

TAAC9

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Agenda

- The size and shape of the Backbone
- Who is riding the backbone
- What are the Authorware opportunities?

User experience

- Macromedia
- Apple
- Microsoft
- Graphic animators
- Game Developers

User experiences also need to be tracked

- Beyond the wow and now looking for proof of effort.
- With Authorware we have been practicing a form of Digital Asset Management for years—how well did my digital assets inform, education, and build recognition, recall & performance

But...

- We get nailed on bandwidth constraints
- Which these conferences have proven false
- The new Web Player which greatly simplifies many issues
- And the pipeline for content has grown in multiple facets

The Size and Shape of the Backbone

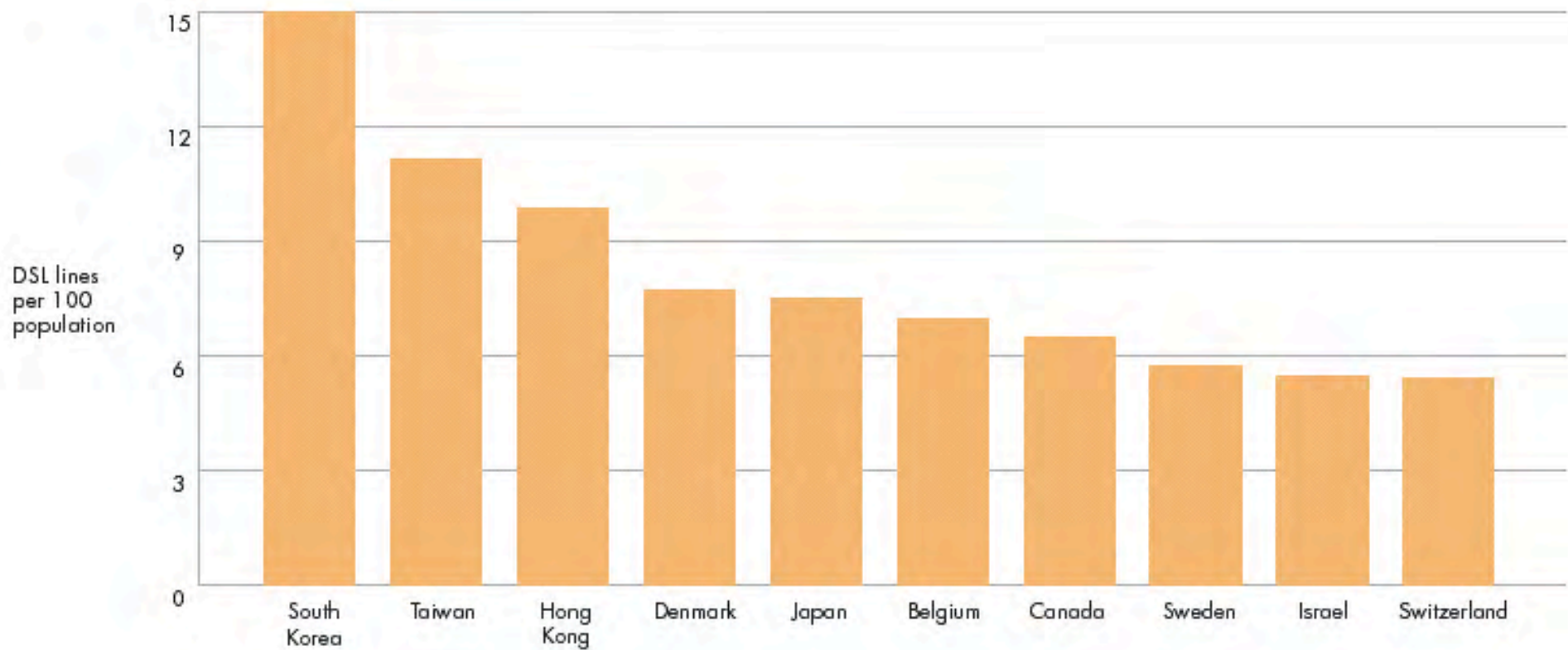
Shape of the backbone

- DSL
- Cable
- Other emerging technologies
 - Fiber
 - Satellite

Size of the backbone

- 63.8 million DSL lines worldwide—a 78% growth in 2003

Figure 1- Top 10 countries by DSL penetration (Q3 2003)



Source: Point Topic, December 2003

Size of the backbone cont...



- Asia Pacific-28 million lines
- Japan-9.2 lines
- US 8.2 million
- China 7.8(2 million is Q4 2003 alone)
- Latin America-1.393 million
- Europe, Middle East, Africa-15 million

Size of the backbone cont...

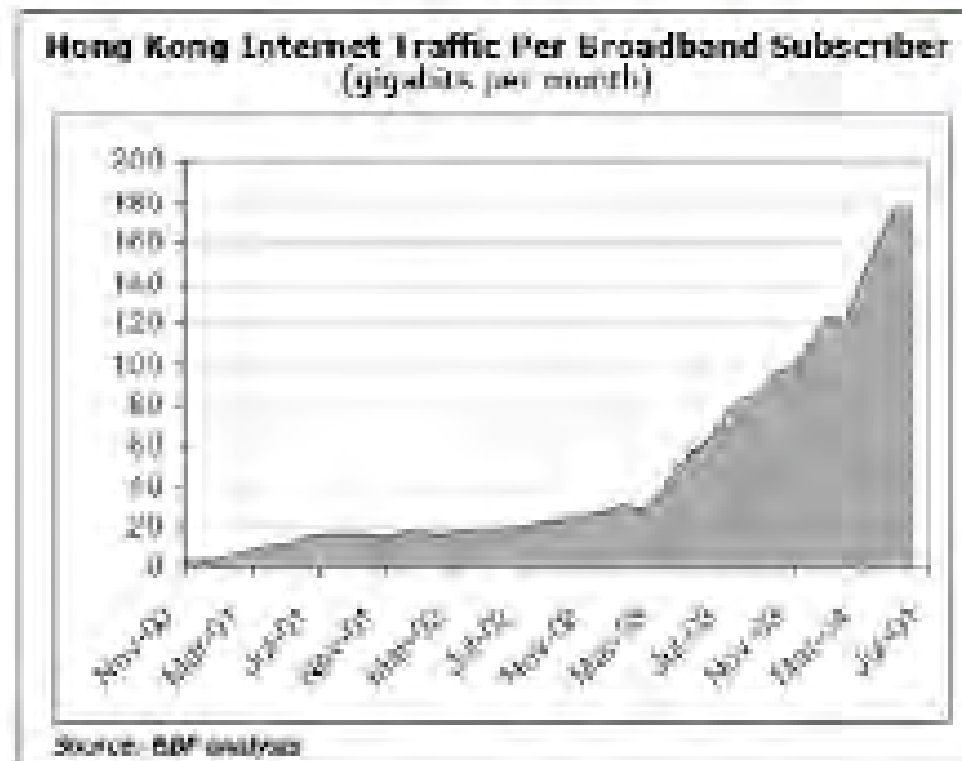
- Notable places
 - Canada

Size of the backbone cont...

- Notable places
 - Hong Kong
 - Korea

September 09, 2004

Broadband Market Snapshot Archive
available to [subscribers only](#) 





Hankooki.com > Korea Times > Technology

e-Learning to Become Strategic Industry

By Seo Jee-yeon
Staff Reporter

With the introduction of a special law on the development of e-learning businesses on Friday, the nation will support the knowledge-based online education industry in becoming one of the nation's core industries, the Ministry of Commerce, Industry and Energy (MOCIE) said Thursday.

"The global e-learning market grows 30 percent a year. Given the nation's world-famous information technology infrastructure, Korea could lead the global e-learning market in technology," the MOICE said.

Under the law, representatives from the eight ministries, including the MOCIE, the Ministry of Human Resources & Education, the Ministry of Finance and Economy and the Ministry of Planning and Budget, will set up a committee for the e-learning industry development. The committee will map out the industry development plans and implement them.

As part of steps to promote e-learning businesses, state-funded educational organizations will be encouraged to raise the e-learning ratio to 20 percent of their total educational programs, the MOCIE said.

According to the MOCIE, the world's e-learning market has been explosively growing, reaching \$6.6 billion won in 2002. The market is expected to grow to \$24 billion in 2006.

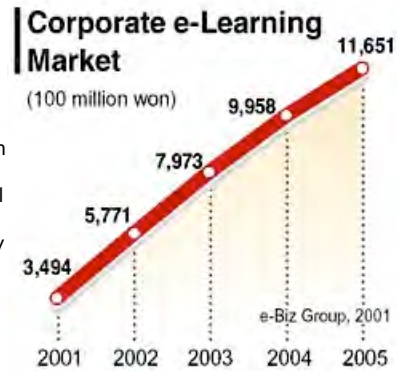
The online education market was estimated to reach 2.5 trillion last year, taking about 5 percent of the total market.

With the government encouraging households to use the internet as an alternative to excessive private tutoring costs, the local e-learning market is currently concentrating on educational programs for middle and high school students. Cyber universities also take big chunk of the market.

To facilitate the market expansion, the government will promote a corporate e-learning market.

The corporate e-learning market, where consumers are business people, continues to grow, reaching 99.6 million won this year, which takes 32.1 percent of the total corporate education market, the ministry said.

It is estimated there are 300 e-learning content providers, 100 solution providers and 1,000 e-learning service companies.



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Services

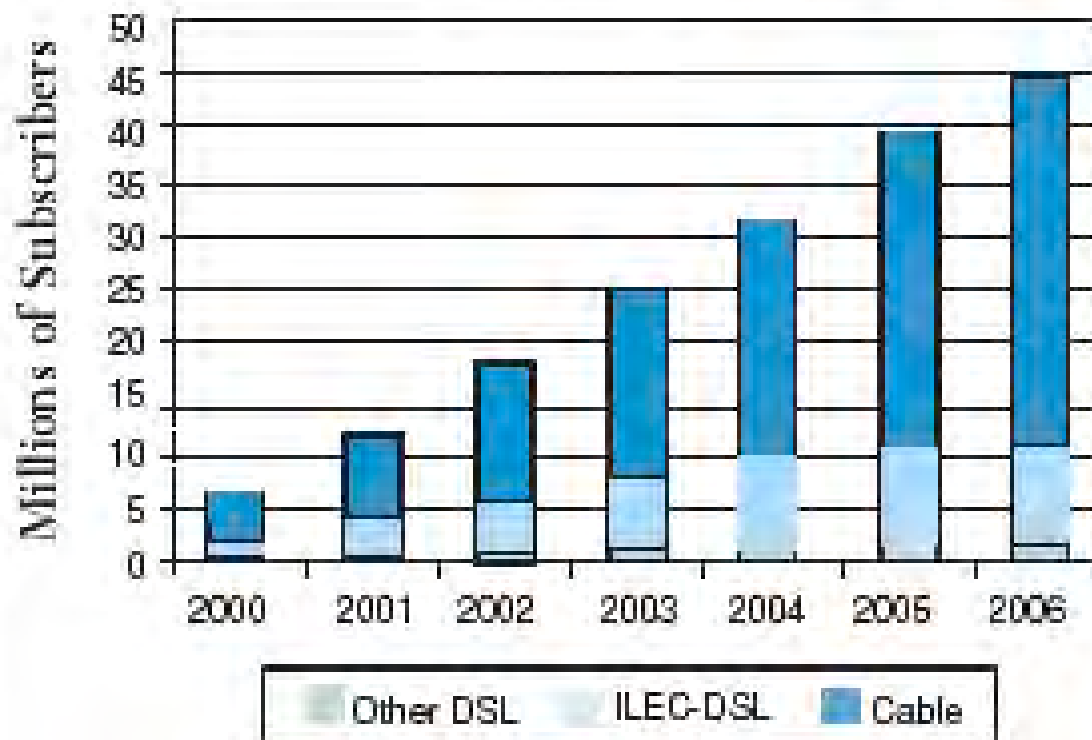
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Size of the backbone cont...

