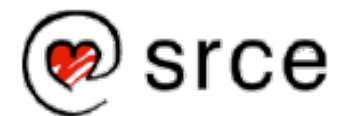


# Monitoring in EOSC and NI4OS

On-Boarding : Train the trainers event

Themis Zamani, GRNET



# What are we going to talk about

- ❑ On-boarding procedure
  - ❑ Monitoring NI4OS
  - ❑ Ready for onboarding? What an SP should do
  - ❑ Monitoring: The Basics
  - ❑ Monitoring: The Topology
  - ❑ Monitoring: The Metrics
  - ❑ Monitoring: The Profiles
-

# On-boarding procedure

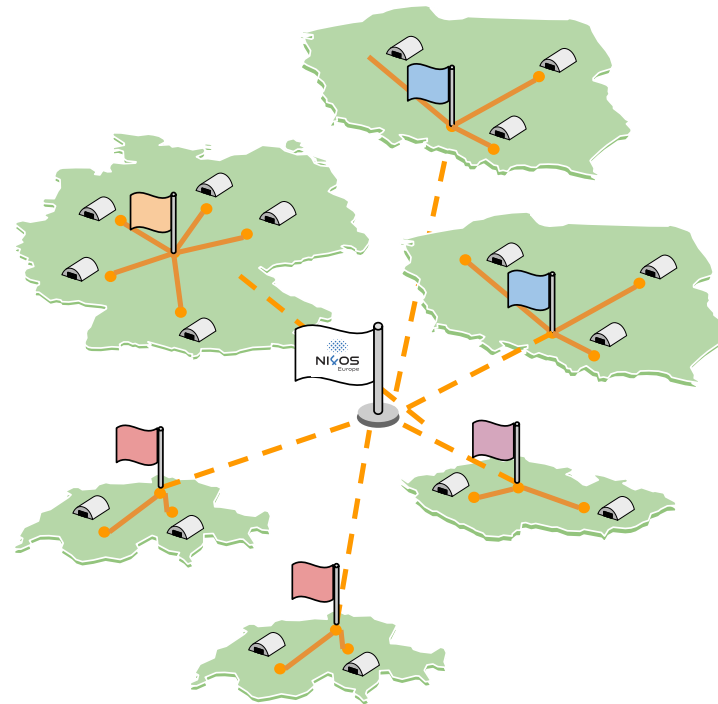
- ❑ On-boarding of a resource (service or repository) into the EOSC includes all practical activities taken to incorporate a research resource into the EOSC federation.
    - ❑ integration with monitoring
  - ❑ In NI4OS we use the ARGO Monitoring System to monitor the Services.
-

# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

Monitoring based on User experience so as to compute:

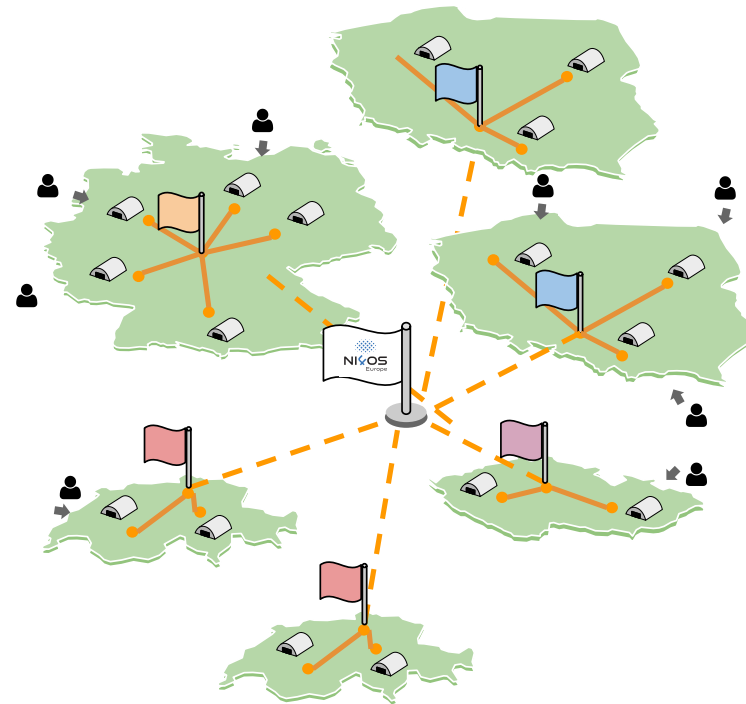
- Status
- Availability
- Reliability



# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

Users / Researchers all around the world will have access to NI4OS services.

