

VoIP: The Catalyst for Universal, Affordable Broadband Access by 2007

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Overview

- State of the Economy
- The President's Broadband Vision
- IP-Based Services and Applications
- International Outlook
- Regulatory View



Overarching Goal: Promoting Economic Growth

- Thanks to the President's policies, America's economy is strong:
 - Over the past four quarters the U.S. economy grew at a real GDP rate of 4.0%; compared to GDP growth in Europe of 2.1%.
 - 262,000 new jobs created in February 2005.
 - The economy has shown job growth for 21 straight months and added 3 million new jobs – more than Canada, France, Germany, Great Britain, and Japan combined.
 - The U.S. unemployment rate is 5.2%, while the unemployment rate in Europe was 8.9% (Dec. 2004).
 - There has been a sharp pickup in business spending on capital equipment.
 - Homeownership rate was a record high of 69.0% in the third quarter of 2004.
 - Manufacturing activity (ISM index) has been growing for 20 straight months and employment has been growing for 14 straight months.

The President's Broadband Vision

Goal

"This country needs a national goal for broadband technology . . . universal, affordable access for broadband technology by 2007."

— President George W. Bush, Albuquerque, NM, March 26, 2004

Government's Role

"The role of government is not to create wealth; the role of our government is to create an environment in which the entrepreneur can flourish, in which minds can expand, in which technologies can reach new frontiers."

— President George W. Bush, Technology Agenda, November, 2002.

Benefits of Broadband

“[B]roadband will not only help industry, it’ll help the quality of life of our citizens.”

— President George W. Bush, US Department of Commerce, June 24, 2004

- Tele-Medicine
- Distance Learning
- Tele-Work
- National Security
- Jobs and Economic Growth



Creating Economic Conditions For Broadband Deployment

“We ought not to tax access to broadband. If you want something to flourish, don’t tax it.”

– President George W. Bush in Baltimore, Maryland on April 27, 2004

- Tax relief has given businesses powerful incentives to invest in broadband technology
 - Accelerated depreciation for capital-intensive equipment
 - Extension of the Internet tax moratorium until Oct. 31, 2007; support making the moratorium permanent
 - An 18-month extension of the research and experimentation tax credit; support making it permanent
 - President's FY 2006 budget requests \$132 billion for research and development.

Removing the Regulatory Underbrush

"[B]roadband providers have trouble getting across federal lands...that's why I signed an order to reduce the regulatory red tape for laying fiber optic cables and putting up transmission towers on federal lands."

– President George W. Bush, U.S. Department of Commerce, June 24, 2004

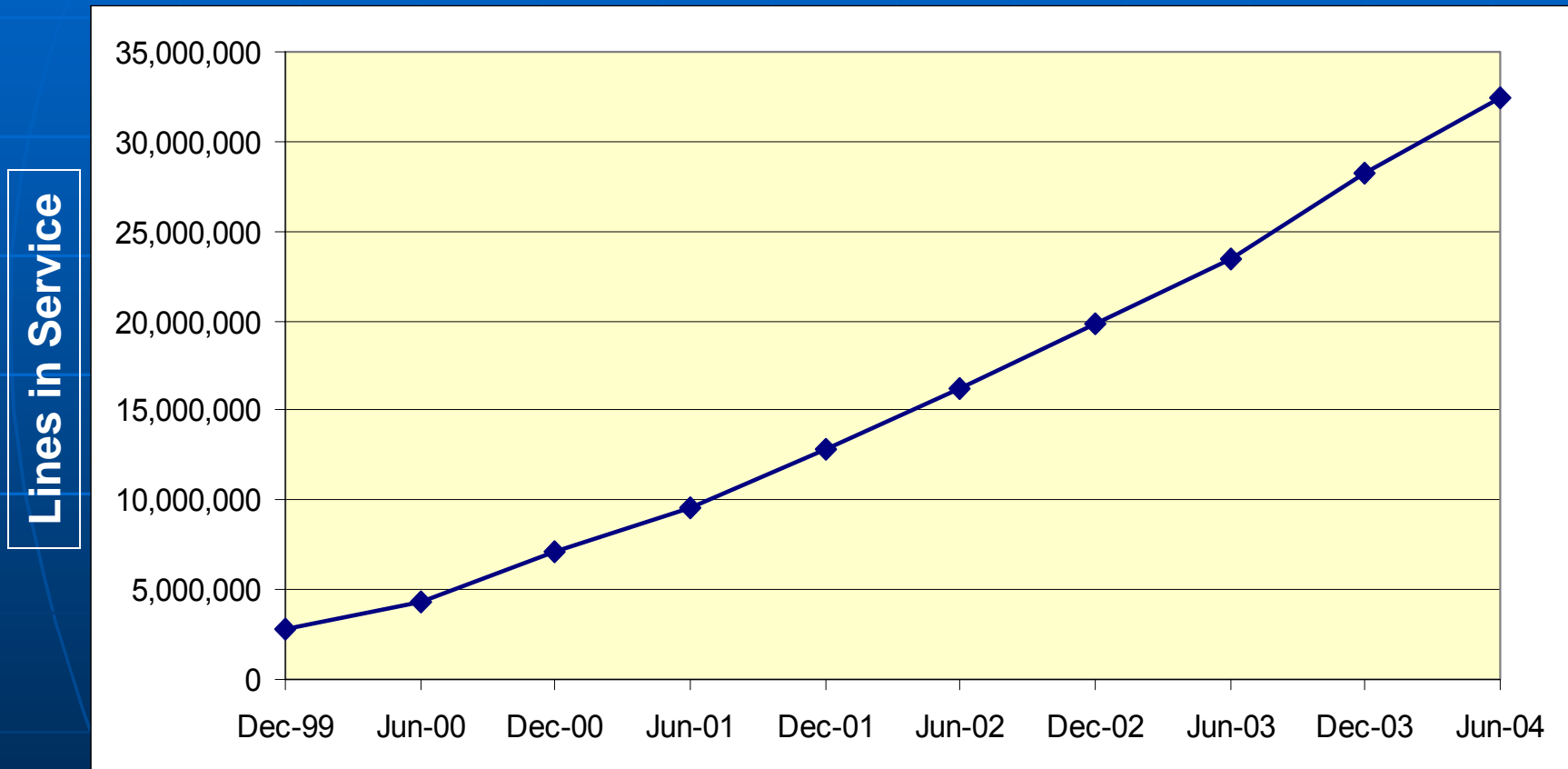
Reducing Legacy Regulation of Broadband Services:

