

Virtualized Performance Assurance

Virtualized instrumentation empowers network operators with complete quality of service (QoS) and quality of experience (QoE) insight without compromise.

Total Visibility

Until recently, scalable, precise network performance monitoring solutions depended on purpose-built hardware probes. Software solutions, although low-cost and easy to install, are unable to achieve the same level of performance.

Accedian's virtualized instrumentation closes this divide, delivering software's ease of deployment, exceptional economics, and open integration, without sacrificing accuracy or granularity. With this visibility centralized in data centers shared with SDN control and big data analytics, providers have an integrated foundation to deliver a new level of customer experience.

Tier-1 network operators have validated the coming of age of fully virtualized performance monitoring by assuring hundreds-of-millions of subscribers' user experience in real time across national-scale deployments.

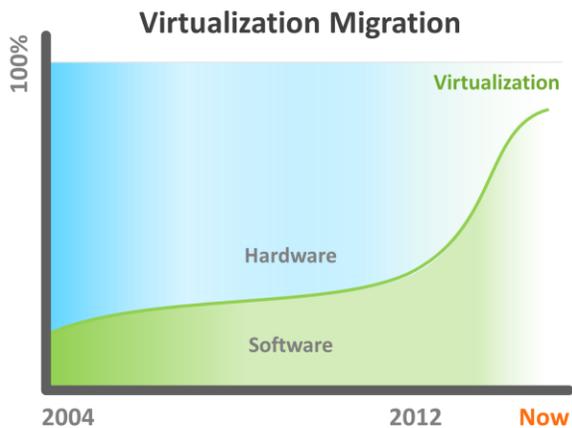
Instrumentation Options		Scalability	Precision	Real-Time	Granular	1-Way Metrics	Ubiquitous	Rapid Install	Cost Efficient	Cloud Platform Integration
2015	Hardware-Based	✓	✓	✓	✓	✓				
	Software-Based						✓	✓	✓	
NOW	Virtualized	✓	✓	✓	✓	✓	✓	✓	✓	✓

Virtualized instrumentation combines exceptional precision and scale with software flexibility.

Proven Solutions, Virtualized

From inception, Accedian's performance assurance technology was designed for virtualization, with an architecture that separates measurement from control. Accedian efficiently virtualized its solutions in step with the rise of cloud compute, and the ever more powerful servers that fuel it.

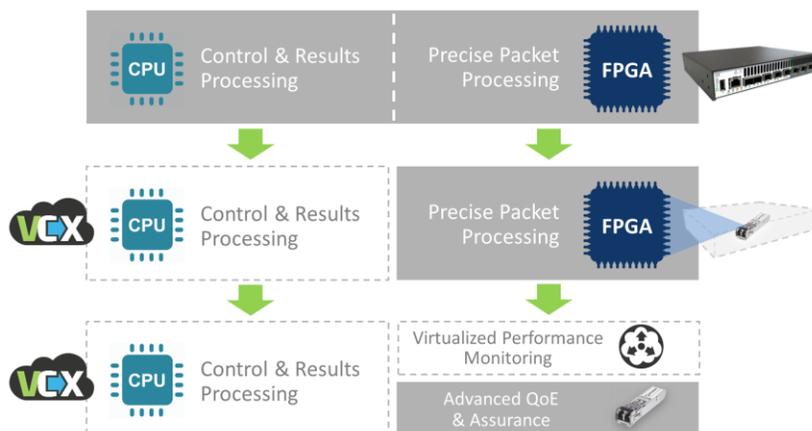
Having migrated from the physical to virtual, Accedian draws on the strength of each to deliver completely new forms of visibility. Using virtualization as a base, lightweight hardware can be strategically deployed to augment coverage where servers are unavailable, or insufficient.



Patented technology permits virtualized solutions to retain hardware precision

Highly "Portable" Architecture

Common "code" for 100% backward compatibility
Permits seamless support for legacy B/OSS systems



Accedian's proven solutions are now virtualized, providing seamless migration from physical to virtual, scaling with the operators' shift to analytics.

Concrete Benefits

Virtualized instrumentation means simple, fast deployment over uniform, familiar infrastructure. Central control can easily scale up in operators' private cloud infrastructure,

while monitoring scales out effortlessly as networks expand and evolve. Commodity pricing aligns cost with data center economics.



