

Consumer Voice Over IP: Selected Market Strategies and Analysis

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Today's Presentation

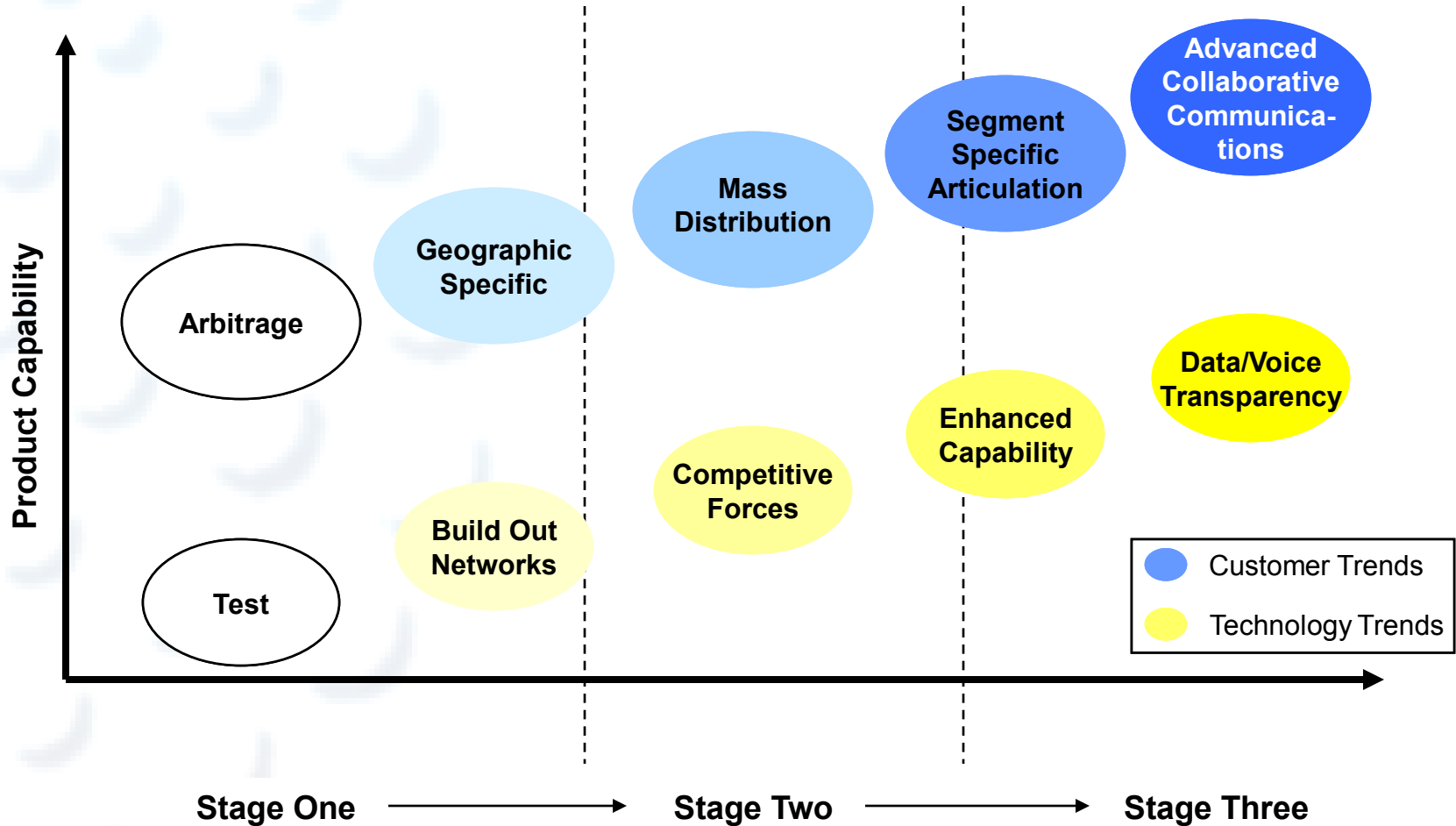
- **State of the Consumer VoIP Market**
- **Market Drivers and Restraints**
- **Selected Carrier Consumer Offerings**
- **Future Enhanced Services**
- **Technology: Impact on Consumers**
- **Consumer Usage and Perspectives**
- **Conclusions**
- **Questions and Answers**

Underlying consumer VoIP market truths

- **Residential VoIP services are in the very early stages of development.** Wide scale consumer adoption of VoIP services is still at least three years away.
- **Business customers will be the first target** of VoIP services and enhanced applications; residential customers will follow.
- The **regulatory environment** as it pertains to IP services is **highly uncertain**.
 - Access arbitrage opportunities in the United States for VoIP long distance services are expected to be a short term phenomenon which will eventually be eliminated.
- A great deal of the enhanced service application development will be completed by **third-party developers**, and not by the carriers themselves.
 - This in contrast to the way most new services were developed for the consumer market historically.
- The service providers are and will be heavily **reliant on the vendor community** to facilitate their VoIP strategies and deployment of IP services.
- A main goal for carriers is that eventually, the **underlying technology** and transport mechanisms for services will be **transparent to consumers**.
 - Consumers will think that they simply are completing a telephone call or data transaction rather than an “IP enabled activity.”

The current interest in IP is driven by cost saving, in both rates and network efficiencies. As the market matures, the opportunity will center on advanced services and data / voice transparency

Evolution of IP Telephony Market



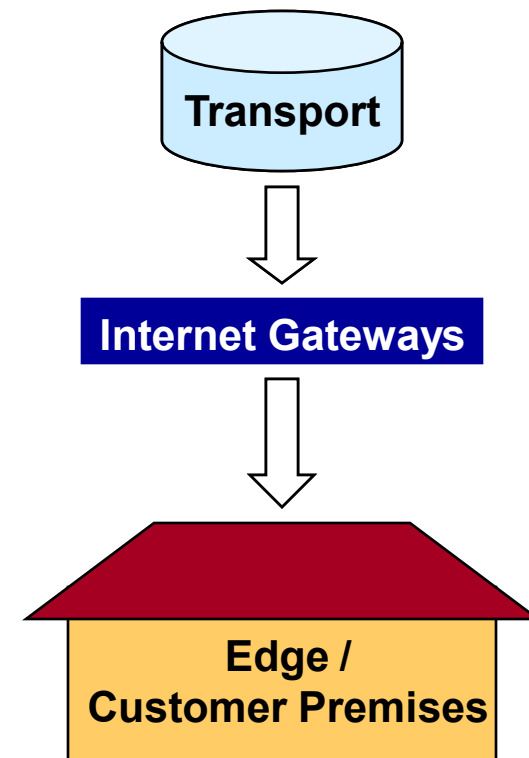
Evolution of IP functionality

- **Long distance transport** ----->
 - Pricing arbitrage strategy
 - Voice applications

- **Local capabilities** ----->
 - Voice, data, fax
 - SS7 / local calling features

- **Enhanced IP based services** ----->
 - Web enabled customer care / billing
 - Universal messaging
 - Video on demand
 - Remote administration

Where's the IP?



As functionality is pushed closer to the edge, the key challenges from an operational perspective will be where and how customer information is ultimately collected

The industry is driven by several supply and demand side issues

Key Restraints

Key Drivers

Supply Side

- Reliability and scaling issues
- Lack of unified Quality of Service standards - interoperability concerns
- Uncertain regulatory environment, Potential access charge reform
- Costs to build out private network
- Uncertainty as to profitability of consumer market

- Technological advancement driven by new entrants (Qwest, L3)
- Desire to look IP ready
- Experimentation with technology
- Business markets driving consumer
- Boom in electronic commerce
- Growth of wireless market
- Declining PC prices

Demand Side

- Reliability and latency issues
- Limited availability of services / lengthy trial periods
- Uninformed consumer market
- Falling per minute long distance rates / growth of dial around services

- Toll avoidance and cost arbitrage opportunity
- New services and increased functionality
- Generational acceptance
- Increasing consumer acceptance and usage of Internet

Consumer VoIP capabilities will most likely follow those deployed in the business space.

