

3. DISCOVERY PROCESSES, SEARCHING FOR SPATIAL DATA AND WEB SERVICES

The concept of discovery in ESDI

- The main ingredients we need to discover relevant spatial data/data series/services/... are:

- **1. Metadata describing a resource**


(in exchangeable format)



- **2. Discovery service**

```
1. <?xml version="1.0" encoding="utf-8" ?>
<gmd:MD_Metadata xsi:schemaLocation="http://www.isotc211.org/2005/gmd
http://www.isotc211.org/2005/gmd/metadataEntity.xml" xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:csl="http://www.isotc211.org/2005/gco" xmlns:gms="http://www.isotc211.org/2005/gmx"
xmlns:xi="http://www.w3.org/2001/XMLSchema-instance" xmlns:gml="http://www.opengis.net/gml">
<gmd:fileIdentifier>
<gmd:language>
<gmd:LanguageCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/
codeListValue="cze">cze</gmd:LanguageCode>
<gmd:characterSet>
<gmd:MD_CharacterSetCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/
codeListValue="utf-8" utf8="gmd:MD_CharacterSetCode"
<gmd:characterSet>
<gmd:hierarchyLevel>
<gmd:MD_ScopeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/M
codeListValue="dataset" dataset="gmd:MD_ScopeCode"
<gmd:hierarchyLevel>
<gmd:contacts>
<gmd:CI_Contact>
<gmd:individualName>
<gco:CharacterString>Tomiš Rezník</gco:CharacterString>
</gmd:individualName>
<gmd:organisationName>
<gco:CharacterString>Masarykova univerzita, Laborař geoinformatiky a
kartografie</gco:CharacterString>
<gmd:PT_FreeText>
<gmd:textGroup>
<gmd:LocalisedCharacterString locale="#locale-en">Masaryk University, Laboratory
of Geoinformatics and Cartography</gmd:LocalisedCharacterString>
</gmd:textGroup>
</gmd:PT_FreeText>
</gmd:organisationName>
<gmd:positionName>
<gco:CharacterString>analitik</gco:CharacterString>
</gmd:positionName>
<gmd:contactInfo>
<gmd:CI_Contact>
<gmd:phone>
<gmd:CI_Telephone>
```

2. **DISCOVERY SERVICE FOR SPATIAL DATA AND SERVICES**

map



Customized time range:
From: 
To: 

Adopted from <http://maps.google.com>

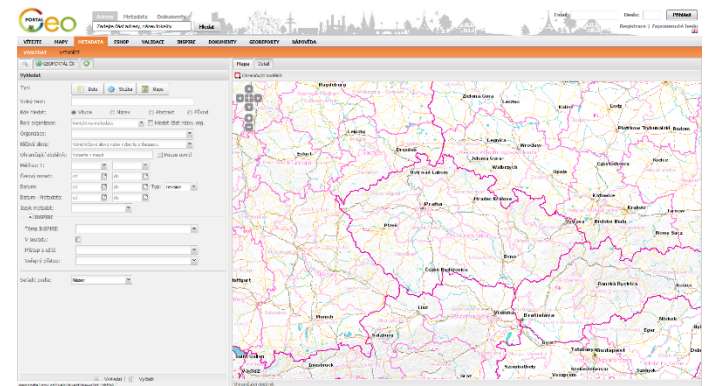
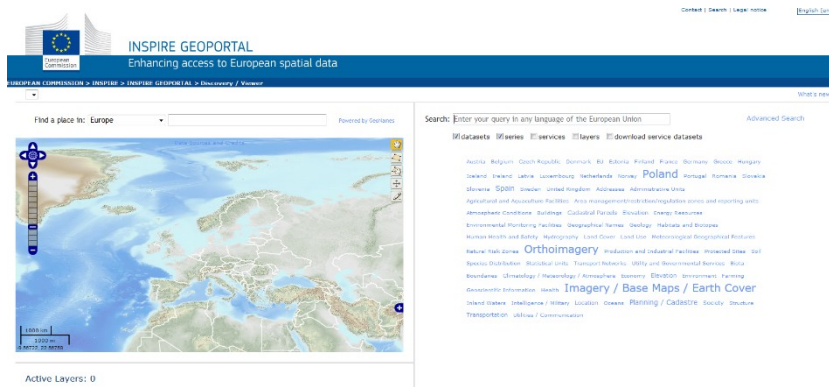


Designation of the same is different in OGC services and INSPIRE

- Get used to it!
- Do you know OGC (Open Geospatial Consortium) **Catalogue Service for Web?**
 - Then you know **INSPIRE Discovery service**
- Do you know OGC (Open Geospatial Consortium) **Web Map Service?**
 - Then you know **INSPIRE View service**
- Do you know OGC (Open Geospatial Consortium) **Web Feature Service?**
 - Then you know **INSPIRE download service**
- *To be continued...*

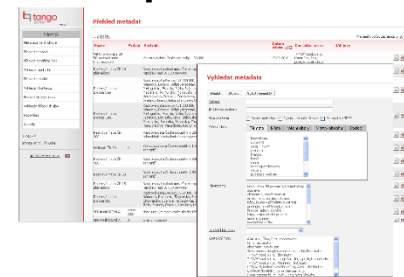
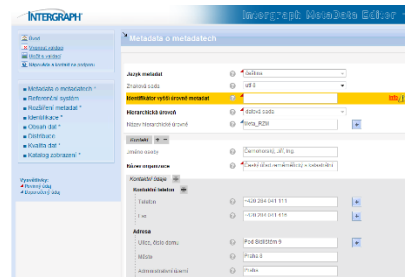
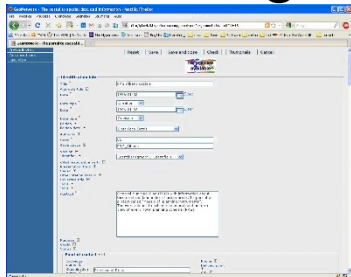
Two possibilities of connecting to a discovery service

