

Residential access: cable modems

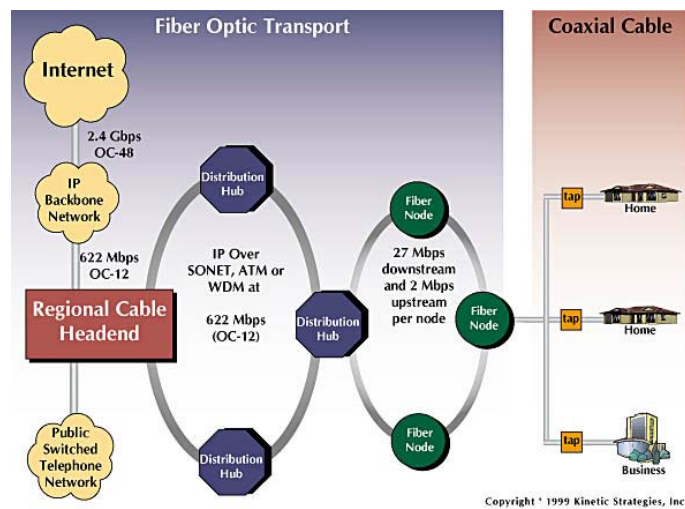
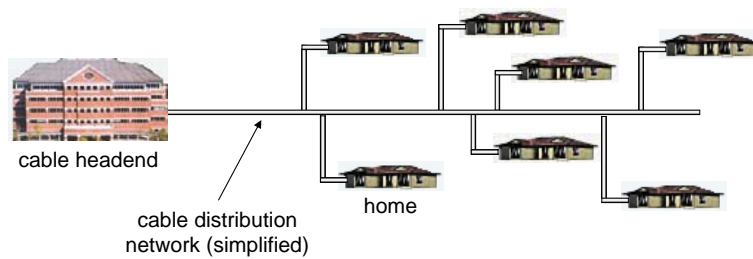