Developing IP products for enterprises will be the driving force behind further evolution of VoIP services for several reasons:

- Business customers are first targets of new entrants such as Qwest and Level 3 and the incumbent IXCs will be forced to respond
- Business customers typically purchase dedicated access that allows for carriers to manage VoIP services on an end-to-end basis
- Business customers have higher networking transport costs, and will be able to realize the savings associated with VoIP contracts priced at much lower rates
- Information technology managers will be able to take advantage of managing a single voice / data network, thus lowering operational expenses
- Enterprises will be heavier users of collaborative communications services that will combine voice and data. These services include video conferencing, collaborative whiteboard services, and universal messaging

The first consumer products will mimic business applications but will be deployed and used in the home environment

VoIP services currently appeal to two distinct groups on the consumer spectrum - those users who are more price sensitive....

Customer Segment	Key Characteristics
Price Sensitive Callers	<ul style="list-style-type: none"> ■ More likely to sacrifice sound quality for lower prices ■ Cost arbitrage is main attraction of VoIP services ■ More likely to churn ■ Demonstrated receptivity to alternative, lower cost calling vehicles such as dial around
International Callers	<ul style="list-style-type: none"> ■ More likely than mass market LD callers to sacrifice sound quality for lower prices (11.6% vs. 8.2%, respectively) ■ Cost arbitrage is significant driver of increased usage
Calling Card Users / Prepaid Calling Card Users	<ul style="list-style-type: none"> ■ Less likely to churn ■ Willing to prepay for services ■ International calling component
College / Youth	<ul style="list-style-type: none"> ■ More likely to sacrifice sound quality for lower prices ■ Cost arbitrage is main attraction of VoIP services ■ High number of foreign nationals studying in the US attracted to international cost arbitrage

....and those users who desire enhanced, data-rich applications and functionality

Customer Segment

Key Characteristics

SOHO / Telecommuters

- Demand for integrated voice and data services (voice, fax, and data messaging, multimedia conferencing) delivered to PC or phone
- High penetration levels for multiple phone lines, PCs, online services, and call management services than average US household
- High work-at-home needs

Early Adopters

- “Hobbyists”
- More technologically savvy / knowledgeable
- More likely to sacrifice sound quality

Three distinct classes of companies are participating in consumer VoIP services today

■ Small Regional Companies

- leverage access bypass opportunities afforded ISPs
- build niche / regional offerings

■ “Newcomers” / Next Generation Telcos

- build private IP-based networks to carry voice and data

■ Incumbent Long Distance Carriers (IXCs)

- develop services to become “IP ready” and participate in market-shifting phenomenon
- experiment with the technology
- publicize understanding of VoIP
- protect existing revenue streams from threat of emerging VoIP services
- migrate network from circuit switched to packet

We will focus today on the latter two groups

Comparison of service providers' consumer VoIP strategies

Service Provider	Short-term Strategy	Long-term Strategy
AT&T	<ul style="list-style-type: none"> ■ Local: cable over IP infrastructure ■ Marketing strategy: keep pace with competitors 	<ul style="list-style-type: none"> ■ Bundled service offering including local, LD, enhanced services, video ■ Local service is the “ultimate” enhanced service
MCI WorldCom	<ul style="list-style-type: none"> ■ Less focused on consumer markets 	<ul style="list-style-type: none"> ■ Focused on business segments and enhanced functionality
Sprint	<ul style="list-style-type: none"> ■ Marketing strategy: reposition company in eyes of the consumer; keep pace with competitors 	<ul style="list-style-type: none"> ■ Bundled service offering including local, LD, enhanced services, video, delivered through ION product
Qwest	<ul style="list-style-type: none"> ■ Use consumer offering to build brand name ■ Ultimately focused on business segment 	<ul style="list-style-type: none"> ■ Voice as “add on” to data services

