



MOBILE BROADBAND EXPLOSION: TECHNOLOGY EVOLUTION AND STRATEGIC CONSIDERATIONS 2012 OUTLINE

3G/4G, Wi-Fi, Platforms, Apps, Cloud, Technology Evolution, Business Considerations

Today's wireless networks and technologies are the culmination of massive innovation and investment, and represent some of humanity's greatest achievements. However, this is only the beginning of a new era of computing and communications, which will be enabled by new wireless technologies such as LTE, and which will lead to a wealth of new mobile platforms and applications. The result will be new ways of doing business, as well as entirely new lifestyles.

This course is intended to address questions such as:

- How is mobile computing completely transforming both computing and communications industries?
- What are the true capabilities of today's technologies and how will they evolve?
- Why are heterogeneous networks so important for the future of mobile broadband?
- What are the key variables that determine the capacity of mobile broadband networks?
- What is the relationship between wireline and mobile broadband?
- What are the opportunities and challenges in integrating Wi-Fi with mobile broadband?
- What are the major app developments, including HTML5, cloud, and native?

This course is technical in nature, emphasizing latest technology developments, technology capabilities, and technology evolution. It is also designed to communicate the greatest opportunities and strategic directions of this rapidly developing market environment. Peter Rysavy has been consulting in wireless for sixteen years, and through multiple engagements and a vast number of clients, has a unique and comprehensive perspective.



Outline

Key Trends and Broadband Context

- Data explosion
- Technology drives innovation and demand
- Global mobile data growth
- Looming capacity and spectrum exhaustion
- Pricing structures
- Wireline versus wireless, speeds and capacity
- Wireline broadband developments
- Applications available for wireline that are problematic for mobile

Wireless fundamentals

- Fundamental tradeoffs
- Modulation and error control
- Principles and tradeoffs of between different access
- Spectral efficiency
- Network layering model

Wi-Fi

- Role in mobile broadband
- Fundamental capabilities
- Architecture and protocols
- Key and emerging standards including 802.11ac, 802.11ad
- Interference management in unlicensed bands
- Consumer vs. enterprise vs. carrier-grade solutions
- Hotspot developments, including HotSpot 2.0
- WiGig and 802.11d relationship
- Mesh and municipal Wi-Fi
- 3G/4G and Wi-Fi Integration

Cellular Networks – Wireless Aspects

- 1G to 4G evolution
- Frequency bands
- Available and forthcoming spectrum, spectrum exhaustion
- Architecture, radio interfaces, protocols for all major wireless families
- Enhanced Data Rates for GSM Evolution (EDGE) and Evolved EDGE
- Universal Mobile Telecommunications System (UMTS)/Wideband CDMA (WCDMA) including 3GPP releases 5 to 11
- High Speed Packet Access (HSPA) and HSPA+
- 3GPP Long Term Evolution (LTE)
- ITU IMT-Advanced
- LTE-Advanced features and mechanisms (e.g., carrier aggregation)
- Inter-technology carrier aggregation
- Evolution of voice in LTE networks
- CDMA 2000 - EV-DO Rev A, EV-DO Rev B, EV-DO Advanced
- WiMAX: IEEE 802.16-2004, IEEE 802.16e-2005, Rel 1.5, IEEE 802.16m
- Cognitive radio

Cellular Networks – Network Aspects

- Backhaul considerations
- Heterogeneous networks

- Core network evolution (flatter architectures, Evolved Packet Core)
- IP Multimedia Subsystem (IMS)
- Quality-of-service architectures and dynamic policy management
- IP Flow Mobility and Seamless Offload (IFOM)
- Femtocells

Technical Comparison of Wireless Technologies

- Throughput comparison
- Latency comparison
- Spectral efficiency comparison

Capacity and Loading

- Growing data usage
- Data consumption of typical applications
- Operator spectrum requirements
- Benefits of spectrum and offload
- Augmenting capacity

Platform and Application Developments

- Smartphone operating systems
- Mobile application architectures including native client, Web-based, middleware
- Development approaches
- Mobile cloud developments
- HTML5

Conclusions and Open Discussion

Biography

Peter Rysavy is the president of Rysavy Research LLC, a consulting firm that has specialized in wireless technology since 1993. Projects have included reports on the evolution of wireless technology, spectrum analysis for broadband services, evaluation of wireless-technology capabilities, strategic consultations, system design, articles, courses and webcasts, network performance measurement, and test reports. Clients include more than seventy-five organizations.

Peter Rysavy is a leading international authority on the capabilities and evolution of wireless technology. He has written more than a hundred and twenty articles, reports, and white papers, and has taught forty public wireless courses and webcasts. He has also performed technical evaluations of many wireless technologies including municipal/mesh Wi-Fi networks, Wi-Fi hotspot networks, mobile browser technologies, cellular-data services, and wireless e-mail systems.

From 1988 to 1993, Peter Rysavy was vice-president of engineering and technology at LapLink where projects included LapLink, LapLink Wireless and connectivity solutions for a wide variety of mobile platforms. Prior to that, he spent seven years at Fluke Corporation where he designed communications hardware and software for data acquisition products.

Peter Rysavy is also the executive director of the Portable Computer and Communications Association (PCCA, <http://www.pcca.org>), a group that evaluates wireless technologies, investigates mobile communications architectures, and promotes wireless-data interoperability. Peter Rysavy graduated with BSEE and MSEE degrees from Stanford University in 1979. More information is available at <http://www.rysavy.com>.