



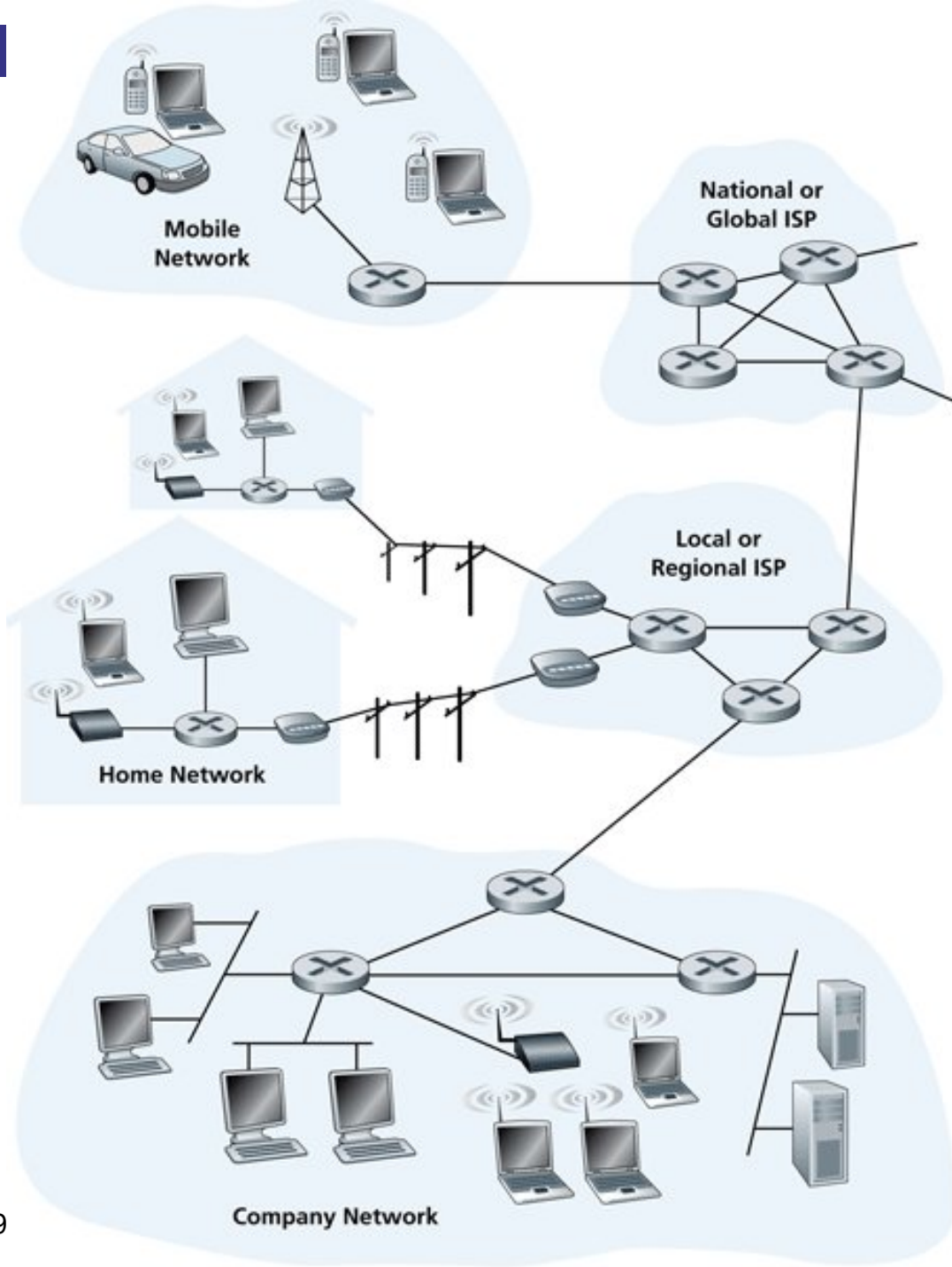
Computer Networks








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Course Introduction

- Syllabus and expectations
- What is Networking?
- What is the Internet?