Comparison of service providers' consumer VoIP offerings

Service Provider	Product Name	Stage of Service	Pricing	Mechanics
AT&T	Connect 'N Save	<ul style="list-style-type: none"> ■ Trial begun 5/98 ■ Ongoing 	<ul style="list-style-type: none"> ■ 7.5¢ / min 	<ul style="list-style-type: none"> ■ Dial around trial ■ Not focused on specific consumer segments ■ Product tested in limited cities
MCI WorldCom	NetLink	<ul style="list-style-type: none"> ■ Trial begun 2/99 ■ Ongoing 	<ul style="list-style-type: none"> ■ Free to existing Internet / LD subscribers 	<ul style="list-style-type: none"> ■ PC-to-phone based ■ Software enabled ■ Trial not focused geographically
Sprint	Callalternatives	<ul style="list-style-type: none"> ■ Trial 8/98 to 1/99 	<ul style="list-style-type: none"> ■ 7.5¢ / min ■ Prepaid via credit card in blocks of \$10, \$25 	<ul style="list-style-type: none"> ■ Dial around trial, calling card based ■ Targeted to users of Sprint calling card services, focused on specific customer segments ■ Trials conducted in five US geographies and several intl.markets
	ION	<ul style="list-style-type: none"> ■ Business trial 1Q99 ■ Consumer trial 3Q99 	<ul style="list-style-type: none"> ■ Subscription based pricing model ■ Pay per transaction for some services 	<ul style="list-style-type: none"> ■ Consumer and business focused
Qwest	Q.talk	<ul style="list-style-type: none"> ■ Trial 1Q99 ■ Ongoing 	<ul style="list-style-type: none"> ■ 7.5¢ / min ■ Post-paid billing and prepaid credit card billing 	<ul style="list-style-type: none"> ■ Dial around trial ■ Phone-to-phone based ■ Limited geographic availability

