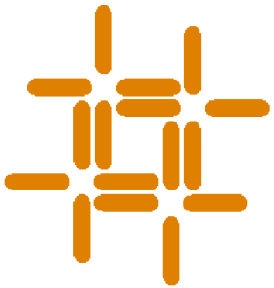
State of the Internet

Internet Society

Reston VA USA

June 1994



Tony Rutkowski,
Executive Director
<amr@isoc.org>

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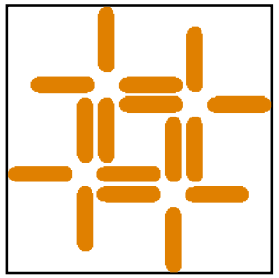
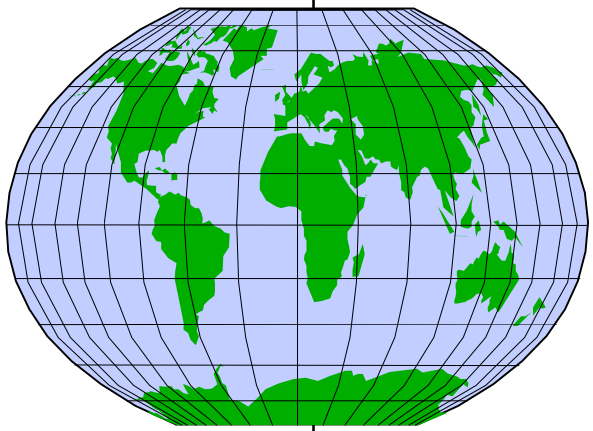
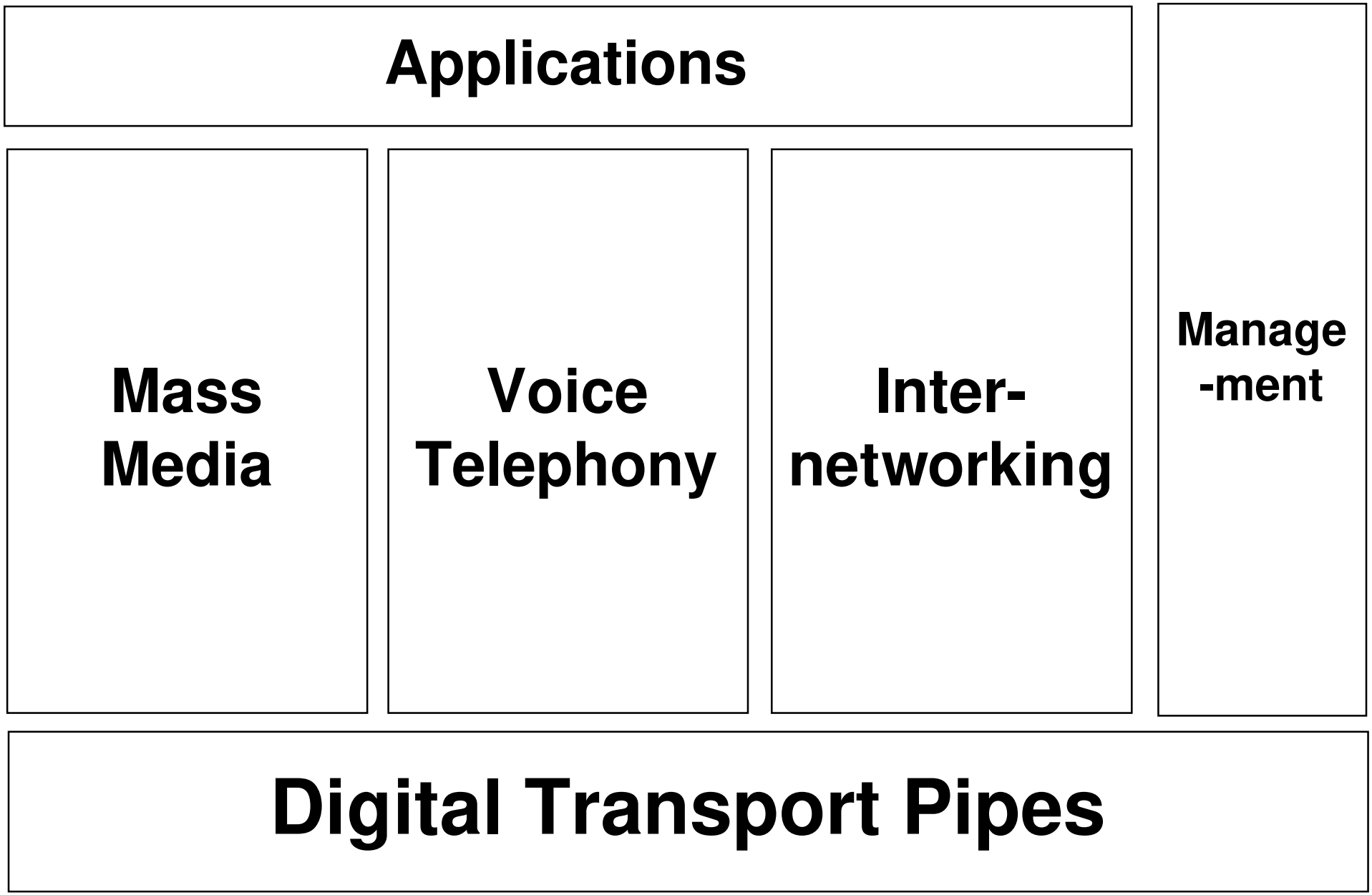
What is the Internet Society ?

- The global international organization for open systems internetworking and the *Internet*
- A common mechanism for:
  - standards making
  - operational administration and coordination
  - research coordination and education
  - global cooperation among national, regional, and other international bodies
- An international means for sharing information and encouraging development of internet-related infrastructure and use around the world
- Members consists of individuals and organizations - commercial, governmental, and non-profit
- Contact <isoc@isoc.org>
  tel: +1 703 648 9888





The Electronic Networking Universe



Internetworking : terms of art

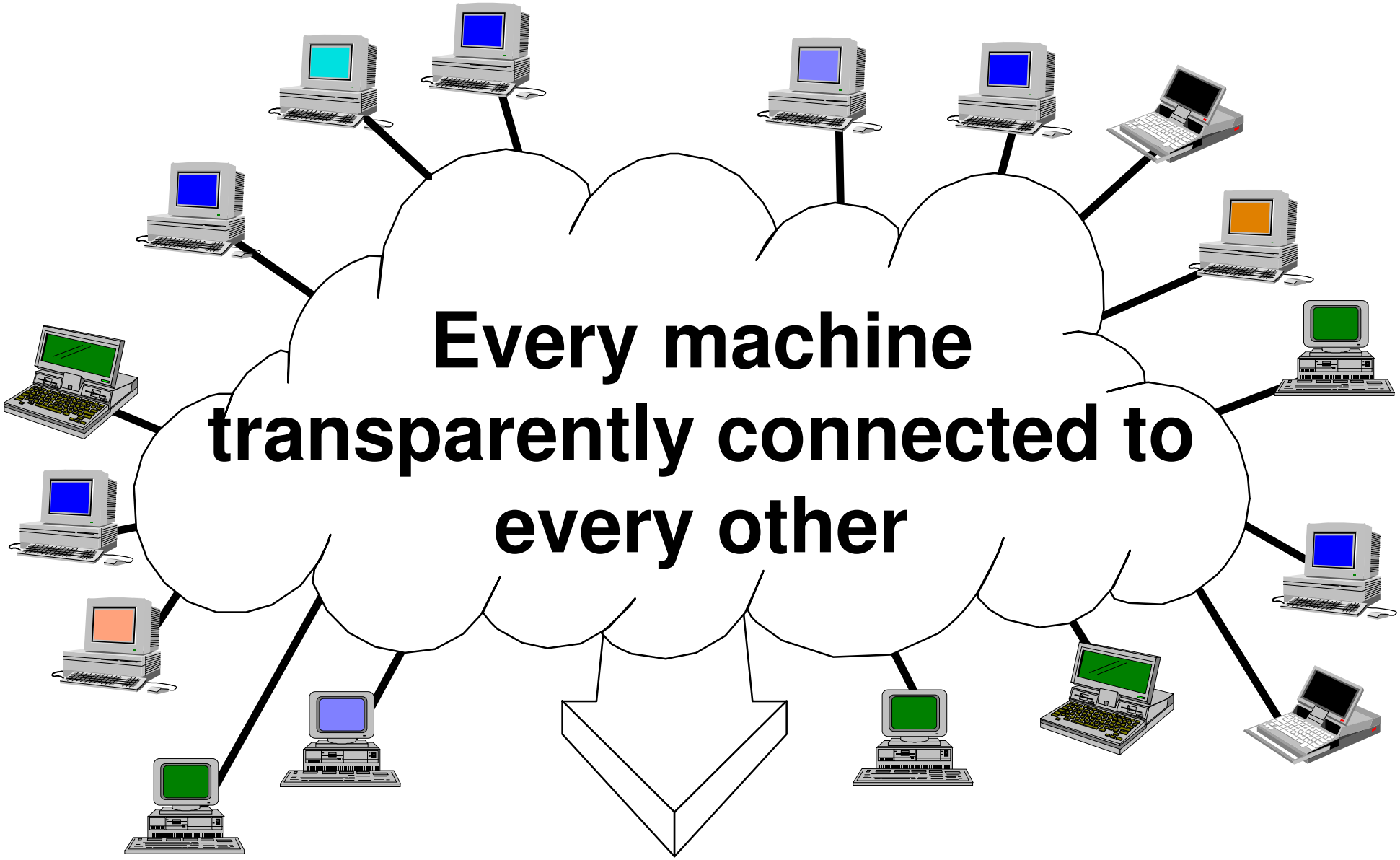
- **An Internet: A network of networks of computer hosts able to seamlessly communicate - usually through the Internet Protocol (IP) and services**