-  Host (or end system)
-  Server
-  Mobile
-  Cell phone
-  Packet switch
-  Modem
-  Base station
-  Cell phone tower

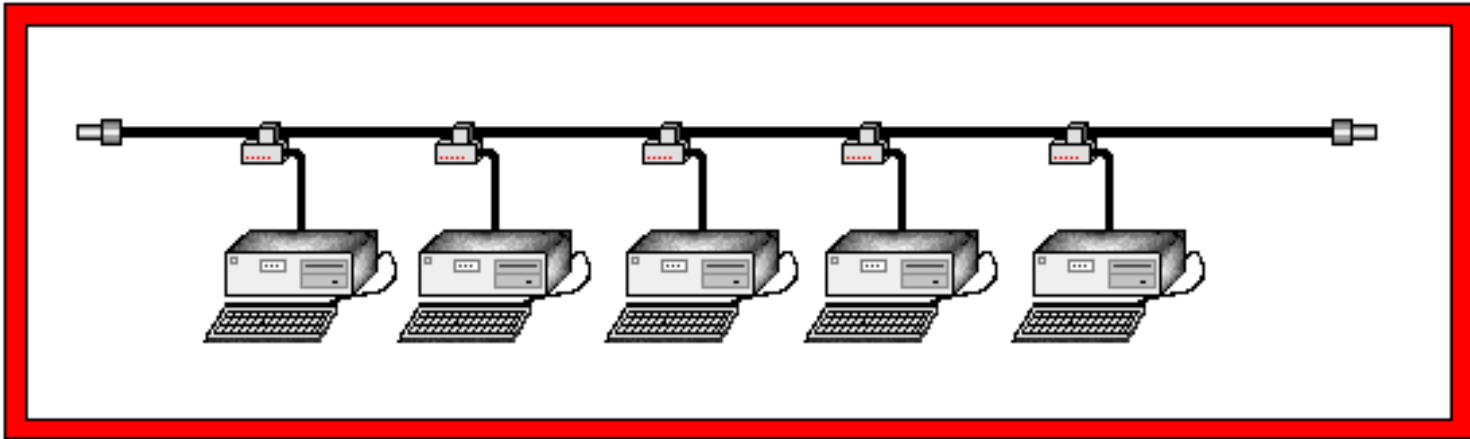
Network Types

- LAN
 - MAN
 - WAN
 - CAN
 - PAN