No Appliances to Install



Rapid Deployment on COTS hardware

e.g. 20 regions, 250,000 endpoints, 8 weeks



Uniform, Consistent Infrastructure

no "sparing," special warranties, install requirements



Easily Managed & Scaled

familiar data center operations, scale up / out as required



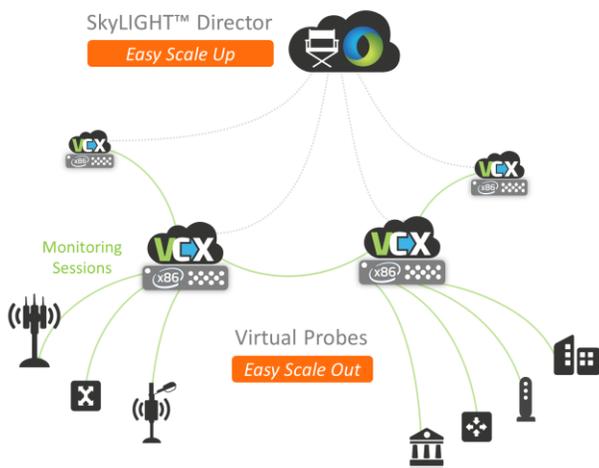
Lowest-to-Zero CapEx

use best-of-breed x86 at volume pricing



Simplified Procurement

no complex hardware shipping & logistics, certification

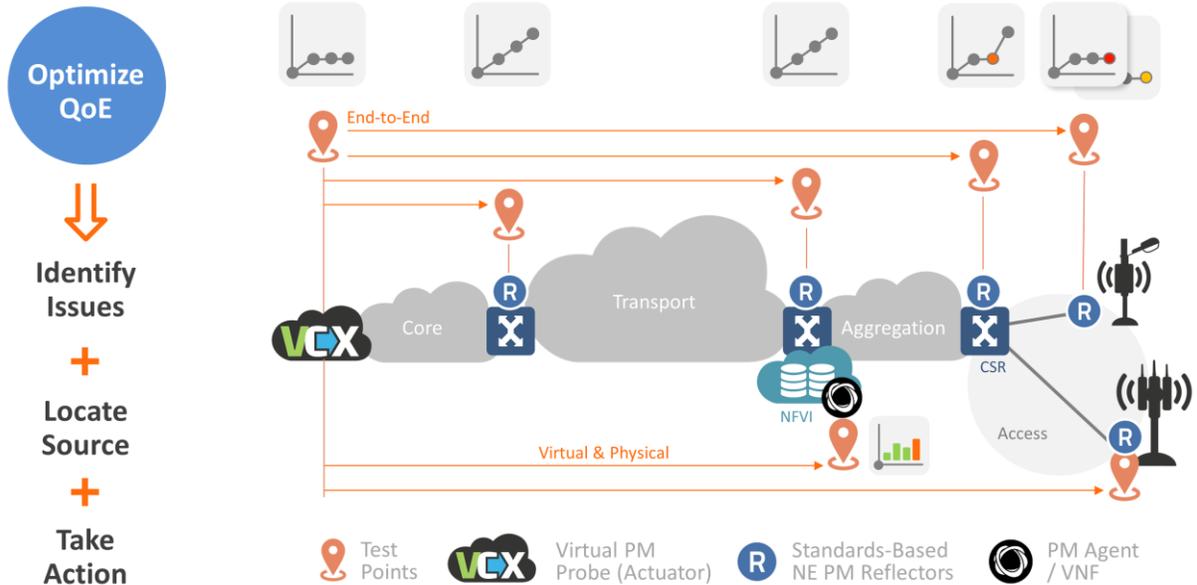


With no appliances to install, Accedian's virtualized instrumentation provides concrete benefits, including rapid deployment, easy management, and simplified procurement.

Complete Visibility

Standards-based monitoring methods integrate the network itself into a ubiquitous instrumentation layer. Network elements and infrastructure become test points, bringing performance awareness to all locations, physical

and virtual. Issues and trends can be easily isolated to prescribe corrective action, ensuring the least subscriber impact.

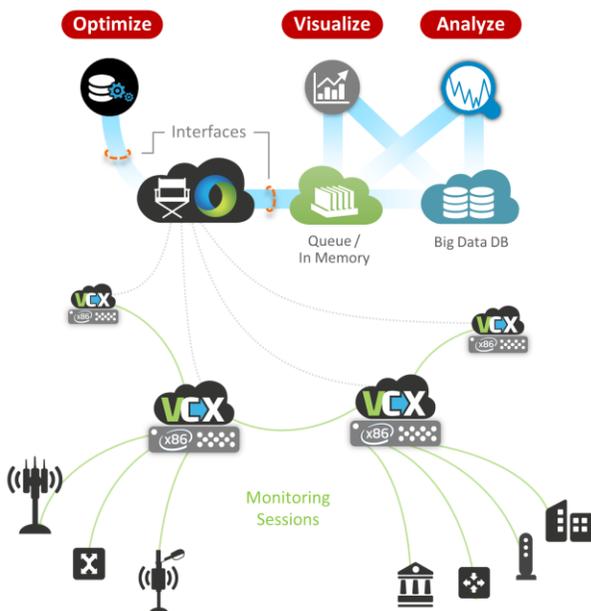


Accedian's virtualized assurance technology instruments all key points along the service path, enabling operators to quickly identify issues, locate their source, and take action to restore optimized QoE.