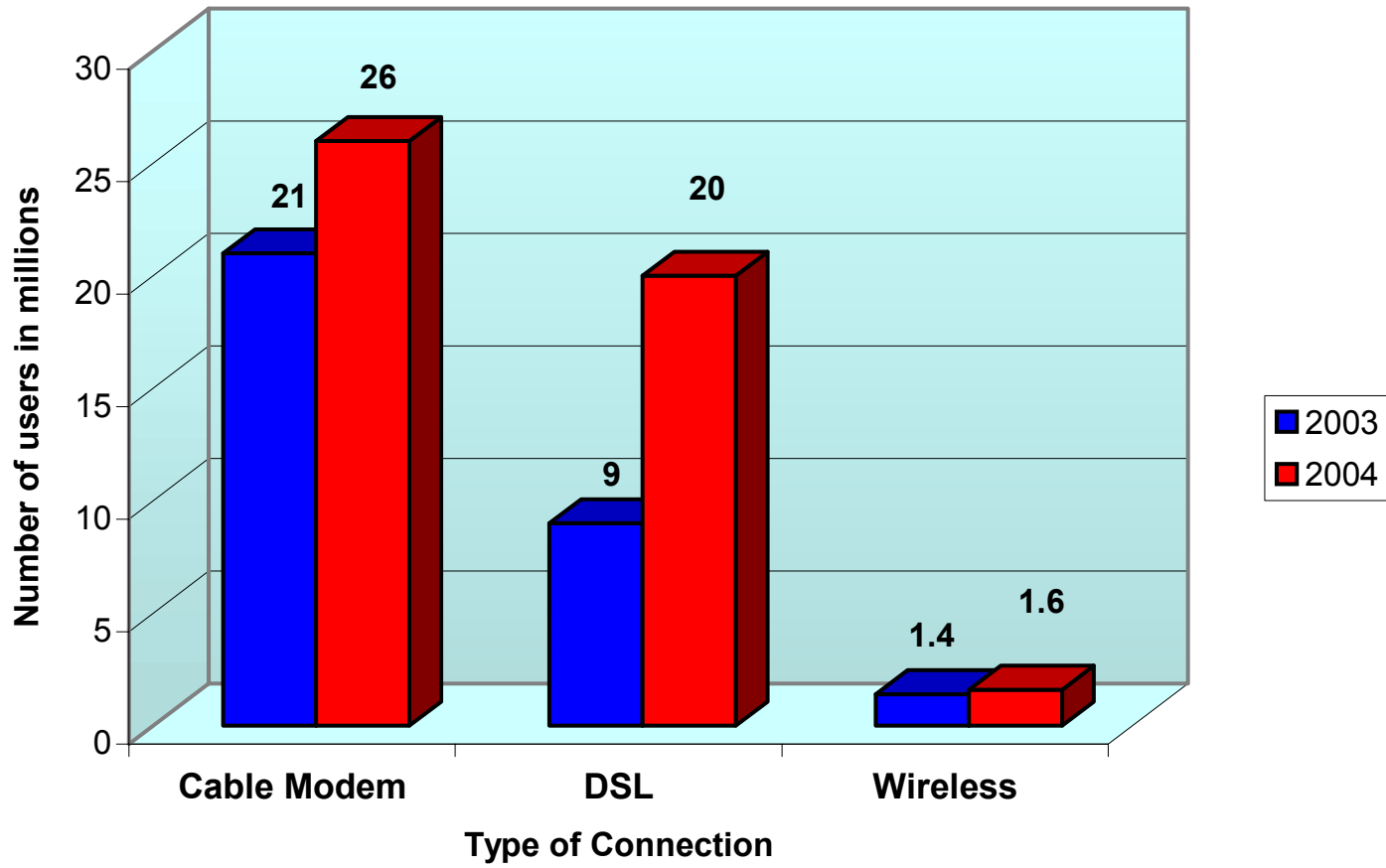
Figure 2:
U.S. Broadband: Forecast by Type of Carrier



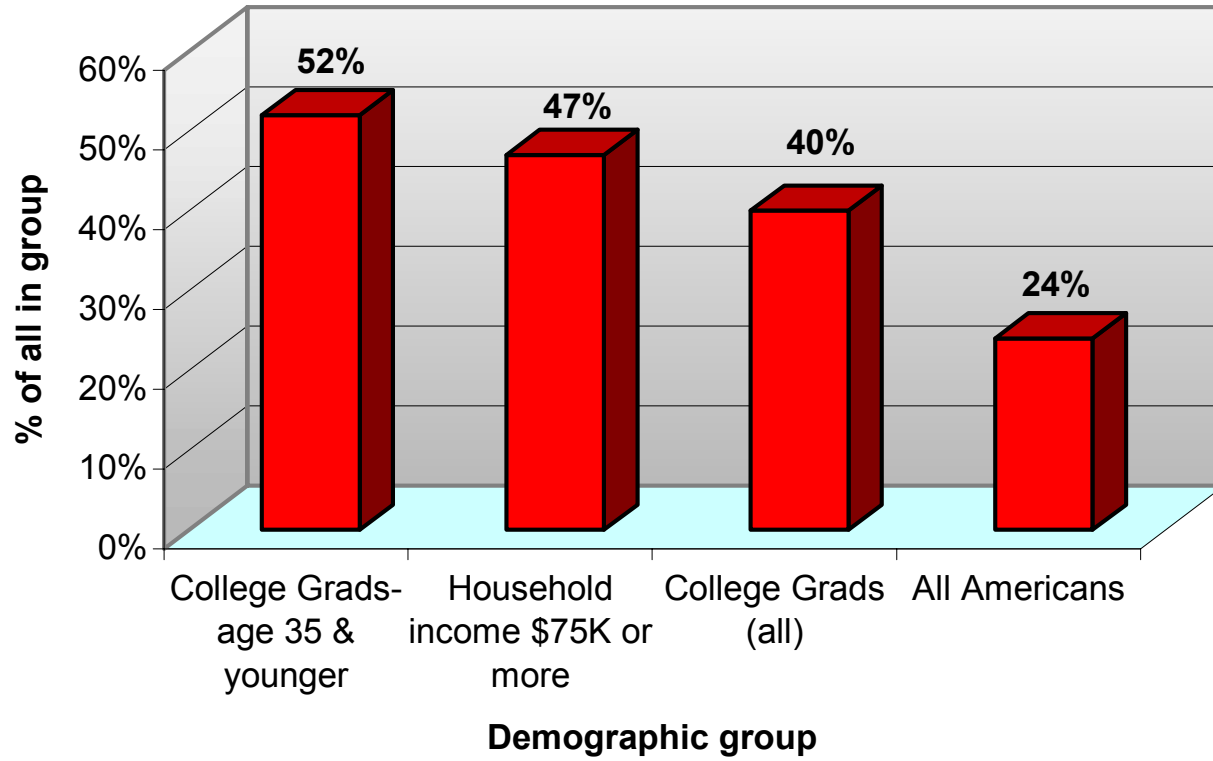
Note: ILEC-DSL are lines provided by the incumbent telephone companies;
Other DSL are lines provided by competitors using the incumbents' lines.

Source: FCC, Morgan Stanley.

Composition of Home Broadband Market



Broadband in the home



Broadband Connection Speed Trend - Home Users (US)

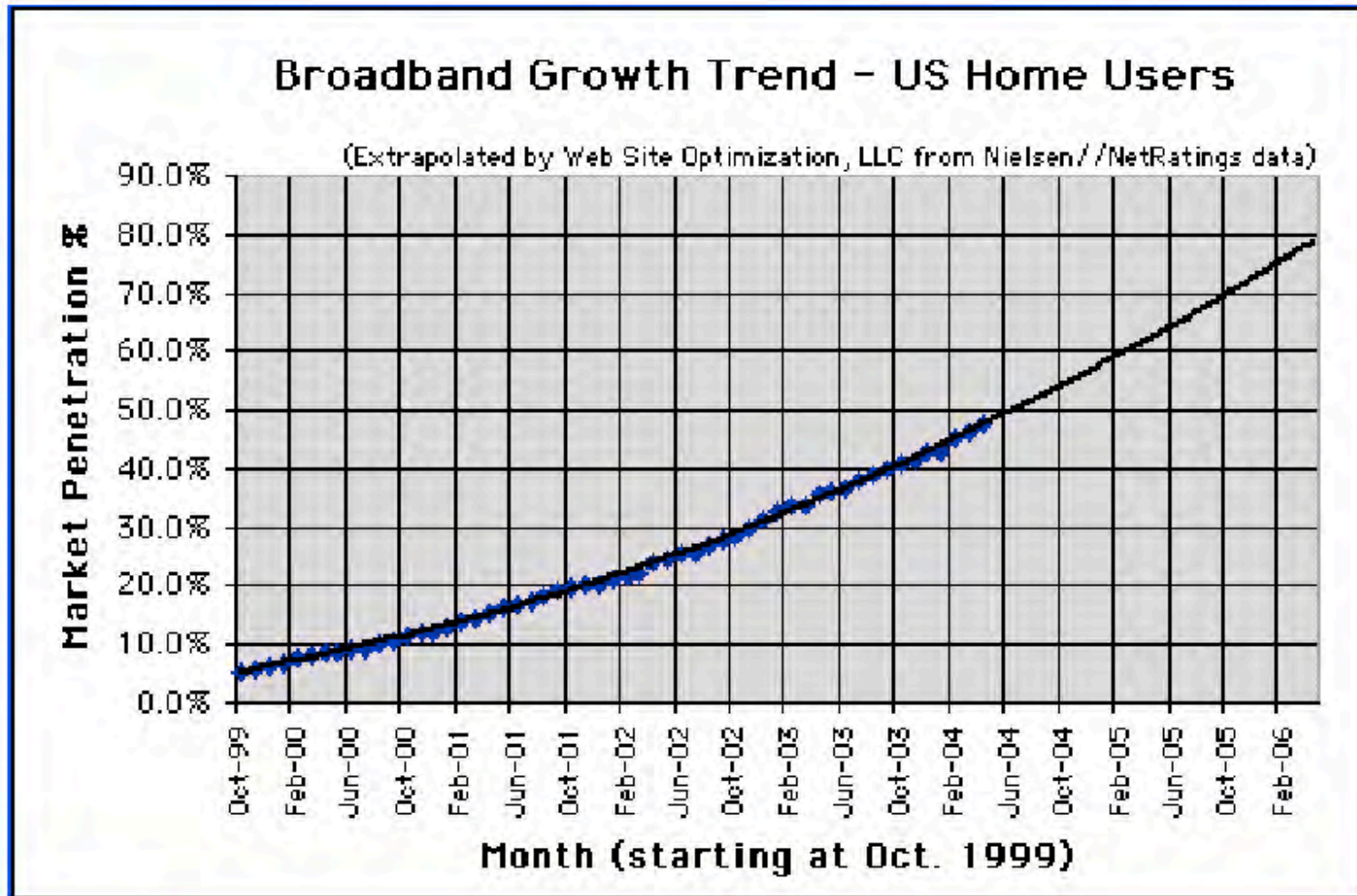


Figure 2: Broadband Connection Speed Trend - Home Users (US)
Extrapolated from Nielsen//NetRatings data

Who is on the backbone



- AOL
- Comcast
- United Online
- Microsoft
- SBC
- Earthlink
- RoadRunner

Who is on the backbone cont...

- Online universities-academic and vocational



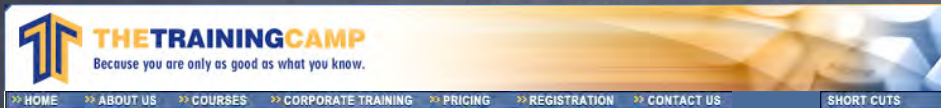
Online Education Degrees

Associate Degree | Bachelor Degree | Master Degree | Doctoral Degree | Technical Degree | Business Degree | Information Technology - IT | Criminal Justice | Paralegal Studies | Computer Science | Nursing | Fashion Design School | Interior Design School | Telecommunications Technology | Multimedia Design

Who is on the backbone cont...

- align learning opportunities with company's initiatives
- utilize technology strategically in or to support and reinforce learning
- create outside partnerships to support organizational goals
- senior management is actively

Who is on the backbone cont...



- Enterprise Solutions
- Available Courses
- Custom Training
- Courseware
- Benefits
- Success Stories



Enterprise: Tailored educational services.

Workforce Training. Added Performance.

Knowledge Key Associates is at the forefront of a movement in the technology training industry away from offering traditional, standardized technical training to corporations. The paradigm of the new millennium focuses on workforce performance enhancement - the key to our clients' business. Our corporate training division designs and implements responsive, cost effective training programs that maximize the productivity of our clients' employees.

In addition to The Training Camp's publicly available courses, Knowledge Key Associates successfully delivers education solutions satisfying the following disciplines:

- Enterprise Deployments
- Disaster Recovery Planning
- Proprietary Applications
- System Infrastructure Software
- Application Development
- Enterprise Migration
- Industry Application Training (SFA; CRM; ERP)

Our corporate education solutions portfolio includes:

- Needs Analysis
- Curriculum Assessment
- Curriculum Development
- Project Management
- Automated Enrollment
- Course Delivery
- "Train the Trainer"
- Return on Investment Analysis

Effective and efficient corporate education begins with acquiring a keen understanding of strategic organizational objectives. Our corporate account executives act as an extension of your organization, serving your needs with an *internalistic* approach - successfully guiding you from requirements gathering through assessment and reporting.

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Thinking beyond dialup and 8X CDROM's

- The problems then...
 - get enough users connected
- The situation now...
 - 740 million individuals have internet access
 - online gambling
 - video conferencing
 - VOIP

Thinking beyond dialup and 8X CDROM's

- Why?
 - It is the service bundle that will attract and retain the customer.
 - the ability to offer multiple services through a single provider is the dominant revenue model.

Thinking beyond dialup and 8X CDROM's

- Examples of services
 - entertainment—movies, music and radio
 - games
 - teleworking
 - online gambling
 - video conferencing
 - VOIP

Opportunities

- What is online training?
- Not just a two product show anymore
- Corporate Training-Blended Learning Model

Enterprise Learning for Corporate Universities

Organizations today are under intense pressure to increase their productivity as well as their performance. People are routinely being asked to produce more with less. In response to this, many organizations have set up corporate universities that partner with line-of-business managers to achieve business objectives such as increasing sales productivity, speeding time-to-market, and reducing compliance risk. They deliver increasing volumes of learning, in smaller 'knowledge nuggets,' on an anytime, anywhere basis. Increasingly, corporate universities are shifting from a physical environment to a virtual one, pushing learning through the Internet and over phone lines worldwide.

