# Overview

The KPC fiber plant and network shall be managed using an industrial grade Network Management System – Spiktel NMS to provide visibility to all assets of the fiber plant in real time.

# NMS for KPC – Spiktel NMS

**Spiktel NMS** is a carrier-grade, highly integrated, Network Monitoring System capable of monitoring large scale and high event networks.

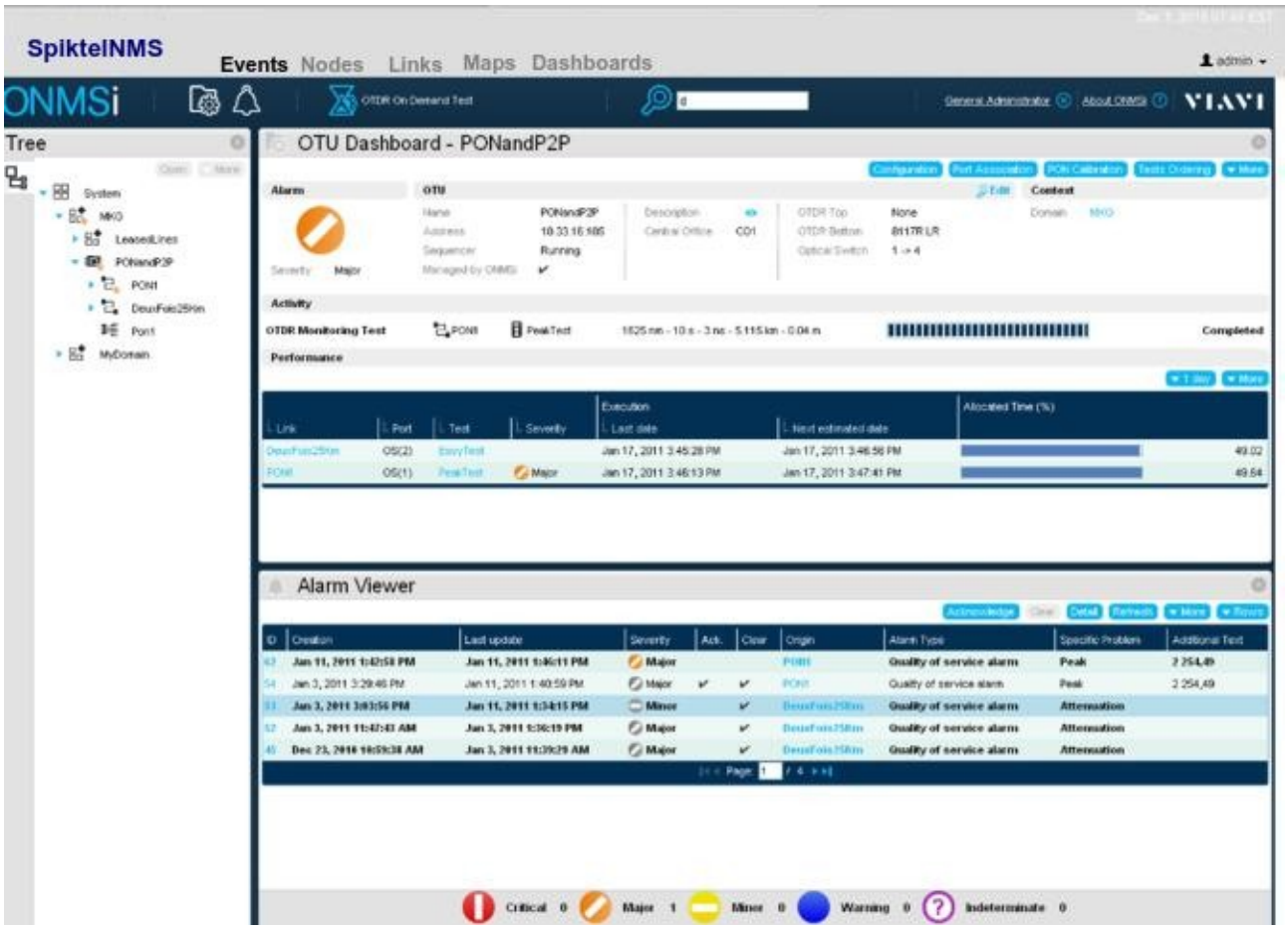
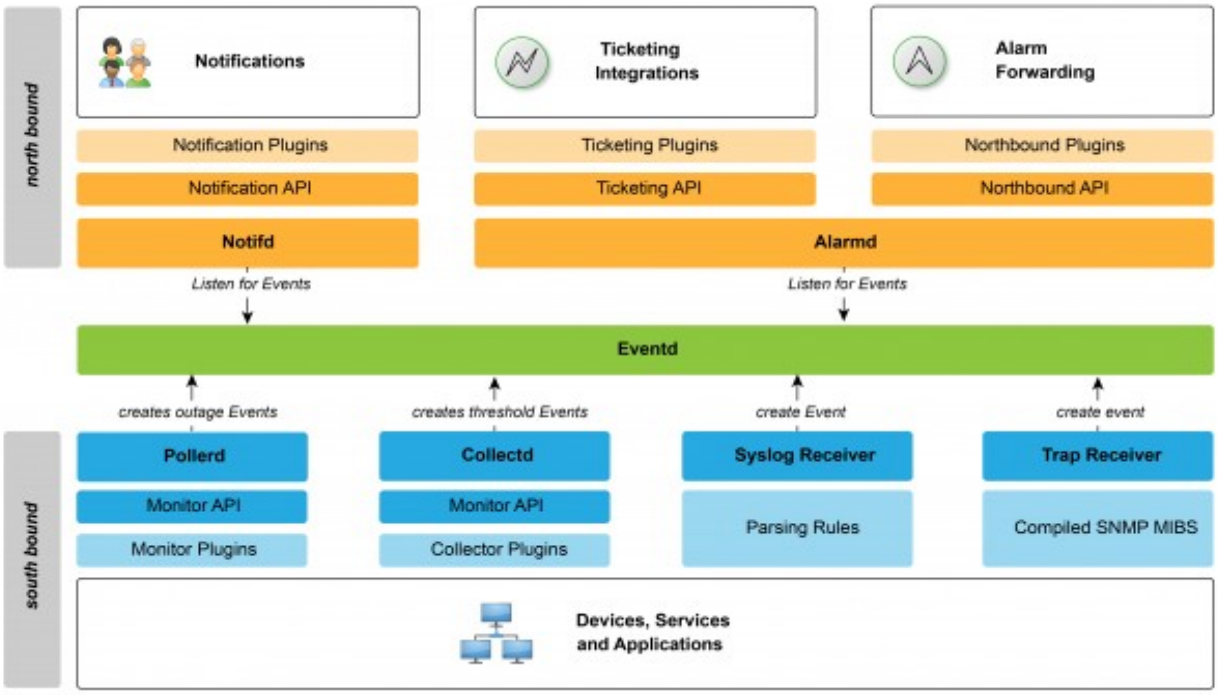