 - SAN
-
- Enterprise Network
 - The Internet

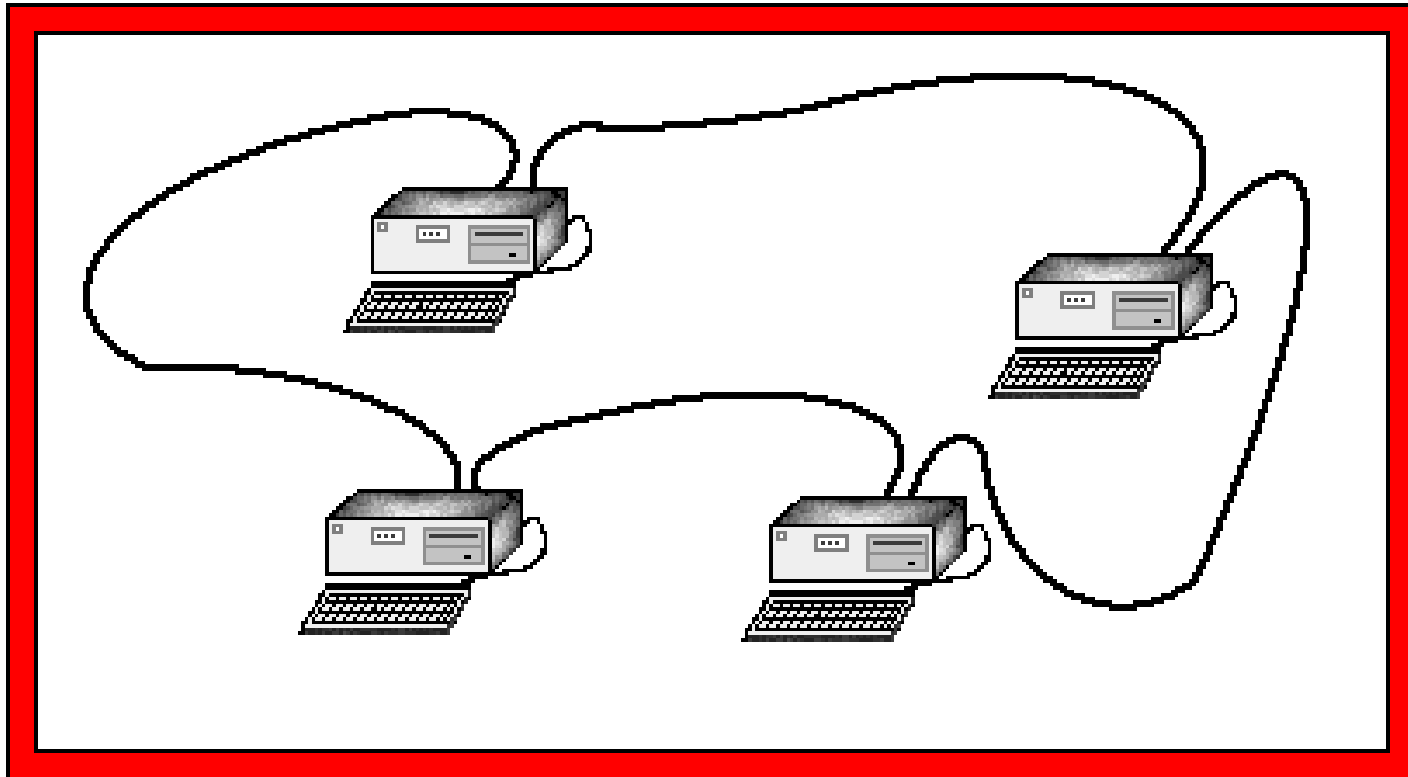
Network Topologies

- Physical Topology
- Logical Topology
- Topology Choices
 - Bus
 - Ring
 - Star
 - Mesh
 - Tree

