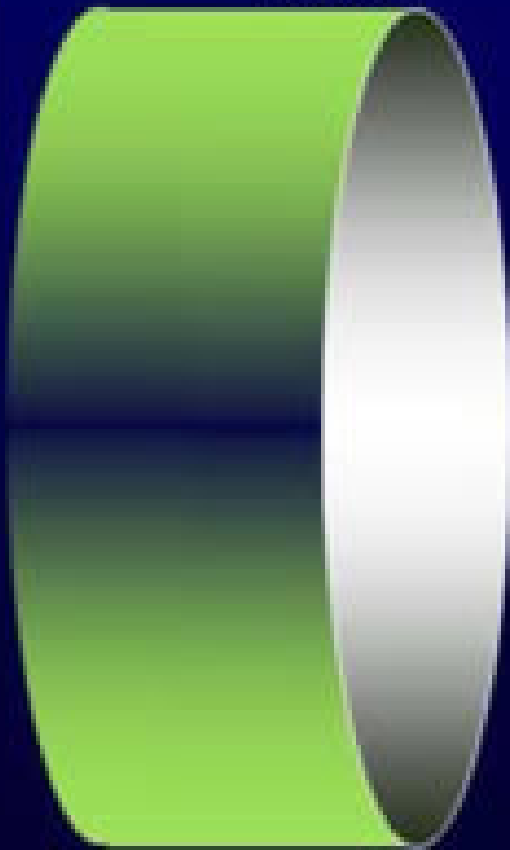


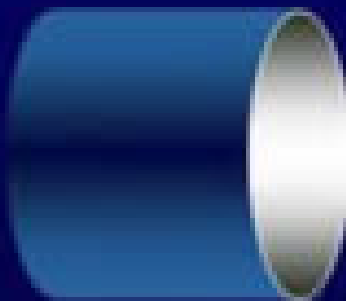
Burch/Cheswick map of the Internet
 showing the major ISPs. Data collected 28 June 1999

<http://www.cheswick.com/map/index.html>
 Copyright (C) 1999, Lucent Technologies

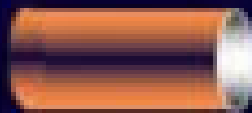
100baseT
Ethernet
≈100Mb



DS-3
≈35Mb



10baseT
Ethernet
≈10Mb



T-1 or
ISDN PRI
≈1.5Mb



3-ISDN BRIs
≈384Kb



Modem
≈56Kb



Application	Speed Required
Text	300 bps
Telephone	8 – 64 Kbps
Color image	25 – 2,500 KB
Digital Photo	1000 – 1,0000 KB
Digital Music	128 – 700 Kbps
Video Conferencing	384 – 750 Kbps
MPEG-4 VoD (Internet)	250 – 750 Kbps
MPEG-2 (DVD, Satellite)	4000 – 6,000 Kbps
HDTV (1080i compressed)	20,000 Kbps

Throughput	Type of Service
28.8 kbps	Plain Old Telephone System (POTS)
56 kbps	Switched 56
56 kbps – 34 Mbps	Switched Multimegabit Data Service (SMDS)
64 kbps	Integrated Services Digital Network (ISDN)
64 kbps	DS0
128 kbps	ISDN Dual Channel
640 kbps UP / 6 Mbps Down	Asymmetric Digital Subscriber Line (ADSL)
720 kbps	Bluetooth wireless PAN (2.4 GHz band)
1 and 2 Mbps	IEEE 802.11 wireless (2.4 GHz band)
1 Mbps	Cable Modem
1.544 Mbps	DS1/T1
2 Mbps	PCS Wireless
6.312 Mbps	DS-2/T2
11 Mbps	IEEE 802.11b wireless Wi-Fi (2.4 GHz band)
20-24 Mbps	U-NII Wireless
25.6-155.52 Mbps	Asynchronous Transfer Mode (ATM)
44.736 Mbps	DS3/T3
51.84 Mbps	OC-1/STS-1 Synchronous Optical Network (SONET)
54 Mbps	IEEE 802.11a wireless WLAN (5 GHz band)
54 Mbps / 11 Mbps	IEEE 802.11g wireless WLAN (2.4 GHz band)
155.52 Mbps	OC-3/STM-1

The Sewall Business Case

- Data Provider / Data Manager / Web Hosting
- Provide existing and new services via the Internet
- Invest in internal infrastructure to support model
- Implement reliable, scalable delivery systems
- Integrate with clients' business processes
- Deliver products such that their value is not compromised by the needs of the delivery system

Example – Small New England Town 36 sq. mi.

- Services/products might include:
 - 1:7200 Scale Color Aerial Photography
 - 1:1200 Scale Digital Orthophotos
 - 1:1200 Scale GIS Base Maps
 - 2-foot Contour Digital Terrain Models
 - 96 Photos
 - 126 Digital Orthophotos
 - 126 GIS Base Maps

Data Volumes Represented:

- 96 Scanned Photographs = 51 GB
 - 126 Orthophotos = 17.5 GB
 - 126 GIS Maps = 100 MB
 - 126 DTM Maps = 300 MB
 - Total = 68.9 GB
-
- Using New Digital Camera Technology
 - 96 Digital Photographs = 204 GB
 - Total = 291 GB

Transmit Time @ DSL Speed (6 Mbps) (Uncompressed)	Time (Seconds)
One Scanned Photo	705
One Digital Orthophoto	184
One GIS Base Map	1
One Digital Terrain Map	3
One Digital Photograph	2833

Quick Facts

- Last year Sewall flew over 2 miles of aerial film
- New digital aerial cameras will collect 6 TB/day
- Sewall currently operates 3 cameras
- Sewall maintains nearly 1 million archive images

Issues

- Sewall sees data volumes and bandwidth issues as an opportunities
- Must have reliable, scalable, redundant network
- Must maintain consistent QoS

Thank You!