GÉANT
Networks • Services • People

Network Management as a Service

Platform for Multi-Tenant Network Management

Pavle Vuletić
University of Belgrade
GN4-3 WP6 T3 Task Leader

Global Research Platform Workshop

September 21st 2021

www.geant.org

GÉANT (GN4-3) WP6 T3 in brief

NMaaS

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

NMaaS

What?

"Market place" offering Network Management … in the cloud

Production service developed and maintained by the GÉANT Project

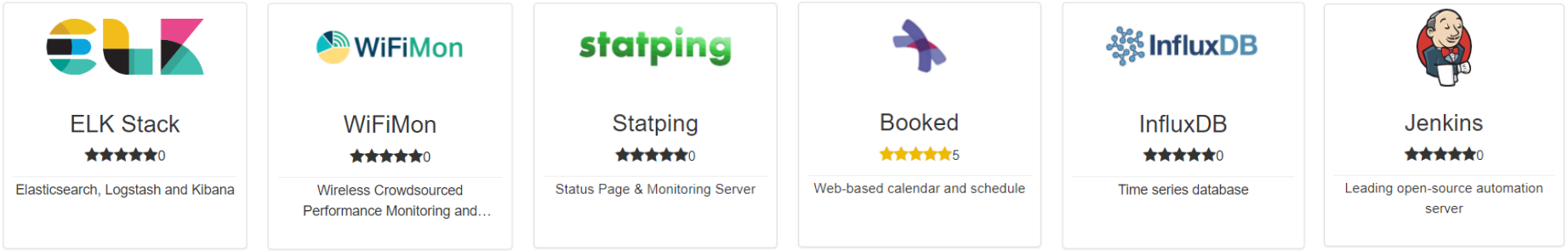
For whom?

NREN End Institutions, GÉANT Project teams, and NRENs

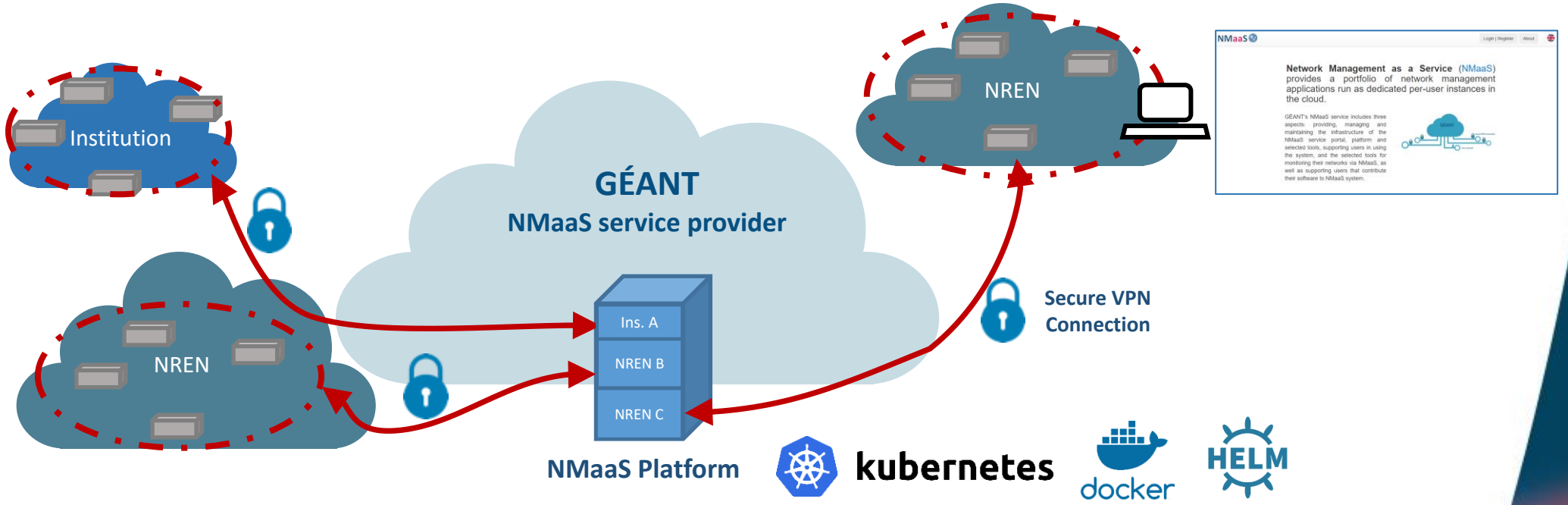
Why?

