



CCI xG Testbed Pioneers First End-to-End O-RAN and CBRS Research Advances Security of Communications

MWC Booth W2.1328

The Commonwealth Cyber Initiative's xG Testbed is conducting **first-of-its-kind** research in two areas: an Open Radio Access Network (O-RAN) and Citizens Broadband Radio Service (CBRS). CCI demonstrates these cutting-edge technologies at the Mobile World Congress (MWC) in Las Vegas, Sept. 28-30, 2022.

The CCI xG Testbed (photo, above) has two sites: An indoor radio network (72 software-defined radio systems, or SDRs) at the CCI hub in Arlington, Va.; and an outdoor CBRS private network, being built in Blacksburg, Va. As part of MWC Las Vegas, the CCI xG Testbed team will present demonstrations based on an end-to-end O-RAN and CBRS.

End-to-End O-RAN Demonstration

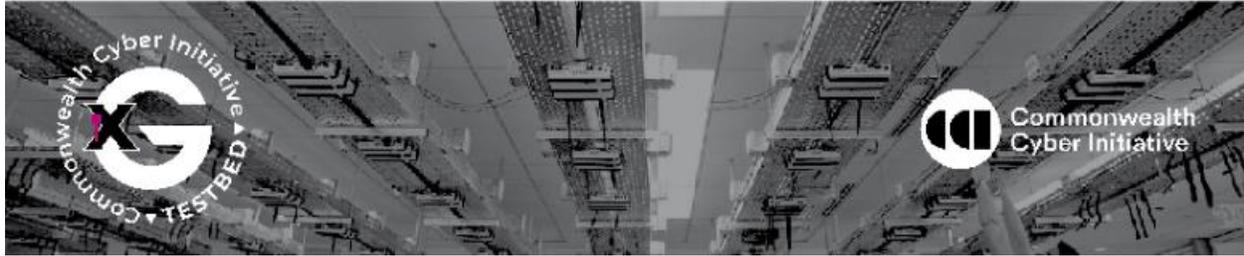
O-RAN is drawing much attention due to the \$280 billion federal CHIPS and Science Act slating \$1.5 billion for open and interoperable radio access networks.

CCI will show an O-RAN secure network can prioritize the communications needs of emergency first responders while ensuring the public's calls and texts go through.

This demonstration of the first end-to-end O-RAN software defined radio (SDR)-based proof of concept will showcase the workflow goes from the service management orchestrator (SMO) to user equipment (UE). The main components of the demonstration include:

- An Artificial Intelligence / Machine Learning (AI/ML) framework.
- A Non-Real-Time Radio Intelligent Control (Non-RT-RIC) and a Radio Access Network Automation Application (rApp) with embedded intelligence.
- A Near-Real-Time Radio Intelligent Control (Near-RT-RIC) and an xApp (software application) with policy-based guidance through interaction with the rApp.
- A Radio Access Network (RAN), which is implemented using system-radio-software (srsRAN) and Software-Defined Radio (SDR) and intelligently controlled by the NexRAN xApp (a macroservice).
- User equipment (UE) implemented through an SDR and srsRAN (srsUE) or implemented using a commercial off-the-shelf (COTS) UE.

The demonstration focuses on policy-based RAN network slicing. CCI will illustrate a first-responder use case to highlight the end-to-end workflow through the O-RAN ecosystem.



CBRS Presentation

Virginia Tech holds a priority access license for the CBRS spectrum in two counties in Virginia. This spectrum is being used in production and research to create a private 5G network that will monitor flood control, and to deploy an outdoor component of the CCI xG Testbed.

In this demonstration, we show an end-to-end CBRS experimental network composed of two main building blocks:

- An SDR and srsRAN-based CBRS base station prototype.
- An open-source spectrum access system (SAS).

The CBRS SDR-based prototype is designed to enhance research and development in the SAS ecosystem. It focuses on investigating SAS vulnerabilities and testing new mechanisms to mitigate them.

In another first, CCI presents OpenSAS, an open-source spectrum access system that emulates the real SAS, enabling experimentation in the SAS ecosystem. The demonstration shows:

- Registration and authentication of the CBRS prototype using a GoogleSAS testing environment.
- Interaction between two CBRS tiers orchestrated by the OpenSAS.

Contact Us

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