Network Slicing Applications

Connected Cars: Low Latency

Enables the fast response times needed for pre-crash sensing and mitigation.

Emergency Response: Fast Speed

Enables public safety networks to exchange large amounts of data quickly, particularly important in disasters.

Smart Factories: Speed/Capacity/Latency

Enable autonomous and remote-operated robots to communicate and react quickly.

5G Security Test Bed Confirms Network Slicing Works Securely to Enhance 5G Network Efficacy

The wireless industry's 5G Security Test Bed successfully tested and validated various properties of networks segmented through network slicing, including authentication, slice isolation, security, and data integrity—a first-of-its-kind industry test bed validation of 5G network slicing.

The 5G Security Test Bed Is the Latest Industry Initiative to Advance 5G Security

Formally launched in 2022, the 5G Security Test Bed is a unique collaborative endeavor between wireless providers, equipment manufacturers, cybersecurity experts, and academia. Its sole purpose is to test and validate 5G security recommendations and use cases from government agencies, standards bodies, wireless operators, and others. The Test Bed is the only initiative that uses commercial-grade network equipment and facilities to demonstrate and validate how 5G security recommendations will work in practical, real-world conditions.

5G Security Test Bed Proves Network Slicing Can Isolate and Protect Network Data Across Multiple Layers of Encryption on 5G Networks

Instead of relying on physical locations, equipment, and hardware, 5G networks will be virtualized and decentralized in the cloud, providing additional opportunities to layer in security features. As wireless providers build out their 5G networks, and enterprises and government adopt new 5G-enabled applications, the 5G Security Test Bed sees value in validating the security features available in these networks in a real-life setting.

The Test Bed developed three initial test cases for network slicing to show that 5G standards body 3GPP's Technical Specifications, along with select measures recommended by the FCC's Communications Security, Reliability, and Interoperability Council (CSRIC), can improve user security, and that layering additional encryption tools can further improve security without compromising data. These base test cases are a foundation for future testing of 5G network slicing advanced security capabilities.

- ✓ **Each user device and its data are authenticated and isolated to a specific slice.** This test confirmed that the network properly segmented each slice and registered each user device to the correct one. This helps strengthen network security by ensuring bad actors cannot access other parts of the network if one slice of the network were compromised.
- ✓ **Additional security (IPsec encryption) can be added to individual slices.** This test confirmed that IPsec encryption could be added to a specific network slice while maintaining isolation between the slices. This verifies that individual slices can meet the security needs of specific use cases without impacting other slices on the network—a factory worker using augmented reality may need a low-latency slice to ensure quick responsiveness, while a slice with additional encryption can be used to transfer login credentials without the need for lower latency.

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✓ **Overlaying multiple layers of encryption does not impact performance.** This test confirmed that two additional layers of encryption could be added to the 5G network's existing layer of encryption—for a total of three layers of encryption—to a specific slice, without negatively impacting its performance. This is important for networks that need highly secure segments, such as in national security use cases.

What Does This Mean?

Network slicing is good for everyone, maximizing network efficiency for use cases ranging from remote surgery to home gaming; from worker safety in manufacturing plants to national security; and everything in between. This is because network slices enable significant flexibility in mobile network management. Each slice can be tailored for specific uses by customizing a blend of faster speed, higher capacity, and/or lower latency, along with additional layers of network encryption as needed for each application.

In other words, network slices enables operators to provide fine-grained, customizable services to meet the diverse needs of a variety of customers and applications, such as in public safety, transportation, or security contexts. Applications like self-driving cars require lower latency, while public safety networks prioritize the transmission of emergency communications, especially during disasters. Some applications could also concurrently use multiple network slices, each with different characteristics.

The 5G Security Test Bed tests confirm that when applying 3GPP Technical Specifications, 5G standalone network slicing can completely separate various types of device traffic and implement additional layers of security without compromising data.

The 5G Security Test Bed's Inaugural Members Span Industry, Government, and Academia

Wireless Providers

AT&T T-Mobile uscellular

Industry

ctia ERICSSON MITRE SECURE

Academia

UNIVERSITY OF MARYLAND

The Future of the 5G Security Test Bed Is the Future of 5G Security

As new participants and the diversity of test cases grow in tandem, the 5G Security Test Bed will continue contributing to the evolving future of 5G network security. For future tests, the Test Bed is also in the process of developing test cases for false base station and roaming security use cases. Additional anticipated test case topics include Open RAN, IMSI privacy, and new trust anchor solutions.

The 5G Security Test Bed members and administrator welcome engagement from stakeholders with an interest in Test Bed's mission, and we expect to develop more and diverse test cases along with new participants. To learn more about the Test Bed, membership, or read the full report, visit www.5Gsecuritytestbed.com.

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