Office of the CTO (OCTO) Update for Technology Committee

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Acting Chief Technical Officer

Overview

- Technical Activities

- OCTO Staffing

- Public Safety Communications Research Program (PSCR) Update

- Early Builders Update

OCTO Focus Areas

TOP PRIORITIES

- Request for Proposal (RFP)
- Consultation
- OCTO Operations & Research
- PSCR Activities
- Technical Support for Consultations
- Early Builder Technical Support
- Support for Public Safety Advisory Committee

OCTO Organization Evolution

TODAY

Post-RFP Award

- Ongoing Operations
- Life Cycle Management
- Quality Assurance Surveillance
- Service Level Agreements (SLAs) / Key Performance Indicators (KPIs)
- Network Evolution & Planning
- Standards advocacy
- *Permanent employees focused on network operations and life cycle maintenance*

Source Selection, Development, & Deployment

- Technical evaluation of offered solutions
- Increased team size to acquisition activities
- *Additional technical engineering staff*

Planning & Design

- Market Research
- Industry Standards
- RFP and associated deliverables
- Skills aligned network elements (RAN, Core, Device, Apps)
- *Federal Leadership Hiring*

OCTO Organization – FY15

Since the last Technical Committee briefing:

- Director of Network Operations: Lynn Bashaw   Dec. 29
- Director of Labs: Mike Van Zuiden   Jan. 12
- Director of Applications: Mark Golaszewski Jan. 12
- Director of Devices: Joe Martinet   Feb. 23

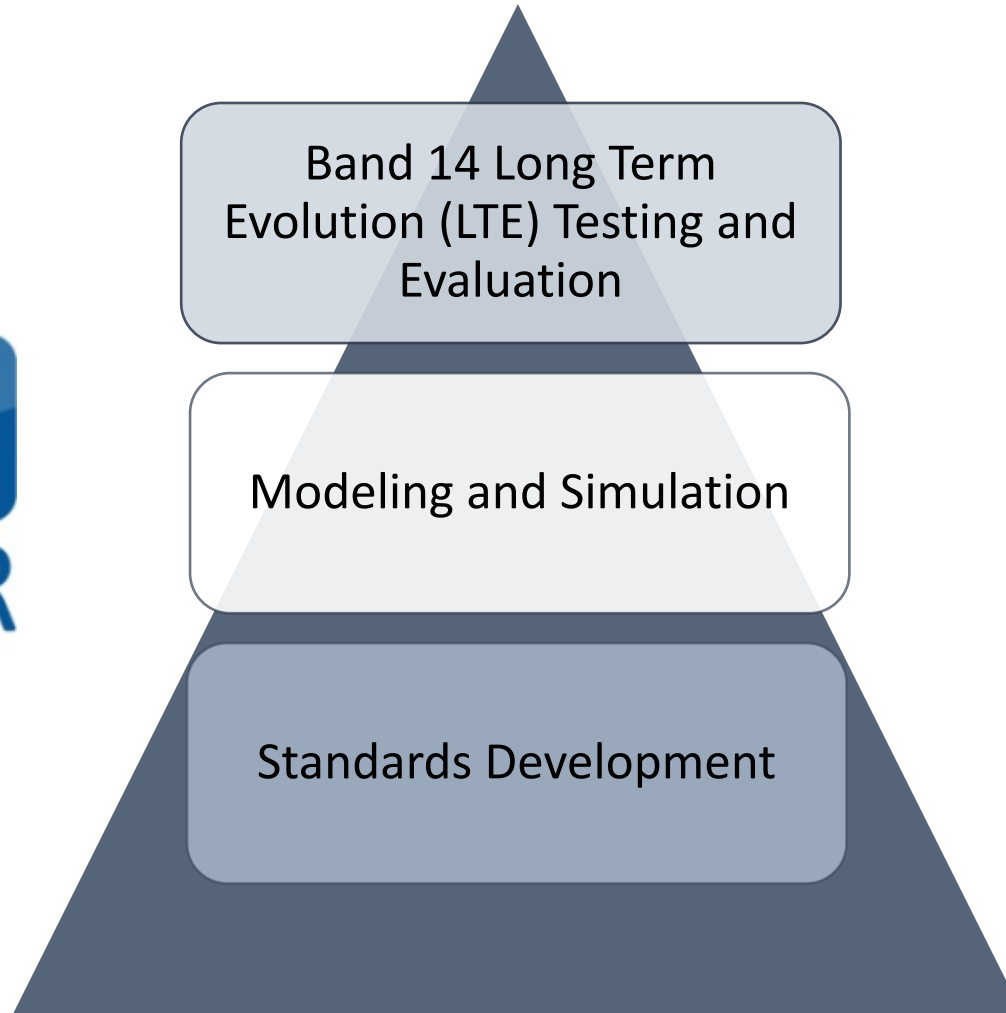- Additional 11 technical contractors - RFP focus