Diagram: <http://www.cabledatcomnews.com/cm/c/diagram.html>

Source: Computer Networking – Jim Kurose, 3rd Edition

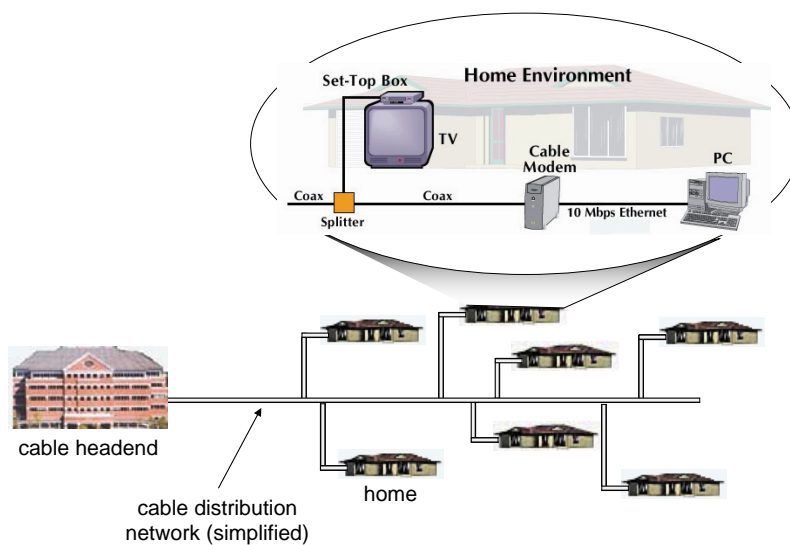
Cable Network Architecture: Overview

Typically 500 to 5,000 homes



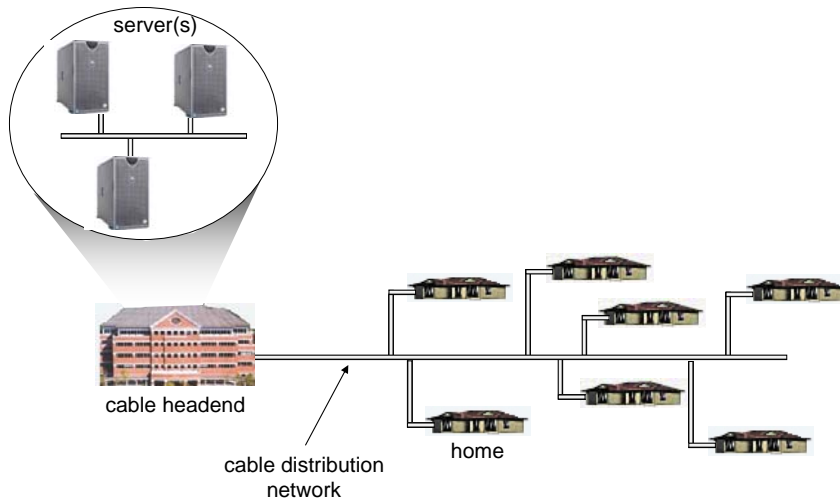
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Cable Network Architecture: Overview



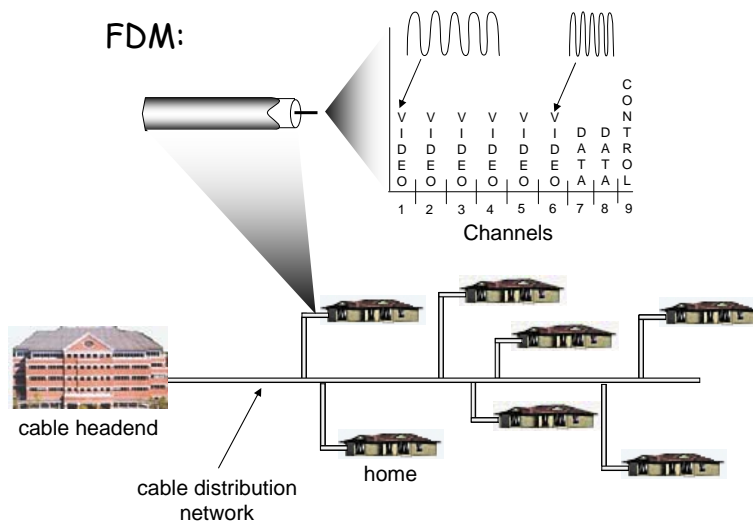
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Cable Network Architecture: Overview



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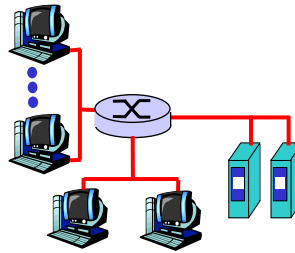
Cable Network Architecture: Overview



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Company access: local area networks

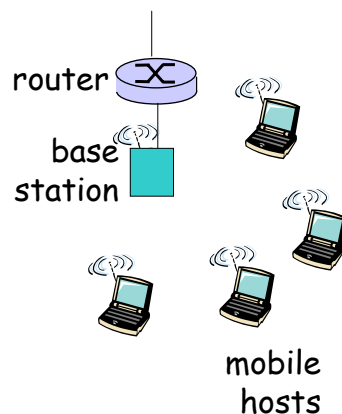
- company/univ **local area network** (LAN) connects end system to edge router
- **Ethernet:**
 - shared or dedicated link connects end system and router
 - 10 Mbs, 100Mbps, Gigabit Ethernet
- LANs: chapter 5



Source: Computer Networking – Jim Kurose, 3rd Edition

Wireless access networks

- shared *wireless* access network connects end system to router
 - via base station aka “access point”
- **wireless LANs:**
 - 802.11b (WiFi): 11 Mbps
- **wider-area wireless access**
 - provided by telco operator
 - 3G ~ 384 kbps
 - Will it happen??
 - WAP/GPRS in Europe