1. Through a “thin” client – typically a Web browser



2. Through a “thick” client

– e.g. a catalogue client, common for GI professionals



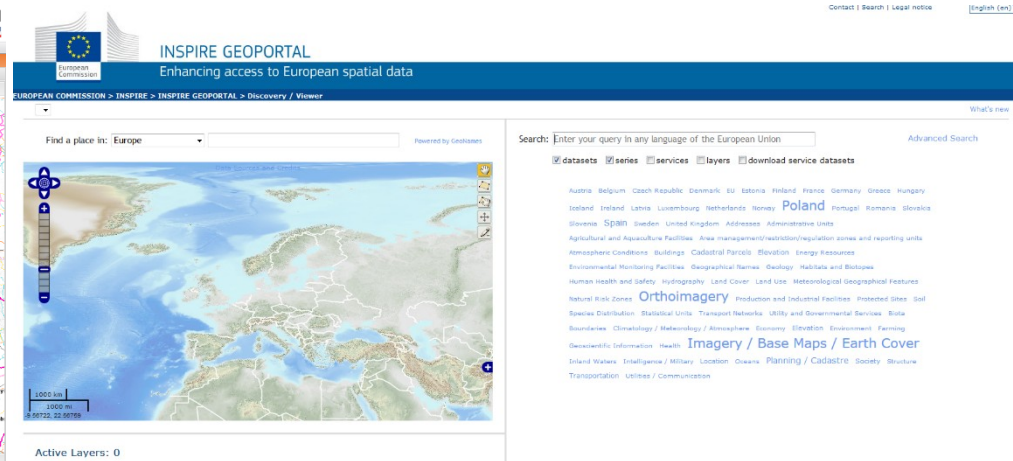
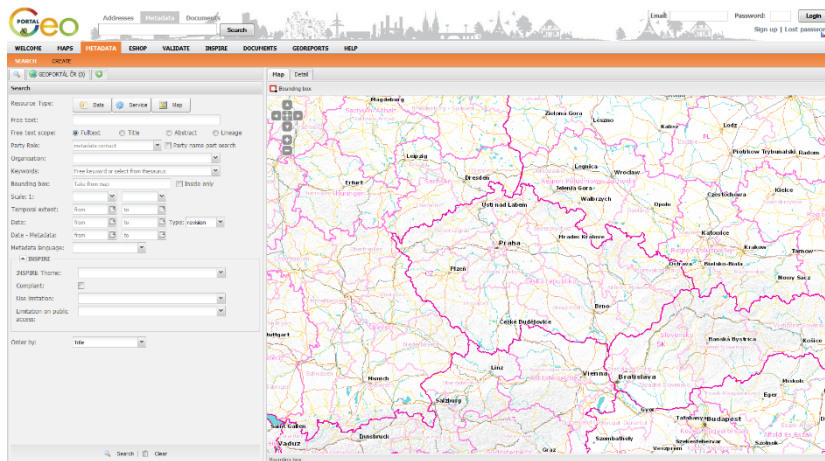
Let's make it simple...a use case with Web browser

- Type in <http://inspire-geoportal.ec.europa.eu/> or <http://geoportal.gov.cz/web/guest/catalogue-client>

The screenshot displays the Inspire Geoportal web interface. At the top, there is a navigation bar with tabs for 'WELCOME', 'MAPS', 'METADATA', 'ESHOP', 'VALIDATE', 'INSPIRE', 'DOCUMENTS', 'GEOREPORTS', and 'HELP'. Below this is a search bar with a 'Search' button and a 'Search' dropdown menu. The main content area is divided into two sections: a search filter panel on the left and a map on the right. The search filter panel includes fields for 'Resource Type' (Data, Service, Map), 'Free text' (Fulltext, Title, Abstract, Lineage), 'Party Role' (metadata contact, Party name part search), 'Organisation', 'Keywords', 'Bounding box' (Take from map, Inside only), 'Scale: 1', 'Temporal extent' (from, to, Type: revision), 'Date - Metadata' (from, to), 'Metadata language', and 'INSPIRE' (INSPIRE Theme, Compliant, Use limitation, Limitation on public access). The map on the right shows a geographical view of Central Europe, with various cities and regions labeled, including Prague, Vienna, Bratislava, and Budapest. The map is titled 'Map' and 'Detail'.