Enterprise Internet:
An Internet within an organization

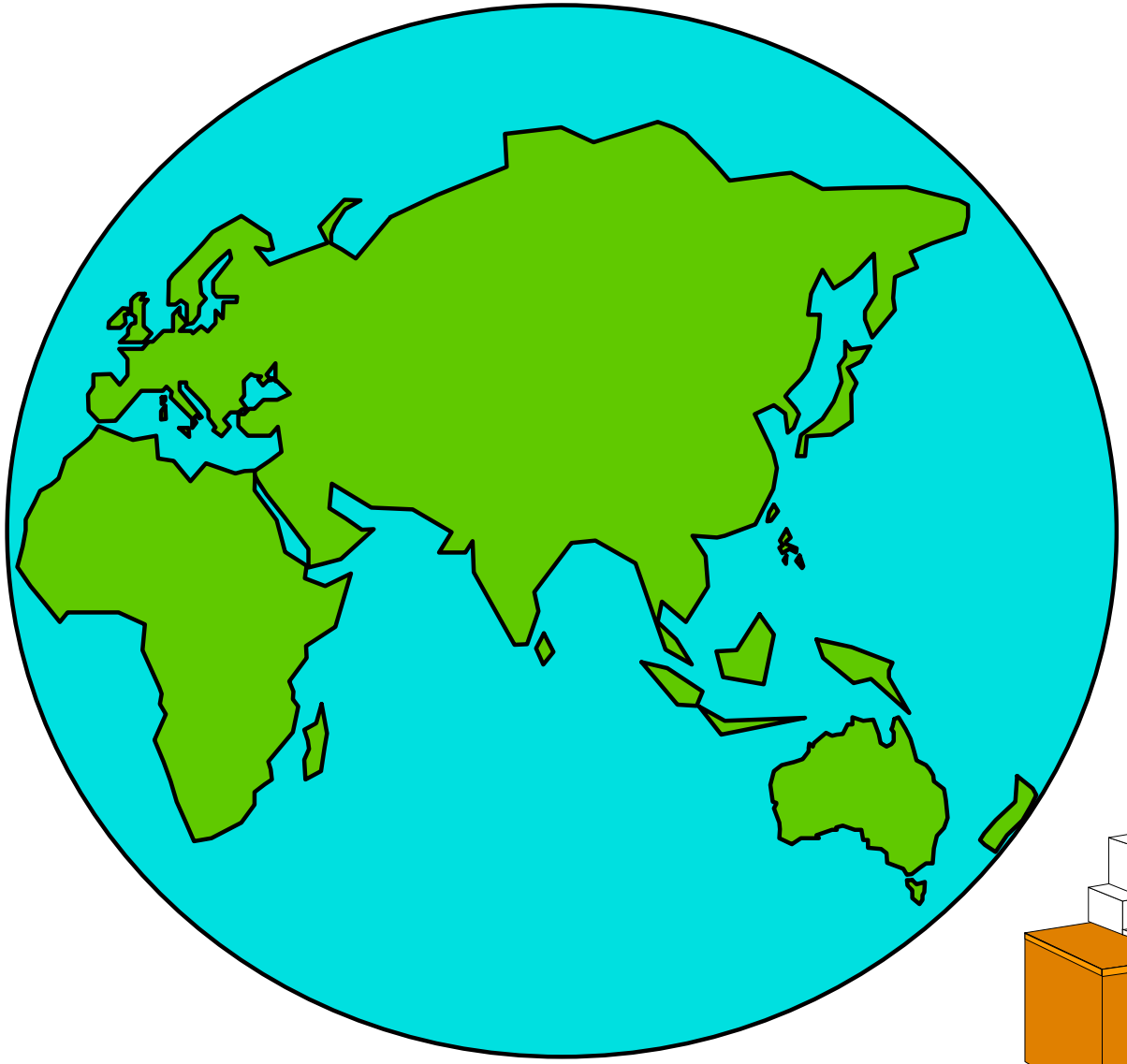
Public Data Internet:
Internet services made available to the public

The Internet:
More than 35,000 Internets connected together

The Enterprise Internet



Internet: Directly Reaching 2,217,000 Computers



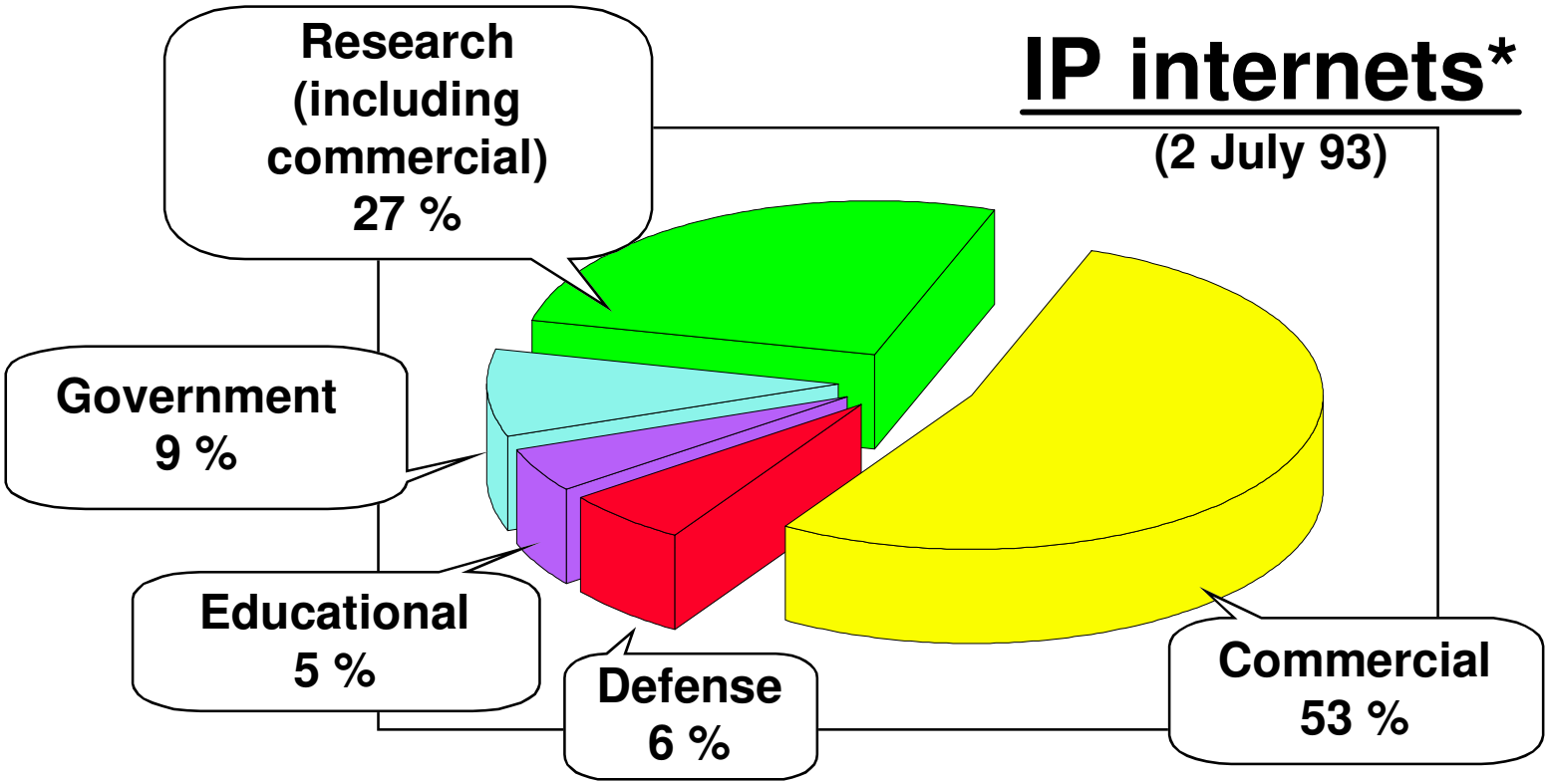
Courtesy of M. Isaacs, University of Newcastle Upon Tyne

