Network Management as a Service

Platform for Multi-Tenant Network Management

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Global Research Platform Workshop
September 21\textsuperscript{st} 2021

www.geant.org
GÉANT (GN4-3) WP6 T3 in brief

WP6 – Network technologies and services development
  Task 1 – Network technology evolution
  Task 2 – Network services evolution and development
  **Task 3 – Monitoring and Management**
    perfSONAR
    PMP – Performance Measurement Platform
    NMaaS – Network Management as a Service
    WiFiMon
    CNaaS – Campus Network management as a Service
    Streaming telemetry
    High speed monitoring (100 Gbps and beyond)
    P4-based unsampled flow monitoring on high speed links
NMaaS in a nutshell

What?
“Market place” offering Network Management ... in the cloud
Production service developed and maintained by the GÉANT Project

For whom?
NREN End Institutions, GÉANT Project teams, and NRENs

Why?
To ease network management and monitoring software deployment, configuration and maintenance
To allow users to focus solely on managing their services
NMaaS Portal

Applications

Search

Tags all

Sort Top rated

Oxidized
Network device configuration backup tool

Booked
Web-based calendar and schedule

LibreNMS
Autodiscovering SNMP based network monitoring tool

Grafana
Open source analytics & monitoring solution for every database

statping
Status Page & Monitoring Server

Prometheus
Monitoring system & time series database

Bastion
Bastion server based on Ubuntu OS

esmond
Central Measurement Archive

perfSONAR

Central Management

SPA Inventory

ELK Stack

WiFiMon

perfSONAR

GEANT

ELK

WiFiMon

GEANT
How NMaaS works

Shared **cloud platform** managed by the GÉANT Project

Each user gets an **isolated** tenant environment connected over a secure **VPN** to his network

Tool deployment and access via a **web portal**
NMaaS Multi-Tenancy Support

NMaaS service provider

Domain A
Domain B
Domain C
Domain D

Institution A1
Institution A2
Institution A3

NREN B
NREN D

Institution C
NMaaS System

Software components
• NMaaS Platform
• Domain and user management
• Tool deployment process orchestration
• NMaaS Portal
• Web-based user front-end

Tools (packaged applications)
• Docker images
• Helm charts

Infrastructure
• Kubernetes
• VPN
• Networking
## NMaaS Tools

### 23 applications available in the marketplace

<table>
<thead>
<tr>
<th>Oxidized</th>
<th>Bastion</th>
<th>perfSONAR</th>
</tr>
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<tbody>
<tr>
<td>LibreNMS</td>
<td>Statping</td>
<td>GÉANT</td>
</tr>
<tr>
<td>NAV</td>
<td>SPA Inventory</td>
<td>GÉANT</td>
</tr>
<tr>
<td>Prometheus</td>
<td>Debian repository</td>
<td></td>
</tr>
<tr>
<td>Grafana</td>
<td>ELK Stack</td>
<td></td>
</tr>
<tr>
<td>Booked</td>
<td>Synapse</td>
<td>WiFiMon</td>
</tr>
<tr>
<td>Routininator</td>
<td>InfluxDB</td>
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<td>CodiMD</td>
<td>Icinga</td>
<td>Victoria Metrics</td>
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Adding new Tools

• ...or new versions
• At the moment done by the NMaaS team
• **Possible** based on user request
• Requirements
  • Docker image(s)
  • Helm chart
  • Metadata and information about the application
NMaaS Tool Deployment Process
Who is using NMaaS?

• NRENs + GÉANT
  • CYNET
  • HEANET
  • PSNC
  • ARNES
  • SURFnet

• End institutions
  • Franja Malgaja Primary School / ARNES
  • University of Murcia / RedIRIS
  • Friedrich Alexander Universität / DFN

• GÉANT Project teams
  • Performance Measurement Platform (PMP)
  • RARE project
  • perfSONAR development team

• Tool developers
  • perfSONAR
  • WiFiMon
  • SPA Inventory
NMaaS for CNaaS

Fills the infrastructure gaps observed by CNaaS institutions

CNaaS institutions – Campuses or Schools – don't want to manage

- The infrastructure needed to manage networks
  - NMaaS provides the infrastructure
- The tools needed to manage networks
  - NMaaS provides and maintains the tools

Assists CNaaS operators and managers

CNaaS operators and managers don't want to have a separate monitoring infrastructure for each network they manage

- NMaaS enables multi-tenant usage
- A domain per network
- Multiple domains per user / CNaaS operator
How can you use NMaaS service?

To try NMaaS out or test offered applications use NMaaS sandbox instance: https://nmaas.geant.org
(no configuration overhead, demo applications already deployed)

To set up your own NMS on the central GÉANT NMaaS NMaaS production instance: https://nmaas.eu
(secure, fully supported)

To run your own instance of NMaaS visit NMaaS Installation Guide: https://wiki.geant.org/display/NMAAS/NMaaS+Installation+Guide
NMaaS next steps

• **Add IPv6 support** (doable after Kubernetes 1.21)

• **Build the community** - define the process of having application maintainers from outside of the NMaaS team with some automated processes of publishing new versions of applications on the Portal

• **Further technical improvement:**
  • this possibility to deploy local K8s cluster + NMaaS with few clicks to ease the testing process (mention above)
  • enabling federation between multiple instances of NMaaS mostly to share the application portfolio