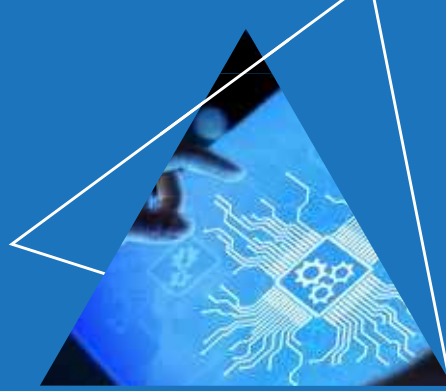


HCL's End to End Automation Solution

Our 5G Network CI/CD/CT Framework from onboarding to Assurance



INDUSTRY OUTLOOK

With the advent of 5G, operators across the globe are transforming their internal network engineering functions responsible for integration, verification and deployment. Transformation was necessitated by the need for operators to optimize deployment cycles, reduce complexities in integration and increase agility to roll out new features.

Continuous integration (CI), continuous delivery (CD) and continuous Testing (CT) are becoming essential practices in Network life cycle. CI, CD and CT work together to ensure successful development operations and testing. Automating build, integration, and testing processes can help you optimize your development pipeline to weed out bugs early on and fix them as quickly as possible at a lower cost to your business.

BUSINESS CHALLENGES



Lack of Agility: With increased softwarization in 5G, operators are expected to roll out new features, and services at webscale rates. There will be significant churn and iterations of software releases. Existing processes and tools are not equipped to address this unique challenge introduced in 5G world.



Lack of E2E Test Automation: One of the key challenges in 5G networks today is lack of holistic test automation solution that can be used for multi-vendor, multi-technology domains. Today's automation solutions are fragmented. There is a need to integrate all the existing automation solutions to create an E2E automation solution.



Network Upgrade: Today's network elements are upgraded during maintenance window by offloading the traffic. In majority of cases, these upgrade go through multiple iterations causing disruption to services. In 5G networks, upgrades can be made more efficient by implementing In-Service Software Upgrade (ISSU).



Support for Hybrid Environment: Evolution of 5G networks introduced to multiple platform variants. 5G Functions are expected to be hosted in multiple platforms: bare metal environment, virtual environment, containers in VM environment, containers in bare metal and public cloud. This diversity in the platform environment introduces complexity in the CI/CD Tool and processes. All the CI/CD tools and processes need to be able to support hybrid environment.



Intelligent Operations: With 5G evolution, there will be significant rise in the number of data sources such as container environment, virtual environment, bare metal environment. There is a need to enhance existing Service Assurance solutions to support correlation of issues between 5G Core and 5G RAN. There is also need to introduce intelligent monitoring and telemetry analysis features to improve quality.

DISRUPT YOUR MARKET WITH ACCELERATED PRODUCT RELEASES DRIVEN BY HCL'S END TO END AUTOMATION SOLUTION

1. E2E Automation Framework

- a. Integration of all the existing tools, frameworks and processes to create an E2E framework
- b. E2E CI/CD Pipeline
- c. HCL's Blugenie for enhancing customers' End to End automation platform

2. Continuous Testing through E2E Test Automation

- a. AI/ML based test automation solution
- b. Test script generation
- c. E2E traceability

3. Service Mesh Implementation

- a. Implementation of service mesh architecture
- b. Based on open source Istio or commercial solutions (ex; Aspen Mesh)

4. Continuous Deployment

- a. Optimize deployment through In-Service Software Upgrade (ISSU) or Canary deployment

5. Service Assurance

- a. 5G core network monitoring
- b. Virtual Probes implementation for Telemetry
- c. Close loop automation

EXPERIENCES ENGINEERED FOR OUR CUSTOMERS

01

Reduced Time to Market by 30% by implementing TaaS for US based Tier- 1 Telecom Service Provider

End to End Test & Automation Solution of Network functions & NRT with full ownership of Lab consolidation, migration and management, thereby benefitting the customer with 800+ network test case automation, OpEx reduction by 40% and reduced Time to Market by 30%.

02

30% Opex reduction in Network Test & Automation for US based Tier – 1 Telecom Service Provider

Test Automation Framework for End to End Testing of RAN, NGN Core, IP, Transport Data & Real Time Services by leveraging Customer's existing Investments thereby resulting in the reduced OPEX by more than 30%, productivity gain of more than 3X and increased test capacity by approx. 300%.

About HCL

HCL Technologies is a \$9.9 billion, next-generation global technology company that helps enterprises reimagine their businesses for the digital age. Our technology products, services, and engineering are built on four decades of innovation, with a world-renowned management philosophy, a strong culture of invention and risk-taking, and a relentless focus on customer relationships.

We offer an integrated portfolio of products, solutions, services, and IP through our Mode 1-2-3 strategy, built around Digital, IoT, Cloud, Automation, Cybersecurity, Analytics, Infrastructure Management and Engineering Services, amongst others. With a worldwide network of R&D, innovation labs and delivery centers, and 150,000+ 'Ideapreneurs' working in 49 countries, HCL serves leading enterprises across key industries, including 250 of the Fortune 500 and 650 of the Global 2000.

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