Session Descriptions

NIST's Public Safety Innovation Accelerator Program

Pulling the Future Forward

Speakers: Dereck Orr, PSCR

The *Middle Class Tax Relief and Job Creation Act of 2012* allocates $300 million to NIST to execute Research & Development to advance public safety communications technologies. PSCR has branded this effort the NIST Innovation Accelerator. The Innovation Accelerator represents a unique opportunity for PSCR to push beyond the identification and characterization of technology gaps; this funding enables PSCR to catalyze innovation to solve critical communications technology problems. The Innovation Accelerator will focus on Mission Critical Voice over Broadband, LMR to LTE integration and eventual migration, Location-based Services, Analytics, and Enhanced User Interface/User Experience.

During this session, PSCR Division Chief Dereck Orr will discuss ongoing roadmapping efforts, opportunities for collaboration, and how the program will leverage open innovation mechanisms such as prize challenges, grants, and cooperative agreements to address public safety needs. Get involved in PSCR's plan to foster a diverse solver community empowered to take part in this unprecedented program.

Mission Critical Voice

Bridging the Gap & Advancing the Future

Speakers: Jeb Benson, PSCR; Richard Rouil, PSCR; Andy Thiessen, PSCR; Paul Roberts, Boise Fire Department

Voice and related communication functionalities such as emergency alerting, direct mode, and audio intelligibility are paramount to effective emergency response and first responder safety. The term 'mission critical voice' (MCV) has been used to describe this capability for decades but standards and key performance indicators to define and measure MCV performance across network technologies have been elusive. This panel discussion will focus on current efforts in this space and how PSCR is approaching R&D activities to enable mission critical communications over Broadband networks.

Public Safety Audio Quality Research Snapshot

Assessing Broadband Codecs for Mission Critical Voice

Speakers: Stephen Voran, PSCR

When a first responder's life is in danger, the ability to communicate a call for help and to warn others is essential. Communications often suffer as background noise intensifies, putting first responders in greater risk. This session will discuss "speech intelligibility" and "speech quality" as it relates to Mission Critical Voice services, and their importance during high-stakes situations. PSCR will present new research findings on various codec performances in selected background noise conditions relevant to first responders. This session will provide an overview of speech intelligibility considerations stemming from degraded radio channels and will transform results from abstract numbers to concrete, real-world experiences.

Public Safety & Network Security Enhancements

Identity Management & Data Isolation Solutions

Speakers: John Belts, PSCR; Josh Franklin, PSCR; Harlin McEwen, PSAC; Paul Grassi, PSCR

Granting unauthorized users access to highly classified data is a network security disaster. Verifying user identities and granting those users access to the right data and services, on the other hand, is crucial to blocking potential threats to Network Security. This panel will discuss the need for and challenges associated with proper identification proofing of users and PSCR's current and future research efforts on this topic.

PSCR's Demonstration Network Snapshot

Preparing Today's Network for Tomorrow's Research

Speakers: Ellen Ryan, PSCR; Don Harriss, PSCR

One of PSCR's primary goals is to create and leverage a state of the art research laboratory and cutting-edge evaluation services in order to address public safety's most critical issues. The PSCR

Lab Operations team deployed PSCR's demonstration network (DemoNet) to provide a secure and diverse Band 14 LTE network that allows the PSCR research engineers to evaluate the LTE functionalities that are critical to public safety including indoor/outdoor coverage; local control; deployable technologies; network priority, and more. This session will discuss critical lessons learned from the buildout and management of DemoNet, including the management of assets, the implementation of network security initiatives, and complexities resulting from multi-vendor environments.

Local Control for Public Safety

A Successful Demonstration of Local Control

Speakers: Tracy McElvaney, PSCR; Mika Skarp, Cloudstreet; Wim Brouwer, Nokia; Chris Walton, PSCR

As the implementation of the Nationwide Public Safety Broadband Network (NPSBN) draws closer, conversations are evolving as technical details for Local Control become more clear and better focused. Local Control is a critical piece of the larger Quality of Service, Priority, and Pre-emption (QPP) puzzle for public safety users. This session will provide an overview of lessons learned from PSCR's current Local Control research efforts as well as information on the state of the industry and the effort required to realize true dynamic QPP management.