Selections to be announced soon:

- Sr. Security Architect

FY 2015 Federal positions in development for posting:

- 17 engineering staff + 1 Admin Assistant

Band 14 Long Term Evolution (LTE) Testing and Evaluation

Modeling and Simulation

Standards Development
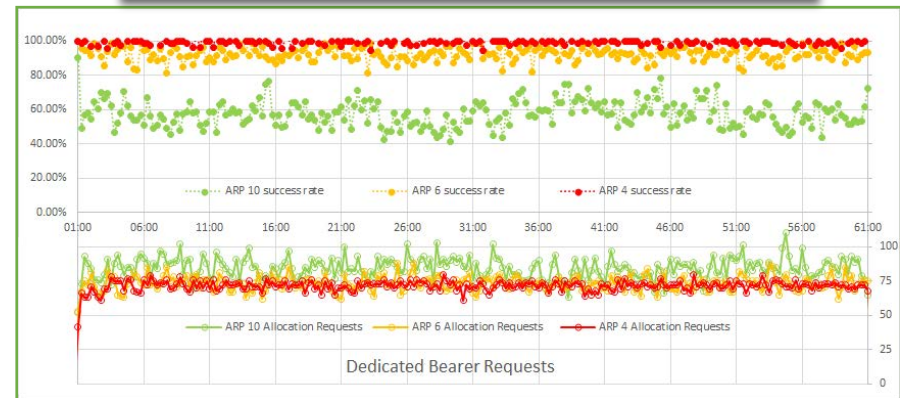
PSCR Testing and Evaluation

Radio Resource Allocation Priority

Expected to see High Priority Establishments take precedence over Normal Priority during congestion. Preliminary results have not shown expected outcome.
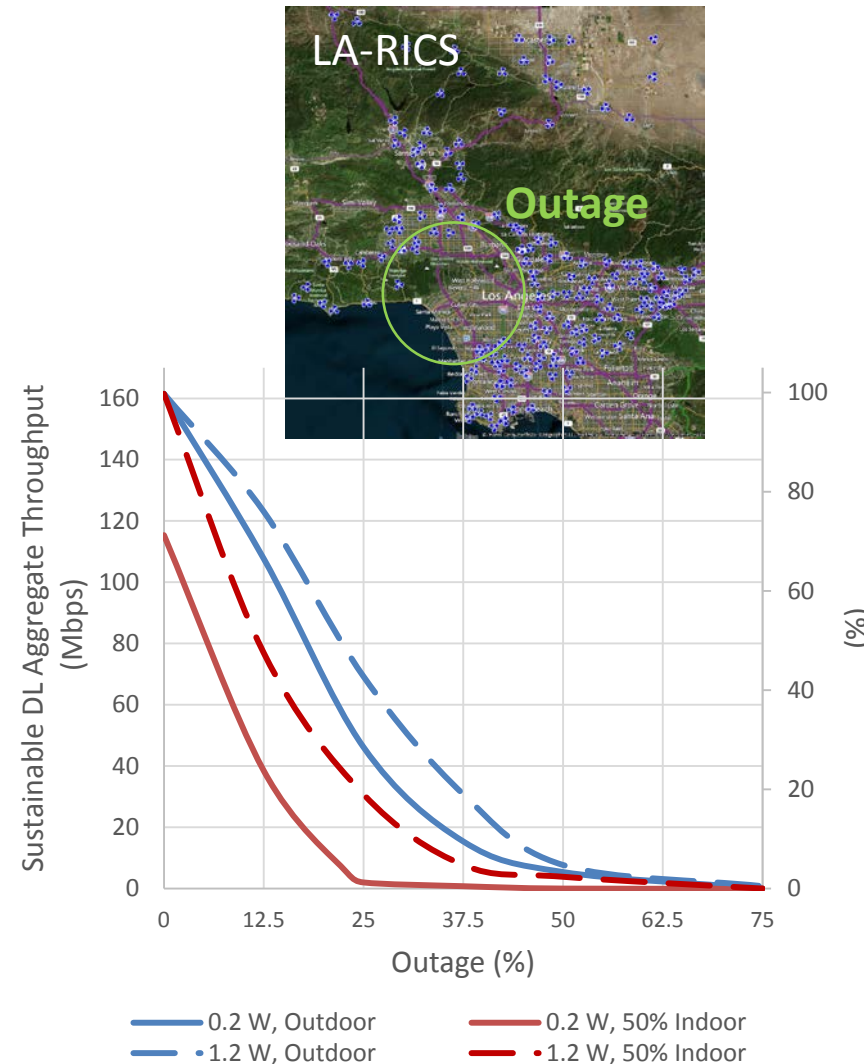
Data Bearer Allocation Priority