Legislation background

- Sure, all this is originating from INSPIRE legislation

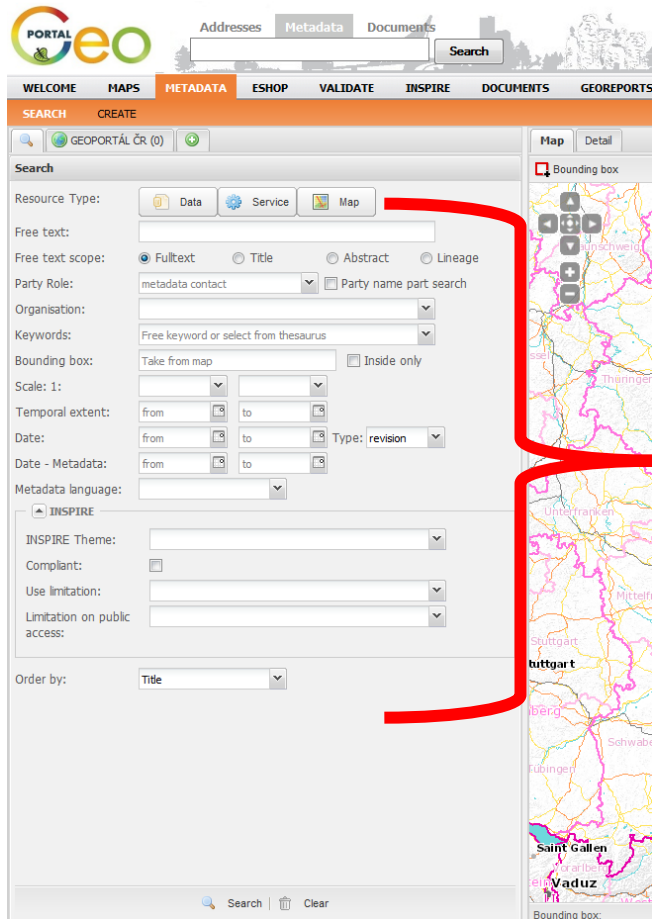


- COMMISSION REGULATION (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services

- <https://inspire.ec.europa.eu/network-services/41>

Legislation background

- Sure, all this is originating from INSPIRE legislation



Minimum search criteria	INSPIRE metadata elements
Keywords	Keyword
Classification of spatial data and services (For spatial data sets and spatial data set series)	Topic category
Classification of spatial data and services (For	Spatial data service type

The following INSPIRE metadata elements or set of elements shall be also available as search criteria:

- (a) Resource Title;
- (b) Resource Abstract;
- (c) Resour
- (d) Unique
- (e) Tempo

To allow for discovering resources through a combination of search criteria, logical and comparison operators shall be supported.

To allow for discovering resources based on the geographic location of the resource, the spatial operator listed in Table 2 shall be supported.

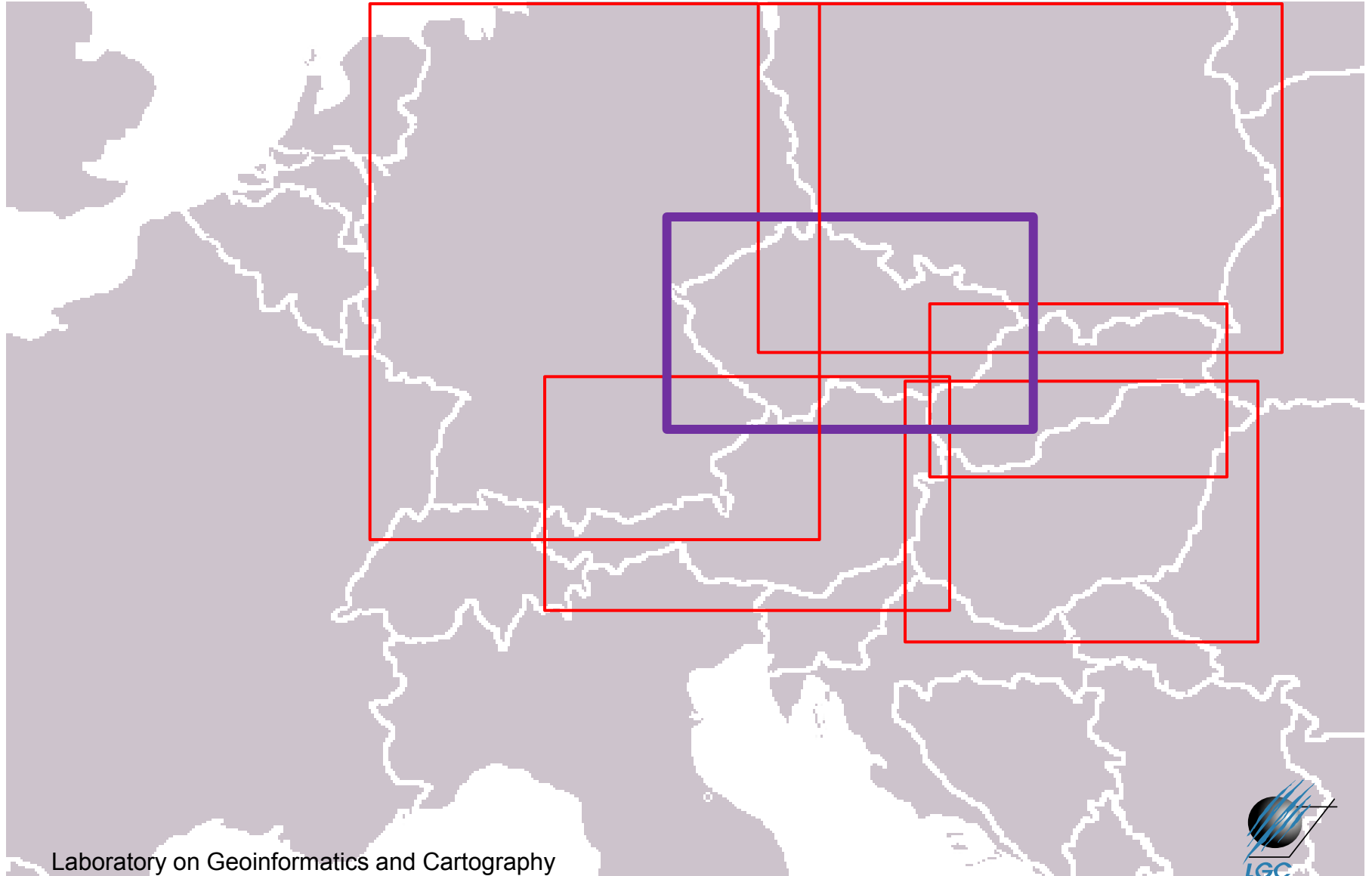
Aren't you missing anything?

