HCL Augmented Network Automation Platform Delivers Scalable, Intelligent Cellular Network Deployment

AWS (Amazon Web Services)
AWS Partner Network (APN) Blog
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The HCL Augmented Network Automation (ANA) Platform takes self-organizing networks (SON) to the next generation. It features a closed-loop network automation environment that supports multi-vendor, multi-technology cellular network deployments.

The HCL ANA Platform on Amazon Web Services (AWS) automates wireless network configuration with hands-free corrections of network anomalies, thereby driving faster time to market of new wireless services and 4G/5G cell networks.

As Telecom Service Providers (TSPs) transition networks to 5G, new challenges have appeared such as increased network complexity and stricter service level agreements (SLAs). These challenges create a need for a platform that manages the added complexity and connects to all network domains.

Additionally, service providers must process vast amounts of data in real-time to detect and correct issues from subscribers, multiple services, and multiple domains of network slices.

Built upon the foundations of Cisco SON, the HCL ANA Platform addresses these challenges by collecting and processing the data, as well as performing proactive multi-domain action using machine learning (ML) analytics capabilities.

HCL ANA enables TSPs to simplify network management complexity and improve end-customer satisfaction. Artificial intelligence-based automation and operation is also becoming a crucial component for all tiers of cellular networks.

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In order to support the O-RAN multi-vendor model, and meet the speed and slicing that 5G technology introduces, HCL ANA Platform on AWS creates a scalable and intelligent solution that can be quickly deployed and overlayed with all of the required automation for mobile network operators (MNOs) and private cellular networks.

HCL Technologies is an AWS Premier Tier Consulting Partner and Managed Cloud Services Provider (MSP). HCL is also a member of the AWS Public Sector and Well-Architected Partner Programs.

Solution Overview

The HCL Augmented Network Automation (ANA) Platform is based on a closed-loop network automation model that continuously monitors and assesses real network conditions, traffic demands, and resource availability to determine the best placement of traffic for optimal service quality and resource utilization.

The platform takes a Snapshot of the radio access network (RAN), identifies the cell-site(s) that are sub-optimal, and classifies them based on the action required (tilt, power, PCI, and others, for example).

The corrective actions are delivered through the cell vendor's operational support system (OSS) and tracked via the feedback loop for constant monitoring and advanced actions.

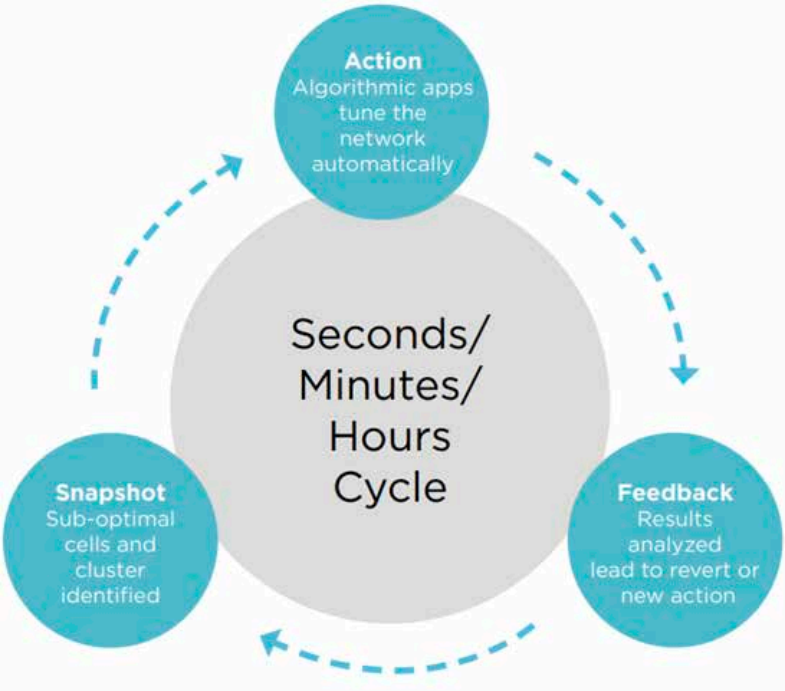

Figure 1 – Fully automatic closed-loop operation of HCL ANA.

