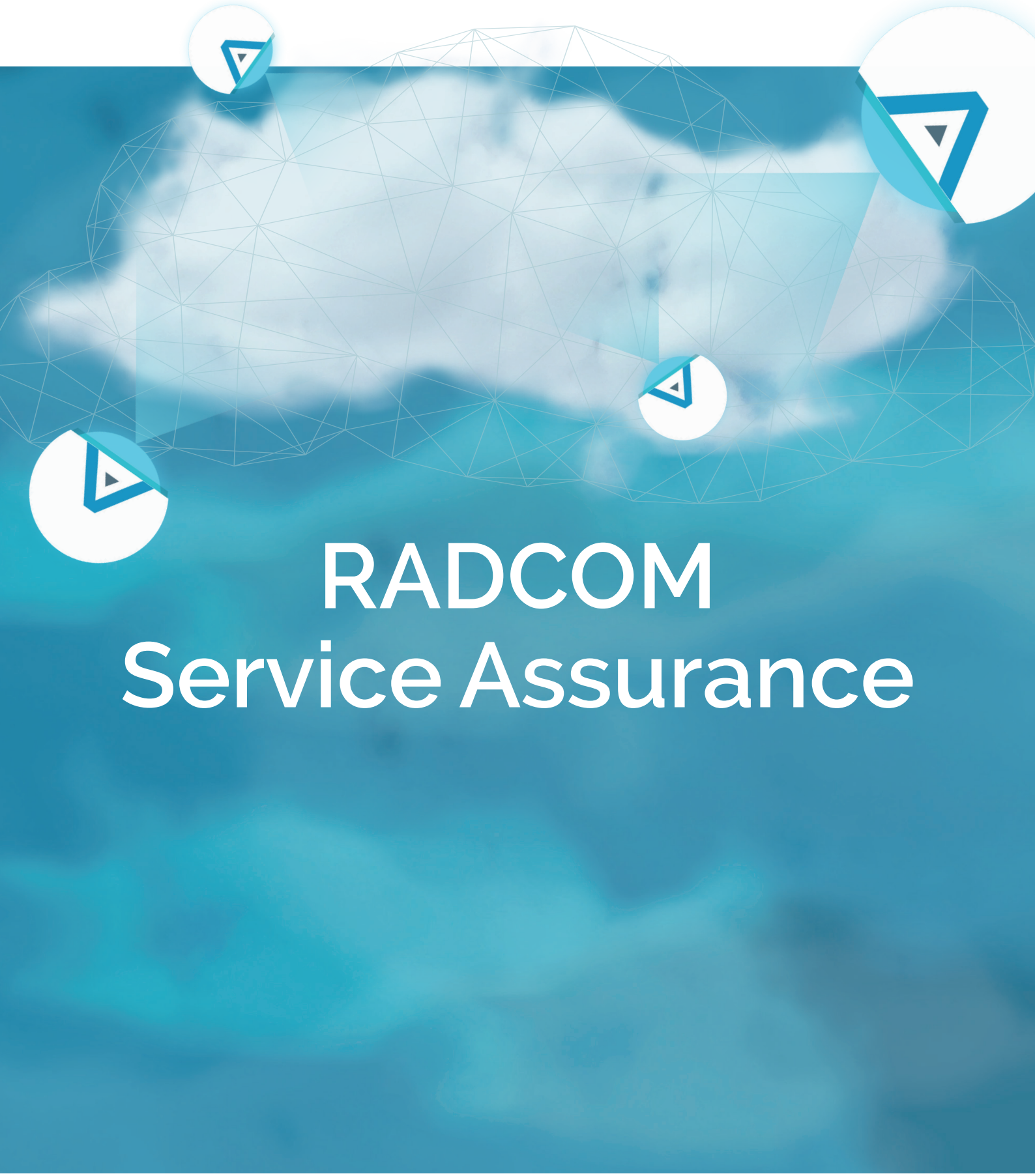
RADCOMize
your NETWORK



RADCOM Service Assurance