Current Dynamics

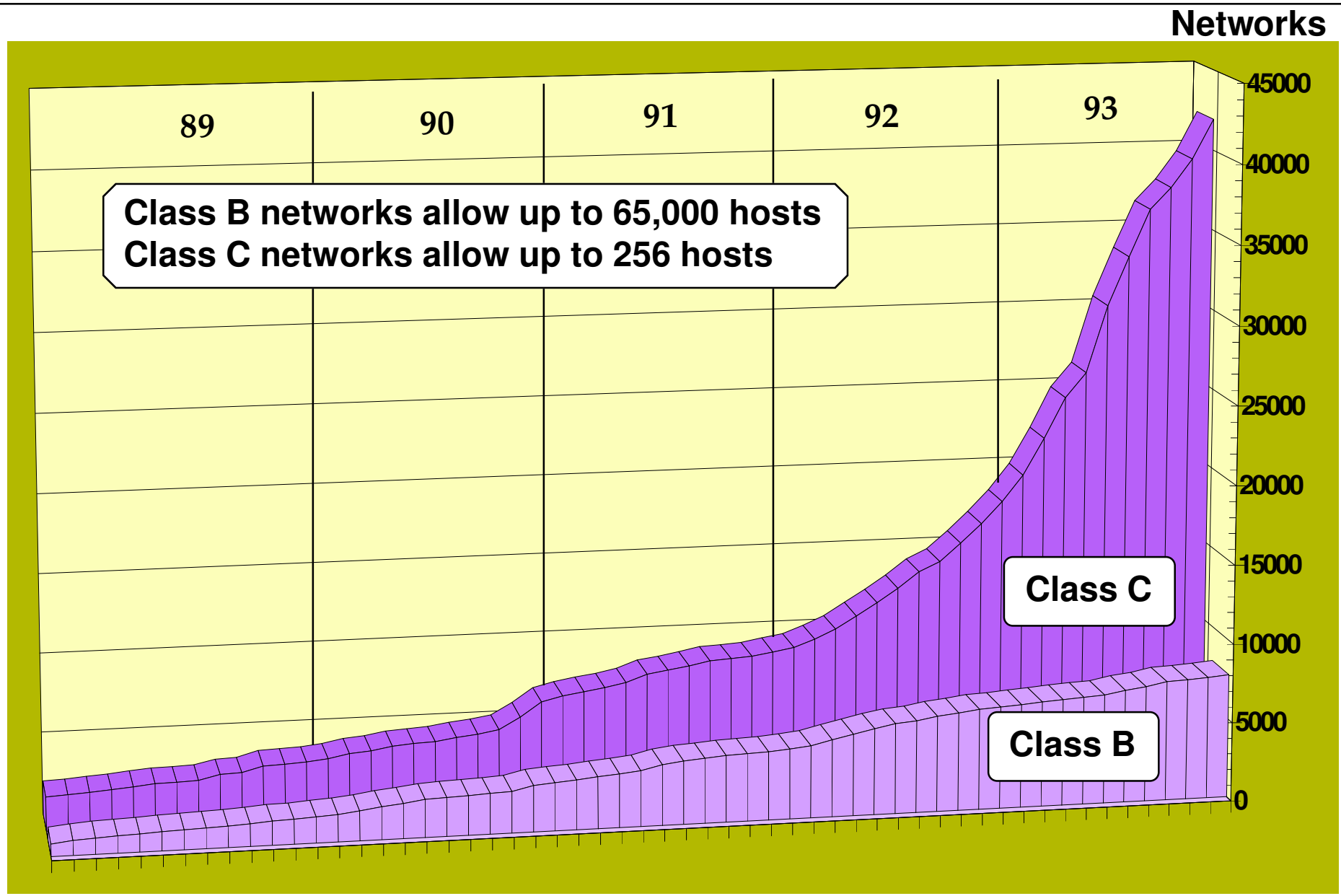
Internets - Current Dynamics

IP internets

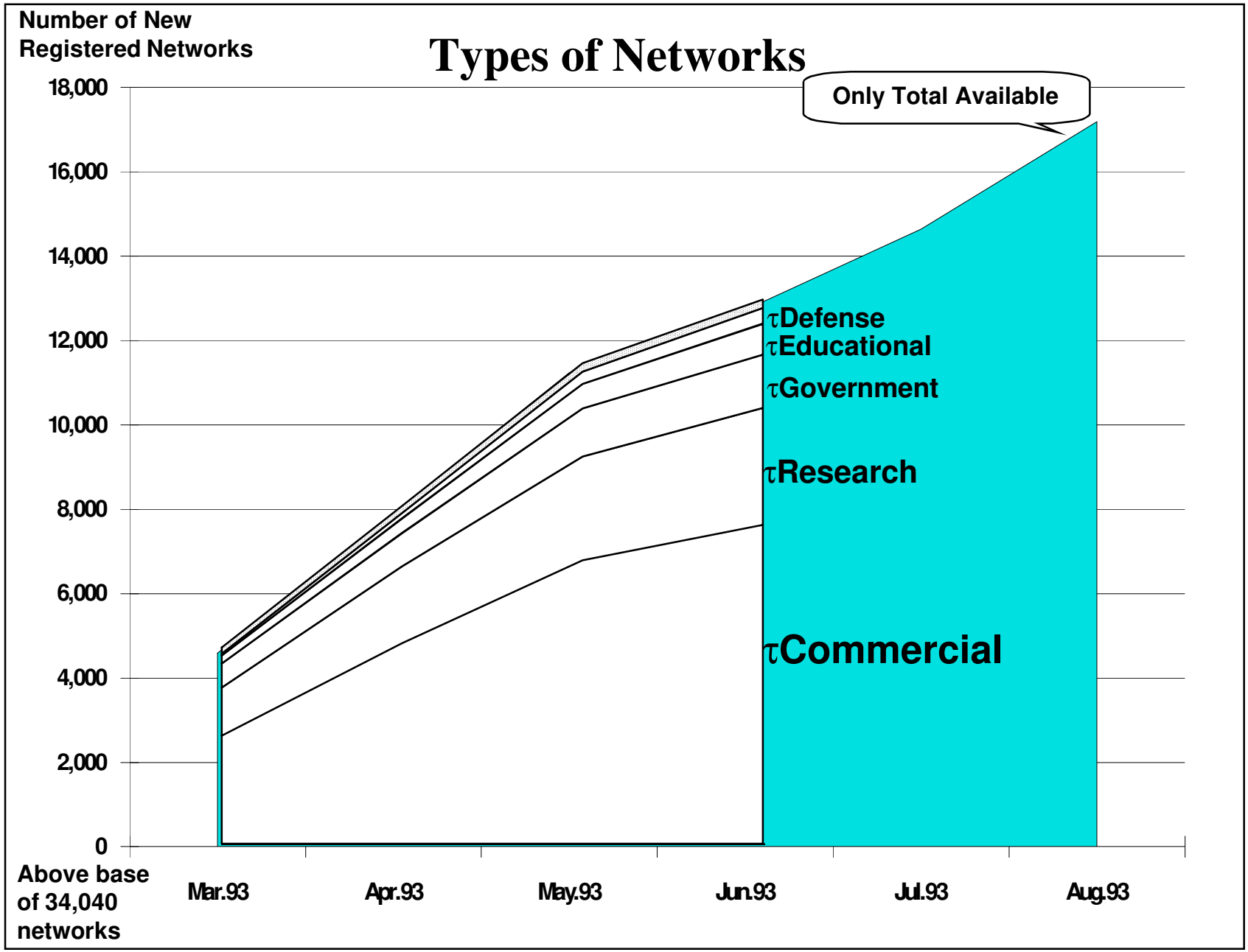
- 57,366 NIC registered (14 Feb 94)
- 92 countries (Sep 93)
- growing at 12 % / month



Growth of Registered IP Networks



Growth in New IP Networks 2Q93-3Q93



The Internet : what is it?

- **General definition: A vast global open information metanetwork (a network of networks) of computer hosts**
- **Narrow definition (IP Internet): a set of at least 35,000 of the 60,000+ registered internetworks which are capable of routing Internet Protocol packets among themselves**
- **Broad definition: the IP Internet plus all connected networks capable of routing traffic to a destination device or process**

The means by which all the world's computers are able to communicate with each other

The number of networks passing traffic via the major backbones

Includes application level gateways (e.g., e-mail), store and forward networks, and networks using non-IP protocols

