



# Aplicação para Avaliação da Qualidade dos Serviços de Dados Geográficos

**Pedro Medeiros, José Borbinha, Bruno Martins**

*IST/INESC-ID- [pmelo.medeiros@gmail.com](mailto:pmelo.medeiros@gmail.com)*

*IST/INESC-ID- [jl@ist.utl.pt](mailto:jl@ist.utl.pt)*

*IST/INESC-ID- [bruno.g.martins@ist.utl.pt](mailto:bruno.g.martins@ist.utl.pt)*

# Assessing the Quality of INSPIRE Network Services

*“Member states are required to establish and operate a network of services for the spatial data sets”*

*“In order to ensure the compatibility and usability of such services on the Community level, it is necessary to lay down the technical specifications and minimum performance criteria for those services”*

# GeoWatchDog

Assess the quality of geographic Web services

- Monitor **performance** and **availability**
- Test **scalability**
- Inspect **geospatial data**
- **Invoke** services



# GeoWatchDog (II)

- Services implement open standards (e.g. OGC standards)
- Based on the **deegree owsWatch** (opensource)
- Model-View-Controller
- Java (J2EE)

# Registering Services on GWD

- GWD Admin
- Services registered in the application has an associated request

### Edit Registered Service

SERVICE DETAILS	
Display Name	SNIG CAOP Conti
Type	WMS
Version	1.1.1
URL	http://mapas.igeo.p

REQUEST DETAILS			
Request Type	GetMap		
HTTP Method	<input type="radio"/> POST (xml) <input checked="" type="radio"/> GET		
Width	400	Height	300
Layers	CAOP		
Styles			
Transparent	<input checked="" type="checkbox"/>	Format	image/png
<b>Bounding Box Information</b>			
SRS	EPSG:4326		
BBOX	-10.1905,36.8994,-5.7129		

# GWD – Querying Geographic Catalogues









- Register services published by catalogues (CSW)

**Add Catalogue Services**

SERVICES RETURNED			
Name	Type	Version	Select
V?@rtices Geod?@sicos (WMS)	WMS	1.1.1	<input checked="" type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - A?bores) - Vers?Eo 6.0	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Continente) - Vers?Eo 6.0	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Madeira) - Vers?Eo 6.0	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Continente) - Vers?Eo 2008.1	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Continente) - Vers?Eo 2008.0	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Madeira) - Vers?Eo 2008.0	WMS	1.1.1	<input type="radio"/>
Carta Administrativa Oficial de Portugal (CAOP - Continente) - Vers?Eo 2008.1	WMS	1.1.1	<input type="radio"/>

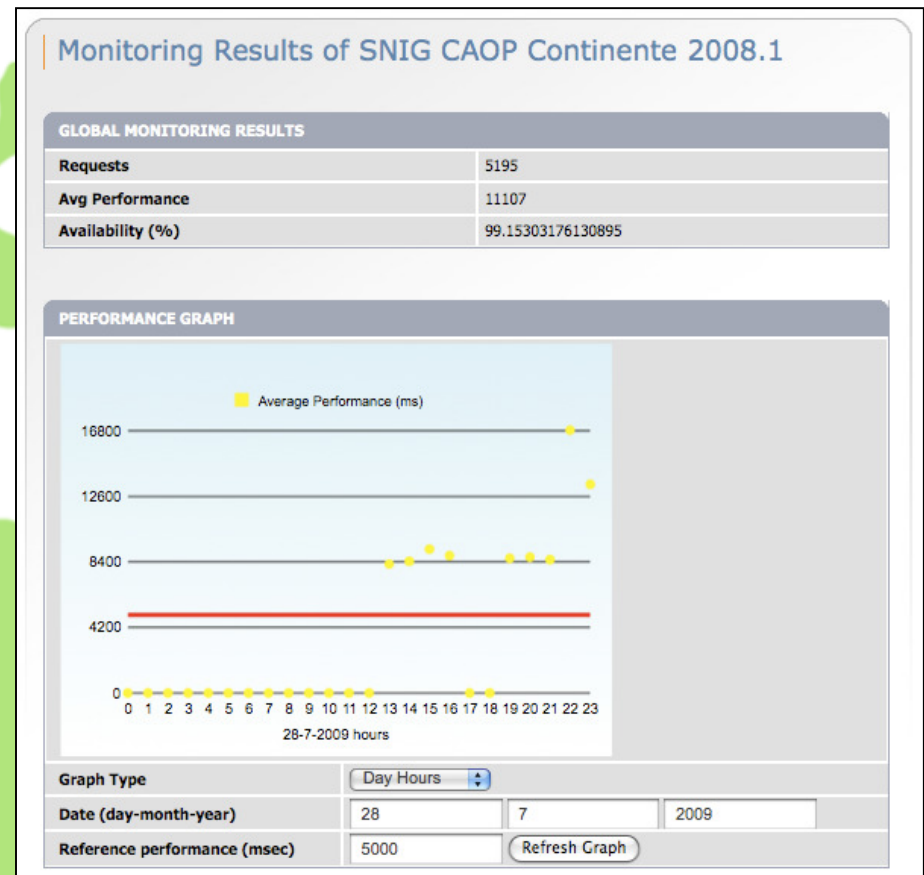
# GWD - Monitoring performance and scalability