Although focused on the business segment, Level 3's activities ultimately impact the consumer market as the company is driving growth in transport and indirectly, application development

Overall strategy

- Primarily focused on business markets
- Consumer play through wholesale of services to other VoIP providers
- end-to-end IP network that is designed to be continuously upgradable

VoIP product offering

- Currently in buildout phase - US, Canada, Europe
- Building network (fiber, switching) ready for IP based services
- *Level 3 IP Voice* - offering to business market, no consumer applications

Market positioning

- Customer segmentation
 - large and medium businesses
 - business customers who will ultimately resell Level 3's capacity (wholesale component)

Key partnerships

- "Build versus buy"
- Acquisition a key part of strategy - XCOM (CLEC and software developer), GeoNet (regional ISP), BusinessNet (London-based regional ISP), miknet (German ISP)
- Potential to move upstream in future (i.e., begin to offer service)
- Potential future acquisition target by company seeking to acquire "ready made" and fully functional IP network

Enhanced services will evolve in two stages

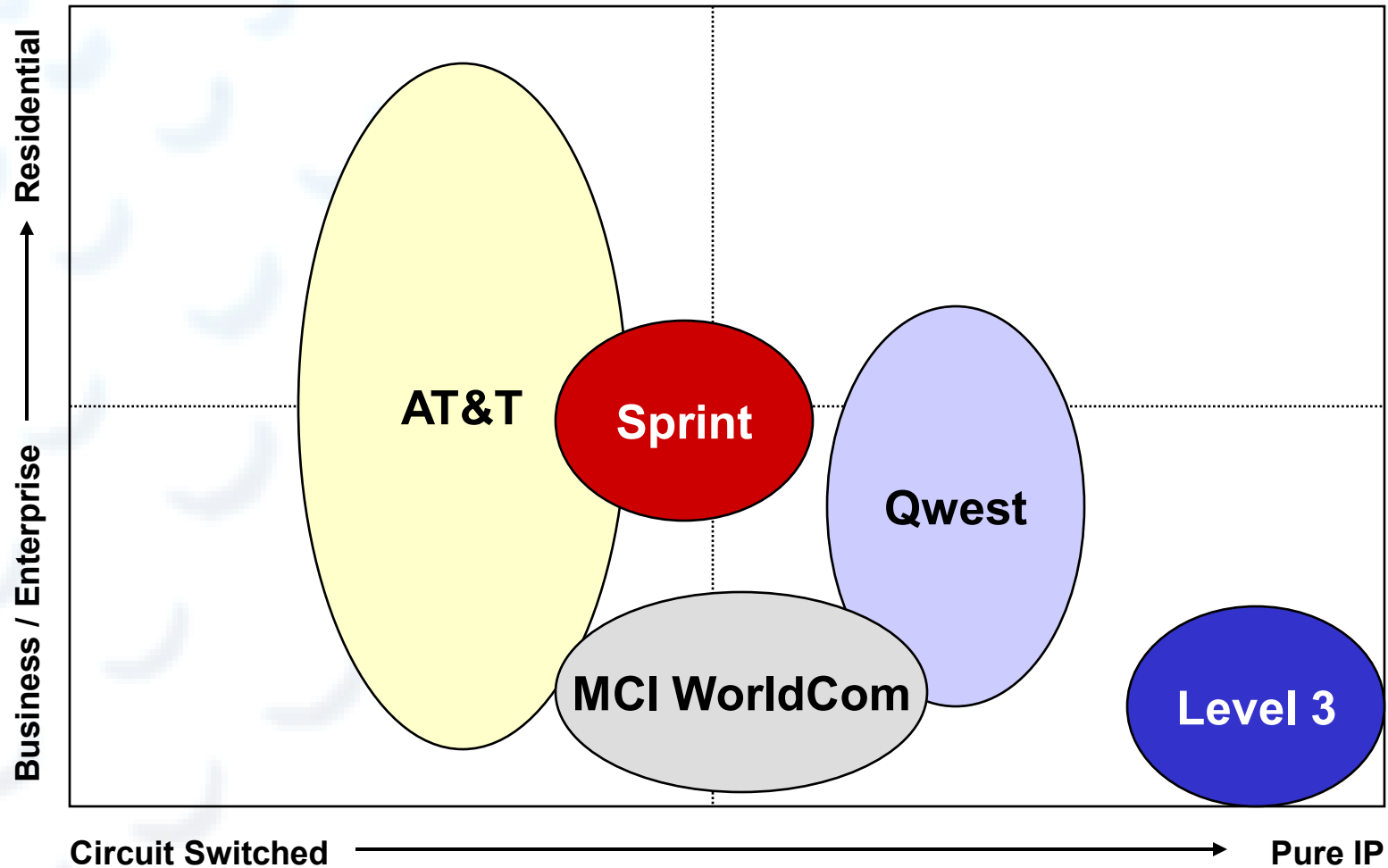
Product Suite #1 - Services resembling features that already exist in today's circuit switched environment