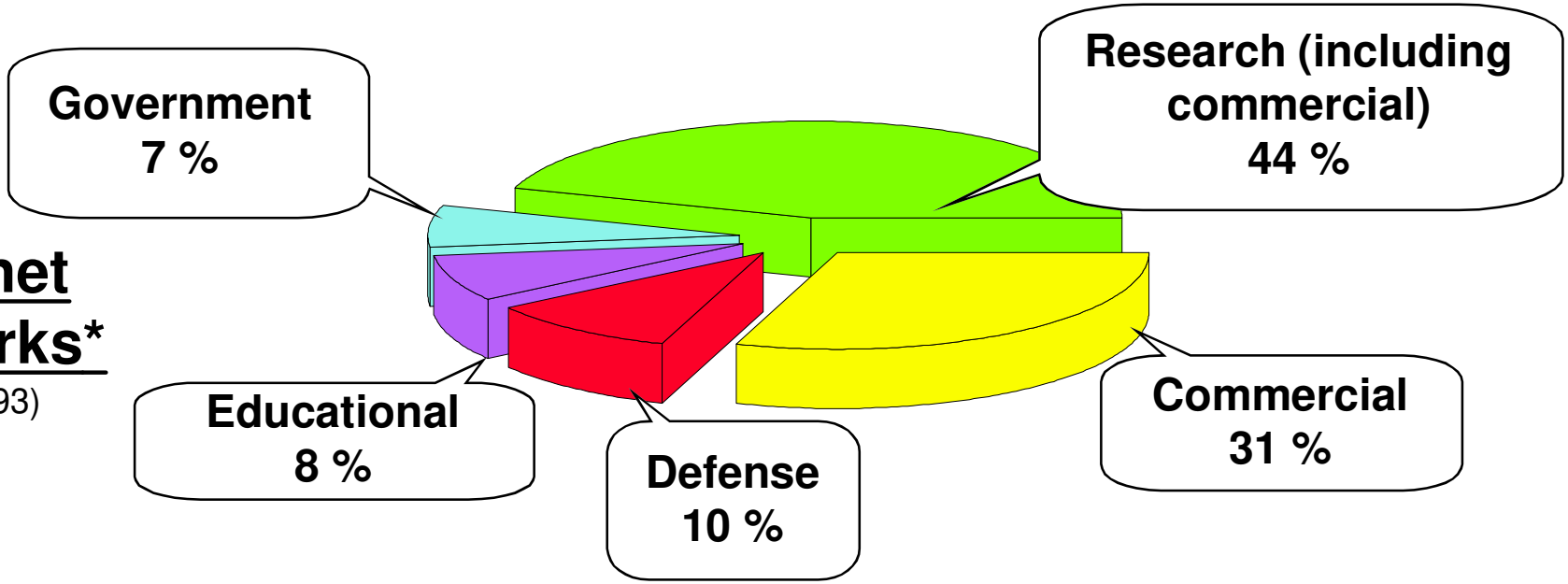
Current Internet Dynamics

Internet

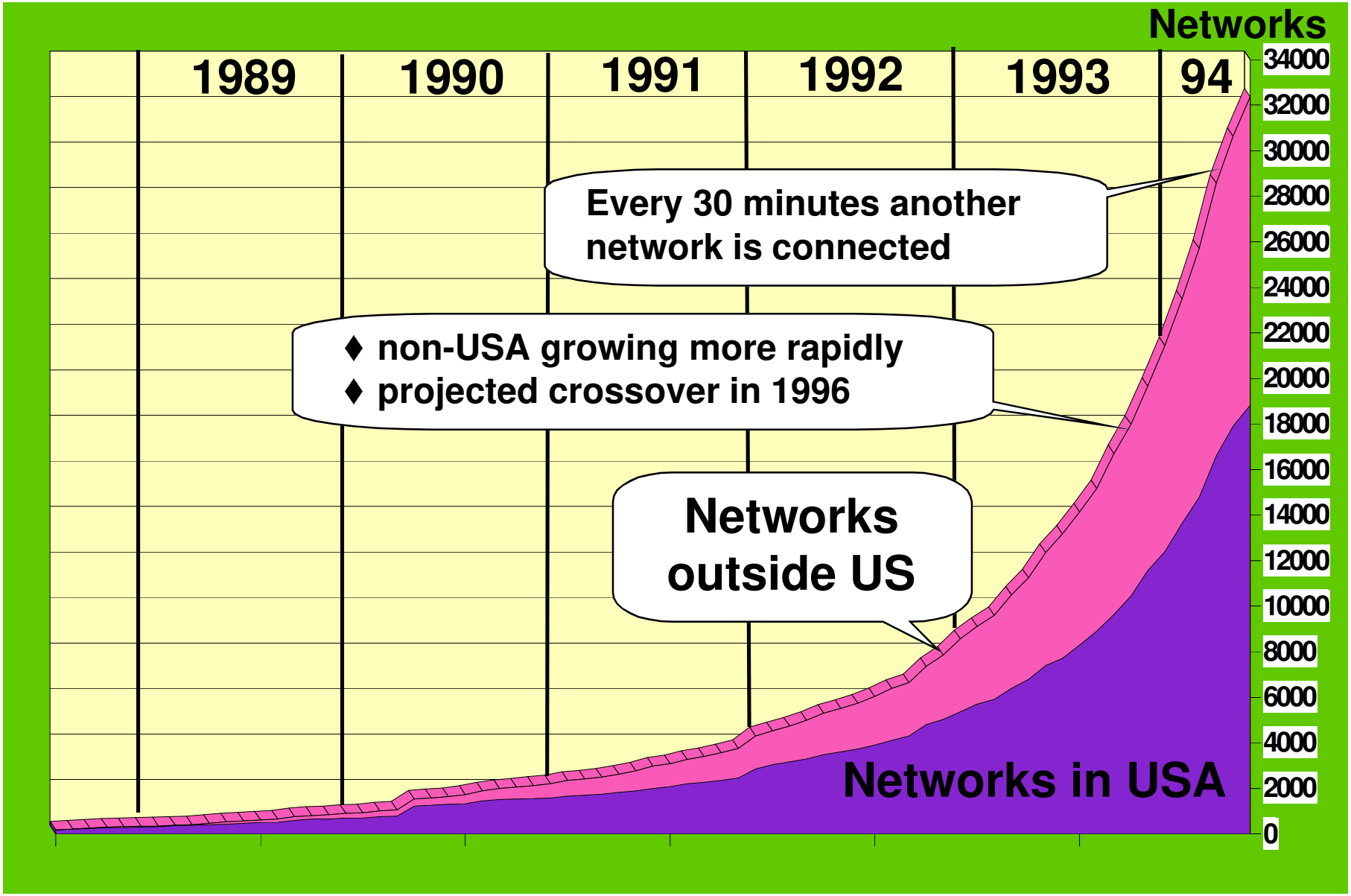
- 33,511 (NSFNet 17 Jun 94) plus 10 % ? connected IP internets seen at other backbones
- 81 (74 verified) connected IP countries (1 June 94)
- '93 ave network growth 160 % (183 % non-USA)
- 2.217 million computer hosts; 30,000 domains (Dec 93)
- E-mail and other gateways to 154 countries (Jun 94)

Internet Networks*

(2 July 93)