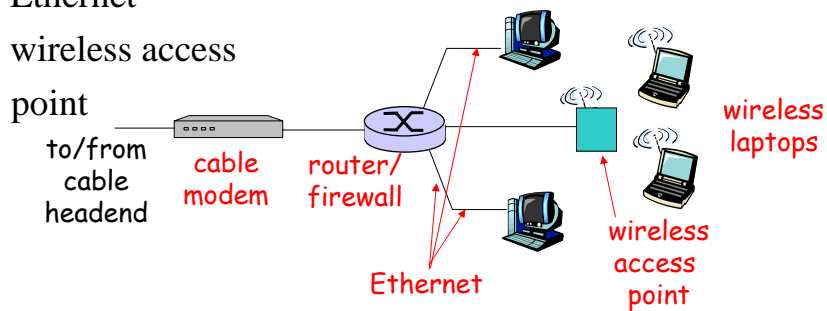


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Home networks

Typical home network components:

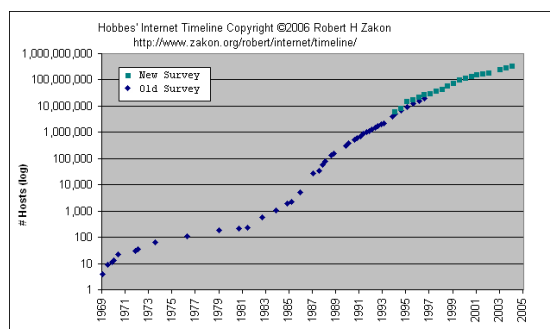
- ADSL or cable modem
- router/firewall/NAT
- Ethernet
- wireless access



Source: Computer Networking – Jim Kurose, 3rd Edition

• Internet has proliferated rapidly

Date	Hosts
12/69	4
12/79	188
01/89	80,000
07/95	6,642,000
07/95	8,200,000
07/96	16,729,000
07/97	26,053,000
07/98	36,739,000
07/99	56,218,000
07/00	80,000,000 (projection)

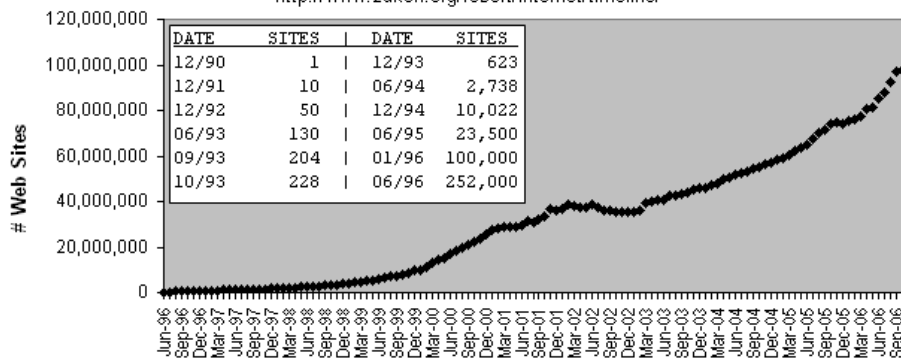


WWW Growth:

Date	Sites	Date	Sites	Date	Sites
06/93	130	04/97	1,002,512	10/98	3,358,969
09/93	204	05/97	1,044,163	11/98	3,518,158
10/93	228	06/97	1,117,255	12/98	3,689,227
12/93	623	07/97	1,203,096	01/99	4,062,280
06/94	2,738	08/97	1,269,800	02/99	4,301,512
12/94	10,022	09/97	1,364,714	03/99	4,389,131
06/95	23,500	10/97	1,466,906	04/99	5,040,663
01/96	100,000	11/97	1,553,998	05/99	5,414,325
06/96	252,000	12/97	1,681,868	06/99	6,177,453
07/96	299,403	01/98	1,834,710	07/99	6,598,697
08/96	342,081	02/98	1,920,933	08/99	7,078,194
09/96	397,281	03/98	2,084,473	09/99	7,370,929
10/96	462,047	04/98	2,215,195	10/99	8,115,828
11/96	525,906	05/98	2,308,502	11/99	8,844,573
12/96	603,367	06/98	2,410,067	12/99	9,560,866
01/97	646,162	07/98	2,594,622	01/00	9,950,491
02/97	739,688	08/98	2,807,588	02/00	11,161,811
03/97	883,149	09/98	3,156,324	03/00	13,106,190
				04/00	14,322,950
				05/00	15,049,382
				06/00	17,119,262

