

Viabile Business Models for Service Providers

VoIP Volcano Workshop
University of California
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Emerging Opportunities

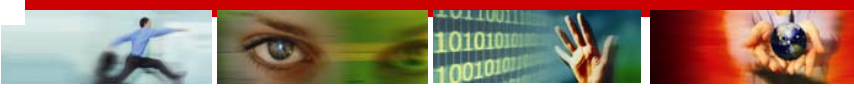
Two Different Worlds

PSTN

Internet

Age of Network	130 Years Old	<i>30 Years Old</i>
Federal Law	2 Laws, 1934 & 1996	<i>None</i>
Federal Regulation	FCC	<i>Little, if any</i>
State Regulation	51 State PUC	<i>Little, if any</i>
Taxes	\$23 Billion Federal, State, Local	<i>Little, if any</i>
Subsidies	Many Subsidy Programs	<i>No Subsidy Programs</i>
Customer Pays	Usage per Minute	<i>Unlimited usage</i>
Content to Media	Coupled	<i>De-coupled</i>
Application	Only Voice	<i>Everything but Voice...</i>

Until Recently



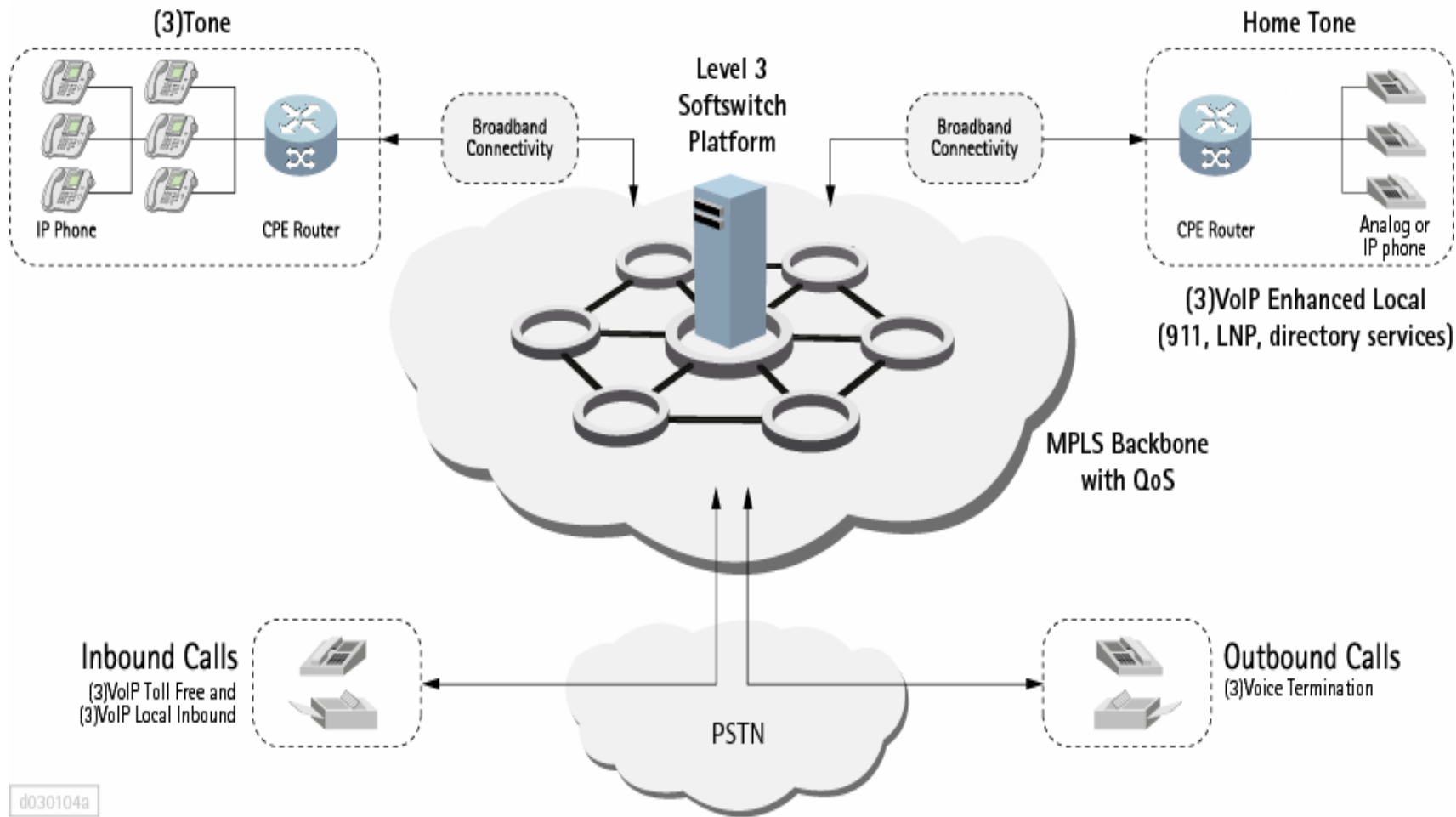
Why Are These Worlds So Different?

