Communications Networks

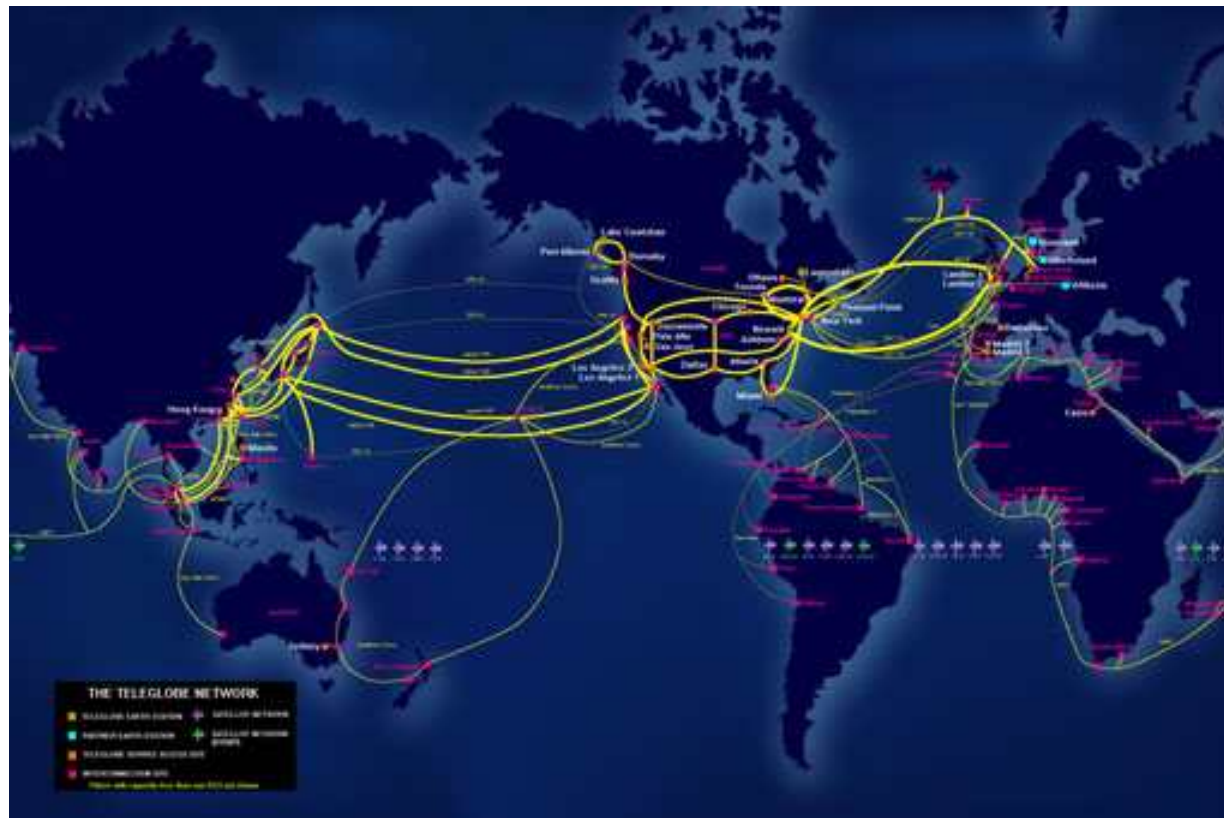# Introduction

Network Examples

Network Components

Internetwork

Internet

Other Networks

Network Examples
