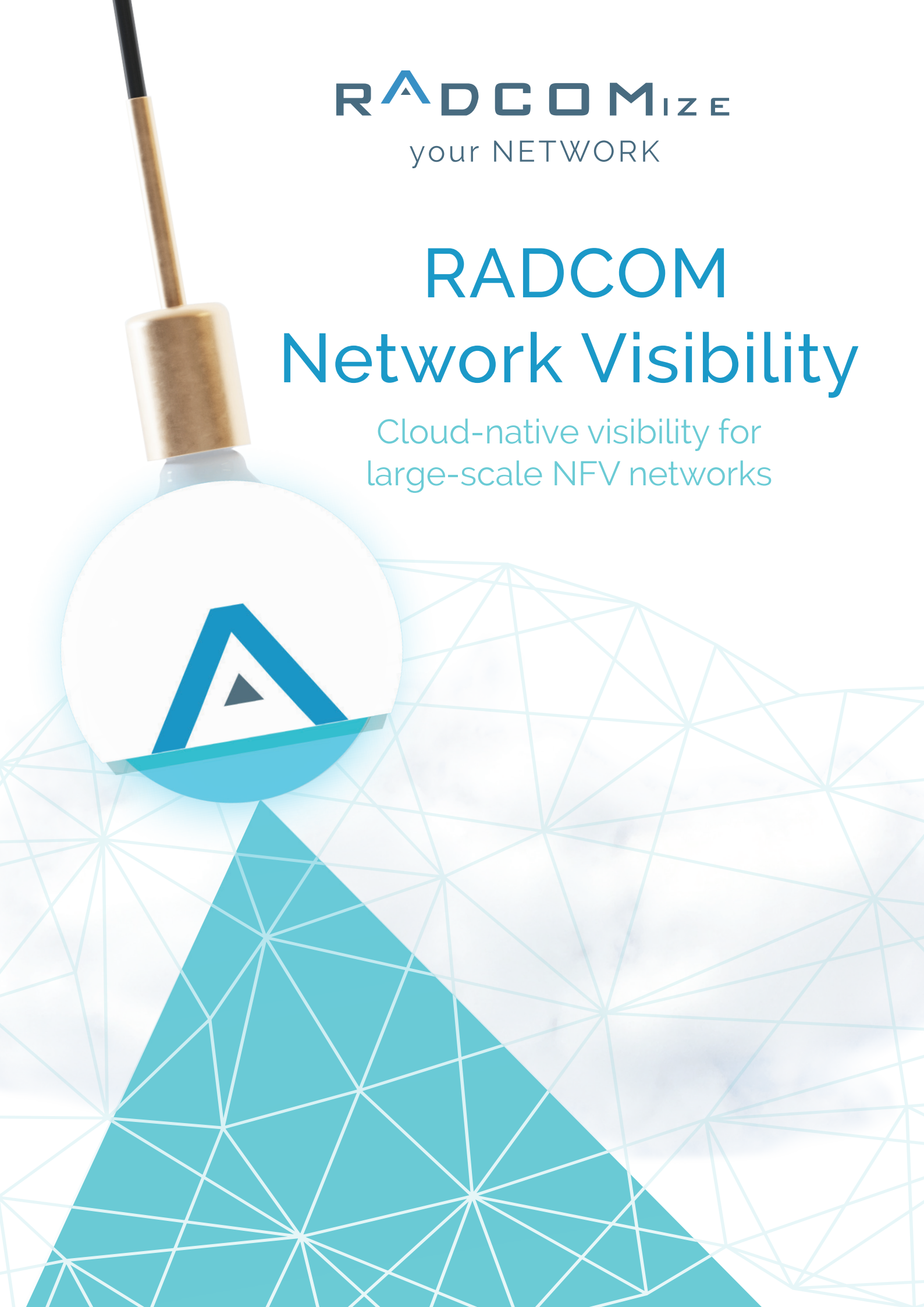
RADCOMize
your NETWORK

RADCOM Network Visibility

Cloud-native visibility for large-scale NFV networks



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Introduction

Network visibility solutions ensure that there are no blind spots in an operator's network while making sure the traffic flows smoothly to service assurance and security tools; preventing bottlenecks, load balancing traffic and filtering out unwanted data. However, the exponential growth in network traffic and the NFV transformation is testing the limits of traditional hardware-based visibility layers that come with a hefty price burden and don't deliver on the need for dynamic, scalable solutions. For operators rolling out their next-generation NFV and 5G networks to gain full network visibility, they will need to look at next-generation solutions. To be cloud-native is the key. Only then will the visibility layer be easy to deploy, agile, and built to handle these new emerging network architectures with elastic scalability, on-demand capabilities, automation and offer cost-efficiency for top-tier NFV deployments.

RADCOM

