

Next Generation Internet (cont..)

- A network always "one step ahead"
  - HPCC in1993
  - vBNS lunched in 1995.
  - Internet-2 Abilene
  - vBNS+
  - Grid

Demonstration
Route Tracing

vBNS Features

- Low latency (average coast to coast less than 100 ms)
- High throughput (over 490 Mbps of payload)
- Stable (99.95% or greater service availability)
- Uncongested (average utilization less than 50%)
- 622 Mbps 14,000+ route mile backbone network

- Today, the vBNS connects:
  - five supercomputing centers
  - about 100 universities
  - peers about 11 other Networks.

INTERNET ENGINEERING

LECT-1, S-25
IN2004S, javed@kent.edu
Javed I. Khan@2004

Reminder….

- "JAVED@kent.edu".

- Don't forget to send email by tonight.
- Subject must have "IN2004S".

INTERNET ENGINEERING

LECT-1, S-26
IN2004S, javed@kent.edu
Javed I. Khan@2004

Next Class

Map of Cyberspace
Who Manages Internet?

27