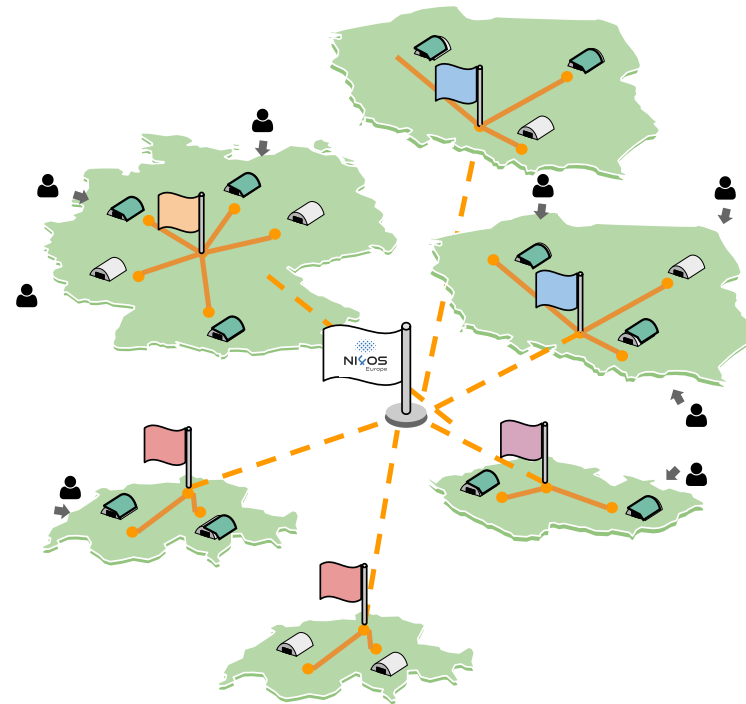


# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

Users / Researchers all around the world will have access to NI4OS services.

Most of the services are up but..

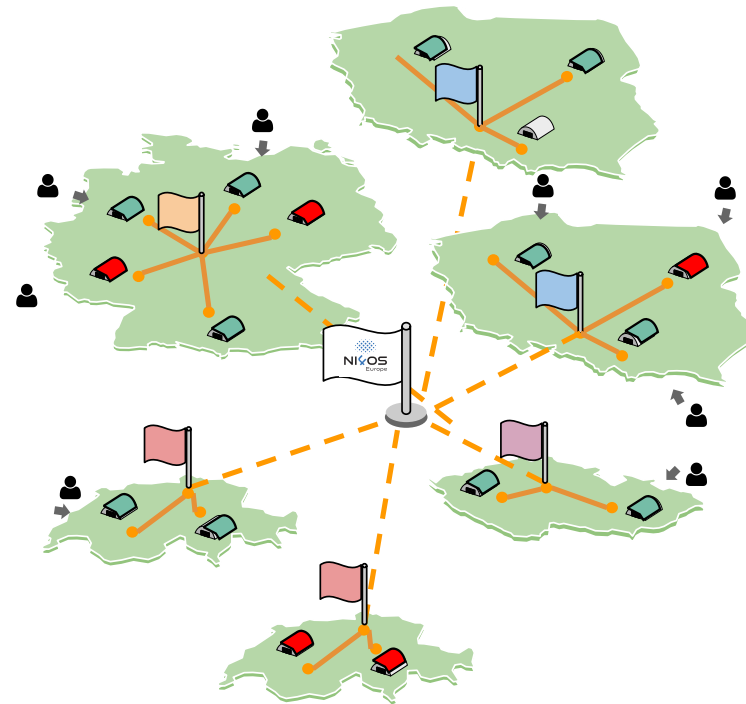


# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

Users / Researchers all around the world will have access to NI4OS services.

- Most of the services are up but..
- Sometimes everything looks OK until the user starts complaining.

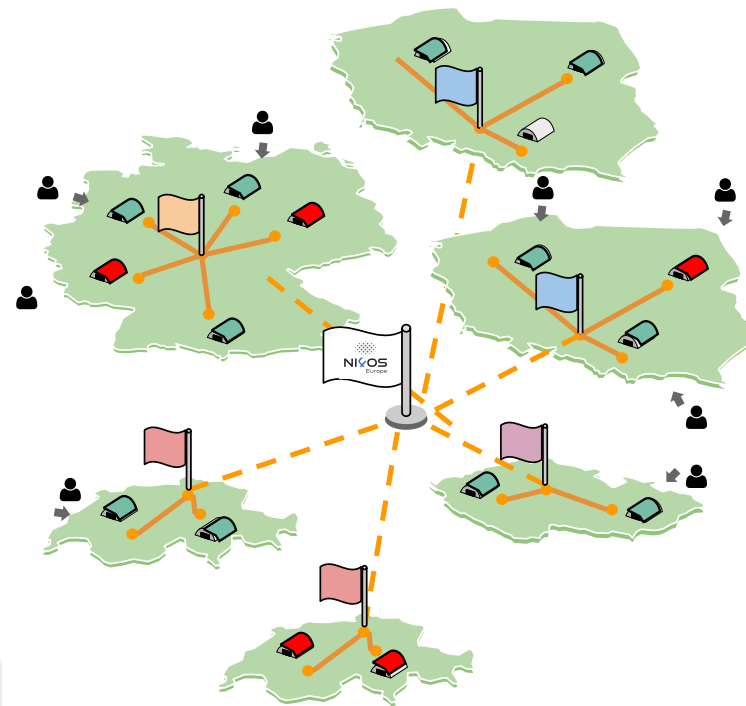


# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

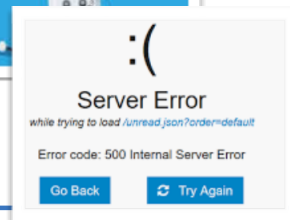
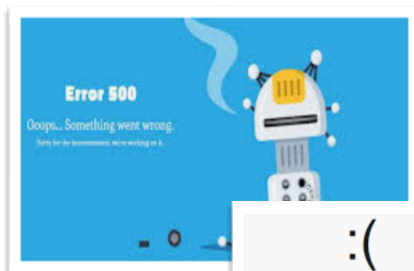
Users / Researchers all around the world will have access to NI4OS services.

- Most of the services are up but..
- Sometimes everything looks OK until the user starts complaining.



Server Error in '/' Application.

The resource cannot be found.





