CLIENT CASE STUDIES

For ABot 4G/5G/ORAN Network Protocol Tester & Analyzer

Scope:

Testing & Certification of Enterprise UPF (Kaloom UPF) with AI/ML Driven Analytics.

Challenge:

1. Integration challenges with Kaloom's UPF and 5G NFs for 5G SA and 4G-5G Migration Testing.
2. Creating Call-flow scenarios and modifications to message IEs by development team.
3. Rapid creation of use cases during customer demo.

Solution:

1. ABot's extensive support for 4G/5G emulated protocol stack could solve most of the integration challenges.
2. ABot ready made feature files and SmartEditor allowed generation of all possible Call-flow scenarios easily.
3. Integrating the CUPS nodes elements over N4, Sxa,Sxb interfaces enabled all UPF related testing.

Outcome:

Successful 5G and 4G-5G migration e2e testbed creation with multi vendor NFs. Seamlessly measuring the functionality and performance of the SUT as a part of pre-deployment testing. ABot generated proper analytics during the integration.

Client:
Kaloom

Industry:
Telecommunications

Technology Service:
Telco OEM (UPF Vendor)

Scope:

Simulation of end-to-end 5G topology in Lab environment and creating new use cases (JHU Applied physics Lab).

Challenge:

1. Integration challenges with different test tool available in the Lab and simulating 4G nodes.
2. Creating different use-cases easily and monitoring different KPIs.

Solution:

1. ABot 4G emulated nodes and extensive REST API enabled easy integration with other test tools.
2. Call-flows were authored easily with SmartEditor without any scripting knowledge.
3. Including new IEs to the relevant feature files, customizing them, and monitoring KPI enabled validation of different use cases.

Outcome:

Successful LTE test bed creation with real and simulated multi vendor nodes, performing functionality and load testing of the SUT. Abot generated proper analytics of the test execution for deep insight. ABot was used as a validation tool to explore multiple 3GPP procedures in the R&D lab environment.

Client:
John Hopkins University

Industry:
Telecommunications

Technology Service:
Research Institute

Scope:

Certification of an indigenously (CDOT) developed Indian LTE Solution targeted for 4G carrier grade commercial deployment in association with TCS.

Challenge:

1. Validating and certifying different scenarios of the CDOT EPC as per requirement specification.
2. Requirement to simulate OCS/OFCS and add new 4G test scenarios.
3. Providing test artefacts to stakeholders for debugging and acceptance.

Solution:

1. ABot ready made 4G test cases are used to rapidly validate requirement use cases.
2. ABot BDD driven test cases allowed easy inclusion of new IEs and customization for SUT's requirement.
3. OCS , OFCS simulator support added and new feature files on-boarded to ABot.

Outcome:

Successful LTE test bed creation with real and simulated nodes to certify the requirement specification. Functionality and performance validation of the SUT for carrier grade 4G EPC testing and certification. ABot generated proper analytics during the integration.

Client:
TATA Consultancy Services

Industry:
Technology

Technology Service:
Service provider and System Integration

Scope:

Demonstrating the capability of an enterprise RAN (Altiostar Networks) with 4G use cases and performance analysis through a CI engine, in association with Telecom Infra Project & Tech Mahindra.

Challenge:

1. Validating the proper deployment of the RAN on the RedHat infrastructure.
2. Developing the 4G use cases and capturing mobility & infrastructure KPIs
3. Providing Continuous Test assurance in a multi-vendor platform.

Solution:

1. ABot emulated the 4G EPC stacks to create an end to end LTE topology.
2. ABot's readymade test cases helped to trigger 4G use cases to execute different scenarios with the SUT.
3. ABot REST API support was used to seamlessly integrate with CI engine for complete test automation..
4. ABot's analytics helped to analyse test execution results and provided insight using various KPIs.
5. ABot analytics helped to monitor the over all network health by displaying the system level KPIs.

Outcome:

Successful LTE test bed creation with ABot simulated 4G EPC nodes & real RAN. Automating the entire testbed with CI/CD integration followed by performance benchmarking and functional validation. ABot generated insightful analytics during the integration.

Client:
Tech Mahindra & TIP

Industry:
Technology

Technology Service:
Service provider and System Integration

Scope:

Continuous Test Assurance solution integrated with CI engine for Magma 5G Core in association with Wavelabs.

Challenge:

1. On-going validation of Magma Core releases by developer community and identifying issues.
2. Generating new test cases for newly released functions those are easily understandable.
3. Identifying integration issues with Magma Core components and other 5G NFs.
4. Optimizing Magma core performance against different platforms.

Solution:

1. ABot simulated 5G NFs and provides Functional, Conformance and Performance testing.
2. Using BDD driven English like test cases to make it easily understandable to the stakeholders.
3. ABot Analytics provides test execution and performance insight
4. ABot PCA and Log analysis along with Mobility and Infra KPIs help in debugging, particularly in the Magma multi-vendor community.

Outcome:

1. Validation of Magma core functionality using ABot 5G Magma test package.
2. ABot is helping to create Continuous Test Assurance framework for Magma release management.
3. ABot is helping to certify the Magma 5G releases for deployment.

Client:
Wavelabs

Industry:
Technology

Technology Service:
Telco OEM & Service Provider

Scope:

Automatic badging for TIP O-RAN Integration in Multi-vendor Cloud-native platform.

Challenge:

1. Integrating multi-vendor RAN components and resolving interworking challenges.
2. Identifying integration issues between network functions and coordinating with the vendors.
3. Manual analysis of test case results and optimizing NF on target hardware.
4. Challenges faced due to disaggregated multi-vendor topology.
5. Prolonged certification process due to back and forth between different vendors.