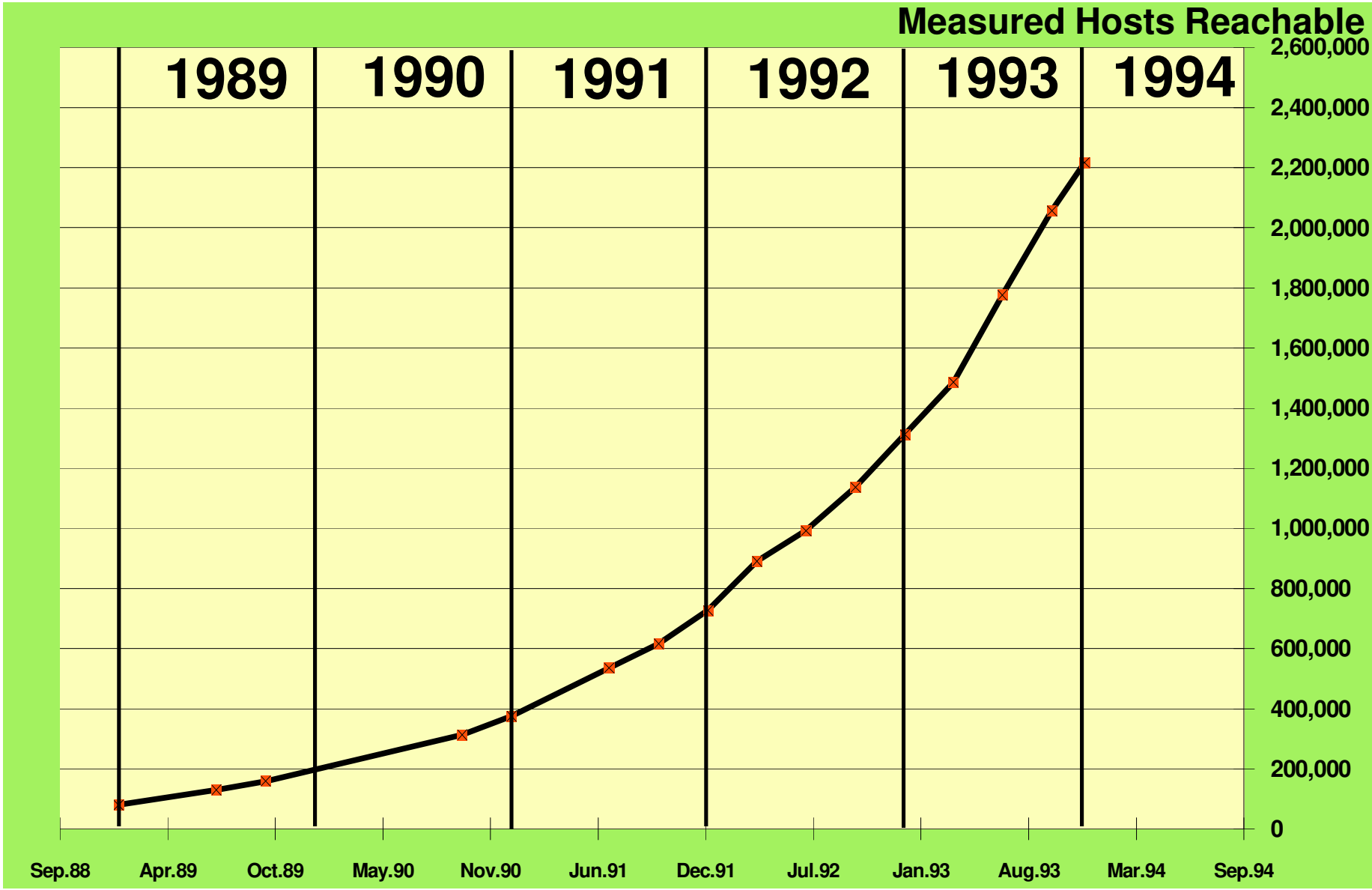


Growth of The Internet

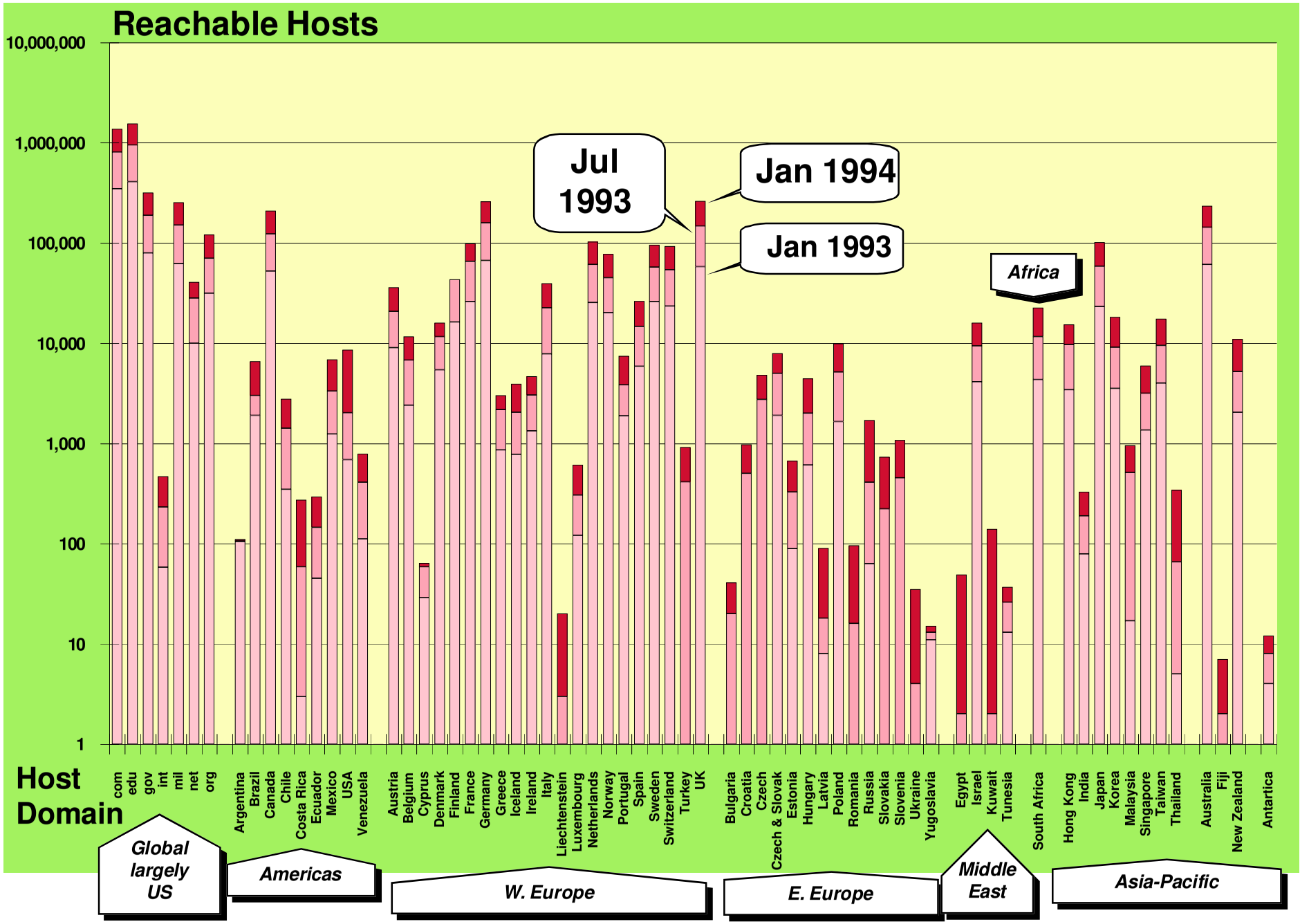


Internet Hosts

Internet Hosts Reachable 1989-1993



Global Growth of Internet Hosts in 1993



Why a Revolution?

Who Uses The Internet ?

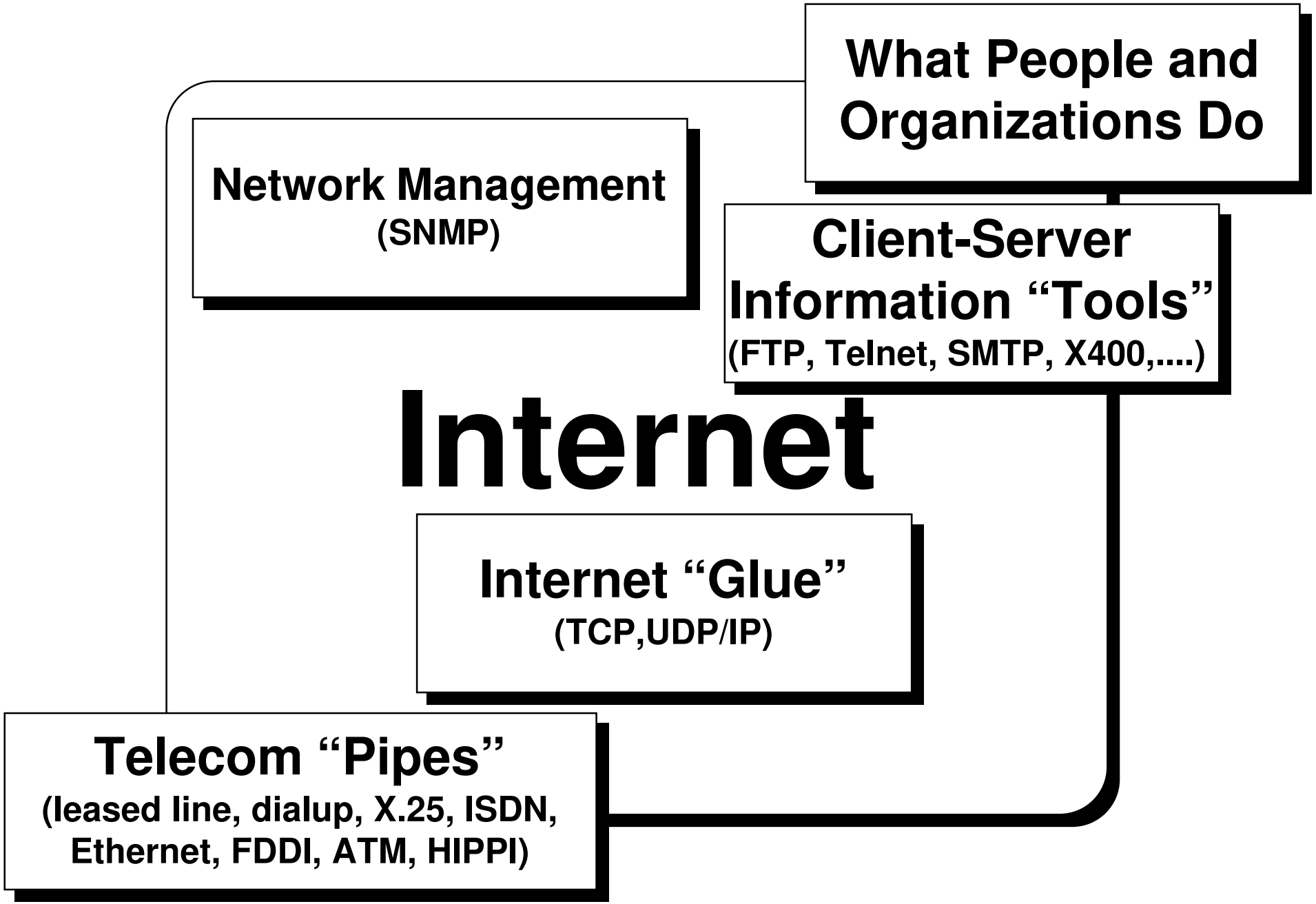
- **Institutions of all kinds - commercial, academic, and government**
  - **to allow their staff to collaborate with peers**
  - **to rapidly coordinate complex, dispersed worldwide activities**
  - **to gather and share information**
  - **by interconnecting their enterprise networks via Internet backbone providers**
- **Professional communities of all kinds - especially research and development organizations**
- **Business enterprises which specialize in providing or collecting information**
- **General public via local access providers and gateways to commercial public e-mail carriers and other kinds of networks**

What Is Driving Internet Growth ?

- TCP/IP protocols & applications with every workstation - now every computer including PCs
- Coincided with enterprise internetworking revolution
- Standards and applications developed by the best standards process in the business
  - Fast
  - User driven and innovative
  - Standards that are proven
  - Rapidly disseminated
- User costs are very low
  - “Sender keep all” accounting
  - Inherently low-cost technology
  - Institutional cost sharing
- Massive global connectivity & professional use
- Ability to directly reach any computer and process
- Very high performance

Internet Services

How does it fit together: an information food chain



Services: Global Information Space

Allow Personal news feeds

Allow Personal browsing

Allow Finding People

Allow Group Interaction

Allow Finding Information

Allow Auto Gathering

Allow Device Monitor/Control

Basic Services

- Transferring files
- Remote Computer Use
- Universal Email
- Fax

Mailing Lists and Bulletin Board Services

- Automated lists
- News Distribution

Interactive Information Delivery Services

- Gopher
- World Wide Web (Mosaic or Cello client)
- WAIS
- Veronica

Directory Services

- WHOIS
- Netfind
- CSO
- X.500
- Whois +++

Interactive Multiuser Services

- Collage, Talk, IRC, MUD, MOO, MUSH, MUCK

Indexing Services

- Archie
- online library catalogu

Active Agents

- Knowbots

Network Management

- SNMP
- SNMP2

Emerging: *Mercantilism, Multimedia & Ubiquity*

Allow exchange of commercial business records

Allow property transactions

Allow multimedia, collaboration, entertainment and broadcasting

Allow universal access

Commercial Electronic Data Services

- Bellcore Mercantilism Project
- Educational EDI initiative
- MCC EINet initiative

Applyied Encryption Technology Services

- Signature verification
- "Digicash"
- Copyright protection
- Privacy enhancement