Expected to see High Priority Data Bearers take precedence over Normal Priority during congestion. Preliminary results confirm expected outcome.

Testing and Evaluation Continues to Provide FirstNet with Valuable Data

PSCR Modeling and Simulation

- Use LA-RICS site plan to evaluate high power resiliency strategy:
  - Set E-UTRAN Node B (eNodeB) to high power (FCC limit)
  - Compare with different user equipment (UE) powers 0.2W and 1.2W
  - Vary network outage from 0 to 75%
  - Compare indoor versus outdoor environments

- During a network outage, in order to maintain 95% coverage, the overall network throughput is reduced

- Using high power-UEs can significantly improve the sustainable throughput

- Certain outage scenarios - up to twice as much sustainable throughput can be achieved

LA-RICS

Outage

Sustainable DL Aggregate Throughput (Mbps) vs Outage (%)

— 0.2 W, Outdoor   — 0.2 W, 50% Indoor
·· 1.2 W, Outdoor   ·· 1.2 W, 50% Indoor

PSCR Standards Development

Proximity Services
Release 12 & 13

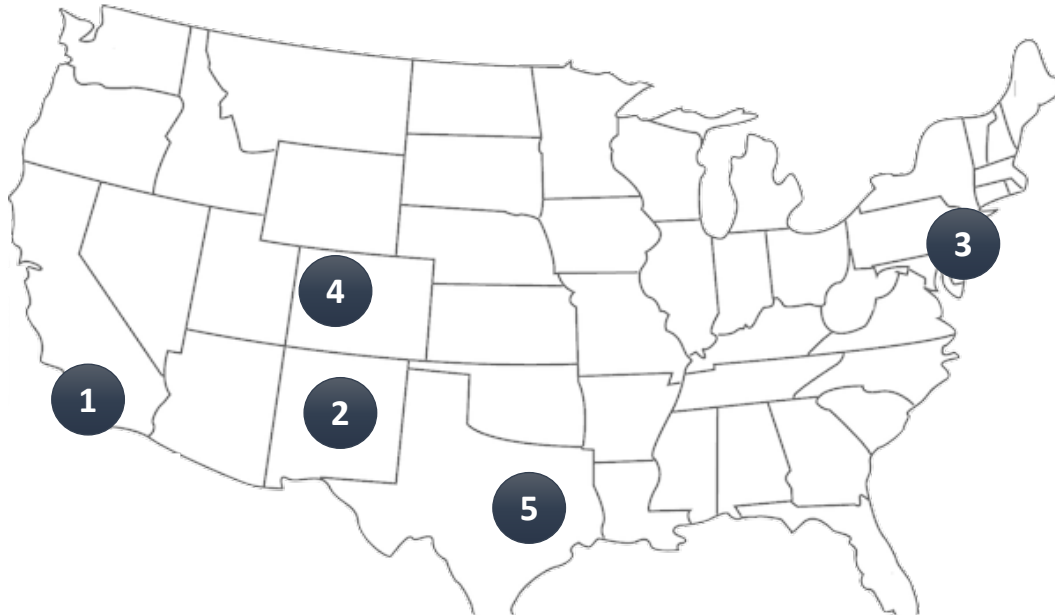**Group Comm-unications**
Release 12 & 13