In particular, corporate universities are being asked to:

- Increase revenues by improving skills and capabilities, accelerating the time-to-market of new and improved products, and reducing the time taken for sales reps to reach quota
- Increase market share by generating performance and productivity gains that lead to superior execution of business objectives
- Reduce the cost of ensuring a highly-competent extended enterprise of employees, customers, partners and suppliers
- Reduce business risks, including loss of business due to poor customer service through lack of knowledge, and failure to maintain regulatory compliance in areas with stringent training requirements

Case Study



"We chose Saba Learning because it offers us a highly scalable, enterprise-wide solution for managing hundreds of training offerings and accelerating development across our growing employee population. Its user interface is highly intuitive and its standards-based platform provides strong support for AICC and SCORM compliant content from Saba Ecosystem partners."



With Saba's solutions, corporate universities can build

Opportunities

- DVD as a medium?
- Richer Content
- Wireless? no contest-yet...

Opportunities

- New customers...
 - Integrated Document Management Vendors
 - Small to Medium Business
 - Financial Investors
 - Seniors

Opportunities

- LMCS and LCMS are intersecting with Knowledge and Content Management Programs
- SCORM-(Shared Content Object Reference Model
- Training Outsourcing

Elicitus amongst "Most"

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Elicitus is an inexpensive tool for quickly creating e-learning courses. Anyone can master Elicitus within days and go on to create rich, interactive multimedia learning experiences. You do not need to have any programming knowledge. You do not need to buy any other software. Once you have created your course, tutorial or demo (you can do all of that and more), you can use it in a variety of ways. You can deliver it via CD-ROM, your intranet, internet or also integrate it with your Learning Management System.

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Conclusions

-
- Certificates word
- Chief Performance Office-Tony Politano-Niteo
- Just in time training
- Retaining customers through training
- "The More they know..."
- LMS's-need to prove training worked

Thank You for Your Interest!

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- Copy of presentation and supporting documents will be on the TAAC9 site

Comparative Estimates: Broadband Subscribers* in the US, 2002-2007 (In millions)

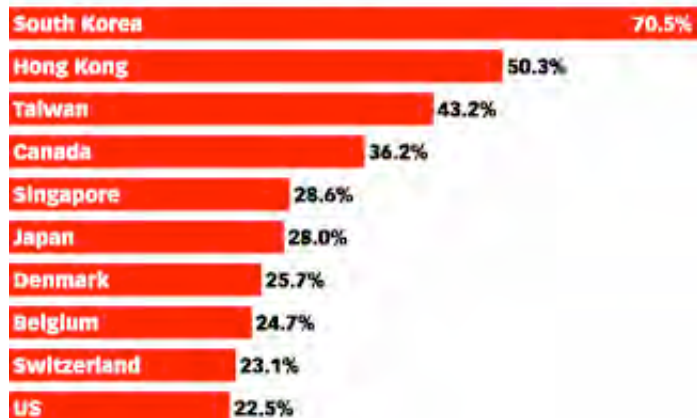
	2002	2003	2004	2005	2006	2007
eMarketer, March 2004	19.9	27.6	35.5	43.2	50.7	58.3
IDC, August 2003 (2)	17.3	24.1	32.5	41.3	49.9	56.9
Yankee Group, August 2003	18.9	26.2	33.5	41.0	48.1	55.2

*Note: *includes business and residential subscribers; (1) includes all residential and business broadband lines except wireless LAN, Bluetooth or 3G mobile subscribers; (2) cable and DSL only*

Source: eMarketer, March 2004

Canada and a number of other countries in Europe and Asia. The US holds a similar position in terms of broadband household penetration as a percentage of all households. eMarketer released its findings for this metric in March 2004, noting that the US still lagged in 2003. What this shows is that the country is lagging not only in terms of connection speeds, but also in terms of how many people are actually signing on for broadband.

Top 10 Broadband Countries Worldwide, Ranked by Household Penetration, 2003



Source: eMarketer, March 2004

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www.eMarketer.com

Granted, there are geographic and demographic factors to consider — South Korea, Hong Kong and Taiwan have smaller land areas and higher population densities compared to the US. Still, South Korea's household broadband penetration is over three times that of the United States, and Canada is 14 percentage points higher.




While the FCC's conclusion that the US is making progress in terms of broadband deployment is correct, it's also obvious that the US is not the leader in the consumer broadband market in terms of usage or technology. The FCC is merely reporting on how far along the country is towards broadband access saturation, and so its conclusion that the country is nearing that goal is correct. What should be addressed, however, is how to better the broadband services US consumers receive, and how to get them to use it more.



Broadband | checker

Broadband Summary

Broadband services for the **DT10 2LH** area on 14th October 2004

- ADSL**  ADSL Broadband is available
- Cable**  See Cable section below
- Satellite**  Satellite Broadband is available

Broadband services may be subject to additional line tests and available network capacity in your area.

Free updates
by e-mail





We take your [privacy seriously](#) - you will only ever receive e-mails from Broadband Checker

Receive occasional updates when new broadband services or offers become available in your area.

ADSL Broadband

Availability for the **DT10 2LH** area

- Exchange**  • Your local BT Exchange is ADSL enabled
- Line**  • Postcode-only checks are not 100% accurate
• Please [enter your phone number](#)

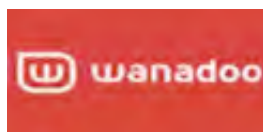


AOL Broadband

- **AOL unlimited broadband - unlimited time online, unlimited downloads**
[Silver £19.99 per month](#). 256 Kbps - Up to 5 x faster
[Gold £24.99 per month](#). 512 Kbps - Up to 10 x faster
[Platinum £29.99 per month](#). 1 Mbps - Up to 20 x faster
- **All packages include:**
Free modem until 31/12/2004
Free connection
Email with 7 email addresses
Instant messaging
Extensive content
McAfee ® firewall protection, anti-virus scanning on emails, spam filters
Pop-up blockers and Parental Controls to help keep everything running smoothly
Free customer helpline and technical advice
- **Exclusive to Gold and Platinum packages:**
Video instant messaging
Home networking support
Radio@AOL Broadband with over 100 stations
Gaming - compatible with Playstation Net and Xbox Live

- AOL are committed to offering members the right choice of products at the right price. Pay just one flat rate fee with no hidden costs - no matter how long you spend online. There are no set up costs, no installation costs and no usage or download limits.

[Click here for more information or to take advantage of this offer](#)



Wanadoo
Broadband



- **£17.99 per month for 1Mb (20x speed) connection**
1Mb speed for the price of regular 512k
- 2GB monthly usage allowance (regular user)
- £22.99 per month for 1Mb (20x speed) connection
- 6GB monthly usage allowance (heavy user)
- £27.99 per month for 1Mb (20x speed) connection
- 30GB monthly usage allowance (power user)
- 512k service still available for lines not capable of 1Mb
- **Monthly limits are not currently enforced**
- **Free connection for on-line orders - save £30**
- **Free modem for on-line orders - save £50**
- Free broadband content - music, entertainment, news and sport
- Unlimited e-mail addresses and free web space
- Fully compatible with Playstation Net and Xbox Live
- Wireless home network package available for £79.99
- Formerly known as Freeserve

[Click here for more information on this offer](#)



BT Broadband



- **£17.99 per month (was £19.99) for 512k (10x speed) connection**
- 1GB monthly usage allowance (light user)
- £24.99 per month for 512k (10x speed) connection
- 15GB monthly usage allowance (heavy user)
- **Free connection**
- **Free modem for on-line orders - save £25**
- Single bill for broadband and BT phone

[Click here for more information on this offer](#)



One.Tel Broadband



- **£29.99 per month for 512k broadband + Unlimited phone calls**
Unlimited broadband - no restrictions
Unlimited calls to UK landlines at any time
Low price calls to mobiles
Free TopCaller - save up to an extra 20% on 18 favourite numbers
Free UK Directory Enquiries
Free £20 credit on your first bill
- **Free connection - save £50**
- **Free modem - save £40**



BT Yahoo!
Broadband



- £26.99 per month for 512k (10x speed) connection
- 15GB monthly usage allowance (heavy user)
- £29.99 per month for 1Mb (20x speed) connection
- 30GB monthly usage allowance (power user)
- Free connection
- Free modem for on-line orders - save £25
- Free spam, junk mail and e-mail virus protection
- Free parental controls and PC Firewall software

Cable Broadband

Availability of selected Cable services in the **DT10 2LH** area



ntl:home Cable



- Unable to determine if ntl:home cable broadband is available in your area
- Please check that you have used a valid postcode and try again
- £17.99 per month for 300k (6x speed) connection
- £24.99 per month for 750k (15x speed) connection
- £37.99 per month for 1.5Mb (30x speed) connection
- First 3 months half price
- Free standard installation - save up to £75
- Free cable modem rental



Telewest Cable



- Telewest blueyonder cable broadband is not currently available in your area
- Click the Telewest logo to see what other services are available
- £19.99 per month for 256k (5x speed) connection
- £27.99 per month for 750k (15x speed) connection
- £37.99 per month for 1.5Mb (30x speed) connection
- £52.99 per month for 3Mb (60x speed) connection
- Extra discounts when ordered with bundled TV/Phone packages
- Free cable modem rental
- Free standard installation - save £50
- Free 2 months service - save up to £100
- Up to £30 extra discount for on-line orders
- *Offers end 31st October 2004*

Satellite Broadband

Availability of selected Satellite Broadband services in the **DT10 2LH** area



Aramiska Satellite Broadband



- **Aramiska Business Satellite Broadband is available from just £125 per month**
- **Call 0808 100 3555 to talk to Aramiska about this special Broadband Checker offer**
- Two-way satellite broadband service
- Download speeds up to 2Mb
- Guaranteed data speeds
- Unlimited data transfers
- Unlimited number of connected PCs
- Local Aramiska mail server with unlimited email addresses
- Firewall, virus scanning, domain name and web hosting included
- End-to-end monitoring of network with around the clock support



Avonline Satellite Broadband



- **Avonline two-way business satellite broadband is available in your area now**
- **In less than 30-days you can be connected to high speed broadband Internet and email**
- Click on the Avonline logo to view all of their products and services
- Business-class service starts at £59.99+VAT per month
- Installation service from £300+VAT
- Two-way, always on service - no need for dial-up
- Download speeds from 512kbps to 2Mbps, uploads up to 2Mbps
- Various service levels with support for IPsec VPN, video conferencing and Voice-Over-IP
- Grants are available - click the logo to request more information
- Wireless solutions are available for shared satellite access, Wi-Fi or building-to-building links



AVC Satellite
Broadband



- **AVC one-way satellite broadband is available in your area**
- Click on the AVC Broadband logo for full service information and special offers
- **From £19.99 per month for 256k service**
- Download speeds up to 2Mb available
- £174.99 for a full installation and equipment package
- £4.99 per month for ISP service (or use your existing connection)
- Free connection
- **Service uses a standard Astra type digital TV satellite dish**
Uses your existing Astra dish or AVC will install a mini-dish free of charge

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Broadband Internet access

From Wikipedia, the free encyclopedia.

The term **broadband Internet access**, often shortened to "**broadband Internet**" or just "**broadband**", generically refers to last-mile Internet connections exceeding the bandwidth capabilities of standard analog modems and of ISDN connections. Broadband Internet connections are typically capable of transmitting 512 kilobits per second (kbit/s) or more.

The term **broadband** is itself often a misnomer, because cable modems utilise a narrowband communication channel to the ISP. Both 56 kbit/s modems and ADSL modems utilise a true broadband communication channel to the ISP.

Broadband is also commonly known as **high-speed Internet**, because the increased bandwidth effectively reduces the time required for transmission of data; this term is something of a misnomer, however, since the actual transmission speed is essentially the same. An Internet access line can be compared to a water pipe: modem access over a telephone line is a small pipe with relatively low water capacity, while broadband access is a larger pipe with a comparatively larger water capacity. The water, or data, travels at roughly the same speed through either pipe, but the larger pipe can move more water, or data, in a given time period.

In some countries broadband services operate at over 1 Mbit/s for connections to private residences, with higher data transfer rates possible for business purposes, but involving a correspondingly higher charge.

In the United Kingdom many domestic users have connections either via cable modems, or via ADSL, and these typically run at around 500 kbit/s. Commercial users can obtain higher data rates for a higher subscription. In a few of the many areas not served by cable or ADSL, community organisations have begun to install Wi-Fi networks.

In the USA many users have connections at about 380 kbit/s (as of 2002), though this situation may change as new equipment appears.

Other technologies include bi-directional satellite satmodems and power line communication modems which use the electric grid to provide access to the Internet.