Efficient Integration

Open interfaces allow existing systems to dynamically control monitoring, while results stream directly to in-memory analytics, visualization, and big data storage

platforms. This integration forms a foundation for predictive analytics, root cause correlation, and the analytics-driven network.



Accedian virtualized instrumentation efficiently integrates with big data analytics and SDN.



Virtualized Platform Integration



Command & Control

easy integration into B/OSS & SDN control



QoS & QoE KPI Streaming

direct connect to big data lakes & fast analytics



Empowering cloud-scale analytics:

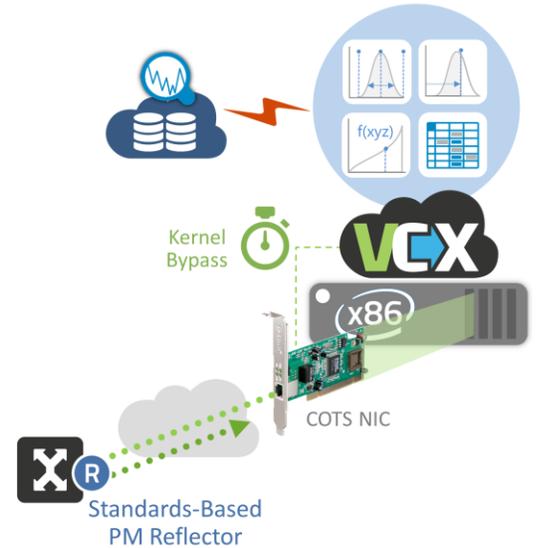
- Open REST / XML interfaces for rapid integration
- Capture billions of metrics / day, "as it happens"
- A foundation for an analytics-driven network

Accedian Delivers Exceptional Precision and Insight

Accedian virtualized instrumentation uniquely preserves the hallmark accuracy and granularity of its hardware-based solutions, with innovation that elevates commercial servers to precision test instruments in their own right. Measurements and derived key performance indicators

(KPIs) are processed 'as it happens', so operators can analyze data from many perspectives at once. Big data analytics profit from this diverse base of observations to extract new degrees of insight, exposing otherwise invisible sources of network impairment.

-  **Precise**  **Microsecond-level precision on COTS hardware**
-  **1-Way**  **Patented virtual clock sync extracts 1-way metrics from round-trip tests**
-  **Granular**  **CPU-Efficient probe engine + carrier-grade management =**
-  **Scalable**  **sub-second granularity with mass scalability**
-  **Real-Time**  **On-the-fly calculation offers immediately actionable metrics**



Accedian uniquely provides hardware-grade precision, granularity, and scale using commercial, off the shelf (COTS) hardware

Extending Software Possibilities

The concentrated power of optimized hardware has its place in virtualized performance assurance. Throughput testing and monitoring, distributed packet capture, and full-mesh monitoring require precise processing in remote

locations. Virtualization reduces hardware to the minimum required, to enable capabilities that software alone cannot deliver.

-  **Full line-rate test traffic generation**
turn up & service activation testing
-  **Remote QoS & QoE probing**
test from—and between—remote sites
-  **Remote packet capture & time-stamping**
distributed packet brokering
-  **Bandwidth Metering**
utilization & microburst monitoring



