

# 8. INSPIRE ESPUS školenie

## „INSPIRE sieťové služby & OGC APIs“

Používanie INSPIRE sieťových služieb & OGC API

### 8. INSPIRE ESPUS školenie

"INSPIRE sieťové služby  
& OGC APIs"



Online formát

Termín: 21.10.2022

Miesto: MS Teams

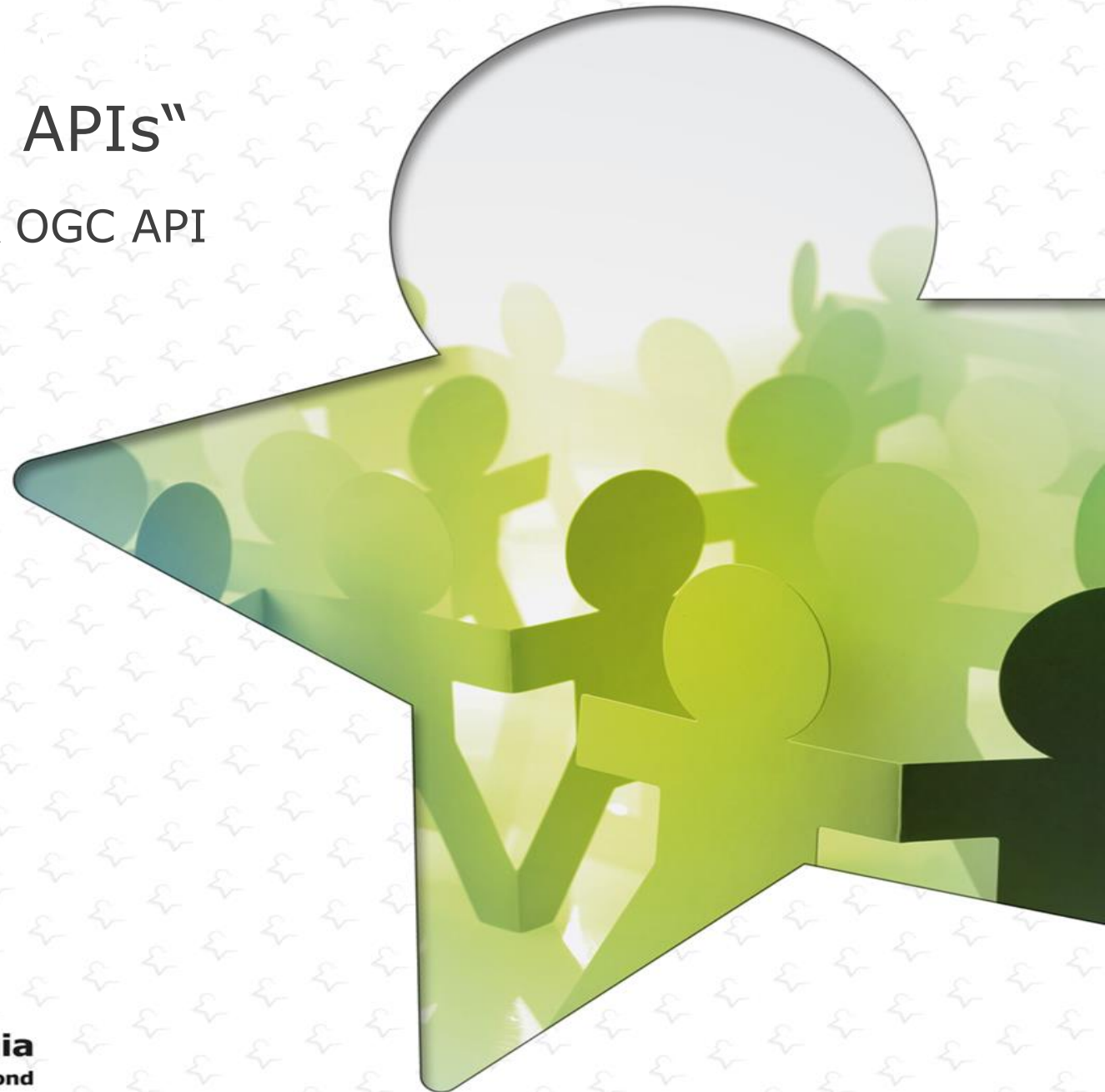


Operačný program  
Efektívna  
verejná správa



Európska únia  
Európsky sociálny fond

Tento projekt je podporený z Európskeho sociálneho fondu





MINISTERSTVO

ŽIVOTNÉHO PROSTREDIA  
SLOVENSKEJ REPUBLIKY



ESPUS