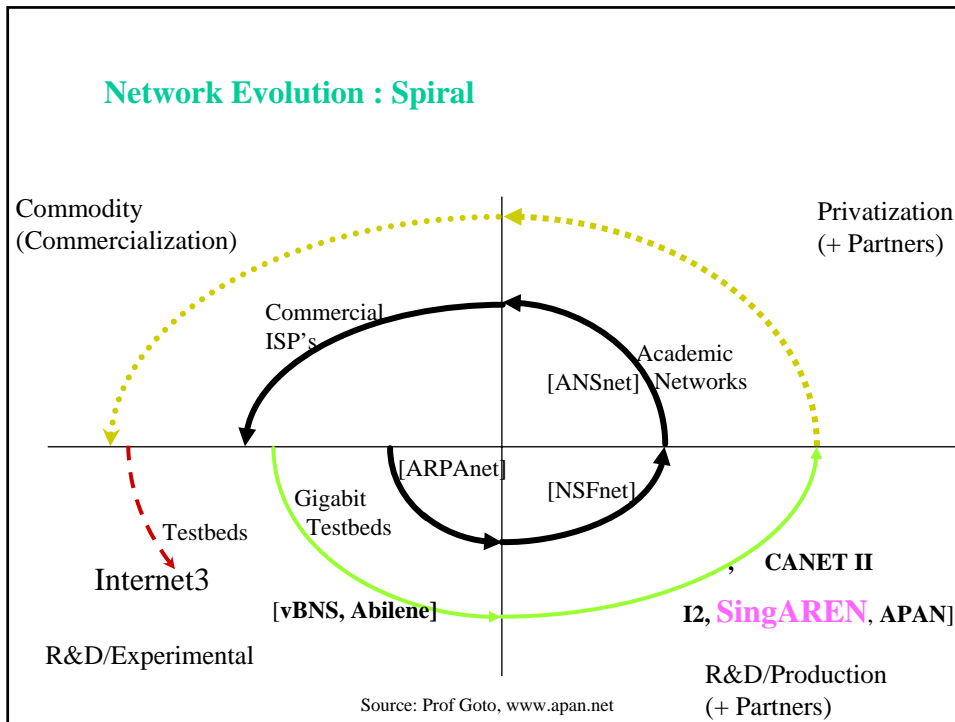
Sites = # of web servers (one host may have multiple sites by using different domains or port numbers)

Hobbes' Internet Timeline Copyright ©2006 Robert H Zakon
<http://www.zakon.org/robert/internet/timeline/>

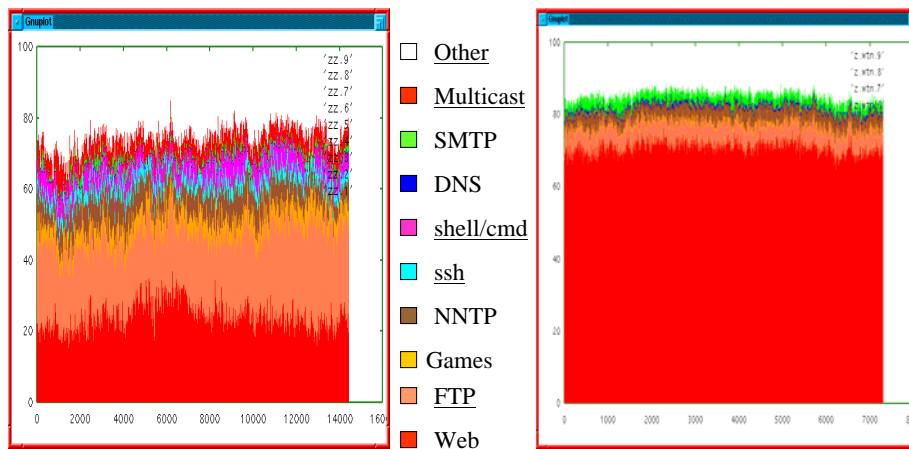


Please refer to the website in the slide (Hobbes' Internet Timeline for Latest stastics)

