



Why Broadband?

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→ The Wireless Market Today

- **Wireless communication no longer means mobile Plain Old Telephone Service.**
 - Communication is not just “anytime, anywhere and always-on,” it is Multi-mode and Integrated.
 - Communication services include Voice mail, E-mail, Instant Messaging, Multi-Media messaging, Web and Intranet access
 - Services supported by a variety of Integration services such as Address Books, Directories, Presence servers, Location servers and Translators.
- **Competition is fierce.**
 - Penetration cannot increase forever. Network build-out costs are huge. Churn is expensive. Multiple nationwide carriers are fighting for share.

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→ Where we need to go

- To survive, wireless carriers must provide **Low Cost or Differentiated services.**
- The move to **All-IP network** holds out the promise of both.
 - Packet based switching fabrics can move more bits at lower cost than TDM fabrics
 - IP based control protocols can integrate media and services much more easily than the combination of circuit and packet technologies in use today.
 - “Cell Phones” are are complex computing platforms that support the rich applications of the future.

→ The move to All-IP

- **It is proven to work.**
 - Landline based network have demonstrated viability of Voice over IP technology.
 - In an ideal environment, IP based voice networks can provide differentiated multimedia communications services at a low cost.
- **The Standards process is underway.**
 - All 3G wireless standards groups have agreed to use the IP based signaling protocol SIP, Session Initiation Protocol, for voice and multi-media services.

→ Why hasn't it been done already.

- **To expensive**
 - Packet based voice switching platforms have historically been more expensive than circuit platforms.
 - Radio technologies are not optimized for Packet traffic
- **To complicated**
 - Hybrid architectures covering Circuit and Packet signaling and inter-working are complex and do not provide all of the Integration benefits.
 - Stable standards for efficient multi-service All-IP networks do not exist.

Basic Technology Needs

- **Extremely efficient use of Spectrum and Backhaul**
 - High “Bits per Hertz” over the air.
 - Efficient Transport and Mobility.
- **Scalable Globally**
 - Flexible Deployment (RF Band, RF Plan, Backhaul, Microcell, Macrocell, Corporate Network, Home Network, etc)
 - Full Mobility
- **Public Carrier Ready**
 - Strong Authentication
 - Multi-carrier Ready
 - Manageable (NMS)

New Technology Needs

IP friendly, QoS Enabled, Wireless Layer 2!

- 3G Cellular standards are optimized for circuit voice and “dial-up” Internet access.
- Wireless LAN standards are inefficient for Voice.
- Flexible IP reach-ability is critical.
- Harmonized IP friendly micro and macro mobility schemes are needed.
- New QoS definitions are needed for Lossy Real Time Services (FEC coded media) and must be linked from Layer 1 through 3 and made available to Applications.
- Focus on Latency along with Throughput.

→ Conclusion

- **It's not just about Broadband, it's about Efficient, Integrated IP based Communications Services**
- **Current Wireless WAN, LAN, PAN and xAN standards do not fully meet users needs.**
- **Development is needed at the lowest layers of the network to provide the foundation for future Wireless multi-media networks.**