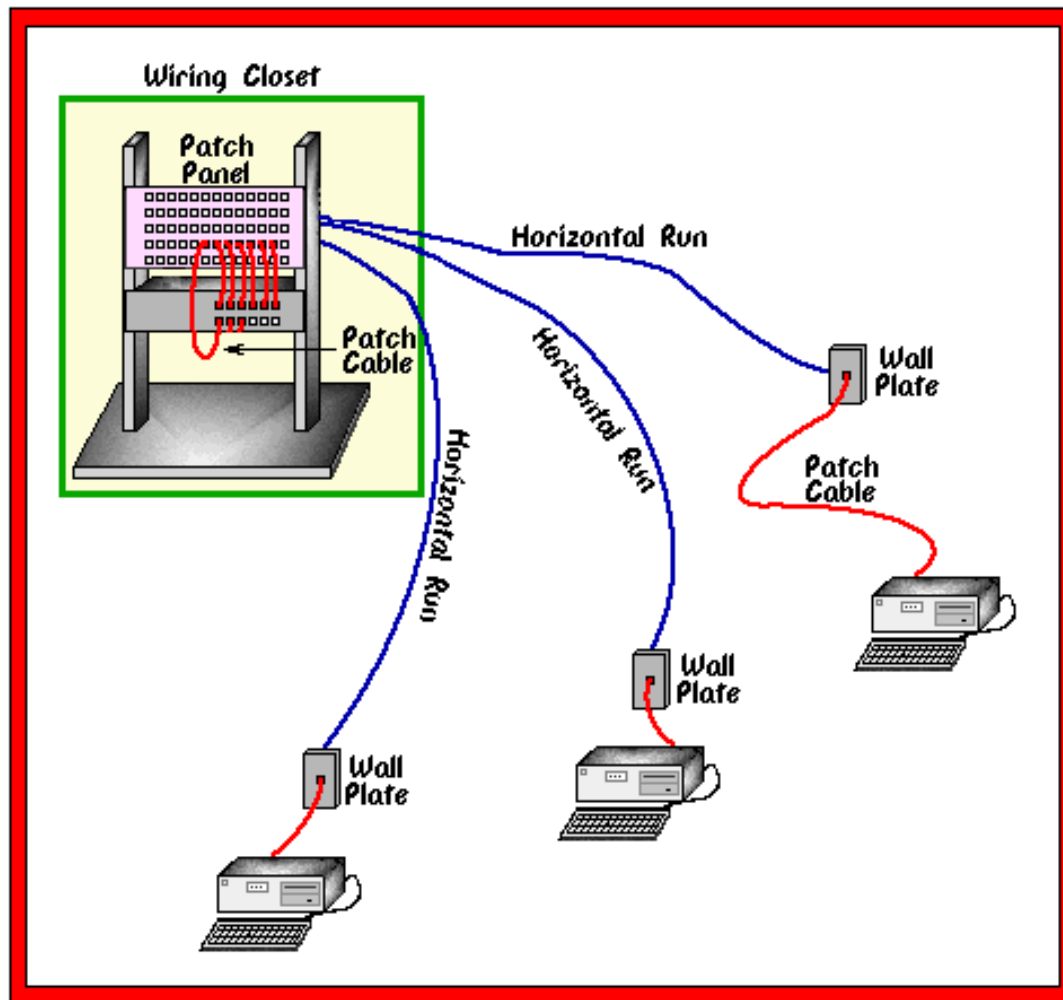
Bus Topology



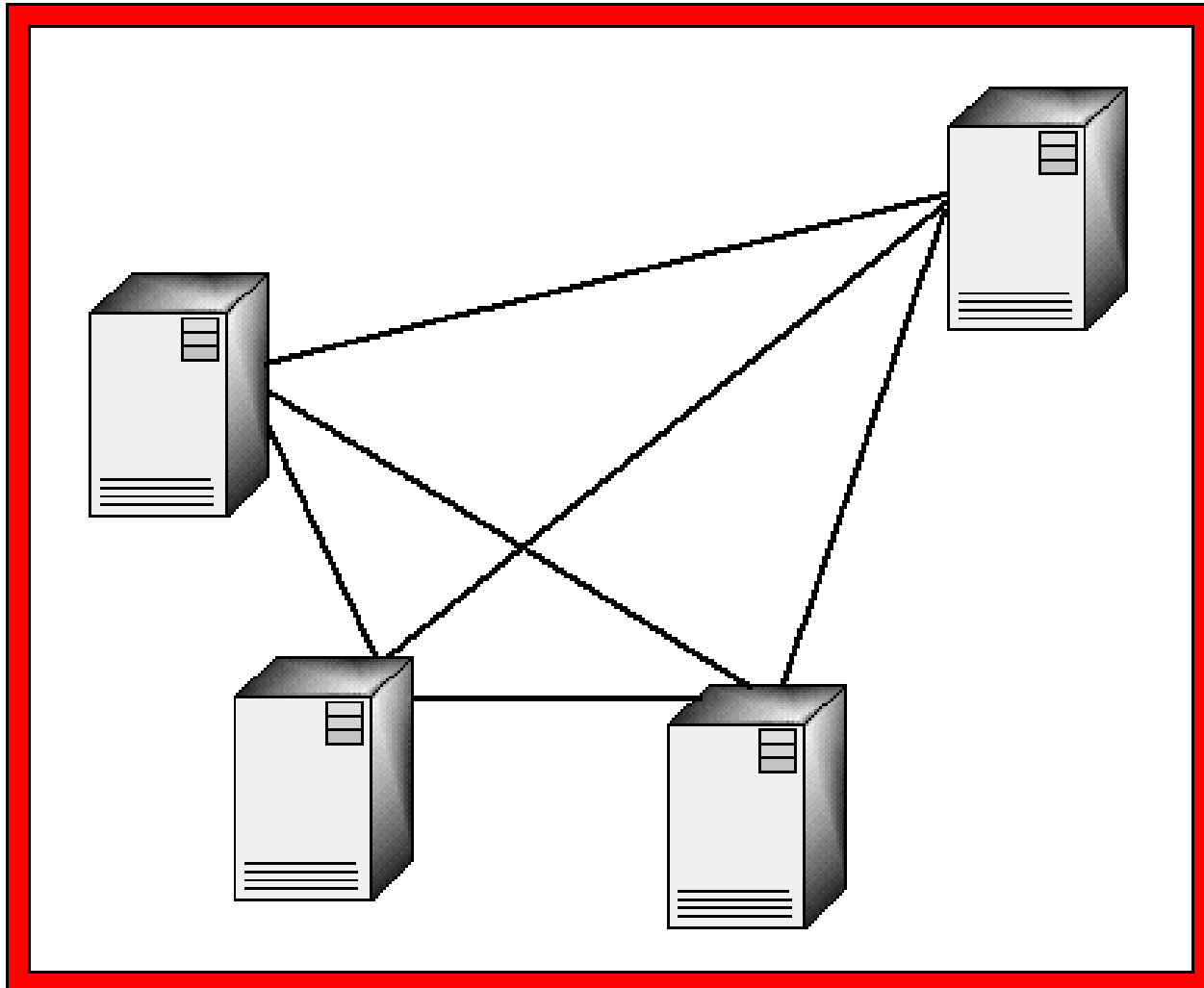
Ring Topology



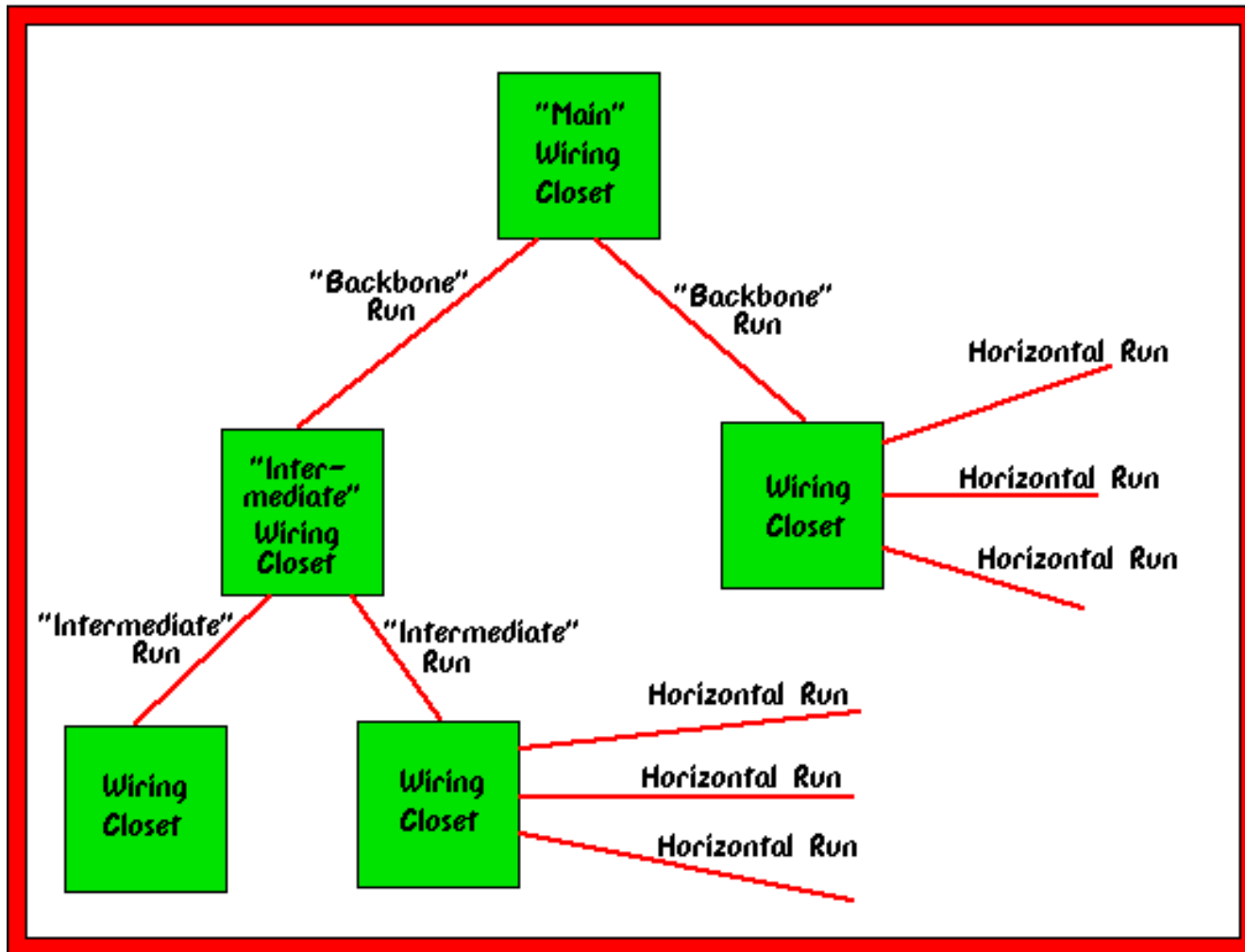
Star Topology



Mesh Topology



Tree Topology



Internet Service Description

- Distributed Applications
- Service
 - Connection-Oriented
 - Connectionless
- *Infrastructure*

Early Networks

- Origin of Internet

- 1960's

- Telephone Network

- ARPAnet

- 1969 – 4 nodes

- 1972 – 15 nodes

- Network-Control Protocol (NCP)

Internetworking & Proprietary Networks

- APRAnet
 - End of 1970's – over 200 nodes
- ALOHAnet
 - Ethernet
- Internetworking
 - DARPA
 - TCP, IP, UDP
- Proprietary Networks

Growth of Networks

- 1980's – Link universities together
 - BITnet
 - CSNET
 - NSFNET
- ARPAnet goes to TCP/IP
- Minitel

The Internet and the WEB

- Two main events in the 1990s
 - ARPAnet dies
 - Release of the World Wide Web
- NSFNET is decommissioned in 1995
- WEB invented 1989-1991
 - First GUI browser released in 1993

Late 1990's – 2000's

- More killer apps: instant messaging, peer2peer file sharing (e.g., Napster)
- Network security to forefront
- Est. 50 million host, 100 million+ users
- Backbone links running at Gbps



Recent Developments

- High-speed access networks
- Security
- P2P Networking

The Internet

- Has evolved today to encompass:
 - > 294 million users (Jan 2004)
 - > 1.2 billion users (Sept 2007)
 - > 63 million registered domains (June 2004)
 - > 96 million registered domains (Dec 2007)
- <http://www.internetworldstats.com/stats.htm>