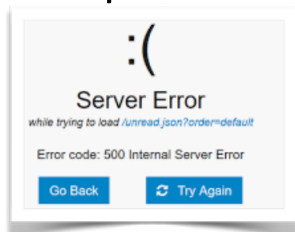
# Monitoring NI4OS

## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

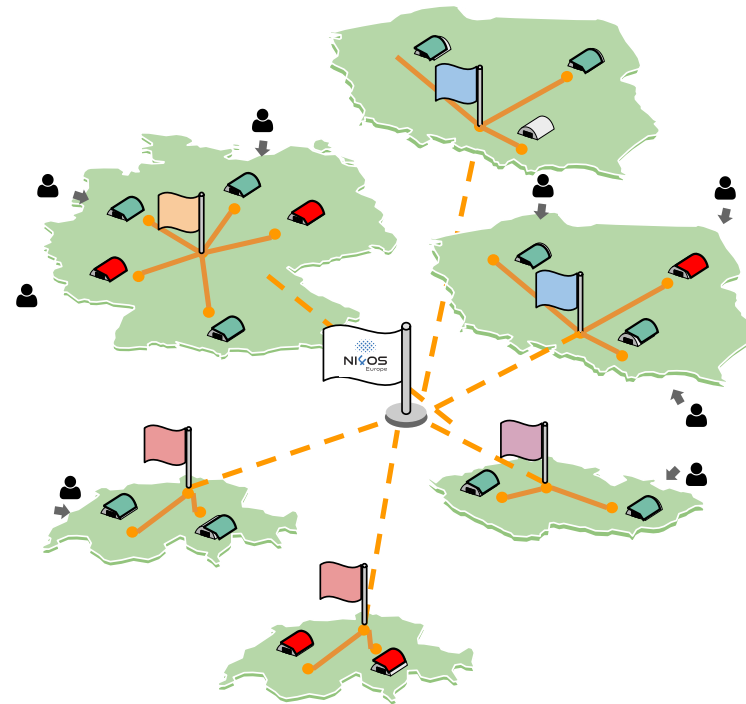
Users / Researchers all around the world will have access to NI4OS services.

- Most of the services are up but..
- Sometimes everything looks OK until the user starts complaining.

### The problem



Service remains unavailable longer than expected.



# Monitoring NI4OS

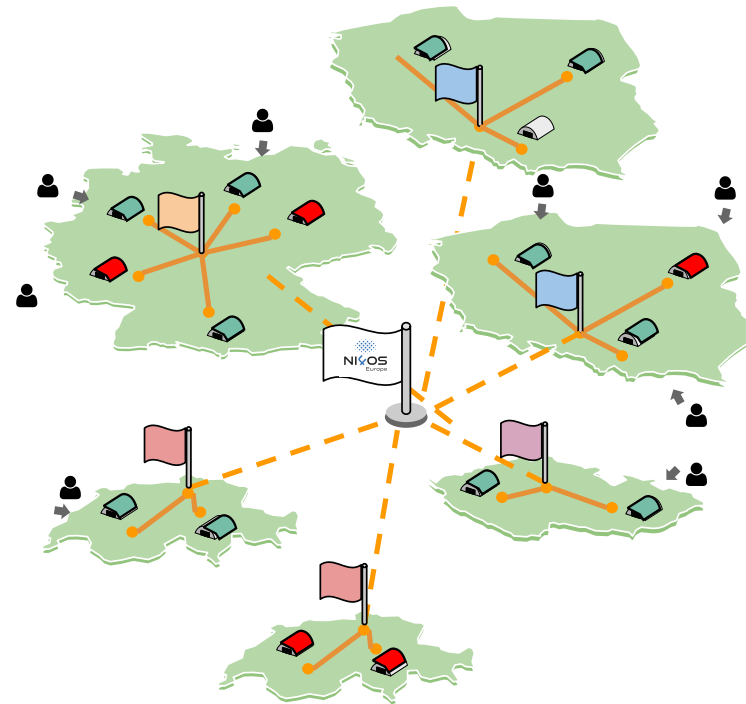
## BUILDING NATIONAL INITIATIVES FOR OPEN SCIENCE IN EUROPE

Users / Researchers all around the world will have access to NI4OS services.

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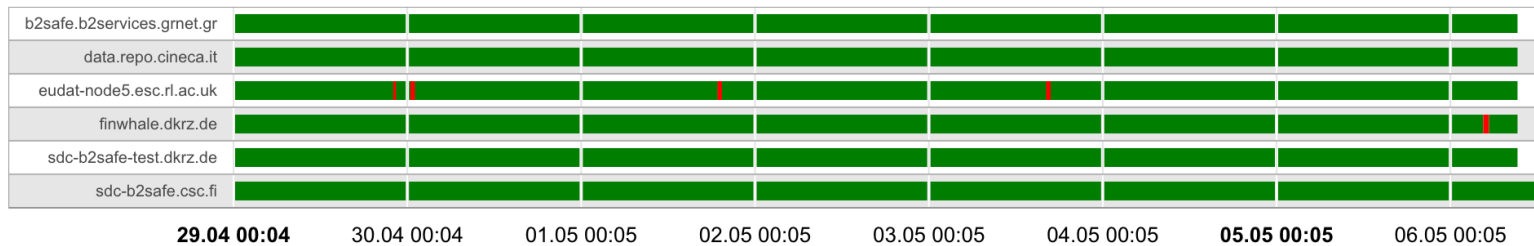
The solution

Monitor Analyse Report Alert



# Real Time Status Report

## Status reports



### Last Status Checks

Show 10 entries

Endpoint (Group)	Metric
<b>CRITICAL</b> 62.65.38.19 (GEO...	eu.seadatanet.org.do check
<b>CRITICAL</b> 95.183.158.50 (U...	eu.seadatanet.org.do check