The typical broadband connection to date, whether cable or xDSL, is configured by the ISP to run at bit rates from 350-500 kbit/s. The full rate connection for a typical cable plant might be as high as 10 Mbit/s and with ADSL it might be 2 to 6 Mbit/s (limited by how long the subscriber loop is - shorter loop, higher speed).

In Canada, broadband Internet access is estimated to serve at least 53% of internet users (January 2003). The competition between the major broadband Internet providers in that country has recently caused frequent increases in the available bandwidth provided to home users. As of May 2004, a standard broadband Internet package provides 3.0 Mbit/s downstream and 300 kbit/s upstream rates for both cable- and DSL-based services. Some residential service providers (such as Cogeco (<http://www.cogeco.ca/>) or Rogers (<http://www.rogers.com>)) offer speeds of 5 Mbit/s or higher.

In practice, even this bandwidth is not always reliably available to the consumer, as ISPs tend to overbook their backbone capacity. Since most user connections typically only operate at a small fraction of their full rated bandwidth, this aggregation strategy works more often than not, so users can typically burst to their full bandwidth most of the time. Peer-to-peer file sharing systems stress these assumptions, and can cause major problems for ISPs who have excessively overbooked their capacity. (See network traffic engineering for a fuller discussion).

As takeup for this introductory products increases, telcos are starting to offer higher bit rate services. For existing connections, this most of the time simply involves reconfiguring the existing equipment at each end of the connection.

In Ireland, the telephone monopoly Eircom resisted the introduction of broadband because they were making so much money from per-minute billing on 56 kbit/s dialup. A consumer pressure group, Ireland Offline, was set up which was successful in convincing the government to force Eircom to introduce flat-rate dialup billing. This set the stage for the introduction of true broadband services by other ISPs (and then Eircom). Because Eircom had not invested in modern telecommunications infrastructure, however, most localities in rural Ireland are unable to get DSL over copper. The Group Data Scheme Society, an Irish cooperative, has organised to help local communities set up their own internet networks whether with wireless or other technologies.

Newer technologies for twisted pair phone lines such as VDSL and pushing fiber optic connections closer to the subscriber in both telephone and cable plants are opening up the possibility of higher performance for streaming data, such as audio and video streams. There are now many streaming audio services, and several streaming video services. Broadband Internet access also facilitates the use of file sharing software.

The data rates on most broadband services still do not suffice to provide good quality video, as MPEG-2 quality video requires about 6 Mbit/s for good results. Adequate video for some purposes becomes possible at lower data rates, with rates of 768 kbit/s and 384 kbit/s used for some video conferencing applications. The MPEG-4 format delivers high-quality video at 2 Mbit/s, at the high end of cable modem and ADSL performance. The Ogg Tarkin format is intended to deliver similar performance.

As the bandwidth delivered to end-users increases, the market expects that video on demand services streamed over the Internet will become more popular, though at the present time such services generally require specialised networks.

Increased bandwidth has already made an impact on newsgroups: postings to groups such as alt.binaries.* have grown from JPEG images to entire CD and DVD images. According to NTL, the level of traffic on their network increased from a daily inbound news feed of 150 gigabytes of data per day and 1 terabyte of data out each day in 2001 to 500 gigabytes of data inbound and over 4 terabytes out each day in 2002.

Transmission rates for common broadband solutions:

Connection Transmission Speed

DS1 (Tier 1)	1.544 Mbit/s
E1	2.048 Mbit/s
DS3 (Tier 3)	44.736 Mbit/s
OC3	155.52 Mbit/s
OC12	622.08 Mbit/s
OC48	2.488 Gbit/s
OC192	9.953 Gbit/s
OC768	39.813 Gbit/s

External links:

- **Broadband Industry Structure** (*<http://www.sims.berkeley.edu/~bigyale/BroadbandIndustryStructure.ppt>*) PowerPoint presentation about broadband business models, technology and pricing.
- **Broadband Fact Sheets** (*<http://www.fact-sheets.com/internet-technology/broadband/>*) Gives an overview of the different broadband connections available to consumers.

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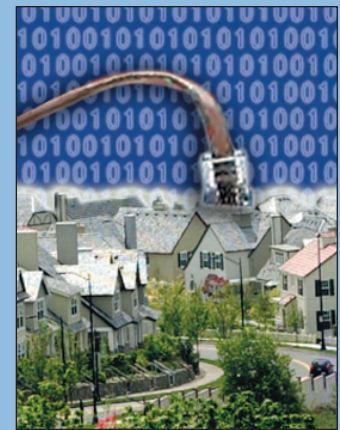
Related Brookings Resources

- *Broadband: Should We Regulate High-Speed Internet Access?*
Robert W. Crandall and James H. Alleman (AEI-Brookings, 2003)
- *The Broadband Problem: Anatomy of a Market Failure and a Policy Dilemma*
Charles H. Ferguson (forthcoming, 2003)
- *Who Pays for Universal Service? When Telephone Subsidies Become Transparent*
Robert W. Crandall and Leonard Waverman (2000)
- The AEI-Brookings Joint Center for Regulatory Studies
www.aei-brookings.org

Debating U.S. Broadband Policy: An Economic Perspective

ROBERT W. CRANDALL

Two years ago, the telecommunications sector seemed poised to grow at astronomical rates, fed by the dizzying optimism over the Internet. Today, the telecom sector is weathering enormous financial strain, despite the fact that two-thirds of U.S. households now have personal computers and nearly 15 percent have high-speed or “broadband” connections to the Internet. Many observers worry that broadband is spreading too slowly to induce the expansion of the content required to make such a service attractive to most Americans and to provide sufficient demand to utilize the enormous excess capacity in telecommunications created by the 1998-2000 investment boom.



Telephone companies such as Verizon, SBC, and BellSouth are highly regulated in their delivery of broadband services. Their principal broadband competitors—cable companies—also face the threat of regulation. There are now calls for increased regulation, including even some cries to require “structural separation” of network facilities from the delivery of retail broadband services. But such regulation may reduce the incentive to deploy broadband or any other new service.

DELIVERING BROADBAND: THE TECHNOLOGY

Just two years ago, telephone carriers, cable companies, and satellite companies were making huge investments to meet the anticipated growth in telecommunications traffic as more and

more households connected to the Internet and every business gave its employees high-speed connections. The principal obstacle to continued growth appeared to be the slow “last-mile” Internet connections to residences and small businesses.



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Washington, DC 20036



The delivery of high-speed or “broadband” Internet services to the dispersed residences and small businesses in the United States is not an easy task. At present, there are essentially three technologies for delivery of these services: cable modem services provided by cable-television companies, digital subscriber line (DSL) services provided by telephone companies, and wireless technologies, including satellite services. All of these technologies have become economically feasible only in the last four or five years, and all require large investments by the carriers. As of mid-2002, about 12 percent of households subscribed to one of these services, according to the Federal Communications Commission (FCC). Roughly two-thirds of the subscriptions are to cable modem services, and DSL accounts for most of the rest. Satellite and wireless services have a very small presence, but one which may be growing in the near future.

No carrier can offer broadband connections without making substantial investments. Traditional telephone company networks were designed to deliver slower voice and data services, often over rather long pairs of copper wires. To offer high-speed services to large numbers of dispersed residential or small business customers, these companies must extend fiber optics closer to their subscribers, install large numbers of remote terminals, and invest in a variety of electronic equipment. Likewise, cable companies’ networks were originally designed for one-way video distribution, not two-way high-speed Internet services. They must also

extend fiber closer to their subscribers, install two-way amplifiers, and invest in modems and other electronic equipment to provide modern broadband services. Finally, satellite and wireless carriers must build their broadband service capability from scratch. Currently, satellite carriers are deploying expensive new satellites with “spot beam” capability to allow for more subscribers per unit of spectrum. Other wireless broadband services are still very much in an experimental stage and may not provide a sufficient return on investment to survive.

All of these investments are risky. No one knows how many residences will want broadband and how soon they will want it. New technologies may overwhelm the existing broadband technologies before the investment in the latter can be recouped. If regulation serves to cap the returns available from favorable market events, it may depress the overall expected return to a level that makes investment in many geographical areas unattractive.

REGULATION: THE ISSUES

The most important public policy issues involving broadband deployment are largely those that derive from existing regulatory policies. The incumbent telephone companies are regulated in two ways. First, their broadband retail offerings are subject to price regulation by either the states or the FCC. Second, the 1996 Telecommunications law requires them to make their network facilities available to competitors at regulated prices whenever such facilities are deemed to be necessary for new entrants to offer their



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own DSL services. Most of the controversy over broadband regulation of incumbent telephone companies involves the determination of which facilities must be provided to competitors and the proper cost standard for determining the leased rates of these facilities.

The cable companies are not currently regulated with respect to broadband Internet connections, but the FCC is now considering whether and how to assert such regulation in response to a federal court decision that concluded that cable modem service has a telecommunications component. The principal controversy in regulating cable modem service is not whether it should be subject to the same retail and wholesale regulation as telephone companies but whether cable systems should be required to open their services to competing Internet service providers (ISPs). Thus, regardless of the FCC's decision on cable broadband services, it seems likely that asymmetric regulation will continue—that is, that telephone companies will be regulated much more heavily than their cable rivals.

The justification for this asymmetric regulation generally falls into two categories. First, telephone companies are alleged to have last-mile “bottleneck” facilities without which independent broadband providers cannot compete. For some reason, the cable companies' last-mile facilities that parallel the telephone company lines are not considered by the current regulatory regime's supporters as similar “bottleneck” facilities. Nor, apparently, are wireless and satellite facilities.

Second, the telephone companies are alleged to have reduced incentives to deploy DSL services because such services could substitute for other high-speed services they sell to medium and large businesses. Cable companies do not generally offer such services.

Legislation that passed the House of Representatives in 2002 would have largely eliminated these regulations on telephone-company broadband services, but the legislation did not clear the Senate. With most new providers of telephone service, particularly those concentrating on broadband DSL services, failing or bankrupt, there is pressure to keep this regulation and even to tighten it to create an environment in which these new competitors can survive. Among the newer regulatory proposals are those that would divide the incumbent telephone companies into separate wholesale and retail divisions or even separate companies. Such separation is proposed to prevent any discrimination by the incumbent telephone companies against their nascent rivals.

A final policy problem concerns the interdependence between the provision of broadband service and the development of broadband content. Many consumers may not choose to subscribe to the new broadband because they perceive that there are few uses of it that interest them. On the other hand, content providers may not invest in new, innovative applications because there are too few subscribers. The obvious solution to this “chicken and egg” dilemma is to allow vertical

“Many consumers may not choose to subscribe to the new broadband because they perceive that there are few uses of it that interest them. On the other hand, content providers may not invest in new, innovative applications because there are too few subscribers.”



integration between content providers and broadband carriers. Such integration is often controversial, however, because of the fear that such integrated enterprises will achieve advantages that result in monopoly power. The lengthy regulatory process that the AOL-Time Warner merger faced is a reflection of these concerns.

Is regulation slowing the pace of broadband subscriptions? Is the current competition between cable and incumbent telephone companies sufficient to spur the deployment of broadband technologies? Is vertical integration required to generate an optimal pace of development of broadband content and broadband subscriber lines? Should the government subsidize broadband deployment in underserved areas, and if so, what form should such subsidies assume? These issues are at the center of the current debate over broadband policy.

ECONOMISTS DEBATE THE POLICY

There is not universal agreement among economists on the nature of the broadband problem, the role of regulation, or the need for government action to promote broadband. With the future of broadband so difficult to predict, this is understandable. However, there are some broad areas of consensus that emerge from a careful debate over the issues. (The recent Brookings book, *Broadband: Should We Regulate Interstate Access?* contains an intensive discussion

of these issues by leading economists involved in this debate.)

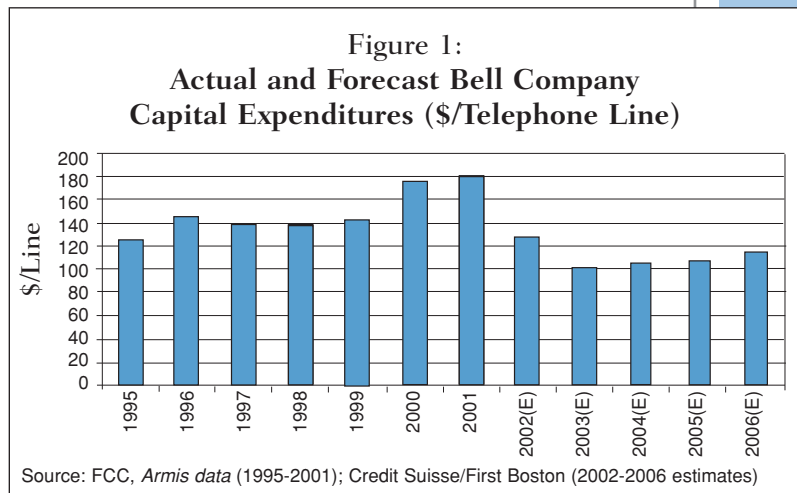
Is Broadband Deployment Fast Enough? Many economists argue that despite the concern over excessive regulation, broadband is spreading at least as fast as previous new consumer technologies such as television, cable television, VCRs, or the personal computer. Nevertheless, many households still do not have a choice of cable modem service and DSL, and some still have no access to either. Given that telephone companies are the more highly regulated, the fact that DSL is still not available to as many households as is cable modem service suggests that regulation may be slowing the diffusion of broadband throughout the population. Whatever the cause, the unregulated cable companies are expanding their lead over DSL.