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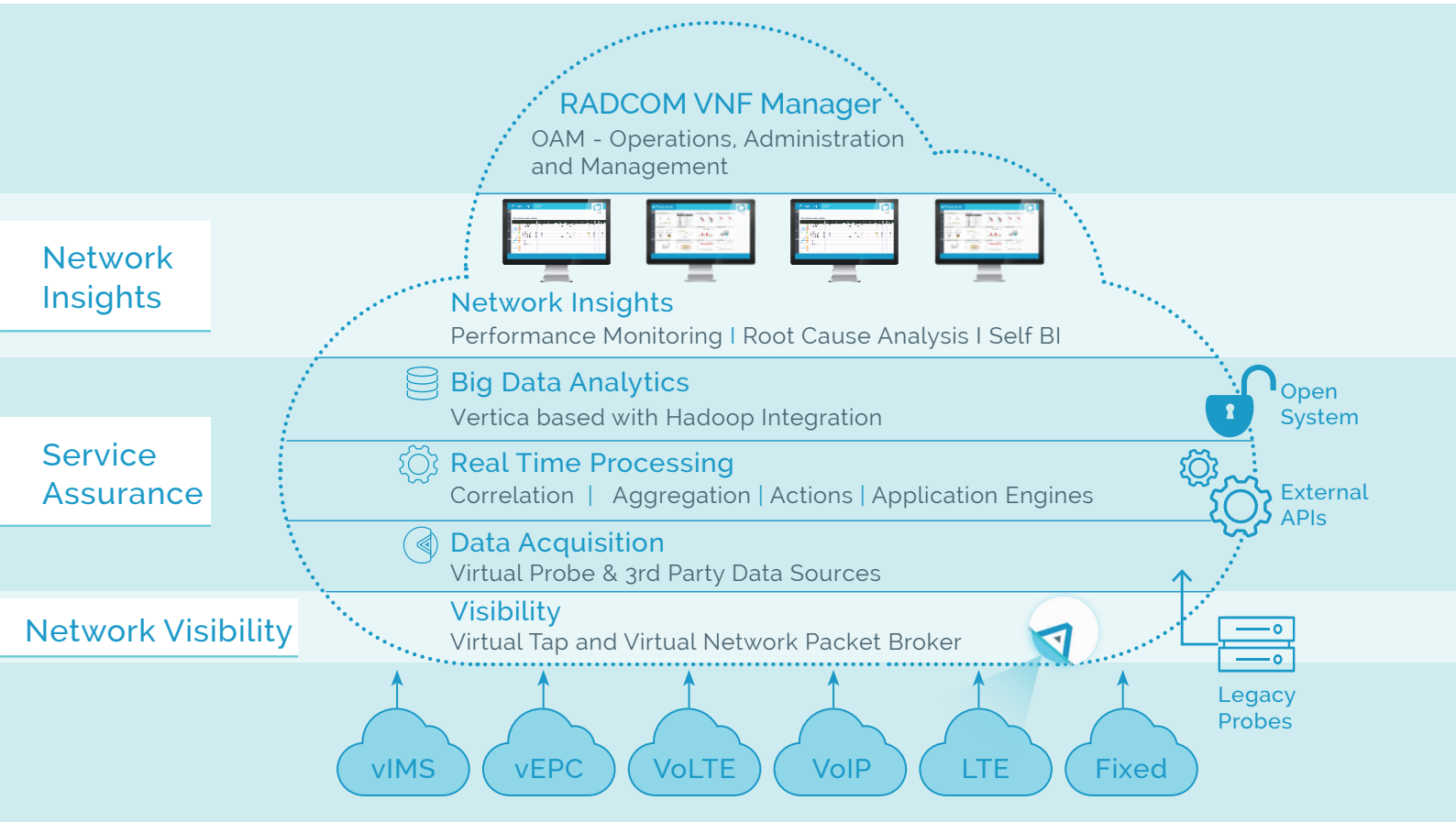
RADCOM's Probe-based Service Assurance