HCL ANA addresses multiple operational challenges like detecting outages, failures, and breaches of all kinds through its self-healing feature.

The platform's dynamic self-healing (DSH) algorithm identifies such outages and uses artificial intelligence (AI) based on the network snapshot. As shown in Figure 1, this algorithm selects the appropriate nearby cell(s) to compensate for the lack of coverage in the affected area by performing antenna(s) up-tilt (Action).

In the Feedback stage, the DSH algorithm continues to monitor the network KPIs and perform either rollback in case the outage is over or follow-up action if further uptilt is required to ensure service continuity.

HCL ANA offers a range of modules that can be customized to suit the customer's requirements. These modules are self-learning, leveraging machine learning capabilities to predict and mitigate such outages. The result is improved efficiency of applications and optimized network resources while delivering a robust subscriber quality of experience (QoE).

Solution Architecture

The illustration in Figure 2 shows the cloud deployment of HCL ANA to any on-premises cell vendor. There is a secure virtual private network (VPN) or AWS Direct Connect connection between both deployments for collecting the metadata like performance, configuration, and logs for generating insights and automatically optimizing the network.

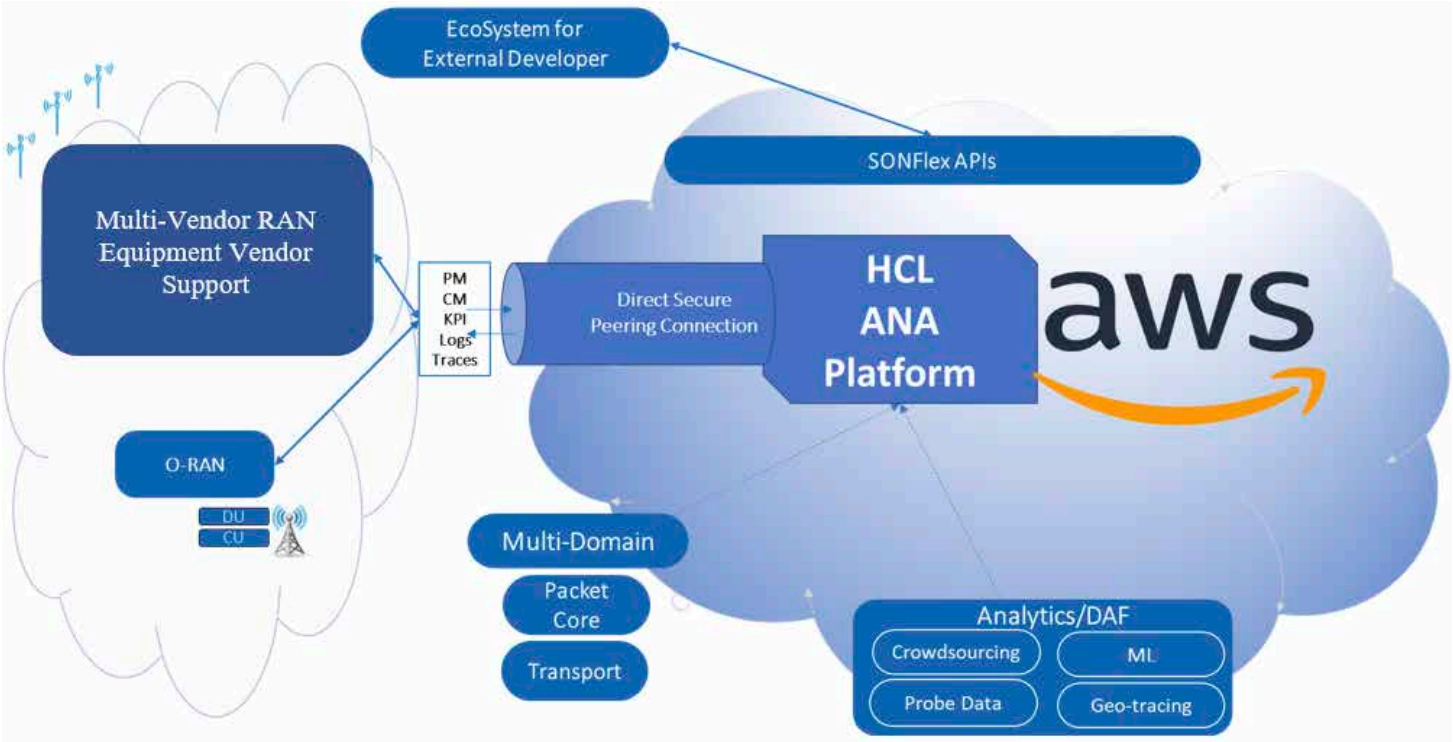

Figure 2 – HCL ANA for 4G/5G on AWS.

HCL ANA deployment on AWS is done on different AWS Availability Zones (AZs), which are different physical locations which make the deployment resilient.

AWS auto scaling groups for the web and application tier help distribute the load across horizontally-scaled Amazon Elastic Compute Cloud (Amazon EC2) instances to cater to unpredictable user traffic.

Encryption of data at rest and in transit is maintained by advanced ciphers using AWS Key Management Service (AWS KMS), while AWS WAF is used with an Application Load Balancer to ensure OWASP (open web application security project) security.

Use of Amazon GuardDuty enhances the security portfolio by performing threat analysis on user activity, domain name service (DNS), and virtual private cloud (VPC) flow traffic.

User authentication and protection is managed by AWS Single Sign-On (AWS SSO), and vulnerability assessment is handled using AWS Inspector on the framework of Center for Internet Security (CIS) and other compliance mechanisms.

As a B2B application, all HCL ANA users gain access via on-premise connectivity or AWS client VPN (point to site VPN). The platform can be integrated with advanced third-party security solutions like next-generation firewalls, privileged access management, and security information and event management (SIEM).

Database redundancy across physical locations is provisioned utilizing MongoDB replica sets. Below is the detailed architecture of HCL ANA on AWS.