### Last Status Checks

Show 10 entries

Search:

Endpoint (Group)	Metric
<b>CRITICAL</b> 62.65.38.19 (GEO_SEAS_DOWNLOAD_MANAGER)	eu.seadatanet.org.do check
<b>CRITICAL</b> 95.183.158.50 (UBSS_DOWNLOAD_MANAGER)	eu.seadatanet.org.do check
<b>OK</b> seadata.bsh.de (EMODNET_BATHYMETRY_DOWNLOAD_MANAGER)	eu.seadatanet.org.do check
<b>OK</b> seadata.bsh.de (EMODNET_CHEMISTRY_DOWNLOAD_MANAGER)	eu.seadatanet.org.do check

# A/R Reports

Availability/Reliability Table
Availability/Reliability Charts

A/R Reports

Copy
Excel
CSV
PDF

entries

Name	2019-01		2019-02		2019-03		2019-04		2019-05	
	Av	Re	Av	Re	Av	Re	Av	Re	Av	Re
B2ACCESS	100	100	99.83	99.83	99.75	99.75	100	100	100	100
B2SAFE									98.61	98.61
B2STAGE									100	100
B2STAGE_CINECA									100	100

Timestamp	Availability	Reliability
2019-05-01	100	100
2019-05-02	100	100
2019-05-03	100	100
2019-05-04	100	100
2019-05-05	100	100
2019-05-06	100	100

Showing 1 to 6 of 6 entries

# Real Time Alerts

## Detailed alerts

The ENDPOINT affected is

● eudat-node5.esc.rl.ac.uk (b2safe.irods)

due to **METRIC** eu.eudat.b2safe.irods-crud

### Summary:

CRITICAL: timed out after 50 seconds

### Status of endpoints in B2SAFE:

- b2safe.b2services.grnet.gr (b2safe.irods)
- sdc-b2safe.csc.fi (b2safe.irods)
- eudat-node5.esc.rl.ac.uk (b2safe.irods)
- data.repo.cineca.it (b2safe.irods)
- finwhale.dkrz.de (b2safe.irods)
- sdc-b2safe-test.dkrz.de (b2safe.irods)

The ENDPOINT affected is

● eudat-node5.esc.rl.ac.uk (b2safe.irods)

It became **Critical** at 2019-04-26T15:13:59Z due to **METRIC**  
eu.eudat.b2safe.irods-crud

### Summary:

CRITICAL: timed out after 50 seconds

The ENDPOINT affected is

● eudat-node5.esc.rl.ac.uk (b2safe.irods)

It became **OK** at 2019-04-26T07:24:31Z due to **METRIC**  
eu.eudat.b2safe.irods-crud

### Summary:

OK: writestatus = 0, liststatus = 0, getstatus = 0, removestatus = 0,  
removetrashstatus = 0

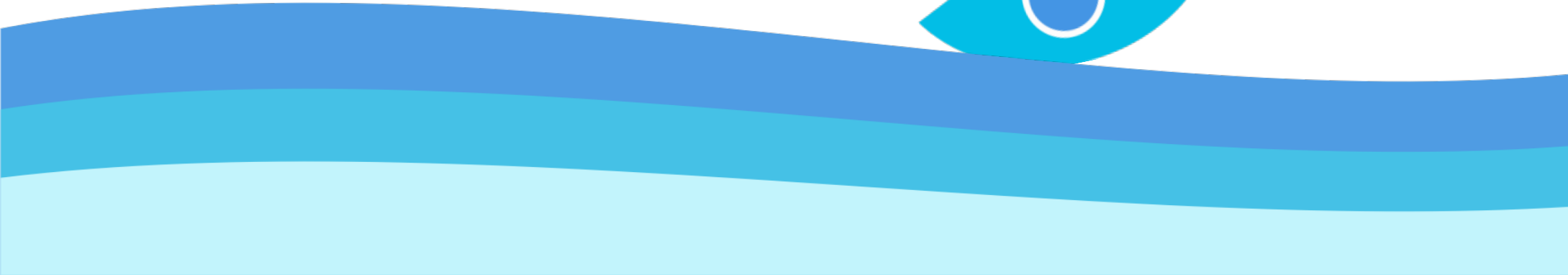
*ARGO is ready  
Is your service*

# Ready for onboarding? NIXOS

What do we need from a SP ?



Europe



# Follow the Guidelines and View the Results.

## Integration Guide for Service Providers at the WIKI

## View the Results

<https://argo.ni4os.eu/>

The screenshot shows the NI4OS wiki page for 'Monitoring service'. The page title is 'NI4OS wiki' and the sub-page is 'Monitoring service'. A table of contents is visible, listing sections like '1 NI4OS services-related resources' and '2 COVID-19 resources'. Under '1.1.4 Monitoring service', there are two bullet points: '• ARGO monitoring service: <https://argo.ni4os.eu/>' and '• Integration Guide for Service Providers'. A blue arrow points from the 'ARGO' link in the table of contents to the right-hand screenshot.

The screenshot shows the ARGO monitoring dashboard. The top navigation bar includes 'Home' and 'Contact'. The main content area displays 'ni4os - Critical' and a list of metrics: 'Dashboard', 'Availability/Reliability', 'Status', 'Custom Report', 'Profile Details', 'ARGO', 'UI Documentation', 'ARGO Documentation', and 'Terms of Use'. A large blue arrow points from the 'ARGO' link in the table of contents to this dashboard. The dashboard features a bar chart titled 'Availability/Reliability - Last 30 days' showing 'Availability' (blue) and 'Reliability' (purple) metrics. Below the chart are two status indicators: 'Availability 100' and 'Reliability 100'. At the bottom, there is a 'Last Status Checks' section with a search bar and a table of status checks.