Is DSL Roll-Out Being Deliberately Delayed by Incumbent Telephone Companies?

The assertion that incumbent telephone companies have delayed deploying DSL services for fear of cannibalizing their high-speed business services rests on three assumptions: (1) these companies have a dominant position in business high-speed services, (2) large numbers of business customers would migrate from these traditional services to DSL, and (3) the loss of residential high-speed services to cable television companies is less costly to telephone companies than an erosion of their business high-speed services. Given the rate at which local entrants, such as Teleport (acquired by AT&T) and MFS

“There is not universal agreement among economists on the nature of the broadband problem, the role of regulation, or the need for government action to promote broadband.”

(acquired by WorldCom), have eroded the market share for high-speed business services of the incumbent telephone companies and the rapid rise of cable modem service, it is unlikely that incumbent telephone companies would be well advised to delay their DSL services.



Is Regulation Slowing Incumbent Telephone Companies' Deployment of DSL?

Continued uncertainty over the scope of the incumbents' wholesale, or "unbundling," responsibilities may well be inhibiting them from investing in network upgrades to deploy DSL services. If they have to share new facilities required for DSL service at cost-based prices, their potential returns from deploying these facilities may be so reduced that they choose to wait. Few economists recommend that incumbents be forced to lease new facilities, even if they favor requiring them to lease their older facilities that were constructed in a period of regulated monopoly. Current FCC requirements that the incumbents offer virtually all of their network facilities to entrants at prices that only reflect forward-looking long run incremental cost have certainly not created a healthy environment for investment. Note the decline in projected Bell company investment in figure 1.

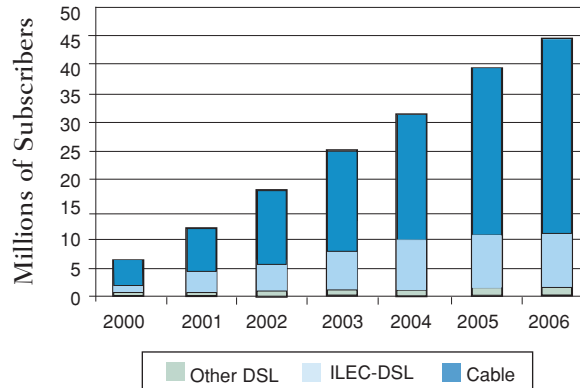
Does Requiring Incumbent Telephone Companies to Share Their Facilities With Entrants Increase Broadband Competition?

The principal justification for requiring the incumbent telephone companies to share their facilities with independent companies is to accelerate competition in local services, including DSL. Once new carriers gain a foothold through leasing incumbent facilities, they can build out their own networks to deliver these and other services. Unfortunately, none of the entrants that have tried to build a DSL offering through the leasing of incumbent lines or other facilities has succeeded. All have encountered severe economic difficulties, and many have filed for bankruptcy. One of the companies, Covad, has reorganized after filing for bankruptcy and now has more than 300,000 DSL subscribers. Nevertheless, despite favorable regulatory treatment, the new entrants have less than 10 percent of DSL lines and about 3 percent of all broadband lines.

The effect of the regulatory requirement that incumbent telephone companies



Figure 2:
U.S. Broadband: Forecast by Type of Carrier



Note: ILEC-DSL are lines provided by the incumbent telephone companies; Other DSL are lines provided by competitors using the incumbents' lines.
Source: FCC, Morgan Stanley.

share their facilities with entrants on the roll-out of DSL is shown in figure 2, based on a recent Morgan Stanley forecast. The statistics suggest that not only will DSL not catch up with cable television in broadband, but also that the entrants who are supposed to benefit from this network sharing will never rise above a minuscule level of participation in the market. Why, then, are policy-makers doing this?

Should the Government Subsidize Broadband Deployment in Marginal Areas?

The slow pace of broadband deployment in smaller cities and rural areas has led politicians from these areas to recommend government subsidies to accelerate deployment and to reduce the probability of a "digital divide" between urban and rural or wealthier and poorer areas. A case can be made for such subsidies if carriers cannot engage in price discrimination in marginal areas. Some potential subscribers may be

willing to pay very large amounts to receive the service, but others may be much less willing to pay. If the carrier has to charge the same price to all subscribers, it may not be able to operate profitably even though the value to all of these subscribers exceeds the cost of offering the service. This creates at least a theoretical justification

for subsidy, particularly a lump-sum subsidy based on the initial start-up costs. The problem with such a subsidy, however, is that funding the subsidy through taxes or higher rates on other services may create greater economic losses in other sectors of the economy.

Should Regulators Require "Equal Access" to Broadband Carriers for All Content Providers or Internet Service Providers?

The most troubling regulatory issue for the cable television industry has been the demand that cable companies open their broadband services to competing ISPs and/or content providers. Such requirements have been opposed by the companies for technical reasons and by some economists as a disincentive for cable companies to deploy cable modem service in many areas. In addition, the mere threat of these "open access" requirements is seen as at least one reason why cable companies allocate only 1 percent of available bandwidth to

"In the rapidly changing world of telecommunications, breaking up firms to achieve a social goal is extremely perilous."

cable modem services. Were cable companies to allocate more bandwidth to cable modem service, they might be required by regulators to share their frequencies with independent broadband companies, much as regulated telephone companies must now share their facilities with entrants.

Should the Telephone Companies be Required to Divide Their Companies into Separate Wholesale and Retail Operations? The idea of isolating the “bottleneck” facilities from the competitive retail operations of regulated carriers is not new or necessarily unique to telecommunications. In 1984, an antitrust decree required AT&T to divest itself of its local bottleneck facilities so that they would not discriminate in favor of AT&T’s long distance and equipment divisions. The divestiture “worked” largely because the decree required the FCC to impose equal-access requirements on all local carriers. This requirement could have been imposed without divestiture, as illuminated by Canada’s success in obtaining even faster competitive results without requiring divestiture of its incumbent telephone companies. Canada and other countries have simply required local companies to connect traffic of all carriers on a non-discriminatory basis.

Because some observers and many failing local entrants argue that local competition in DSL and other services is being impeded by incumbents’ unwillingness to share their facilities on a non-

discriminatory basis, a few economists have supported the idea of requiring “structural separation” of the incumbent telephone companies. Few advocate outright divestiture because they correctly fear that the resulting wholesale network companies may have difficulty attracting capital and making investments in new facilities. Given the enormous costs involved in enforcing the 1984 decree that broke up AT&T’s long-distance monopoly and the inherent difficulty in drawing lines between “monopoly” and “competitive” activities in this rapidly changing sector, the risk of such a policy would appear to create greater costs than benefits. State regulators in New York and Pennsylvania have largely rejected such proposals, and British regulators have recently decided against imposing it on British Telecom.

CONCLUDING OBSERVATIONS

It should come as no surprise that there is no unanimity among economists on broadband policy. However, most economists familiar with the history of regulation in this and other sectors are wary of imposing regulation on new services or new technologies. Too frequently, such regulatory exercises are used to protect major industry participants and thereby to delay new innovations or services. Moreover, experience from other industries suggests that rivalry from two or three separate platforms may well be sufficient to obtain most of the benefits of competition. The recent experience in railroads, where only two major carriers

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generally compete on a route, or even airlines, where the presence of Southwest Airlines is sufficient to drive fares toward costs, provides considerable support for a policy of encouraging competition in broadband and not hindering any of these competitors by forcing them to share their networks at regulated prices with any entrant that is able to raise capital.

No one disputes that competition is important in driving the efficient deployment of broadband or other new services. Nor do many economists see a need to regulate new facilities to deliver

new, innovative services. In a period when telecommunications investment is declining precipitously, there can be little support for a policy that might depress investment even farther. Finally, the history of government-mandated dissolutions or divestitures of business firms is not one that should provide advocates of “structural separation” much solace. In the rapidly changing world of telecommunications, breaking up firms to achieve a social goal is extremely perilous, particularly after the stock market value of telecom firms has declined by at least 70 percent. B

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Broadband facts

[Ready Steady Power Your Starter for Ten](#)

[What is Broadband power?](#)

[Your choice of connections](#)

[Broadband in your business](#)

[Enhancing communications](#)

[Improving performance](#)

[Developing e-learning](#)

[Broadband in your community](#)

[Broadband in your home](#)

Ready Steady Power

OK, so broadband is green for go – and this is your starter for ten. But what does it all mean?

Well, it's simple. Broadband is either newly arrived in your community or it could be coming very soon. Most local exchanges will be broadband-enabled by summer 2005. So that's what we mean by 'green for go' – it's happening, and it's happening right now.

But as with any change – and in particular with rapid change. There are bound to be lots of questions. In this text, we set out to provide some answers. We consider the choices you have and we briefly look at what broadband will mean for you in businesses, in schools, in communities and in your own home. So that's your 'starter for ten' – an overview of what's happening and what it means.

And if we don't manage to answer all your questions – then we do aim to point you in the right direction.

[^ top](#)

What is broadband power?

Broadband means speed. It is the collective name given to a range of high speed internet connections that are (normally) always switched on. Always on, always available – just like your electricity or water supplies – broadband is ready, steady, communication power.

Quick Stats

Ready For Service

1 AIness	20/10/04
2 Kyle	20/10/04
3 Invergordon	27/10/04
4 Kingussie	27/10/04
5 Spean Bridge	27/10/04
6 Fearn	03/11/04
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For businesses, organisations and individuals, the prospect of moving from an internet connection over a standard telephone line to a broadband connection has been described as like moving from a single track road to a ten lane highway – and one where you're allowed to drive up to ten times faster!

Broadband is the future of telecommunications – not just for business and personal web and email use, but also for other internet applications such as voice, video conferencing, e-business, radio, streaming video and digital TV. In business, in particular, broadband will impact across almost every sector from education and healthcare to manufacturing and tourism.

Offering speeds up to ten times faster (and sometimes even 40 times faster) than a standard internet connection, broadband makes it easy and cheap to transfer large quantities of data, images, graphics, video and high quality sound. It has obvious advantages for business – which we look at later – but it is also likely to revolutionise education, community life and home entertainment. In fact, the true impact of broadband may only become apparent over the next few years, as individuals and businesses explore its full potential.

To begin our overview of broadband in the Highlands and Islands, we briefly consider the range of broadband connections available.

Measuring broadband power

There is no definition of how fast an internet connection should be before it is described as a broadband connection. (It's a bit like asking how fast does a car have to be before it becomes a sports car?) However, most standard modems currently connect at 28 or 56kbps (where 'kbps' stands for kilo-bits per second, and a 'bit' is a single unit of information). But with a broadband connection, you'll experience connection speeds of up to 512kbps – with the possibility of up to 2Mbps (megabits per second) with some business services!

[^ top](#)

Your choice of connection

Different kinds of broadband connection will be available to you depending on your location. – and in particular depending on the size of the community in which you live or where your business is located. The main connection types available are:

ADSL (Asymmetric Data Subscriber Line)

ADSL can be up to 40 times faster than an ordinary dialup connection. It uses an existing analogue telephone line and, once connected, you can still use the line for phone/fax calls. That means you don't need to get an extra line installed for this service. However, upload speeds are typically half or even only a quarter of the download

speeds.

Exchange Activate (Mini DSLAM)

Uses the same technology as ADSL, but limited to 512Kbps – which is still up to 10 times faster than a dialup connection. This service is suited to medium sized villages or population centres which don't support the demand required for full ADSL. This service is available in both Muir of Ord and Drumnadrochit. We hope to have more communities connected during 2004/2005.

Powerline Broadband

Initially piloted in Campbeltown in Argyll, powerline broadband uses the 240v electricity grid to deliver an internet connection up to 10 times faster than a dialup connection. It is completely independent of your phone line – you simply plug your 'modem' into a 240v socket. As with Exchange Activate, this service is likely to be made available in medium sized towns – but will only work up to 300m from an enabled substation. SSE Telecom is currently undertaking commercial trials in Stonehaven which will determine the scope of future roll out.

Community Wireless Broadband

Wireless broadband is up to 10 times faster than a dialup connection and is completely independent of your phone line. You connect via a small outdoor antenna to a network of small community-based radio repeater stations. Upload speeds are typically up to 256Kbps only and if the service uses a satellite feed to connect back to the internet there may be some limitations such as not being able to use video conferencing tools. Wireless broadband may be an option where there is enough demand, but where ADSL, Exchange Activate or Powerline Broadband are not commercially or technically viable. The HIE-funded community roll-out programme was launched in Cromarty in early 2003.

Satellite (two-way)

Using a dish antenna to connect to the internet via a satellite can provide a broadband connection which is up to 80 times faster than a dialup connection. Completely independent from any form of infrastructure, satellites can be used practically anywhere where there is an unobstructed line of sight to the south. However, due to the distance of the satellite from Earth, there is a time delay (latency) which can restrict certain applications such as voice, video conferencing and on-line gaming. Satellite is ideal for individuals or businesses which cannot access any other services – normally due to their remote location.