To **ease** network management and monitoring software **deployment**, **configuration** and **maintenance**

To allow users to focus solely on managing their services



How NMaaS works

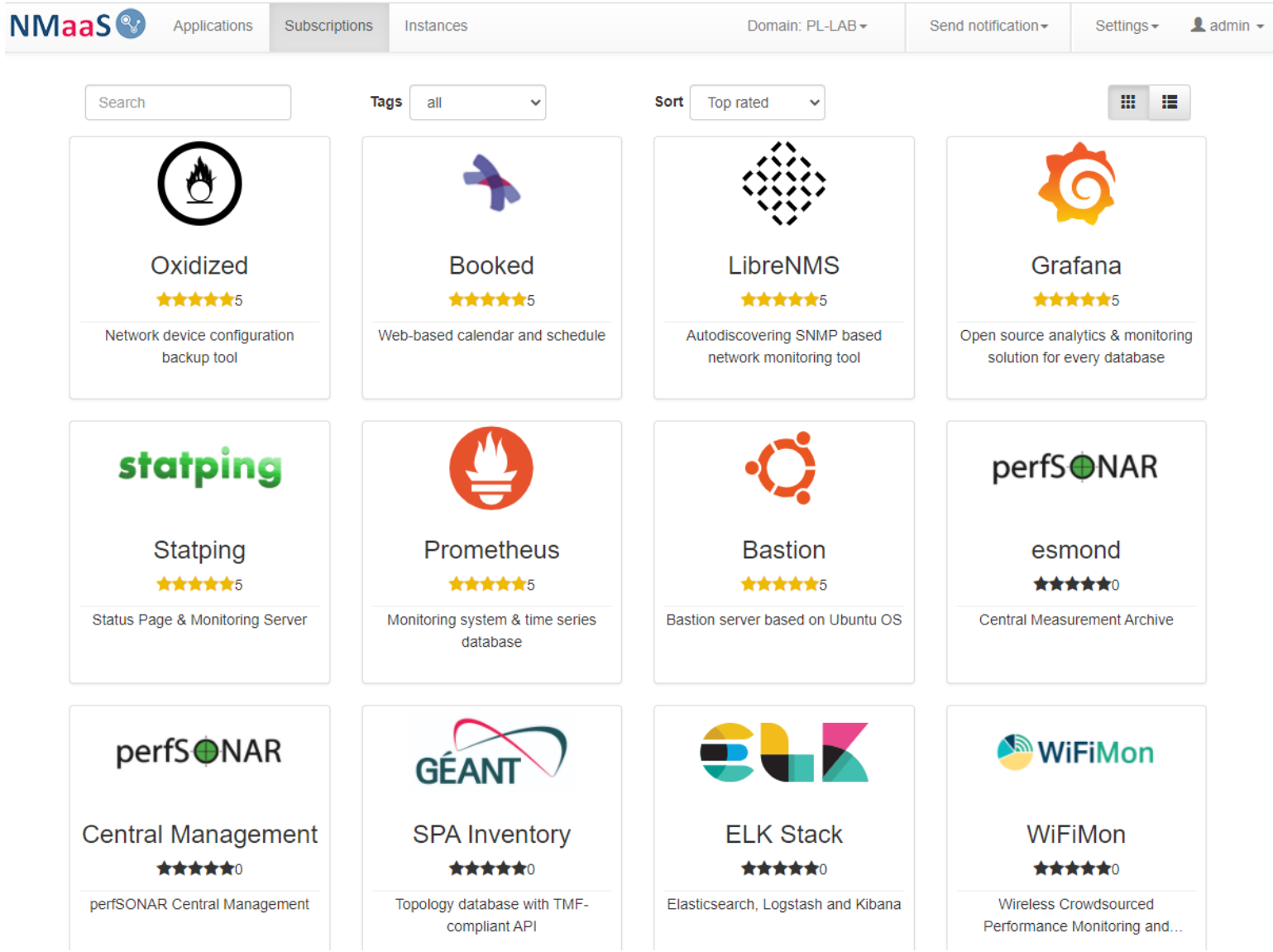