Advanced Positioning Snapshot

Using Improved Timing within an LTE Network

Speakers: David Howe, PSCR

Advanced Location-based Services have the potential to provide significant value to the public safety community. This session will describe how devices in dense urban areas can determine a 3-Dimensional position solution using OTDOA (Observed Time Difference of Arrival). NIST Time and Frequency Metrology Group Lead David Howe will discuss modulation protocols used in precise timing that would enable sub-meter 3D uncertainty.

Public Safety Location-based Services

Roadmap, Summit Findings, & Project Launch

Speakers: Tracy McElvaney, PSCR; Ryan Felts, PSCR/Corner Alliance; Vihang Jani, PSCR; Christian Militeau, West Safety Services

It's all about location, location, location! The first responder community has unique requirements and challenges associated with location-based services (LBS) such as 3D-geolocation, mapping and visualization, interoperability, and more. This session will provide an overview of PSCR's R&D efforts, including the Location-based Services Roadmap, Summit findings, and current projects. This session will also provide information regarding the FCC's 4th report and order on Indoor Location Accuracy and the ATIS Emergency Location Task Force (ELOC) to Improve Wireless 9-1-1 Location Accuracy.

LMR to LTE Standards Snapshot

Speakers: Andy Thiessen, PSCR

This session will provide the audience with a standards update regarding the interconnection of Land Mobile Radio (LMR) systems and LTE based Mission Critical Push-To-Talk systems. This discussion will emphasize the current status of the standards development efforts led by the First Responder Network Authority in 3GPP in addition to future plans for stakeholder engagement in the wider discussion of LMR to LTE integration.

Department of Homeland Security Snapshot

Office of Emergency Communications & Office for Interoperability and Compatibility

Speakers: Rear Admiral Ronald Hewitt (Ret), DHS OEC; John Merrill, DHS S&T OIC

How are the Department of Homeland Security (DHS) Office of Emergency Communications (OEC) and the Office for Interoperability and Compatibility (OIC) working together to address the emergency communications ecosystem as a whole? What specific efforts are OEC and OIC undertaking to promote and enhance land mobile radio sustainment as well as prepare for broadband? Which additional key partners are involved? Come find out the answers to these questions and more at the session jointly sponsored by these DHS offices.

Prizes and Competitions 101

How to Engage in Prizes and Competitions

Speakers: Tammi Marcoullier, PSCR; Heather Evans, NIST

More than 680 competitions have been run in the federal government over the last 6 years; the practice of seeking groundbreaking solutions from a broad and diverse audience has existed since the 1700s. This session will describe the key principles of challenge and prize competitions and how PSCR plans to leverage prize competitions and open innovation practices such as crowdsourcing, hackathons, and more to accelerate innovation and offer solutions to some of the public safety's most pressing communications technology problems.

Mission Critical Voice Tutorial

PTT, D2D, GCSE – Oh my!

Speakers: Jeb Benson, PSCR

This breakout session will expand on the topics covered in the Mission Critical Voice (MCV) panel discussion to further define MCV, its roots in LMR, and new links to LTE. This high-level technical overview is targeted for those wanting to learn more about MCV features, technologies, and how MCV might work on an LTE network.

LTE Network Security Tutorial

Public Safety Security Enhancement Through Identity Management & Data Isolation

Speakers: John Beltz, PSCR; Joshua Franklin, PSCR; Michael Ogata, PSCR; Paul Grassi, PSCR

Public safety broadband network communications security will be highly dependent on the specific security mechanisms implemented on user devices as well as the Identity Management and verification frameworks. This panel will provide an update on PSCR's research efforts to address these security needs. First the panel will provide a presentation on Application and Data Isolation on mobile devices followed by a brief panel discussion describing why these findings are important for the public safety community. The panel will transition into a discussion on the importance of Identity Management in all aspects of public safety communication. The conversation will focus on

the need for proper identification proofing of the users of the Public Safety Broadband Network and describe the associated challenges this presents to the public safety community. This panel will appeal to attendees wishing to gain insight into PSCR's cybersecurity research at a high level, while providing sufficient detail to understand the research being conducted to ensure a strong cybersecurity posture.