RADCOM Service Assurance enables operators to gain full network visibility with a clear and unified view of their customers' experience across multiple services including LTE, Advanced-LTE, 5G, IMS, Fixed Wireless, SDN/NFV and other network domains on a single unified platform. RADCOM Service Assurance takes the raw network data and converts it into rich, actionable intelligence that enables high end-to-end service quality, enhances network operations and delivers a superior customer experience. The solution provides tailor-made insights to multiple departments across the operator's organization; management, network operations, customer care and marketing. Full network visibility helps operators drive network and operational efficiency while also reducing churn. With RADCOM Service Assurance operators can attain;

- A 360° view of the customer's quality of experience across all network domains
- Ensure quality of service and quality of experience for voice, data, VoLTE, SMS, fixed mobile and broadband services
- Proactive troubleshooting and predictive analytical insights to reduce churn
- Improve VIP customer experience to protect revenue streams

RADCOM Service Assurance slots into an NFV network as a Virtual Network Function (VNF) with multiple VNF Components (VNFC). Each system component is a virtual machine and built to work seamlessly in the cloud; integrated into standard ETSI-compliant NFV Management and Orchestration (MANO) and monitors both North-South and East-West traffic. Working with OpenStack and VMware, the assurance solution can be deployed and configured at the click of a mouse.



MAXIMize

value from day one

RADCOM Service Assurance disrupts the sizeable costs of legacy assurance, including the OPEX and CAPEX associated with initial setup, network capacity upgrades, technology adoption and maintenance payments. RADCOM's solution is software-based and enables advanced features such as on-demand deployments, auto-healing, and elastic scalability. Operators can stop investing in equipment-based solutions right away and extend the same cloud-native solution architecture into assuring their physical network as well. Transitioning to RADCOM's solutions means significant savings from day one and lays down the foundations for an automated, and highly scalable solution that is 5G-ready, today. FUTURize your NETWORK.

> "By deploying RADCOM's risk-free solution, we saved $8M in CAPEX expenditure while ensuring a great customer experience and becoming the top provider in the country."
>
> Leading top-tier operator

By decoupling solution functionality from hardware dependencies, RADCOM Service Assurance provides operators with a risk-free pricing model that also reduces CAPEX and OPEX over the lifetime of the project. No longer will assurance costs grow year-over-year due to network capacity. RADCOM Service Assurance provides operators with predictable, consistent pricing which allows the operator to gain cost-efficient and economically sound network insights across the whole network, and to be able to scale the solution as the network grows. A cloud-native pricing model for a pure cloud-native solution.

If operators already have an OpenStack cloud environment, RADCOM Service Assurance can be integrated into the existing infrastructure. For operators who don't, RADCOM has partnered with Red Hat to provide a turnkey cloud environment that lets operators rapidly achieve network visibility for their NFV transformation. RADCOM Service Assurance runs as a virtual network function on top of Red Hat's Enterprise Linux OpenStack® platform delivering the power and cost-efficiency of a cloud-native solution without the hassle of first having to create the cloud environment.

Once established in an operator's network service assurance as a VNF is a game-changer. It provides operators next-generation assurance that blends seamlessly into the NFV environment and is ready for the challenges of an agile, on-demand network and lays down the foundation for an automated, closed-loop environment in which data captured and analyzed by the assurance solution is continuously used by the network to optimize itself.

Virtualized, automated, dynamic probing

Cloud-native probe-based assurance is the only choice for operators to achieve full network visibility across the hybrid network and ensure customers continually receive high service quality. RADCOM's virtual probes (vProbes) provide operators with an end-to-end view across different network tiers (edge, core, IP, etc.), cross-domains (physical and virtual) and are essential for assuring the customer experience in today's highly competitive market.

vProbes act as the eyes of the network. Watching all the traffic that flows through the network and correlating the data into individual customer sessions to understand the service quality experienced in each call and data session (VoLTE call, web browsing, video streaming, etc.). This level of granular detail allows the operator to visualize the end-to-end network services and understand the customer experience from both a network-wide to per-subscriber perspective. With RADCOM's vProbes deployed, operators have an independent auditor in place that will paint a vendor agnostic picture of the end-to-end service quality, which is challenging if relying just on network element counters that depend on the network equipment to monitor itself and the data output varies from vendor to vendor.