Teleglobe Communications Corporations: Fiber + Satellite
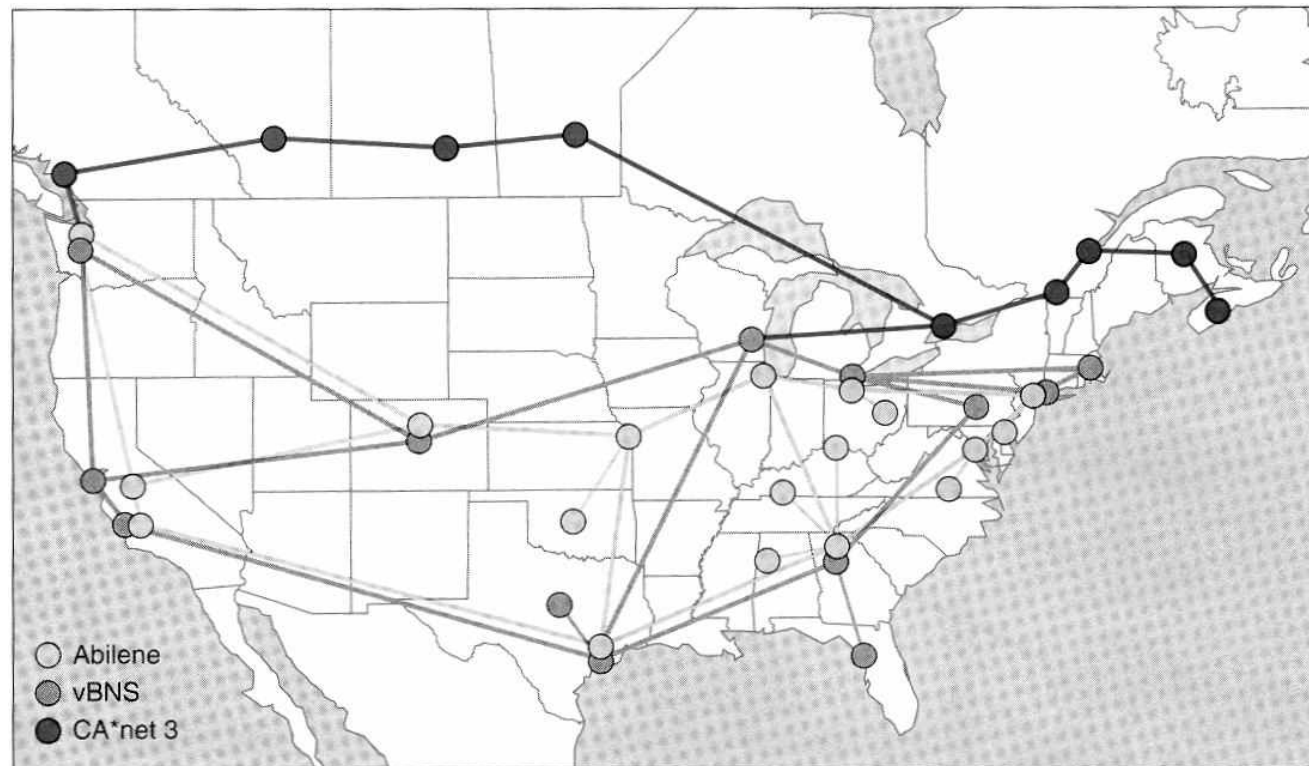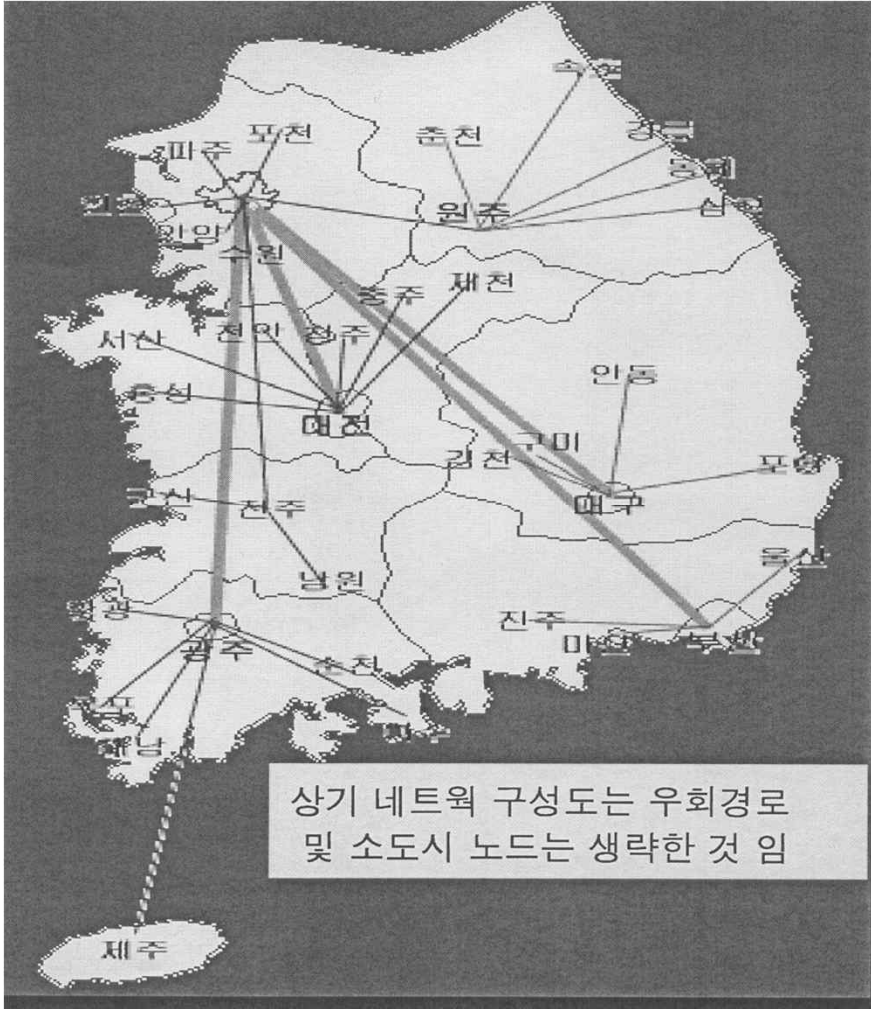
Network Examples
Gigapops and High-speed Backbones