Network Evolution : Spiral



Traffic Characteristics: Research networks vs. Commodity Internet

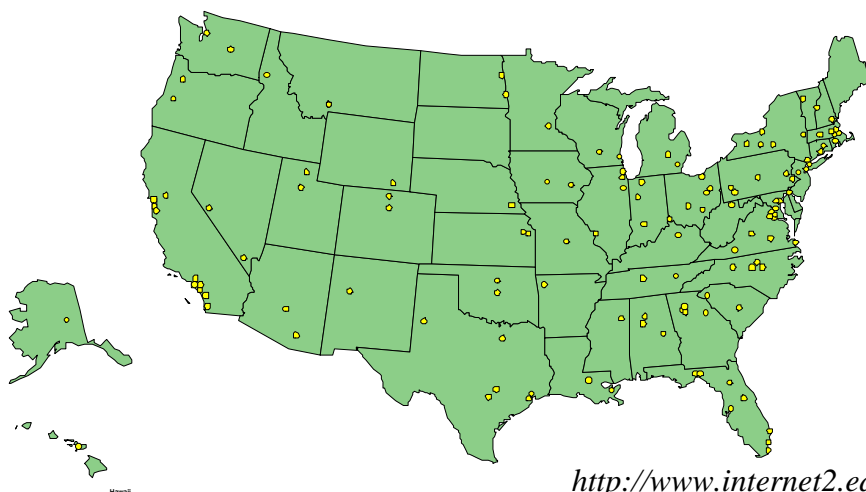


Internet2 Mission

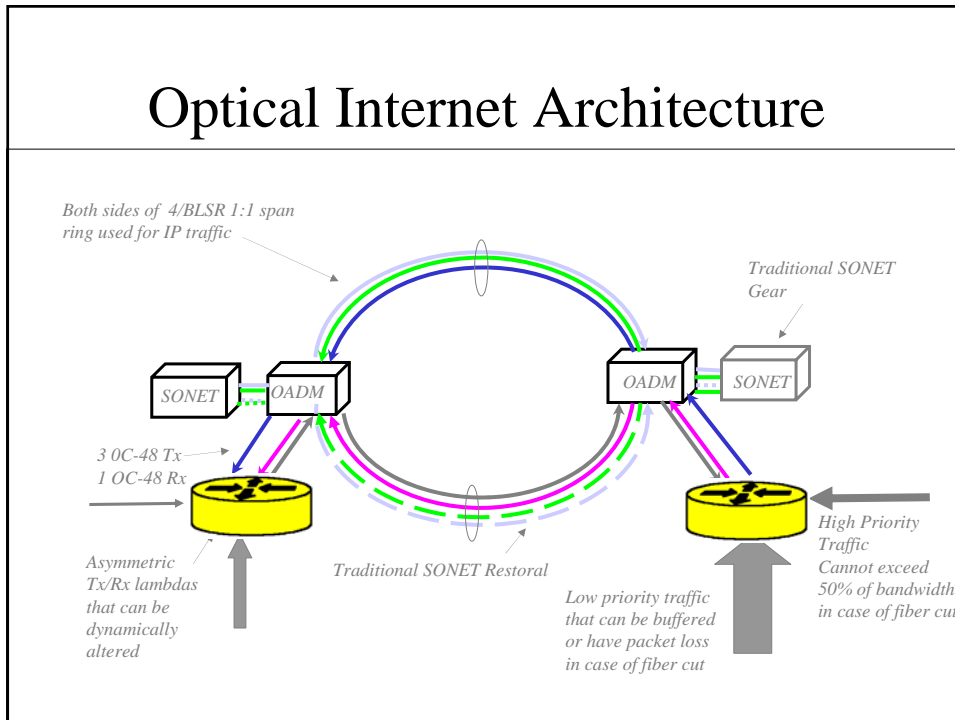
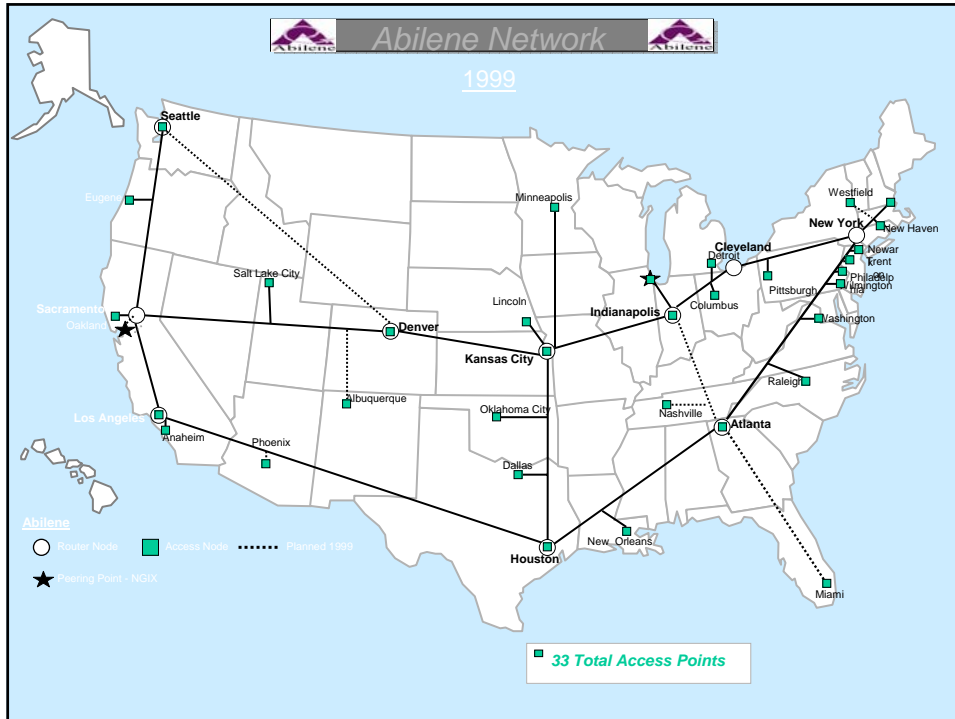
Facilitate and coordinate the development, deployment, operation and technology transfer of advanced, network-based applications and network services to further research and higher education and accelerate the availability of new services and applications on the Internet.

