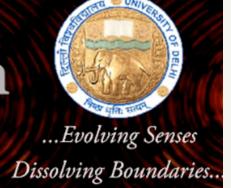# Cluster Innovation Centre

...Evolving Senses
Dissolving Boundaries...

5G JIO ODSC

RESEARCH AND SECURITY VULNERABILITY ASSESSMENT OF RADISYS 5G NR (NEW RADIO) SMALL CELL AND OPTIMIZATION OF 5G-NR PRODUCT TESTING WITH AUTOMATION USING ROBOT

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AIM

1 Research and security vulnerability assessment of Radisys 5g NR (New Radio) Small Cell

2. Optimization of 5G-NR product testing with automation using Robot

ORGANISATION

Radisys Corporation is an American technology company, headquartered in Hillsboro, Oregon, United States that makes technology used by telecommunications companies in mobile networks.
They are a global leader in open telecom solutions and a proud member of the Reliance Industries family. The corporation enables service providers to become digital experience providers through open and disaggregated platforms and solutions.

Vulnerability Assessment Scans

A vulnerability assessment is a systematic review of security weaknesses in an information system i.e. the vulnerabilities. It evaluates if the system is susceptible to any known vulnerabilities, assigns severity levels to those vulnerabilities, and recommends remediation or mitigation, if and whenever needed.

The objective of this exercise is to discover the security vulnerabilities in 5G Radio product using two methods:

1. Port Scan
Determining if a communication port (TCP/UDP) is open or closed in the system. This is an important step in discovering the attached surface of a product.

2. Device Scan
This test allows us to discover vulnerabilities that could allow unauthorized control or access to sensitive data on a system.
Misconfiguration, Denials of service (Dos) vulnerabilities etc.

Security Tool comparision

Functionality	Nessus	Nmap
Installation	Easy	Easy
Port Scanning	One function of Nessus	The only function of Nmap
Vulnerability Scripts	Available	Available
Cost	Free and Pro	Free
Configuration Assessment	Available	Very Limited
Ease of Use	Easy	Medium
Customer Support	Available	Not Available
Speed	Faster	Slower than Nessus

Hence, NESSUS was used.

Robot Framework

Test Cases
A test case is exactly what it sounds like: a test scenario measuring functionality across a set of actions or conditions to verify the expected result. They apply to any software application and can use an automated test. The test case suite tested in the synopsis had a total of 140 test cases.

Test Suites
A test suite TestSuite.robot is a robot file, which is a container that has a set of tests which helps testers in executing and reporting the test execution status. It can take any of the three states namely Active, In Progress and completed. The test suite used for the synopsis in JIO_SA_FUNC.robot suite which is a functional suite.

Task Overview

Task Analysis -

Conclusion

1.The detailed analysis, methods, and outcome of security vulnerability assessment of Radisys 5G radio product is explained in a thorough manner. Using the security tool, Nessus, the two scans i.e. the port scan and the device scan were performed on the product to disable unauthorized services/daemon running on the node and to allow only those services that serve a documented operation or business to run and listen on a communication port and to find out any configuration mistake and the results were obtained successfully.
2. Test Case script correction, using keywords, understanding, execution and log analysis of test cases made for functional and feature testing of 5G-NR ODSC product were successfully completed.