FIGURE 7-12 Gigapops and high-speed backbones of Internet 2/Abilene, very-high-performance Backbone Network Service (vBNS), and CA*net 3.

Legend:
- ○ Abilene
- ◑ vBNS
- ● CA*net 3

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Network Examples
BORANet Backbones
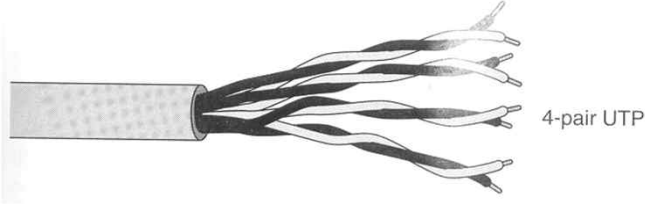
Network Components

Link: carry bits from one place to another (or maybe to many other places)

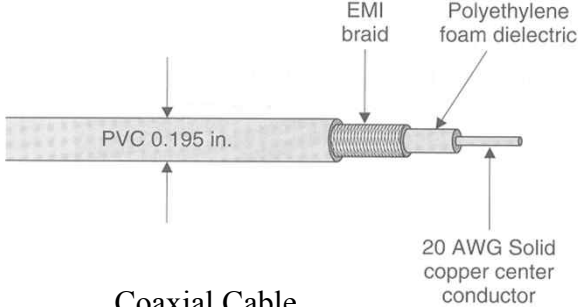Switch/router: move bits between links, forming internetwork

Host: communication endpoint (workstation, PDA, cell phone, toaster, tank)
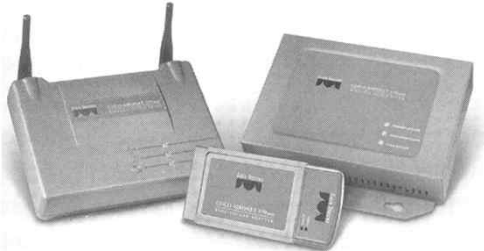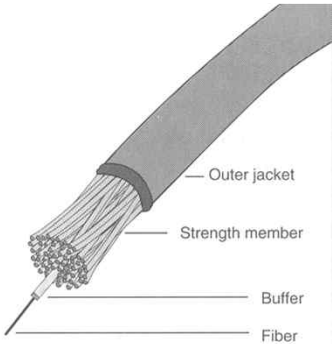
Network Components
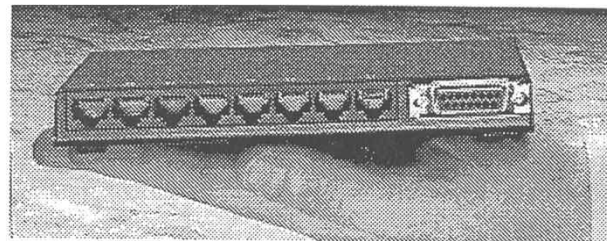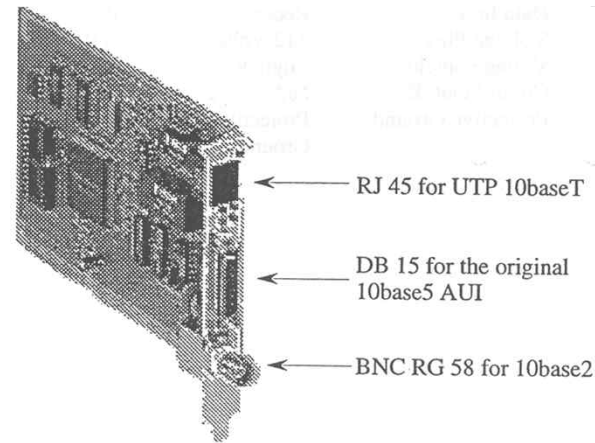
Links