Satellite (one-way)

Same as two-way satellite, with the exception that only downloads take place via the satellite and are only up to 20 times faster than a dialup connection. Uploading takes place via a telephone or ISDN line. This means that this service requires both a landline and an unobstructed line of

site to the south to work. Furthermore, with the exception of ISDN, additional telephone lines may also be required to enable simultaneous phone or fax use. Users will, however, experience less delay than with two-way satellite because of the upload via landline, but upload speeds will be restricted to less than 56Kbps for an ordinary telephone connection and up to 128Kbps for ISDN.

[^ top](#)

Broadband in your business

Broadband has implications for every business in the Highlands and Islands. With access speeds up to ten times faster than a standard modem – or about seven times faster than ISDN – broadband means faster access to information, lightning fast downloads of data, and improved communication through real time email, video conferencing and other tools.

For example, a 1Mb file accessed via a 56k modem would take approximately two minutes and 28 seconds to download. Using a broadband connection, the same 1Mb file will download in three seconds. So there are opportunities to save time – and, as everyone knows, that means saving money too. Even more so when you consider that you will be paying a flat monthly subscription fee for an always on, unmetered service.

And, perhaps more importantly, your always on connection will also open up a host of innovative business opportunities – by unlocking the door to e-business in a way you may never have thought was possible. In doing so, broadband may help you to reduce costs, increase sales by enabling customers to order on-line, and enhance your after-sales service. In short, broadband can help you to become more responsive to customer needs and to win more business as a result.

On the following pages, we look in more detail at some of the specific business benefits. Although we consider these separately, they are part of a continuum – each one building on and underpinning the other. Enhanced communication, both internally and externally, will provide the springboard for ensuring that broadband connectivity delivers improved performance in your business. And likewise, a high-speed connection can help you to exploit the potential of e-learning to ensure that your staff have the skills they need to realise the full benefits of broadband in your business.

[^ top](#)

Enhancing communications

Broadband can make a profound impact on the way you do business. And that impact is often most apparent in the area of communications, both internally among employees, and externally with customers, suppliers and other stakeholders. Broadband means that many small businesses can finally exploit the full potential of already familiar communication tools such as the web and email –

while it also opens the door to using more sophisticated tools such as remote storage services and online meeting facilities.

The always on nature of broadband technology means that employees can communicate with each other much more easily. They can also have online information updates delivered direct to their desktop with no need to dial up. For smaller businesses, an always on connection will help to improve external relationships – particularly with customers. For example, it will help you to deal more effectively and efficiently with customer enquiries and orders. You will receive enquiries and orders as soon as they are sent, and so you should be able to respond much sooner too. Individual customers will enjoy greater personal contact with the key people within your business.

A broadband connection will also allow you to collaborate with partners and suppliers remotely – using advanced web-based meeting and planning tools. With high speed connections, collaborative communications can overcome any distance barriers and enable you to work with others in virtual private networks (VPNs).

Business communications can also be improved. Using your broadband connection to exercise constant control over your website, you can rapidly add or amend content and sales data as required. As a result, communication with your customers and potential customers will be more efficient. And, of course, using your broadband connection to ensure that your website is always up to date is the first step in beginning to exploit the potential of e-business.

^ top

Improving performance

Getting the most out of business communications and e-business can help to improve productivity and performance within your business. The simple ways in which broadband may help small and medium sized businesses to improve performance will include:

- freeing up dial up and download times for other activities
- enabling employees to use the phone and internet simultaneously
- being able to connect different PCs to the web at the same time
- reducing paperwork by using web services to book travel, buy stationery, etc.
- improving employee satisfaction and, as a result, individual productivity
- creating more effective home working opportunities

Businesses will also be able to improve their customer

service – and cut the time taken to process and manage customer orders – by operating web-based customer relationship management systems and on-line ordering facilities.

Similar opportunities to improve performance will extend throughout most areas of your business. Because, to put it bluntly, the full use of many existing business software applications is simply not practical with a traditional dial up service. For example, a broadband connection will make it much easier to use online procurement systems to find new suppliers.

And, of course, broadband will also break down many of the traditional barriers to export. The use of streaming video and conferencing facilities such as Net Meeting will make it easier to make business presentations, and market and sell your products, to potential customers anywhere in the world.

^ top

Developing e-learning

The development of broadband will be critically important to the future of education and learning. For small and medium-sized businesses, broadband will mean that online learning and training for staff will become a viable option for the first time.

In the past, too many online training packages have been limited by restricted bandwidth. As a result, many have been relatively dull, short on interactive content, and lacked the power to engage learners. Broadband can now provide businesses with access to a new generation of training packages – which are designed specifically to take advantage of the new technology.

Covering everything from customer service to sales techniques, these new training packages are content-rich and designed to deliver a compelling and engaging experience. If a company is already committed to staff development, then on-line training via a broadband connection will offer many advantages – particularly to smaller and rural businesses. These will include:

- personalised content to reflect specific company or individual needs
- staff access to training when they need it – at their own desks!
- the ability to log on and log off with ease
- no dial up charges with an always on connection
- flexible training tailored to meet the demands of the workplace

In short, broadband has the potential to make continuous learning in the workplace a reality. As the broadband network expands – both nationally and across the

Highlands and Islands – so will training providers offer increasingly effective training packages that deliver relevant and exciting learning direct to employees' desktop computers. It is a development with the potential to transform the learning landscape in businesses and organisations of all sizes – and based in any location.

[^ top](#)

Broadband in your community

For HIE, the objective of exploring a wide range of different broadband connections is to ensure that across the Highlands and Islands as many communities as possible benefit from broadband.

While super-fast broadband connectivity alone may not be the answer to the challenges faced by many rural communities – social exclusion, sustainability, isolation – it is widely accepted that it will help in many areas of community development.

Certainly it is anticipated that access to broadband services through community centres and other public access points will have a significant impact on delivery of services such as local government, education and healthcare services in many rural and disadvantaged communities. The anticipated benefits include improved opportunities to:

- enjoy remote access to public services I pursue leisure and cultural interests promoted by community organisations
- acquire knowledge and develop skills via community learning centres
- share experiences and opinions with each other and with other communities globally
- develop confidence and community identity
- participate in the democratic process
- develop community-based businesses

The Government has made a commitment that every primary and secondary school in the UK will have broadband internet access by 2006. As part of the same £6bn investment, the government is investing £1bn towards improving key public services via broadband connectivity. If we are to ensure that the Highlands and Islands benefits fully from these commitments, then communities have to be proactive in demanding and using broadband services.

[^ top](#)

Broadband in your home

The benefits of broadband will be felt far beyond business and community life. The availability of super fast internet connections will herald a host of new entertainment and

lifestyle applications that many believe will revolutionise the way we live our lives in the future. Some of these are available now – many will be here sooner rather than later.

For people who work from home – broadband is going to be increasingly indispensable. Broadband will be the highway that countless home workers travel to research projects, deliver work and meet with their customers and collaborators. It will be the utility that means more people can live where they want, and work when they want.

And in many homes, the same technology will be the foundation of family learning. In the same way that businesses will use broadband to deliver e-learning solutions, so will individuals be able to access a huge new market of on-line educational resources in their homes. Whether it is young people seeking help with their school work or adults choosing to learn a language or another new skill – broadband will make it possible to access increasingly sophisticated and useful learning packages.

But arguably the biggest impact will be on home-based leisure time. Already music and film trailers can be downloaded direct from the internet – soon it will be complete movies! Likewise online multi-player gaming is already huge – but broadband will enable both the companies that supply the games and the players themselves to bring gaming to new levels!

Looking further ahead (but not too far) domestic video conferencing – using PCs or televisions – will make it possible for families to 'get together' in the lounge even though they are in different cities or different countries. Other domestic appliances will also be broadband enabled to enhance their functionality. The washing machine will download upgrades for itself; the fridge will order the family groceries; your home heating system will be controlled from your office keyboard or even from your mobile phone!

Of course, in every home, the impact of broadband will be different. Like our electricity, we will all use it to do different things. But what is certain is that broadband will make many more things possible. It will give us many more choices in the way we live our lives.

[^ top](#)

Site updated: 08/10/2004
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Broadband Users Account for Almost a Third of Online Spending

At home broadband users currently represent 19 percent of online adults in the U.S., but accounted for 31 percent of the \$15 billion consumer online spending last year.

[Scarborough Research](#), a leader in identifying local, regional and national consumer patterns, announced a recent study that shows American adults with at-home broadband connections accounted for almost one-third (31 percent) of all consumer online spending last year totaling 15 billion dollars.

At home broadband users— those who used an ISDN, DSL technology or a cable modem to access the Internet in the past 30 days— currently represent 19 percent of online adults. America's 23 million broadband users are twice as likely as all Internet users to have spent \$2,500 or more online in the past 12 months.

Broadband users are 39 percent more likely to purchase jewelry online; 64 percent more likely to purchase toys and games online; and 64 percent more likely to purchase cars, trucks and SUVs. Furthermore, broadband users are more likely to use the Internet to view traditional media content than other Internet users. This escalating category of Internet users is the next generation of web users and information seekers.

Where do broadband users live?

According to Scarborough Research, Honolulu is the top ranked broadband market as 40 percent of Honolulu adults who accessed the Internet in the past 30 days have a broadband connection at-home. San Diego, CA, is second highest with 34 percent followed by Rochester, NY, with 32 percent. Cities with the lowest broadband penetration include Spokane, WA (nine percent), Albuquerque/Santa Fe, NM (eight percent), and Roanoke/Lynchburg, VA (six percent).

Compared to all Internet users in the U.S., broadband users are well-educated (12 percent more likely than all adults accessing the Internet to hold a college degree and 17 percent more likely to have a post-graduate degree) and affluent (32 percent more likely than total Internet users to have household incomes of \$75,000 or more). Slightly more than a quarter (26 percent) of broadband users are between the ages of 35 and 44 and almost half (49 percent) have one or more children in the household.

"At-home broadband consumers spend more money online than the average Internet user and their affluence and education levels make them a favorable marketing target," said Mr. Meo. "Local media outlets can take advantage of broadband penetration in their markets – and the expanded creativity of rich content – to reach this valuable consumer group with content and advertising."

Related Resources

- [Scarborough Research](#)
- [Local Market Variations in Broadband Users](#) - Scarborough Research 04:24 PM #

Back-to-School Season Update

• [Back-to-School Retail Shopping Trends](#)

A survey of consumer spending intent for the upcoming back-to-school season by The NPD Group, Inc. reports traditional back-to-school items like clothing, shoes, backpacks and school supplies should experience healthy sales increases this year versus last.

• [Back-to-School Consumer Spending Forecast](#)

Consumers are planning a trip back to the stores before sending their children back to school this year. According to the findings of a new National Retail Federation survey, families with school-aged children will spend an average of \$450.76 on back-to-school items, up from \$441.60 in 2002.

• [Tax Rebates Mean Extra Back-to-School Shopping Dollars](#)

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Many paths to broadband reality

by Dan O'Shea

TelephonyOnline.com, Sep 16 2004

How many times have you been in a bar that seemed to be much more fun--or much less fun--for the selection of music available on the jukebox? Not everyone is such a music connoisseur that they grade bars on the basis of the jukebox, but I bet you can remember the last time you were in bar and a song came on that was so dreadful, it made you ask, "Who programs the music in this dive?"

Ecast is trying to reduce the likelihood those kinds of comments will ever be made again. The Sunnyvale, Calif. company markets jukeboxes enabled with broadband connections that allow bar patrons to download their music selections from an Internet-based library of more than 10,000 songs, rather than the giant flipbook of CD jackets in most traditional jukeboxes (though some people would scoff at the idea that a "traditional" jukebox contains CDs).

In addition to the broadband connection into the jukebox, the Ecast jukeboxes also are equipped with Wi-Fi access points that allow the bars to offer their patrons Wi-Fi service, and also allow the jukebox to be placed just about anywhere inside the bar.

What Ecast is doing is a great example of putting broadband networks to work, but that might not be the most interesting aspect of this application for the broadband carrier community. Worth noting is that Ecast has not tried to standardize on one or two specific types of broadband connections. Though many of its connections are via cable modem, it has not chosen sides in the war between cable modems and DSL, and it also buys broadband access of virtually every other type, including satellite and broadband wireless.

Since there are no broadband carriers that have every market served, Ecast really couldn't have one provider for the 1600 bars and other venues across the nation in which its jukeboxes reside. But that's also an advantage, because not every kind of environment or location is viable for a cable modem connection or any other type of broadband line.

Harris Interactive announced a poll last week that suggested about 44% of adult online users now have residential broadband service. As broadband becomes as dominant as we always hoped it would be, it also is becoming very clear that no one access technology or network operator will dominate. Many broadband technologies could flourish, and users certainly will be the ones to win.

E-mail me at doshea@primediabusiness.com.