*Figure: High level monitoring views of Spiktel NMS*

An event-driven architecture allows flexible workflow integration in existing monitoring and management stacks.




*Modular architecture of Spiktel NMS*

With its extensible architecture the Spiktel NMS is the best fit solution for monitoring needs of any large scale network or fiber plant future proofing the network needs as it grows.

The modular architecture of Spiktel NMS facilitates separation of concerns for the following capabilities critical to a best of breed Network Management Solution:

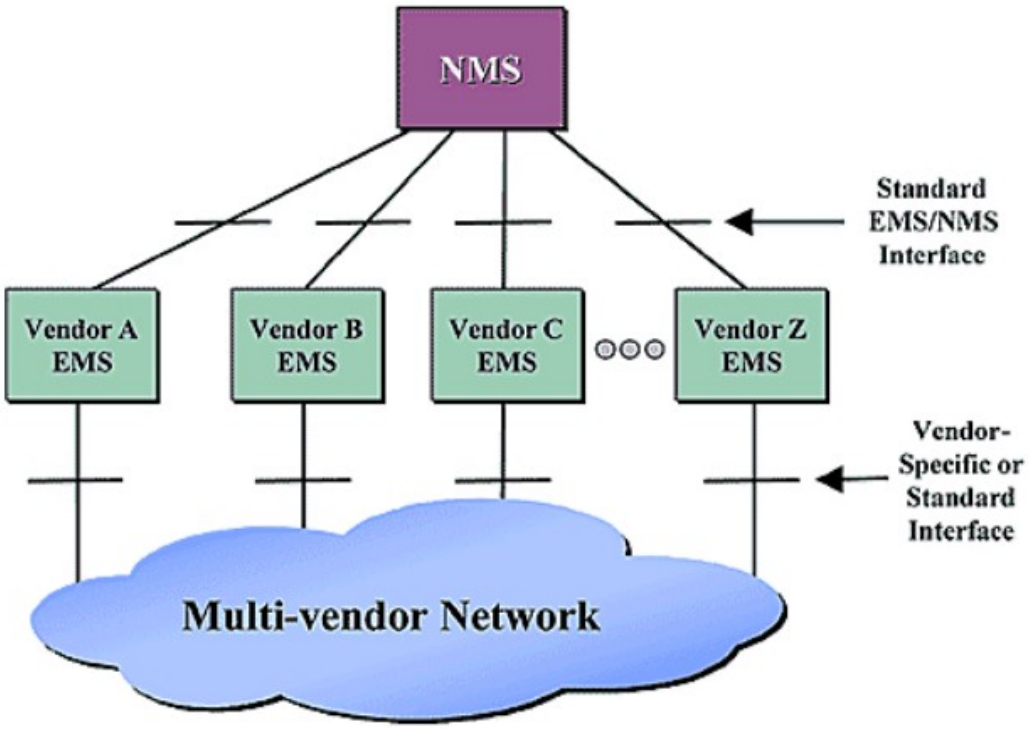
- ***Extensibility*** Each of the north bound and south bound interfaces are tuned for maximum flexibility to integrate with 3rd party components as well as standard interfaces providing extenisble support for
- ***Scalability*** The individual modules can be optimized to manage the network throughput and ingress and egress event rates as well configuration management requirements of the network. In case of ***High Throughput*** events the monitoring capabilities scale to meet the need.
- ***Security*** Besides the network controls available for a private network based deployment, the Software components use IETF standards and TMN Forum approved Access Authentication and Authorization software components to provide a carrier grade security framework.
- ***High Availability*** The modular design separates the data storage from the application software that can be deployed, per need of the network, in an active-passive High Availibility configuration.

Spiktel NMS provides:

- A 24x7 physical layer fiber monitoring system
- Proprietary OTDR technology with optical switch to test multiple fibers
- Ruggedized, remote units to continuously tests fibers in all conditions
- Comprehensive network reporting, trends analysis and alarm management
- Customizable user interface

## Inter-operation with Device EMSs

As defined in the TMN framework for Network Management Systems, a NMS like Spiktel NMS bridges the Element Management Solutions using standard EMS/NMS interfaces. The device specific Management Solutions are integrated into the Spiketel NMS as per the monitoring and management capabilities of the pertinent device.




*TMN architecture for NMSs*

Here, for a fiber plant with diverse managed devices (NE)s the Spiktel NMS integrates with ONMSi which provides EMS capabilities in the larger context of the overall KPC deployment.