Unshielded Twisted Pair

Coaxial Cable

Wireless LAN Equipment

Fiber Optic Cable

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Network Components

Ethernet Network Interface Card

RJ 45 for UTP 10baseT

DB 15 for the original
10base5 AUI

BNC RG 58 for 10base2
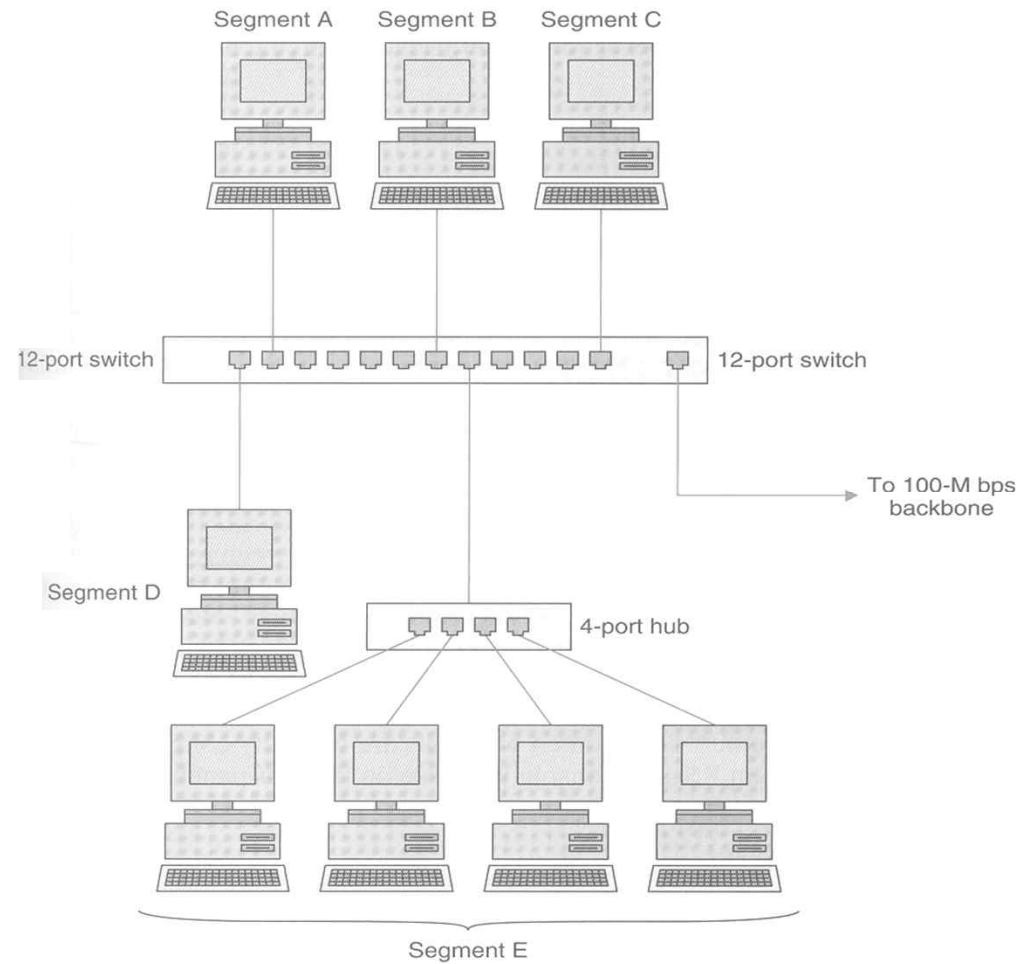
A 10BaseT 8-port Ethernet Mini Hub
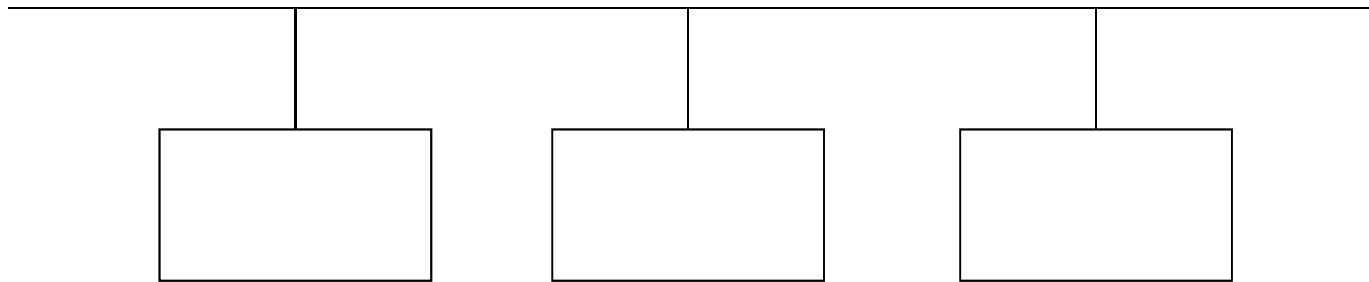
Network Components