Network Visibility

Scalable, on-demand, cost-effective and dynamic

RADCOM Network Visibility delivers a disruptive, cloud-native NFV distributed approach to high scale network packet brokering, entirely orchestrated and centrally controlled. Providing operators with a next-generation network visibility solution that leverages high-performance, on-demand capabilities and built-in troubleshooting functionality for full network visibility within the NFV network. Designed from the ground up for scalability, flexibility, and agility, RADCOM Network Visibility provides an intelligent and cost-effective solution that scales for operators migrating to high-capacity networks such NFV and 5G. Users manage and visualize the distribution of RADCOM's solution from a single-pane-of-glass for rapid, on-demand deployments, ease of control and simplistic traffic flow optimization.

Visibility

Virtual Packet Broker

Session Awareness

TCP/UDP Flow Aware
Mobile Session Aware
Application Session Aware

Filters and Actions

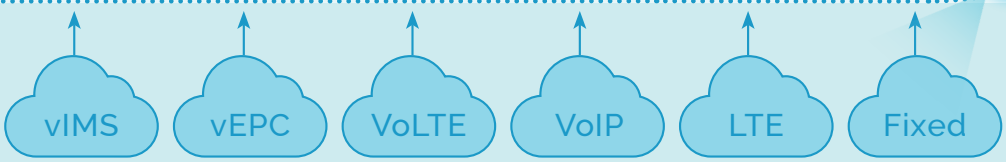
Smart Load Balancing
Intelligent Filtering
Packet Manipulation

Traffic Sampling

Sampling (sFlow)