Internet Statistics

- Internet World Stats

- <http://www.internetworldstats.com/stats.htm>

- Internet Traffic Report

- <http://www.internettrafficreport.com/main.htm>

- Domain Statistics

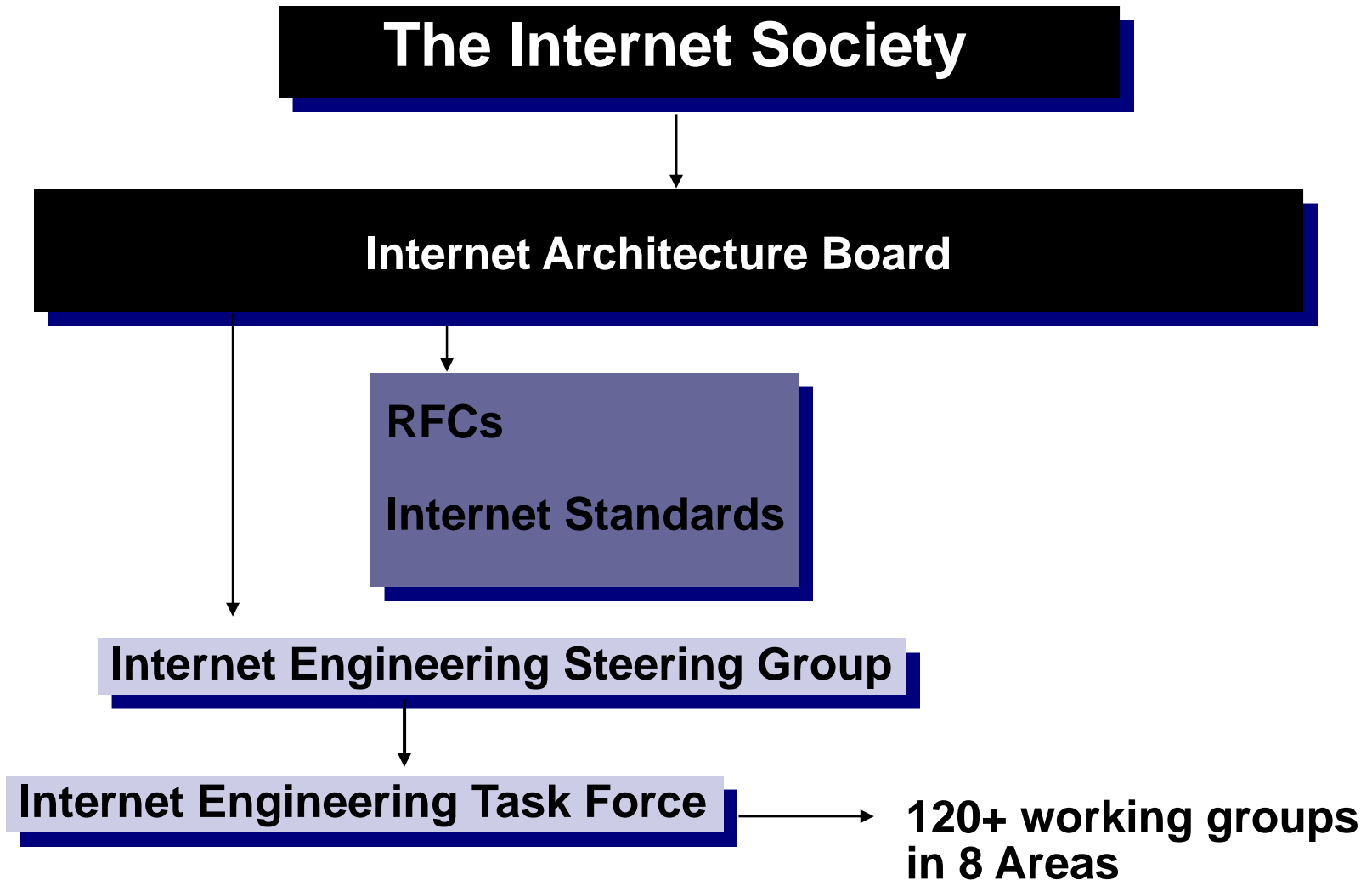
- <http://www.domaintools.com/internet-statistics/>



Internet Design Philosophy

- Peer to Peer Network
- End-to-end design principle
- Internet Protocol provides “glue” for running over a variety of subnetwork types
- Network merely carries packets.

TCP/IP STANDARDS BODIES





Internet Standards Goals

- Technical excellence
- Prior implementation and testing
- Clear, concise, and easily understood documentation
- Openness and fairness
- Timeliness

TCP/IP Standards Process

