# Present

**Size**

- $\sim 10^6$ hosts
- $\sim 10^4$ nets
- $\sim 5 \times 10^6$ users (?)
- $\sim 10^4$ routers
- $\sim 10^2 - 10^3$ (?) service providers

*Someone gets to sell these!*

**Services**

- Interactive Computing
  Scroll, Screen, X-Windows
- File Transfer
- Electronic Mail
- Database Access — Text, Data, Images
- Voice
- Video

Teleconference

**Users**

- Academic/Research
- Government
- Business

## Future (Technical)

*Someone gets to sell these!*

**Size (2000 AD)**

| | Conventional | | Ubiquitous Computing | |
|---|---|---|---|---|
| | $\sim10^8$ | hosts | $\sim10^{10}$ | hosts |
| | $\sim3 \times 10^6$ | nets | $\sim10^8$ | nets |
| | $\sim10^9$ | users | $\sim10^9$ | hosts |
| | $\sim3 \times 10^6$ | routers | $\sim10^8$ | routers |
| | $\sim10^3 - 10^4$ | service providers | | |

**Many Challenges**

- Mobile Hosts & Nets
- TOS/QOS Support
- Security, Privacy, Access Control
- Accounting
- Large Scale Net Management
- Large Scale Routing
- Multiprotocol Support

**Architected for $\sim10^9$ nets**

## Future (Services)

- Remote Access
- Voice, Video, W/S Teleconferencing
- Digital Libraries/Publishing
- Multi-Computer Computation
- Knowbotic (Autonomous) Services
- Multimedia EMail (MIME/PEM)
- CAD/CAM
- Networked Manufacturing
- Business Transactions (EDI, EFT)
- Public/Commercial Information Services
- Distributed Games
- Mobile Personal Communication
- Toasternet
- Pre-Programmed, Dedicated Hosts!
  (like pre-recorded videos)

## Future (Network Service Provision)

- Increasing Commercial Service — bus. / res.
- Mission-Specific Networks
  (gigabits…terabits)
- Mobile Service
  LEO, Digital Radio
- N-ISDN – Residential [SMDS?]
- B-ISDN – Business/WANs

*Must!*

- More Global Coordination
  - Name/Addr Assignment
  - Facilities Planning
  - Operational Cooperation

## Summary

- Rapid Growth
- DivERsIty!
- Demand for Interoperability