



## **QUALITY ASSURANCE WITH ACTIVE PROBE SYSTEM**

**WHITEPAPER**

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Kron's Quality Assurance Active Probe System is capable of monitoring performance, measuring quality of various kinds of services and protocols, in the IP level, using pro-active methods from the user's point of view.

Besides providing resolution for quality based and network problems to the operator, on the fly, it also provides consolidated reports which make possible to analyze and monitor the events that have occurred in the network.

Kron Active Probe System runs on Kron's patented Distributed Network Application Platform (DNAP). There are services/applications called test engines, which are capable of making measurements depending on the service type. Every individual test engine produces different performance metrics and test flows. Each test engine runs as plug-ins of DNAP.

Kron Active Probe System, equipped with dynamic deployed KPI test engines on active probes to generate KPI's which cannot be derived from network events. Probes have necessary network interfaces which makes them deployable to core and edge of your infrastructure.

Kron Active Probe System has following KPI Test Engines :

- » IPQM (IP QoS KPI's)
- » VoQM (Voice over IP QoS KPI's)
- » NSQM (Service based QoS KPI's)
- » ISQM (Internet Service Quality KPI's)
- » LGQM (Traffic Load Generator)

## Customer Benefits

- » Identify and resolve outages quickly with using detailed and clear reports.
- » Control the performance of delivered services.
- » Get quicker and better quality feedback
- » Improve communication between Call Center and NOC
- » Ensure higher availability, better quality
- » Maximize availability and optimize performance with avoiding SLA violations
- » Simulate and see what-if scenarios before service launch
- » More profit by optimizing your network performance
- » Faster problem localization with using advanced analysis techniques
- » Common quality management for different services and networks through unified platform
- » Awareness of the service problems of customer in early states and decrease of MTTD and MTTR
- » Customer Experience Management readiness.

## Business Scenarios

Patented technology ensuring your customers satisfaction of services and your company.

Kron QA gives you unique service offerings among your competition.

Kron Quality Assurance platform helps Service Providers to synchronize their network infrastructure, services and liabilities to their customers seamlessly.

Customers learn to change their service provider rapidly with the introduction of new technologies and increasing expectations.

Service Providers have to treat their customers individually to keep their perception of the services at a satisfactory level correlated with what they pay for. Especially with higher speed broadband mobile networks (4G), it is getting harder to keep customer, where there are many other alternatives in the market and service activation is nearly real-time. Service Providers do not compete with this challenge around customer's experience; will then spend time and money in rising customer turnover problems.

## Case Study-1

Recently one of the tier-1 fix operators has decided to commit a service level to their IP VPN customers which consists of 50.000 end-points.

Depending on the usage of traffic classes, customers are put into 4 groups: Platinum, Gold, Silver and Bronze. Each group has its own target SLA metrics for availability, Jitter, round-trip latency and loss ratio. As the VPN service is an end-to-end service, they were looking for a distributed solution and some agents / clients that can be hosted on customer premises for testing and monitoring.

Challenges:

- 1000's of tests/monitoring from a location
- Modem-size SLA clients for on-site monitoring
- Central management for whole system
- Give access to end customer

Overcoming these challenge needs network resources and customer contracts to be managed inline in the whole business and network operations. Kron All in One QA solves this problem for you.

Kron Active Probing gives you the chance to imitate your customers' behavior of the use of the services; distributed according to the nature of the service and Kron Single Control gives you near-real time performance and alarm management from your infrastructure. And finally, Kron SQM harmonizes between what you measure and what you have to measure with its intuitive approach. These three pre-integrated products build Kron All in One Quality Assurance Platform. Kron QA Active Probing System, equipped with dynamic deployed KPI test engines on active probes to generate KPI's which cannot be derived from network events. Probes have necessary network interfaces which makes them deployable to core and edge of your infrastructure including outdoors or BTS's.

Kron QA Active Probe System's distributed architecture has provided site-to-site performance monitoring and service level performance monitoring.

By the deployment of the KRON IAP-L probes with BigProbe support near to PE routers in IP/MPLS network, and defining customized test scenarios according to the customer packages, operator can evaluate the each service level of the traffic class in real-time and historically between each service point.

For the Platinum group of customers, operator positioned Kron's modem-size IAP-F and IAP-G probes for on-site SLA monitoring.

Multi-tenant user account and customer definition infrastructure of the solution enabled operator to give access to each their customer to monitor its own network elements.

## Key Features

- » Active traffic monitoring with distributed probe architecture
- » Edge-to-edge monitoring over a network Measurement of IP performance metrics
  - » Availability, jitter, latency, packet loss, re-ordering ratio, hop-count, MTU size detection
- » Configurable test traffic and alarm policy / threshold mechanism
- » Simulations of network applications like VOIP, HTTP, and Mail etc.
- » Centralized reporting
- » Real-time and customizable dashboard screens
- » Historical performance reports, tabular and graphical reports with support of excel and PDF export
- » IP SLA tests
  - » One-way UDP test
  - » RTT ICMP test
- » 802.1q support VLAN tagging support
- » Traffic prioritization with TOS and DSCP marking
- » VOIP service monitoring and MOS Scoring
- » Traffic type simulation and quality monitoring
- » Data, Voice , Video
- » Service Level Monitoring HTTP, IPTV, DCHP, PPPoE NTP, DNS, VoIP, SNMP , POP3, FTP, SQL
- » Load test traffic generation
- » 1 Gbit, 10 Gbit, up to 40 Gbit load generation
- » Service level agreement monitoring, measurement, and verification
- » Troubleshooting of network operation via remote probes
  - » on demand ping
  - » on demand trace route
- » User account and customer definition infrastructure, each customer monitors its own network elements
- » North-bound interface for data query
- » Proven Kron Platform appliance
- » AC and DC power options
- » Hardened Kron Linux Kernel
- » High Availability Support

## Technical Specifications

### Data Interfaces

Web-based user interface, North-bound interface, CLI interface, SQL views for reporting

### Supported Protocols

TWAMP/OWAMP, ICMP, HTTP, DNS, POP3, FTP, DHCP, IGMPv3, SNMP, NTP, PPPoE

### Test Engine Modules

IPQM, NSQM, VoQM, ISQM, LGQM

### HW Probes

Kron IAP-F, IAP-G, IAP-I, IAP-M, IAP-LX, IAP-GX

## QA-Active Probing Scalability Matrice on Kron IAP Appliances

Test Engines	IAP-F	IAP-G	IAP-I	IAP-M	IAP-LX	IAP-GX
IPQM	250 test	500 test	500 test	1000 test	2000 test	5000 test
NSQM	25 test	50 test	50 test	100 test	100 test	100 test
VoQM	n/a	5 test	5 test	25 test	50 test	100 test
ISQM*	1 active	1 active	1 active	1 active	1 active	1 active
LGQM	100 Mbit/sec	1000 Mbit/sec	1000 Mbit/sec	1000 Mbit/sec	10 Gbit/s	40 Gbit/s
BigProbe**	n/a	n/a	n/a	10000 test	20000 test	50000 test

Note: Figures are calculated for the default test scenarios.

IPQM default scenario is 100 packets, 50 ms. frame interval, 64 bytes packet size.

\* ISQM is fully compliant with ETSI EG 202 057-4. As it includes a throughput testing, one active test should be executed but other tests are executed in sequentially.

\*\* BigProbe is an optional feature of Kron QA Active Probe System. It enables to effectively usage of time slots on a probe which increases the number of test execution in a minute. It also enables cascading several probes under a single virtual probe.