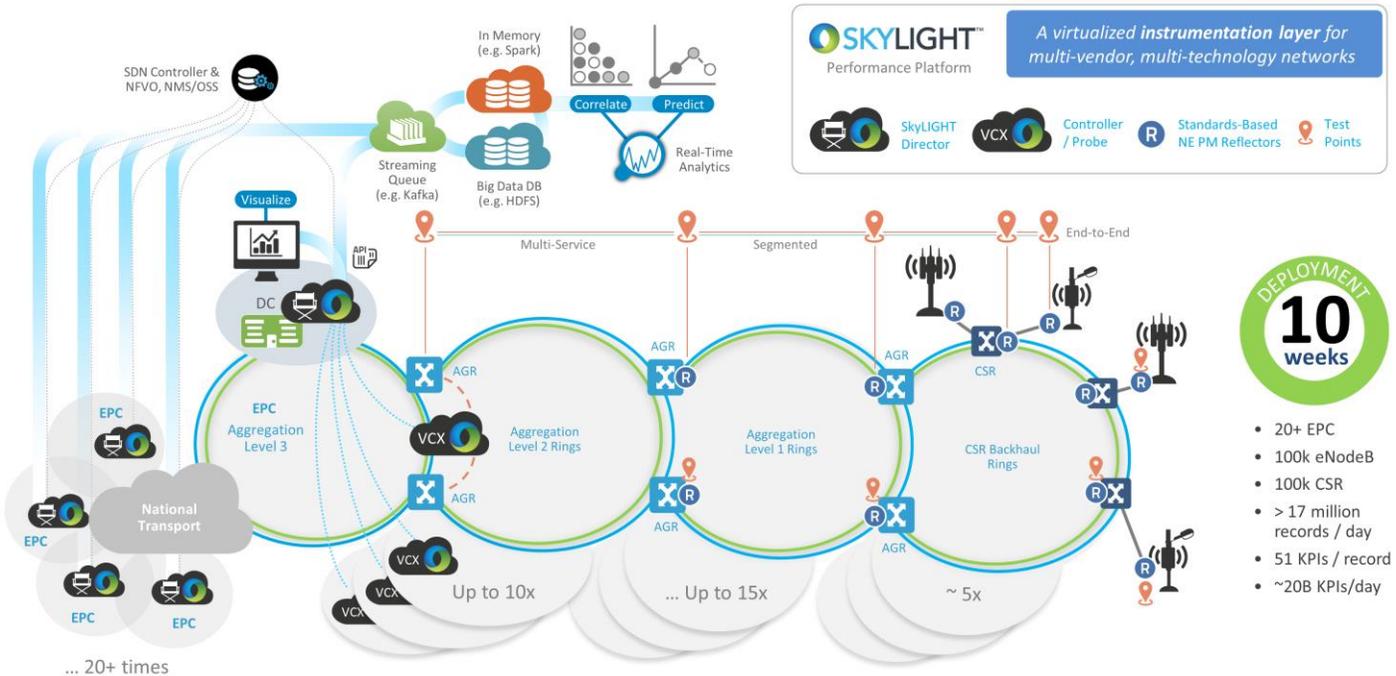
Accedian's instrumentation extends possibilities for virtualization, with minimized hardware to introduce capabilities software alone cannot.

Example: Tier-1 Virtual Performance Assurance Deployment

International scale deployments provide undisputed proof that virtualized instrumentation is carrier grade. Service providers use Accedian to monitor millions of services and sites within their networks, every second, every day. A precise, dependable source for actionable analytics—big data in its own right—billions of monitoring metrics representing every vital sign are effortlessly captured for

immediate and extended insight.

Value lies in the ability to resolve complex problems in seconds, that would otherwise escape human detection. This helps service providers localize performance pinch points: to focus upgrades and optimization efforts, predict failures, and extract the most from their networks



In this example, a Tier-1 operator uses Accedian's SkyLIGHT platform to maintain impeccable QoS and QoE over one of the largest LTE networks in the world.

A New Level of Visibility

Virtualized instrumentation is a new necessity. Exceptionally accessible and simple to deploy, its combined cost efficiency, completeness of coverage, exceptional precision and diverse perspectives are the perfect complement to software defined networks, and

analytics systems. Providers can instrument their networks in weeks, to gain visibility into all applications, layers and sections of their network. They can take control, and differentiate themselves with a new level of customer experience.

Virtualized Instrumentation Without Compromise

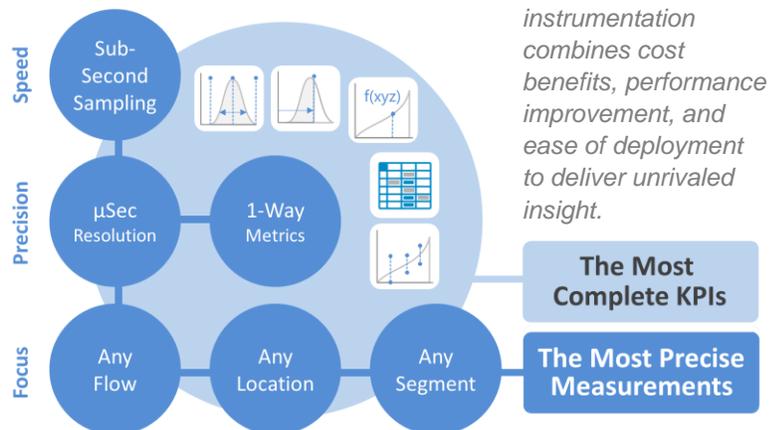
- A proven, patented, portable technology platform
- The performance, precision, granularity of hardware
- The programmability and flexibility of software

Disruptive Cost & Ubiquity

- Rapid deployment at scale
- Complete network coverage
- Affordable insight everywhere

Augmented Assurance

- Real-time integration with big data / analytics
- Extend resolution with NFV-powered modules



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