Show	10	entries	Search:	
Endpoint (Group)	Metric	Timestamp		
OK	UKIM (webinar.ni4os.eu)	org.nagios.WebCheck	2020-06-02T10:05:12Z	Q



[Main page](#)  
[Recent changes](#)  
[Random page](#)  
[Help about MediaWiki](#)

Tools

[What links here](#)  
[Related changes](#)  
[Special pages](#)  
[Printable version](#)  
[Permanent link](#)  
[Page information](#)

Page [Discussion](#)

Read [View source](#) [View](#)

## Monitoring guide for SPs

The ARGO Monitoring service provides a flexible and scalable framework for monitoring status, availability and re infrastructures with medium to high complexity. ARGO generates reports using customer defined profiles (e.g. for generation, ARGO takes into account custom factors such as the importance of a specific service endpoint and sc

ARGO Monitoring Service for NI4OS consists of production and development infrastructure. Production infrastruc generating reports and raising alarms for production-grade on-boarded services. Development infrastructure is us probes. Web UI can be found:

- Production: <https://argo.ni4os.eu>
- Development: <https://argo-devel.ni4os.eu>

### Contents [\[hide\]](#)

- 1 [Topology](#)
  - 1.1 [Topology Information](#)
  - 1.2 [Extra GOCDB attributes](#)
- 2 [Metrics](#)
  - 2.1 [Service probe](#)
  - 2.2 [Probe Development Process](#)
- 3 [Checklist](#)
- 4 [References](#)



# Monitoring

The basics



# The starting point from SP

## **Generic Service - (Repository service)**

I am an SP and i want to start monitoring my service. Actually this is an online repository at <https://www.ni4os-repository.com> that we run at GRNET.

Until we start using helpdesk  
Send an email to : [argo@ni4os.eu](mailto:argo@ni4os.eu)

---

# The basic(s) from the Monitoring: main sources of truth

The topology of the infrastructure and the services it contains

Kind of tests (metrics) to execute for a given service

A list of dependencies that create profiles needed for the monitoring

- 1 How Services and associated tests are grouped into profiles that instruct monitoring instances what kind of tests to execute
- 2 how monitored items are grouped and form hierarchies

# Lets see the process



# Monitoring

1) Topology: The topology of the infrastructure and the services it contains

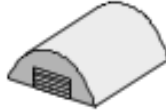





# Topology : 1st step

- ❑ Information about
    - ❑ the **monitored service(s)**
    - ❑ the **service types** they are running (ex. wiki)
    - ❑ the **service endpoints** of the service (ex. endpoint)
    - ❑ the way they are organized (ex. in groups of sites, in groups of services). Model different types of infrastructure architectures
    - ❑ the **service actors** (owners, admins)
-

# Topology based on example

an online repository at <https://www.ni4os-repository.com> that we run at GRNET.

<b>SITE</b>	The organization responsible for the service.		GRNET
<b>Service Type</b>	Each <i>Service Type</i> can have a defined set of <i>metrics</i> , which are explicit tests that we check		repository
<b>Endpoint</b>	the combination of an hostname and Service Type		a repository at <a href="http://www.ni4os-repository.com">www.ni4os-repository.com</a> uses port 443
<b>Service actors</b>	the people responsible for the service operation		Administrator: Stelios Papadopoulos <a href="mailto:steliospapa@grnet.gr">steliospapa@grnet.gr</a> Site Owner: Themis Zamani <a href="mailto:themis@grnet.gr">themis@grnet.gr</a> Security: Manos Papadopoulos <a href="mailto:steliospapa@grnet.gr">steliospapa@grnet.gr</a>

---

# The tool we use

□ GOCDB is a configuration database at [gocdb.ni4os.eu](http://gocdb.ni4os.eu).

When adding service endpoint following fields are mandatory for monitoring service:

Production Level (Is this service in production?):

Y = monitored on production & development infrastructure

N = monitored only on development infrastructure

Monitored (Is this service monitored?):

must be set to Y

Notifications (Do you wish to receive notifications about this service?)

set to Y if you wish to receive alerts.

**Service: training.ni4os.eu - eu.ni4os.ops.training**  
NI4OS-Europe training platform

System	
Host name	training.ni4os.eu
IP Address	194.149.137.233
IP v6 Address	
Operating System	Linux
Architecture	
Contact E-Mail	
Notifications	<input checked="" type="checkbox"/>

**www.ni4os-repository.com**

Grid Information	
Host DN	https://www.ni4os-repository.com
URL	http://www.ni4os-repository.com
Parent Site	UKIM <b>GRNET</b>
Scope Tags	NI4OS-Europe

**The main flags**

Project Data	
Production Level	<input checked="" type="checkbox"/>
Beta	<input checked="" type="checkbox"/>
Monitored	<input checked="" type="checkbox"/>

**The main flags**

Service Groups this Service Belongs To



# Monitoring

2) What to check : metrics



# What to check : metrics

- ❑ A metric is a simple chunk of code that checks specific functionality of a given service
  - ❑ org.nagiosexchange.Portal-WebCheck: checks the http if it responds
  - ❑ eu.egi.CertValidity: checks the validity of a certificate

## METRIC CONFIGURATION

### PROBE EXECUTABLE

check\_http

### CONFIG

Key

interval

maxCheckAttempts

path

retryInterval

timeout

Value

5

3

\$USER1\$

3

120

# Metrics based on the example (first checks)

an online repository at <https://www.ni4os-repository.com> that we run at GRNET.

