The Changing Face of Communications
Cautionary Language Concerning Forward-Looking Statements

Information set forth in this presentation contains financial estimates and other forward-looking statements that are subject to risks and uncertainties, and actual results might differ materially. A discussion of factors that may affect future results is contained in AT&T’s filings with the Securities and Exchange Commission. AT&T disclaims any obligation to update and revise statements contained in this presentation based on new information or otherwise.
1. The Changing Face of Communications
2. The Internet as an Economic Engine
4. Service Comparison Discussion
The Changing Face of Communications

2. The Internet as an Economic Engine


4. Service Comparison Discussion
How Consumers “See” the Internet

shopping

Google

YouTube
Google Search
Google Earth
e-Bay

movies
games
shopping

Disney

Yahoo

Yahoo Search
e-mail
photos

amazon.com
200,000+ private networks

Source: Lumeta
AT&T’s IP Network is one of the 200,000+ Networks that Comprises the Internet
Where are We Today?

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2010</th>
<th>2012</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic data generated this year</td>
<td>38</td>
<td>180</td>
<td>309</td>
<td>713%</td>
</tr>
<tr>
<td>(exabytes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet users (billions)</td>
<td>1</td>
<td>1.8</td>
<td>2.26</td>
<td>126%</td>
</tr>
<tr>
<td>YouTube daily downloads (millions)</td>
<td>100</td>
<td>2,000</td>
<td>4,000</td>
<td>3900%</td>
</tr>
<tr>
<td>Active Facebook Users (millions)</td>
<td>50</td>
<td>400</td>
<td>800</td>
<td>1500%</td>
</tr>
<tr>
<td>Tweets per Day (thousands)</td>
<td>5</td>
<td>50,000</td>
<td>250,000</td>
<td>50,000%</td>
</tr>
</tbody>
</table>

Source: Facebook.com, HubSpot.com, blog.twitter.com
The Online World Stats for 2012

- 156 Million Blogs
- 555 Million Websites
- 3.146 Billion Email Accounts
- 124+ Billion Tweets/yr
- 4 Billion Video Playbacks on YouTube/day
- 2.267+ Billion internet Users
- 107+ Trillion Emails Sent
- 901 Million Facebook Users

Worldwide Mobile Subscribers: 6 Billion 4Q2011

IN 2010:
• Strategy Analysts predicted 5.8 billion by 2013
• 286 million mobile phones in US

Source: Informa Telecoms & Media, December 2011 WCIS+
"Cutting the Cord"
Wireless Substitution

As of 2010 nearly 30% of all U.S. households disconnected their landlines--up from 25% the year before. (Averaging 1% increase per quarter)

Households without landlines
Percentage of U.S. adults and children living in homes that use cell phones as their primary home phone, July 2009-June 2010.

Maryland:
18.4% (age 18 & older)
18.0% (under 18)

Source: National Center for Health Statistics
The Growing Irrelevancy of the Public Switched Telephone Network

Customers are demanding other services

- ILECs in AT&T’s 22-state area have lost about 68% of their PSTN lines over the last 13 years
- Less than 30% of the homes connected to ILEC PSTN networks still subscribe to traditional telephone service
Mobile Traffic Estimates: Video in High Demand

In 2010 on a global basis mobile phones were used more for accessing data than they were to make calls, and global data traffic exceeded an Exabyte of data. (moconews.net 4/1/2010)

Source: Cisco, graph at: www.itu.int/net/itunews/issues/2010/06/35.aspx
The “Internet of Things”: Machine to Machine (M2M)
1. The Changing Face of Communications
2. The Internet as an Economic Engine
4. Service Comparison Discussion
## The Internet as an Economic Engine

The Internet provides a global distribution platform to deliver content & services at lower cost to consumers.

<table>
<thead>
<tr>
<th>Distributed Data</th>
<th>Distributed Content: www</th>
<th>Distributed Voice</th>
<th>Distributed Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed Text</td>
<td></td>
<td></td>
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<tr>
<td>E-mail</td>
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<tr>
<td>Instant messaging</td>
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<tr>
<td>Text messaging</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E-collaboration/ e-work</td>
<td></td>
<td></td>
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<tr>
<td>Blogs</td>
<td></td>
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<tr>
<td>Distributed Text</td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>Software distribution</td>
</tr>
<tr>
<td>Retail sales</td>
<td>Public information</td>
</tr>
<tr>
<td>Games</td>
<td>Books</td>
</tr>
<tr>
<td>Publishing</td>
<td></td>
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Distributed Voice