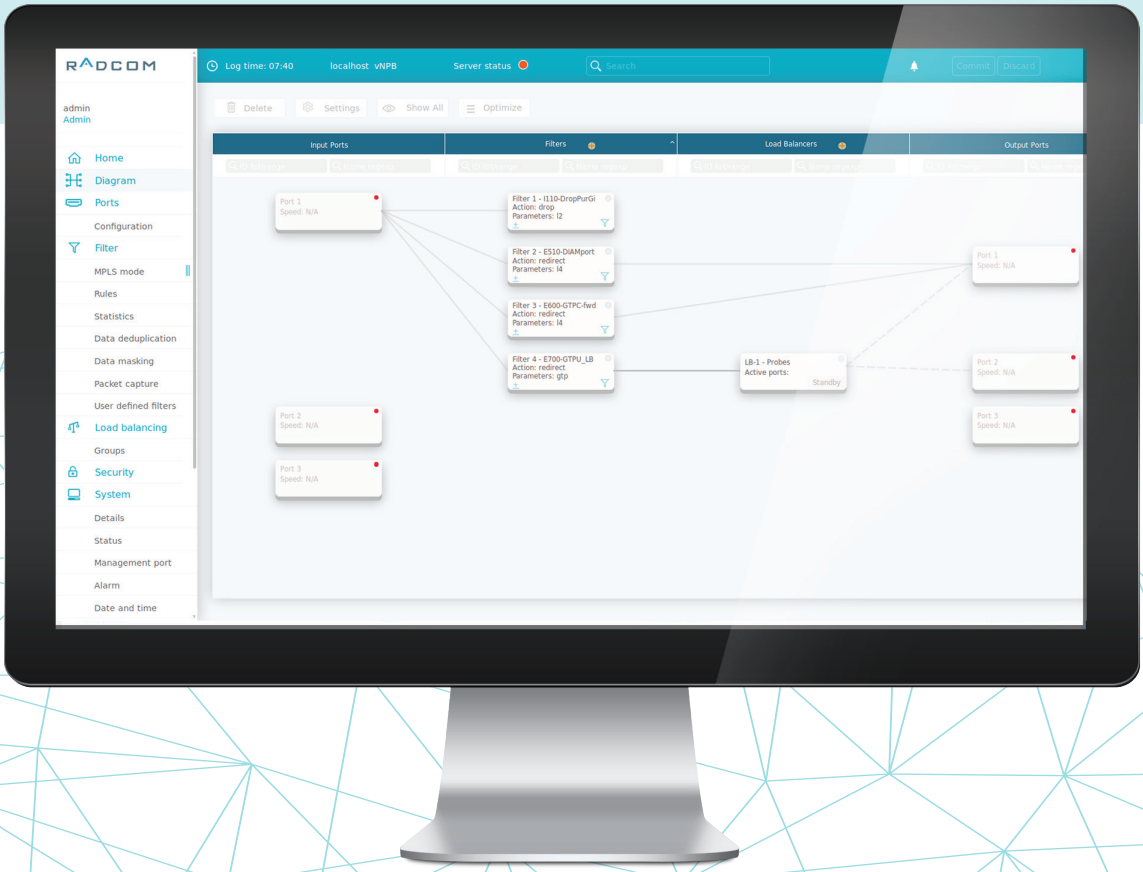
Built-in Troubleshooting

Easy management (UI, CLI and NETCONF/YANG)



RADCOM Network Visibility enables operators to;

- Manage, scale and load balance the network traffic intelligently and efficiently
- Gain 100% visibility of east-west, inter-VM traffic
- Smartly distribute traffic between service assurance probes/security tools without having to duplicate traffic and waste network resources
- Proficiently load balance MME/IMS traffic with deciphering support
- Automate and orchestrate visibility and assurance onboarding, configuration and scaling



RADCOM's solution offers visibility management via a centralized web UI, a Command-line Interface (CLI), a NETCONF/YANG, Simple Network Management Protocol (SNMP) and network access control list (ACL). Delivering complete network visibility for the NFV transformation with unmatched simplicity, multi-tenancy support, unrivaled cost-efficiency, and unlimited scalability. With built-in troubleshooting capabilities that provide users with packet and flow-level access into all parts of their network and provides efficient steering of the traffic to monitoring/security tools - based on set rules and policies, to ensure that unnecessary traffic is filtered out.

RADCOM Network Visibility decouples the solution functionality from dedicated hardware to fully virtualized software; creating a more cost-effective, and dynamic solution which is essential for operators as they transform their networks to NFV. Providing operators with a cloud-native solution for packet brokering and tapping that is critical for large-scale NFV transformations. RADCOM Network Visibility filters out the network "chaff" from the "wheat" and assures that the operator gains the essential network insights as quickly as possible.

MAXIMize

value from day one

RADCOM Network Visibility disrupts the sizeable costs of legacy visibility, including the OPEX and CAPEX associated with initial setup, network capacity upgrades, technology adoption and maintenance payments. RADCOM's solution is fully virtualized software and enables advanced features such as on-demand deployments, and elastic scalability. Operators can stop investing in equipment-based visibility solutions from day one. Transitioning to RADCOM's solutions means significant savings and lays down the foundations for an automated, and highly scalable solution that is 5G-ready, today.

