



Virtual Probe and Analytics (vProbe)

Embedded Real-Time Network Intelligence

The Challenge

If the future of mobile network operators (MNOs) could be summed up in one word, it would be this: More. More traffic. More devices. More competition. To meet the demands of more, MNOs need less complexity and cost in their networks, fueling the migration to network virtualization. As the mobile industry moves to network functions virtualization (NFV) and a virtualized Evolved Packet Core (vEPC), traditional network measurement and monitoring tools are left behind. Virtualized elements are dynamic in nature and require network probes that can be added, moved and deleted in an equally dynamic fashion, creating the need for a virtual probe.

The Native Solution: Affirmed Active Intelligent vProbe

Affirmed vProbe is the industry's first native virtual probe, co-located with the Affirmed's Mobile Content Cloud vEPC and WiFi Solutions rather than delivered as a separate network appliance. With the vProbe, MNOs can dramatically reduce hardware costs, network complexity and the performance issues typically associated with probe solutions while providing real-time network intelligence.

Network Efficiency

Co-locating the vProbe with the vEPC and WiFi solutions reduces network hardware requirements and eliminates the need to duplicate network functions such as user/control plane packet correlation and deep packet inspection (DPI). As a result, performance impacts on the network are minimized and total cost of ownership is lowered by 50% or more.

Intelligent Visibility

vProbe puts "intelligence first" by creating Intelligent Event Data Records (iEDRs) in real time from flow and transactional data. The iEDRs provide 100% network and subscriber visibility in correlated data record sets. Operators can use these data records to identify target areas in the network that require packet mirroring for a deeper analysis. This means that only

a subset of traffic data needs to be mirrored—a significant upgrade from the "mirror first, ask questions later" approach that other probe solutions take and which can add sizable cost and complexity to the network.

Data Flexibility

Current network probe solutions in the market provide restricted access to rich signaling and data plane session information. Affirmed vProbe provides open access to session information using Google's standards-based Protocol to create data records. These can easily be integrated with a variety of third-party analytics tools to deliver real-time insight into network operations, network security, network planning, marketing activities and more. vProbe is currently available as a pre-validated solution with EMC's Real-Time Intelligence (RTI) analytics platform.

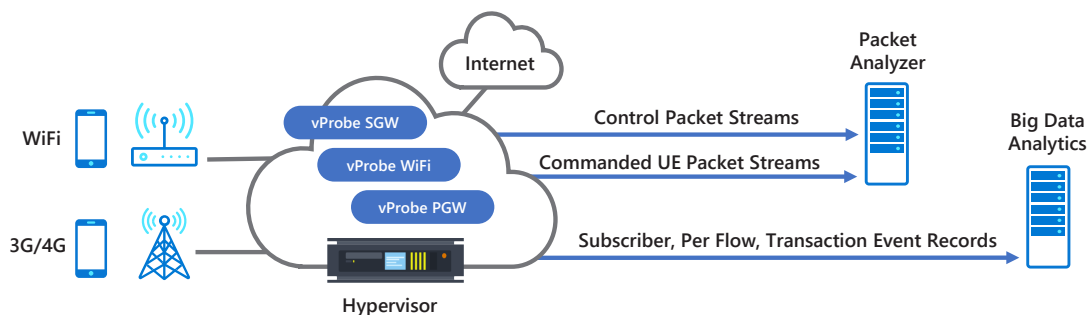


Figure 1. Affirmed Active Intelligent vProbe

“Virtualization of the network and cloud-based services will render physical passive probe technology obsolete.”

Patrick Kelly, Founder, Appledore Research Group

Why vProbe?

- Costs 30% to 50% less than alternative network probing solutions
 - No dedicated VM’s required for vProbe
- Easily probe virtualized network functions—even if they’re dispersed in different networks or different geographies
- Capture reliable, real-time data that can help create dynamic service offers, identify performance issues and block network attacks
- Combines vEPC, WiFi, network intelligence and analytics into a single, seamless solution
- No significant degradation in performance/efficiency of the deployed vEPC and WiFi solution
- Gain real-time insights that can reduce customer churn, generate new service revenue, drive smarter network planning/provisioning and improve the customer experience.

vProbe Features

- Native, scalable traffic-flow monitoring eliminates hardware requirements and minimizes network impact
- Real-time network intelligence for troubleshooting, proactive fault detections, service creation, market analysis and more
- Reports session control, subscriber events and subscriber data selectively through user-defined filtering
 - vControl Flow—Collection of all control plane traffic
 - vData Flow—User defined filtering of data plane traffic
 - iEDRs—Intelligent event data records that provide a complete granular data capture of session, bearer, flow and transaction details in the data plane. Provides a basis for determining filters for vData Flow.
- Supports real-time security and network protection against fraud and attacks
- Open data protocols enable full integration with third-party analytics tools

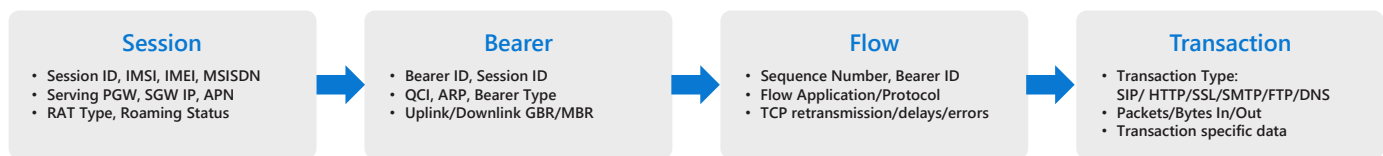


Figure 2. Affirmed Intelligent Event Data Records (iEDRs)

By the Numbers

- **Five Times Market Size Growth**—The anticipated growth of NFV solutions between 2015 and 2019, from \$2.3 billion to \$11.6 billion (source: IHS/Infonetics)
- **40 Percent Subscriber Churn**—The percentage that can be attributed to network quality of service issues, according to Appledore Research Group.
- **50 Percent TCO Savings**—The percentage of savings in total cost of ownership (TCO) that service providers can experience when switching from a hardware-based probe solution to vProbe.

