Converged Services and the Telco of the Future

Presented By:
Mike Schwartz
Executive Director
mschwart@telcordia.com
+1 732 699 4307

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A Vision of a Fixed-Line Operator in 5 years (Business as Usual?)

- Profit from Fixed Line voice subscribers and minutes declines
  - Wireless Substitution
  - VoIP (Internet Bypass, Peer-to-Peer, CLEC)
- Price War for High Speed Data
  - Cable Modems beat DSL
  - WiFi and WiMax operators gain market share
  - CLECs compete on price
- Cable and Satellite TV dominate the Content Delivery Business
- Margins Drop, Revenue Declines, ........

This is the future many Fixed-Line Incumbents Face
A better Vision

- Broadband Access pipes of more than 20 Mb/s are available to residential customers in targeted areas
- Telco offers a broad portfolio of services
  - Fixed voice, partnering with Mobile for seamless fixed-mobile access (in-house or MVNO)
  - Secure and Managed High Speed Data + Voice
  - Interactive “when you want it” Hosted video content
  - Interworking voice, video, data (and games)
  - Attractive Pricing Bundles “pull-through” service take
- New Services are introduced quickly – many per quarter
- *Services interact and interoperate – creating unique offerings that are not commoditized.*
- Subscribers, Minutes, and ARPU grow

In Other Words, a Converged Network offering Converged Services
Two Fundamental Elements Needed for the Bright Future

- Spread of Broadband and Ethernet Access
  - DSL, ADSL2+, VDSL
  - Cable Modems, FTTx, GbE, WiMax

- IP becomes the Telecom “Common Platform” for Converging Services
  - Voice
  - Data
  - Video
  - Mobility
The number of broadband subscribers explodes, Worldwide

Broadband Subscribers - Worldwide


65 M Broadband Customers yet to be Added in Asia/Pac
FTTx Investment

Worldwide FTTx Investment Forecast

Source: Dittberner Associates Inc., Nov 2004
Japan Celebrated 1 Millionth FTTH Subscriber – YE 2003

<table>
<thead>
<tr>
<th>Service Provider</th>
<th>Type of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTT East and NTT West</td>
<td>100-Mbps shared type for apartment</td>
</tr>
<tr>
<td></td>
<td>100-Mbps shared type with VDSL and PNA of more than 8 users for apartment</td>
</tr>
<tr>
<td></td>
<td>100-Mbps basic type for house</td>
</tr>
<tr>
<td>Tepco Hikari by Tokyo Power Electric Company</td>
<td>100-Mbps basic type for house</td>
</tr>
<tr>
<td>K-Optic.com by Kansai Power Electric Company</td>
<td>10-Mbps shared type by for apartment</td>
</tr>
<tr>
<td></td>
<td>100-Mbps basic type for house</td>
</tr>
<tr>
<td>Usen Broadband Networks</td>
<td>100-Mbps shared type of 8-16 users for apartment</td>
</tr>
<tr>
<td></td>
<td>100-Mbps basic type for house</td>
</tr>
</tbody>
</table>

Source: Gartner

Gartner Dataquest predicts that only in regions such as Japan and South Korea, where there is strong government support, will carriers undertake accelerated deployment of FTTH.

But even so, FTTH will constitute only a small fraction of broadband households in Japan.

Source: IDC
The Rest of Asia Lags – But Has Plans for FTTx

- **Korean FTTx**
  - June 2003: New Apartment Bldg in Seoul, 896 Subscribers (Active Netwk)
  - November 2003: 100 Subscribers in Gwangiu (EPON)
  - December 2003: Residential Subscribers in Busan, WDM-PON
  - March 2004: 1092 “Superclass” Homes

- Korea Telecom plans to begin a major FTTP deployment in 2006, delivering 50 Mb/s to 100 Mb/s of bandwidth to 73% of total households by the end of 2010.

Source: “Convergence Access in Korea”, Dr. Chu Hwan Yim, President of ETRI, June 2004
The Rest of Asia Lags – But Has Plans for FTTx (2)

• FTTx in China
  – July 2003: China Netcom to deploy Salira FTTP equipment in Beijing and Changsha City in Hunan Province
  – April, 2004: Great Wall Broadband Network Service Co. Ltd. one of China's fastest growing broadband service providers selected WorldWide Packets’ LightningEdge Ethernet FTTP system to offer their customers data access, voice, VPNs, IP Centrex, video (VOD, IPTV), content and gaming, interactive television programs, and distance education.