By decoupling solution functionality from hardware dependencies, RADCOM's Network Visibility provides operators with a risk-free pricing model that also reduces CAPEX and OPEX over the lifetime of the project. No longer do visibility costs grow year-over-year due to network capacity. RADCOM Network Visibility provides operators with predictable, consistent pricing which allows the operator to manage and load balance the network traffic cost-efficiently, and to be able to scale the solution as the network grows. A cloud-native pricing model for a pure cloud-native solution.

Virtualized, automated, dynamic visibility

RADCOM Network Visibility brokers network packet traffic from the network switching layer or close to the virtual network function (VNF) while smartly load-balancing and filtering traffic to assure a more-efficient usage of service assurance/security tools while also preventing bottlenecks, optimizing network resources and delivering efficient, on-demand troubleshooting capabilities.

In NFV networks intelligent, session-aware load balancing is an essential tool for operators as network virtualization means almost unlimited network capacity and traffic needs to be managed efficiently to prevent overloading of the service assurance/security tools. Also, with smart filtering and traffic sampling, unwanted data can either be dropped or routed to different tools allowing operators to focus on critical issues that affect the customer experience.

Traffic is captured from multiple sources;

- Single Root I/O Virtualization (SR-IOV)
- SR-IOV mirroring
- Network-stack mirroring inside the VM
- Top-of-Rack (ToR) tapping
- OpenvSwitch (OVS) port mirroring (TaaS)

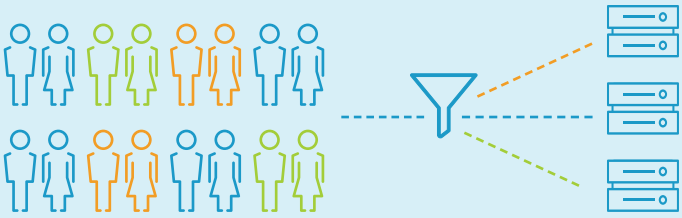
RADCOM's Network Visibility solution also offers operators more advanced packet brokering functionality. Including capture to file, central management that allows operators to configure rules once and apply to tens of thousands of virtual network packet brokers (vNPBs) instances, management at scale and flow-based CDR generation. RADCOM Network Visibility can be deployed stand-alone or integrated with RADCOM Service Assurance to provide a fully automated solution from virtual tapping to network insights.

RADCOM Network Visibility consists of a virtual network packet broker (vNPB) that provides full network packet broker capabilities in a fully virtualized solution and virtual tapping & filtering (vFilter) that offers distributed traffic filtering at scale. A central management web UI allows users to dynamically modify flow definitions and traffic optimization functions via a simple drag and drop UI. Operators can also manage 10000s of vFilters in groups based on instance tags. A user can tag specific devices and create groups and configure rules once and apply to a group of vNPB instances.

RADCOM's vNPBs can be used for multiple use cases such as;

Optimizing network traffic flow to service assurance probes

- Filter unnecessary traffic to reduce overload
- Session-aware load-balancing to distribute traffic across multiple probes
- Traffic sampling of a specified amount of flows or subscriber data



