CREA NORD

TUCANA CYBER SECURITY SOLUTIONS

Creanord Solution for Mobile Transport *Performance Monitoring*

Solution Brief

Key Benefits

- ☐ Vendor agnostic performance monitoring with the service provider friendly licensing model
- ▽ Scalability for hundreds of thousands of measurements and up to 10 000 sessions in a single probe
- ○ Microsecond level measurement accuracy for real latency and jitter
- ☐ Forwarding loss detection of down to 1 ms
- ▽ Advanced tools to automate and speed-up deployment, monitoring and troubleshooting

Measurable network quality becomes a must with 5G

Mobile services are a fiercely competitive market with ever-increasing requirements for capacity, quality and price. Data traffic volumes are exploding and demand is moving towards real-time services. Mobile transport establishes a major part of the overall mobile network infrastructure and its performance has a direct impact on every mobile user's service experience. A service provider's challenge is to find the most efficient use of its network to support growth without risking the service quality.

With 5G stepping in, the service breadth will grow into areas which we haven't seen before. Transition to 5G sets completely new requirements not only to capacity but also to network availability and latency. While network quality has a strong impact on customer experience and churn today, it will, if not adequate, be a complete show-stopper for a large part of emerging 5G services. Therefore, in order to build confidence on the network quality there must be a system that provides reliable visibility to the network performance at an entire network and at a class of service level. This is a challenge for many service providers as the most part of traditional performance monitoring systems falls behind in measurement accuracy, granularity and lack the applicability in large-scale multi-vendor networks.

Creanord builds the confidence on the mobile transport quality

Creanord solution enables you as a service provider to guarantee the mobile transport network performance with precise measurements and service quality monitoring across a multi-vendor network. Moreover, accurate visibility to the network performance enables you to maximize the network usage and plan investments accordingly.

Many service providers, either mobile or wholesale operators, rely today on the Creanord solution in their 3G and 4G backhaul and core.

Creanord's market leading performance measurement technology is 5G ready as it provides the needed accuracy and granularity even for the most demanding 5G use cases. You can, first of all, verify if and how well the transport network meets emerging 5G mobile service prerequisites and further bring a continuous awareness over the network performance.

The Creanord solution consists of CreaNODE measurement probes and a performance monitoring system, Echo-Vault. The CreaNODE probes, which are available as a range of physical and virtual appliances, measure according to configuration the network performance between the probes or against existing network elements. Within a mobile transport network, the CreaNODE probes are typically located at the base station controller or mobile core sites from where they simultaneously measure the quality of backhaul connections towards a large number of base stations. Measurements beyond the backhaul are easy to expand to mobile core where the compact CreaN-ODE probes fit well. By deploying additional probes in strategic locations in the network, it is possible to build even a more precise, segmented performance view of an important network area.