## Service Type

Each *Service Type* can have a defined set of *metrics*, which are explicit tests that we check



repository

<https://www.ni4os-repository.com>

First checks to start monitoring the service

Web service

Portal-WebCheck: checks the http if it responds

Under https

eu.egi.CertValidity: checks the validity of a certificate

---

# Metrics based on the example (user perspective)

an online repository at <https://www.ni4os-repository.com> that we run at GRNET.

## Service Type

Each *Service Type* can have a defined set of *metrics*, which are explicit tests that we check



repository

<https://www.ni4os-repository.com>

From the user perspective

Login

Check the login functionality of the service

Upload a file

Check the upload functionality of the service

Create your service probe

---

# Introduce Your Service

## Describe your service



### Intro

A few thinks about your service and the technologies it uses ?

Does it support an authorization and authentication mechanism ?

Is there an interconnection with another Ni4OS service ?

Which are the main functions the user uses?

# Introduce your service

## Describe your service



### Intro

A few thinks about your service and the technologies it uses ?

Does it support an authorization and authentication mechanism ?

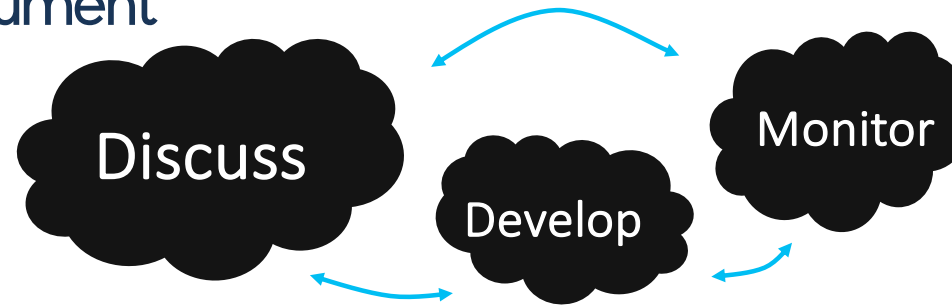
Is there an interconnection with another Ni4

Which are the main functions the user uses?



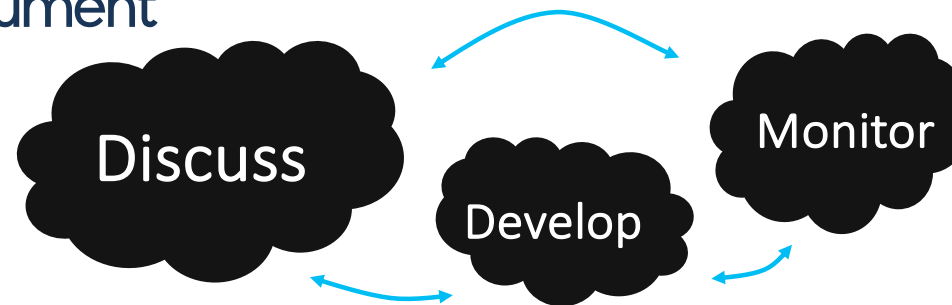
# Probe Development

Specify and Document



# Probe Development

Specify and Document



## Discuss

what to check

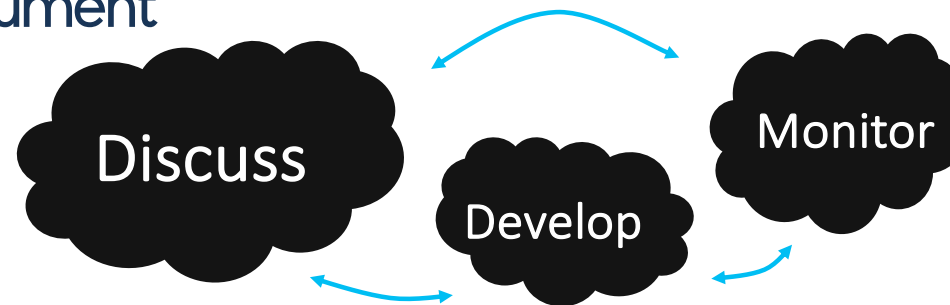
Discussion with representatives - developers of each service in order to agree on a set of monitored metrics.

New ticket so as to support and help.



# Probe Development

## Specify and Document



### Discuss

#### what to check

Discussion with representatives - developers of each service in order to agree on a set of monitored metrics.

New ticket so as to support and help.

### Develop

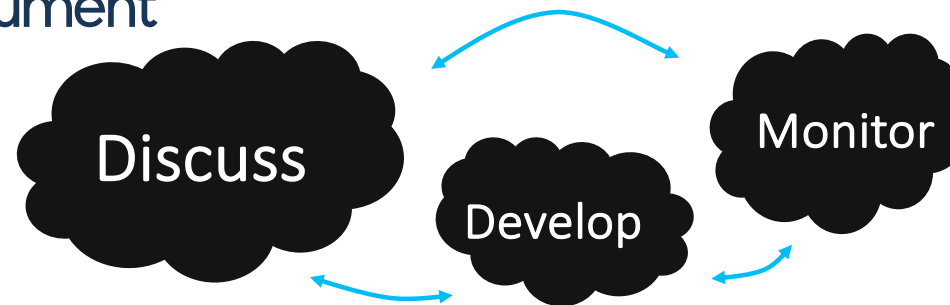
#### how to check

Development and testing of probe(s).  
The development lifecycle includes: coding of the probe, documentation, testing and packaging.

guidelines, documentation and training material is available.