- Local dial tone on an IP platform
- Long distance over IP
- Call waiting, caller ID, call forwarding, and all other SS7 based enhanced features
- Voice messaging
- High-speed Internet access

Product Suite #2 - Advanced capabilities enabled by IP intended to provide a competitive advantage to carriers going forward

- Universal messaging
- Video on demand
- Video conferencing
- Virtual account provisioning and bill management
- Advanced gaming and virtual reality applications
- Home networking
- Home automation services

In five years, most consumers will still be receiving services on circuit switched architecture. At this time, new IP-based enhanced services will be relatively new, if available at all



Note: This slide is meant to be conceptual in nature only; the size of each bubble does not correspond to the actual size of the respective company in revenues, income, assets, or any other measure.

Technology - impact on consumers

Migration Strategies

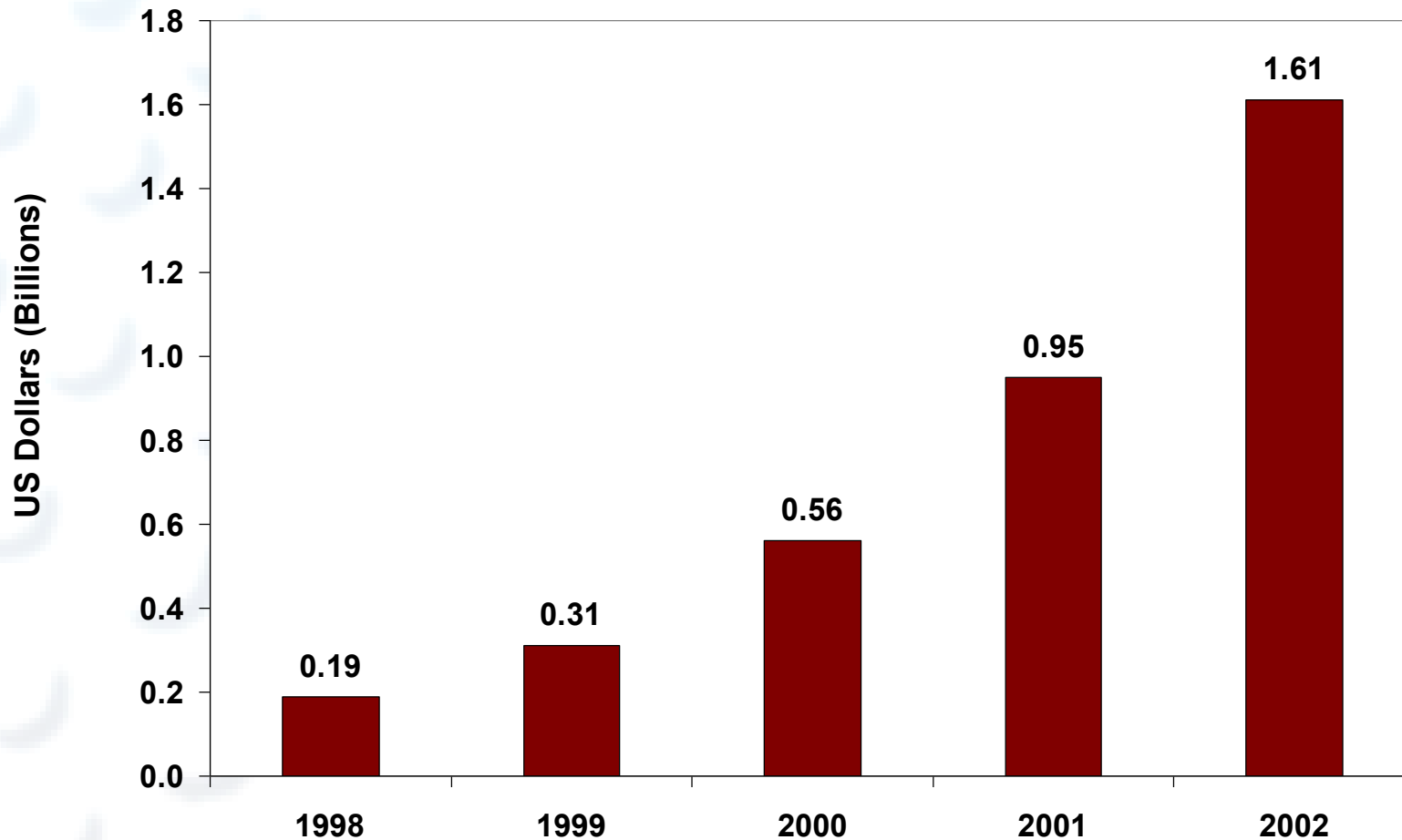
- Each carrier, with the exception of Level 3, has articulated a migration path for the movement away from circuit switched architecture to a more data intensive fabric.
- The vendor community is essentially driving functionality
 - Carriers are heavily dependent on vendors to facilitate their VoIP strategies and deployment of IP services.
 - Carriers are partnering more with the vendor community to determine standards and application development

Implications for Consumers

- **Carriers will try to leverage their IP expertise in multiple markets and customer segments**, namely business and consumer.
 - Introducing consumer VoIP offerings enables the carriers to mitigate huge capital costs required to build infrastructure.
- **Prices will eventually decrease**, as consumer offerings and applications are more widely deployed.
- **Network efficiencies will increase**, as redundancies are eliminated and interoperability standards set.

Continued investment in traditional circuit switch infrastructure is and will be significantly smaller than investment in IP capabilities


Worldwide Market for Voice Over IP Gateways (US\$ Billions)




Consumer usage and perspectives - VoIP services

Questions: Have you ever used Internet calling? How interested would you be in using Internet calling?

