

Approved: _____
Date 3/18/98

MINUTES OF THE HOUSE COMMITTEE ON UTILITIES.

The meeting was called to order by Chairperson Don Myers at 9:00 a.m. on February 20, 1998 in Room 519-S of the Capitol.

All members were present except:

Committee staff present: Lynne Holt, Legislative Research Department
Mary Ann Torrence, Revisor of Statutes
Mary Shaw, Committee Secretary

Conferees appearing before the committee: Dr. Victor Frost, Professor, University of Kansas

Others attending: See attached list

Chairman Don Myers opened the meeting by announcing that the Sub-committee on telecommunications slamming will meet immediately following the meeting.

The Chairman introduced Dr. Victor Frost, a Dan F. Servey Distinguished Professor of Electrical Engineering and Computer Science, University of Kansas, on "Trends in Telecommunications Technology". (Attachment #1) Dr. Frost noted that he brought copies for the committee for his presentation, and if anyone wanted a copy, see him after the meeting.

Dr. Frost spoke regarding customer expectations and technology, and access technologies in telecommunications. Questions and discussion followed.

The Chairman thanked Dr. Frost for his presentation.

The meeting was adjourned at 9:54 a.m.

The next meeting is scheduled for February 23, 1998.

Trends in Telecommunications Technology

Victor S. Frost

Dan F. Servey Distinguished Professor
Acting Director

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House Utilities
02-20-98
Attachment 1

Outline

- Drivers: Customer expectations
- Drivers: Technology
- Summary of Access Technologies
- Conclusion

Communications Networks

- Voice
- Data
 - » E-mail
 - » Web
 - » Network based applications
- Video
 - » Broadcast
 - » Video on Demand
- Today => Separate networks
- Future => An integrated network

Drivers: Customer Expectations

- Sense of always connected
- Instant response
- Ubiquitous connectivity
- Multimedia support
- Mobility support

Drivers: Customer Expectations

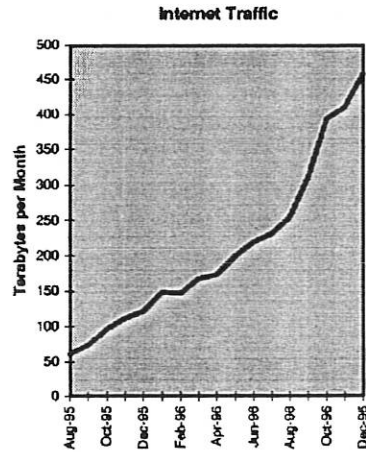
- Conferencing (simultaneous communications with multiple users)
- Personalized information services
- Context sensitive information services
- Absolutely secure
- Cheap

Drivers: Technology

Value of the Network

- The value of a network increases as the square of:
 - » The number of connected users
 - » The connection bandwidth
 - » The user computer capabilities

Drivers: Traffic Growth



Internet traffic
doubles every three
months

From: "The Dark Fiber
Paradigm",
Gilder Technology Report,
Vol. II, No 2, Feb. 1997

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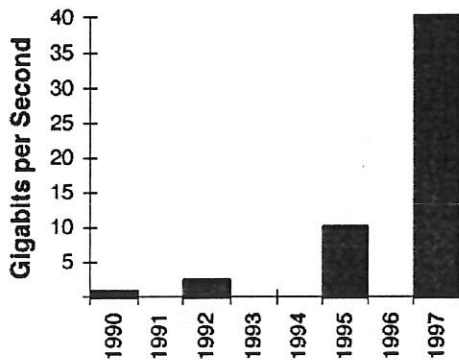
Drivers: Technology

- Processing power doubles every 18 months
- This trend has been true for the past 20 years
- Total telecommunications system capacity (b/s) triples every three years

Drivers: Technology

Available bandwidth

Fiber Speeds in Commercial Use



- Capacity of each fiber used to interconnect communications switches

- Projected to reach 1000 Gb/s in next 2-5 years

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From: "The Dark Fiber
Paradigm",
Gilder Technology Report,
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Drivers: Technology Ramifications

- Products go obsolete before they wear out
- Terminal cost decreases
- Cost of bandwidth decreases
- Value of the *network* increases
- Network devices, capacity and software technologies are *constantly changing* to support customer expectations
- Expect the trend to continue for the next 20 years.