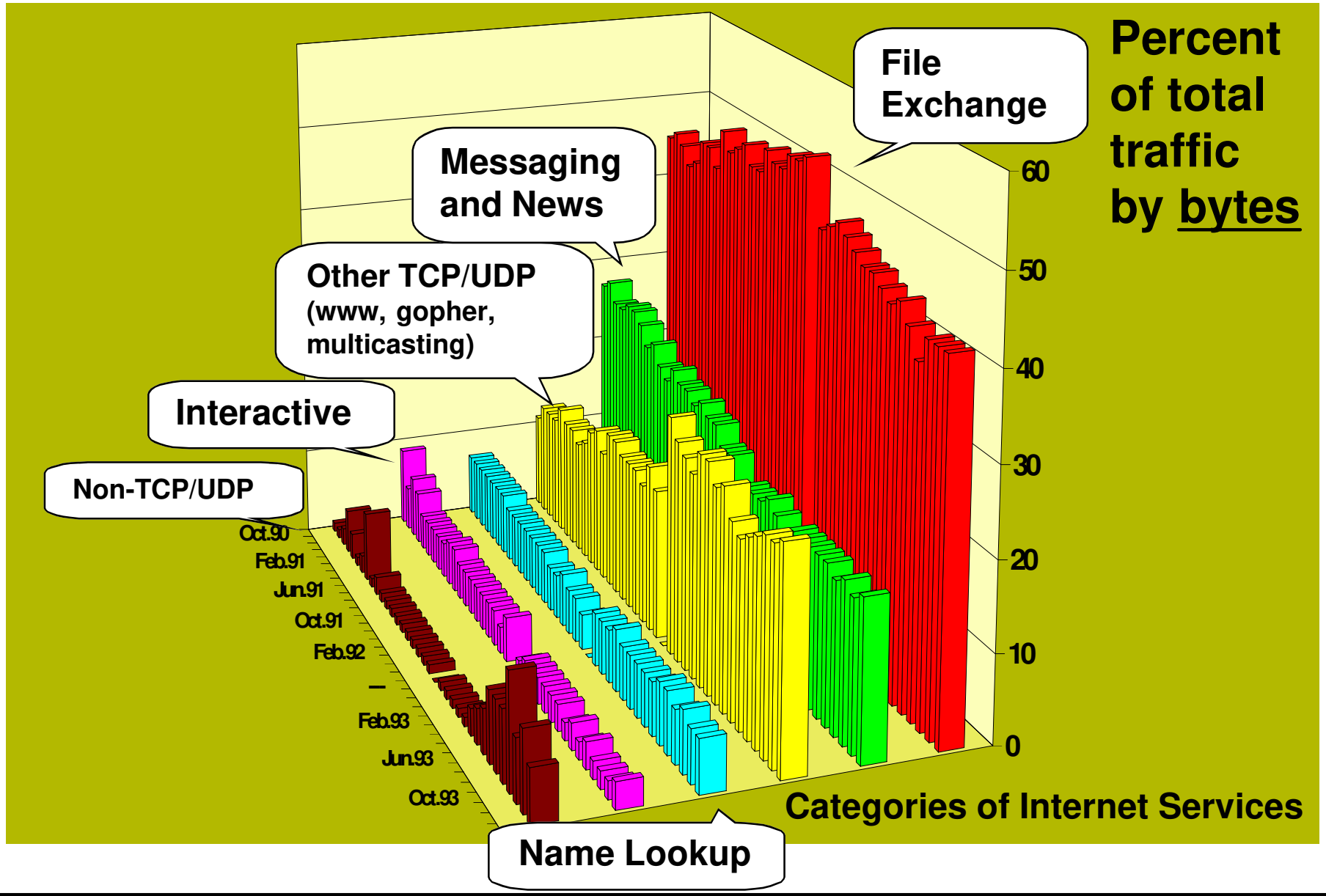
Multimedia and Video Services

- MIME
- CU-See Me
- Mbone, Multicasting

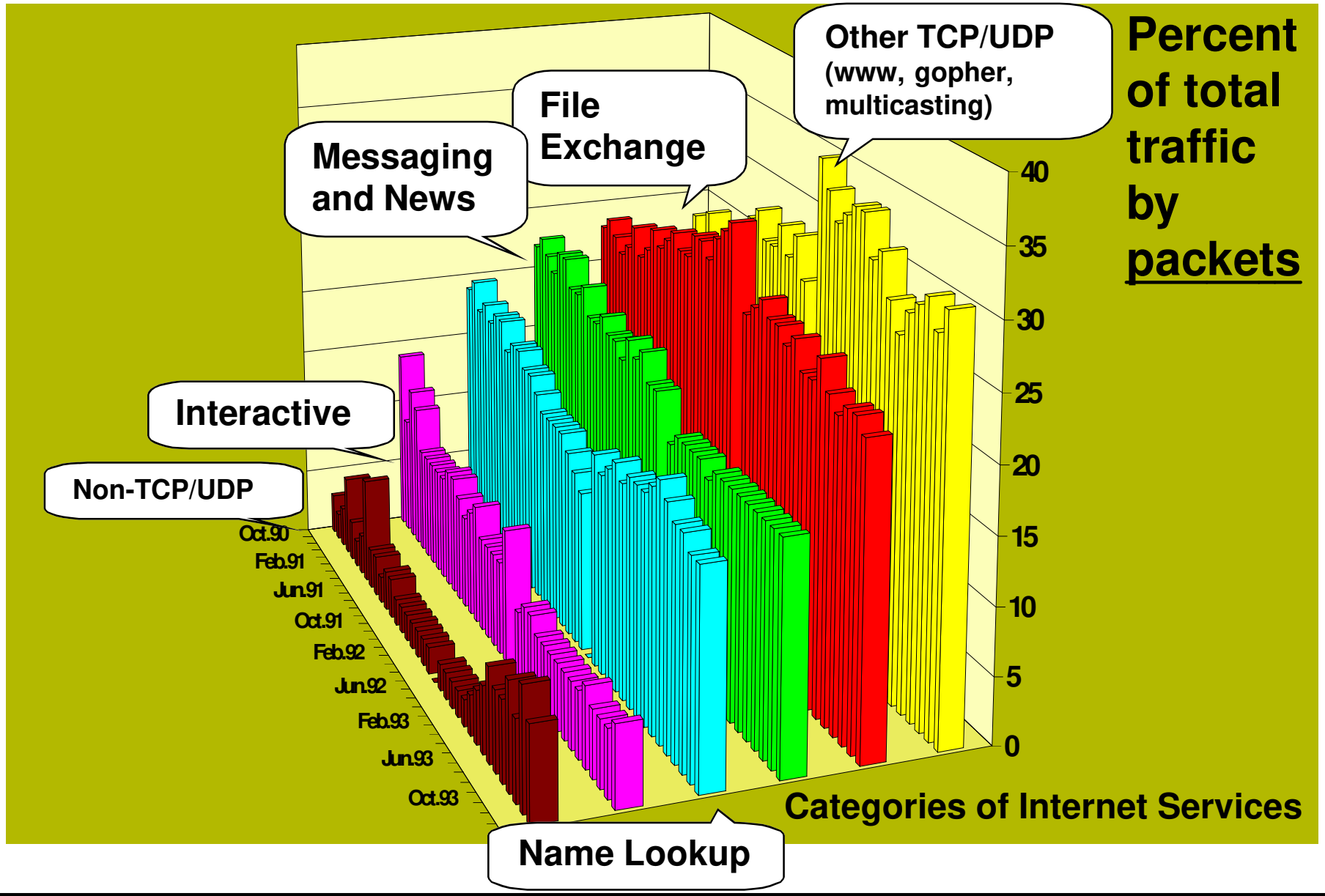
Ubiquitous Connectivity & User Friendliness

