



# xG Testbed

The **COMMONWEALTH CYBER INITIATIVE** (CCI) is deploying the first end-to-end **OPEN ACCESS RADIO NETWORK** (O-RAN)-compliant testbed in the United States, creating a foundation for openness, innovation, and flexibility in radio access networks.

The **CCI xG TESTBED** is the largest and most advanced of this kind. It is built on **SOFTWARE-DEFINED RADIO** (SDR) and open-source software and incorporates massive computing and storage capabilities for the integration of artificial intelligence (AI) solutions.

The testbed offers unparalleled opportunities for researchers, as well as industry and government partners, to test secure 5G and NextG network technologies, develop new intellectual property, and provide hands-on training for cyber professionals.

#### **ABOUT CCI**

CCI is a consortium of **41 INSTITUTIONS OF HIGHER EDUCATION IN VIRGINIA**, encompassing more

than **320 RESEARCHERS** focused at the intersection of cybersecurity, autonomous systems, and intelligence. CCI's mission of research, innovation, and workforce development makes Virginia a globally recognized leader in cybersecurity.

CCI is a member of the NextG Alliance, an industry-led effort that's mapping a North American vision for NextG. We are also a member of the O-RAN Alliance. CCI research is informing the standardization process, with the testbed playing an essential role.

The CCI xG Testbed is based at the Virginia Tech Research Center in Arlington, Virginia, with additional components deployed at other CCI sites throughout the commonwealth. It's one of the first such SDR networks to support native AI and machine-learning capabilities. These small, powerful networks shift traditional radio duties from bulky hardware to software.



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The CCI xG Testbed emphasizes programmability and interoperability, relying on open interfaces and open-source software.

## CORE PRINCIPLES OF THE CCI xG TESTBED INCLUDE:

- **Openness:** Open standards, open interfaces, and open-source software allow experimentation with new technologies at the pre-commercial stage.
- **Accessibility:** CCI researchers, collaborators, and students in CCI institutions can perform experiments in the testbed from any location.
- **Programmability:** Hardware and software solutions enable programmability, from end devices to the network core to applications and services.
- **Interoperability:** The testbed is compatible with other hardware and software solutions, including commercial products, and other testbeds.
- **Modularity:** We adopt containerized, cloud-native implementations with open APIs.

Learn more about the CCI xG Testbed at [cyberinitiative.org/xg-testbed.html](https://cyberinitiative.org/xg-testbed.html)