- The Administration supports the FCC's order freeing newly deployed broadband infrastructure from legacy regulation.
- Verizon, SBC, and Bell South announced they will wire at least an additional 20 million homes with fiber-optic cable by 2007 → Total investment is expected to be more than \$6 billion over next several years.
 - Bell South aims to provide 150,000 households with fiber per year and plans to increase the number of homes equipped with a fiber platform by 40% in 2005.
 - SBC will bring video and broadband via fiber to 18 million homes in the next 2-3 years.
 - Verizon aims to connect more than 2 million homes and businesses in 2005.

Improving Access to Rights-of-Way:

- On April 26, 2004, the President signed an executive memorandum directing federal agencies to implement recommendations set out by the Federal Rights-of-Way Working Group. They called for improvements in: 1) Information Access and Collection, 2) Timely Processing, 3) Fees and Other Charges, and 4) Compliance.

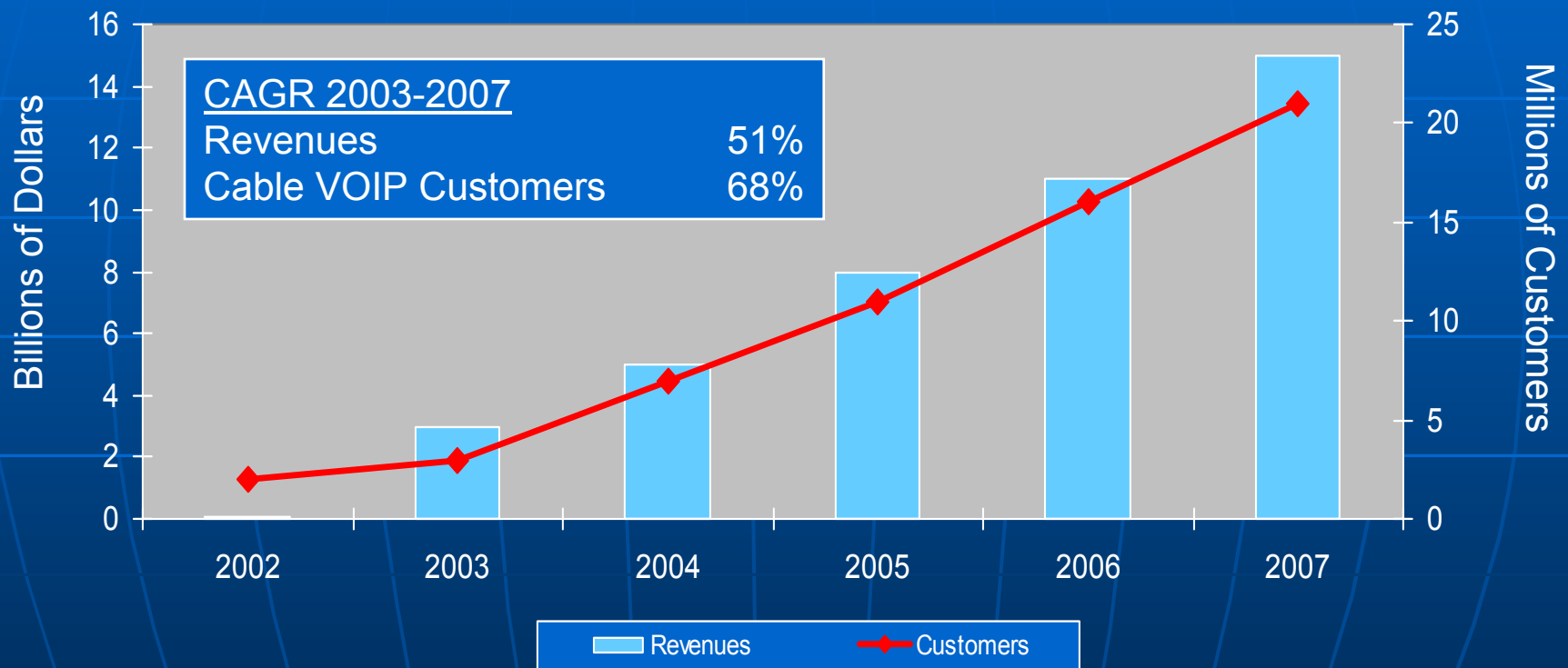
Total High Speed Lines in the U.S.