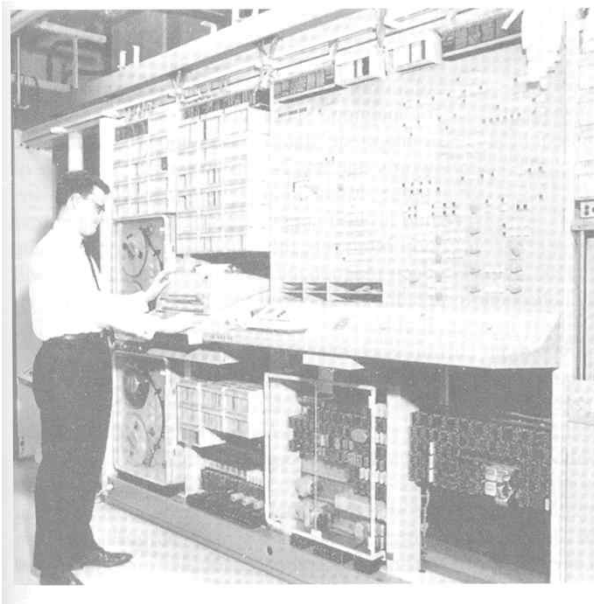## Ethernet

Network Components

Link: Ethernet

Ethernet is a broadcast-capable, multi-access LAN