RADCOM Service Assurance splits the system into two main elements; the back-end for the heavy lifting (data processing and big data analytics layer) and the front-end (data acquisition layer – the probes) to be dynamic and agile. This design is opposed to legacy assurance that throws a lot of hardware at the probe layer but prevents that probe layer being agile and dynamic. Having a lightweight front-end allows the solution to deliver almost unlimited scalability, which will be required as operators integrate service assurance into their cloud platforms.

Operators no longer need to limit their probe-based assurance deployments because of cost concerns. RADCOM Service Assurance is cost-efficient and dynamic so operators can freely deploy assurance across their end-to-end service. On-demand probing lets operators launch and monitor services on the fly, so when implementing new services or network elements, quality and performance is assured immediately with the click of a mouse.

RADCOM probes can receive and process packets from multiple sources/methods including virtual port mirroring, vTAP, physical port mirroring and directly from VNFs and TAPs over GRE Tunnels. These probes utilize technologies such as DPDK, SR-IOV, and MPP to achieve high software performance and efficiency. Also, RADCOM's backend can receive and process XDR/EDR feeds from 3rd party legacy probes and network elements using real-time processing modules that convert the data to standard formats.

Real-Time Processing

The centralized backend processing layer comprises of real-time software engines that perform aggregation, correlation, and enrichment in real time before XDR insertion to the database, thus offloading the database to achieve superior performance and making KPIs available in real time internally, as well as on northbound interfaces. The processing layer enables advanced statistical computations such as unique subscriber per cell, per roaming partner, per website, Top X analysis, for instance, top performers, top sites, and heavy usage handsets on all multiple KPIs and over numerous dimensions in a matter of seconds.

Big data analytics

RADCOM Service Assurance includes an embedded state-of-the-art HP Vertica column database which provides the ability to perform real-time data crunching for large terabit networks. The Vertica database is a column-based database that stores all information in columns, thus eliminating the need for indexing and allowing for quick queries working only on relevant columns, as opposed to the entire row, in a traditional database.

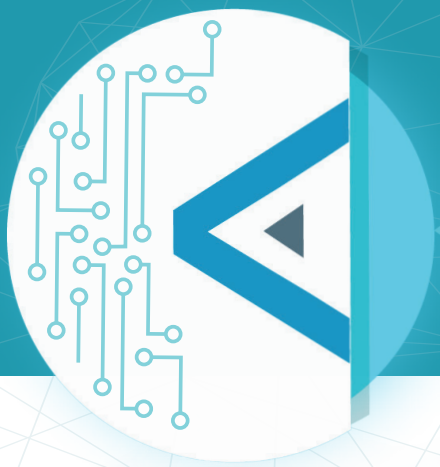
RADCOM leverages Vertica technology to provide:

- Ultra-fast queries using Massively Parallel Processing technologies
- Superior compression reducing CAPEX and allowing more historical data stored in the same storage
- High availability and recovery
- Automatic data replication, failover, and recovery provide for active redundancy, increasing performance. Nodes recover automatically by querying the system
- Column duplication across cluster nodes. If one machine goes down, you still have a copy K+1 redundancy as default. K+2 optional.

Network and Customer Insights

RADCOM's real-time data visualizations and big data capabilities provide operators with customer, service, network and device insights for NOC/SOC, engineering, operations, marketing, customer care, and management. With no need for DBI expertise users can quickly view in real-time, the end-to-end network performance, rapidly troubleshoot issues and assess the real-life customer experience.

Built from the ground up to answer the needs of top-tier operators for on-demand, network and customer insights. RADCOM Service Assurance provides dynamic data visualizations for today's agile networks, allowing multiple departments to interact with real-time data, run ad-hoc analysis, create smart, personalized data visualizations, create on the fly smart alarming with notifications, as well as share and efficiently collaborate with colleagues.