20.10.2009 EN Official Journal of the European Union L 274/13

Table 2

Operator Name	Property
Intersects	Requires the geographic bounding box INSPIRE metadata element to intersect a defined area of interest

Intersect as a spatial operator



Operations of an INSPIRE discovery service

- **Get Discovery Servi**

- i.e. GetCapabilities

- **Discover Metadata**

- i.e. GetRecords acc

- **Publish metadata**

- i.e. harvest, transac

- **Link Discovery serv**

- an equivalent of se
OGC

In order to be in conformity with Article 11(1) of Directive 2007/2/EC, the Discovery Service shall provide the operations listed in Table 3 of this Annex.

Table 3

Operation	Role
Get Discovery Service Metadata	Provides all necessary information about the service and describes service capabilities
Discover Metadata	The Discover Metadata operation allows requesting INSPIRE metadata elements of resources based on a query statement to be retrieved from the target Discovery Service

In order to be in conformity with Article 12 of Directive 2007/2/EC, the Discovery Service shall support the operations listed in Table 4 of this Annex.

Table 4

Operation	Role
Publish Metadata	The Publish Metadata operation allows editing INSPIRE metadata elements of resources in the Discovery Service (push or pull metadata mechanisms). Editing meaning insert, update and delete
Link Discovery Service	The Link Discovery Service function allows the declaration of the availability of a Discovery Service for the discovery of resources through the Member State Discovery Service while maintaining the resource metadata at the owner location

The request and response parameters of each operation complete the description of each operation and form an integral part of the Discovery Service technical specification.

Get Discovery Service Metadata

- Intended for “thick” clients
- Not applicable for an ordinary user with a Web browser

```

<csw:Capabilities xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2 http://schemas.opengis.net/
version="2.0.2">
  <ows:ServiceIdentification>
    <ows:Title>Czech republic INSPIRE metadata catalogue</ows:Title>
  </ows:ServiceIdentification>
  <ows:Abstract>
    Metadata catalogue of Czech republic for INSPIRE project.
  </ows:Abstract>
  <ows:Keywords>
    <ows:Keyword>CSW</ows:Keyword>
    <ows:Keyword>CENIA</ows:Keyword>
    <ows:Keyword>INSPIRE</ows:Keyword>
    <ows:Keyword>geospatial</ows:Keyword>
    <ows:Keyword>catalogue</ows:Keyword>
  </ows:Keywords>
  <ows:ServiceType>CSW</ows:ServiceType>
  <ows:ServiceTypeVersion>2.0.2</ows:ServiceTypeVersion>
  <ows:Fees>NONE</ows:Fees>
  <ows:AccessConstraints>Transactions for authorised users only.</ows:AccessConstraints>
  <ows:ServiceIdentification>
  <ows:ServiceProvider>
    <ows:ProviderName>CENIA, Czech Environmental Information Agency</ows:ProviderName>
    <ows:ProviderSite xlink:href="http://www.cenia.cz/">
  </ows:ServiceContact>
    <ows:IndividualName>Ing. Pavla Albrechtová</ows:IndividualName>
    <ows:PositionName>Metadata administrator</ows:PositionName>
  </ows:ContactInfo>
    <ows:Phone>
      <ows:Voice>+420 267 225 111</ows:Voice>
    </ows:Phone>
  </ows:Address>
    <ows:DeliveryPoint>Liteská 1174/8</ows:DeliveryPoint>
    <ows:City>Praha</ows:City>
    <ows:AdministrativeArea>
    <ows:PostalCode>100 05</ows:PostalCode>
    <ows:Country>Czech republic</ows:Country>
    <ows:ElectronicMailAddress>info@cenia.cz</ows:ElectronicMailAddress>
  </ows:Address>
    <ows:OnlineResource xlink:href="http://www.cenia.cz/">
  </ows:ContactInfo>
    <ows:Role>pointOfContact</ows:Role>
  </ows:ServiceContact>
  <ows:ServiceProvider>
  <ows:OperationsMetadata>
    <ows:Operation name="GetCapabilities">
      <ows:DCP>

```

Title	Czech Republic INSPIRE metadata catalogue
Service type	INSPIRE Discovery Service (CSW – Catalogue Service for Web according to the OGC)
Service version	2.0.2
Supported languages	Czech, English
Fees	Free of charge
Responsible Party	CENIA, Czech Environmental Information Agency
E-mail	info@cenia.cz
Supported operations	Discover Metadata Publish metadata Link Discovery service



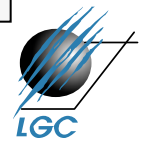
<http://geoportal.gov.cz/php/micka/csw/index.php?SERVICE=CSW&REQUEST=GetCapabilities>



catalogue

client

<http://geoportal.gov.cz/php/micka/csw/index.php?SERVICE=CSW&REQUEST=GetCapabilities>



