NMaaS as a platform for management service outsourcing

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Why do we need NMaaS?

The **cost and complexity of developing** and integrating in-house network management **may be too high** for many NRENs and Institutions.

Out-of-the-box solutions might not be suitable and might be costly.

NMaaS aims to support these users to provide an **effective, efficient** network and service **management platform**.
What NMaaS offers?

NMaaS simplifies intra-domain network management by providing the infrastructure and tools for building a cloud-based, network management system.

It enables management and monitoring of client networks through on-demand deployment of network management tools in the cloud infrastructure.

Using a multi-tenant approach, each NREN or Institution has private access to their network and services from a highly available cloud-based platform.
Who is NMaaS for?

Small and Emerging NRENs
Campuses
Small Organisations / End institutions
Distributed research projects
Other teams within the GÉANT Project
How NMaaS works?

- NMaaS uses a secure shared cloud platform managed by the GÉANT Project
- Each user has a isolated tenant environment connected over a VPN to his network
- Users can deploy and access network management applications via a web portal

Central NMaaS production instance operated by the GÉANT Project
Possibility to deploy NMaaS by organisations willing to provide it to their users
NMaaS Architecture

NMaaS components

• **NMaaS Platform**: Tool deployment process
• **NMaaS Portal**: Web-based user front-end
• **NMaaS Tools**: Packaged applications

Goals

• Easy to install and use
• Easily extendable with more tools
• Federated login

Both tools and NMaaS components are run in Kubernetes

Secure connectivity provided by OpenVPN
NMaaS tool deployment process

1. **Login**
   - Username
   - Password
   - Login

2. **Prometheus**
   - **Power your metrics and alerting with a leading open-source monitoring solution.**
   - **Details**
   - **Deploy**

3. **Deploy new instance of Prometheus**
   - **Instance name**
   - Prometheus
   - **Submit**

4. **Installation progress**
   - **Subscription validation**
   - **Environment creation**
   - **Setup connectivity**
   - **Apply app configuration**

5. **Prometheus**
   - **Prometheus access username**
   - **Prometheus access password**

6. **Targets**
   - **demo-job (1/1 up)**
   - **Endpoint**
     - **http://10.1.0.1:9100/metrics**
   - **State**
     - **UP**

7. **App container deployment**
   - **Go to app**
   - **Update**
   - **Undeploy**

8. **App running**
   - **Global scrape**
     - 15s
   - **Global evaluation**
     - 30s

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Who is using NMaaS?

- End institutions
  - Franja Malgaja Primary School (OSFM) / ARNES
  - Friedrich-Alexander-University (FAU) / DFN
- NRENs
  - CYNET (with intent to offer the service to end institutions)
  - PSNC (distributed research infrastructure)
- GÉANT Project Team
  - PMP: Performance Measurement Platform (central servers and particular nodes)
NMaaS Tools Portfolio

**Oxidized** - Oxidized is a simple open-source device configuration backup tool exposing a web-based GUI

**LibreNMS** - LibreNMS is an auto-discovering PHP/MySQL/SNMP based network monitoring system which includes support for a wide range of network hardware and operating systems

**NAV** - Network Administration Visualized (NAV) is an advanced software suite to monitor large computer networks. It automatically discovers network topology, monitors network load and outages, and can send alerts on network events by e-mail and SMS.
NMaaS Tools Portfolio

**Prometheus** - Prometheus is an open-source systems monitoring and alerting toolkit

**Grafana** - Grafana is an open source, feature rich metrics dashboard and graph editor for Graphite, Elasticsearch, OpenTSDB, Prometheus and InfluxDB

Users can select the tools required for their purposes and create a customised toolset tailored for their network
NMaaS Tools Portfolio

New tools are being added...

• **perfSONAR central components**
  - **esmond** - measurement archive for collecting time series metrics from networks
  - **MaDDash** - tool for collecting large amounts of inherently two-dimensional data and presenting it in visually useful ways
  - **pSConfig Web Administrator** - GUI and tools to publish configs in pSConfig/MeshConfig formats
NMaaS Tools: New tool integration process

- General information, deployment details and configuration options
- Docker image preparation
- Helm chart preparation
- Configuration wizard design
More Information

Main GÉANT web page:
• geant.org/NMaaS

Contact e-mail address of NMaaS team:
• nmaas@lists.geant.org

NMaaS production instance:
• https://nmaas.eu
Your feedback is very welcome

• Other use cases?
• New tools?
• Additional features?

Would you like to try NMaaS out?
Any questions?
Thank you

Any questions?

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