- Each network was born in a different century
- Business Environment
 - PSTN grew around one large, closed monopoly and many smaller monopolies
 - Internet grew around many entities of all sizes with open interconnection
- Technology
 - PSTN used proprietary circuit-switching
 - Internet used open technical protocols like TCP/IP
- Social Policy
 - PSTN protects consumers with Regulation
 - Internet protects consumers with Competition

VoIP Adoption is Creating Opportunity

- Lines blurring between the PSTN and IP
- VoIP is gaining traction
 - Softswitch networks carry ~2 billion minutes/day vs. 2.3 million in 1999
 - IP-Centrex and IP-PBX are being adopted by enterprises
 - Over 40% growth in IP enabled ports from 2002 - 2003
 - Major carriers consider VoIP their future
- Follow the Silicon
 - 62.5 million VoIP IC ports shipped for IP phone, enterprise gateway and infrastructure (carrier class) segments.
 - 43 million 802.11 Wi-Fi devices in operation
 - 64 million DSL ports shipped total for the industry in 2003 compared to 19 million total ports from 2000-2002.
- Level 3 Strategy
 - Wholesale/OEM Building Blocks to many distribution channels

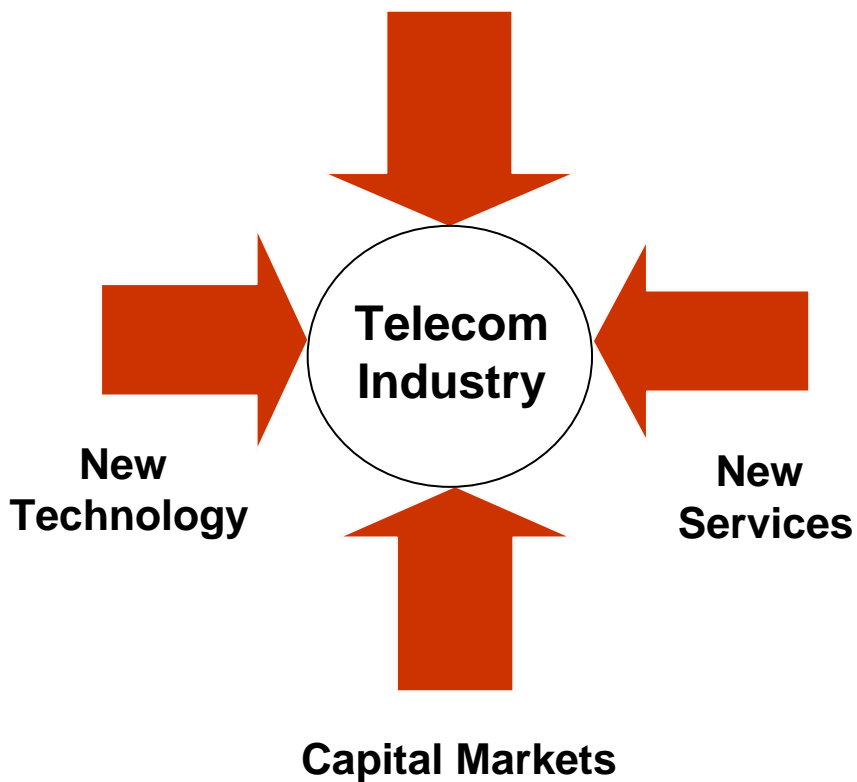
Softswitch Services – Voice Network



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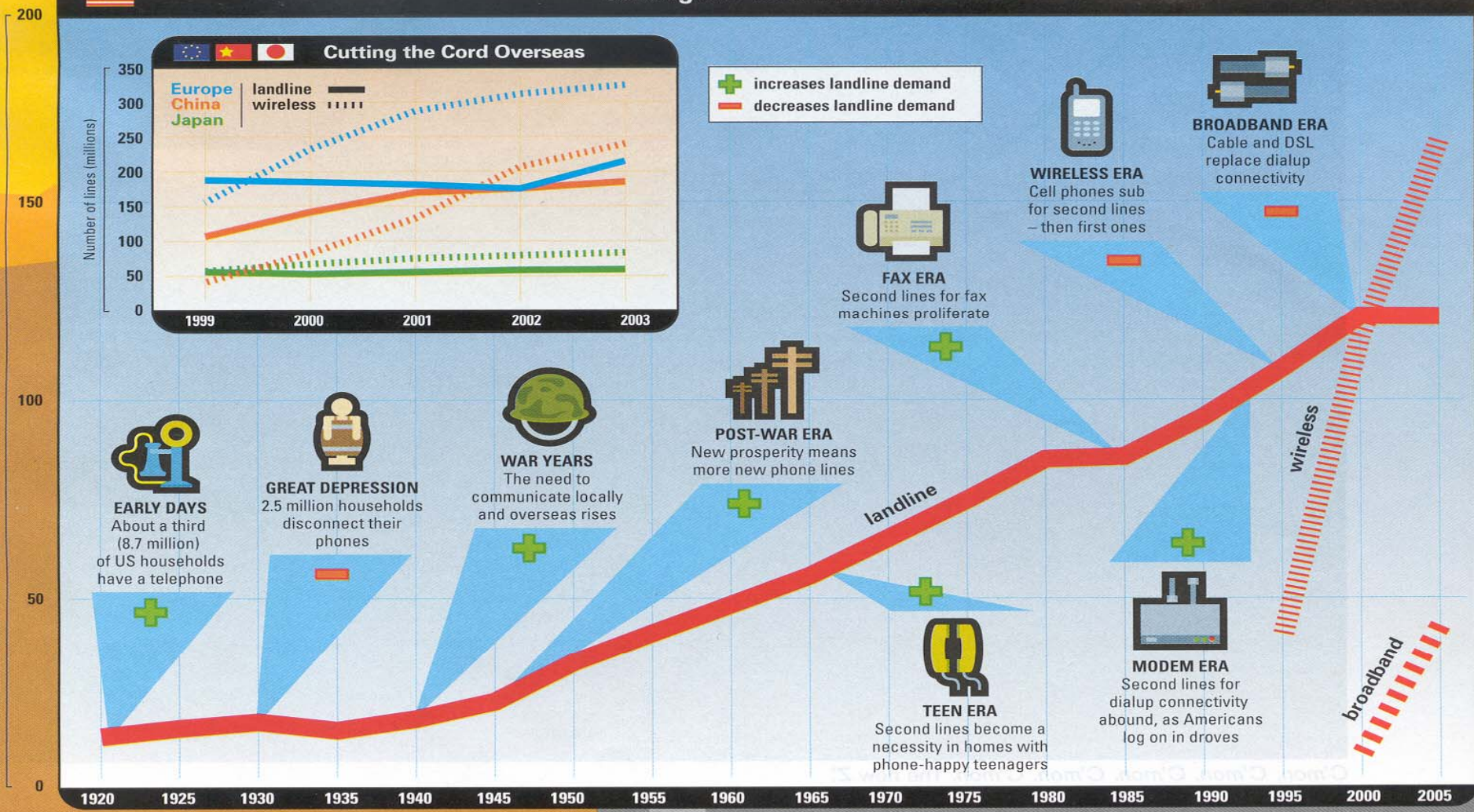
Over its history, this industry has been molded by fundamental forces

Change in Regulation



- 1876, Invention of the Telephone
- 1913, Kingsbury Commitment
- 1934, Communications Act
- 1947, Invention of the Transistor
- 1974, MCI anti-trust case
- 1977, First Fiber Optic cable
- 1984, AT&T Divestiture
- 1995, Commercialization of the Internet
- 1996, Telecommunications Act
- 2000, Peak of the NASDAQ
- 2004, VoIP

Cutting the Cord in the US



Sources: AT&T; Cellular Telecommunications and Internet Association; eMarketer; Federal Communications Commission; Japan's Ministry of Public Management, Home Affairs, Posts, and Telecommunications; Primetrica; The Yankee Group