

PULScore™

Solution Brief



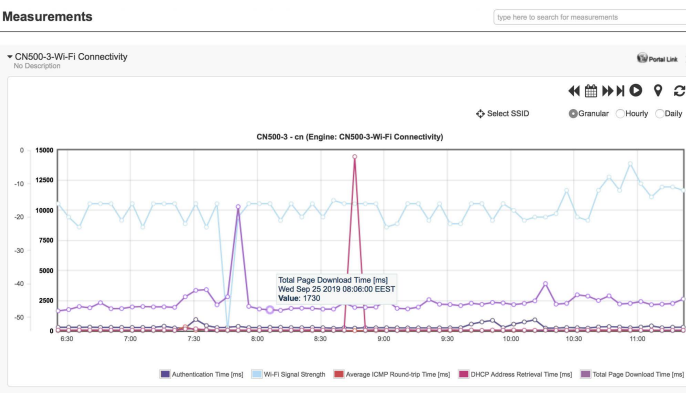
Network performance and customer SLA monitoring with superior accuracy

As a service provider the network is your most important asset. However, staying on top of its performance have become more challenging. Customers today are more critical with their service quality and services such as 5G are less tolerant even for small network impairments. High service performance has become the core factor for winning customers and keeping them satisfied.

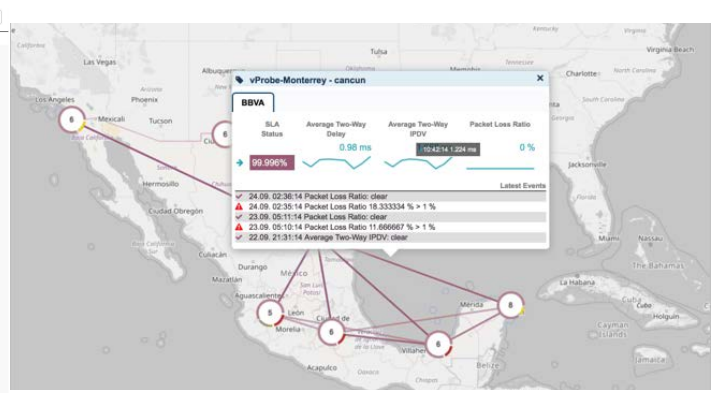
PULScore, which is the central part of the Creanord's PULSure™ performance monitoring solution, tracks accurately the network performance and builds a holistic view of the network and service quality for a service provider. PULScore collects near real time the KPIs from the measurements fulfilled by the Creanord PULSensor™ probes, calculates the Service Availability metrics according to configuration and displays results in a well-structured manner to the user. PULScore provides a set of web-based intuitive dashboards, reports, and visualizations with data correlations, which build a comprehensive picture of the network state. Service provider can quickly set up and activate measurements, whether Service Acceptance Tests (SAT) or continuous measurements across the network using the PULScore centralized provisioning tools.

The accuracy and granularity provided by the PULSensor probes combined with the analytics and intelligence of the PULScore system will identify even small anomalies in the network performance and provide insights for actions needed to isolate and fix them.