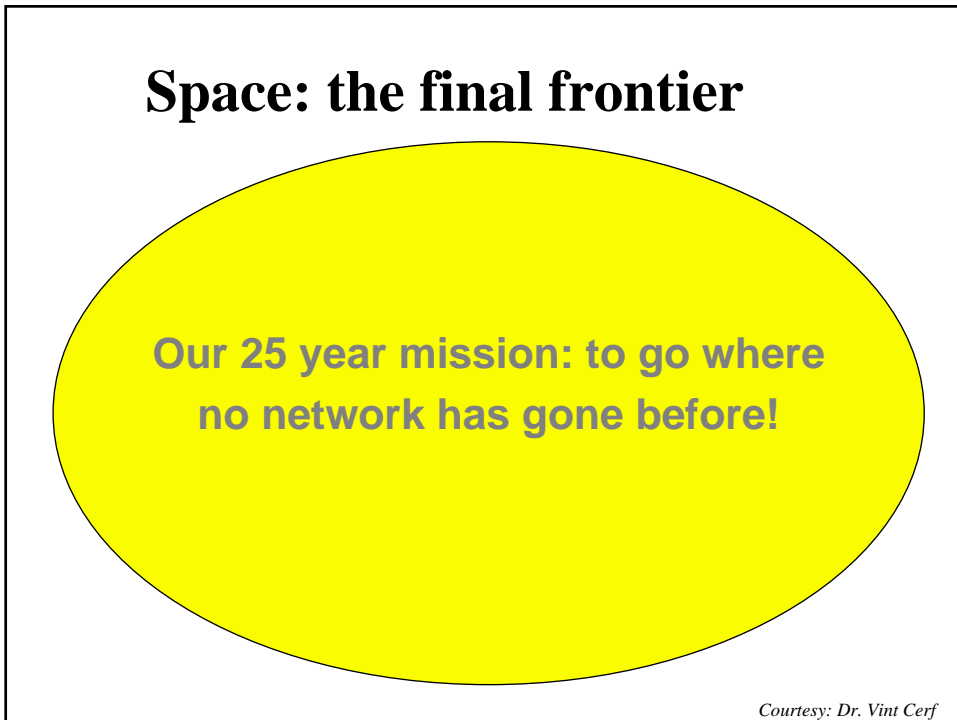
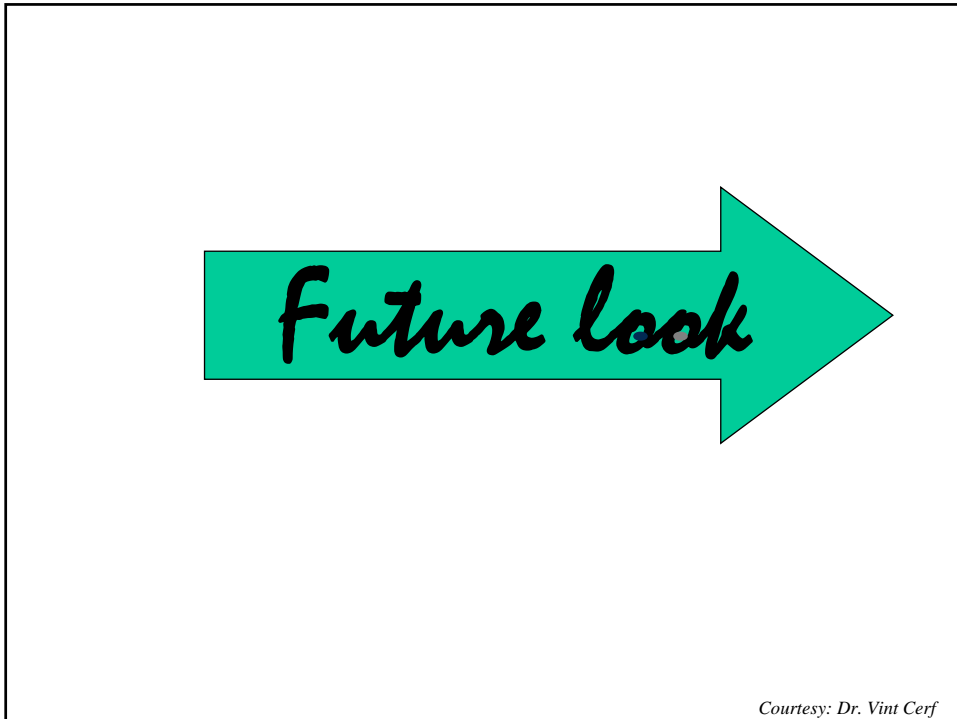