Mission Critical Push-To-Talk
Release 13

FirstNet features are also supported by the UK, South Korea, Australia, Canada, France, Germany, and the Netherlands

Release 12 Start

Stage 1 Freeze – June 2013
Stage 2 Freeze – March 2014
Stage 3 Freeze – March 2015

Release 13 Start

Stage 1 Freeze – December 2014
Stage 2 Freeze – June 2015
Stage 3 Freeze – March 2016

Release 14 Start

Stage 1 Freeze – June 2016 (Tent.)

Early Builder Band 14 LTE Projects

FirstNet Guiding Principal

"FirstNet will provide technical support to these projects and will share any lessons learned with the broader public safety community to enable the successful implementation of FirstNet's nationwide network deployment. Designing and deploying a network that lives up to these principles will require an extraordinary level of coordination and collaboration among all stakeholders."

Project	SMLA	KLCP	Sites	Primary Focus Areas / Key Learning Conditions	On-Air
1. LA-RICS	Yes	Yes	182	Secondary responders partnerships, Quality of Service (QoS), priority/pre-emption	FY15 Q2
2. NM	Yes	Yes	7	Hosted core, int'l border spectrum management, Federal partnerships	FY15 Q3
3. NJ	Yes	Yes	30	Deployables, disaster recovery, training, Network Ops Center notification	FY15 Q3
4. ADCOM	Yes	Yes	16	PSCR/FirstNet test support, Band 14 device testing, demonstration access	NOW
5. TX	Yes	Yes	14	Core migration, data analytics, rural coverage, special events, LTE training	NOW

SMLA: Spectrum Manager Lease Agreement
KLCP: Key Learning Conditions Plan

What Have We Learned?

- Public safety managed mobile virtual private network (MVPN) might prevent QoS, priority, and pre-emption from operating at the application level

What Have We Learned?

- Most states and public safety entities are not familiar with the relationship between "per-Gigabyte" pricing for public safety users and the need for pre-pay/Intelligent Network/Online Charging-based billing systems to support the pricing

What Have We Learned?

- Use of state and local infrastructure more complex, time consuming, and potentially costly than expected
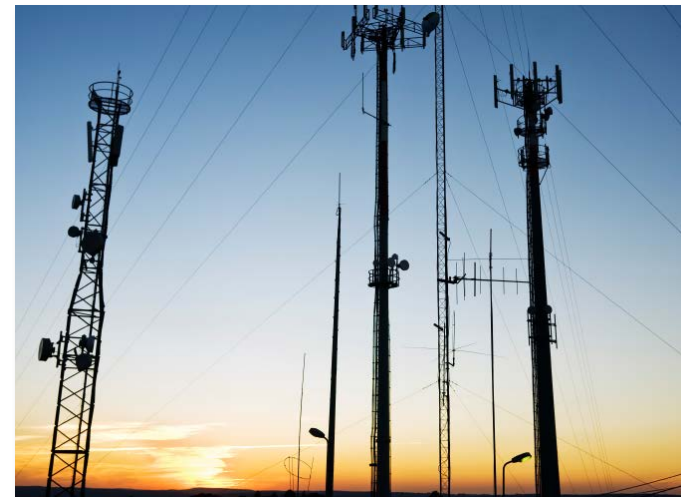
What Have We Learned?

- In general, initial early builder networks do not have robust network performance, device, service reporting, or operations, administration, and management (OA&M) platforms included

What Have We Learned?

- Relatively short life cycle of LTE equipment makes upgrades and technology replacement costly
  - Important to understand in the context of a multi-year network deployment schedule for the NPSBN
  - Important to factor in upgrade costs and application updates that will be needed to ensure functionality

Thank You