Shared **cloud platform** managed by the GÉANT Project

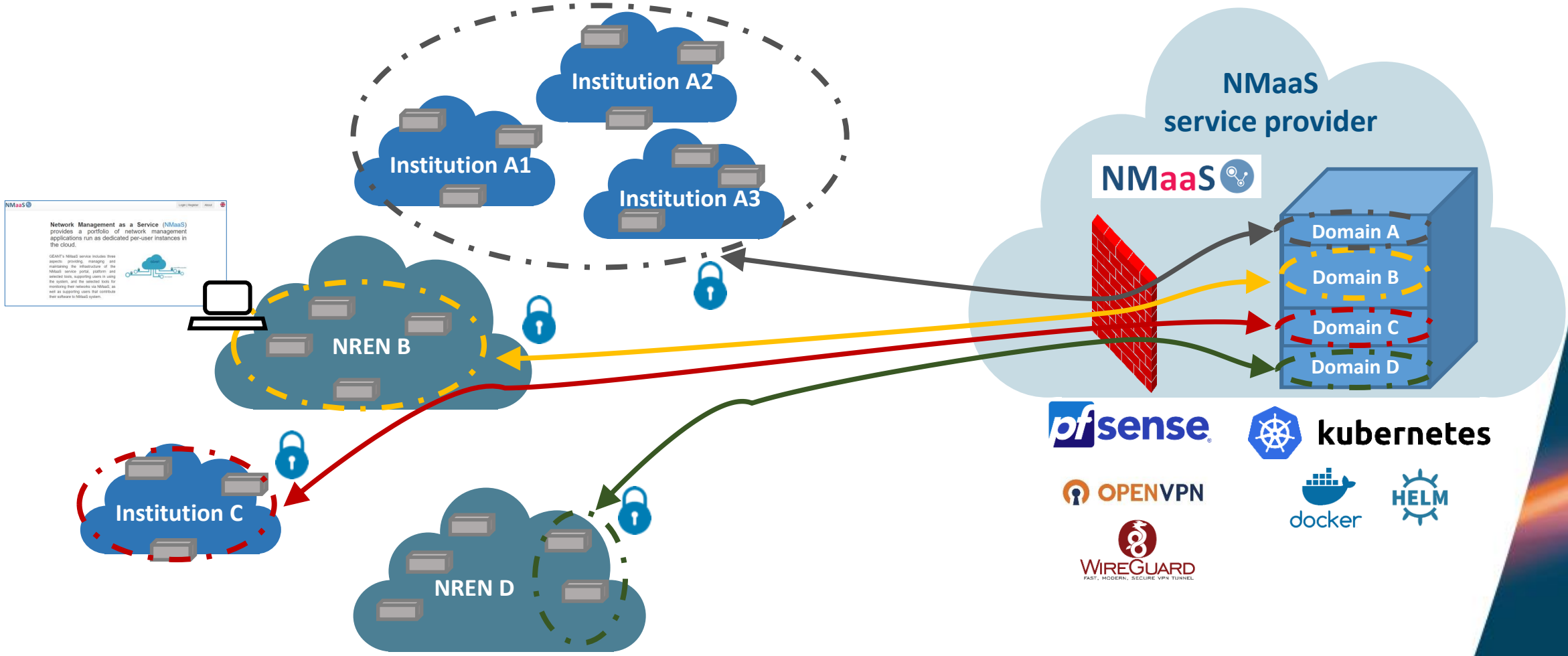
Each user gets an **isolated** tenant environment connected over a secure **VPN** to his network