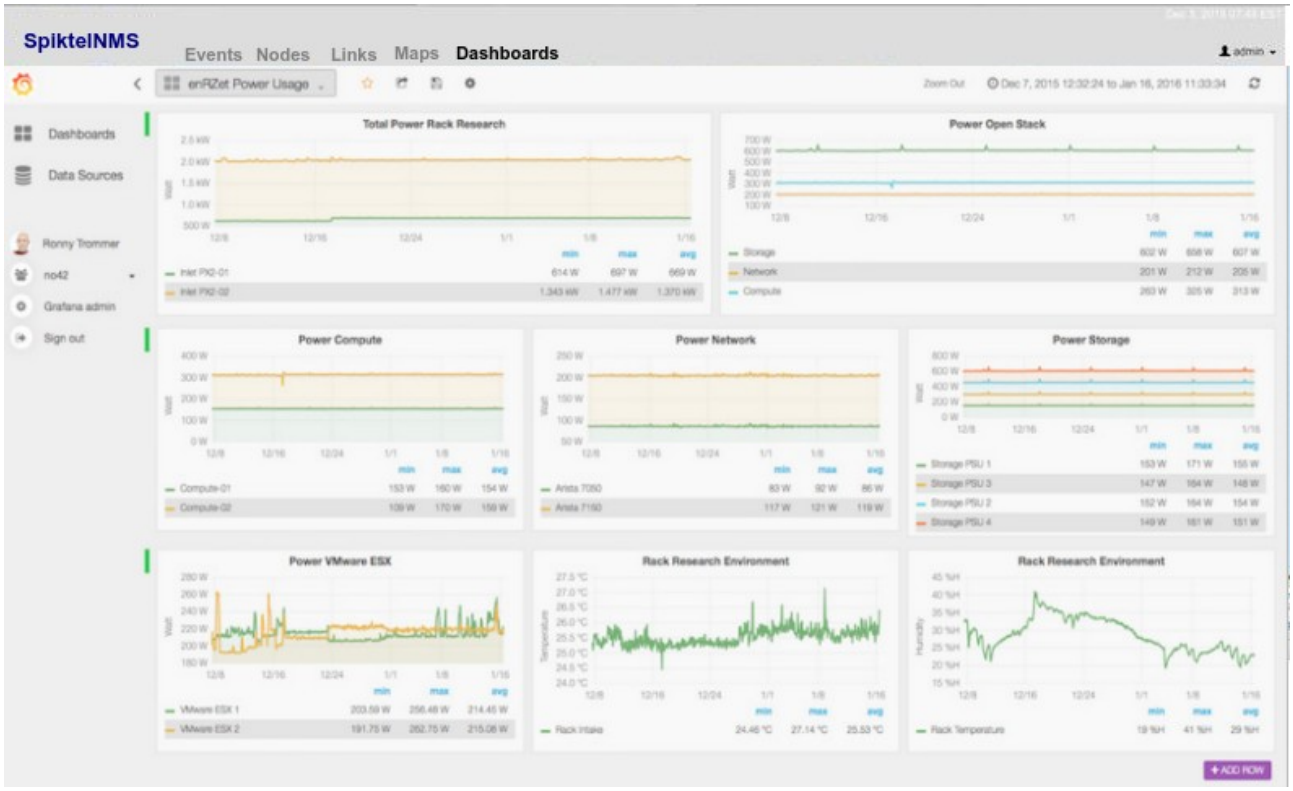
***Such a deployment facilitates future expansion of the Network Management framework for extending it to diverse managed devices from different vendors.***

Spiktel NMS normalizes device- and vendor-specific messages and protocol-specific performance measurements. Based on robust open technologies, the data are accessible through a powerful ReST API and can be used in high level management workflow applications.

The design permits an ease of deployment and a speedy implementation in out-of-box configurationa as it leverages standards based interfaces between the ONMSi and the Spiktel NMS as per TMN forum standards.

## Critical Events Monitoring

To provide more flexibility for performance data visualization the project built a Grafana data source for Spiktel NMS. It allows to build highly customizable and interactive performance dashboards for a variety of use cases across different device types.

