

5x9 Lightweight Monitoring System

Highlights

5x9 Lightweight Monitoring System is designed to assure full network and services visibility, incorporated with high scalability and maximum flexibility.

System supports thousands of hardware-agnostic distributed Probes that are configured and managed from a central location via IP protocol.

The measurement software modules and configurations on the Probes are distributed from the central location, which also automatically collects and analyses all measurement results.

Key Features

- System support for thousands of distributed Probes
- Centralized system configuration and management
- GUI and API system configuration
- Security design that assures safe exposure to public Internet
- Alerting via fixed thresholds or patterns using Machine Learning
- Simplified and fair license policy
- New software measurement modules and system features subscription included in SLA
- Remote Probes are platform/HW agnostic – x86, ARM, VM, Docker and Android
- List of already available software measurement modules assures full network and application visibility
- Remote troubleshooting support via remote capture and test execution
- Simple integration with 3rd party analytics systems

Product Overview

5x9 Networks has employed 100 years of in-house IP and telecommunication experience in Lightweight Monitoring System with only one goal - to build a system that will assure full network and application visibility. We understand the network you use (fixed and mobile), supporting platforms that are the enabler for the network to operate (Radius, Diameter, DHCP, DNS, etc), and all applications that you run on top to provide services to your internal and external customers (VoIP, IPTV, HTTP, etc.). And we can monitor availability and measure the performance of them all.

During Lightweight Monitoring System (LMS) development we had maximum focus on end-user value combined with simplicity and flexibility. Just check our Licensing policy and you will immediately realize that LMS is a platform with exceptional value, especially since new software modules and features subscription are included within valid SLA. Our System easily scales to thousands of distributed Probes that are centrally configured and managed. All activities related to Probes, like pushing measurement software and configuration, are centrally performed with a single GUI click or API call. All raw performance data from remote Probes are automatically uploaded to the Node Manager on the central location for analysis, visualization and alerting, or performance data can be easily exported to 3rd party analytics systems using an embedded message broker.

Architecture and Key Components

5x9 Lightweight Monitoring System has three main components:

- Node Manager
- Probe Software and Measurement Modules
- Software Framework for communication between the Node Manager and the Probes

Node Manager is the central brain of the system that communicates with remote Probes. It pushes to each Probe instructions what should be measured, how often, and collects measurement results. The Node Manager is deployed on a central location in redundant fashion, ensuring continuous uptime.

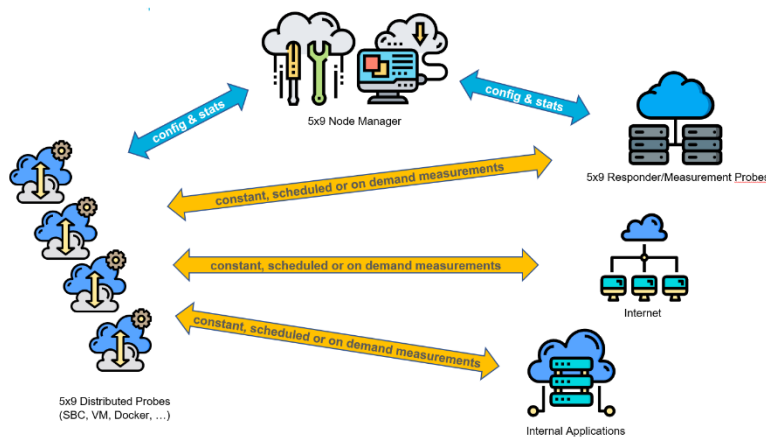
Probes consist of the underlying software which enables zero-touch communication with the Node Manager and the measurement modules which are responsible for a specific measurement or set of measurements. All software measurement modules that are fetched from the Node Manager are digitally signed and hashed. Before software installation, the Probe will check if content has been altered during transmission for maximum security.

All communication between Node Manager and remote Probes, like measurement software distribution, configuration, and performance data delivery uses the Software Framework. It is a hidden component which uses TLS for communication between various system components in order to ensure security.

Node Manager

Node Manager is the central system component designed for automated Probe configuration and management. Main Node Manager tasks are:

- Manage registry and configuration of all network Probes
- Assign measurement modules and module configuration to each network Probe
- Measurement data collection, performance visualization and performance alerting based on predefined thresholds or machine learning



Probe Software and Measurement Modules

Probe Software is a platform-specific software image or package for Linux OS including zero-day configuration required to contact Node Manager with the goal of automated configuration and management. It runs measurement software modules and reports raw performance data to Node Manager. Probe software images are currently developed for SBC (RPI, NanoPi, ...), Docker, VM and Bare Metal deployments.

Measurement modules are standard and custom-developed Probe modules responsible for a specific measurement or set of measurements. Currently, there are 5 types and over 20 different measurement software modules that are covering both fixed and mobile networks services and applications. More details related to Measurement software modules can be found in the technical specification.

Software Framework

Software framework is a hidden system component that glues Node Manager to distributed Probes and enables remote Probe configuration and management, distribution of measurement modules and corresponding configurations, performance data collection and processing. This component is run on both previously mentioned components, the Node Manager and Probe.

System licensing

5x9 Networks has an extremely simplified and fair license policy – only the number of installed Probes is licensed. Node Manager and Software Framework are not licensed, but there is a one-time installation fee for initial system setup.

Measurement Modules are also not licensed. 5x9 strongly believes that measurement modules are a constituent part and a true value of the system, so a customer with valid support is subscribed to all measurement modules available now and developed in the future. It means that 5x9 will deliver all future developed measurement modules to all existing 5x9 system installations.

Four types of 5x9 Lightweight Probe licenses exist:

- Micro Probe – 1 installed measurement module
- Small Probe – up to 5 installed measurement modules
- Medium Probe – up to 10 installed measurement modules
- Large Probe – 10+ installed measurement modules

Technical specifications

Measurement Software Modules

Network:

TWAMP (IETF)
Network performance (delay, loss, OoO and jitter)
Network BW (TCP and UDP throughput)
Latency (ICMP latency)
SpeedTest

Applications

Radius
Diameter (Q3/2021)
DHCP
DNS
Database
HTTP(S)
YouTube P3
File Download P3
FTP
TFTP
NTP
IPTV (multicast and unicast)
SIP (signaling and media)
POS (SPDH POS terminal emulation)

Mobile

SMS (2/3G, SMSoIP, SMSoLTE, Q3/2021)
2/3G CS Voice (CSSR, CST, MOS, Q3/2021)
VoLTE (CSSR, CST, MOS, Q4/2021)
LBS (Q3/2021)

Frameworks

PPPoE
WiFi
Android (Q3/2022)

Security & Troubleshooting

Security Scan
Traffic Capture