- GWD Monitor
- Monitoring List

Monitoring List							
Name	Type	Request	Monitor	Performance	Availability	Last Test	Select
WMS demo Capa	WMS	GetCapabilities		1816		Wed Oct 28 23:12:00 WET 2009	<input checked="" type="radio"/>
SNIG CAOP Continente 2008.1	WMS	GetCapabilities		634		Wed Oct 28 23:12:00 WET 2009	<input type="radio"/>
IDEE Cartocidad: Nomenclatura deCodigo postal	WFS	GetCapabilities		230		Wed Oct 28 23:12:00 WET 2009	<input type="radio"/>
WMS demo GetMap	WMS	GetMap		3404		Wed Oct 28 23:00:00 WET 2009	<input type="radio"/>

# GWD – Monitoring results

- Graphing interface for visualizing results





# GWD – Testing scalability

- GWD Load-Tester
- Integration with the Apache JMeter tool
- Send request batches

## Load Test Results

### TEST DETAILS

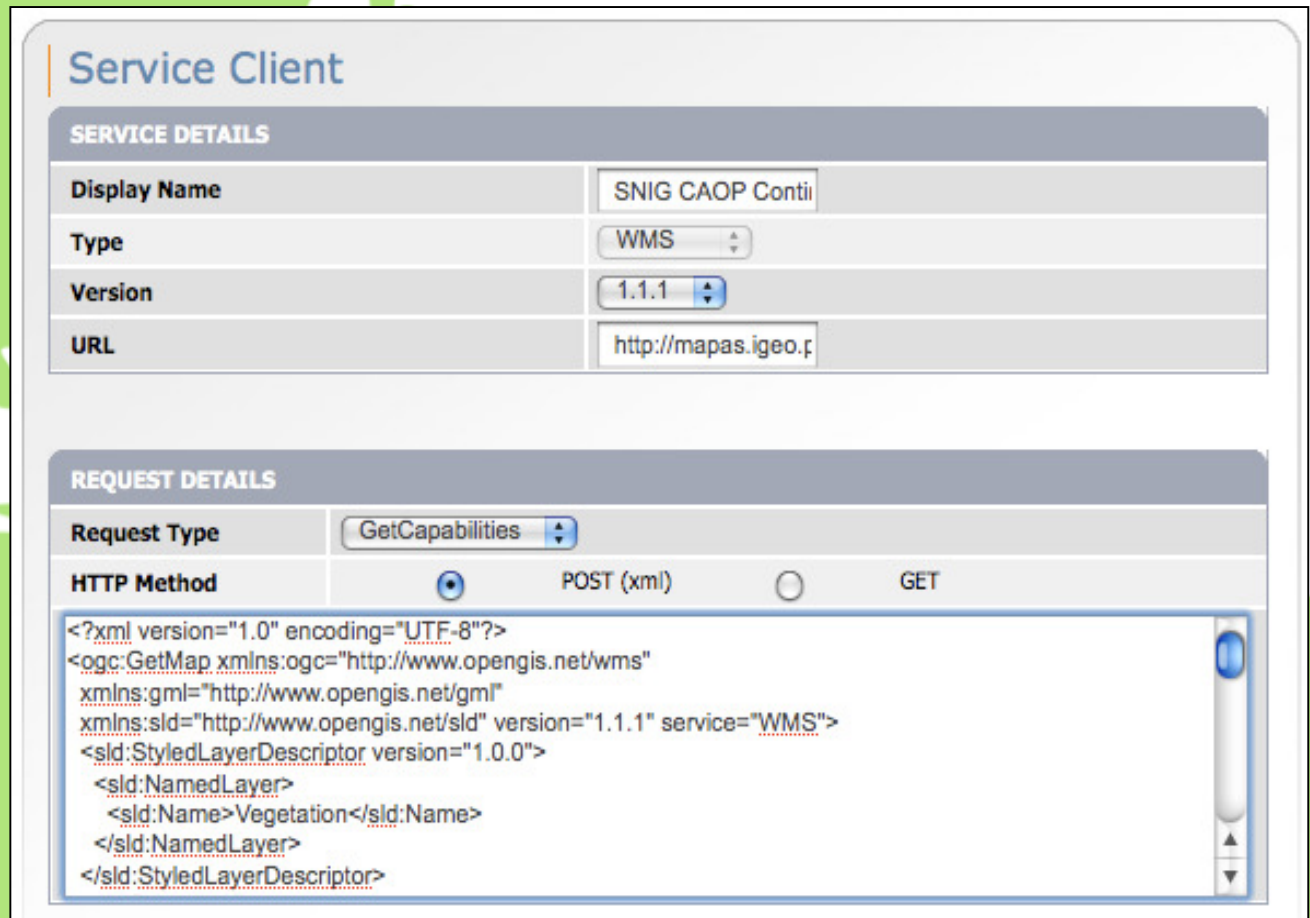
Number of Threads (users)	30
Period (seconds)	2
Loop Count	3
Sent Requests	90

