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Keysight and Aarna Build CI/CD Test Automation

AMCOP and LoadCore™ integration automates workflows, create efficiencies, and enables CI/CD

Summary

Keysight Technologies' LoadCore solution simulates mobile subscribers and generates traffic under real network conditions for systems testing and analysis. Formerly a manual process, Keysight integrated Aarna Networks' AMCOP solution with LoadCore to automate workflows, create efficiencies, and enable Continuous Integration / Continuous Delivery (CI/CD).
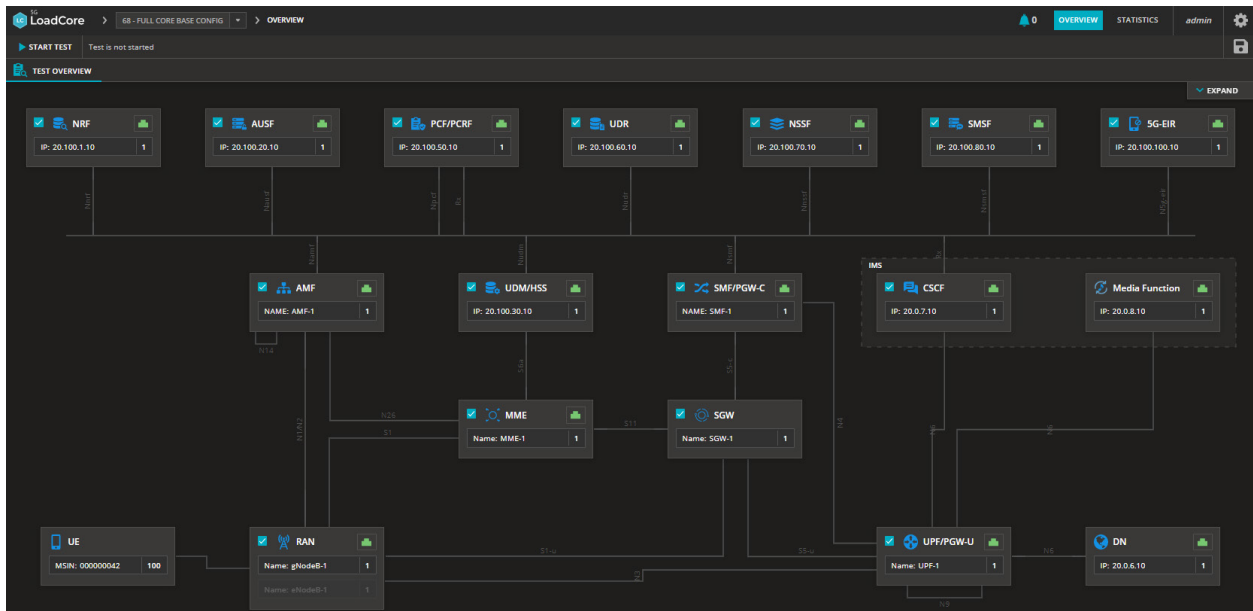
Keysight LoadCore Testing Dashboard

The Challenge

The elastic nature of the 5G Core network creates new challenges for testing the core network elements, both in isolation and in end-to-end setups.

Building specific scenarios to test is a manual process; but once configured, becomes a prime candidate for automation. When the test infrastructure involves private or public clouds, the ability to orchestrate test resources and dynamically adapt to changes becomes paramount. Being able to deploy VMs or containers and spin-up for both real or simulated 5G NFs, update test configurations to match the newly created environments, and dynamically assign compute resources to tests represents a critical aspect of 5G automation.

Keysight was seeking ways in which to automate these workflows and approached Aarna Networks about integrating AMCOP with LoadCore and automating test agents infrastructure deployment orchestration for both public and private clouds.

"Leveraging AMCOP into the LoadCore offering certainly reduces test time and costs—but even more importantly—it reduces human intervention and creates a truly dynamic CI/CD environment for today's elastic scaling environments."

