Case Study

Revolutionizing 5G rollout: How Amdocs Mobile Network solutions drove a North American Tier-1 operator's end-to-end acceptance automation

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About the customer

A tier-1 North American operator, providing more than 110 million US consumers with communications experiences across mobile and broadband. As the first service provider in the US to deploy 5G, the company currently operates the largest 5G network deployed in the US. Today, the operator offers reliable 5G service across all 50 states and on more US interstate highways than any other service provider, as well as affordable high-speed home internet powered by an expansive 5G network.

Challenges

As an early adopter of 5G, this operator had rolled out over 75,000 sites within only a few months. Achieving seamless integration and collaboration across all vendors, along with quality assurance, posed as a significant challenge in implementing a project of this magnitude. This demanded a fast-paced adaptation of the existing infrastructure, with the ability to support constant updates to device, chipset and data collection software, while exploring different settings and metrics in the network.

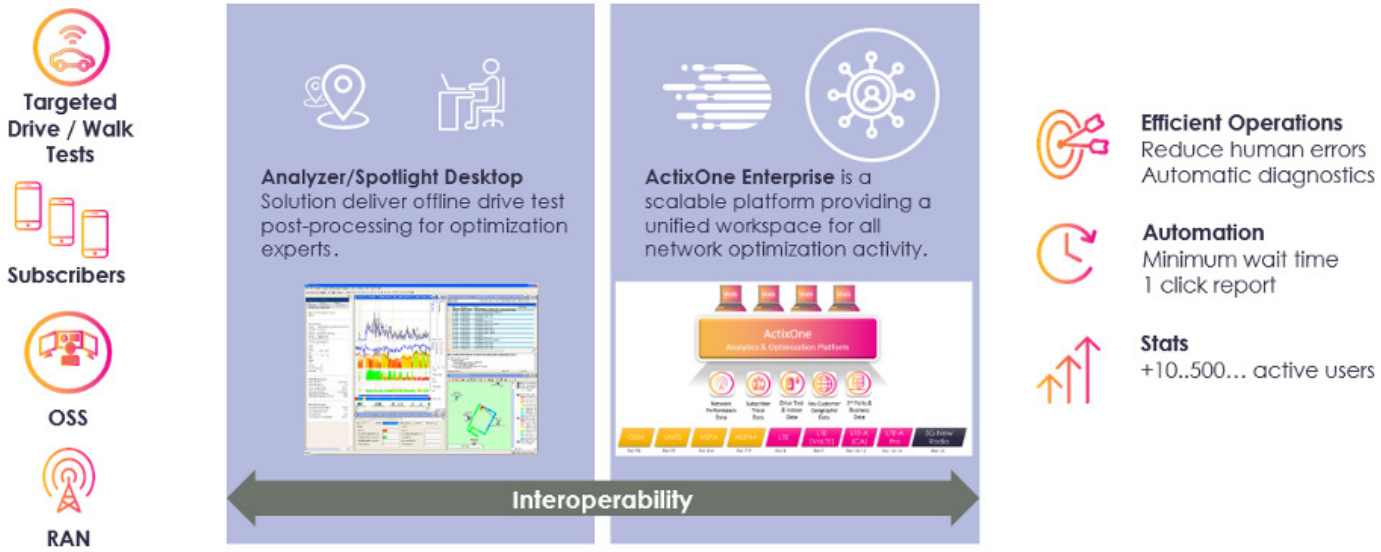
The challenge was further amplified by the operator's multi-vendor, multi-technology environment, which required a solution that could support planning, building, deployment, management and optimization of all networks (from GSM to 5G-NR) effectively and efficiently, while also delivering service quality. Furthermore, many of the operator's partners were evolving their technology in real time, which required the operator to seek a vendor who could collaborate closely with all stakeholders to support multiple software updates for seamless 5G deployment.

Choosing the right partner

With a view to expanding their delivery of 5G sites nationwide with high quality assurance, the operator selected Amdocs for its powerful, widely deployed multi-vendor, multi-technology optimization platform. Utilizing this system would enable planning, building, launch, management and optimization of all networks from GSM to 5G NR more effectively and efficiently – while delivering service quality.

Enabling fast-paced deployment

Amdocs' Drive Test Analytics Suite by Actix and Amdocs Network Optimization Suite by Actix form part of Amdocs' network deployment and optimization products, which were designed for the rapid deployment and optimization of 5G, 4G/LTE and hybrid networks. The solutions provide analytics, insights and optimization capabilities for operators moving to the open, programmable and intelligent RAN. Amdocs Network Optimization Suite currently processes terabytes of data daily across over 90 deployments globally.



Analyzer, part of Amdocs Drive Test Analytics Suite by Actix, provided the operator with a unique combination of insights into RF performance, 3GPP signaling and application-layer user experience. In addition, its powerful configuration layer enabled their lab teams to perform before/after lab tests to determine the optimal network configuration settings ahead of deployment to initial rollout clusters.

Once the first sites were deployed in the initial rollout areas, Analyzer provided the operator with a detailed, vendor-independent view of the relative performance of their selected network equipment vendors, including performance KPIs, and enabling fast turnaround of updates and adjusted configuration settings. This was particularly important due to the fast-paced nature of the rollout environment, which included many moving parts, including:

- Multiple network equipment vendors
- Multiple network node software updates
- Regular software updates from both chosen drive test vendors
- Many iterations of chipset firmware from the silicon vendors used on the devices, which were planned to be part of the launch offering

This ability enabled the operator to troubleshoot and diagnose many early equipment problems, ranging from unplanned beam coverage from multi-panel antenna arrays to comparing before/after reports during transmit power level tests to maximize coverage and quality KPIs.