Efektívna správa priestorových údajov a služieb

## 8. INSPIRE ESPUS školenie „INSPIRE sieťové služby & OGC APIs“ Používanie INSPIRE sieťových služieb a OGC API

21.10.2022



Európska únia  
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# Prehľad

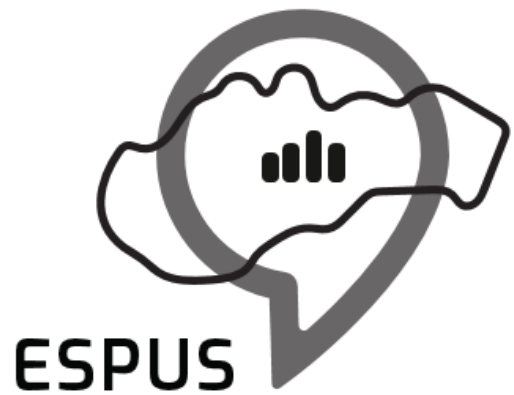
## Používanie INSPIRE sieťových služieb

- Vyhľadávacie
- Zobrazovacie
- Ukladacie

## Používanie OGC API

- OGC API records
- OGC API maps
- OGC API features





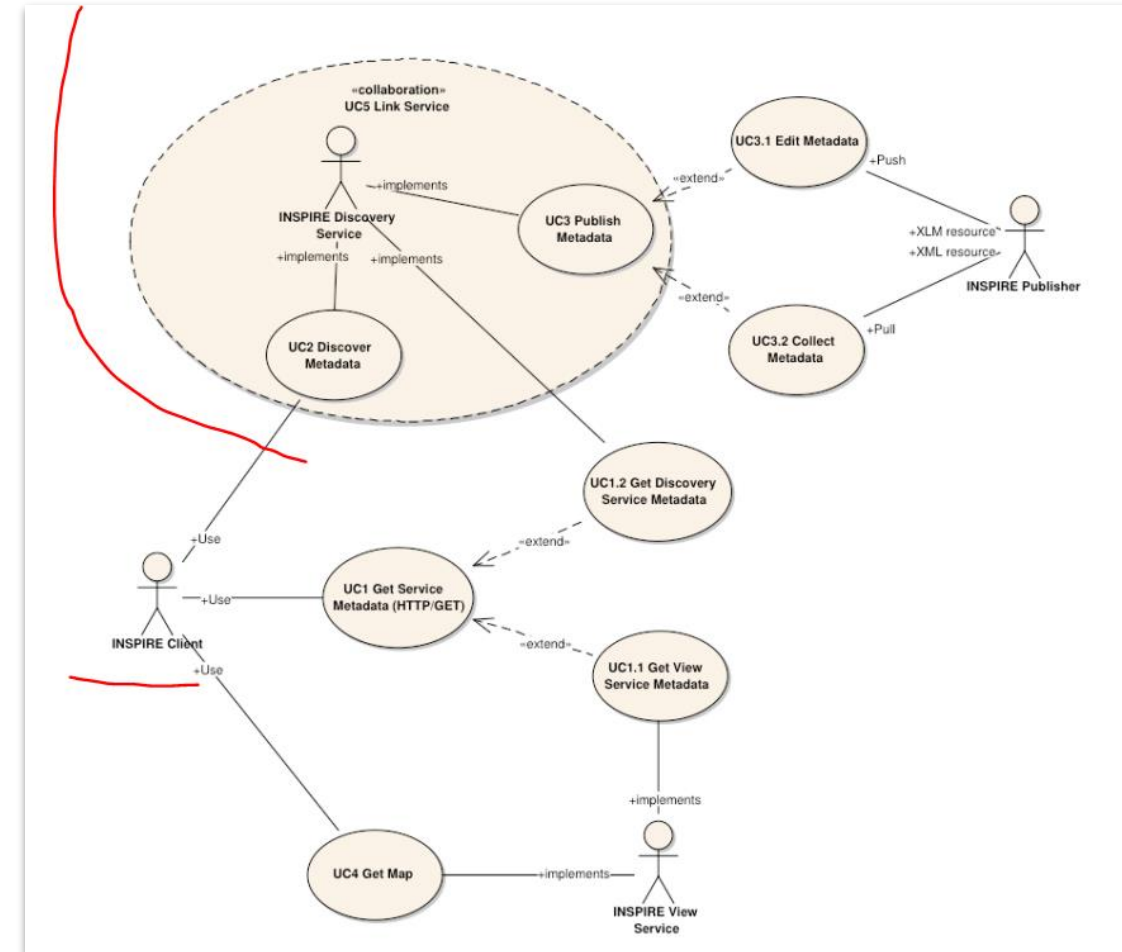
Efektívna správa priestorových údajov a služieb