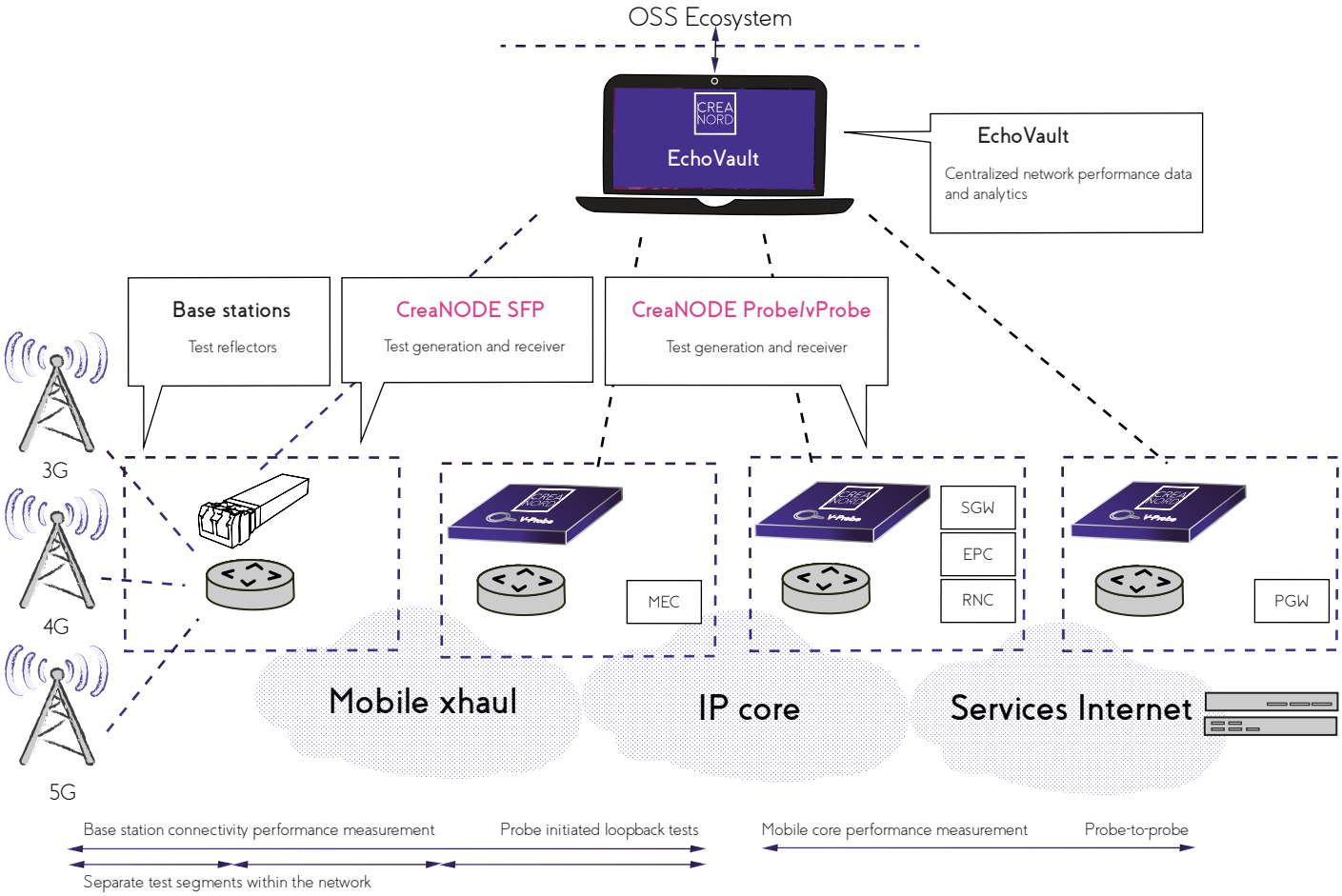


Figure 1 Creanord solution components for managed WLAN SLA monitoring

The EchoVault is the brains of the system as it stores all the measurement data from the CreaNODE probes and then processes this data further for various purposes. Via the EchoVault, you can remotely configure the measurements and once set-up get a comprehensive view of your network performance. Possible performance degradations are instantly visible which enables you to optimize operations and work predictively. The same reliable and accurate data can be fed to other systems, for instance, via EchoVault REST API or Kafka API to enable network automation or enhance the troubleshooting process.

Accuracy and granularity ready for 5G

The performance measurement accuracy and granularity must always relate to the actual service requirements. When service end-to-end delay requirement gets down to 1ms and below, which is the case with 5G URLLC, the measurements must also be way more precise than what used to be the norm with 3G and 4G. Apart from 5G low-latency requirements, microbursts are today unpleasant sources for issues in current networks. The microbursts are hard to detect and can cause all sorts of problems, particularly with applications that require reliable, high-speed and low-latency data transmission. Only with granular enough, precise data you can see the microbursts and warning signs of performance degradation before the actual services get impacted.

SDN controllers and NFV orchestrators, which are becoming central automation elements in service provider networks heavily rely on accurate and reliable measurements data from the network.

With the Creanord solution, you can monitor the network quality even at millisecond level sampling rates and microsecond level accuracy and set your thresholds to match your performance targets and processes. Each connection may be measured with several class of service levels against their class-specific targets. A high measurement accuracy leveraging hardware timestamping is built into the product architecture and thus available across the entire CreaNODE portfolio. Frequent sampling rates at even 1 ms level reveals also the microbursts, which normally remain invisible. Using the EchoVault REST API, the data and alerts can be fed to e.g. SDN/NFV systems to trigger automated actions e.g. for re-routing or service reconfiguration.