INTELLIGize your NETWORK

RADCOM Service Assurance converts the network data into real-time, actionable insights to maximize revenue streams, assure all the network services, proactively locate and resolve performance issues as well as improve customer retention and network and capital efficiency. With these insights integrated into decisions and processes across the organization, operators gain the ability to act faster and in the right areas; taking proactive steps to improve customer loyalty and drive growth. Split into three different use cases; monitoring, root-cause analysis, and self-BI, RADCOM Service Assurance presents the data visualizations for each use case, so the time from data acquisition to network insight is quick as possible;

Performance Monitoring

End-to-end service monitoring (such as VoLTE, video streaming) is vital in assuring service availability and quality. For network engineering and operational teams, RADCOM Service Assurance provides dynamic dashboards and smart alarming with outstanding performance and real-time updates so that the data displayed reflects the real-life situation so that teams can keep one step ahead of the curve. With the ability to drill down from a service-wide view to perform root-cause analysis both on an individual or group of subscribers when network performance is degrading service quality, RADCOM Service Assurance enables operators to troubleshoot efficiently and continually deliver top-quality services to customers.

Root Cause Analysis

Root-cause analysis (RCA) is a critical component of any operators' toolkit. By quickly determining the root-cause of issues in the network, the operator can resolve issues before they affect customers and allow engineers to focus on the real cause of the problem and not waste resources. With the ability to monitor all traffic at all levels, both call/session-related and non-call/session-related, as well as online or historical data, with all protocols displayed in a single view, engineers can define the root-cause of an issue quickly and efficiently to make sure the network performance is delivering the required end-to-end service quality.

Self-BI

For certain types of analysis and more advanced troubleshooting RADCOM Service Assurance provides a compelling self-BI platform for users to create their data visualizations from scratch. Self-BI capabilities can be used to check how to improve revenue, examine what iPhone users are doing on Facebook or checking why specific VoLTE calls are disconnecting. Self-BI is also used to fine-tune ready-made data visualizations. A user can start with data about why iPhone 6 has reduced data usage. By using RADCOM's easy self-BI, the user can drill down and filter out all the iPhone 6 users whose data usage has gone down and don't use WhatsApp. Or, in troubleshooting dropped calls they can filter by the network element. Often network issues can boil down to device issues.

Features and Benefits

Features	Benefits
Service assurance as a virtual network function (VNF) with multiple VNF components (VNFCs)	Automatic VNF lifecycle management On-demand probing Automated horizontal and vertical scalability Auto-healing
Cloud-native pricing model Single software, single license: fits virtual and hybrid (a mix of physical and virtual) networks	• 50% or higher reduction in costs (CAPEX and OPEX) • Save on hardware costs from day one for deployment, maintenance, and upgrades. • Unlimited, risk-free pricing - assurance pricing is decoupled from network capacity and subscriber growth • Predictable, consistent pricing
Interoperable	• Integration into standard ETSI-compliant NFV MANO. (Including Open Source MANO, AT&T's ECOMP, ONAP, Amdocs' Network Cloud Service Orchestrator, Cloudify, Nokia CloudBand). • Manages resources in unison with the rest of the network • Automatically assure new services
Microservices architecture	• Increased efficiency - real-time performance, using less hardware • Reliability - failure resilience for continuous monitoring • Elastic scalability - dynamic, automated in/out scalability
Monitors virtual and hybrid networks	Assure a seamless customer experience during and throughout the NFV transformation lifecycle
Multiple technology support; LTE, Advanced-LTE, 5G, IMS, SDN/NFV, Fixed Wireless and others	Ensure end-to-end service quality across all network technologies
Support for OpenStack or VMware cloud environments	Assurance integration into an operators' current cloud environment
Constant and agile development with DevOps design and modeling for continuous integration and delivery (CI/CD)	Provides a hardened and mature solution with cutting-edge technology and rapid feature development and solution enhancements

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