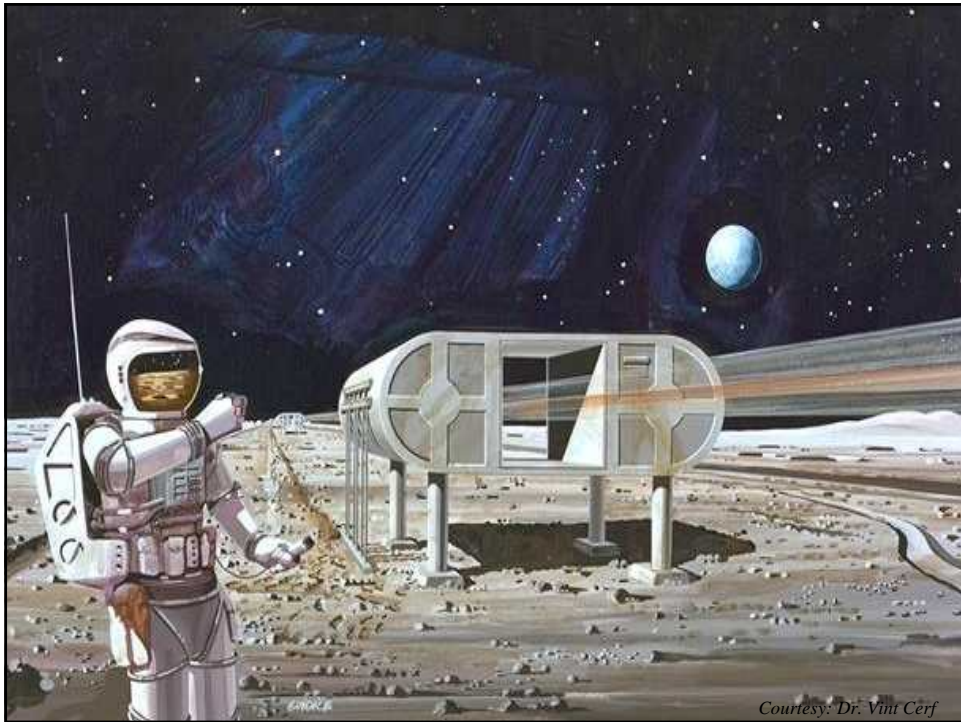
Internet2 Member Universities

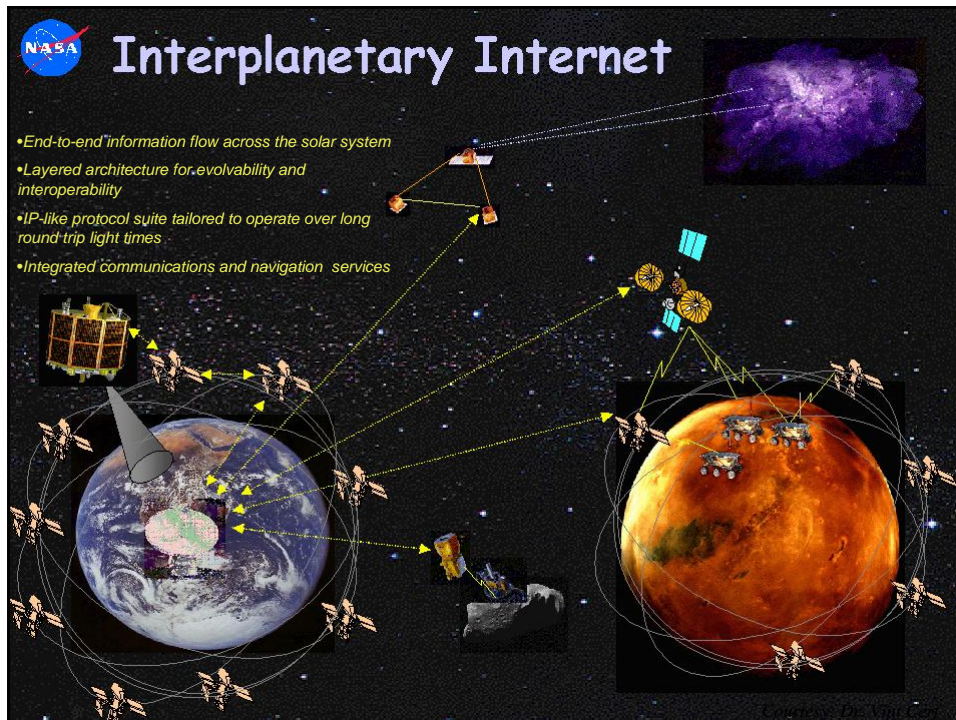


<http://www.internet2.edu>









Interplanetary Internet Status

- Part of the Mars Mission Plan
- Possible Earth/Moon mission 2001
- Low Mars Orbit and Areosynchronous satellites by 2008
- Mars Outposts by 2010
- Possible Orbiting manned mission 2018
- Possible Manned Mars station 2030??
- Stable Interplanetary backbone 2040?

Courtesy: Dr. Vint Cerf

KEY MESSAGE

As with many new developments, the most significant results and applications of the Next Generation Internet have not even been thought of yet," said **George Strawn, division director for NSF's Division of Advanced Networking Infrastructure and Research. **"The best is yet to come."****