- Mobile
- Dialup
- Internet in a box
- CATV
- VSAT
- Object orientation

NSFNet Backbone Network History of Services

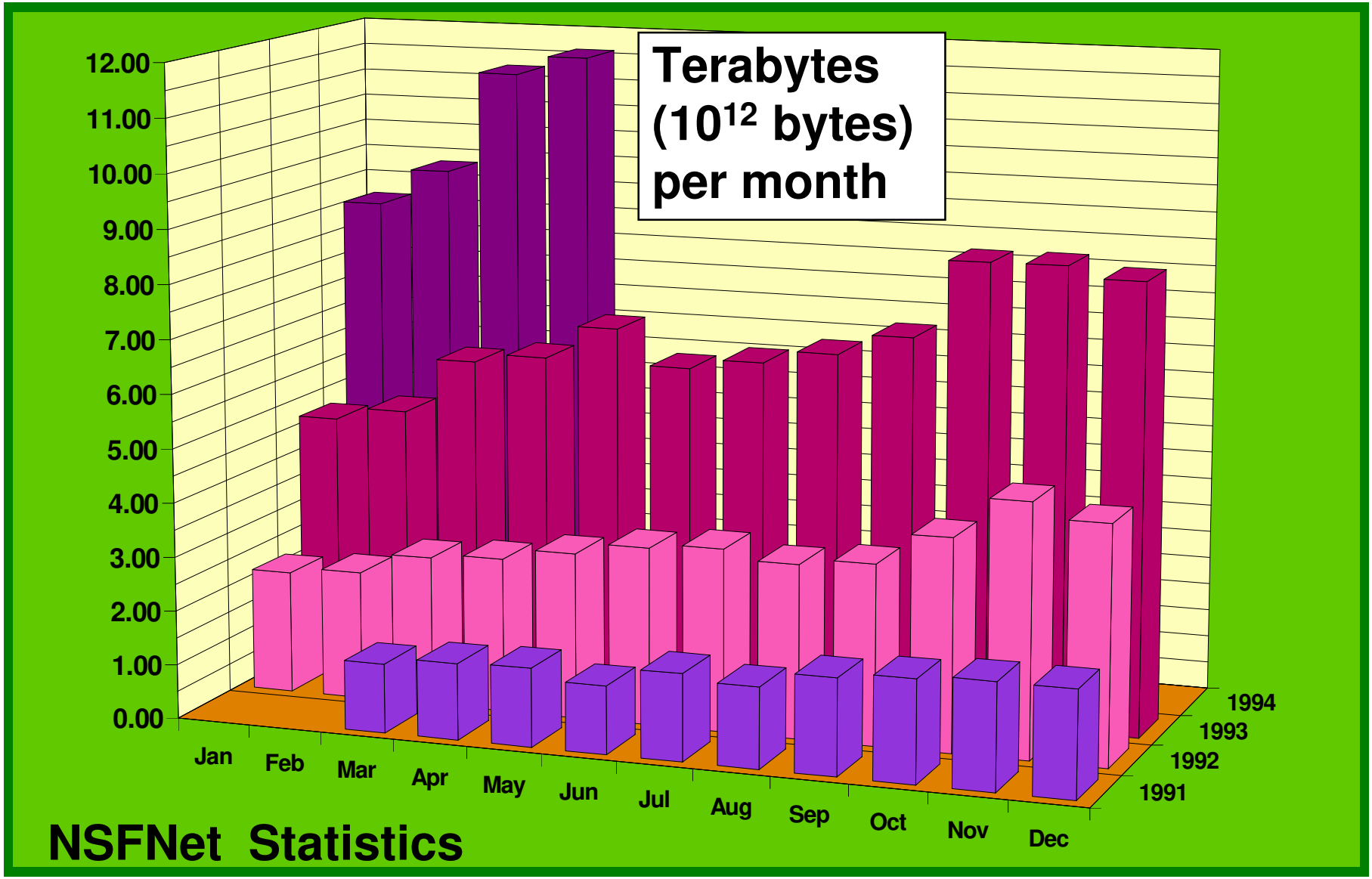


NSF Internet Backbone Network History of Services

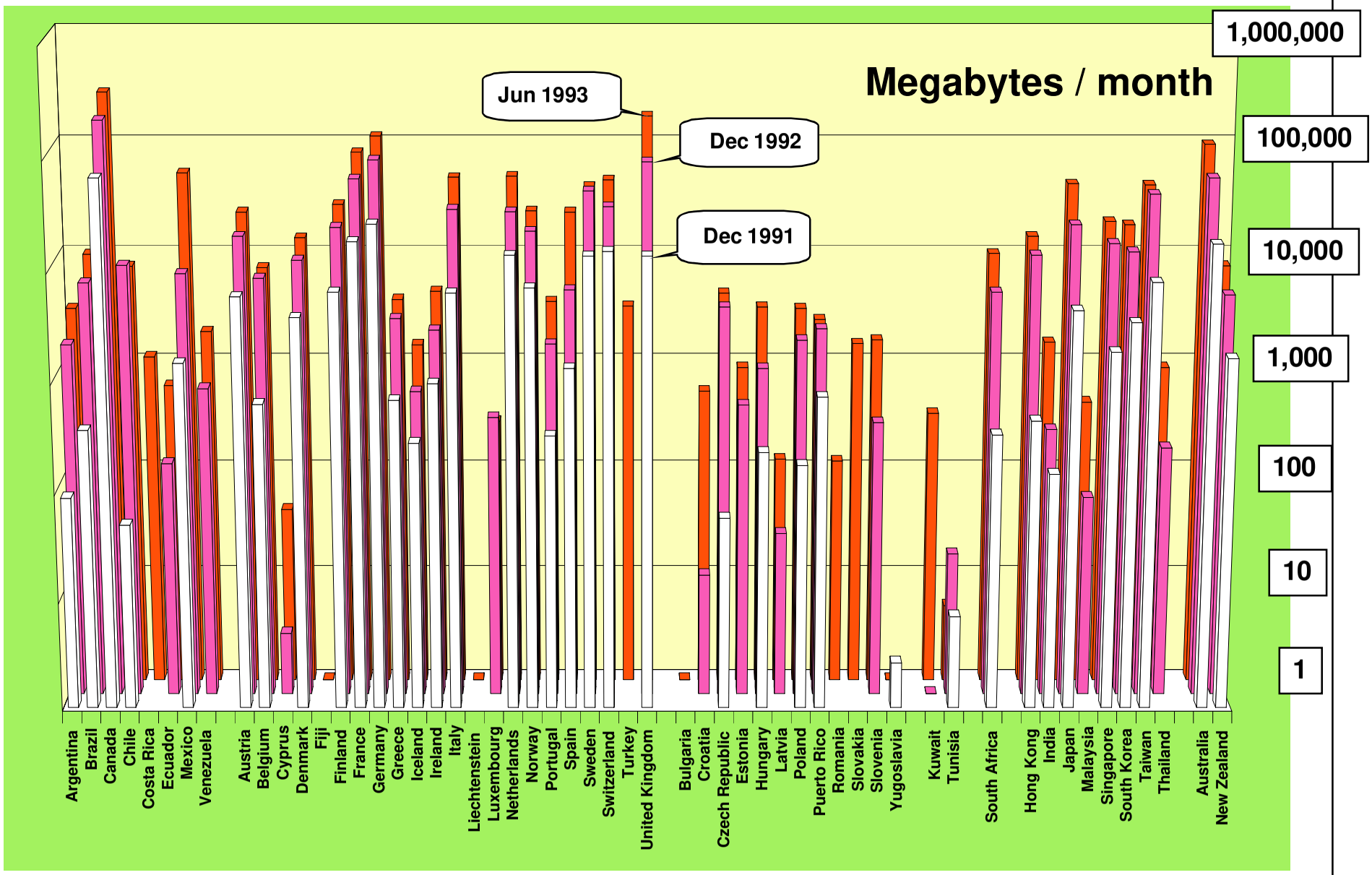


Internet Traffic

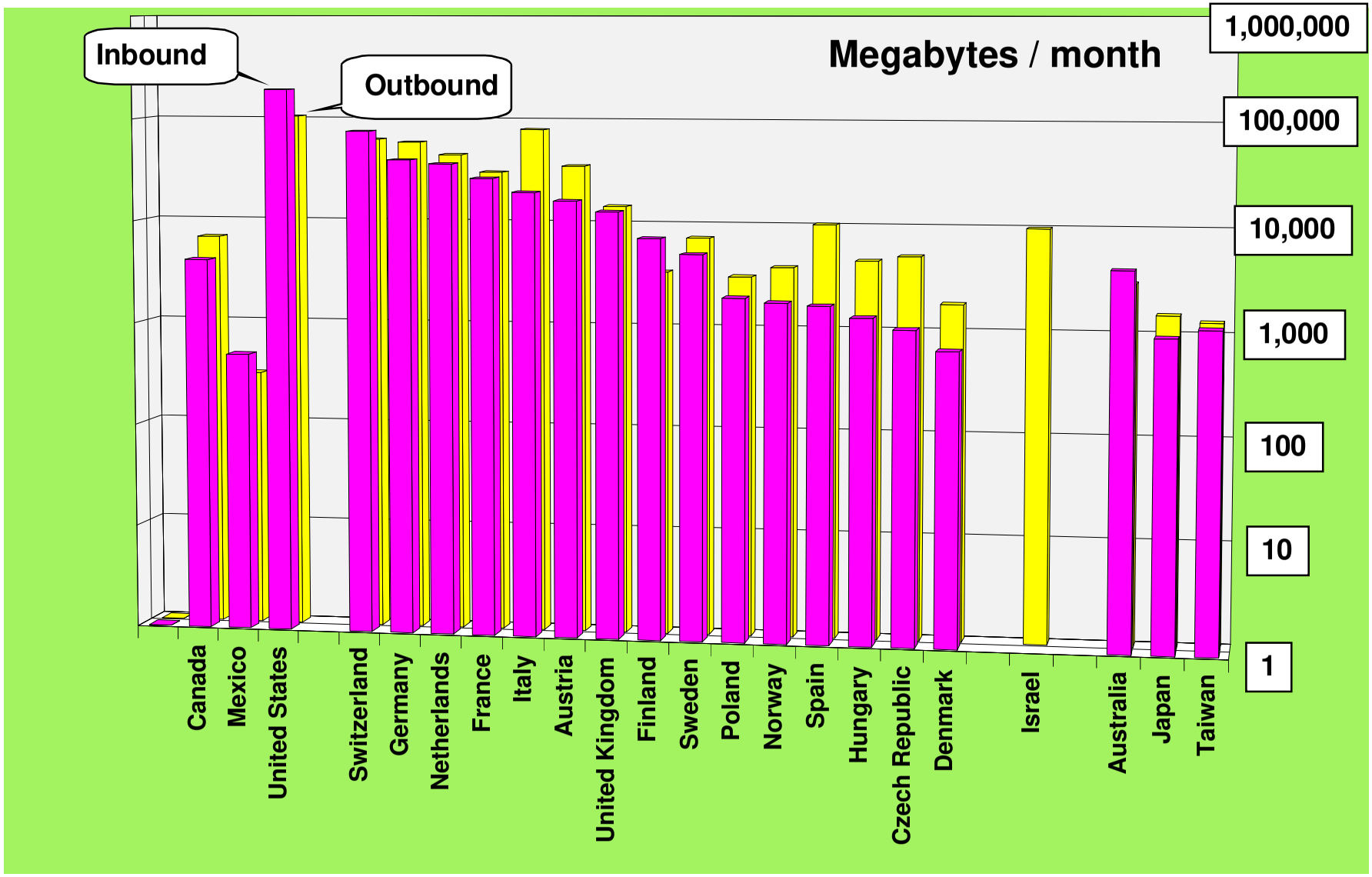
Traffic on the NSFNet Backbone



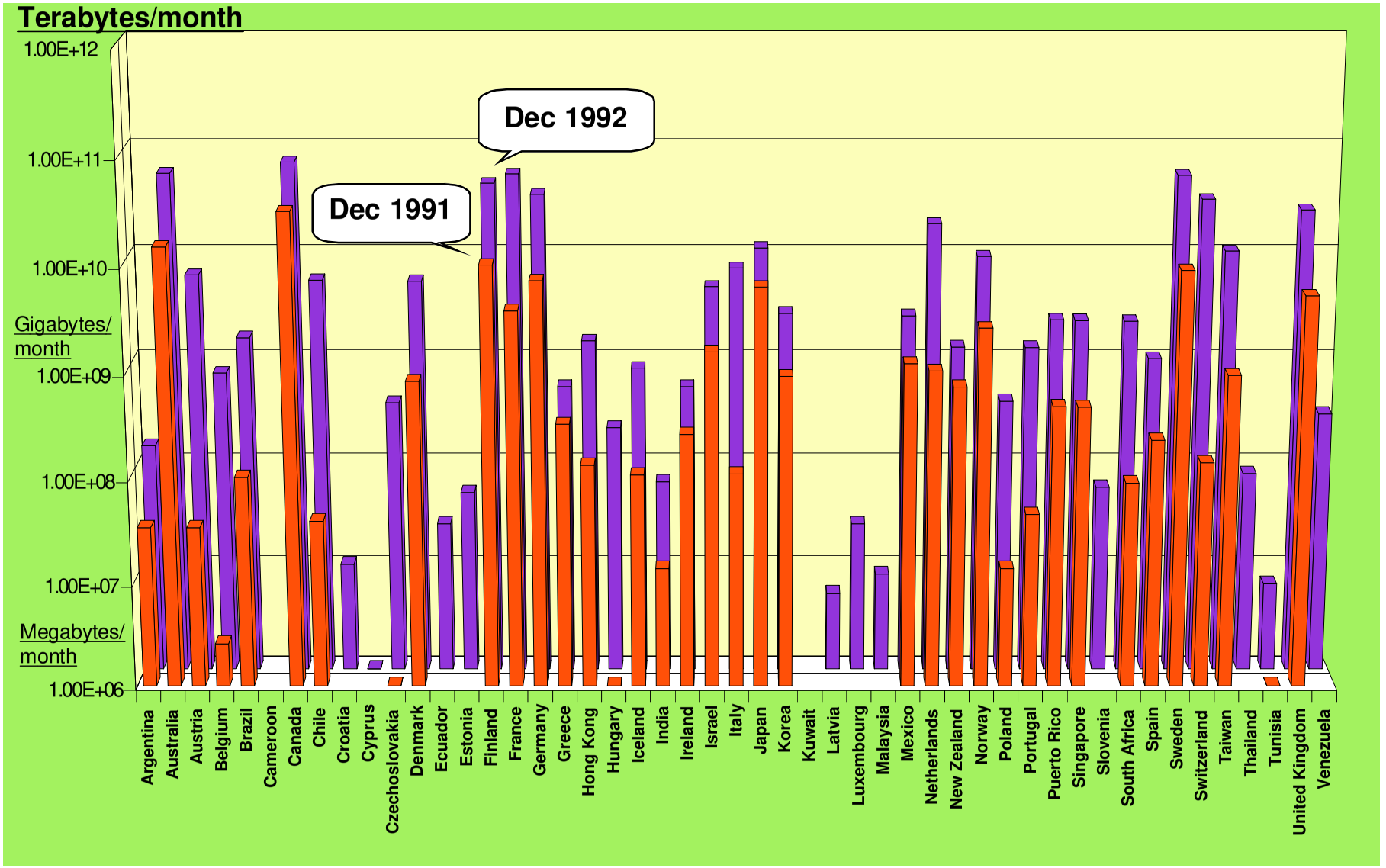
Outbound NSFNet Internet Traffic 1992-93