Discover Metadata

The screenshot shows the 'Discover Metadata' interface of the Geoportal. The top navigation bar includes 'WELCOME', 'MAPS', 'METADATA', 'ESHOP', 'VALIDATE', 'INSPIRE', 'DOCUMENTS', 'GEOREPORTS', and 'HELP'. The search interface is divided into several sections:

- Resource Type:** Includes 'Data', 'Service', and 'Map'. The 'Service' button is circled in red.
- Free text:** A search box containing the word 'hydro' is circled in red.
- Free text scope:** Includes 'Fulltext', 'Title', and 'Abstract'. 'Fulltext' is selected.
- Party Role:** A dropdown menu with 'metadata contact' selected.
- Organisation:** A dropdown menu.
- Service Type:** A dropdown menu.
- Keywords:** A dropdown menu.
- Bounding box:** A text box containing the coordinates '16.045 48.795 17.347 49.481' is circled in red.
- Scale:** A dropdown menu.
- Temporal extent:** Includes 'Date' and 'Date - Metadata' with 'from' and 'to' fields.
- Metadata language:** A dropdown menu.
- INSPIRE:** Includes 'INSPIRE Theme', 'Service Classification', 'Compliant', 'Use limitation', and 'Limitation on public access'.
- Order by:** A dropdown menu with 'Title' selected.
- Search:** A 'Search' button is circled in red.

Three numbered steps are overlaid on the interface:

1. Choose a resource type
2. Select search criteria as defined by legislation
3. Start searching

Discover Metadata

PORTAL Geo Addresses Metadata Documents

Search metadata... Search

Email: Password: Sign up | Lost password

WELCOME MAPS METADATA ESHOP VALIDATE INSPIRE DOCUMENTS GEOREPORTS HELP

SEARCH CREATE

GEOPORTÁL ČR (31)

AGS View Service - Base maps of CR (Web Mercator) is provided as a public view service on the Base Maps of the Czech Republic data for scales 1:10,000, 1:25,000, 1:50,000 and 1:200,000 in Web Mercator coordinate system. It is completed with maps of the Cz ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - Data200
WMS-DATA200-P view service is provided as a public view service for the product Topographic Database of the Czech Republic (Data200) - all layers data. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - Overview maps of the CR
WMS-PRHELEDKY-P view service is provided as a public view service for the Map of the Czech Republic 1:500,000 and Map of the Czech Republic 1:1,000,000 data. It serves above all as a suitable background for navigation in the territory of the Czech Republic ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - ZABAGED®
WMS-ZABAGED-P view service is provided as a public view service for the ZABAGED® data (incl. altimetry in the form of contour lines). The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the OGC WMS 1.1.1 and ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - ZM 10
WMS-ZM10-P view service is provided as a public view service for the Base Map of the Czech Republic 1:10,000 data. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the OGC WMS 1.1.1 and 1.3.0 standards. ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - ZM 200
WMS-ZM200-P view service is provided as a public view service for the Base Map of the Czech Republic 1:200,000 data. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the OGC WMS 1.1.1 and 1.3.0 standards. ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - ZM 25
WMS-ZM25-P view service is provided as a public view service for the Base Map of the Czech Republic 1:25,000 data. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the OGC WMS 1.1.1 and 1.3.0 standards. ...
Czech Office for Surveying, Mapping and Cadastre

WMS view service - ZM 50
WMS-ZM50-P view service is provided as a public view service for the Base Map of the Czech Republic 1:50,000 data. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and simultaneously fulfils the OGC WMS 1.1.1 and 1.3.0 standards. ...
Czech Office for Surveying, Mapping and Cadastre

WMTS - ZABAGED® view service - state to January 13th, 2013
WMTS - ZABAGED® view service is provided as a public view service for the ZABAGED® data. To optimize the speed of the service, the data are provided in the form of map tiles. The service fulfils Technical guidance for INSPIRE view services v. 3.11 and sim ...
Czech Office for Surveying, Mapping and Cadastre

Map Detail

Bounding box

16.045 48.795 17.347 49.481

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Discover Metadata

PORTAL Geo

Addresses Metadata Documents

Search metadata... Search

Email: Password: Login

Sign up | Lost password

WELCOME MAPS METADATA ESHOP VALIDATE INSPIRE DOCUMENTS GEOREPORTS HELP

SEARCH CREATE

GEOPORTÁL ČR (31)

HEIS VÚV
Hydroekologický informační systém VÚV T.G.M. ...
Výzkumný ústav vodohospodářský T. G. Masaryka, v.vi.

HEIS VÚV - OpenGIS WMS
Hydroekologický informační systém VÚV T.G.M. - mapový server OpenGIS WMS (WebMap) poskytuje prostřednictvím mapového serveru OpenGIS WMS (WebMap) přístup k prostorovým datům evidenci ISVS voda vedených Výzkumným ústavem vodohospodářským T.G.M., v.vi ...
VÚV TGM, v.vi.

HEIS VÚV - OpenGIS WMS
Hydroekologický informační systém VÚV T.G.M. - mapový server OpenGIS WMS (WebMap) ...
Výzkumný ústav vodohospodářský T. G. Masaryka, v.vi.