# Používanie INSPIRE sieťových služieb

# Vyhľadávacia služba

OGC 07-045, CSW ISO AP, OGC™  
Catalogue Services Specification 2.0.2

INSPIRE Discovery Services Operations	INSPIRE Cardinality	OGC CSW ISO AP operations
Get Discovery Service Metadata	Mandatory	OGC_Service.GetCapabilities
Discover Metadata	Mandatory	CSW Discovery.GetRecords
Publish Metadata	Conditional	CSWT Manager.Transaction or CSWT Manager.Harvest
Link Discovery service	Mandatory	Combination of OGC_Service.GetCapabilities and CSW Discovery.GetRecords OR using Publish Metadata operation: CSWT Manager.Transaction or CSWT Manager.Harvest



# Vyhľadávacia služba

Operácia GetCapabilities (Get Discovery Service Metadata)

- `URL?service=CSW&request=GetCapabilities&version=2.0.2`
- INSPIRE rozširuje túto operáciu o jazykové požiadavky
- Odpoveď na požiadavku musí obsahovať:
  - metaúdaje služby (musí zahŕňať všetky metaúdajové položky pre INSPIRE vyhľadávacie služby)
  - metaúdaje operácii služby
  - jazyky - podporované jazyky a jazyky odpovede

# Vyhľadávacia služba

Odpoveď na GetCapabilities (Get Discovery Service Metadata) musí obsahovať rozšírené informácie (metaúdaje)

spôsobu implementácie cez Extended Capabilities:

- referenčná URL na metaúdajový záznam
- vyplnenie všetkých požadovaných metaúdajov v odpovedi GetCapabilities

```

<?xml version="1.0" encoding="UTF-8"?>
<inspire_ds:ExtendedCapabilities xmlns:ows="http://www.opengis.net/ows/1.1"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:inspire_ds="http://inspire.ec.europa.eu/schemas/inspire_ds/1.0"
  xmlns:inspire_common="http://inspire.ec.europa.eu/schemas/common/1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://inspire.ec.europa.eu/schemas/inspire_ds/1.0 http://inspire.ec.europa.eu/schemas/inspire_ds/1.0/inspire_ds.xsd">
  <!-- Položka definuje URL adresu, kde je možné získať metaúdaje o službe. Je možné uvádzať URL na CSW službu s volaním operácie GetRecordById. Typ url definuje atribút MediaType.
  | MediaType má striktné definovanú enumeráciu hodnôt v schéme http://inspire.ec.europa.eu/schemas/common/1.0/common.xsd - inspire_common:mediaType.
  -->
  <inspire_common:MetadataUrl>
    <inspire_common:URL>http://gis.fns.uniba.sk/geonetwork/srv/eng/csw?request=GetRecordById&service=CSW&version=2.0.2&elementSetName=full&id=http://data.gov.sk/set/rpi/
    <inspire_common:MediaType>application/vnd.ogc.csw.GetRecordByIdResponse_xml</inspire_common:MediaType>
  </inspire_common:MetadataUrl>
  <!-- Definícia jazykov, ktoré podporuje služba -->
  <inspire_common:SupportedLanguages xsi:type="inspire_common:supportedLanguagesType">
    <inspire_common:DefaultLanguage>
      <inspire_common:Language>eng</inspire_common:Language>
    </inspire_common:DefaultLanguage>
  </inspire_common:SupportedLanguages>
  <!-- Definícia jazykov, v ktorých je možné získať odpoveď služby -->
  <inspire_common:ResponseLanguage xsi:type="inspire_common:languageElementISO6392B">
    <inspire_common:Language>eng</inspire_common:Language>
  </inspire_common:ResponseLanguage>
</inspire_ds:ExtendedCapabilities>