Source: FCC, December 2004

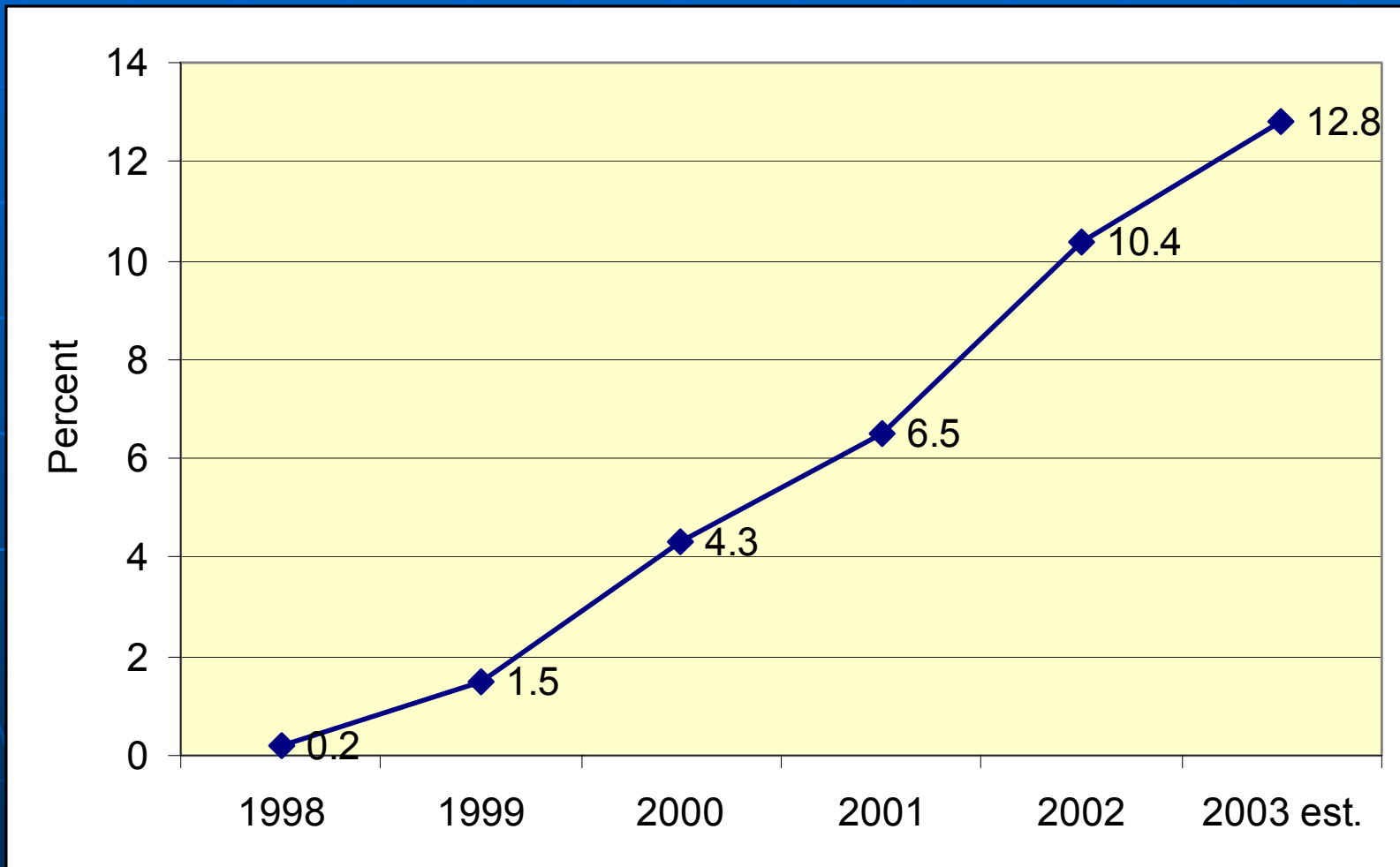
VoIP and Other IP Applications Will Continue to Change the Market