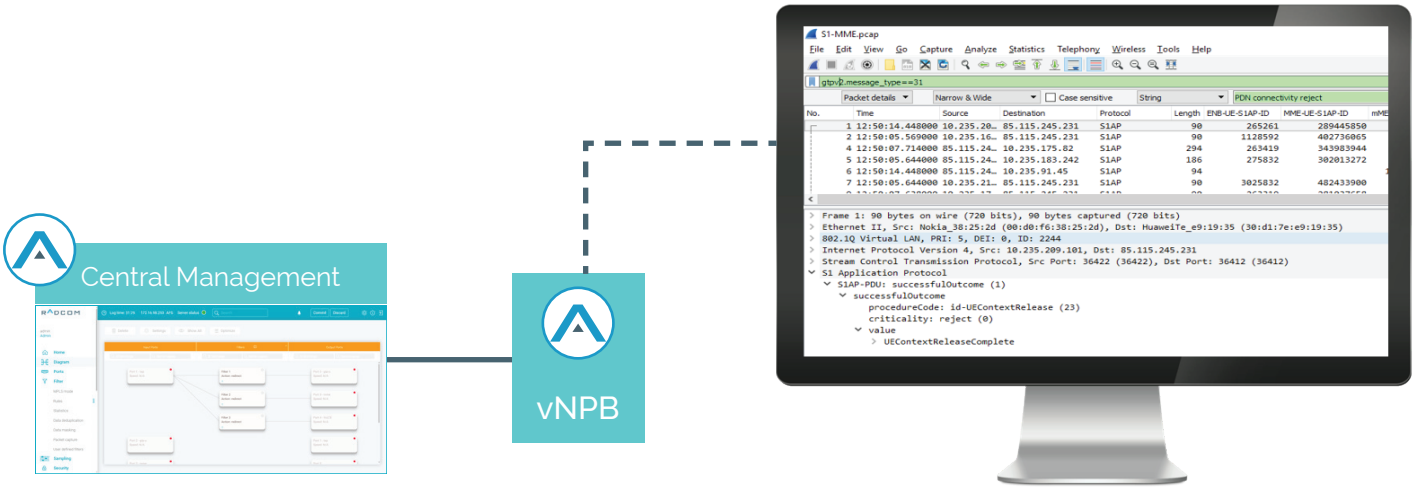
Subscriber based load-balancing

Facilitating on-demand troubleshooting

- Filter only relevant traffic to the issue being investigated
- Forward filtered data to a central checkpoint, or capture data close to the source for later inspection
- Detect root cause with advanced application intelligence
- Troubleshoot network outages and performance degradations
- Speed up network problem isolation with QAnalyzer

vFilters are instantiated across multiple clouds and controlled and configured centrally through a web UI, REST API, NETCONF/YANG API, and scripts. The vFilter resides as a lightweight VM within the monitored VM environment or container, interacting with the overlay network to receive replicated east-west traffic. It then forwards the replicated traffic to the vNPBs, or directly to service assurance probes or security tools, through GRE or VXLAN tunnels.

For operators with a hybrid network (a mix of virtual and physical networks), the solution is deployed on COTS hardware to provide network visibility on the physical network. As the operator transitions to a full NFV deployment, the COTS deployment can be easily migrated to a fully virtualized implementation (as a Virtual Network Function).



Network troubleshooting with QAnalyzer

INTELLIGize your NETWORK

Enabling more efficient troubleshooting

RADCOM Network Visibility enables operators to monitor and troubleshoot the network more efficiently by moving some of this functionality from the service assurance layer to the visibility layer, closer to the tapping point. Helping speed up network problem isolation, reduce resolution times and more effectively manage human and network resources.

An operator can decide on the fly want they want to analyze, filter the traffic, capture to disk and then perform on-demand troubleshooting. Even streaming this data to QAnalyzer - RADCOM's packet-based, protocol analyzer - to view any packet flowing through the network for any selected subscriber or time span. This data can also be exported as a full user-plane PCAP trace for even more in-depth troubleshooting.

Moving specific troubleshooting functions to the visibility layer and enabling on-demand troubleshooting means that operators can collect statistics from across the entire network and then when problems arise zoom in on selected subscribers, network elements or traffic sets based on app or service usage for further analysis.

This approach enables a more rapid way to troubleshoot network issues and provides a disruptive, new method to network packet brokering that facilitates dynamic evaluation of network issues, and provides the operator with actionable network insights more quickly and efficiently.