### TEST RESULTS

Tests	90
Failures	0
Success Rate (%)	100.0
Average Time (ms)	697
Average Bytes	7484

# GWD – Analyze Geospatial Data

- GWD Data-Tester
- Send requests
- Analyze or inspect the responses



The screenshot displays the 'Service Client' interface, which is used for testing geospatial services. It is divided into two main sections: 'SERVICE DETAILS' and 'REQUEST DETAILS'.

**SERVICE DETAILS**

Display Name	SNIG CAOP Contii
Type	WMS
Version	1.1.1
URL	http://mapas.igeo.p

**REQUEST DETAILS**

Request Type: GetCapabilities

HTTP Method:  POST (xml)  GET

The response is displayed in a text area with a scrollbar:

```
<?xml version="1.0" encoding="UTF-8"?>
<ogc:GetMap xmlns:ogc="http://www.opengis.net/wms"
xmlns:gml="http://www.opengis.net/gml"
xmlns:sld="http://www.opengis.net/sld" version="1.1.1" service="WMS">
<sld:StyledLayerDescriptor version="1.0.0">
<sld:NamedLayer>
<sld:Name>Vegetation</sld:Name>
</sld:NamedLayer>
</sld:StyledLayerDescriptor>
```

# GWD – Invoking services

- Send requests and visualize the responses
- Openlayers client

The screenshot shows a web interface titled "Test Playground" with three main sections: SERVICE DETAILS, REQUEST DETAILS, and RESPONSE.

**SERVICE DETAILS**

- Type: WMS
- Version: 1.1.1
- Example URL: [http://ema1.agr.gov.ca/cgi-bin/mapplm12000\\_1?](http://ema1.agr.gov.ca/cgi-bin/mapplm12000_1?)
- URL: <http://mapas1.geo.>

**REQUEST DETAILS**

- Request Type: GetMap
- HTTP Method: POST (xml) (selected), GET
- Example Request: GetMap.xml
- Width: 400, Height: 300
- Layers: CAOP
- Styles: (empty)
- Transparent:
- Format: image/png

**Bounding Box Information**

- SRS: EPSG:4326
- BBOX: -10.1913,36.8987,-5.7141

**RESPONSE**

The response section displays a map of a geographical area, likely a coastline or landmass, with a blue overlay indicating the requested data. The map includes navigation controls (directional arrows, zoom in/out, and a full-screen button).