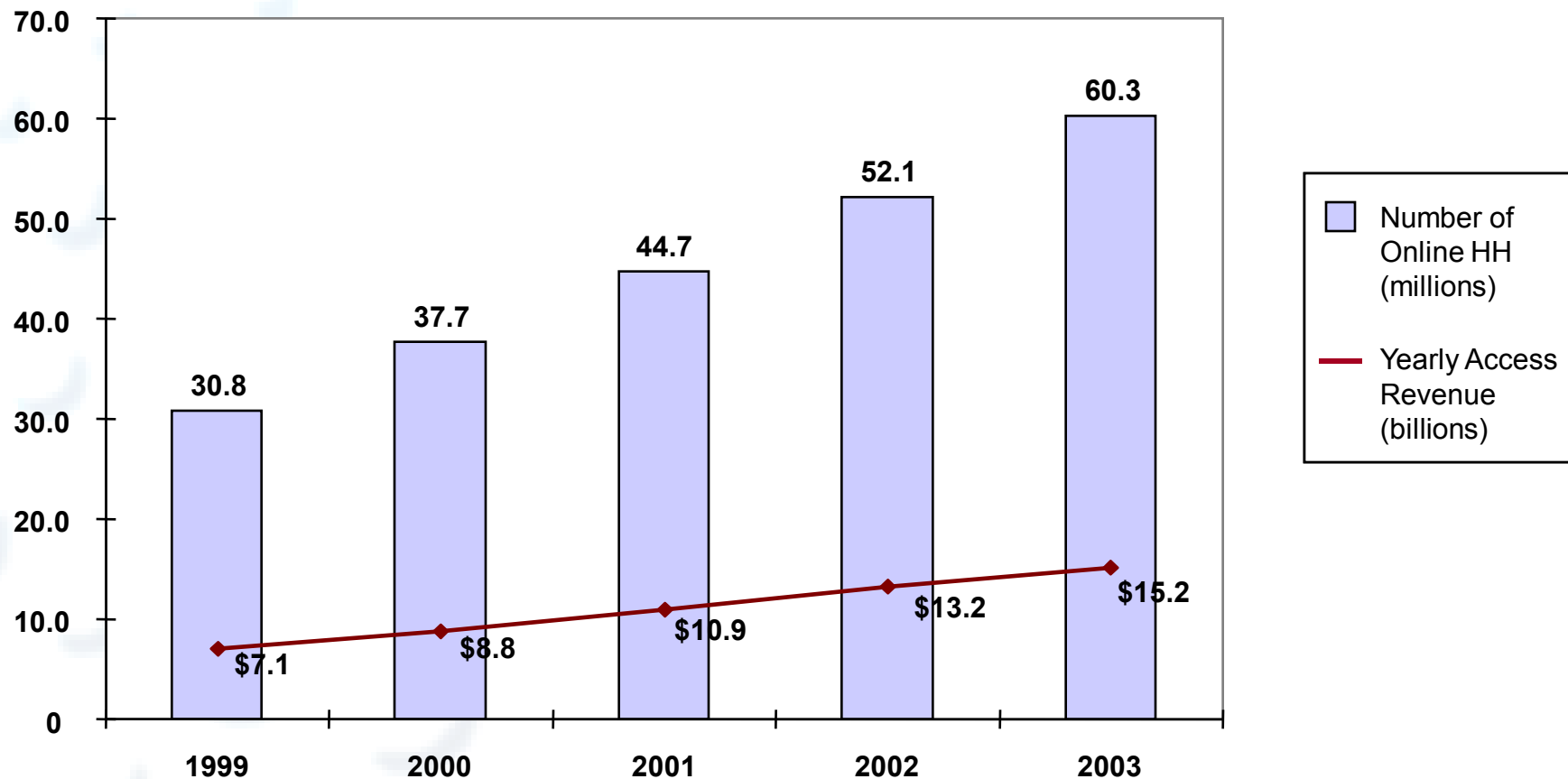
Of all consumers....

Used Internet calling	4%
Heard of but IP telephony never used	37%
 Never heard of Internet telephony	56%

Of those consumers who have never used IP telephony....

Very or somewhat interested in using	20%
 Not interested in using	58%

The number of US households that are online will continue to grow significantly over the next five years



Implications

- Continued Internet acceptance will drive consumer usage of Internet telephony
- Growth in online HH will bode well for future enhanced services from both a consumer acceptance and application development perspective

How will consumer telephony be impacted by VoIP and other IP-based services?

Current Market Dynamics

- Bill for voice services on per minute basis
- Closed, proprietary architecture
- Few, dominant players controlled market
- Focus on voice
- Subscription services
- Uniform product offering
- Voice separate from data



Future Market Dynamics

- Open architecture wins
- New, venture funded, entrepreneurial players
- Traditional providers expanding offerings into new areas of value chain
- Voice is add-on to data, focus on enhanced services
- Video telephony
- Quality of Service standards
- Multi-party conference calling
- Advanced call routing
- Voice combined with data
- Functionality pushed to the edge

Several questions still must be addressed in the IP environment

- **As technology is pushed to the edge, what consumer usage and demographic information can be captured?**
- **What transactions will be billable events?**
 - How will usage be measured?
 - Is “minutes of use” still an accurate measurement of usage for enhanced data services?
- **How much control will shift to the consumer?**
- **How will services converge?**
- **Which pricing models will prevail?**
 - Transaction based versus subscription based
 - Hybrid

Questions and Answers

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