Drivers: Technology

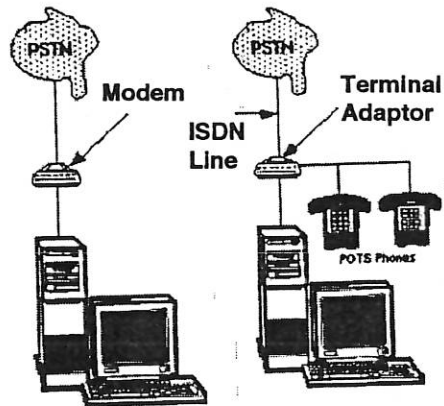
Impact of Speed

Time to transmit
a 10 Mbyte file

MODEM SPEED / TYPE	TRANSFER TIME
9.6-Kbps Telephone Modem	2.3 hours
14.4-Kbps Telephone Modem	1.5 hours
28.8-Kbps Telephone Modem	46 minutes
56-Kbps Telephone Modem	24 minutes
128-Kbps ISDN Modem	10 minutes
1.54-Mbps T-1 Connection	52 seconds
4-Mbps Cable Modem	20 seconds
10-Mbps Cable Modem	8 seconds

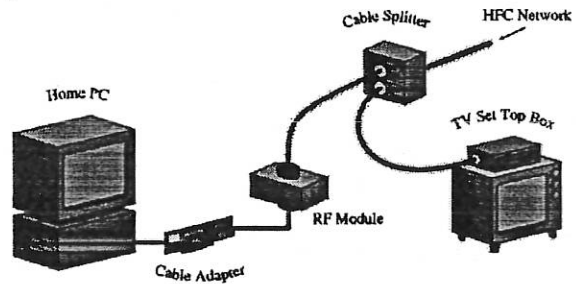
New Modes for Information Distribution to the Home: ISDN

- Integrated Services Digital Network (ISDN)
- What it is
 - » Transmission over standard telephone wires
 - » Peak rate 128 kb/s
 - » Available now



New Modes for Information Distribution to the Home: Cable

- What it is: Simultaneous transmission over cable TV coax facilities
 - » Current technology - Cable modems @ Peak rate = 500 kb/s
 - » Available now
 - » Future technology: Digital TV + 10's Mb/s



New Modes for Information Distribution to the Home: Satellite

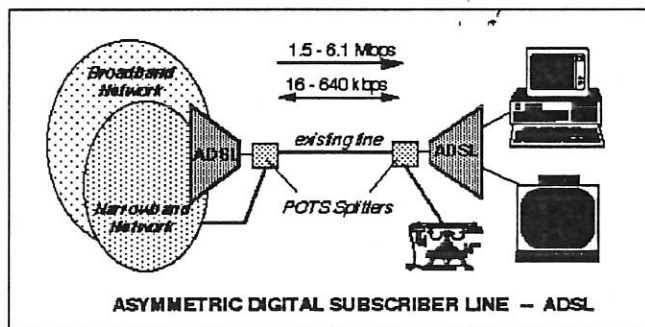
- What it is: Satellite access
 - » Asymmetric
 - » Requests are sent via modems
 - » Responses sent via satellite at 400 kb/s
 - » Available now



New Modes for Information Distribution to the Home: HDSL

- What it is

- » High-bit-rate digital subscriber line (HDSL)
- » Peak rate ~10's Mb/s
- » Access over standard telephone copper wires
- » In trials and limited deployment



ASYMMETRIC DIGITAL SUBSCRIBER LINE -- ADSL

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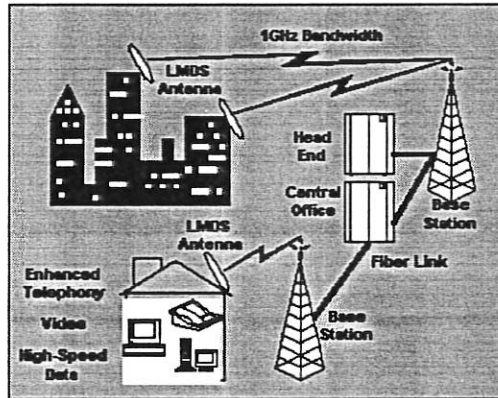
New Modes for Information Distribution to the Home: Wireless

Local Multipoint
Distribution System
(LMDS)

High Speed Wireless
Access for

- Telephone
- Video
- Internet

LMDS Infrastructure



Adapted from Texas Instruments

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New Modes for Information Distribution to the Home: Wireless

- What it is
 - » Symmetric Access ~ 10's Mb/s
 - » Asymmetric wireless access
 - Over 100 Mb/s to home
 - 1.5 Mb/s from home
 - » In trials
 - » A future technology

New Modes for Information Distribution to the Home: Costs (Estimated as of 2/98)

- Cable modem cost
 - » Installation ~ \$25
 - » ~ \$30/mo
- ISDN
 - » Installation ~ \$200.00
 - » ~ \$50 - \$100/mo
- ADSL
 - » ~ \$95/mo (for 1.5 Mb/s)
 - » SOURCE: http://www.3com.com/xdsl/05_30_97b.html
- Satellite
 - » Hardware ~ \$400
 - » ~ 24.95/month up to 64MB(approximately 25 hours online)

Conclusions

- Customer expectations are growing
- The value of being “*connected*” is increasing
- Information technology is:
 - » Changing rapidly
 - » Offering many access alternatives
- Trends are expected to continue for many years

New Modes for Information Distribution to the Home: Powerline Communications

- What is it:
 - » It is a data communication technology that operates over the electricity supply.
 - » Rates range up to 1 Mb/s
 - » In trials
 - » Future technology