Tool deployment and access via a **web portal**

NMaaS Portal



NMaaS Multi-Tenancy Support



NMaaS System

Software components

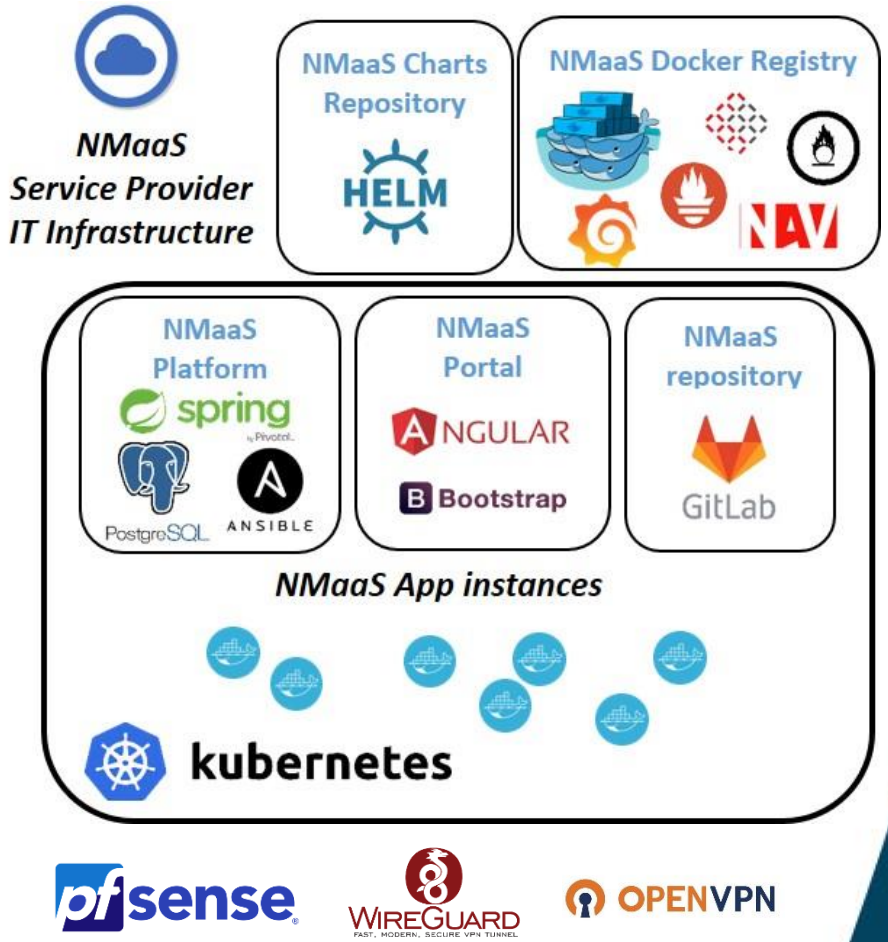
- NMaaS Platform
- Domain and user management
- Tool deployment process orchestration
- NMaaS Portal
- Web-based user front-end

Tools (packaged applications)

- Docker images
- Helm charts

Infrastructure

- Kubernetes
- VPN
- Networking



NMaaS Tools

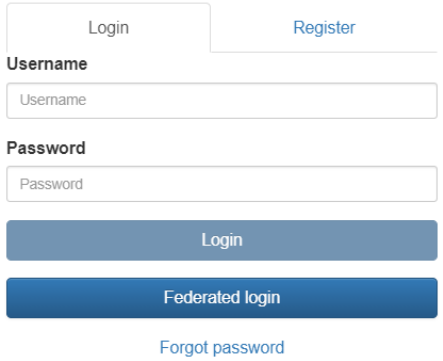
23 applications available in the marketplace

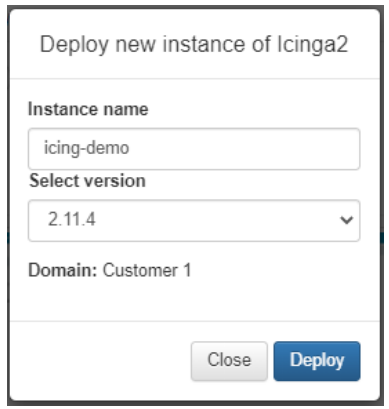
- Oxidized
- LibreNMS
- NAV
- Prometheus
- Grafana
- Booked
- Routinator
- CodiMD
- Bastion
- Statping
- SPA Inventory
- Debian repository
- ELK Stack
- Synapse
- perfSONAR 4 components
- WiFiMon
- InfluxDB
- Jenkins
- Icinga
- Victoria Metrics