# INSPIRE – Requirements for Network services

- *“the response time for sending the initial response to a GetMap request to a view service shall be maximum 5 seconds in normal situation”*
- *“The response time for sending the initial response to a Discovery service request shall be maximum 3 seconds”*

❖ *...in normal situation (out of peak load, 90% of the time)*

# INSPIRE – Performance Criteria

- *“the response time for sending the initial response to a GetMap request to a view service shall be maximum 5 seconds in normal situation”*
- *“The response time for sending the initial response to a Discovery service request shall be maximum 3 seconds”*

❖ *...in normal situation (out of peak load, 90% of the time)*



# INSPIRE – Availability Criteria

- *“The probability of a Network Service to be available shall be 99% of the time”*

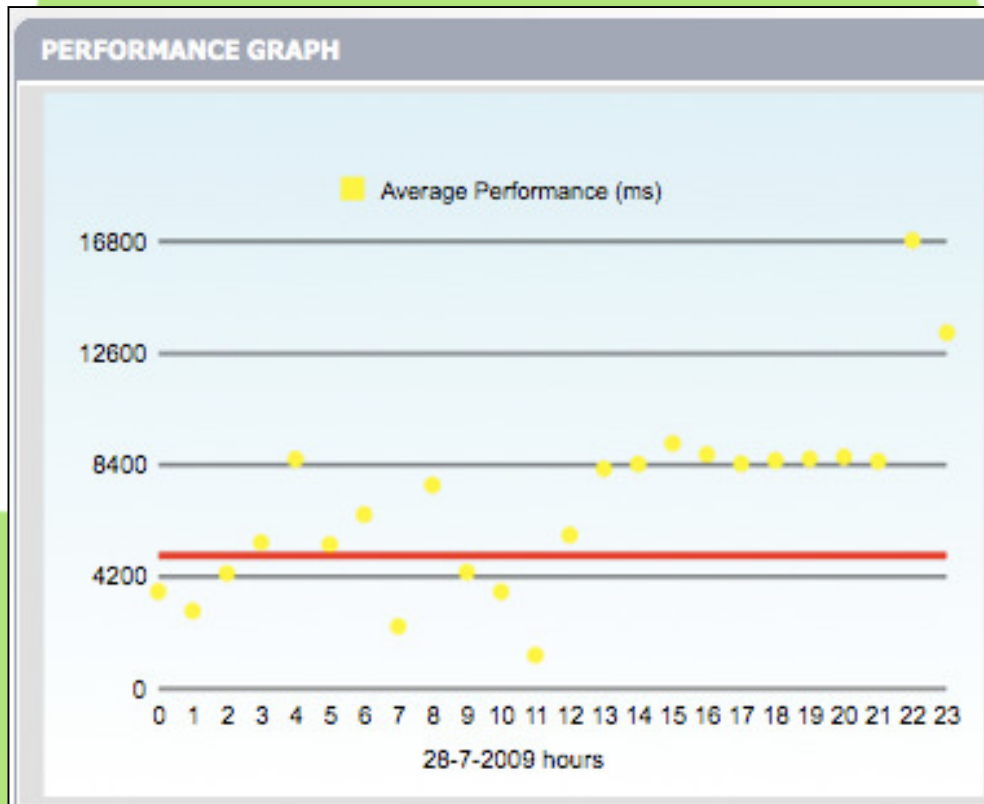
# Monitoring Performance and Availability

- Monitoring details:
  - Service timeout: 30s
  - Refresh rate: 1m
  - WMS 1.1.1