The lessons learned during lab trials and initial site deployments were then quickly applied within the solution's powerful configuration layer to create complex queries and KPIs, and subsequently ported into loading pipelines of Amdocs Network Optimization Suite by Actix (former ActixOne). This was of particular benefit to the operator, as it enabled their initial processes and KPIs to be scaled to the full network rollout at a fast pace, whilst ensuring that a consistent approach could be maintained across both lab and field teams.

As the field team progressed towards nationwide rollout targets, the lab teams continued to utilize Analyzer's detailed view on call flow to ensure the deployment of voice services (native VoNR, and VoNR using EPS-Fallback) was complete by the target launch date.

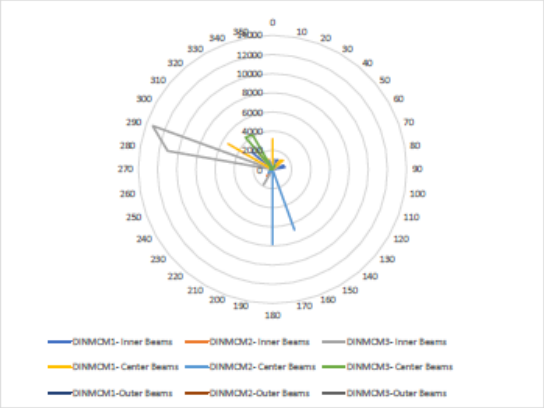
Leveraging insights from the combined NR and IMS signaling to make refinements to network timer thresholds, the operator continually increased its in-house expertise, and with the help of Amdocs Network Optimization Suite by Actix, harnessed the knowledge to scale the early voice trials to a full rollout with an additional VoNR KPI acceptance report.

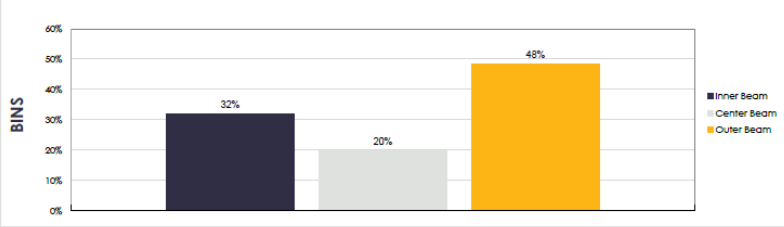
By verifying network performance, identifying issues and driving exceptional user experiences, Amdocs Network Optimization Suite was instrumental to the operator's ability to achieve their rollout goals. Furthermore, by utilizing drive, indoor, configuration management tools, the company was able to perform analyses across the entire country. This included providing support for loading, processing and analyzing large data volumes (2TB monthly), using centralized and distributed deployment models.

mmWave Assessment and beamforming

Leveraging Amdocs solutions, the operator parsed drive test data containing mmWave measurements to gain a detailed understanding of coverage behavior and how the network would perform under certain RF conditions.

By analyzing metrics generated by Amdocs solutions, and using a combination of scanning receivers and UEs, the operator was also able to understand antenna beamforming and validate whether antenna beams were working as planned, which was critical to the network rollout. Metrics used included bin distribution per beam index and beam index usage to validate that all expected beams were detected.





Development and consultancy services to define metrics, KPIs, reports

The operator also leveraged best-in-class consultancy services from Amdocs experts to define details such as triggers, messaging content extraction and KPI definition across all the phases of the deployment, which included site and cluster acceptance of the 5G NSA, 5G SA, Voice over New Radio (NR) and carrier aggregation. These definitions were propagated into Amdocs' solutions via the rich configuration layer and leveraged by the operator from initial tests in the lab, all the way to final site deployment and acceptance. This was only possible due to Amdocs' expertise in supporting a multi-vendor, multi-technology environment, as well as seamlessly adapting to fast-paced changes.

End-to-end automation

The operator was able to overcome the significant challenges of deploying a nationwide network with the help of Amdocs' ability to define and automate the entire end-to-end process. This included enabling field test engineers to send files collected in the field as soon as an activity was finished and having a report available as soon as data was processed by Amdocs Network Optimization Suite, with email notifications sent at each stage of the process. For example, during a site acceptance scenario, within hours of finishing the drive, engineers would have a report confirming whether the site met the required KPIs. The same applied to cluster drives, which represented a large set of the sites deployed to provide 5G coverage within a predefined region.

Results

Amdocs enabled the operator to perform end-to-end analytics and generate automated site/cluster acceptance reports throughout the multiple phases of their 5G deployments on low-band (600MHz spectrum), mid-band and high-band (mmWave). Leveraging Amdocs' experience and solutions, this included measuring, validating, optimizing and accepting thousands of 5G sites during its nationwide rollout and go live, leading it to becoming North America's largest, fastest and most awarded 5G network.

Amdocs helps those who build the future to make it amazing. With our market-leading portfolio of software products and services, we unlock our customers' innovative potential, empowering them to provide next-generation communication and media experiences for both the individual end user and large enterprise customers. Our 31,000 employees around the globe are here to accelerate service providers' migration to the cloud, enable them to differentiate in the 5G era, and digitalize and automate their operations.

Listed on the NASDAQ Global Select Market, Amdocs had revenue of $4.58 billion in fiscal 2022.

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