Cable VoIP Market



Source: Kaufman Brothers, "A General Flavor of Mild Decay," July 14, 2003

VoIP Share of International Traffic (1998-2003)



Source: Telegeography 2004

Cost Savings Drive VoIP Market

- Costs of deploying IP-based network are estimated to be about 1/3 the cost of deploying traditional circuit switched network; operating costs of IP network may be 50-60% less. (Source: Sonus Networks, NYT 1/12/04)
- Percentage of corporations using VoIP grew to 12% in 2004, from 3% in 2003. (Source: InStat/MDR, CommDaily 12/8/04)
- Vonage announced 400,000 lines in operation as of Jan. 5, 2005 – 115,000 lines added in 4Q2004 alone.
- TIA's 2005 Telecom Market Review & Forecast said the number of VoIP access lines jumped to 6.5 million in 2004 from 3.8 million in 2003 and was expected to expand rapidly to 26 million by 2008.

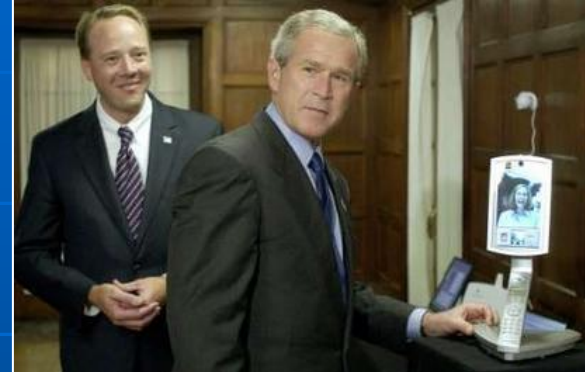
Video Phones: Becoming a Reality

Then...



Bell System (AT&T/Western Electric) Picturephone Model I version from the 1965 "The Telephone Story" poster (Source: Bell Labs "Record" magazine, May/June 1969)

Now

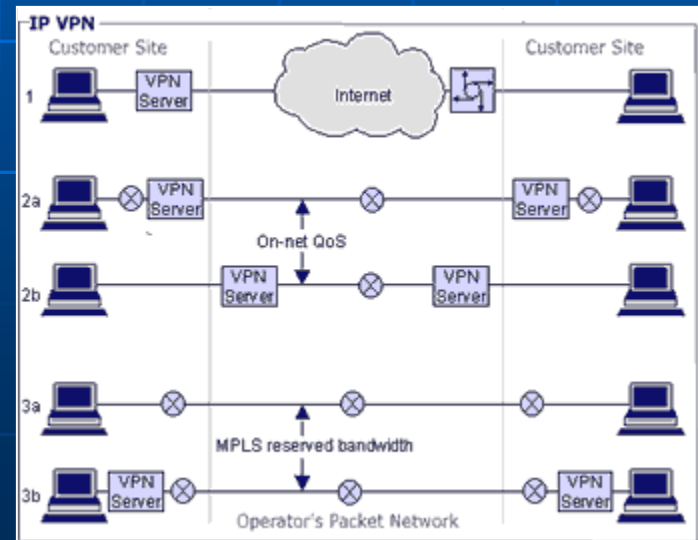


President George W. Bush and Assistant Secretary Michael Gallagher making a call with an Ojo videophone (Source: U.S. Department of Commerce, 6/24/04)

- AT&T first introduced the Picturephone at the 1964 World's Fair, but price and quality prevented the Picturephone from taking off.
- IP platform, TV-quality images and lower costs may finally make videophone service commercially viable.
- More VoIP providers are offering videophone service.
- Sales of video-calling equipment reached \$40 million in 2004, up 23% from 2003.