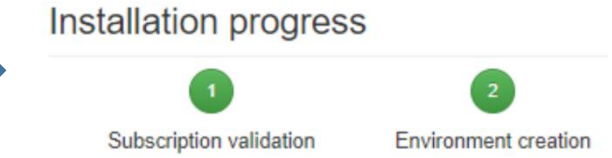
Adding new Tools

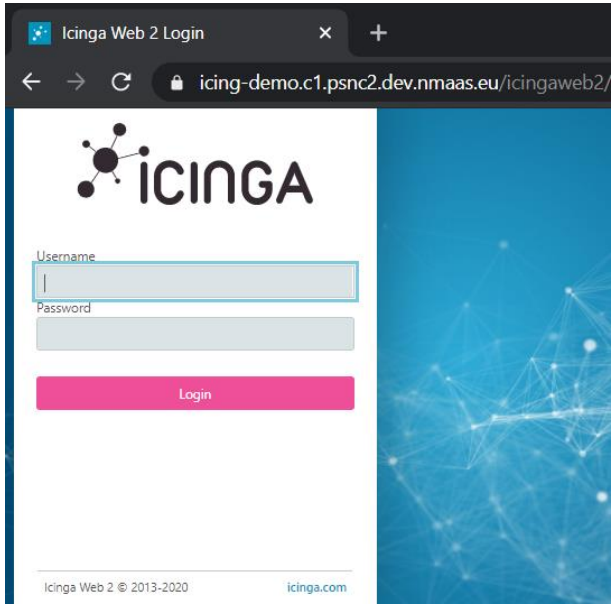
- …or new versions
- At the moment done by the NMaaS team
- **Possible** based on user request
- Requirements
  - Docker image(s)
  - Helm chart
  - Metadata and information about the application

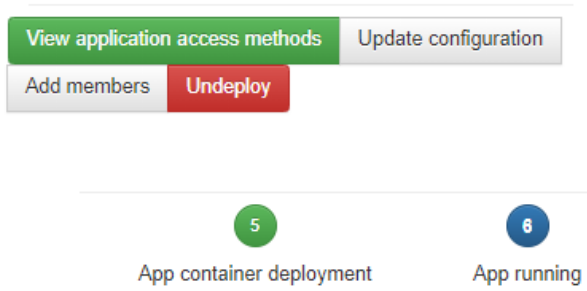
NMaaS Tool Deployment Process

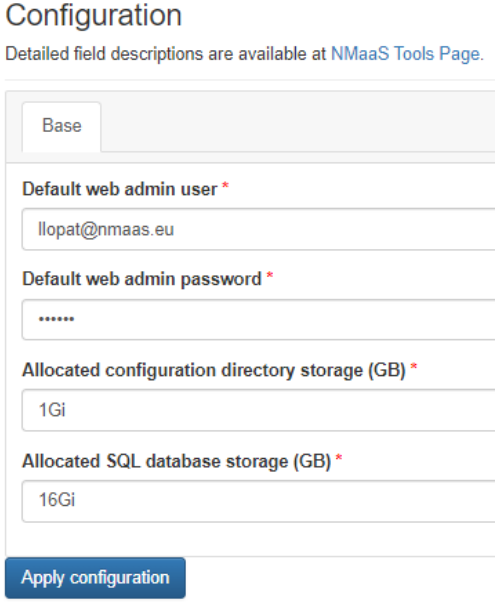












NMaaS Service Usage Statistics

https://nmaas-metr.pllab.nmaas.eu

https://a8e91173-eabd-4bac-a882-8856338eaaea.public.nmaas.eu

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

How can you use NMaaS service?

NMaaS

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

Northwestern University

RENATER
CONNECTEUR DE SAVOIRS

MicroK8s

K3S

VAGRANT

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

Thank you

Any questions?

www.geant.org

© GÉANT Association on behalf of the GN4 Phase 3 project (GN4-3).
The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 856726 (GN4-3).