

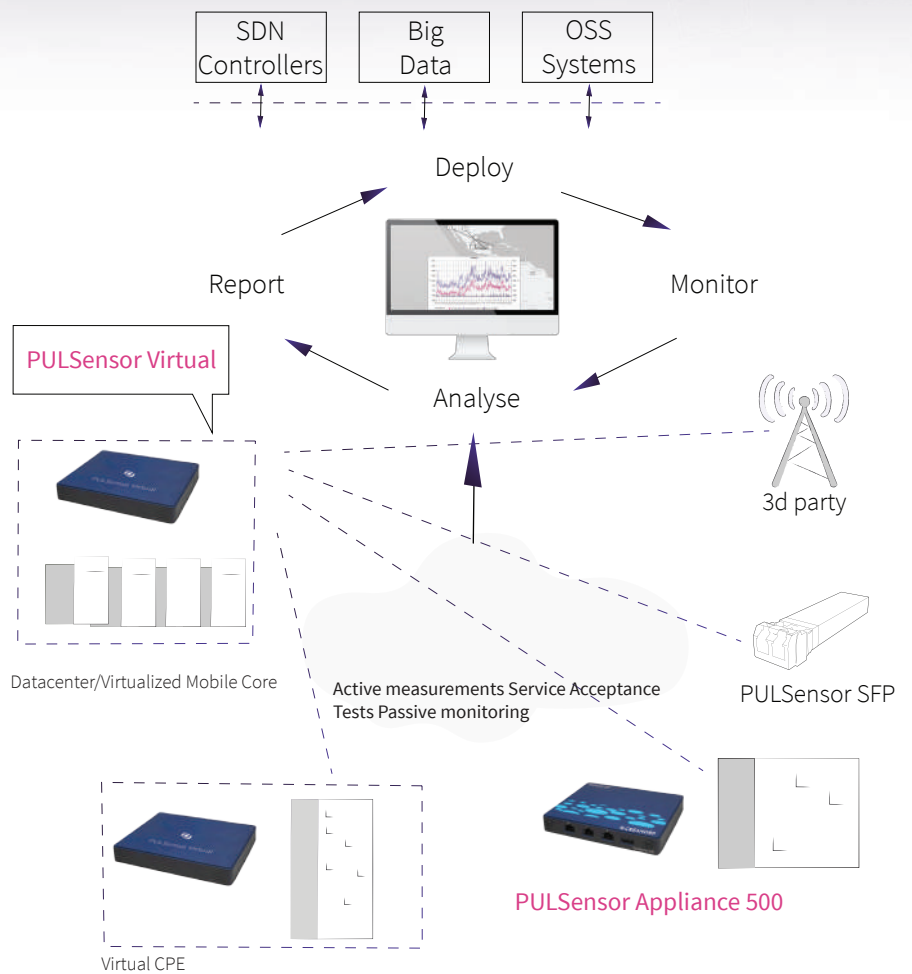


PULSensor Virtual

Data Sheet

Highlights

- Precise microsecond level measurements and granular reporting
- ▽ Broad set of measurement types including active and passive measurements and service activation tests
- Multiple variants from small uCPE variants to highly scalable central probes for any application
- Support for all major hypervisors
- ▽ Docker containerized probe for integration with different white-box appliances



Deterministic Performance for Virtualized Networks

Ongoing transition from traditional hardware installations to cloud has increased demand for software-based products, which can share a common, virtualized server platform and scale flexibly. PULSensor Virtual are Crenord's software-based performance measurement probes, which technically and economically fit to various service provider use cases where virtualization is required.

The PULSensor Virtual portfolio deploys the same market leading performance monitoring and SLA management technology as used across all PULSensor Appliances. On top of this, Creanord's PULScore provides a clear visibility to all measurements and analytics both in real-time and as history reports.

Today, the most common locations for the PULSensor Virtual are data centers of different sizes, which run mobile core applications or business services in a single consolidated location. The PULSensor Virtual, which measures and monitors the connectivity between the data center and a mobile base station or business customer, can now be deployed on the very same virtualized platform with all the other applications. Additionally, the PULSensor Virtual can be used within a data center to monitor interconnectivity between chained NFVs. Alerts upon threshold violations can be instantly fed via REST API, for instance, to SDN controllers and NFV Orchestrators, which automate operations according to service provider defined rules and configurations. Another popular application for the CPULSensor Virtual is a virtual CPE (vCPE), which may be a white box type appliance located at the customer premises or in a small data center nearby. With the vProbe the service provider can remotely test service connectivity throughout the service lifecycle including service launch, monitoring, troubleshooting, and reporting.