• FTTx in Taiwan
  – September 2004: Chunghwa Telecom has deployed the ECI HiFocus FTTP system
There’s Fibre, But Many Incumbents have another way to get to Extreme Broadband

ADSL/VDSL over existing Copper can meet much of their need.

- >50% of customers are within 1,500 m of a DSLAM in Europe.

- Compare to US and Canada - < 25%

20 Mb/s is minimum needed for Triple Play.
Broadband Access with DSL or Fibre is the basic underlying infrastructure needed by Telcos ..... But it’s Services that will pay the bills!
VoIP Carrier Announcement Timeline

Pre 2003


VoIP Carrier Announcement Timeline

Oct 2003

Nov 2003

Dec 2003

Jan 2004

Feb 2004

Mar 2004

Apr 2004

May 2004

Jun/Jul 2004
Voice over Broadband: Selected Asian Deployments

Asia-Pacific Cable VoIP Subscribers (in Thousands)

% VoIP Penetration of Cable Modems

Broadband and IP Telephony in Japan
Number of IP Telephony users are still growing, not saturated yet.

Yahoo!BB Phone subscribers
Increasing by 160 thousands per month

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What is the Triple Play?

- **Triple play**: The bundled offer of voice, data (broadband) and video (TV and video on demand).
  - Bundled at the Bill, separate partner networks
    - E.g. Telco + Satellite TV Bundles
  - Single Network Offer
    - E.g. Telco with FTTx or Advanced DSL
    - E.g. Cable MSO with Digital Video, Broadband Access, and VoIP

- **What’s at Stake?** Access to a new revenue stream
  - By 2008, $4,700 M will be spent annually on subscription video services, worldwide. This is a CAGR of 47%

- **Leads to the Quadruple Play**
  - Add mobility to the Triple Play
  - The ultimate target for communications companies

Sources: Gartner, InStat, and RHK
## Incumbent Telcos are already offering Triple Play

<table>
<thead>
<tr>
<th>North America</th>
<th>Europe</th>
<th>Asia/Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manitoba Telephone <em>(MTS TV)</em></td>
<td>France Telecom <em>(MaLigne)</em></td>
<td>PCCW – Cascade Hong Kong</td>
</tr>
<tr>
<td>SaskTel <em>(MAX™)</em></td>
<td>Telefonica de Espana <em>(Imagenio)</em></td>
<td>Chunghwa Telecom</td>
</tr>
<tr>
<td>Bell Canada <em>(TotalVision)</em></td>
<td>Deutsche Telekom <em>(T-Online Vision)</em></td>
<td>KT – So. Korea <em>(Home N Service)</em></td>
</tr>
<tr>
<td>Aliant <em>(TV on my PC)</em></td>
<td>Telecom Italia <em>(Rosso Alice)</em></td>
<td>China Telecom <em>(Shanghai)</em></td>
</tr>
<tr>
<td>QWEST <em>(capped)</em></td>
<td>BT <em>(BT Openworld)</em></td>
<td>NTT West <em>(OnDemandTV)</em></td>
</tr>
<tr>
<td></td>
<td>KPN <em>(Bredbandportal)</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Telekom Slovenije <em>(SiOL)</em></td>
<td></td>
</tr>
</tbody>
</table>

Source: Gartner Dataquest, August 2004, RHK, March 2004 and September 2004
And more are announcing plans or trials - every day

<table>
<thead>
<tr>
<th>North America</th>
<th>Europe</th>
<th>Asia/Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBC (Lightspeed)</td>
<td>Swisscom (Bluewin)</td>
<td>Reliance Telecom (India)</td>
</tr>
<tr>
<td>Verizon (FIOS)</td>
<td>Telecom Italia (Microsoft IPTV)</td>
<td>China Netcom</td>
</tr>
<tr>
<td>BellSouth</td>
<td>Sistema Companies (Russia)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KPN (Netherlands)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wireless DVB-T</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Belgacom (iDTV)</td>
<td></td>
</tr>
</tbody>
</table>
### How Much Bandwidth?