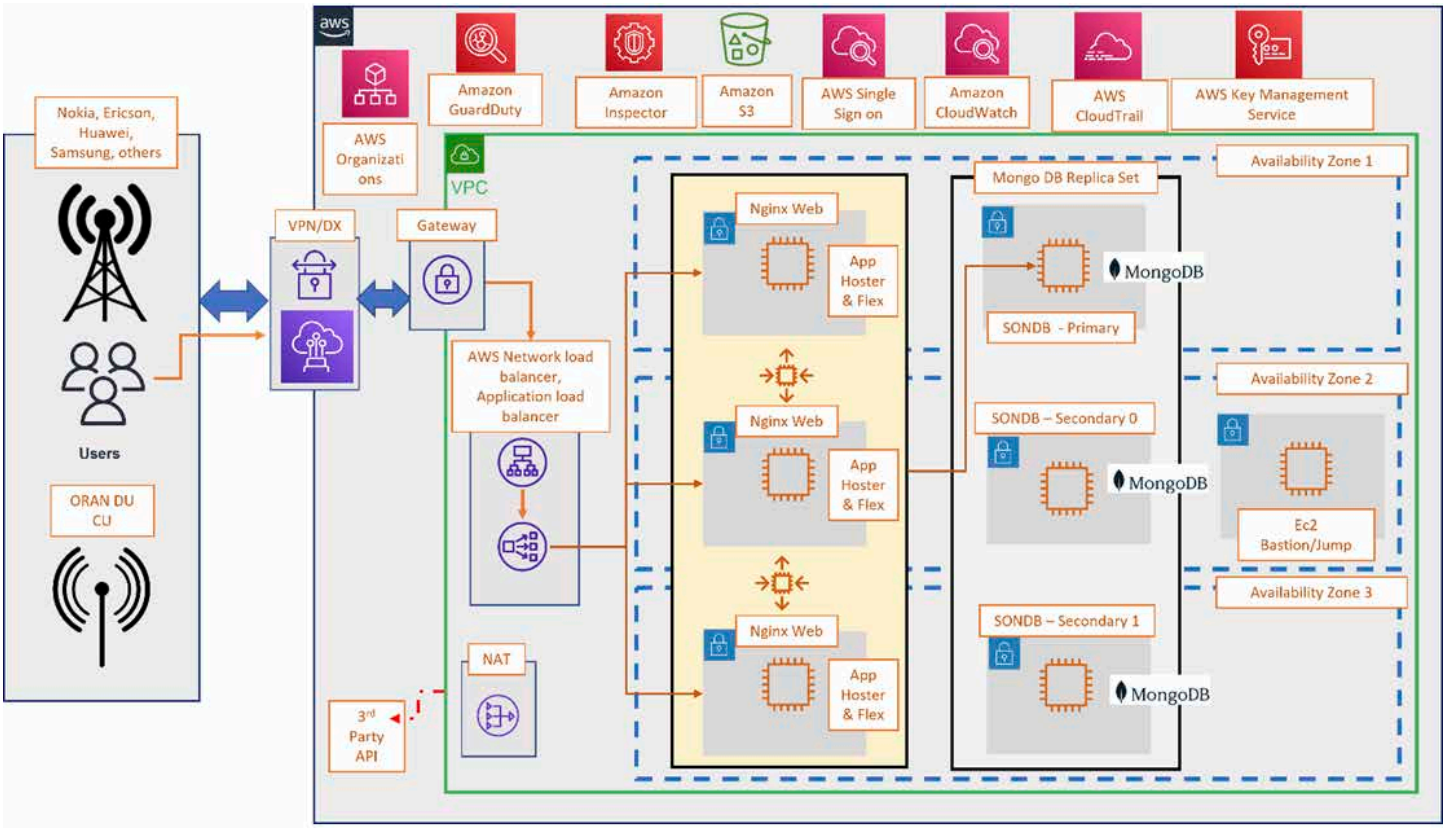

Figure 3 – Solution architecture of HCL ANA on AWS.

HCL ANA Customer Deployments Use Cases

Leveraging AWS Cloud and open-source technologies, HCL ANA Platform automates and optimizes multi-vendor multi-technology networks.

The platform leverages the established framework of the HCL SON to offer further flexibility and scalability through an open architecture including HCL SONFlex API for RAN developers, and ORAN integration. Multi-vendor support affords choice and reduces operational risk for MNOs and enterprises.

AWS supports HCL ANA cloud deployment for multiple modules. The diagram below illustrates different use cases and unique features of HCL ANA cloud deployment on AWS.

HCL is also a member of the “OnGo alliance,” which is also known as CBRS Alliance, and meets the highest standards of interoperability and security.