Broadband networking

transforms

the landscape for
delivery of high-value services

Position Paper
Residential broadband trends:
A North American perspective

The broadband market in North America continues to be a dynamic sector as the competitive landscape and consumer demand for new communication services continue to evolve. Driven by the need to find new sources of revenue, service providers are looking for ways to unleash the potential of broadband networks. This position paper provides a brief overview of both the service delivery trends and competitive market conditions now defining the North American broadband marketplace, and focuses primarily on the residential sector.

Service discontinuity

The proliferation of the Internet around the world is changing the very fabric of the way we live, the way we shop, and the way we do business. Residential consumers now have access to a vast amount of information available at the click of a mouse button. In addition, emerging services are starting to leverage this Internet connectivity in new and different ways. For example, the music and video industries are undergoing rapid change as consumers gain access to content via the Internet, particularly those subscribers with broadband connections. Online gaming communities are booming with hundreds of thousands of users online every day. There is a significant amount of consumer spending in the entertainment and telecommunication sector that is up for grabs with the advent of new emerging broadband solutions. Competing to unlock these potential sources of new revenue are wireline service providers, cable companies, and increasingly, wireless service providers.

Capturing these service revenues is a two-part problem for any service provider. The first problem is providing the necessary connectivity infrastructure to effectively deliver high-quality services. The second problem is defining the right service bundle, with the right price point, that will attract and retain customers. For example, in the United States several large service providers are attempting to capture a greater share of price-sensitive customers by lowering DSL pricing to US \$30 per month, a substantial discount compared with other wireline or cable offerings. This tactic seems to be having some initial success, but may be short lived. In the United States, cable companies still hold a significant market share advantage with about 15.5 million subscribers as compared to about 8.8 million DSL subscribers at year end 2003.¹ Many analysts predict that the cable industry will continue to outpace wireline service providers as they can price match DSL offerings, as well as having a superior broadband infrastructure advantage.

The challenges of providing a viable connectivity infrastructure and the creation of compelling service bundles must be considered together, as both must be overcome in order to be successful in the long run. Let's first examine the challenge of service bundling. In North America there are many traditional communication services purchased by residential subscribers: local wireline voice, long-distance voice, wireless voice, Internet access and service, and broadcast television. These services are often offered to the consumer by three different types of service providers: wireline voice providers, wireless providers, and broadcast television providers (i.e., cable and satellite companies). There are also a host of new services emerging that are in large part associated with the emergence of Internet

¹ Yankee Group, August 2003

“There is a huge amount of consumer spending in the entertainment and telecommunication sector that is up for grabs with the advent of new emerging broadband solutions.”

services. These services include: music and video downloads, streaming media, information services, online shopping, interactive gaming, multimedia (integrated voice-data-video) services, and Voice over Internet Protocol (VoIP). The list continues to grow at a rapid pace as new uses for the Internet connection proliferate.

The question is what is the optimal service bundle that will create a level of stickiness to attract and retain customers? Service bundling is intended to decrease customer churn and increase profitability. The North American market has seen several attempts at service bundling that have resulted in only partial success. For example, according to company and industry analyst reports, SBC, a U.S. incumbent local exchange carrier, has offered service bundles—yet has struggled to meet both profitability targets and to reduce customer churn. More recently, SBC has made some gains with existing customers as there was an uptake in purchasing of bundled services. However, this gain was offset by lower operating margins and only a small increase in average revenue per user. In contrast, cable operators are reporting the opposite experience with bundling. Cox, a leading cable operator, reports a 50 percent reduction in subscriber churn for those customers who have three services: television, data, and residential telephony.² The Canadian-based cable operator, Rogers, recently disclosed that while only 8 percent of their subscribers sign-up for their “triple play” of television, data, and mobile telephony, those subscribers contribute 28 percent of the company’s Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA).³ Perhaps one obvious lesson that can be learned here is that service bundling has the best chance of succeeding long term if existing services and new services are bundled together, thereby offsetting increased operational expenses with new revenues.

Players in the broadband industry are now starting to call the voice, video, and data service bundle the “triple play.” While this service bundle is certainly a step in the right direction, it falls short of the ultimate service bundle. For example, where is the “Turbo Button” service that will unleash extra bandwidth on demand for online gaming users? Where are the multimedia services for the growing number of work-at-home employees and small business owners? The end-game for the winning service set goes far beyond the delivery of a mere three services. This is where the focal point should be—revenue-generating, value-rich services. Yes, the infrastructure is an important part of the equation as it will ultimately enable the services, but it is not the end-game.

Infrastructure discontinuity

How can service providers deliver both traditional and emerging new services? Part of the answer is clear; the ultimate service bundle cannot be delivered to the mass market unless there is an enabling end-to-end infrastructure capable of carrying such services. This is the first step that must be taken if service providers are to successfully capture the winning services combination in the long run.

Taking the triple play as the minimum services baseline that must be offered to attract and retain customers, there is also a minimum set of corresponding infrastructure requirements. In general, the supporting infrastructure must have a minimum bandwidth capacity in the range of 10 Mbps to effectively carry all three services, while also delivering a high quality of service. Most of the service provider equipment and infrastructure that has been deployed serving the residential sector does *not* meet this criterion. Across the globe there is rapid ADSL deployment occurring, with estimates of US \$4 to US \$5 billion capex dollars being spent each year on access infrastructure.⁴ In the United States, the top four service providers are increasing their DSL subscriber base at a rate of about 10 percent per quarter, or about 2.5 million new subscribers for the year 2003.⁵ However, much of this new infrastructure investment already falls short of the bandwidth requirements needed to compete in the long run. It should be noted that there are some in the industry who believe that 1 or 2 Mbps to the home is more than sufficient for most broadband users. This claim is partially correct. If the only service being delivered to the subscriber is a data or basic Internet access service, 1 or 2 Mbps is sufficient. However, the game is already changing. Internet access alone is not enough to win and retain the customer. Let there be no confusion, higher bandwidth to the home is not being driven by the need for a super Internet connection. There is a “need for speed” to deliver a greater range of services. The requirement to upgrade the existing infrastructure to 10 Mbps is still in its infancy, but certainly in the next three to five years as video services to the home start to pick up, there will be a shift in momentum towards this direction.

² Cox VoIP whitepaper, February 2003

³ Ted Rogers CEO, panelist, The Western Show, December 2003

⁴ RHK 2003, InStat/MDR, July 2003

⁵ RHK, 2003

“A higher-speed or ‘ultra-broadband’ infrastructure is now required to unleash the complete service set for maximum revenue generation and customer retention.”

This brings into question the very term “broadband.” The term “broadband” has been widely used in the industry to define a higher bandwidth service, one that goes beyond traditional narrowband voice services. Broadband fails to accurately describe the higher bandwidth infrastructure that is now required for the delivery of triple play services. The “broad” is not broad enough—much of today’s xDSL equipment falls short of the needed bandwidth mark. A new term is needed to describe the category of infrastructure that at a minimum enables the triple play bundle. A higher-speed or “ultra-broadband” infrastructure is now required to unleash the complete service set for maximum revenue generation and customer retention.

Competitive disruption

North American wireline service providers have long been in a position of control when it comes to traditional voice services. However, technology advancements in the cable television and wireless domains are rapidly changing the competitive horizon. In the past, wireline, wireless, and the cable television industry have not directly competed against each other—as each entity offered a unique service. However, today this is no longer true. Each of these service provider segments is now competing for the same customers with an overlapping set of services. In addition, the financial community is placing heavy pressure on companies to turn-up new sources of revenue and to increase profitability.

Wireline service providers are now offering high-speed access via xDSL and are looking to move to “ultra-broadband” services such as broadcast or IP television. In addition, telcos such as Verizon, SaskTel (Canada), and Bell Canada are moving to bundle a host of solutions together for their customers, all delivered over a unified pipe. Verizon, for example, will offer a complete suite of services to consumers and small businesses that include local and long distance voice, Internet access, and Multimedia Communication Services or MCS (simultaneous voice, video, and data) in order to help their customers achieve higher productivity.

Cable companies are approaching the market from the other direction. They currently offer broadcast television and high-speed access, and are now aggressively moving to offer voice services. This will enable cable companies to develop new sources of revenue, while protecting their high-speed access revenue, and more effectively compete against direct broadcast satellite providers who are limited to offering only one service. On a related note, in South America, Chilean telecommunications company VTR Broadband has developed a unique way to attract new users to broadband from slower dial-up service. They offer per-session usage where the subscriber can pay for the speed and minutes of use for each session in a pre-paid format.

With the proliferation of wireless voice services, wireless carriers are now starting to capture local wireline customers along with long distance. Case in point, the total number of landline phone households is expected to decrease from 103M in 2002 to 96M in 2007, primarily because of the trend towards wireless primary phone adoption.⁶ In addition, next-generation wireless technologies are emerging that will allow wireless carriers to directly compete in the high-speed access market. Some technologists are predicting that wireless technologies will continue to evolve to the point where video services will someday be possible. Thus in North America there is a three-way race to capture a greater share of the consumer spend on telecom and entertainment services. Nortel Networks is uniquely positioned to provide solutions to all three provider types. While it is difficult to predict who will be the ultimate winner, or even if there will be a single winner, one thing is clear—if wireline service providers do not make an investment in an ultra-broadband infrastructure, they will not be able to compete in the long run.

Regulatory challenges

In the United States, federal regulators recognize that they must eliminate the regulatory uncertainty in the broadband market so that incumbent service providers and their competitors will invest in new infrastructure. Although one critical ruling was made last summer (*Triennial Review Order*), a number of important broadband proceedings remain outstanding: *Wireline Broadband Proceeding*, *Cable Modem Proceeding*, *ILEC Dominant/Nondominant Proceeding*, etc. In addition, there have been court challenges to broadband-related rulings that are prolonging the state of regulatory uncertainty. Regulators are also considering policy opportunities to promote broadband investment with wireless spectrum options and emerging platforms such as broadband over powerline.

⁶ JP Morgan Market Research, U.S. Telecommunications, *The Art of War*, November 2003

In Canada, service providers face similar regulatory uncertainty, particularly around network access, VoIP, and regulatory parity. In an effort to promote competition, the Canadian Radio-Television and Telecommunication Commission (CRTC) has proposed that competitors should be able to access incumbents' digital networks at cost. The CRTC decision, expected in the first quarter of 2004, could substantially impact planned network build-outs. Of particular interest on the VoIP front in Canada is whether the various service providers are "Canadian carriers offering telecommunication services" and, hence, fall under the CRTC's regulatory scope. This point is similar in relevance to the "telecommunication service" vs. "information service" question surrounding VoIP in the United States. Major issues still to be addressed are contribution, equal access to long distance, and support of emergency 911 services.

Going forward, there will also likely be much debate in both countries on the establishment of a framework that creates symmetry between the regulation of telcos and cable companies. Today the two groups face substantially different regulations—which will specifically impact the delivery of triple play service bundles.

Considering the current state of broadband deployment, and its potential to stimulate economic growth, Nortel Networks is urging regulators to adopt new broadband policies with great speed.

Technology choices

There are several solutions that are targeted at delivering higher bandwidth to the home. Fiber solutions such as Fiber-to-the-Home or Fiber-to-the-Business provide very high bandwidth capacities, but at a price. The cost of pushing fiber deep into the access plant can be costly. New DSL over copper solutions such as VDSL and ADSL2+ can be used in combination with fiber to provide a more cost-effective solution, but deliver less bandwidth than pure fiber-based solutions. There are also a variety of platform options such as DSLAMs, DLCs, and Mini-RAMs depending on the service provider's particular needs and preferences. Service providers across North America are embracing a variety of service delivery strategies and utilizing all of the various technology options. Service providers are faced with the business decision of deciding how much up-front investment they are willing to make while meeting return-on-investment demands of shareholders.

Once again there is no clear answer as to which technology or solution path will provide the best return on investment. The transition to this new infrastructure has clearly begun. The race is on. May there be many winners as the network continues to transform, with the ultimate winner being the consumer.