Comprehensive set of test methods

Performance monitoring and testing plays an essential role throughout the entire network and service lifecycle starting from service validation prior to customer delivery and continuing to constant monitoring and occasional troubleshooting. To comply with these needs the Creanord solution offers a broad set of testing and measurement capabilities including:

- Continuous active measurement
- Service activation and throughput tests
- Passive monitoring

CreaNODE Virtual and Physical Probes

Continuous Active Measurements	Service Acceptance and Throughput Tests	Passive Monitoring
NetPrecision	Y. 1564 SAT	eXtended SNMP Branwidth Variables & Math operations
TWAMP		
UDP Echo	RFC 2544	eXtended SNMP Network Element Resources
Y. 1731		eXtended SNMP Element Health
TCP Connect	TrueTCP (RFC 6349)	pCap Packet Capture

Picture 2: Wide range of supported testing methods

There are multiple technologies and methods on the market to accomplish the above listed tests. Supported network technologies, interoperability with the installed base and service providers' other preferences determine the required set of test methods.

Continuous active measurements can be run in the background without actual network traffic disturbance. Active measurement protocols for the delay, delay variation and packet loss monitoring include TWAMP and UDP Echo, which are typically used when testing connectivity from a CreaNODE probe against the base station sites. In addition to the backhaul monitoring, the CreaNODE probe can measure the network performance across the core, where the measurements are established between the CreaNODE probes. In this case, the Creanord NetPrecision testing provides an easy-to-deploy option for accurate one-way and two-way measurements across ring, mesh or partial mesh topology. When the CreaNODE probes are additionally deployed into locations between the measurement end-points, it is possible to split one end-to-end measurement into segments, which are measured as individual connections. Through the EchoVault thousands of tests can be activated in a matter of minutes.

> "Deployment was really rapid. It took only half a day to initially get the Creanord solution up and running in our network with
>
> *5000 base stations*
>
> – a mobile operator in Europe"

The service activation and throughput testing are always intrusive and thus executed in service activation phase or as a part of troubleshooting. The CreaNODE probes offer standards-based throughput and service activation testing based on RFC 2544, ITU-T Y.1564 and RFC 6349. Using RFC 2544 or Y.1564, it is possible to measure bandwidth and multiple QoS parameters for multiple flows on L2 or L3 with a single test.

For the enhanced passive monitoring the CreaNODEs provide eXtended SNMP KPI collection from installed base equipment. Collected information may include KPIs such as bandwidth utilization, CPU, temperature and memory load.

The measurements are easy to configure and activate from the EchoVault without site visits.

Always-on visibility to the relevant information

The EchoVault is the center of the network performance intelligence. It provides a real-time visibility to the network performance and how it meets target quality objectives.

The EchoVault gets all the measurement data from the CreaNODEs, processes the data against the configured thresholds and represents the analyzed information through intuitive visuals to legitimate users.

EchoVault tools and views have been built to maximize the value for the service provider. For instance, the network level health is analyzed in one view, which includes the network topology on a map and a real-time network status graph. A dashboard view, instead, gives a quick outlook on the network status per region. Direct drill-downs and tool-tips from these high-level views to specific measurements facilitate the investigation of problems. Flexible filtering options and arbitrary metadata added by the user enable efficient data categorization to benefit correlation, reporting and network behavior analysis.