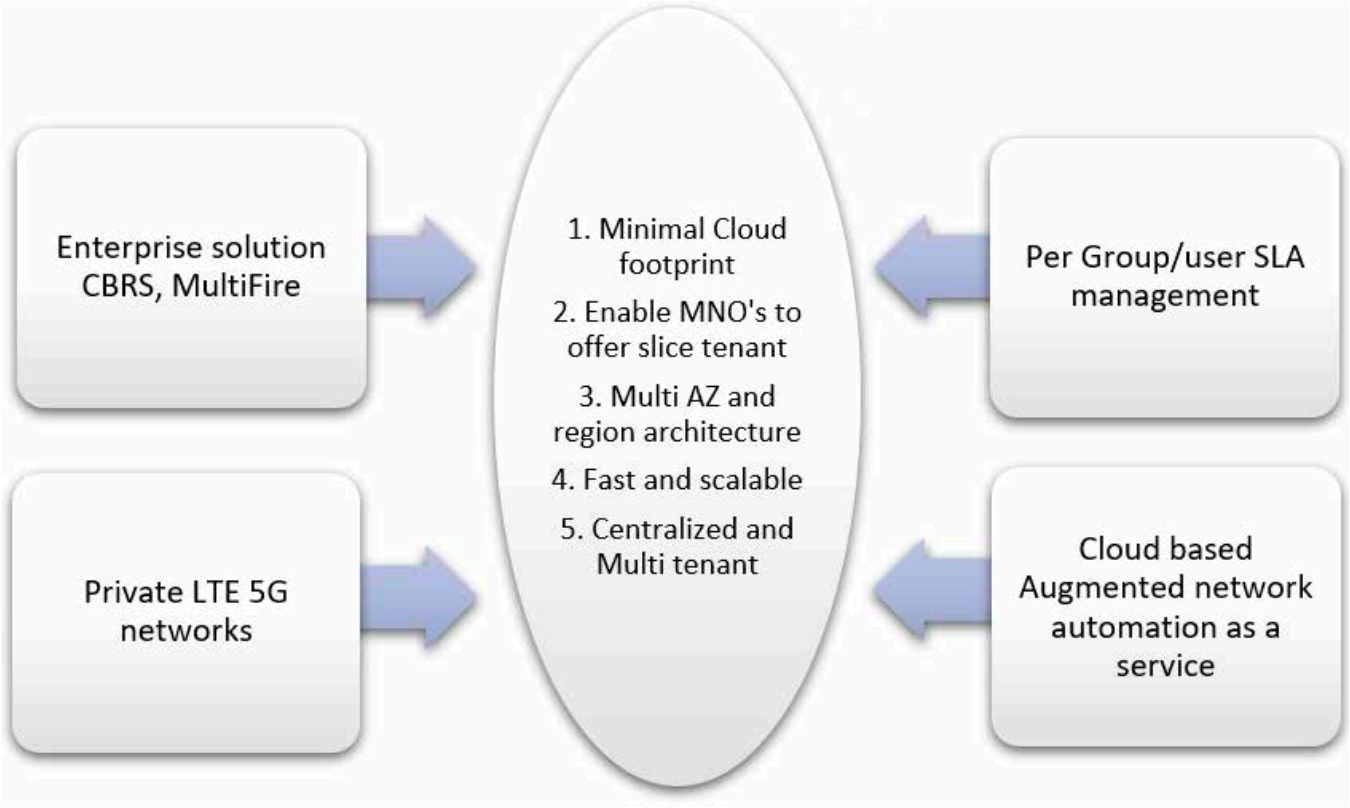

Figure 4 – Use cases of HCL ANA Platform on AWS.

Conclusion

The HCL Augmented Network Automation (ANA) Platform on AWS ensures agility, commercial viability, and scalability for customers.

Both HCL Technologies and AWS are committed to making complex technology deployment easy, supporting distributed deployments, and managing capacity as needed.

HCL is committed to enable O-RAN and 5G deployments to meet the present and future needs of telecommunication customers and private LTE and 5G networks.

In summary, HCL ANA on AWS Platform benefits include:

Optimizes cellular network performance: Automatically predicts, configures, and optimizes cellular networks leveraging self-healing and reinforced learning techniques.
Scalable and flexible: Easily scale networks with a cloud-based platform that enables flexible deployments (on-premises, hybrid, and public cloud).

Supports multi-vendor environment: Multi-vendor support enables service providers to leverage one automation platform to manage existing and new cellular vendors, thereby improving network efficiency and significantly reducing costs.

Open platform for innovation: The open platform supports ORAN and enables service providers and partners to develop and quickly deploy custom applications to the cellular network.
For the latest telecom and 5G information, visit HCL's Industry Software Division.

Find out more about
HCL Augmented Network Automation (ANA) Platform

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