KPI view per connection



Map view



Drill-in to measurements



Dashboard View

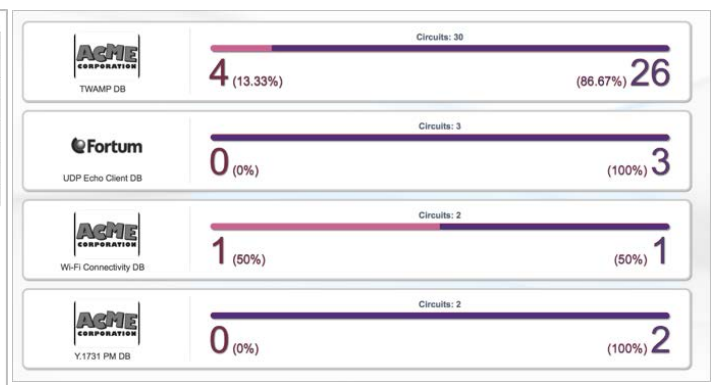


Figure 1 Examples of PULScore dashboards and reports

Versatile test coverage and visibility

PULScore enables the service provider to verify the network and service performance at different levels of functionality in different phases of the service lifecycle. Service Activation Tests (SAT), which tests the throughput, latency, jitter and packet loss even at QoS level, shall be used prior to turning on the service or as part of the troubleshooting. PULScore supports a broad set of SAT tests for L2, L3 and L4 testing including Y.1564, RFC2544 and RFC6349. Once activated the continuous active testing is turned on providing real-time information of the service quality. PULScore supports TWAMP and Creanord's NetPrecision technologies in continuous active monitoring of latency, jitter and packet loss. Additionally, the tests can be complemented with infrastructure tests and user experience tests even at application level. Moreover, detailed information of bandwidth utilization and visibility to microbursts, which are passively monitored, are accessible via PULScore with correlations to active measurements.

Intuitive reporting and up-to-date SLA information

Monitoring of end-to-end network performance with focus on service availability provides a well-rounded view of how the network is performing, with a capability to exploit performance at different levels from entire network level to regions, customers and specific services. Service Availability can be based on multiple measured KPIs – throughput, latency, jitter and packet loss on multiple levels and standards – which all have configured thresholds.

Service Level Agreement (SLA) is commonly part of the service contract between the service provider and the end-user. PULScore reports the SLA compliance by calculating the service performance from the KPIs and comparing it with the SLA commitment. Real-time SLA views help to ensure the performance targets of service provider network are being met, whether they are based on external SLAs or internal service level objectives.

Test results and calculations are made available via intuitive dashboards and reports, which are directly downloadable from the PULScore minimizing the need for manual work and unnecessary data exports. These SLA report documents are generated automatically at a configured interval. Additionally, using the PULScore Portal, the service provider can share real-time and historical SLA reports to a customer via a multi-tenant web portal. The portal can also be used for service provider internal communication.

Efficiency for troubleshooting

PULScore optimizes the service provider workflow in daily tasks such as service monitoring and troubleshooting. The user can instantly see the big picture of the network and service status from configurable dashboards and map view and when needed navigate from top level to the details within the right context. Network analysis and troubleshooting can be further facilitated using arbitrary metadata tags, which makes it easy to filter the data from a complex network for building conclusions. When multiple measurements are correlated in one view it is possible to better understand the overall performance, dependencies and impacts of events. With these tools to the service provider will reduce time and resourcing in troubleshooting, which not only saves costs but minimises the customer business disruption.

While monitoring, reporting and troubleshooting are central use cases for PULScore the network optimization and capacity planning are other important areas where it provides valuable information. With the holistic and accurate multi-level performance data the service provider can easily pinpoint the weakest links in the network and proactively do corrective actions and focused investments for the future.

Automation for process optimization

Network and service monitoring is one important piece of the service provider operational ecosystem, which is in a constant move towards automation. PULScore offers open, well documented APIs such as REST APIs and Kafka, through which the service provider can seamlessly integrate accurate performance monitoring into their overall processes.