CERN Exchange Internet Traffic March 93

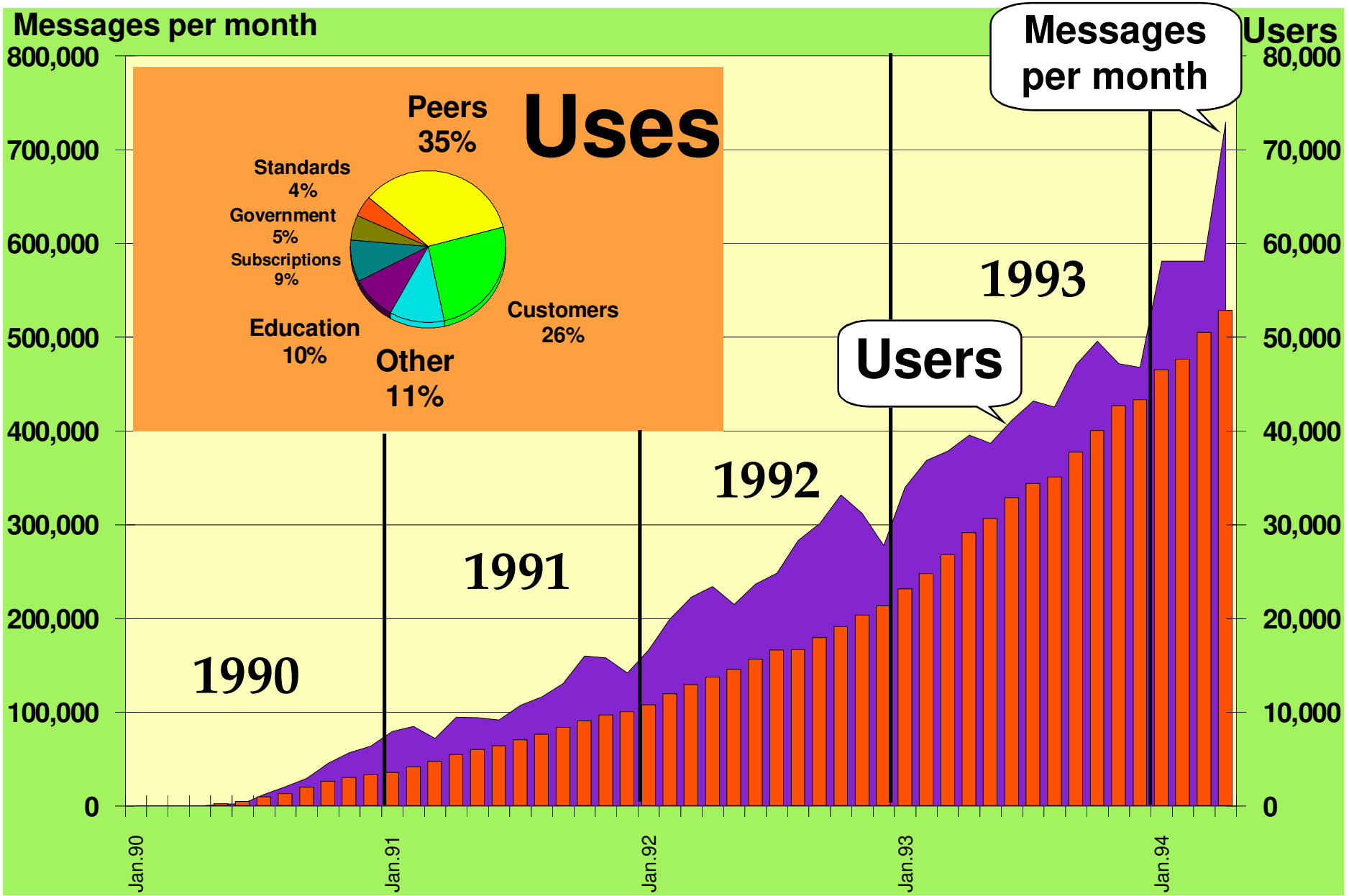


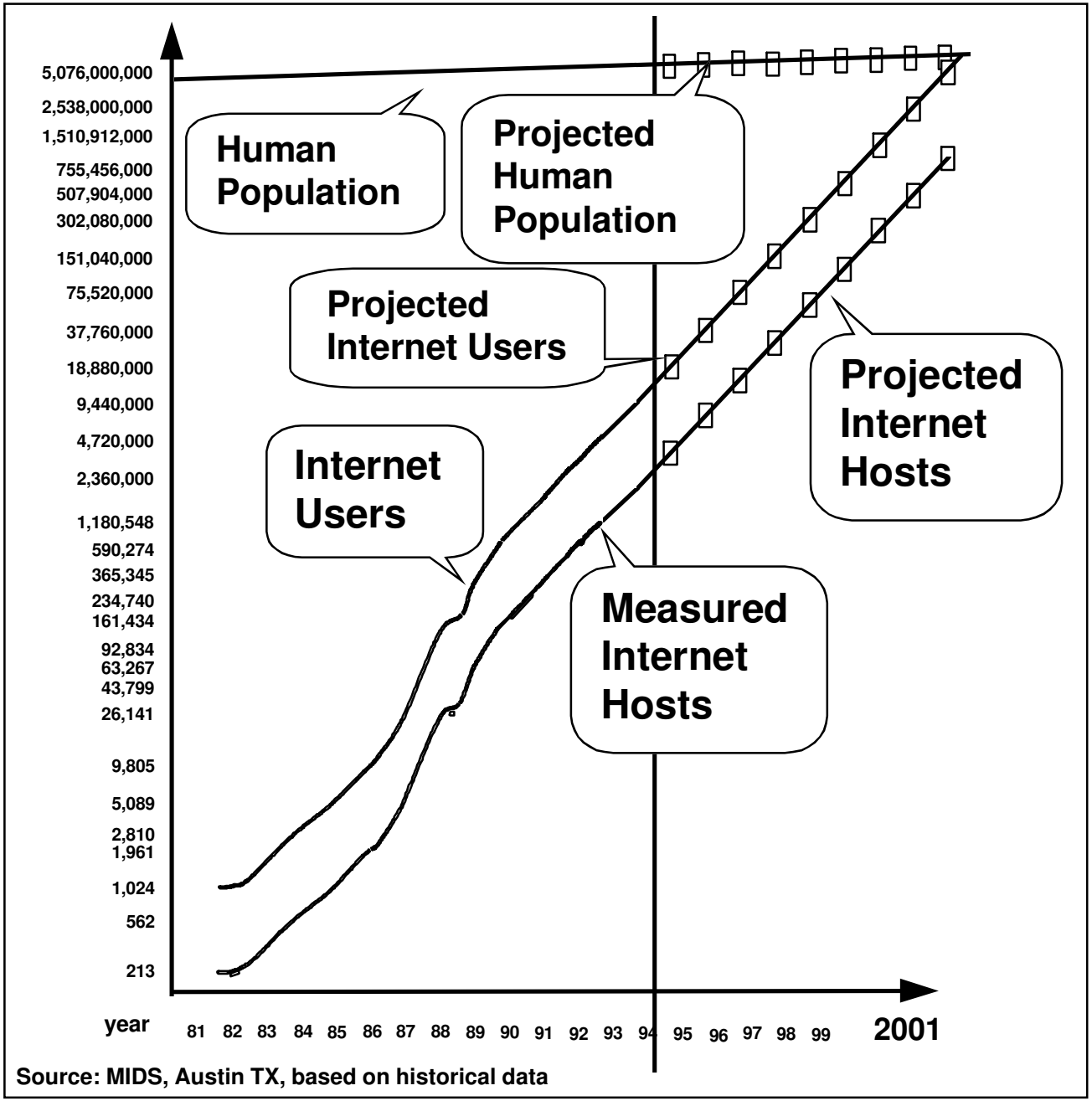
Inbound NSFNet Internet Traffic 1992-93



Internet Gateways

IBM Corporate-Internet Gateway Profile



Courtesy of Advantis

2001: Users = Human Population ?