Distributed Video
The Internet as an Economic Engine

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<th>Distributed Video</th>
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<tbody>
<tr>
<td>Distributed Text</td>
<td></td>
<td>VoIP phone calling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chat</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Audio conferencing</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Answering services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Record and send</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Distance learning
- Medical consultation
- Remote monitoring for security & medical
- Video conferencing
- Video distribution
Five Major Technology Discontinuities Are Enabling Convergence

1. IP networks (common protocol)
2. Broadband Everywhere
3. Ubiquitous Wireless
4. Multi-access Interactive devices
5. Delayered and Open Network and IT platforms
Network Convergence

The Past
Multiple backbones for each access technology or service

Today
Multiple access technologies & services on one IP-based backbone
Internet Protocol (IP) separates applications from the network:

- Voice is not longer restricted to telephone networks
- Voice becomes another IP data application
Video Becomes Another Data Application On an IP Network

Internet Protocol (IP) separates applications from the network:
- Video is not longer restricted to cable or Satellite networks
- Video becomes another IP data application

Broadcast Video
Cable, Satellite Network

Traditional Video Services

IP/Internet Applications
- Voice
- Video
- Domain Name Service
- E-mail
- WWW

Enhanced/Information Services
- SIP, RTP
- SMTP
- POP3
- DNS
- HTTP

TCP, UDP, RSVP

IP (IPv4, IPv6), IPSEC

L2TP (tunnels), Media Access Control (Ethernet, DSL, ISDN, FDDI)

Satellite, Wireless, Cable, Phone, Electric Networks

Physical Layer
Logical Layer
Application Layer

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Services Convergence

1. Traditional Services Move to IP
2. Integration of Multiple Real Time Applications
3. Fourth-Generation Services and Applications Emerge

- Sensor & Ad-Hoc Networks
- Business Intelligence @ Scale
- IPTV
- Online Gaming
- Grid Computing, Cloud and Mesh Computing
- Voice & Video Conferencing
- Skype
- Click-to-Dial
- Instant Messaging
- Document Collaboration

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IP operates in layers that allow applications to be separated from the infrastructure

- Enables multiple players to enter the market at different layers and compete, stimulating innovation
- The type of the network (electric, co-axial, copper, wireless, fiber) no longer dictates the application or services
Key to Economic Growth – Companies are able to enter the Market at Different Levels to Compete, Stimulating Innovation

<table>
<thead>
<tr>
<th>AT&amp;T U-verse IPTV</th>
<th>Ooma VoIP</th>
<th>Garmin GPS</th>
<th>Amazon Kindle</th>
<th>Skype Video calling</th>
<th>Apple iPad</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T / content owners</td>
<td>Ooma/Phone Number Administration</td>
<td>Garmin / map, TMC traffic providers</td>
<td>Amazon / content owners</td>
<td></td>
<td>Apple / content owners</td>
</tr>
<tr>
<td>AT&amp;T/Partners</td>
<td>Ooma</td>
<td>Garmin</td>
<td>Amazon</td>
<td>Skype</td>
<td>Apple/100,000s application providers</td>
</tr>
<tr>
<td>AT&amp;T/Partners</td>
<td>Cable &amp; DSL</td>
<td>Satellite &amp; FM radio</td>
<td>Amazon / Global 3G providers</td>
<td>Cable &amp; DSL, Wireless</td>
<td>Apple / AT&amp;T 3G or broadband wifi</td>
</tr>
<tr>
<td>AT&amp;T</td>
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<td>Cable &amp; DSL, Wireless</td>
<td>Apple / Global 3G providers or wifi</td>
</tr>
<tr>
<td>AT&amp;T/Partners</td>
<td>Ooma/VoIP box mfgr</td>
<td>Garmin GPS</td>
<td>Kindle, PC, MAC, iPhone, Blackberry, iPad, Android</td>
<td>PCs, MAC, camera, cell phone mfrs</td>
<td>Apple iPad</td>
</tr>
</tbody>
</table>
Realization of the Vision:
Any Application from Any Device to Any Device over Any Network

- Laptop with Camera
- Smart Meter
- Internet/IP Networks (200,000+ networks)
- Cable, DSL, Fiber, Wireless and Satellite
- VoIP Gateway
- Broadband Modem
- WiFi Hotspot
- Broadband Modem
- IP Softphone
- Personal Hotspot
- Home Controller
- Broadband Modem
- WiFi
- Set top box
- iPBX (Gateway)
- IP Phone
- Laptop
- Netflix
- iPod
- IPTV
- Wii / Playstation
- Broadband Modem
- Broadband Modem
- IP Phone
- Cordless Phone
Service Comparison Discussion

1. The Changing Face of Communication
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Voice over IP
Google Voice

Consumer is provided a “google” number for all devices for free; pays Google for international calls