IP VPNs

- Virtual private networks (VPNs) enable organizations to establish private, secure connections with remote offices or employees via the public Internet.
- VPNs are increasingly important as businesses seek to tie together globally-dispersed operations.
- IP VPN revenues in U.S. were \$2.45 billion in 2003; revenues projected to increase to \$6.1 billion in 2008.
(Source: In-Stat/MDR, reported in NetworkWorld, 9/20/04)
- IP VPN revenues are increasing at 30% per year.



Source: ISP-planet.com

Moore meets Marconi: Wireless Applications of VoIP

- **Wi-Fi**: Until recently, the utility of Wi-Fi phones was limited to businesses and colleges. Companies such as Nokia, Flarion, IDT, Motorola, Cisco, and SpectraLink are beginning to develop hardware and software to facilitate Wi-Fi telephony.
- **WiMax**: Intel plans to build WiMax into its Centrino chip platforms, which power 80% of all PCs, by 2006. InStat/MDR estimates that a company could reach 97.2% of the US population with a \$3.7 billion investment in Wi-Fi.
- **Software Defined Radio** (SDR) devices can dynamically reconfigure the device's characteristics for better performance and new services.
- **Cognitive radio technology** is a particular extension of SDR that employs model based reasoning based upon its assessment of the radio environment.
- **Smart antenna systems** provide numerous benefits in wireless communications environments.



- Skype offers free global telephony to make unlimited, superior quality voice calls via its next-generation peer-to-peer software for Windows, Linux, Mac OS X, and Pocket PC platforms.
- Since its launch in August 2003, Skype has been downloaded over 79 million times -- more than 28 million registered users and over 5.6 billion minutes served as of 3/2/05.
- March 3, 2005 - Wireless provider Broadreach and Skype announced free voice over Wi-Fi service at 350 hotspots around the UK.
- Recently announced partnership with Motorola to provide hands-free accessories and mobile devices to enable truly mobile VoIP communications -- Motorola 'Skype Ready' companion products are expected to be available in the first half of 2005.

VoIP Technology Evolution: QoS & Security

QoS

- Quality of VoIP service is continually improving.
- Service quality depends heavily on the reliability and capacity of the underlying broadband connections.
- Inform customers of quality differences and value proposition.

Security

- While converting voice communications into a data stream can produce significant efficiencies, it can also expose those communications to the same vulnerabilities as other Internet transmissions.
- Industry is aware of potential security challenges and is moving to address them through the VoIP Security Alliance (VOIPSA).

How Should Government Treat VoIP and Other IP-Enabled Services?

- VoIP and other IP-enabled services are engines for expanded competition, lower prices, and robust service innovation.
- VoIP creates new market opportunities for equipment manufacturers and applications vendors.
- Regulatory framework must give this powerful technology full and fair opportunity to maximize its potential.
- FCC's has already taken useful first steps
 - Declared some VoIP services (e.g., Pulver.com's Free World Dialup) to be unregulated information services.
 - Determined that Vonage's DigitalVoice service and similar VoIP offerings are interstate services subject to exclusive FCC authority.

Opportunities for International Trade and U.S. Job Growth

“In the last ten years, 3 billion people have joined the world economy.”

- Craig Barrett, CEO Intel Corporation

■ China

- World's largest landline and mobile telecom networks -- China plans to inject \$500 billion between 2001-2005 into its telecom infrastructure.
- China's telecom equipment market, (\$20 billion estimated worth) is among the world's largest. U.S. exports comprise only \$630 million of that total, leaving ample room for expansion.

■ India

- 1.08 billion people = world's largest democracy ¹
300 million people = world's largest middle class ²
- Broadband and internet growth a priority -- Government of India has set a minimum goal of 20 million broadband subscribers and 40 million Internet subscribers by 2010.

■ Russia

- Market for IP Telephony expected to reach \$200 million in 2004.
- Mobile penetration almost twice that of fixed-line telephony, and growing at 104% annually.

¹ The World Factbook 2004 (updated Feb. 10, 2005)

² UC Santa Cruz, <http://humwww.ucsc.edu>

Governing Principles for Emerging Elements of a Sustainable Policy Framework

- Create President Bush's pro-technology, entrepreneurial environment.
- Respect the diversity of IP services.
- Serve important social policy goals without reflexively imposing legacy regulations.
- Recognize the importance of regulatory stability -- a stable regulatory environment enables businesses to make rational investment decisions.
- Fully engage VoIP stakeholders in developing regulatory framework.