Hydrogeological map of Czechoslovakia 1 : 1,000,000 - territory of the CR (raster)

This map at a scale of 1:1M was compiled by O. Franko, M. Hazdrová, M. Chaloupská, J. Jetel, G. Kačura, E. Kulman, V. Myslík and P. Pospíšil, with the use of H. Daňková's research material and was published in 1966. It contains information about ground-water data, geological characteristics of rocks, hydrogeological objects, and tectonics. It has been derived from a geological map at a scale of 1:1M. In March 2008 it was published part of the map describing territory of the Czech Republic as a WMS service from the raster data.

Czech Geological Survey

Hydrogeological map of the Czech Republic 1 : 50 000
ArcGIS Server map service for accessing hydrogeological map of the Czech Republic at a scale of 1:50k ...
Czech Geological Survey

Hydrogeological surveys
WMS služba poskytuje plošné záznamy větších regionálních hydrogeologických akcí s výsledky archivovanými v CGS. ...
Czech Geological Survey

Hydrogeological zones 1 : 1,000,000
Projekt Hydrogeological zones 2005 is related to the older hydrogeological zone classification created in 1965, 1973 and 1986. The project updates the last one version and corresponds to modern knowledge, data processing technology, present requirements o ...
Czech Geological Survey

II. vojenské mapování
Služba zobrazuje rastrové dlaždice 2. vojenského mapování (Františkovo). Zpracování tištěných map do digitální podoby provedl Vojenský geografický a hydrometeorologický úřad. Mapování území Čech, Moravy a Slezska probíhalo v letech 1836-1852. ...
CENIA, česká informační agentura životního prostředí

Imisní charakteristiky, celkové emise a síť imisních měřicích stanic
Služba byla vytvořena na základě dat ČHMÚ a obsahuje vrstvy: 1) imisní charakteristiky v gridu 1x1 km, 2) celkové emise SO2 a tuhých znečišťujících látek v gridu 5x5, 3) síť imisních měřicích stanic (měřicích programů) registrovaných v databázi ISKO. ...
CENIA, česká informační agentura životního prostředí

INSPIRE View Service for the theme Hydrography (HY)
INSPIRE view service for theme Hydrography provides a possibility to view data image for INSPIRE theme Hydrography. The data are harmonised according to INSPIRE Implementing Rules. The service fulfills Technical guidance for INSPIRE view services v. 3.11 a ...

Map Detail

Hydrogeological map of Czechoslovakia 1 : 1,000,000 - territory of the CR (raster)

Identification

Abstract This map at a scale of 1:1M was compiled by O. Franko, M. Hazdrová, M. Chaloupská, J. Jetel, G. Kačura, E. Kulman, V. Myslík and P. Pospíšil, with the use of H. Daňková's research material and was published in 1966. It contains information about ground-water data, geological characteristics of rocks, hydrogeological objects, and tectonics. It has been derived from a geological map at a scale of 1:1M. In March 2008 it was published part of the map describing territory of the Czech Republic as a WMS service from the raster data.

Resource type service

Resource type mapová služba - WMS (EN)map service - WMS (EN)

Resource Locator

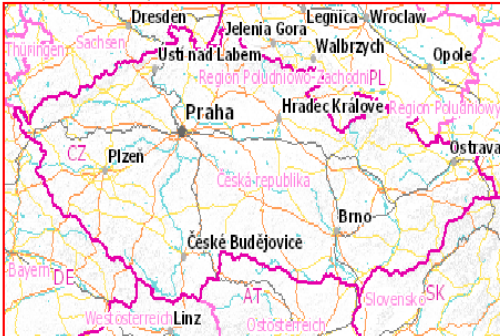
Identifier CZ-00025798-CGS-HG1M-WMS

Service Type WMS

Keywords *ISO 19119:*

- Geographic viewer
- Czech Geological Survey - Concepts, version 1.0 :
- hydrogeology

Bounding box 11.99 , 48.253 , 18.91 , 51.247



Date creation: 2012-02-01

Use Limitation no conditions apply

Access Constraints other restrictions
No limitations

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Preview of discovered Web service

The screenshot displays the PORTAL geo web application interface. At the top, there is a navigation bar with tabs for WELCOME, MAPS, METADATA, ESHOP, VALIDATE, INSPIRE, DOCUMENTS, GEOREPORTS, and HELP. Below this, there are sections for MAP VIEW, VIEW SERVICES, and OTHER PORTALS. The main map area shows a geographical map of the Czech Republic with various layers overlaid, including hydrogeological maps, shaded relief, and cadastral maps. The map is centered around a specific location, with coordinates x=-432059 and y=-1172544 displayed. A scale bar indicates 20 km. The interface includes a search bar, a login section, and a detailed layer management panel on the right side.

PORTAL geo

Addresses Metadata Documents
Specify an address or locality Search

Email: Password: Login
Sign up | Lost password

WELCOME MAPS METADATA ESHOP VALIDATE INSPIRE DOCUMENTS GEOREPORTS HELP

MAP VIEW VIEW SERVICES OTHER PORTALS

Map Compositions: x=-432059, y=-1172544

Layers

- Hydrogeological Map of Czechoslovakia
- Hydrogeological boreholes
- Shaded Relief
- Labels
- Cadastral maps
 - Cadastral map
 - Definition points of parcels
 - Cadastral map of estates
- Topo map COSMC
- Fundamental Base of Geographic Data
- DMU
- Ortphoto map (50's)
- Ortphoto map COSMC (current)
- 3rd Military Survey
- 2nd Military Survey
- Military maps (raster)
- Road Map