# Probe Development

## Specify and Document



### Discuss

#### what to check

Discussion with representatives - developers of each service in order to agree on a set of monitored metrics.

New ticket so as to support and help.

### Develop

#### how to check

Development and testing of probe(s). The development lifecycle includes: coding of the probe, documentation, testing and packaging.

guidelines, documentation and training material is available.

### Monitor

#### starting to check

The lifecycle of the deployment of the service probe is based on the following repetitive steps: a) test, verify. if it passes the tests b) guidelines for the service owners are created. The monitoring team makes the necessary configurations. c) The A/R report(s) changes!!!

# Monitoring

3) Profiles: A list of dependencies that create profiles needed for the monitoring



# Metrics Profile

Services and associated metrics are grouped into profiles that instruct monitoring instances what kind of tests to execute for all and for a given service.

## **OPS\_CRITICAL**

- ❑ ni4os.repository → eu.egi.CertValidity
  - ❑ ni4os.repository → org.nagiosexchange.Portal-WebCheck
  - ❑ Argo.webui → org.nagios.ARGOWeb-AR
  - ❑ Argo.webui → org.nagios.ARGOWeb-Status
-

# Metrics Profile

[Home](#) / [Metric profiles](#) / MON

## Change Metric profile

Clone

History

Name MON

Name of metric profile

Description:








Profile used to configure Monitoring Engine

Free text description outlining the purpose of this profile.

Group NI4OS

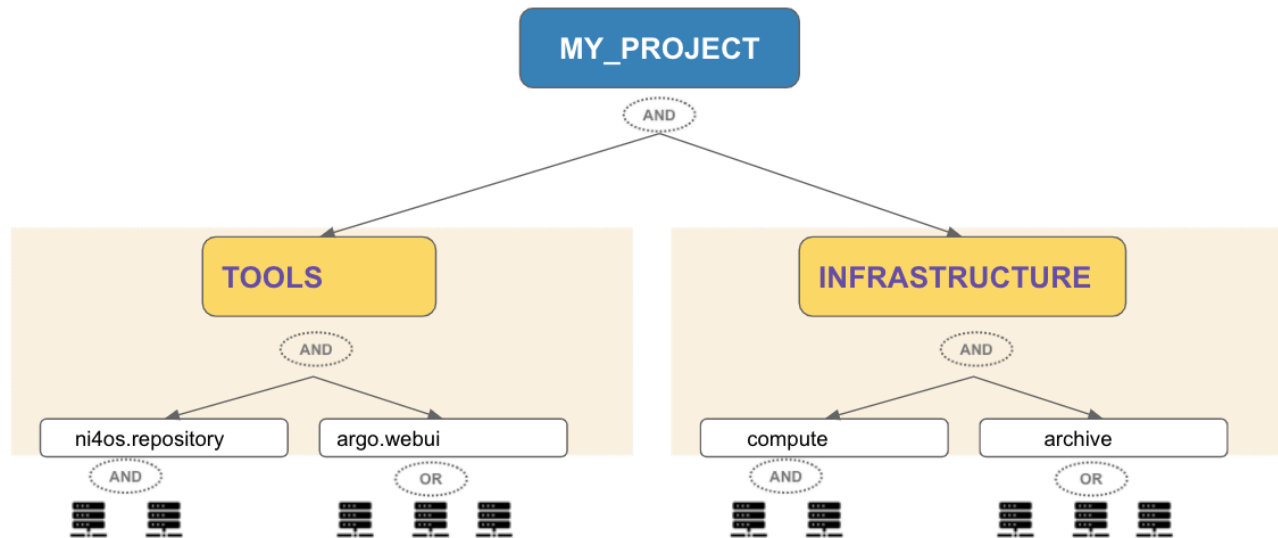
Metric profile is member of given group.

### METRIC INSTANCES

#	 Service flavour	 Metric	Actions
	<input type="text" value="Search"/>	<input type="text" value="Search"/>	
1	eu.ni4os.ops.training	eu.egi.CertValidity	 
2	eu.ni4os.ops.training	org.nagios.WebCheck	 

# Aggregation Profiles

Define how monitored items are grouped and form hierarchies



# Operations Profile

- How two different statuses are combined. In principle these define how ANDing and ORing operations are performed between status values.

OK + CRIT → CRIT

OK + WARN → WARN

OK + OK → OK

```
{
  "available_states": [
    "OK",
    "WARNING",
    "UNKNOWN",
    "MISSING",
    "CRITICAL",
    "DOWNTIME"
  ],
  "operations": [
    {
      "name": "AND",
      "truth_table": [
        { "a": "OK", "b": "OK", "x": "OK" },
        { "a": "OK", "b": "WARNING", "x": "WARNING" },
        { "a": "OK", "b": "UNKNOWN", "x": "UNKNOWN" },
        { "a": "OK", "b": "MISSING", "x": "MISSING" },
        { "a": "OK", "b": "CRITICAL", "x": "CRITICAL" },
        ...
      ]
    }
  ]
  ...
}
```

## Now that we know:

- ❑ The **topology** of the infrastructure
- ❑ **What** to check (metric profile)
- ❑ **how** monitored items are grouped (aggregation profile)
- ❑ how ANDing and ORing **operations** are performed (operations profile)