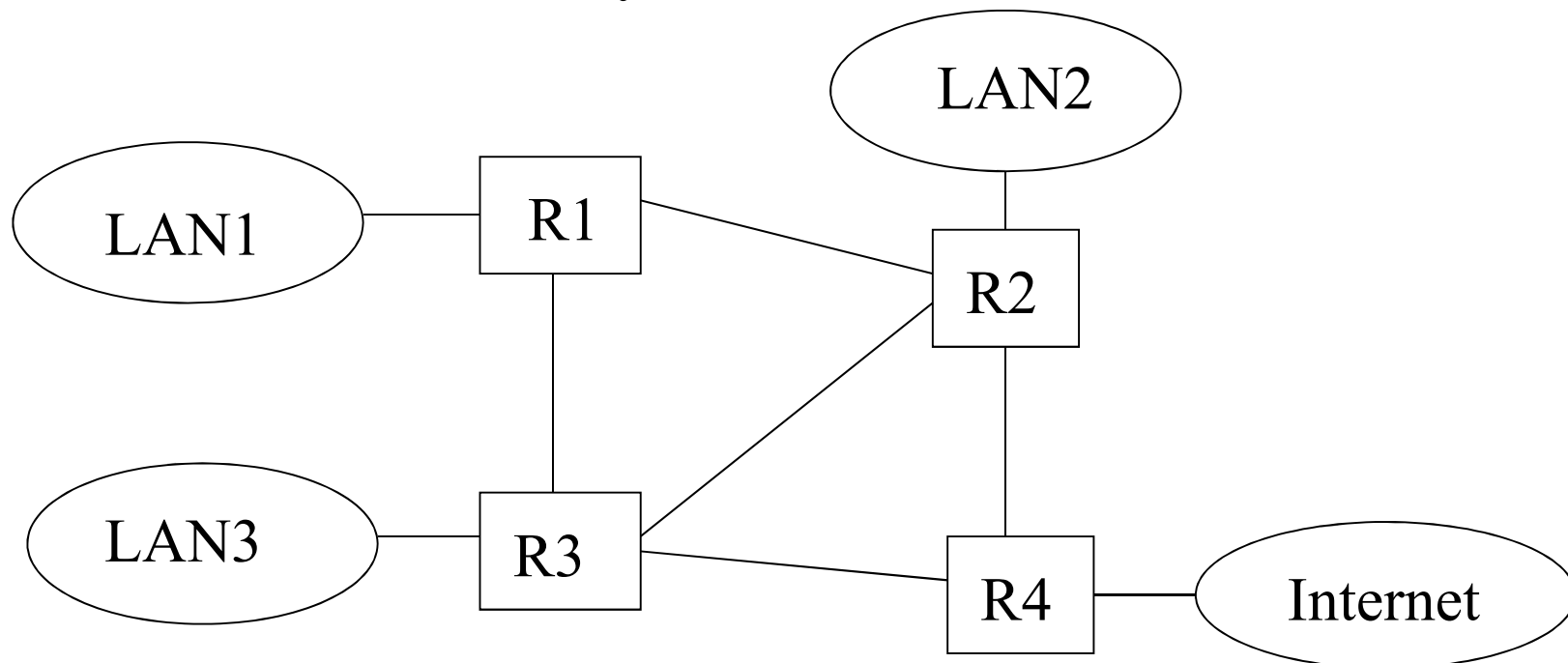
Network Components
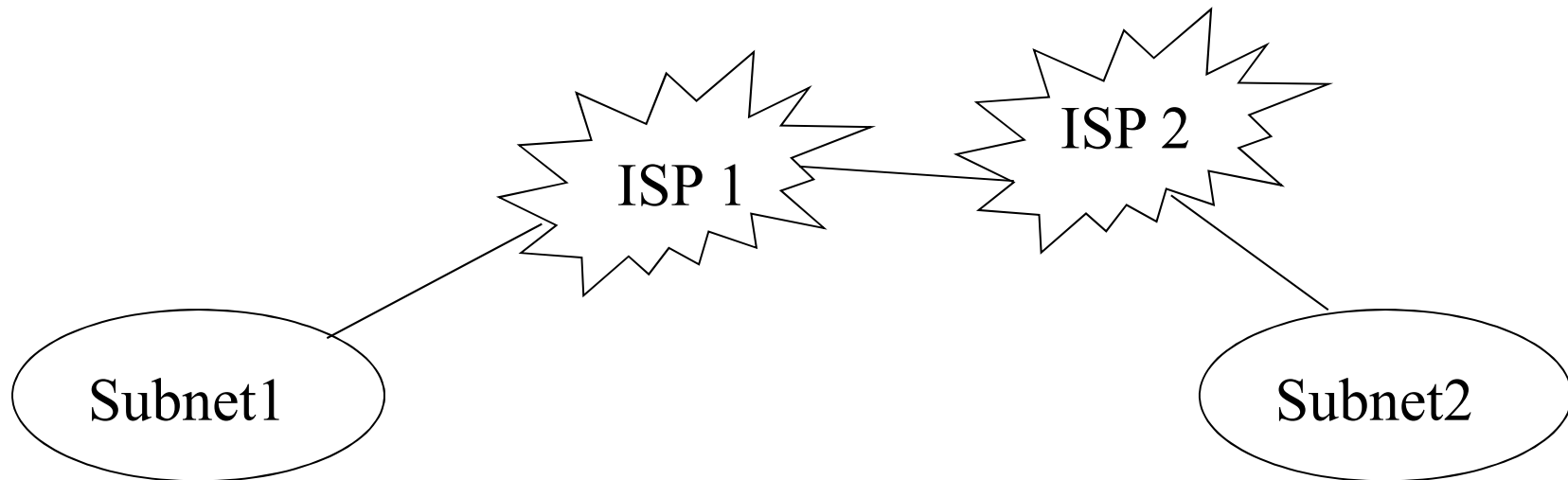
Telephone Switch