Prizes and Competitions 201

Brainstorming Early Prize Competition Opportunities

Speakers: Tammi Marcoullier, PSCR

PSCR will conduct a brainstorming session for initial prize challenges to address public safety R&D priorities and help solve critical communications problems. This session will be hands-on and will allow participants to collaboratively brainstorm problem statements and explore basic prize design. Attendees will have an active role in identifying critical problem areas and discussing opportunities for future solution development.

In-building Coverage Measurements Snapshot

Practical Techniques for Public Safety

Speakers: Bob Johnk, PSCR

First responders experience significant communications challenges when operating indoors, namely reduced network coverage. This snapshot session will reveal the latest results on the development and validation of low-cost tools that public safety could use to grade the quality of LTE coverage inside of buildings. Utilizing PSCR-developed applications, selected devices (phone or tablet) can act as in-building measurement and coverage assessment tools. This capability could place both in-building measurements and coverage quality assessment directly in the hands of the public safety community without the need for highly specialized and expensive test equipment or extensive operator training and skill. This capability could also enable public safety to collect valuable in-building data on a national scale resulting in significant benefits to first responders and the public.

User Interface Roadmapping for Public Safety Panel

Mobilizing the Future from Interface to Experience

Speakers: Mary Theofanos, PSCR; Brian Stanton, PSCR; Brad Fain, Georgia Tech Research Institute; Lexie Spiro, Motorola; Ray Bizal, National Fire Protection Association

In order for the public safety user experience to be successful, first responders must be able to achieve specific goals with effectiveness, efficiency, and satisfaction in their unique context of use. In other words, the user interfaces must be usable. Research and development of devices must take a whole-system rather than piecemeal approach focusing on a variety of user types. This panel will discuss the merits of the holistic approach from user requirements to design and testing.

Public Safety's Immersive Test Environment Snapshot

Possible Uses of Augmented & Virtual Reality

Speakers: Dereck Orr, PSCR

One of the most exciting developments in consumer electronics in recent years has been the emergence of Virtual Reality and Augmented Reality (VR/AR) products. These new technologies utilize both hardware (headsets) and software (virtual programmed environments) to replicate and/or simulate an environment in a virtual domain. PSCR is exploring the potential application of VR/AR technologies to create a low-cost method to evaluate and measure other emerging public safety communications solutions in real-world environments. In this session, PSCR Division Chief Dereck Orr will present an overview of VR/AR technologies, why they could be a game-changing evaluation tool for public safety communications technology, and how PSCR plans to leverage open innovation to make this vision a reality.

International Public Safety LTE Deployment Panel

Lessons Learned from Around the World

Speakers: Andy Thiessen, PSCR; Jeff Bratcher, FirstNet; Richard Hewlett, UK Home Office; Joe Fournier, Canada Centre for Security Science; Jeong-ki Kim, Korean Ministry of Public Safety and Security

During this panel, attendees will hear from government representatives from the United Kingdom, Korea, and Canada on the current status of their public safety LTE deployment initiatives. Although each country is pursuing LTE as the technology for public safety broadband deployments, requirements are not always the same. This panel will an update on these exciting initiatives and will provide insight into the larger, global public safety LTE environment.

Public Safety Analytics Roadmapping

Paving the Road to the Summit

Speakers: Jeb Benson, PSCR; Noah Fritz, International Association of Crime Analysts; Tom Sorley, City of Houston; Marc Leh, PSCR/Corner Alliance; John Garofolo, PSCR; Neal Fishman, IBM

As public safety communications technology progresses, collecting data and developing analytics increases situational awareness for the public safety community and allows network operators to adequately measure the performance of new technologies. These measurements reveal meaningful patterns that lead to better decision-making – ultimately saving lives. In this session, we are excited to explore the value of analytics from a first responder perspective and examine real-world initiatives developed within private sector, public sector, and at the practitioner level. Join us as we review the Analytics Roadmap, discuss plans for the highly anticipated Analytics Summit, and recap the Video Analytics Workshop, scheduled to take place Monday, June 6th.