<table>
<thead>
<tr>
<th>Service</th>
<th>Unit Bandwidth</th>
<th>Total Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Definition IPTV (MPEG 4 or WM9 coding)</td>
<td>7.5 Mb/s (WM9) or 10 Mb/s (MPEG 4) each</td>
<td>7.5 Mb/s - 10 Mb/s (1 Stream)</td>
</tr>
<tr>
<td>Standard Definition IPTV</td>
<td>1.33 Mb/s each</td>
<td>4 Mb/s (3 Streams)</td>
</tr>
<tr>
<td>High Speed Data</td>
<td>3 Mb/s</td>
<td>3 Mb/s</td>
</tr>
<tr>
<td>Voice (VoIP)</td>
<td>0.5 Mb/s</td>
<td>1.5 Mb/s (3 talkers)</td>
</tr>
<tr>
<td>CD Quality Voice</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>16.0 – 18.5 Mb/s</strong></td>
</tr>
</tbody>
</table>

Most Analysts Believe 20 Mb/s Downstream is Minimum Required.

- Initial Triple Play offers usually over Copper + ADSL2+
Convergence is more than offering bundled multiple services

Source: IDC, March 2005

Single Service ➔ Multiple Services and Bundled Billing ➔ Convergence
When I’m online,
I want text to my mobile to come up in Messenger …

and I want to click to reply.

That’d be cool.
I want to purchase music from the television, and send it to my mobile.

Or store on my music library..
When we’re watching a movie, we want to see who is calling when the phone rings. 
on the television.
Great goal!

I’ll send that as a message to my friends
Ah, What a game.
Joe Chen
732-699-5555
Are you watching the game?

Joe, Hi,
I sure am watching the game!

Joe, that was a great goal, I'll send it to your cell phone.

I'm on the train. I saw the score change? Was it a good goal?
Pretty neat. How's our fantasy team doing?

Let me check.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Team</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T.J.</td>
<td>1855</td>
</tr>
<tr>
<td>2</td>
<td>Bicycle Kickers</td>
<td>1775</td>
</tr>
<tr>
<td>3</td>
<td>Basso F.C.</td>
<td>1768</td>
</tr>
<tr>
<td>4</td>
<td>Ginas Guys</td>
<td>1728</td>
</tr>
<tr>
<td>5</td>
<td>MaxMOJO</td>
<td>1722</td>
</tr>
<tr>
<td>6</td>
<td>Blind Luck</td>
<td>1716</td>
</tr>
<tr>
<td>7</td>
<td>Valderrama</td>
<td>1716</td>
</tr>
<tr>
<td>8</td>
<td>Soccer10</td>
<td>1703</td>
</tr>
<tr>
<td>9</td>
<td>Crew Brew</td>
<td>1697</td>
</tr>
<tr>
<td>10</td>
<td>Richton Park Fire</td>
<td>1695</td>
</tr>
<tr>
<td>11</td>
<td>Marshall Plan</td>
<td>1689</td>
</tr>
<tr>
<td>12</td>
<td>Section One</td>
<td>1684</td>
</tr>
<tr>
<td>13</td>
<td>Wazirds</td>
<td>1682</td>
</tr>
<tr>
<td>14</td>
<td>Etcheverry</td>
<td>1680</td>
</tr>
<tr>
<td>15</td>
<td>McBride</td>
<td>1677</td>
</tr>
<tr>
<td>16</td>
<td>Pele is here!!!</td>
<td>1675</td>
</tr>
</tbody>
</table>

With that goal, they moved up one spot.

That's great. See you tomorrow at our game. Bye.
Now, back to this game!
What will it take to achieve the vision?

- A Broadband, IP Infrastructure
- Convergent Services and Customer Bundles
- Good Marketing and Communications
- Rapid Introduction of Innovative New Services
- Network and Service Quality and Security
- Cost Efficient Operation
- Business Transformation to a Service-Centric Operation and Customer-Centric Organization
In the Midst of all this Technology Change
Operators Must Transform their Business Operations

- Modernize Legacy OSS
- Consolidate “mini-solutions” purchased to manage a single initiative
- Break down organizational and functional “silos”
- Wholesale Transformation of Software Platforms
It’s Not Your Grandfather’s Telephone Company..... Anymore!