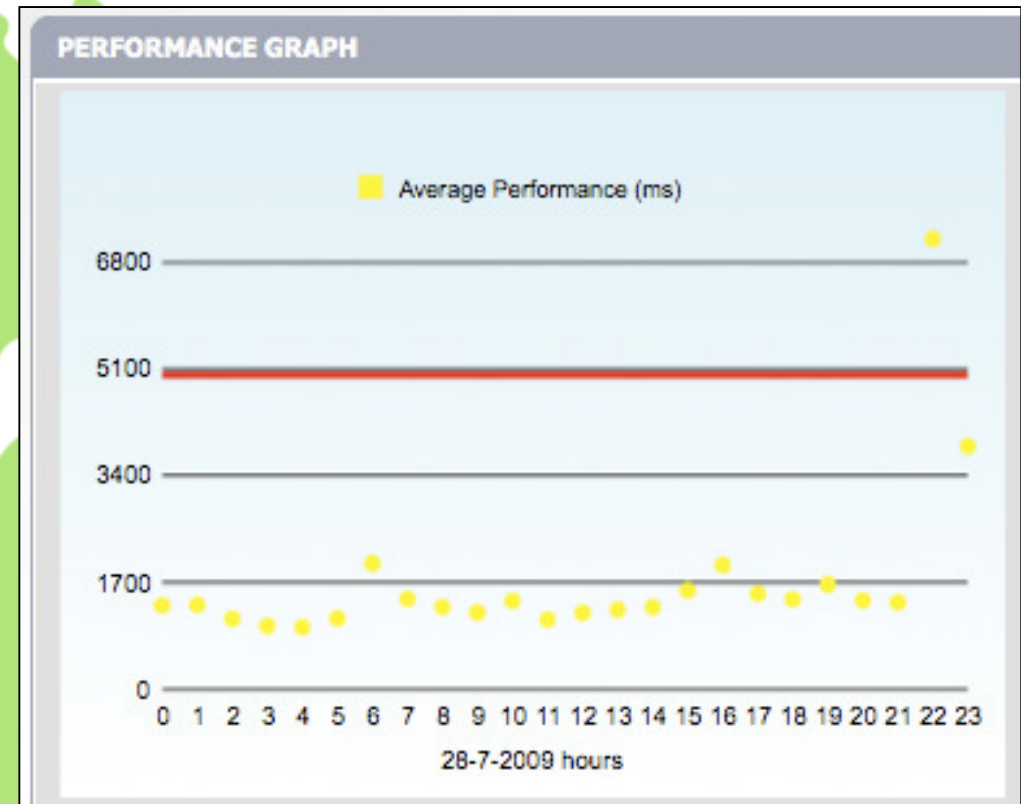
Service	Requested Layer
CAOP Continente	CAOP
Vértices Geodésicos	VG
CAOP Açores	CAOP2008_Acores
SNIRH Águas Superficiais	13