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Nortel Networks is an industry leader and innovator focused on transforming how the world communicates and exchanges information. The company is supplying its service provider and enterprise customers with communications technology and infrastructure to enable value-added IP data, voice and multimedia services spanning Wireless Networks, Wireline Networks, Enterprise Networks, and Optical Networks. As a global company, Nortel Networks does business in more than 150 countries. More information about Nortel Networks can be found on the web at:

www.nortelnetworks.com

For more information, contact your Nortel Networks representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

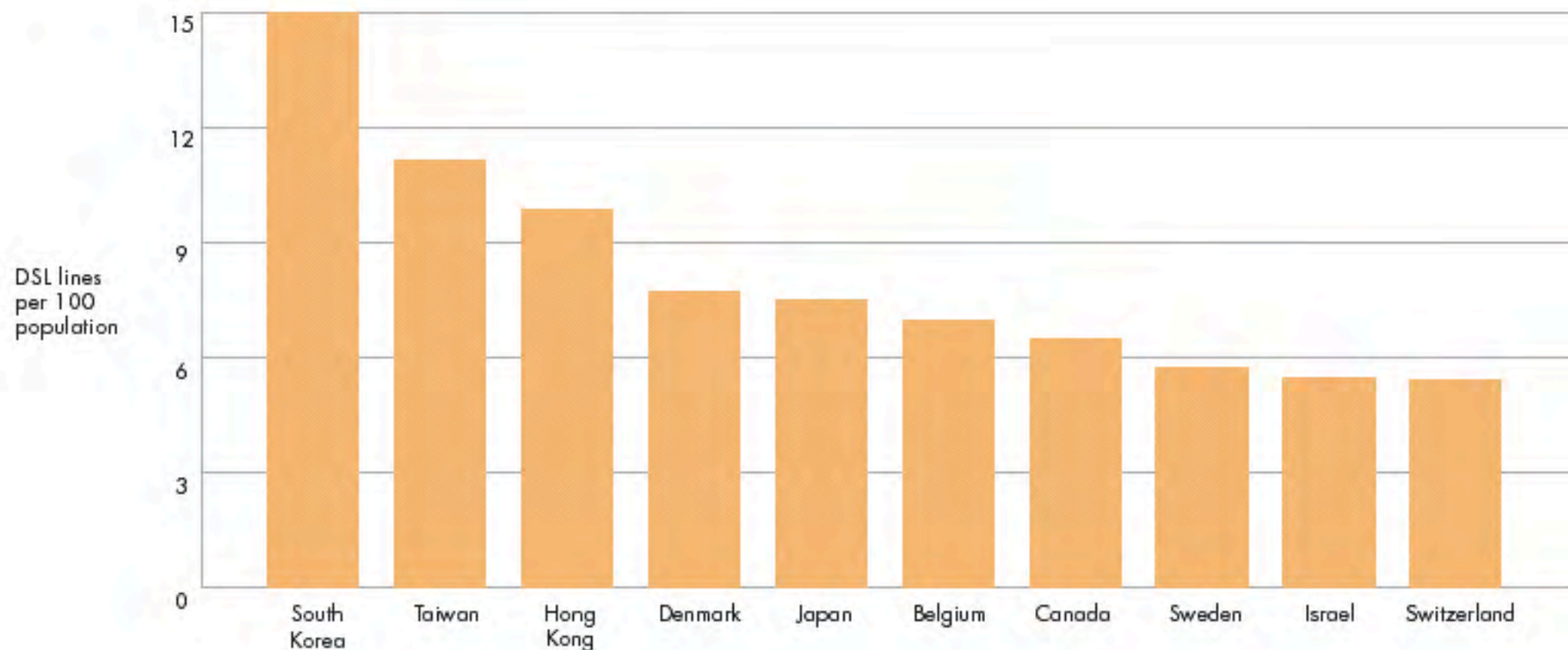
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Figure 1- Top 10 countries by DSL penetration (Q3 2003)



Source: Point Topic, December 2003

RESEARCH

SeniorNet Members Interest Survey, Summer 2004

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The results of our recent Interests Survey are in and they show that SeniorNetters love email, are joining the digital photography craze, have diverse interests and love to learn.

During June and July 2004, 1,461 SeniorNet members and web site users responded to more than 25 questions designed to help SeniorNet plan our development of products and services to meet your needs and interests. The survey was focused on some specific areas. We'll be conducting more surveys in the near future to ask you about other areas of interest.

Email is king

We asked members what one or two computer users are most important to them. About half of all respondents (788) gave a resounding vote for email.

Responses to other questions also revealed email as a major interest. When asked which computer uses were of interest email showed up again:

- 71% of respondents said emailing family and friends was of greatest interest.
- 39% of respondents said emailing photos was of greatest interest.
- And, when asked what online features members spend the most time using, 56% said email.

Many computer uses

Besides being used to "reach out and touch someone," SeniorNetters' currently use their computers, or want to learn to use technology, related to a wide range of interests.

Digital photography, a technology that has become very popular in the last year, has the full attention of the SeniorNet group (rated 5 on a scale of 1 to 5):

- 36% said being able to manipulate or manage photos was of greatest interest.

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- 32% said creating printed photos or photo albums was of greatest interest.

Other computer activities of greatest interest to SeniorNetters (rated 5 on a scale of 1 to 5) include:

- 37% to find information/manage your health.
- 33% to be more safe, efficient and effective at Internet transactions or online shopping.
- 28% to socially converse with friends on the internet.
- 27% to access information on local, state or federal government web sites.
- 26% Find information/manage your finances
- 24% to create printed greeting cards.
- 23% to conduct and manage genealogy research or create family trees.
- 23% to share photos on a web site.

There were a number of other areas in which significant interest (rated 4 on a scale of 1 to 5) was expressed. That means SeniorNet has to cover a lot of territory to meet the widely diverse needs of its members.

- 36% become a better informed consumer.
- 26% taking more informed and effective charge of personal finances.
- 26% learning more about current political or social issues.
- 25% learning more about significant people, trends and historical events occurring during your lifetime.
- 23% volunteering for an organization you care about.
- 22% manage databases.
- 21% manage spreadsheets or budgets.
- 20% talk about books you have read.

Learning

SeniorNetters are lifelong learners While many members have pragmatic goals, most members also like learning for its own sake. The highest interest responses to a question about reasons for learning to use computers and the Internet were:

- Keep mind active – 61%
- Joy of learning – 54%
- Need/want the skill in order to accomplish a personal interest – 47%
- Fun/recreation – 46%

Respondents showed a strong preference for the traditional classroom (40%) but there also was interest in one-on-one tutoring (27%) and in Internet-based learning, either as an online group activity (23%) or as a self-paced course (22%).

Most popular online features

We asked respondents to rank the ways they use most of their online time. Most said their main online occupations were sending or reading email (56%) and browsing/reading web pages (25%).

Demographics

We also asked for general demographic information, which is important for our grant applications and of interest to the whole community. We found that respondents to this survey are:

- 79% are retired
- 63% work as volunteers
- 93% have Windows-based computers
- 58% use dial-up modems
- 73% have "intermediate" computer skills
- 65% are female
- 23% are 65 to 69, 23% are 70-74
- 89% are in good-to-excellent health
- 85% have had at least some college education
- 35% are Learning Center members, 65% are web users

What does it mean?

SeniorNet will use the survey results to expand its offerings – both in our Learning Centers and on our web site. We will continue to conduct surveys to gain a better understanding of your interests and to generate ideas for exciting new programs.

You can see the percentage rating for responses to all of the multiple choice survey questions at [survey results](#).

Open ended responses

"Open-ended" comments reflected a wide range of computer expertise and uses. One respondent wondered why we didn't ask about users of UNIX and Linux, while another indicated that we used too much computer jargon.

Many told why they love their computers:

- "Being profoundly deaf and immobile due to ill health, it is my life-saving occupation. I have no friends still living and before I got the computer, I was completely isolated. Now I am back in the world and can have intelligent conversations like hearing persons."
- "MY Computer is my Square-Headed Boy Friend! I love him dearly...I would feel so alone without the benefit of the Internet. It is my connection to folks MY age."

An idea of the amazing range of interests

- "Is there room for a radical activist in your organization?"
- "I'd like classes on such things as quilting, cooking, painting,

gardening, money management, auto repair, household repair and other do-it-yourself projects.”

- “I'd really appreciate a course in writing. I'd like to write short stories.”
- “Would like to see some scrap book classes on your Senior Net.”
- “I also like to listen to online instrumental music from the 50s.”
- “Environmental policies, preserving nature's species and leaving our world better and safer for later generations than the way it was when we arrived.”
- “I am interested in 3D virtual reality and more ability to make my own records. I would like to be able to see GOOD plays, music, forums, etc., right on my computer.”
- “I am interested in duplicate bridge and go frequently online... to learn what is new.”
- “I'm into exercising and fitness. As you promote “young in mind” for your educational activities, you should promote “young in body” for fitness and active recreation.”
- “Travel, places of interest, home treatment and remedies, basic computer repair...”
- “I'd like to meet either a husband or a good pal with same interests, namely abstract art and anything French!”

We'll be doing more surveys in hopes of better understanding all the needs and interests of the SeniorNet community, so we can provide programs and services to meet those needs. Of course, there may be some needs that SeniorNet just can't take care of. Some comments were about a common problem, we just can't solve:

One member expressed it this way: “I find it frustrating that I can't seem to find time enough for using the computer in a more intensive way. I would like to use SeniorNet more often if you can arrange for a 36-hour day for me!”

Another said simply: “Whoever said that 'Retirement is a time for relaxing' isn't retired!”

[Survey results by question.](#)

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Children

comScore Media Metrix: Canada trumps US in broadband use

Apr 08 2003: New research from comScore Media Metrix indicates that Canada has a higher percentage of broadband Internet users than the US.

According to the company's latest study, more than half of Canadian Internet users have high-speed broadband connections.

As of January 2003, broadband users represented fully 53.6 percent of the Canadian online population, compared to just 33.8 percent of the US online population.

The study also reveals that Canadian broadband users consume more online content than their American counterparts. Collectively, Canadian broadband Internet users account for 63 percent of all time spent online in Canada, whereas their US counterparts account for 54 percent of Internet usage time in America.

As of January 2003, Canadian Broadband Internet users spent 55 percent more time online than dial-up users and viewed almost twice as many Web pages over the course of the month.

The study indicates that Canadian Broadband users are also more likely to engage in activities involving streaming content and online shopping, while dial-up users are expectedly more likely to spend their time online with activities that are less impacted by speed.

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Web Connection Speed Trends - Home Users (US)

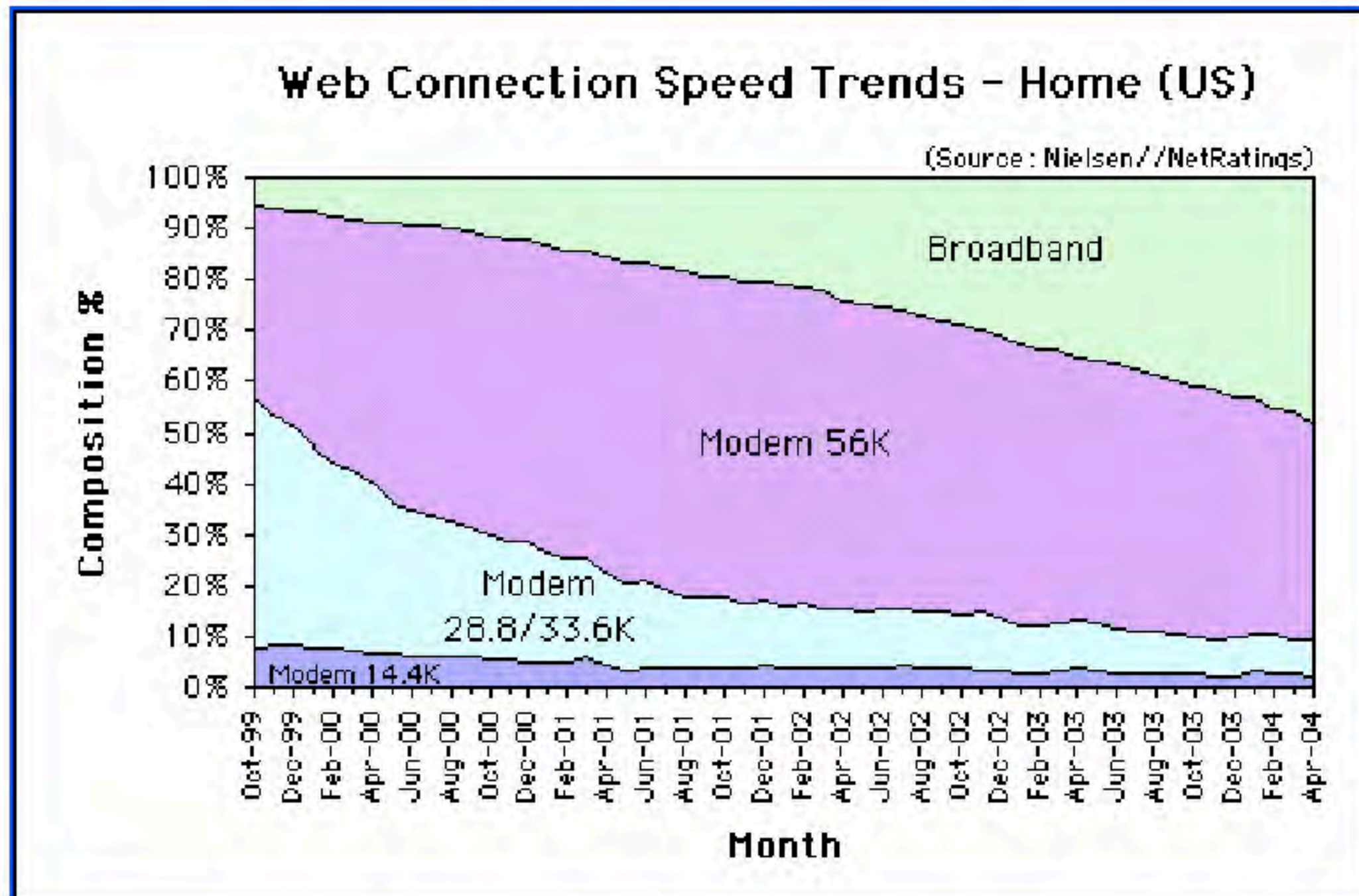


Figure 1: Web Connection Speed Trends - Home Users (US)