Filter: Logical Order Physical Order

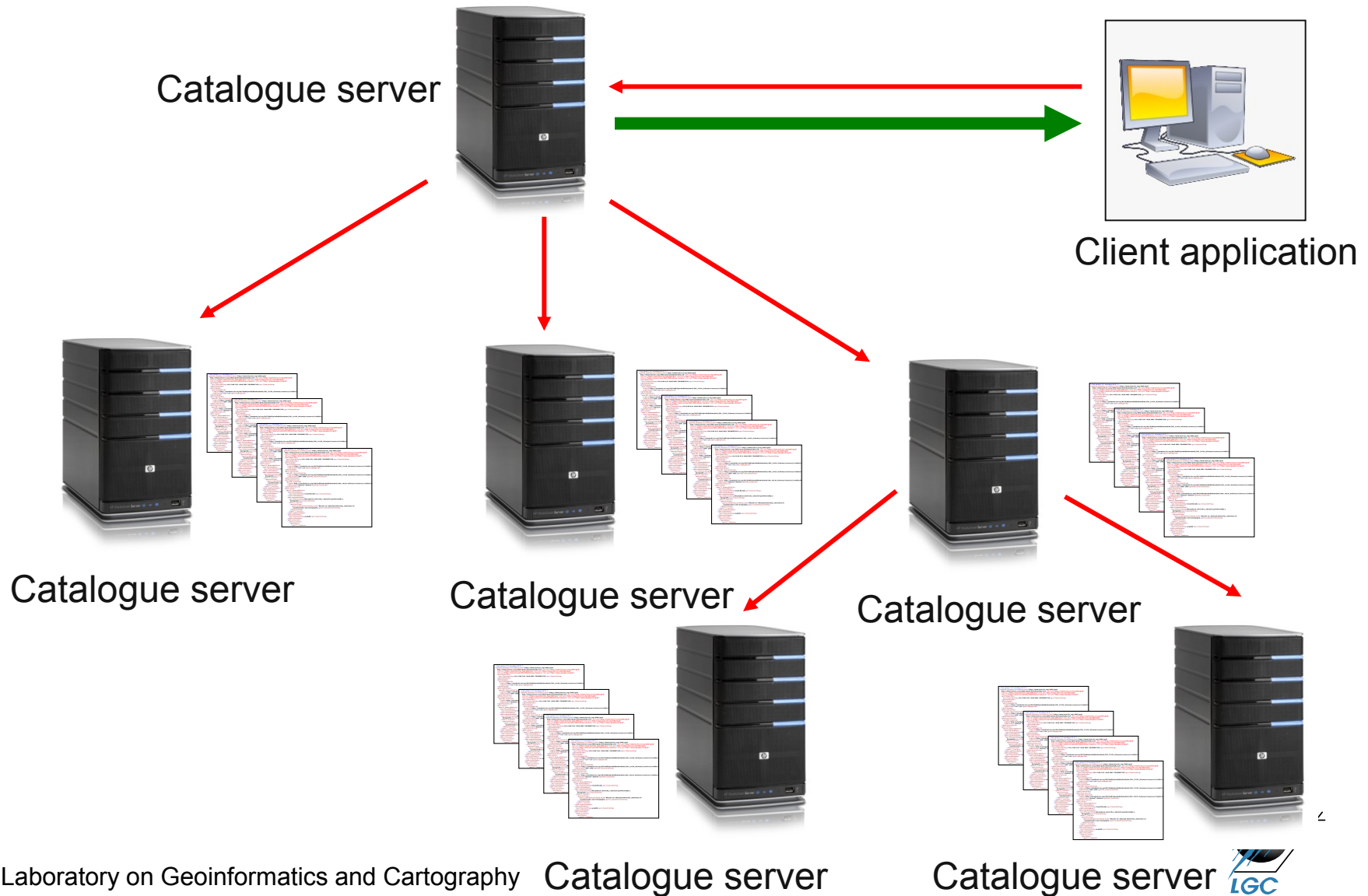
Info Maps OWS Georeports

20 km © Copyright

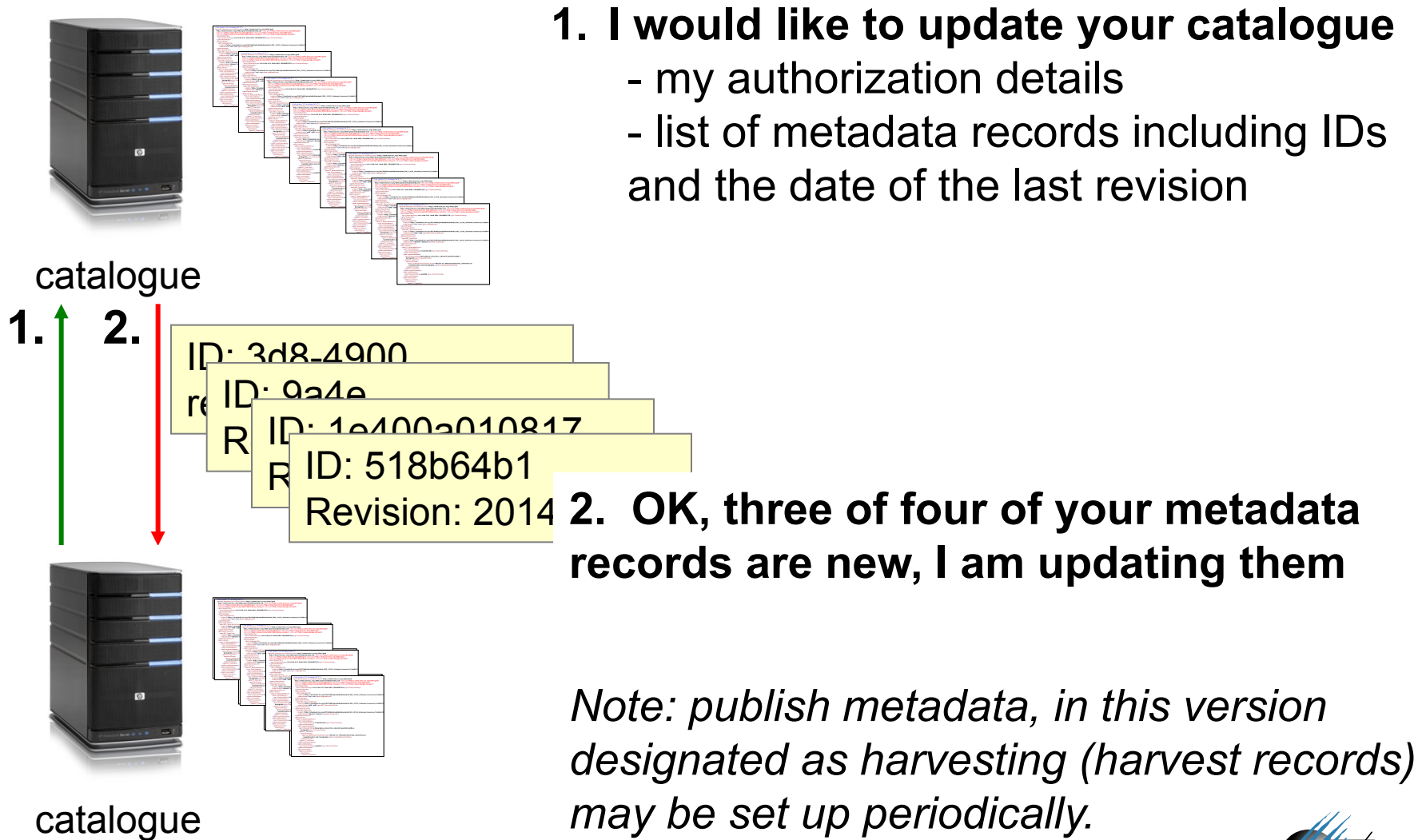
Where is the difference in comparison to other catalogues?

- It is an SDI catalogue! Enables to search in other associated catalogues as well at the same time.

Chaining of catalogues (through Link Discovery Service Operation)



Publish metadata (harvest)



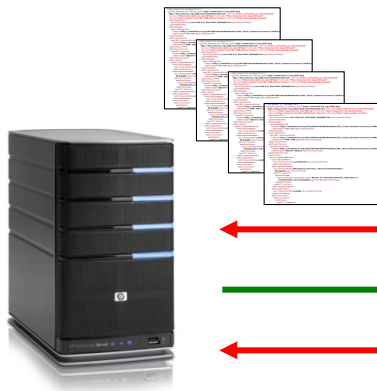
Publish metadata (transaction)

1. I would like to update the metadata record with ID 1e400a010817
- authorization details

2. OK, authorization details are correct, here is the metadata record with ID 1e400a010817

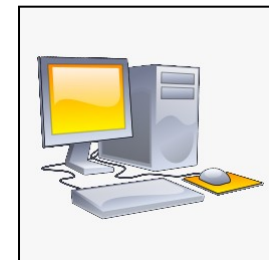
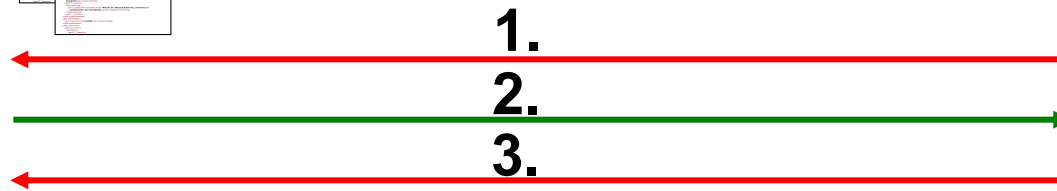
3. Uploading the modified metadata record with ID 1e400a010817

Resource Title	National parks in the Czech Republic
Identifier	1e400a010817
Abstract	A database containing detailed information about all 4 national parks in the Czech Republic. This database...
Classification	Environment
Keyword	Protected Sites
Date of creation	1995-01-05
Date of revision	2014-08-21
Linkage	http://inmapy.cz/data/NatPark _v2.0
Responsible Party	INmapy.cz company
E-mail	info@inmapy.cz



catalogue

Laboratory on Geoinformatics and Cartography



client



Quality of service

- Again defined in legislation
- The response time for sending the initial response to a Discovery service request shall be **maximum 3 seconds in normal situation**. Normal situation represents periods out of peak load. It is set at 90 % of the time.
- The **minimum number of served simultaneous requests** to a discovery service according to the performance quality of service shall be **30 per second**.
- The probability of a Network Service **to be available** shall be **99 % of the time**.

Quality of service

Uptime [%]	Maximum downtime		
	Per week	Per month	Per year
95	8.4 hours	36.00 hours	18.25 days
98	3.4 hours	14.40 hours	7.30 days
99	1.7 hours	7.27 hours	3.63 days
99.9	10 minutes	0.73 hours	8.76 hours