– Daniel Musat, Keysight Technologies

The Solution
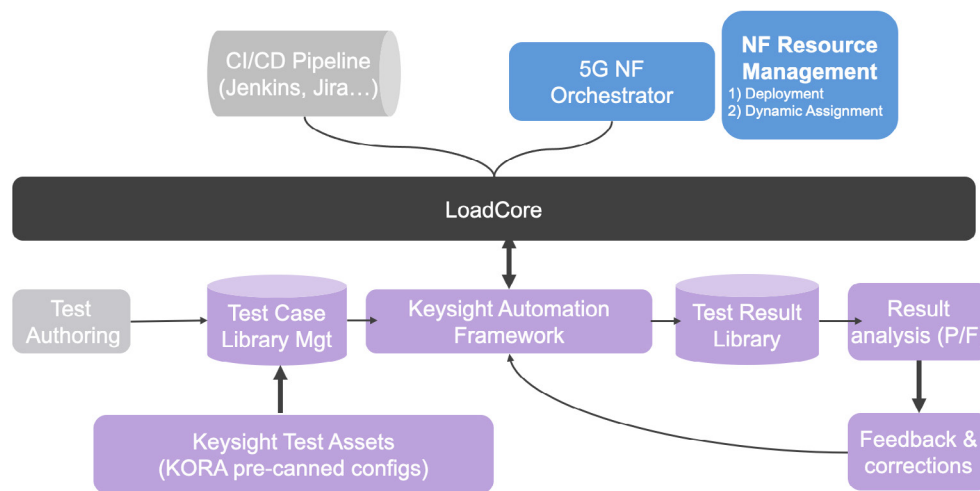
Test Automation Framework incorporating NF Orchestrator

Aarna Networks and Keysight set off on an integration based on a test automation and execution framework (southbound of LoadCore) with a library of test cases and results analysis for systems under test (AMF, SMF, UPF, etc). A Continuous Integration / Continuous Delivery (CI/CD) approach was taken to introduce dynamic monitoring and ongoing automation.

The difference between the before and after scenarios is stark.

Testing Steps Before AMCOP:

▶ Manually deploy LoadCore Agent infrastructure over public or private cloud

▶ Manually map the 5G nodes using the LoadCore UI or REST API

▶ Configure interface attributes such as SR-IOV etc.

▶ Manually destroy the LoadCore infrastructure once test was executed

▶ Repeat the same for new test configurations

After AMCOP:

► Use AMCOP to automatically deploy the infrastructure, test execution, monitoring, and destroy the infrastructure

► Automatic onboarding of composite application via Helm charts or Terraform

► Achieve auto-scaling by automatically performing vertical and horizontal scaling when test requirements modify from one step to another (eg., run test-1 with low capacity VMs and increase VM compute resources for test-2 when more performance is needed)

► Repeat the same to execute multiple test configurations in parallel

Keysight was able to integrate LoadCore Test Campaign Manager with AMCOP to run tests and deployments in real time. Test cases that fail are now automatically decommissioned which simplifies test analysis, avoids manual configuration steps, and reduces OPEX by conserving server resources and staff time. What once took hours and days has now been automated to run continuously as a seamless component of the CI/CD workflow. For example, for a 100,000 UE Simulation with 100 tests, the amount of manual effort can be cut from from 1 week to just 2 minutes.

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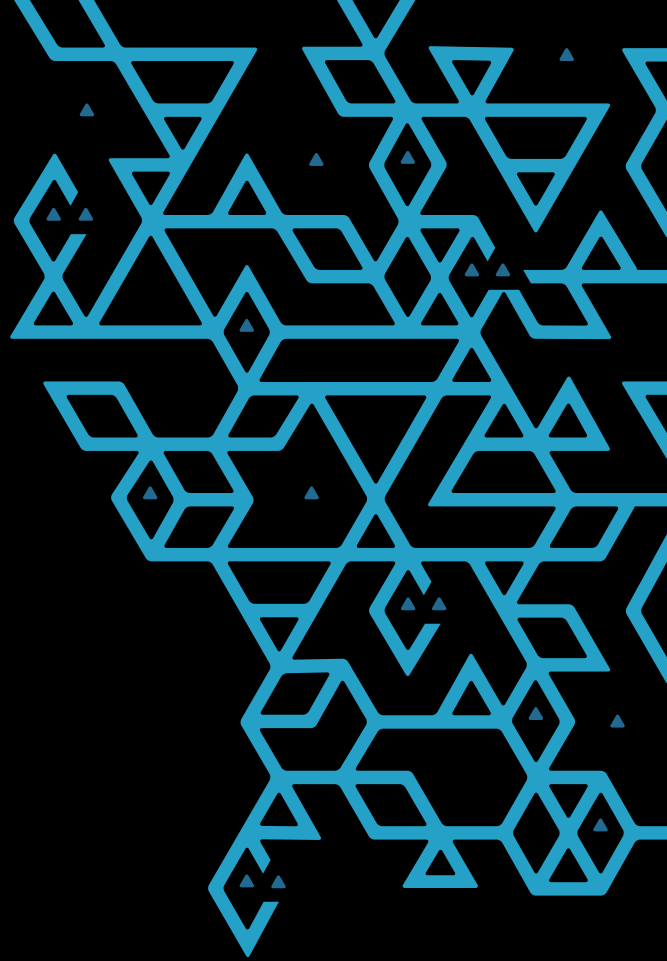
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