

# NMaaS as a platform for management service outsourcing

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Workshop on Network Management and Monitoring

Copenhagen, 22 October 2019

[www.geant.org](http://www.geant.org)

## 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

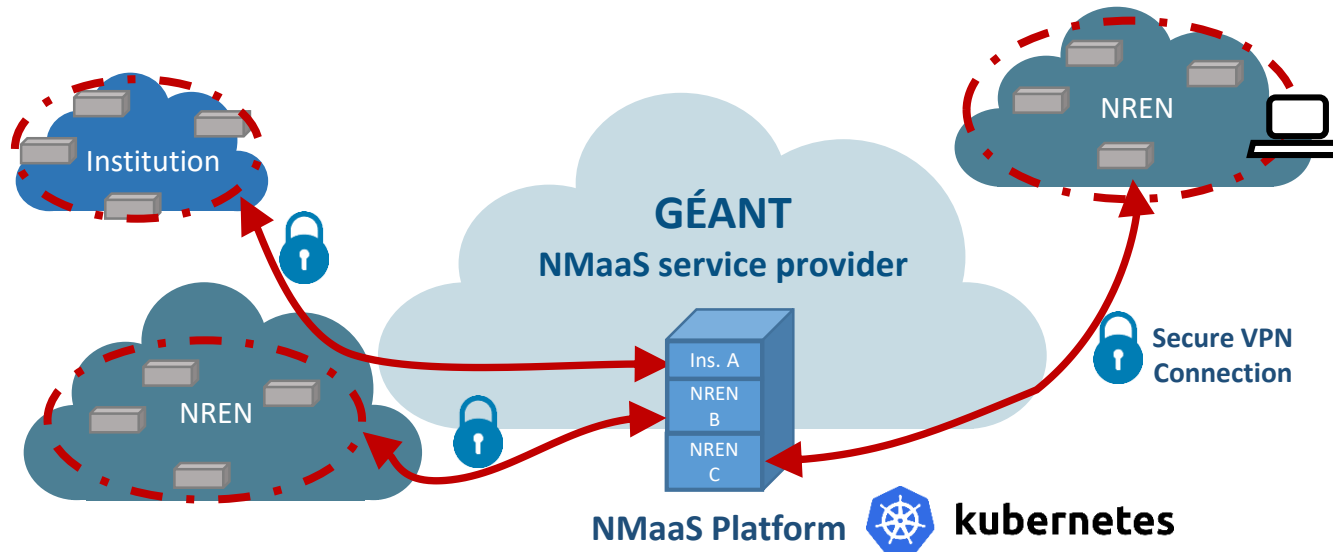
Campuses

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**

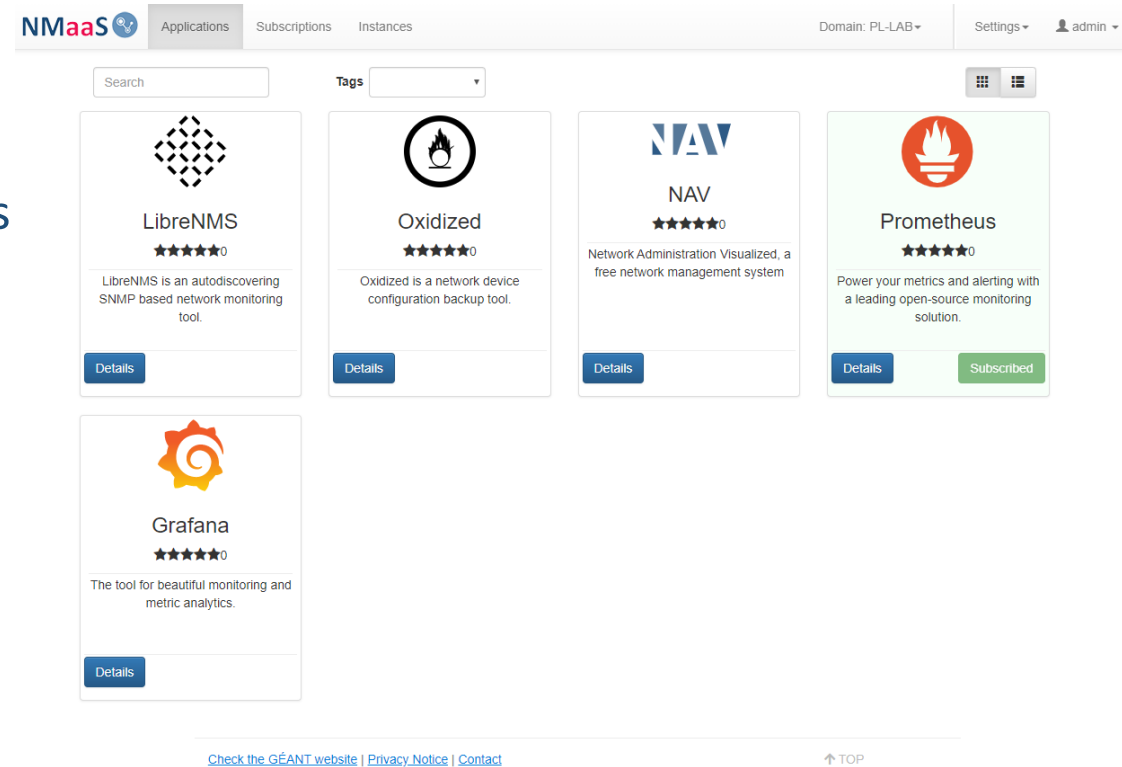
# NMaaS Architecture

## 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

Login Register

**Username**

**Password**

Login

Login with eduGAIN



## Prometheus

★★★★★5

Power your metrics and alerting with a leading open-source monitoring solution.

Details Deploy



Deploy new instance of Prometheus

**Instance name**

**Domain:** PL-LAB

Close Deploy



## prom-demo (Prometheus)

★★★★★2 votes  
v.2.8.0 | Apache 2.0 | WWW | Source | Issues

Monitoring Alerting

Installation progress

- Subscription validation
- Environment creation
- Setting up connectivity
- Applying app configuration



prom-demo.pllab.nmaas.eu/targets

Prometheus Alerts Graph Status Help

## Targets

All Unhealthy

demo-job (1/1 up) show less

Endpoint	State
http://10.1.0.1:9100/metrics	UP



Go to app Update Undeploy

- App container deployment
- App running



Configuration

Base Additional Advanced

**Prometheus access username \***

**Prometheus access password \***

**Global scrape**  
15s

**Global evaluation**  
30s

**Jobs \***

Job name *	Scrape interval *	Metrics path *	Targets *	Labels
<input type="text"/>	15s	/metrics	IP address and port * 127.0.0.1	+ Add label

# 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)

availability

network performance

server resources

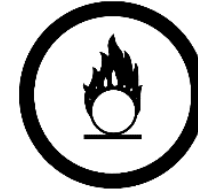
configuration backups

alerting



## 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

perfSONAR

# NMaaS Tools: New tool integration process



Configuration

Base Additional Advanced

Prometheus access username \*

Prometheus access password \*

Global scrape

15s

Global evaluation

30s

Jobs \*

Job name *	Scrape interval *	Metrics path *	Targets *	Labels
	15s	/metrics	IP address and port *	+ Add label
			127.0	

- 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](https://geant.org/NMaaS)

Contact e-mail address of NMaaS team:

- [nmaas@lists.geant.org](mailto: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?

[www.geant.org](http://www.geant.org)