# Performance and Availability Results

## CAOP Continente



## CAOP Açores

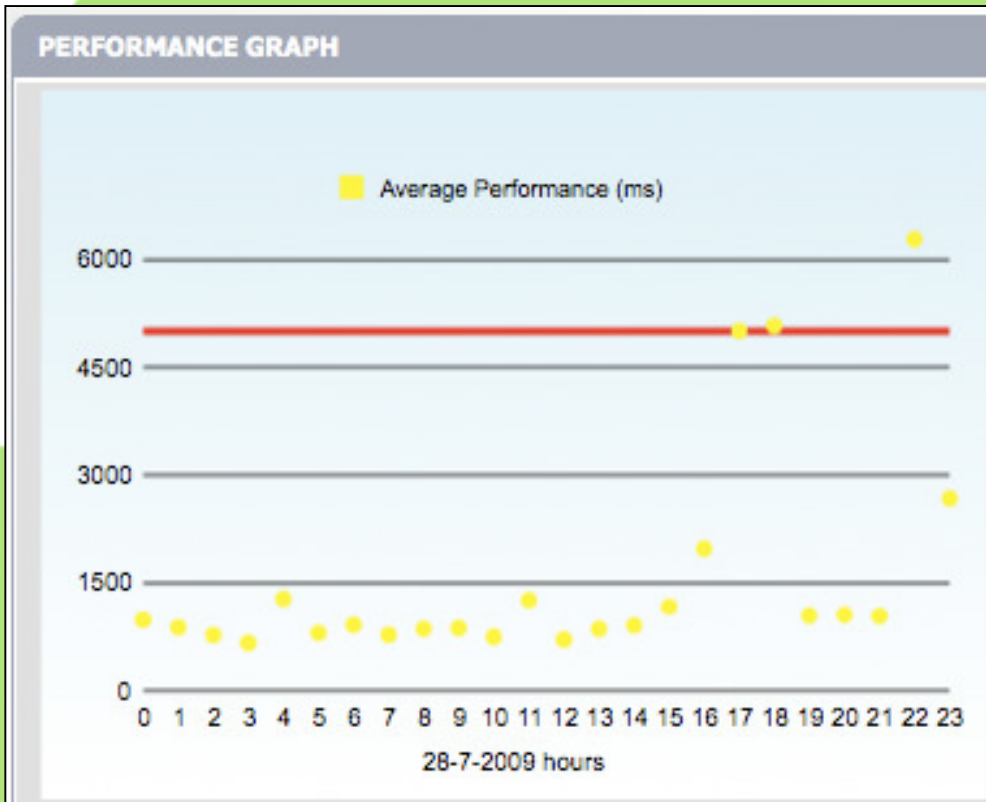


- Availability – **99%**

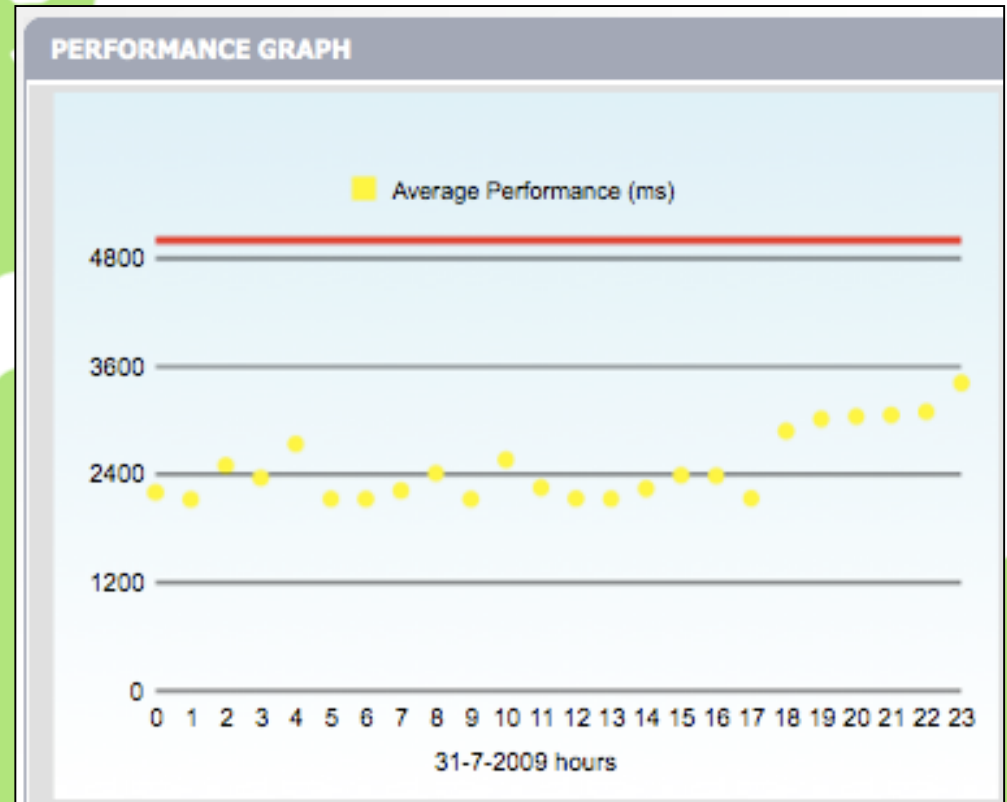


# Performance and Availability Results (II)

## Vértices Geodésicos



## Águas Superficiais



- Availability – **99%**

# INSPIRE – Capacity Criteria

*“the minimum number of served simultaneous requests to a view service according to the performance QoS shall be 20 per second”*

# Testing Capacity

- Test-plans:
  - Simulated users: 30, 60, 90
  - Period: 2s
  - Iterations: 3
- Services

Service	Type	Request
CAOP	WMS 1.1.1	GetMap("CAOP")
Vértices Geodésicos	WFS 1.1.0	GetFeature("vg")
SNIG Catalogue	CSW 2.0.2	GetCapabilities()

# Capacity Results

Service	Requests	Avg Time (ms)
CAOP Continente	90	800
	180	2246
	270	3555
Vértices Geodésicos	90	580
	180	3597
	270	5074
SNIG Catalogue	90	62
	180	70
	270	39

# GWD is a prototype...

- Present monitoring indicators
- Export reports with monitoring indicators
- Compare results



# Muito obrigado!

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*IST/INESC-ID- [pmelo.medeiros@gmail.com](mailto:pmelo.medeiros@gmail.com)*

*IST/INESC-ID- [jlb@ist.utl.pt](mailto:jlb@ist.utl.pt)*

*IST/INESC-ID- [bruno.g.martins@ist.utl.pt](mailto:bruno.g.martins@ist.utl.pt)*

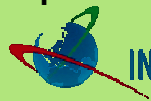
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