Solution:

1. Invoking ABot's REST API for seamless integration with TIP CI engine.
2. Integrating ABot with TIP's exiting CI/CD framework to provide Continuous test assurance.
3. Simulating missing NFs to complete the use case topology.
4. Customizing ABot Analytics to process test results generated by TM500.
5. Using ABot Analytics to analyse test results, generate artifacts, and produce reports automatically.

Outcome:

1. ABot helped to create a continuous test assurance platform with TIP's CI/CD for automatic validation and badging.
2. ABot helped to test and certify ORAN & RAN components of Multi-vendor platform.

TELECOM INFRA PROJECT

Client:
TIP

Industry:
Technology

Technology Service:
Open Source Initiatives

Rebaca

Scope:

Validation of the 5G Lab environment and orientating the 5G test team of the L&T Technology Services using free5GC.

Challenge:

1. Free5GC is not thoroughly compliant with the 3GPP specifications, that makes it difficult to validate.

2. Free5GC being an opensource, the 'git repo' and helm charts are not updated.

3. Deploying k8s version of free5GC requires in-depth systems knowledge, and deployment expertise on container environment.

4. Developing 5G end-to-end test cases require deep understanding of the NFs and 3GPP specifications.

Solution:

1. ABot simulated the missing NFs to complete the network topology in a k8s based environment.

2. ABot team helped to update the yamls for a seamless deployment.

3. ABot's plug and play test cases helped to trigger 5G use cases to validate free5GC with customized test case support.

4. ABot SmartEditor guided the LTTS team to author customized test case with minimal domain knowledge and no automation scripting background.

5. ABot's analytics helped to analyse test execution results and provided insight using various KPIs.

6. REST API support was used to seamlessly integrate with CI engine for complete test automation.

Outcome:

ABot is helping to test/certify LTTS 5G Lab and train the LTTS test team prior to real customer engagements.

Client:
LTTS

Industry:
Technology

Technology Service:
Service provider and System Integration

Scope:

Network Slicing use case validation and video KPI analysis with different resolution video traffic for a multi-vendor platform, in association with Linux Foundation Networking.

Challenge:

1. Integrating Kaloom UPF and Altran 5G Core in a disaggregated architecture.

2. Developing 'network slicing' use case to demonstrate multiple PDU session having different SST/QFI.

3. Simulating different resolution video traffic and analyzing the video KPI statistics to validate the slicing use case.

Solution:

1. ABot simulated the missing 5G NFs and video server & client in a k8s cluster to complete the network topology.

2. ABot's 'network slicing' test cases triggered the real time traffic having diff. QFI/SSTs.

3. ABot's extensive REST API support helped in seamless integration with AMCOMP Orchestrator.

4. Test case flexibility enabled modifications to IEs to match the SUT(s) requirements.

5. ABot's AI driven analytics module helped to analyse the video KPIs for different slices.

Outcome:

1. ABot helped to demonstrate 'Network Slicing' use case in a multi-vendor cloud-native platform with AI driven Video KPI analysis.

2. ABot analytics module helped to generate insightful Video statistics like playback duration, buffering information , network bandwidth during the video execution, video frame drop, latency etc. for a comparative analysis and measurement of each scenario in an interactive dashboard.

Client:
Linux Foundation Networking

Industry:
Technology

Technology Service:
Opensource Forum

Scope:

Measurement and analysis of k8s infrastructure on Intel hardware for different 5G mobility scenarios.

Challenge:

1. Easy and flexible means to create different mobility scenarios.
2. Test tool that works with k8s free5G Core and has readymade test cases.
3. Ability to throttle the network traffic to manage congestion and failure.
4. Validate the execution and analyze results in an automation fashion from a CI engine.

Solution:

1. ABot simulated the gNB and missing 5G NFs to complete the network topology.
2. ABot's readymade test cases helped to trigger 5G use cases to execute different scenarios on free5GC.
3. ABot SmartEditor enabled authoring of new mobility scenarios.
4. ABot analytics helped to co-relate infra KPIs with mobility scenarios executed on free 5GC.
5. Complete test automation was possible using extensive REST support of ABot features.

Outcome:

ABot enabled execution of various 5G scenarios on free5GC and collected Infra KPIs for Intel hardware performance validation.

Client:
Intel

Industry:
Technology

Technology Service:
Telco OEM

Rebaca

Scope:

Demonstrated the capability of cloud-native Robin.io CNP integrated platform by executing video traffic on the user plane and collecting video KPIs.

Challenge:

1. Requirement to generate Video traffic of various resolution to exercise Robin.io CNP.
2. Triggering the 'network slicing use case' with live video KPI analysis.
3. Mechanism to capture live KPIs and successfully executing various use cases on Robin.io CNP.

Solution:

1. ABot simulated 5G NFs in a K8s cluster based environment.
2. ABot simulated video server and client in a cloud-native environment and triggered different resolution (low/high) video traffic with different set of QFI and SSTs.
3. ABot's plug and play test cases helped to simulate the network slicing use case over Robin.io CNP.
4. ABot's AI driven analytics module helped to analyse the video KPIs with traffic classification.
5. ABot analytics helped to monitor the over all network health by displaying the system level KPIs.

Outcome:

1. ABot helped to validate Robin.io CNP integrated cloud native platform using different resolution video traffic.
2. ABot analytics module helped to generate insightful Video KPI statistics like playback duration, buffering information, network bandwidth during the video execution, video frame drop, latency, etc. for a comparative analysis of Robin.io CNP.

Client:
Robin.io

Industry:
Technology

Technology Service:
Telco OEM