Fixed Mobile Convergence

Bruce Lee, Industry Product Management
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> Push to Talk – Interoperability
> Custom Network Solutions
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## Sprint At-a-Glance

<table>
<thead>
<tr>
<th><strong>Services</strong></th>
<th><strong>Unmatched in the Industry</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Global IP backbone – “IP anywhere”</td>
</tr>
<tr>
<td></td>
<td>World’s premier walkie-talkie platform</td>
</tr>
<tr>
<td></td>
<td>High-speed wireless data &amp; next generation wireless broadband</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Spectrum</strong></th>
<th><strong>Largest Spectrum Position in U.S.</strong></th>
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<tbody>
<tr>
<td></td>
<td>Re-band but maintain 800/900 MHz band</td>
</tr>
<tr>
<td></td>
<td>National footprint, continuous 1.9 GHz band</td>
</tr>
<tr>
<td></td>
<td>2.5 MMDS spectrum – Next generation wireless broadband</td>
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<table>
<thead>
<tr>
<th><strong>Scale</strong></th>
<th><strong>Efficiencies and Future Expansion</strong> *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>44M wireless subscribers</td>
</tr>
<tr>
<td></td>
<td>80,000 employees; 19,000 indirect and retail outlets</td>
</tr>
<tr>
<td></td>
<td>Investment grade characteristics, ample liquidity</td>
</tr>
<tr>
<td></td>
<td>$12B Net Present Value in combined synergies</td>
</tr>
</tbody>
</table>

* as of June 30, 2005
Defining Fixed Mobile Convergence

“The ultimate goal of convergence is to deliver seamless [customer] experience across multiple locations, multiple devices, and multiple types of use.” (The Yankee Group, November 2004)
Convergence – More than Just Data & Voice

“Enterprise perception of convergence has expanded to encompass more than just voice and data integration” - Meta Group
Customer Value for Fixed Mobile Convergence

When evaluating wireline and wireless communication solutions, customers seek reliability, simplicity, and cost-effectiveness.

"Make it dependable”
(e.g. coverage, quality, etc)

"Help us better administer our communications”

"Reduce the complexity of our communications”

"Help us lower our total communications costs”

"Give us a solution that enables us to live and work better”

"Enable us to do more with our communications systems”

"Reduce our risk relative to adopting new-technology base solutions”
Sprint and Fixed Mobile Convergence

Sprint’s vision is an integrated services offering that delivers voice, data, and access to business applications from multiple devices.
VoIP: Enabling Convergence

VoIP serves as the foundation for seamless communication between devices by bridging wireline and wireless networks for added flexibility and improved customer interactions.
Example: Wireless Integration to IP PBXs

End users require a seamless experience with functionality similar to their wireline phones.

> Wireless device becomes an extension of the IP PBX
> Eliminates device duplication
> Enables one number, one voicemail
> Users have access to common phone features
> IT managers have greater control over wireless deployment
# Device Convergence - Current

<table>
<thead>
<tr>
<th>Services</th>
<th>Network</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice</td>
<td>WWAN (Cellular)</td>
<td>Nextel i930</td>
</tr>
<tr>
<td>&gt; Phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Walkie Talkie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Email</td>
<td>WWAN (Cellular)</td>
<td></td>
</tr>
<tr>
<td>&gt; Applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimedia</td>
<td>WWAN (Cellular)</td>
<td></td>
</tr>
<tr>
<td>&gt; Photo/Camera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Video</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Device Convergence - Emerging

<table>
<thead>
<tr>
<th>Services</th>
<th>Network</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice</td>
<td>WWAN (Cellular)</td>
<td>Sprint PPC 6700</td>
</tr>
<tr>
<td>&gt; Phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>WWAN (EVDO)</td>
<td></td>
</tr>
<tr>
<td>&gt; Email</td>
<td>WLAN (802.11)</td>
<td></td>
</tr>
<tr>
<td>&gt; Applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimedia</td>
<td>WWAN (EVDO)</td>
<td></td>
</tr>
<tr>
<td>&gt; Photo/Camera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Video</td>
<td>WLAN (802.11)</td>
<td></td>
</tr>
</tbody>
</table>
# Device Convergence – Future?

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<th><strong>Services</strong></th>
<th><strong>Network</strong></th>
<th><strong>Example</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice</td>
<td>WWAN (Cellular)</td>
<td>WWAN (EVDO+)</td>
</tr>
<tr>
<td>Phone</td>
<td>VoWLAN (802.11)</td>
<td>WLAN (802.11)</td>
</tr>
<tr>
<td>Walkie Talkie</td>
<td></td>
<td>BBWWAN (2.5Ghz)</td>
</tr>
<tr>
<td>Data</td>
<td>WWAN (EVDO+)</td>
<td>WWAN (EVDO+)</td>
</tr>
<tr>
<td>Email</td>
<td>WLAN (802.11)</td>
<td>WAN (802.11)</td>
</tr>
<tr>
<td>Applications</td>
<td>BBWWAN (2.5Ghz)</td>
<td>BBWWAN (2.5Ghz)</td>
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</table>
What is IMS?