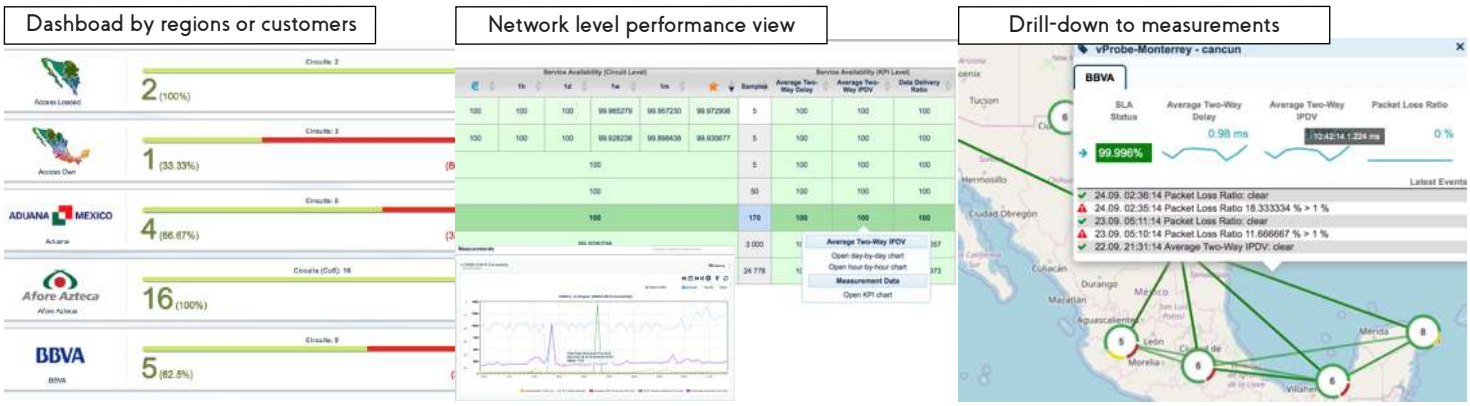


Figure 3 Full network visibility with versatile Creanord's reporting tools

Depending on the operational people´s roles and responsibilities, the EchoVault users may have rights to different views and privileges. The same data from a very large network with hundreds of thousands of measurements can be made available for chosen users with proper control, via the EchoVault itself or in a web Portal.

Optimized scalability for each location

In a mobile transport network, measurement points must be first positioned at locations where the connections to be monitored terminate. A base station controller or a mobile core site are the most obvious locations for a CreaNODE probe. Since the number of base stations per one controller is typically in a scale of a few thousands, the site should be equipped with a relatively scalable probe, such as CreaNODE 3000, which scales up to 10 000 test targets. If the elements on the CreaNODE target site are virtualized, it is logical to go with a virtual CreaNODE probe alternative. A CreaNODE vProbe contains all the same functionality and scales to the same performance targets as the physical CreaNODEs. The only difference is that it is software instance and can be on-boarded to all commonly used virtualization platforms.

A smaller version of CreaNODE is optimal when the measurements are extended to cover core network connections, where the number of monitoring sessions is much smaller compared to base station access. A compact CreaNODE 500 appliance or a CreaNODE vProbe with the same scalability fits well to those needs.

With the Creanord portfolio, you can choose the right product for each location in order to optimize footprint and cost without losing a unified network performance visibility. The Creanord solution is flexible to expand to new sites and evolve to cloud when needed.

> "We were amazed to see that in a month time from deployment the amount of our five nines services increased
>
> *from 20% to 60%*
>
> – a Pan-European mobile operator"

Cost-efficient performance monitoring covering all mobile generations

Transport network performance is critical for all mobile services today and it may become a barrier for 5G service launch in the future.

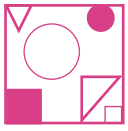
The Creanord solution is a safe, long-term choice as it builds on a solid foundation for accurate network performance monitoring covering 3G, 4G and 5G service needs of today. It is a perfect fit to multi-vendor networks and scales optimally to mobile backhaul and core transport performance monitoring. Besides the technical excellence, the Creanord solution is economically attractive because of its clear and coarse pricing model. Further, unlike with other systems, you can extend network monitoring to new service quality classes without being commercially penalized.

Specialized in network connectivity performance and SLA management - Creanord helps service providers and alike operate their network with complete visibility and uses the service quality as a competitive asset. With Creanord solution you can discover the pulse of your networks and build the confidence to sell, deliver and use the services to your customers.

At Creanord we believe in the Five V's, which sets us apart

Volume

Scales to hundreds of thousands of measured connections
Kafka API for big data
Great economical fit to growing performance monitoring needs



Variety

Compatible today with 3G, 4G and 5G application requirements
Broad range of physical and virtual measurement probes
Diverse data categorization options including arbitrary metadata

Velocity

Rapid deployment with point-and-click provisioning
Real-time measurement data for SDN/NFV automated operations
Automated SLA reporting with built-in approval process

Veracity

Microsecond accuracy in measurements
Granular reporting through down to millisecond sampling rate
Versatile testing options at L2, L3 and L4-L7

Value

Measurement and analytics as a package
Cost predictability with no hidden costs
Reliable data from top down enabling proactive and efficient operations

Stellar product technology and customer first-thinking combined with flexible operations makes Creanord your business partner of choice.

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