Superior measurement accuracy and reporting granularity technology makes Creanord a safe, long-term choice for any service provider. Measurement accuracy combined with a broad set of standard based measurements ranging from L2 and L3 to application level complemented with Creanord specific NetPrecision gives service provider a comprehensive visibility of network quality and impact on customer services. Creanord's long-term co-operation with Intel has been a key for achieving a distinguished performance and scale lead in both Virtual and Appliance PULSensors. Since scale requirements vary between use cases, the PULSensor Virtual is available in different variants, which can be installed on all commonly used virtualization platforms and beyond.

Measurement	Key Performance Indicators (KPIs)	Unique features
Active testing and monitoring		
NetPrecision	One-way measurements for: Delay, Delay Variation, Packet Loss Two-way measurements: Delay, Delay Variation, Packet Loss	1 ms accuracy in one-way KPIs (probe to probe) Test Topology Designer
TWAMP (RFC 5357)	One-way measurements for: Delay, Delay Variation, Packet Loss Two-way measurements: Delay, Delay Variation, Packet Loss	1 ms accuracy in timestamping, Peak-to-Peak IPDV, custom percentiles
UDP Echo	Two-way measurements: Delay, Delay Variation, Packet Loss	1 ms accuracy in timestamping, Peak-to-Peak IPDV, custom percentiles
Ethernet OAM (Y.1731)	Two-way measurements: Delay, Delay Variation, Packet Loss	1 ms accuracy in timestamping
Ping (ICMP)	Two-way measurements: Delay, Delay Variation, Packet Loss	Percentiles
TCP Connect	TCP connect, DNS resolution time	Includes DNS measurement
System acceptance testing, Troubleshooting		
RFC 2544 testing	Bandwidth, Two-way Delay, Delay Variation, Packet Loss	1 ms accuracy in timestamping

Ethernet service activation test (Y.1564)	Bandwidth, Two-way Delay, Delay Variation, Packet Loss, Availability	1 ms accuracy in timestamping
TrueTCP (RFC 6349)	TCP Throughput, Transfer Time Ratio, Buffer Delay	1 000 000+ connections (dependent on the vProbe variant)
Passive monitoring		
eXtended SNMP polling	Delay, Packet Loss, Bandwidth, Capacity etc.	Distributable and flexible

Standards

Standard	
RFC 5357	TWAMP Control Client TWAMP appendix 1 "TWAMP light"
RFC 6349	TCP Throughput
ITU-T Y.1564	Service Activation Testing
ITU-T Y.1731/802.1ag	Ethernet Loop-back (ETH-LB)
ITU-T Y.1731	Frame Delay Measurement (ETH-DM), Synthetic Loss Measurement (ETH-SLM)
RFC 862	UDP Echo
RFC 792	Internet Control Message Protocol (ICMP)
IEEE 1588v2	Precision Time Protocol (PTP)
RFC 958	Network Time Protocol (NTP)
RFC 2544	Network Benchmarking
RFC 2865	RADIUS Authentication
RFC 4511	LDAP Authentication

Product variants

	PULSensor Virtual 100	PULSensor Virtual 200	PULSensor Virtual 500	PULSensor Virtual 3000
Number of measurement sessions	50	100	500	10000

HW timestamping*	No	Yes	Yes	Yes
Active testing	Yes	Yes	Yes	Yes
eXtended SNMP polling	Yes	Yes	Yes	Yes
TrueTCP testing	No	No	<1G	<100G
Ethernet SAT Y.1564	No	No	<1G	<10G
CreaSFP management	No	No	Yes	Yes

Installation requirements / recommendations

	CreaNODE vProbe XS	CreaNODE vProbe S	CreaNODE vProbe M	CreaNODE vProbe L
Platform**	Docker Container	OpenStack KVM VMware Microsoft Azure	OpenStack KVM VMware Microsoft Azure	OpenStack KVM VMware Microsoft Azure
vCPU	Shared	2	4	8+
RAM	256 MB	1 GB	8 GB	8 GB+
Storage	500 MB	2.6 GB	2.6 GB	2.6 GB
Network adapter/ driver		Virtualized Intel e1000 driver	Dedicated 1 GE NIC	Dedicated 10/100 GE NIC

*HW timestamping requires a specific driver. Contact Creanord sales for more details.

**Contact Creanord sales for additional platform support



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