IMS (IP Multimedia Subsystem)

> A **standards** based architecture defined by 3GPP2* and 3GPP** to enable enhanced IP based services over 3G networks.

> Based on **SIP (Session Initiation Protocol)** signaling architecture.

> IMS architecture enables **logical separation** between applications and network elements.
IMS: Converging Networks

- Open, extensible, and standards based application architecture
- Uses a full range of shared network capabilities, which increases functionality
- Enhances end-user experience
Key Benefits of IMS

Common voice/data network allows for integrated multimedia services

IMS architecture enables smooth introduction of new and innovative services

> Services available from multiple open interfaces
> Rapid deployment of new multimedia features and services
> Innovative features do not risk entire network

Access-independent core network provides for:
> Consolidated resources
> Merge of services for wireline and wireless end devices
> “Roaming” capability for wired devices
> Wireless devices with wireline option
IMS Examples

<table>
<thead>
<tr>
<th>IMS Enabled Feature</th>
<th>Sample Application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rich service environment</strong> – enable a wireline-like internet access experience</td>
<td>User leverages video feature on wireless device to share visuals with coworkers in real-time</td>
</tr>
<tr>
<td><strong>Mixed multimedia sessions</strong> – enables voice, text, video in a single call</td>
<td>User extends collaboration by text messaging while talking on a wireless device</td>
</tr>
<tr>
<td><strong>Presence management</strong> – enables “availability” indicators</td>
<td>User checks availability before calling or sending text message</td>
</tr>
<tr>
<td><strong>Simplified and seamless</strong> – allows access to multiple communication media during one session</td>
<td>User decides to expand voice call by adding others through a push-to-talk group session</td>
</tr>
</tbody>
</table>
Example: IMS at Work

1. Facilities Manager receives a call on her wireless phone with emergency.
2. Checks “presence” of her staff to determine availability for emergency meeting.
3. Sends wireless instant message to available staff members inviting them to an immediate conference call on personal bridge number.
4. Staff receives the instant message on their desktop or their wireless phones and simply clicks the URL or hits a soft key to be placed directly into the conference.
5. Immediate connection to staff.
Walkie Talkie - Interoperability

Interoperability Gateways

QChat

Demonstrated at CTIA 2005
Walkie Talkie – Use Case

1. Colleagues at a conference want to meet at a restaurant for dinner, but no one is familiar with the area.

2. One Group member invokes a location based service to:
   - Browse available restaurants

3. Colleagues discuss options via walkie-talkie to select restaurant

4. With restaurant selected, group member with LBS then:
   - Maps a route to restaurant
   - Pushes the map out to others

5. Additional content and services may be available based on restaurant choice.
Custom Network Solutions
In-Building, On Campus

> Provides In-building coverage
> Can incorporate WLAN (802.11)

RadioFrame Unit (RFU)
CNS Solutions

Full-Scale Network Solution
Generally covers a broader area - a full building or campus of buildings - and impacts more than 200 units. Full-Scale Network Solutions enable Advanced Campus Mobility Solutions.

Basic Network Solution
Generally implemented in cases where enhanced coverage for a small area is required - on one or two floors of a building for example - and where there are less than 200 units involved.

Private Radio Solutions
Augment or provide interoperability for private radio (LMR) systems with cost-effective, reliable, high capacity digital radio systems.

WLAN Infrastructure
Deploy an 802.11 system in parallel with your Full-Scale Network Solution.

PBX Integration
Ensures that 'away from your desk' never means out of touch by integrating your Nextel phones into your PBX system.

Campus Unlimited Program
Control costs, increase productivity, and provide better service, with unlimited on-campus calls.
Custom Network Solutions – Case Studies

**IBM Research**
World’s Largest Corporate Research Organization

**NEED:** Increased cellular coverage, expanded wireless capabilities

**SOLUTION:**
Integrated Cellular/WLAN in-building platform

**RESULT:**
• Seamless cellular coverage
• Broadband data access throughout campus
• Improved productivity

**MGM Mirage**
Landmark Hotel and Casino properties

**NEED:** Increased wireless coverage across 5 properties in Las Vegas

**SOLUTION:**
Custom wireless digital voice and data network

**RESULT:**
• Robust in-building wireless services for guests and staff
• Access to mission critical applications

**Ford Motor Company**
Global leader in Automotive Industry

**NEED:** Mobility solution that allows quick communications on a single device

**SOLUTION:**
Replace 8000 desk phones w/wireless, expand coverage

**RESULT:**
• Engineers can be reached anywhere, real-time
• Improved in-building coverage
• Faster product cycle
Campus Unlimited Program
Unlimited Mobile Minutes with a Virtual Campus

> In-building coverage
> Unlimited on-campus calling
> Off-campus roaming
Land Mobile Radio (LMR) Interoperability

> Provides seamless Interoperability with Land Mobile Radio Systems
> Complements existing LMR system
> Provides framework that supports future application needs
> Eliminate device duplication
LMR Console Integration

> Provides seamless Interoperability with Land Mobile Radio Systems
> Critical capability for Public Safety
> Spectrum efficiencies
> Enhance coverage; can include nationwide users
Questions & Answers