RADCOM's intelligent virtual network packet brokers (vNPBs), come with enhanced user plane analysis letting operators apply application filtering and routing. For example, to identify SSL traffic and gain network insights without unnecessarily sending it to the service assurance solution. Or, by sending specific traffic types, like SIP to particular probes or by dropping entire sets of data to prevent unnecessary network utilization for unneeded traffic. RADCOM's vNPBs can provide operators the following data:

- NetFlow: Generate NetFlow records along with additional context-aware extensions like URLs from traffic fed to the visibility platform
- Stateless 'Netflow' counters
- Stateful correlated subscriber flow based CDRs

Troubleshoot "on the fly"

Reduce resolution times

Disruptive, cloud-native visibility

User plane analysis

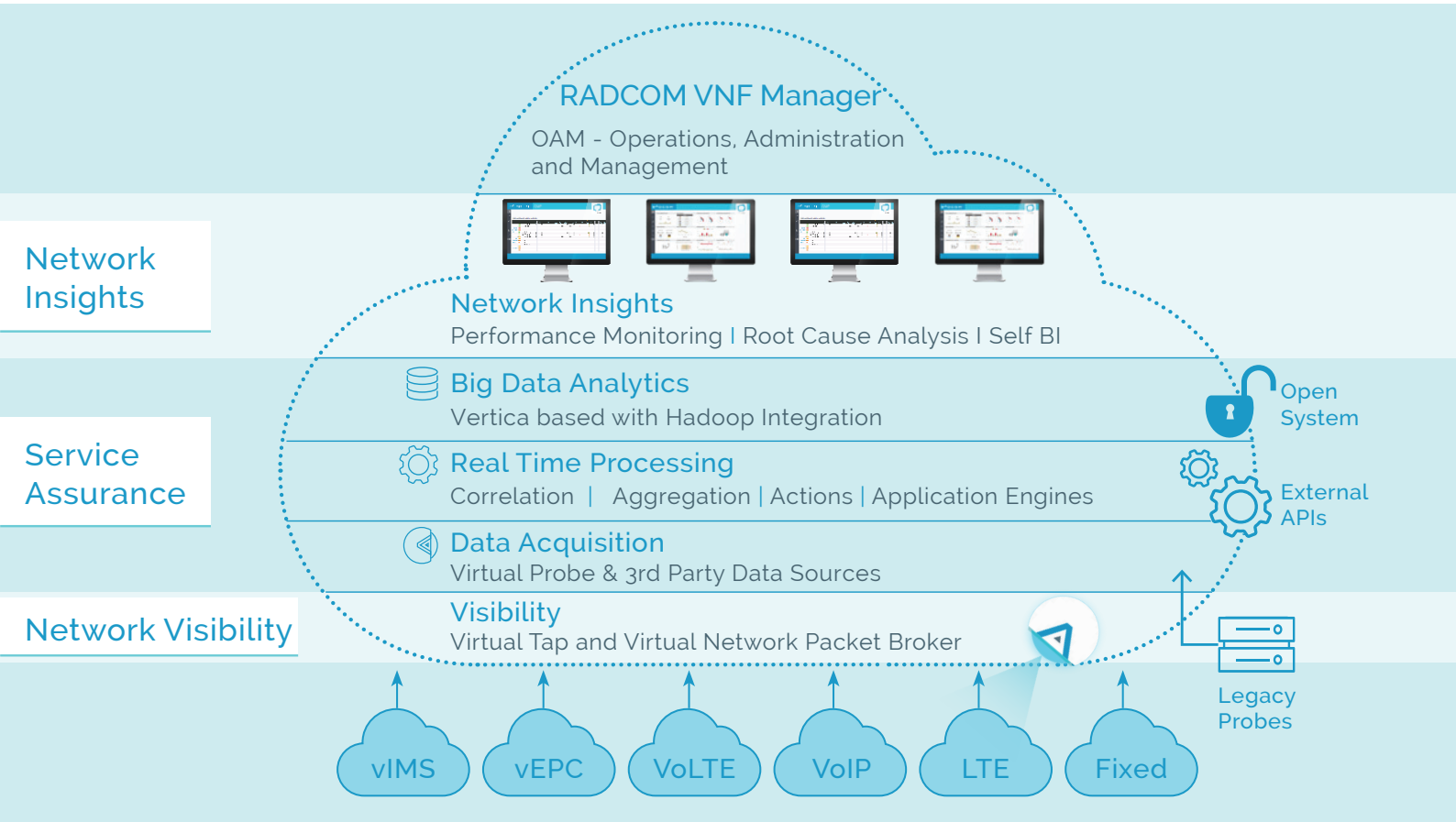
VISUALize
your Network End-to-end

Gain Fully Automated Network Visibility

Within an NFV network, RADCOM's VNF Manager - an ETSI-compliant Virtual Network Function Manager (VNFM) provides operators with full software lifecycle management of RADCOM Network Visibility. With the RADCOM VNF Manager being responsible for communication between the NFV orchestration, and RADCOM's cloud-native solution.

For operators with hybrid networks (a mix of physical and virtual), Visibility supports both environments. As the operator transitions from physical to virtual networks, RADCOM Network Visibility is seamlessly migrated from a physical to fully virtualized implementation via an easy software license upgrade.

By deploying RADCOM Network Visibility together with the rest of RADCOM Network Intelligence - that combines cloud-native service assurance and network insights - operators can smartly manage and intelligently load balance network traffic while efficiently gaining real-time insights to assure customer experience and optimize end-to-end network services.



Features and Benefits

RADCOM's vNPBs offer the following features and unlike many competing solutions these all work together in the same cloud-native module:

Features	Benefits
Session Awareness	
TCP/UDP Flow Aware	Track TCP connections, filter and invoke actions on a complete traffic flow
Session Aware (Mobile, Fixed and Voice)	For example, when deployed on mobile networks operators can correlate between the Gi and Gn and thus report, filter and invoke actions based on the subscriber ID (IMSI, IEMI, etc.)