Consumer pays Broadband Provider for Broadband service

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Ooma VoIP

Consumer pays Ooma for (a) device with unlimited US local and LD calling, (b) optional monthly subscription fee for advanced phone features (c) optional rate plan for international calling

Consumer pays Broadband Provider for Broadband service
“Wireless Landline”

Sample Features

• Home Phone – voice only
• Self-install
• Purchase the antenna box or get free with a 2 year contract
• Uses the cellular network
• Can port your home number
• Includes features such as caller id, call forward, 3-way calling
• Monthly Service
  • ~ $20 for unlimited minutes or
  • ~ $10 for add-a-line to a Family Plan

Sample Services

• AT&T Wireless Home Phone
• Sprint Phone Connect
• Verizon Home Phone Connect
Video Calling/Conferencing using IP
Skype

Customer pays broadband provider for monthly service

Customer pays Skype for calls to landlines and mobiles, SMS messages, and voicemail

Invitee pays for broadband provider for monthly service
AT&T Connect

Teleworker pays broadband provider for monthly service

Invitee pays for broadband provider for monthly service

Teleworker’s company pays AT&T a monthly invoice based on contracted rates; have the option to have audio portion via phone
## Skype Statistics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of Skype users as of Jan. 2012</td>
<td>31 million</td>
</tr>
<tr>
<td>Average time spent on a Skype conversation</td>
<td>27 minutes</td>
</tr>
<tr>
<td>Number of time that active Skype users spend on Skype per month</td>
<td>100 minutes</td>
</tr>
<tr>
<td>Total percentage of small businesses that use Skype as primary</td>
<td>35%</td>
</tr>
<tr>
<td>communication service</td>
<td></td>
</tr>
<tr>
<td>Number of Skype enabled television sets</td>
<td>50 million</td>
</tr>
<tr>
<td>Number of iphone Skype downloads in 2010</td>
<td>7 million</td>
</tr>
<tr>
<td>Number of people who have ever used Skype</td>
<td>560 million</td>
</tr>
<tr>
<td>Total percentage of Skype calls that are video to video</td>
<td>40%</td>
</tr>
<tr>
<td>Average spent yearly by a paying Skype user</td>
<td>$96</td>
</tr>
<tr>
<td>Skype revenue in 2010</td>
<td>$406.2 million</td>
</tr>
<tr>
<td>Number of monthly log-ins to Skype</td>
<td>124 million</td>
</tr>
<tr>
<td>Number of monthly paying Skype users</td>
<td>8.1 million</td>
</tr>
<tr>
<td>Amount of money spent by Microsoft to acquire Skype</td>
<td>$8.5 billion</td>
</tr>
</tbody>
</table>


Date Verified: 3.28.2012
TeleGeography estimates that cross-border Skype-to-Skype calls (including video calls) grew 48 percent in 2011, to **145 billion minutes.** TeleGeography estimates that **Skype added 47 billion minutes** of international traffic in 2011—**more than twice** as much as all the telephone companies in the world, combined.

IP Television
Customer pays broadband provider for monthly service

Customer gets basic service free which includes upfront ad; optional premium service with a monthly charge just announced
Customer pays AT&T for monthly TV & broadband; VoIP phone optional
In August of 2009, Hulu had More Viewers than Time Warner Cable

2012
Netflix ended 1Q12 with 22.7 million domestic streaming subscribers and about 3 million international users.

AT&T ended the same quarter with 4 million U-verse TV subscribers.

Verizon reported that it counted 4.4 million FiOS TV subscribers.

Hulu vs. Pay TV: Total Video Reach (Millions)

Pascal-Emmanuel Gobry
October 06, 2011
Hulu Plus is very successful, writes Hulu CEO Jason Kilar. It has now 1 million paying subscribers, and Kilar believes it will soon bring in half of Hulu’s revenue.
Customer purchases a game console and pays Netflix a monthly fee for streaming movies.

Customer broadband provider monthly fee

Netflix "TV" via a Game Console

Home

Game Console

Wifi enabled Broadband modem

Broadband Network

Internet

Netflix Network

Content Providers

Advertizing Partners
**Mobile TV via Slingbox**

Customer pays TV and broadband provider(s) monthly fee.

Customer purchases Slingbox and Internet capable device. Customer may pay wireless provider a monthly fee.
Cutting the TV Cord – A Growing Trend

“Though less than 5 percent of TV households, homes with broadband Internet and free, broadcast TV are on the rise—growing 22.8 percent over last year. These households are also found to exhibit interesting video behaviors: they stream video twice as much as the general population and watch half as much TV.”