	PULScore use cases
Mobile backhaul	<p>Cost-effective assurance of mobile network performance using a centralized PULSensor 4000 running continuous TWAMP measurements and versatile SAT tests against base stations. Great scalability and superior accuracy make the system inherently ready for 3G, 4G and 5G technologies. PULScore enables quick configurations and set-up for the measurements even in a large, multi-vendor mobile networks.</p> <p>Additionally, using the PULScore the service provider can augment the testing to user experience testing and bandwidth utilization monitoring.</p>
Core and carrier	<p>Accurate and highly granular performance view across the core network. Point-and-click provisioning of measurements based on different topologies between the PULSensor probes makes the system fast to deploy even in large core networks.</p> <p>Via PULScore the service provider can identify and react to even small latency, jitter and packet loss impairments, which pose a risk for a large amount of services.</p>
Wholesale	<p>Testing and monitoring the end-to-end connectivity performance and SLA compliance of a wholesale service, which may be a basis for mobile or enterprise services. Measurements are easy to provision centrally via PULScore UI. Depending on the wholesale service – L2 or L3 – the service provider can leverage different test types from PULScore. Additionally, testing can be extended to application level and bandwidth monitoring.</p>
Enterprise	<p>Enterprise service – site to site, within the site or broadband access – monitoring and SLA reporting to the customer. With the same PULScore system the service provider can monitor the Wi-Fi network performance as well as network infrastructure performance and user experience. Downloadable SLA reports, which are automatically built in PULScore, can be shared as files or via online Portal to the end-customer.</p>
Cloud	<p>Cloud access or cloud internal performance monitoring making use of PULSensor Virtual probes, which scale well from small to large testing needs. PULScore provides an accurate and reliable visibility to the cloud service infrastructure and helps to detect and locate needs for optimization. Using the APIs the PULScore can be seamlessly integrated to the overall cloud infrastructure.</p>
Critical comms	<p>Cost efficient and reliable means for monitoring the quality of a private critical comms network such as security, transport or utility. Detecting and predicting any anomalies in the network minimizes the risk for disruptions of mission critical services.</p>

Key features and benefits

Feature	Benefit
Microsecond level measurement accuracy	> Discover issues before they impact customer service – even in 5G
Active and passive monitoring combined	> Complete view of the network state including latency, jitter, packet loss and bandwidth utilization via a single system
Broad range of test types for turn-up and continuous monitoring	> Ability to validate network and service performance part of different use cases in all phases
Graphical point-and-click Test Topology Designer tool for provisioning	> Quick set-up time with minimal operational costs
Automated reporting and SLA management	> Real-time and transparent reporting to customers directly from the system
Configurable Dashboard views with drill-ins to KPIs	> Maintain constant visibility to network performance and focus areas. Rapid troubleshooting and problem isolation.
Metadata tags	> Versatile filtering and categorization for efficient troubleshooting, reporting and network optimization

System properties

- Carrier-grade network performance monitoring and SLA management
- Scalability to million active measurements per system
- Granular role-based user access control
- Map visualization with segmented performance views
- Point-and-click measurement circuit provisioning
- Continuous active testing with Ethernet/IP test targets allowing running tests in multiple QoS classes per test target
- Event management with configurable thresholds with proactive Service Level Threshold (SLT) warning
- Configurable Performance Dashboards* with drilldowns to active and passive measurements
- Real-time and periodical (configurable weekly, monthly, quarterly) SLA reporting (provider branded)*
- Interactive Portal for real-time performance & SLA reporting *
- Service Acceptance Testing (SAT) with provider branded SAT reports as Birth Certificates *
- Integration APIs*

Technologies and Interfaces

Technology	Details
Continuous active monitoring	Y.1731, TWAMP (RFC5357), UPD Echo, ICMP Ping Creanord NetPrecision (PULSensors as test generators)
SAT testing	Y.1564, RFC2544, RFC6349 and iPerf3 (PULSensors as test generators)
Nortbound APIs**	REST API, RESTCONF, Kafka, CSV
Southbound interfaces	SNMP
Database	Postgre as embedded database and data repository

*License required

**See separate data sheet

About Creanord

Creanord designs and delivers network performance quality solutions that build confidence and readiness for communications service providers to create and sell services with service level agreements (SLAs) and quality guarantees.

Creanord PULSure™ is a design framework used for network performance and experience-tracking to customer-specific needs at a fraction of the cost, time and effort of conventional systems. The PULSure solution enables you to set, offer and track network experience-based SLAs and key performance indicators (KPIs) with superior accuracy, giving you insights about the metrics such as speed, latency, jitter, and availability that go far beyond those reported by conventional systems. With the PULSure the service provider gains and preserves end-to-end situational awareness, performance visibility and control needed to automate, continuously optimize network performance and prevent negative impacts, to meet the most demanding service needs.

Already since 2000 Creanord has served customers globally, operating the most demanding networks and connectivity applications.

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