Application Session Aware	Classify the application per-flow using the built-in DPI engine Export application name + additional metadata per flow or aggregated Filter monitored traffic by application that originated it and invoke actions accordingly
Filters and Actions	
Smart Load Balancing	Traffic can be distributed to a cluster of monitoring tools servers while ensuring all packets from a specific mobile subscriber or flow or IP address are forwarded to the same server to ensure correct customer experience analysis
Intelligent Filtering	Filters out unwanted traffic from reaching the monitoring tools so only traffic of interest is processed and analyzed
Packet Manipulation	Advanced packet manipulation tools, such as packet deduplication, IP defragmentation, masking of sensitive data, slicing the packet payload, time-stamping, header-stripping, port-labeling
Tunneling/IPSec	Receive traffic encapsulated in many types of tunnels and decapsulate/decrypt it before processing; Encapsulate/encrypt packets when forwarding packets to a monitoring tool over a tunnel
SSL Decryption	Performs SSL decryption to gain more visibility into the network traffic
Capture to Disk	Save packet headers and payload on disk for future analysis, and index that data for quick access and search

Features and Benefits

Features	Benefits
Traffic Sampling	
Sampling (sFlow)	Send only a fraction of the overall monitored packets to any monitoring tool that can operate on statistical data
NetFlow	Export flow information to any NetFlow (IPFix) collector
Flow-based sampling	Reduce overall traffic forwarded to a bandwidth-limited monitoring server, by automatically selecting a sub-group of flows and forwarding only traffic that belongs to this group
Subscriber-based sampling	Reduce overall traffic forwarded to a bandwidth-limited monitoring server, by automatically selecting a sub-group of subscribers and forwarding only traffic that belongs to this group
Management	
Easy-to-use web UI Command-line Interface (CLI) NETCONF/YANG Simple Network Management Protocol (SNMP) Network access control list (ACL)	Single pane of glass for rapid, deployment, configuration, ease of control and simplistic traffic flow optimization Standard control interfaces towards any SDN/NFV controller/ orchestrator
Central Management	
Central Management Server	Configuration and health management (incl. performance analytics and alarms) of up to tens of thousands of vNPB instances
Central Management web UI	Configure filter rules once and apply to a group of vNPB instances

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