4G Americas Offers Recommendations on 5G Requirements and Solutions

• Thank you for joining us at this FierceLive! Webinar. We will begin momentarily.

• The audio will be streamed live over the Internet, so please make sure your computer speakers or headphones are turned on and your volume is turned up.

• During the presentations, you can submit your questions in the “Q&A” widget to the right of this screen. The speakers will answer questions at the end of the webinar.

Enjoy the presentation!
4G Americas’ Recommendations on 5G Requirements and Solutions
WELCOME TO THE WEBINAR!

Moderator: Mike Dano
Executive Editor, Fierce Wireless

SPEAKERS

Chris Pearson
President
4G Americas

Kris Rinne
Chairperson, 4G Americas
Senior Vice President,
Network & Product Planning,
AT&T Services

Brian Daly
4G Americas 5G Project Leader
Director,
Core & Government/Regulatory Standards,
AT&T
The mission of 4G Americas is to promote, facilitate and advocate for the deployment and adoption of the 3GPP family of mobile broadband technologies throughout the ecosystem – including networks, services, applications and wirelessly connected devices – in the Americas.
4G AMERICAS — AREAS OF CONTRIBUTION

- Technical Facilitation and Coordination
- Regulatory Policy
- Educational Outreach

www.4gamericas.org
LTE MOBILE BROADBAND MARKET UPDATE

346 Million Subscriptions
324 Commercial Networks
112 Countries

USA/Canada
144 Million
41%

Asia Pacific
137 Million
39%

Western Europe
47 Million
14%

Eastern Europe
6M 2%

Middle East
3M 1%

Africa
2M 1%

Latin America
6M 2%

USA = 140 million LTE subscriptions / 40% of global total

Subscription Data Source: Ovum, September 2014 Estimates

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THE PATH TO 2020 AND BEYOND!

LTE / LTE-Advanced

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<tr>
<td>Rel 10 LTE DL: 1.2 Gbps UL: 568 Mbps 40+40 MHZ</td>
<td>Rel 11 LTE DL: &gt;1.2 Gbps</td>
<td>Rel 12 LTE DL: &gt;1.2 Gbps</td>
<td>Rel 13 LTE DL: &gt;1.2 Gbps</td>
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Flexibility

- New frequency bands
- Carrier aggregation: 20+20 MHz
- Heterogeneous networks (micro/pico/femto cells)
- Wider radio channels: 20+20MHz

Efficiency and Capacity

- Advanced antenna configurations
- Coordinated multipoint transmissions
- VoLTE

Experience

- Self-optimization/organization
- Policy-based quality of service

www.4gamericas.org
5G: A New Frontier for Mobile Broadband Innovation

4G Americas provides an Americas viewpoint on 5G requirements and recommendations

October 23 2014

BELLEVUE, Wash. – The debate around 5G continues as new mobile broadband developments emerge by the minute. It is not surprising that several theories and assumptions have been made on what requirements are needed for this new generation of mobile broadband technologies. Common questions on this hot topic typically include: When will 5G be deployed? What will characterize networks in 2020 and beyond? What are the likely solutions and technologies that will come in to play?

4G Americas, a wireless industry trade association representing the 3GPP family of technologies, including LTE and LTE-Advanced, today published an important and significant white paper titled, 4G Americas’ Recommendations on 5G Requirements and Solutions. This notable white paper examines the 5G market drivers, use cases, requirements, regulatory considerations and technology elements for the purpose of being considered for the further development of the end-to-end 5G system for deployments in 2020 and beyond. The paper is aimed at providing readers with a clearer understanding of the vision of 5G, specifically with the technology solutions for consideration, as it expands further into the anxiously watching eyes of the wireless industry.

Chris Pearson, President of 4G Americas, stated, “5G networks will not be standardized, manufactured or deployed in a days’ notice for tomorrow; however, the long term planning cycle is upon the mobile broadband industry, and it is imperative that the Americas region be represented. This 4G Americas white paper provides a vision of 5G that can be utilized throughout the world.”
THE 4G AMERICAS 5G PROJECT

Nine Months
Consensus Driven

Subject Matter Experts

www.4gamericas.org
White Paper Objectives

- Address key use cases, challenges and requirements for future wireless access

- Pinpoint key new technologies and solutions that can be used to address those challenges
KEY PRINCIPLES

5G is:

• Architected to meet the expected use cases/demand in 2020 and beyond

• Inclusive of the entire ecosystem, including air interface, devices, transport, packet core and more

• Allows time for true advances of technology, feasibility studies, standardization and product development

• A critical investment of the Americas

Features considered 5G requirements should be implemented as LTE-Advanced extensions in advance of full 5G availability.

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5G REQUIREMENTS

USER DRIVEN REQUIREMENTS

- Battery Life
- Per-user Data Rate and Latency
- Robustness and Resiliency
- Mobility
- Seamless User Experience
- Context Aware Network

NETWORK DRIVEN REQUIREMENTS

- Scalability
- Network Capacity
- Cost Efficiency
- Automated System Management & Configuration
- Network Flexibility
- Energy Efficiency
- Coverage
- Security
- Diverse Spectrum Operation
- Unified System Framework

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BUILDING ON 4G FOR 5G

5G WILL ENHANCE SOME OF THE BUILDING BLOCKS DEFINED IN 4G

Networking Flexibility
Additional support for essential functions as fundamental attributes of networking layer

Providing more flexible mobility solutions
Expanding form of multi-RAT integration and management

Enhanced efficiency for short burst or small data communication
Expanding context information known to the network

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5G MARKET DRIVERS & USE CASES

INTERNET OF THINGS

CONTEXT AWARE SERVICES

PUBLIC SAFETY

EXTREME VIDEO AND GAMING APPLICATIONS

EXPLOSIVE DATA DENSITY USAGE

PSTN SUNSET

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POTENTIAL 5G TECHNOLOGIES

- Massive MIMO
- RAN Transmission – Centimeter and Millimeter Waves
- New Waveforms
- Shared Spectrum Access
- Advanced Inter-Node Coordination
- Simultaneous Transmission Reception
- Multi-RAT Integration & Management
- D2D Communications

- Efficient Small Data Transmission
- Wireless Backhaul / Access Integration
- Flexible Networks
- Flexible Mobility
- Context Aware Networking
- Information Centric Networking
- Moving Networks

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# REGULATORY CONSIDERATIONS

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<td>Lawful Surveillance</td>
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<td>Public Warning System &amp; Wireless Emergency</td>
<td>Tower Sharing</td>
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<td>Location Accuracy (including indoors)</td>
<td>Public Safety</td>
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<td>• Mission Critical Voice &amp; PTT</td>
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<td>• Broadband Data</td>
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THANK YOU!

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Questions
Thank you for joining us!

- Thank you for joining us at this FierceLive! Webinar!
- This webinar has been recorded and will be available on-demand within 24 hours. You will receive a notice when the recording is up.

Presented By: