

On-Demand Network Management with NMaaS: Network Management as a Service

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Agenda

Introduction to NMaaS

NMaaS in a Nutshell

Reasons for using NMaaS

Deployment Options

NMaaS Demo

Discovering the NMaaS Web Interface

Deploying a new Application

Accessing the new Application

Application Configuration Workflow

Q&A



What?

A catalog of open-source applications, with a focus on Network Management

A platform developed and maintained within the GÉANT Project

Allows on-demand deployment of applications present in the catalog on the infrastructure where NMaaS is installed

For whom?

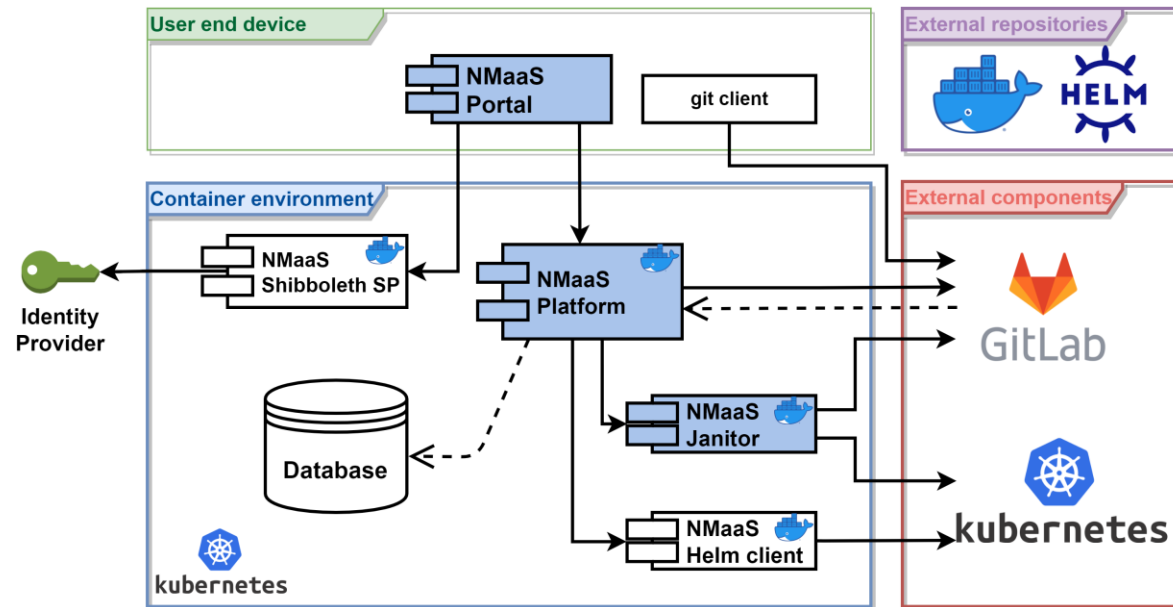
NRENs and NREN end institutions, GÉANT Project teams, private institutions

Why?

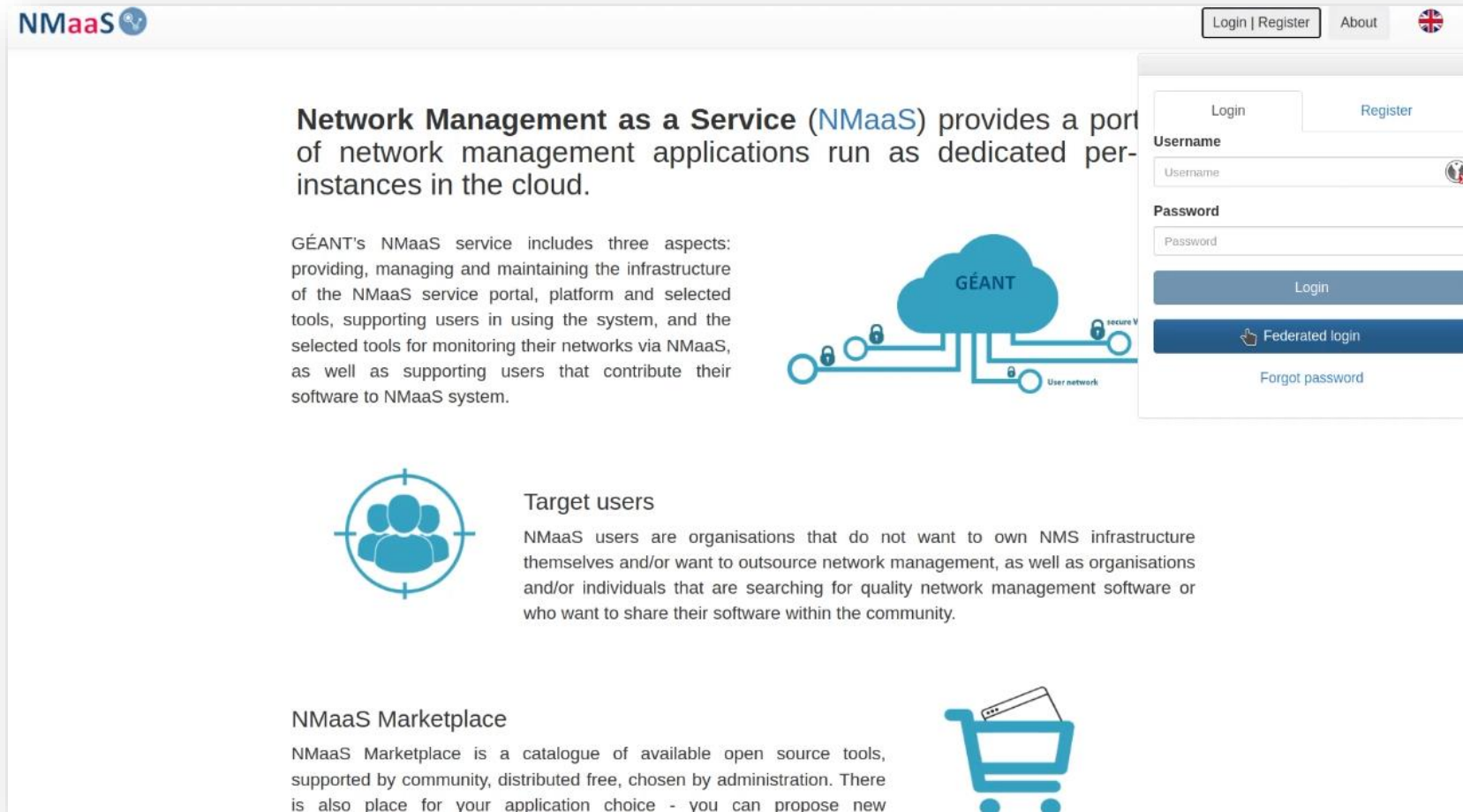
To **ease** network management and monitoring software **deployment, configuration and maintenance**


To allow users to focus solely on using their services


- Kubernetes container orchestrator
- Applications added to the NMaaS catalog are represented by Helm charts
- GitOps principle for configuring deployed applications



- Demo instance available on <https://nmaas.geant.org>
- Production instance managed by the GÉANT Project available on <https://nmaas.eu>
 - Limited to GÉANT Project partners
- **Running your own instance on-premise**
 - **Free software (as in beer)**
 - Open sourcing of all the components underway
 - Installation documentation available online
 - <https://wiki.geant.org/display/NMAAS/NMaaS+Installation+Guide>
 - <https://wiki.geant.org/display/NMAAS/NMaaS+User+Guide>
 - <https://wiki.geant.org/display/NMAAS/Local+NMaaS+Testing+Environment>




NMaaS 

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Network Management as a Service (NMaaS) provides a port of network management applications run as dedicated per-instances in the cloud.

GÉANT's NMaaS service includes three aspects: providing, managing and maintaining the infrastructure of the NMaaS service portal, platform and selected tools, supporting users in using the system, and the selected tools for monitoring their networks via NMaaS, as well as supporting users that contribute their software to NMaaS system.



Target users

NMaaS users are organisations that do not want to own NMS infrastructure themselves and/or want to outsource network management, as well as organisations and/or individuals that are searching for quality network management software or who want to share their software within the community.


NMaaS Marketplace

NMaaS Marketplace is a catalogue of available open source tools, supported by community, distributed free, chosen by administration. There is also place for your application choice - you can propose new

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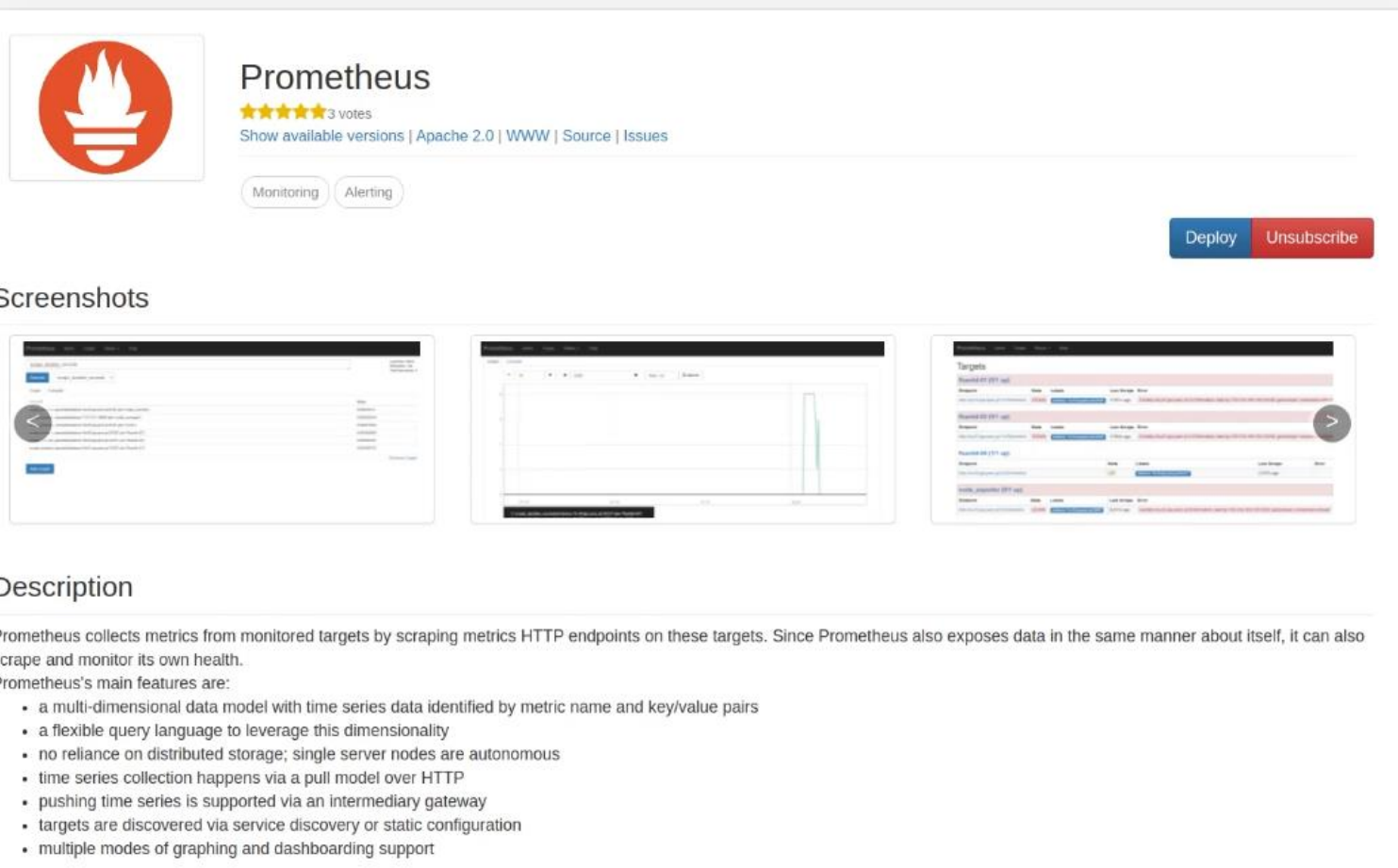
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Demo: Using NMaaS – The Application Catalog

★★★★★0 Elasticsearch, Logstash and Kibana	★★★★★0 Secured instant messaging for teams	★★★★★0 Monitoring and Debugging Dashboard	★★★★★0 Web-based UI for perfSONAR administrators
 WiFiMon ★★★★★0 Wireless Crowdsourced Performance Monitoring and...	 Jenkins ★★★★★0 Leading open-source automation server	 InfluxDB ★★★★★0 Time series database	 CodiMD ★★★★★0 Collaborative Markdown Editor
 Debian repository ★★★★★0 Debian package repository based on Reprepro	 Statping ★★★★★5 Status Page & Monitoring Server	 Grafana ★★★★★5 Open source analytics & monitoring solution for every database	 Prometheus ★★★★★5 Monitoring system & time series database
 Icinga2 ★★★★★0	 SPA Inventory ★★★★★0	 Routinator ★★★★★0	 WebDAV Server ★★★★★5



 **Prometheus**
★★★★★ 3 votes
[Show available versions](#) | [Apache 2.0](#) | [WWW](#) | [Source](#) | [Issues](#)

Monitoring Alerting

Deploy Unsubscribe

Screenshots

Description

Prometheus collects metrics from monitored targets by scraping metrics HTTP endpoints on these targets. Since Prometheus also exposes data in the same manner about itself, it can also scrape and monitor its own health.

Prometheus's main features are:

- a multi-dimensional data model with time series data identified by metric name and key/value pairs
- a flexible query language to leverage this dimensionality
- no reliance on distributed storage; single server nodes are autonomous
- time series collection happens via a pull model over HTTP
- pushing time series is supported via an intermediary gateway
- targets are discovered via service discovery or static configuration
- multiple modes of graphing and dashboarding support

Demo: Using NMaaS – First Step of the Deployment Wizard

The screenshot shows the NMaaS interface for deploying a Prometheus instance. A modal dialog titled "Deploy new instance of Prometheus" is open, allowing the user to configure the instance. The dialog includes a text input for "Instance name", a dropdown menu for "Select version" (currently set to 2.8.0), and a "Domain" field set to "FINKI-LAB". The background shows the Prometheus application page with a 5-star rating, "Monitoring" and "Alerting" tabs, and "Deploy" and "Unsubscribe" buttons. The "Description" section at the bottom explains that Prometheus collects metrics from monitored targets by scraping metrics HTTP endpoints.

Applications Subscriptions Instances Domain: FINKI-LAB Settings - vojdan.kj

Deploy new instance of Prometheus

Instance name

Select version
 2.8.0

Domain: FINKI-LAB

Cancel Deploy

Prometheus
★★★★★ 3 votes
Show available versions | Apache 2.0

Monitoring Alerting

Deploy Unsubscribe

Screenshots

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Prometheus collects metrics from monitored targets by scraping metrics HTTP endpoints on these targets. Since Prometheus also exposes data in the same manner about itself, it can also scrape and monitor its own health.


Demo: Using NMaaS – Initial Configuration Wizard

The screenshot shows the 'Configuration' page of the NMaaS Initial Configuration Wizard. The interface is divided into several sections:

- Configuration:** A header bar with a 'Configuration' link.
- Help:** A note stating 'Detailed field descriptions are available at NMaaS Tools Page.'
- Tabs:** 'Base', 'Additional', and 'Advanced' tabs are visible, with 'Base' selected.
- Prometheus access username:** A text input field containing 'nomsdemo'.
- Prometheus access password:** A password input field with masked characters '*****'.
- Global scrape:** A text input field containing '15s'.
- Global evaluation:** A text input field containing '30s'.
- Jobs:** A table with columns for 'Job name', 'Scrape interval', 'Metrics path', 'Targets', and 'Labels'.

Job name *	Scrape interval *	Metrics path *	Targets *	Labels
device1 *	15s *	/metrics *	IP address and port * 192.168.56.10:9100 *	Label name Label value
- Buttons:** '+ Add jobs' at the bottom left and 'Cancel' at the bottom right.

Demo: Using NMaaS – Status of a Deployed Application



noms-demo (Prometheus)

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

Monitoring Alerting

Active

Actions ▾

- Access
- Configure
- Members
- Undeploy

i Your application is now active. You can access it using the *Access* option from the *Actions* menu. Use the *Configure* and *Members* options to update the configuration and the list of application users respectively

Installation progress

- 1 Subscription validation
- 2 Environment creation
- 3 Verifying connectivity
- 4 Application deployed
- 5 Activation
- 6 Application active

Additional Information

Demo: Using NMaaS – Validating the Status of a Deployed Application



The screenshot shows the Prometheus web interface. At the top, there is a navigation bar with 'Prometheus', 'Alerts', 'Graph', 'Status', and 'Help'. Below this, the 'Targets' section is visible. There are two buttons: 'All' and 'Unhealthy'. Underneath, it says 'device1 (1/1 up)' with a 'show less' link. A table displays the target details:

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://192.168.56.10:9100/metrics	UP	instance="192.168.56.10:9100"	11.876s ago	63.2ms	

Demo: Using NMaaS – Integration with a Git Repository

NMaaS Applications Subscriptions Instances Domain: FINKI-LAB Settings voidan.kiorveziroski

Update configuration

Use the following command to clone the Git repository containing configuration files used by this application instance. Each change applied to any of the files and pushed back to the repository will be used to update the running application.

```
git clone ssh://git@gitlab.nmaas.eu/groups-finki-lab/finki-lab-prometheus-626.git
```

Access credentials

Prometheus access username *

Prometheus access password *

Apply configuration

OK

Demo: Using NMaaS – Altering an Application's Configuration Locally

```
id to clone the Git repository containing configuration files used by this application instance. Each change applied to any of the files and pushed back to the repository will be used to update
b.nmaas.eu/groups-finki-lab/finki-lab-prometheus-626.git
```

```
finki-lab-prometheus-626 : nano — Konsole
GNU nano 4.8                                prometheus.yml
global:
scrape_interval: 15s
evaluation_interval: 30s
alerting:
  alertmanagers:
    - static_configs:
    - targets:
rule_files:
scrape_configs:
  - job_name: 'device1'
    metrics_path: /metrics
    scrape_interval: 15s
    static_configs:
    - targets: ['192.168.56.10:9100', '192.168.56.11:9100']
    labels:
[ Wrote 15 lines ]
^G Get Help      ^O Write Out    ^W Where Is    ^K Cut Text    ^J Justify     ^C Cur Pos
^X Exit          ^R Read File   ^\ Replace     ^U Paste Text  ^T To Spell    ^_ Go To Line
finki-lab-prometheus-626 : nano  noms-demo : bash
```

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Demo: Using NMaaS – Pushing Configuration Changes Upstream

```
finki-lab-prometheus-626 : git — Konsole
File Edit View Bookmarks Settings Help
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
      modified:   prometheus.yml

no changes added to commit (use "git add" and/or "git commit -a")
vojdan@ottovm:~/Data/noms-demo/finki-lab-prometheus-626$ git add .
vojdan@ottovm:~/Data/noms-demo/finki-lab-prometheus-626$ git commit -m "add device2"
[master 717c71e] add device2
 1 file changed, 1 insertion(+), 1 deletion(-)
vojdan@ottovm:~/Data/noms-demo/finki-lab-prometheus-626$ git push
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 317 bytes | 317.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To ssh://gitlab.nmaas.eu/groups-finki-lab/finki-lab-prometheus-626.git
 8bb4e3c..717c71e  master -> master
vojdan@ottovm:~/Data/noms-demo/finki-lab-prometheus-626$
```

Demo: Using NMaaS – Validating the New Configuration

Prometheus Alerts Graph Status ▾ Help

Targets

All Unhealthy

device1 (2/2 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://192.168.56.10:9100/metrics	UP	instance="192.168.56.10:9100"	2.813s ago	114.8ms	
http://192.168.56.11:9100/metrics	UP	instance="192.168.56.11:9100"	1.271s ago	119.9ms	

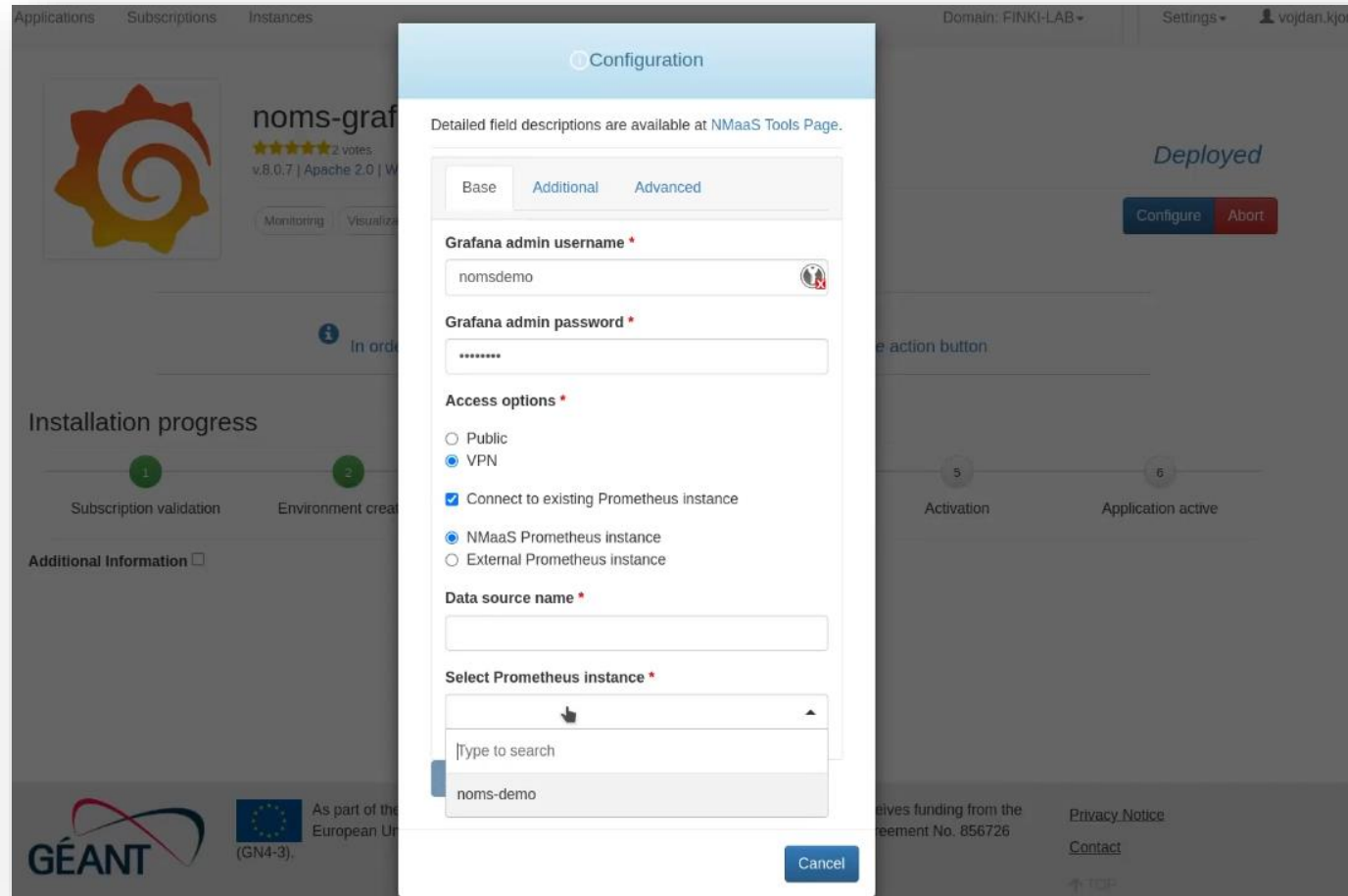
Demo: Using NMaaS – Deploying a Second Application, Grafana

The screenshot displays the NMaaS configuration interface for Grafana. A modal dialog titled "Configuration" is open, showing the following fields and options:

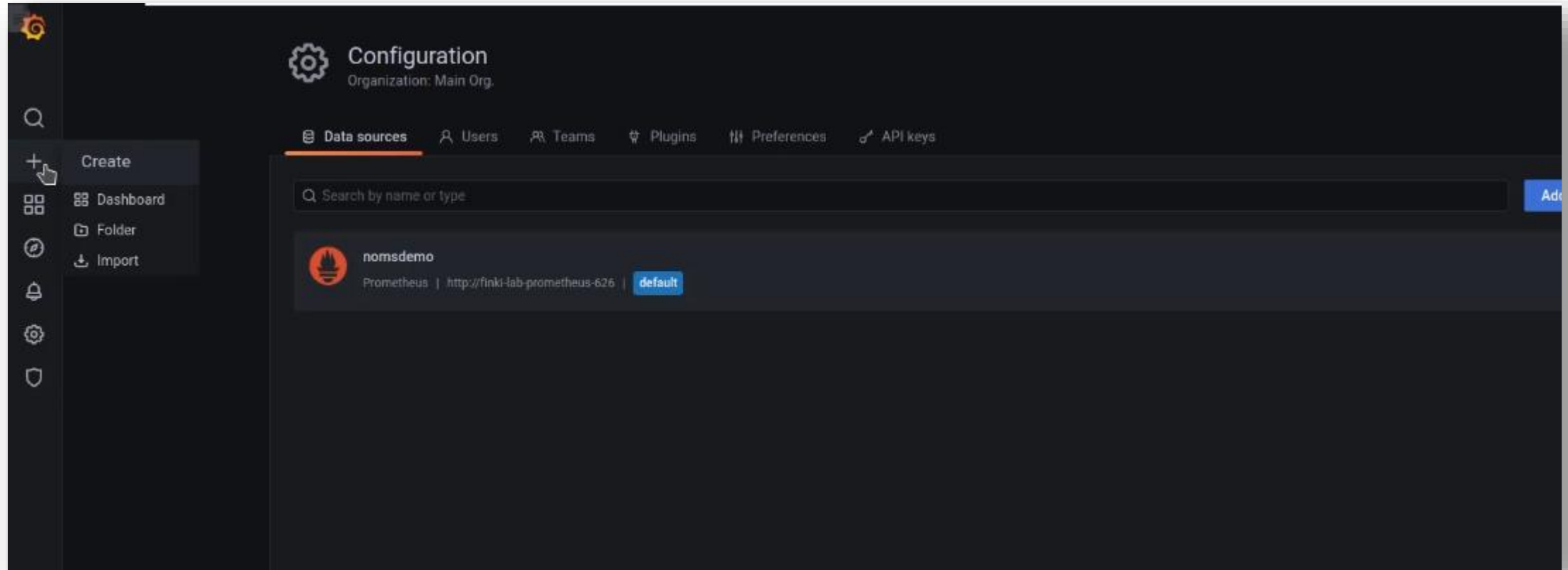
- Configuration** (Title)
- Base | **Additional** | Advanced (Tabs)
- Detailed field descriptions are available at [NMaaS Tools Page](#).
- Grafana admin username ***: nomsdemo
- Grafana admin password ***: [Masked]
- Access options ***:
 - Public
 - VPN
 - Connect to existing Prometheus instance
- Buttons: Apply configuration, Cancel

The background interface shows the "Installation progress" section with steps: 1. Subscription validation, 2. Environment creation, 5. Activation, and 6. Application active. The application is currently in the "Deployed" state, with "Configure" and "Abort" buttons visible.

Demo: Using NMaaS – Configuration Wizard for Grafana



Demo: Using NMaaS – Validating the Grafana Deployment (1)



Demo: Using NMaaS – Validating the Grafana Deployment (2)



Thank you

Any questions?

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