*So lets start monitoring*

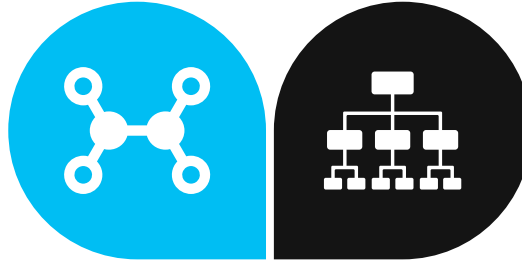
---



# The Process

## Services to monitor

We define the services to monitor

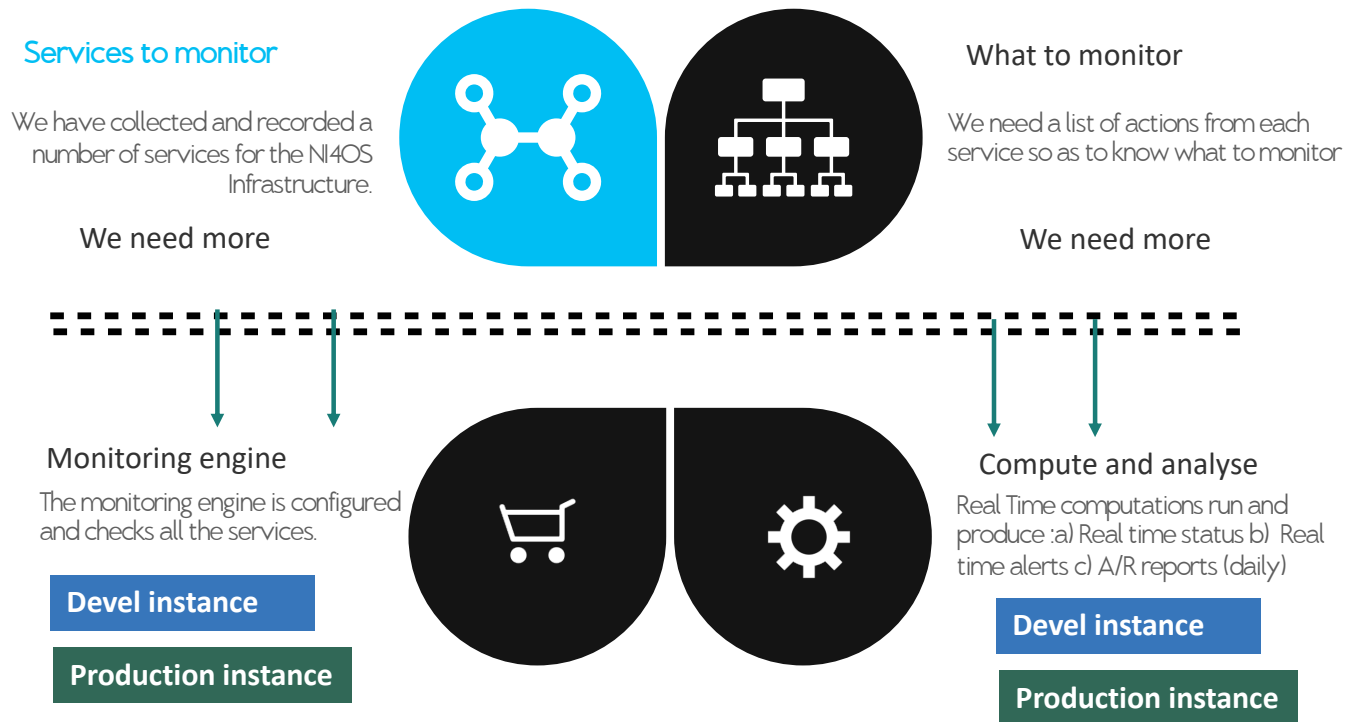


## What to monitor

We need a list of actions from each service so as to know what to monitor

This will happen periodically!!

# The Process



# Alerts

Is there a problem with your service?

An alert should be sent !

**analyze** the monitoring results  
and **send alerts** based on  
a **set of rules!**



[ KR-KNU-T3 ] - Service CREAM-CE is CRITICAL

Alert ID	5bde6370-51bb-4945-aa5b-2556c8aa4ae1
Create Time	2018-04-17 09:46:17.753000
Monitored Time	2018-04-17T09:46:11Z
Processed Time	2018-04-17T09:46:17Z
Repeated	false
Resource	KR-KNU-T3/CREAM-CE
Event Type	servicestatus
Severity	Indeterminate -> Critical
Status	Open

MORE DETAILS



● SITE BUDAPEST is **Critical**

**SITE BUDAPEST** became **Critical** at 2019-09-10T06:17:51Z  
The ENDPOINT affected is  
● grid143.kfki.hu (SRM)  
due to **METRIC** org.sam.SRM-Put

Questions? Email [EGI Monitoring Team](#)  
the monitoring team

# Service Check List

Category	Check list	Service Provider	Monitoring Team	GOCDB Team
Topology	Topology information about the Site owner (one time)			
	Topology information about the service and the service endpoints			
	Topology information about the service actors			
Metrics	Starting monitoring with the basic checks			
	Metrics (from user perspective). Creation of probe			
	Starting monitoring from the user perspective			
Profiles	Metrics profile. Decision of the grouping of the metrics into profiles			
	Aggregation profiles. Decision on how monitored items are grouped and form hierarchies			

---

# Thanks!



<https://ni4os.eu/>



[https://twitter.com/NI4OS\\_eu](https://twitter.com/NI4OS_eu)



<https://www.facebook.com/NI4OS/>

