Present

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

Services
- **Interactive Computing**
  Scroll, Screen, X-Windows
- **File Transfer**
- **Electronic Mail**
- **Database Access** ─── Text
  ─── Data
  ─── Images
- Voice ─┐
- Video ─┘ Teleconference

Users
- **Academic/Research**
- **Government**
- **Business**

*Someone gets
to sell them!*

Future of Internet

Future (Technical)

	Conventional	Ubiquitous Computing
Size (2000 AD)	$\sim 10^8$ hosts	$\sim 10^{10}$ hosts
	$\sim 3 \times 10^6$ nets	$\sim 10^8$ nets
	$\sim 10^9$ users	$\sim 10^9$ hosts
	$\sim 3 \times 10^6$ routers	$\sim 10^8$ routers
	$\sim 10^3 - 10^4$ service providers	

Someone gets to sell these!

Many Challenges

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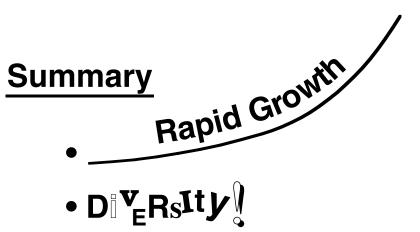- Multiprotocol Support

Architected for $\sim 10^9$ 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**
- **More Global Coordination** *(Must!)*
  - **Name/Addr Assignment**
  - **Facilities Planning**
  - **Operational Cooperation**

Summary

- *Rapid Growth*
- **DiVeRsIty !**
- **Demand for Interoperability**