Large Router

Network with Routers

LANs interconnected by routers

An Internetwork

Provides message delivery between multiple networks

ISP 1

ISP 2

Subnet1

Subnet2

Example:

Subnet 1 = network of LANs of previous slide

ISP 1 = Sprint, ISP 2 = MCI

Subnet 2 = UCB network

The Internet

A global network of networks all using a common protocol (IP, the Internet Protocol)
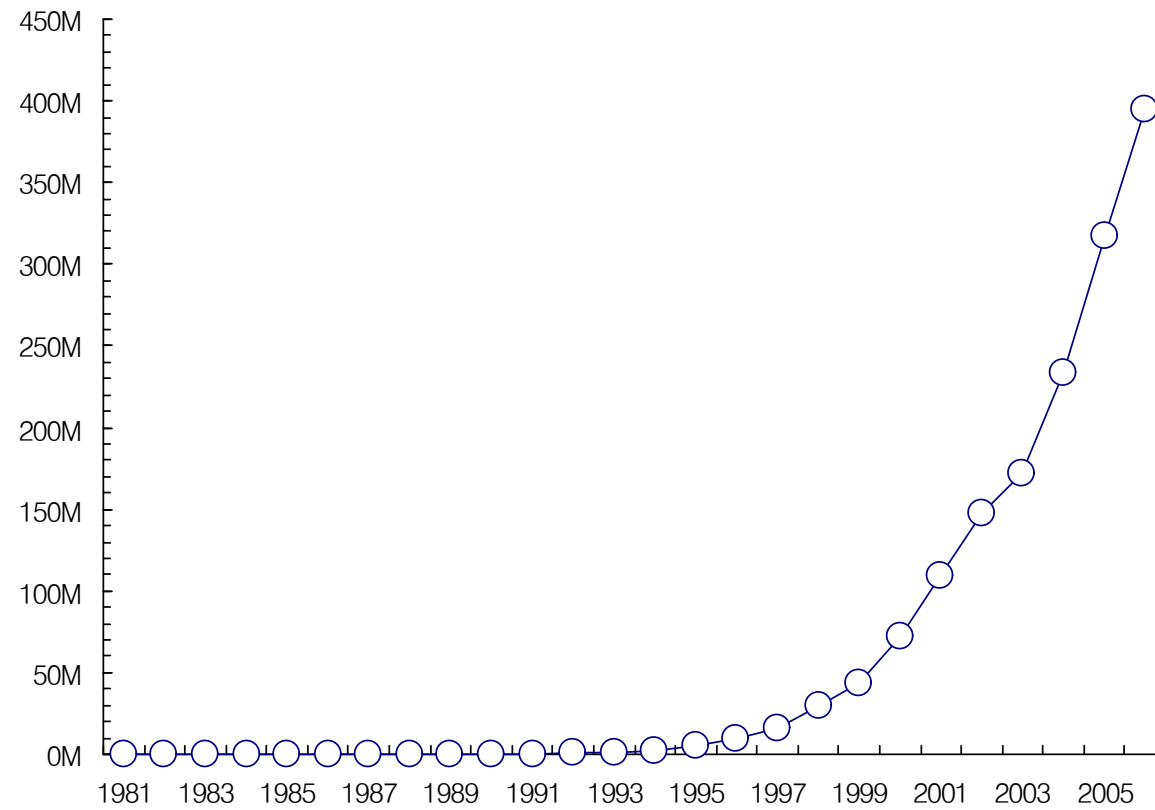
Focus of this class

A challenge to understand:

- Large scale (2.8/7.1 billion of users and 1 billion hosts in 2013)

- Heterogeneity, irregular topology, decentralized management

Scale of Internet

Worldwide Internet hosts

Other Networks

The Telephone Network

Processor Interconnection Networks

ATM Networks

Cable-TV Networks