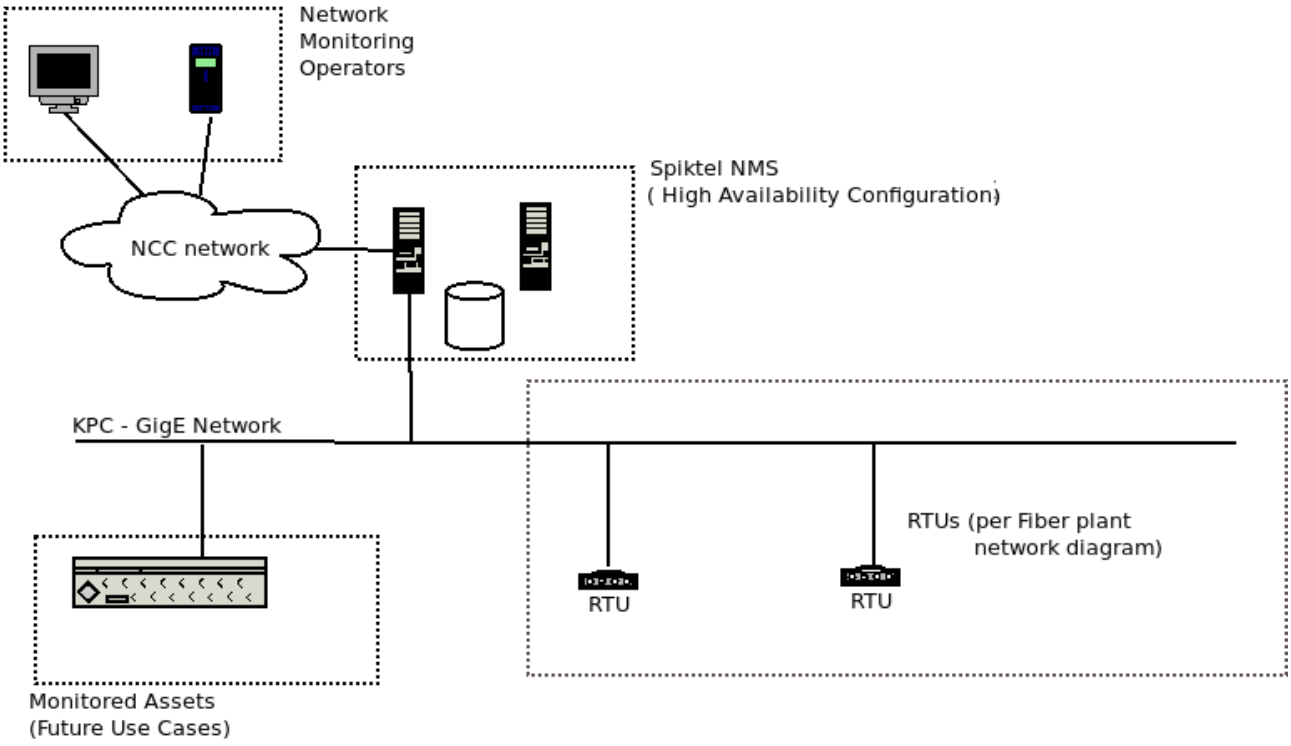



*Custom dashboards integrated with external graphing tool - Grafana*

Collect performance metrics from industry standard agents via SNMP, JMX, WMI, NRPE, NSClient++ and XMP simply through configuration. Gather performance data from applications via customizable generic collectors with HTTP, JDBC, XML or JSON.

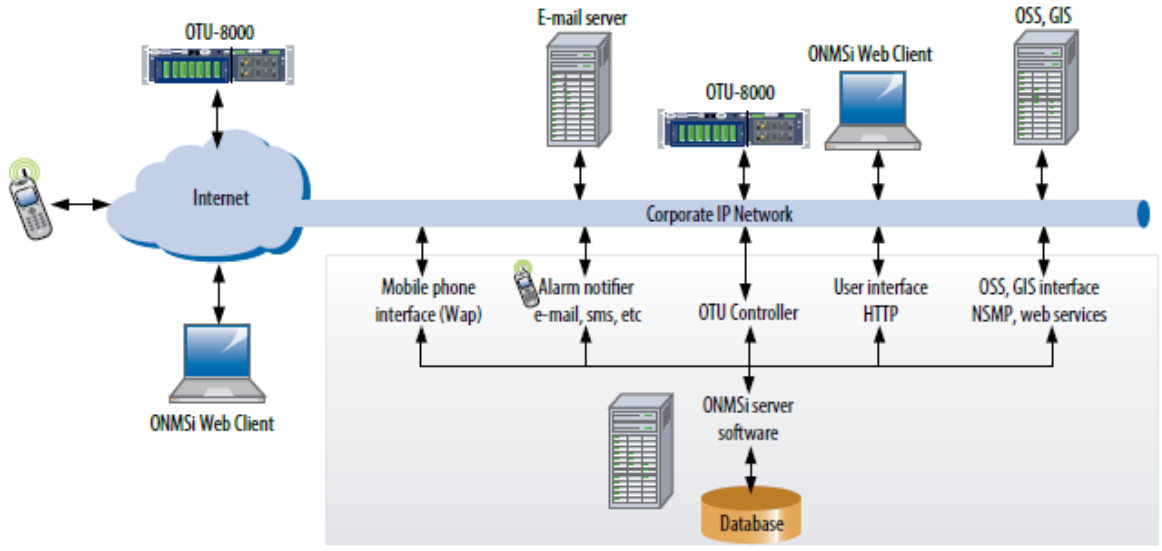
# KPC Solution Design

The NMS (Spiktel NMS) shall be deployed at the Nairobi Control Center (NCC). The Spiktel NMS Server shall be installed at the Nairobi, with monitoring agents at pre-destined monitoring points along the fiber, as noted in the RTU network diagram (see attached with the bid)




The RTU specific EMS (ONMSi) receives alerts on basis of parameter data from the RTUs and these are centralized at the Spiktel NMS to generate alerts via email/screen based alerts at the NCC

### Scalable System from One up to Hundreds of OTUs



## Proposed Network Layout: KPC Project Specific