```



```
<?xml version="1.0" encoding="UTF-8"?>
<inspire_ds:ExtendedCapabilities xmlns:ows="http://www.opengis.net/ows/1.1"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:inspire_ds="http://inspire.ec.europa.eu/schemas/inspire_ds/1.0"
  xmlns:inspire_common="http://inspire.ec.europa.eu/schemas/common/1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://inspire.ec.europa.eu/schemas/inspire_ds/1.0 http://inspire.ec.europa.eu/schemas/inspire_ds/1.0/inspire_ds.xsd">
  <!-- Lokátor zdroja. Uvádza sa ako URL adresa na službu alebo iný zdroj, kde je možné získať informácie o zdroji. Pomocou MediaType je možné špecifikovať o aký typ zdroja sa jedná.
    MediaType má striktné definovanú enumeráciu hodnôt v schéme http://inspire.ec.europa.eu/schemas/common/1.0/common.xsd - inspire_common:mediaType.
    Pre CSW je kód application/vnd.ogc.csw.capabilities.response_xml.
  -->
  <inspire_common:ResourceLocator>
    <inspire_common:URL>http://gis.fns.uniba.sk/geonetwork/srv/eng/csw?service=CSW&request=GetCapabilities&version=2.0.2</inspire_common:URL>
    <inspire_common:MediaType xsi:type="inspire_common:mediaType">application/vnd.ogc.csw.capabilities.response_xml</inspire_common:MediaType>
  </inspire_common:ResourceLocator>
  <!-- Typ zdroja. Element musí nadobúdať hodnotu service. -->
  <inspire_common:ResourceType>service</inspire_common:ResourceType>
  <!-- Časové referencie. Je potrebné uviesť aspoň jednu z hodnôt: Dátum vytvorenia/Dátum poslednej revízie/Dátum publikácie/Časový rozsah -->
  <inspire_common:TemporalReference>
    <!-- Dátum vytvorenia -->
    <inspire_common:DateOfCreation>2016-01-01</inspire_common:DateOfCreation>
    <!-- Dátum poslednej revízie -->
    <inspire_common:DateOfLastRevision>2016-01-02</inspire_common:DateOfLastRevision>
    <!-- Dátum publikácie -->
    <inspire_common:DateOfPublication>2016-01-02</inspire_common:DateOfPublication>
    <!-- Časový rozsah -->
    <inspire_common:TemporalExtent>
      <inspire_common:IntervalOfDates>
        <inspire_common:StartingDate>2016-01-01</inspire_common:StartingDate>
        <inspire_common:EndDate>2016-01-02</inspire_common:EndDate>
      </inspire_common:IntervalOfDates>
    </inspire_common:TemporalExtent>
  </inspire_common:TemporalReference>
  <!-- Súlad. Je potrebné definovať súlad s Nariadením pre interoperabilitu súborov a služieb. Je potrebné deklarovať Názov špecifikácie, jej dátum publikácie, URI identifikátor, lokátor dokumentu.
    Názov špecifikácie je striktné daná enumeráciou inspire_common:citationInspireInteroperabilityRegulation_slo pre slovenský jazyk. Nižšie uvedený príklad je pre slovenský jazyk.
  -->
  <inspire_common:Conformity>
    <inspire_common:Specification>
      xsi:type="inspire_common:citationInspireInteroperabilityRegulation_slo"
      <inspire_common:Title>NARIADENIE KOMISIE (EÚ) č. 1089/2010 z 23. novembra 2010, ktorým sa vykonáva smernica Európskeho parlamentu a Rady 2007/2/ES, pokiaľ ide o interoperabilitu súborov a služieb
      <inspire_common:DateOfPublication>2010-12-08</inspire_common:DateOfPublication>
      <inspire_common:URI>OJ:L:2010:323:0011:0102:SK:PDF</inspire_common:URI>
      <inspire_common:ResourceLocator>
        <inspire_common:URL>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:323:0011:0102:SK:PDF</inspire_common:URL>
        <inspire_common:MediaType>application/pdf</inspire_common:MediaType>
      </inspire_common:ResourceLocator>
    </inspire_common:Specification>
    <!-- Stupeň súladu. Vyjadruje sa ako hodnota číselníka inspire_common:degreeOfConformity: v súlade (conformant),nie je v súlade (notConformant), nehodnotený (notEvaluated). -->
    <inspire_common:Degree xsi:type="inspire_common:degreeOfConformity">conformant</inspire_common:Degree>
  </inspire_common:Conformity>
  <!-- Kontaktný bod pre metaúdaje. Uvádza sa ako názov organizácie a emailová adresa -->
  <inspire_common:MetadataPointOfContact>
    <inspire_common:OrganisationName>Katedra kartografie, geoinformatiky a DPZ</inspire_common:OrganisationName>
    <inspire_common:EmailAddress>rado.chudy@gmail.com</inspire_common:EmailAddress>
  </inspire_common:MetadataPointOfContact>
  <!-- Dátum, kedy boli metaúdaje vytvorené alebo aktualizované -->
  <inspire_common:MetadataDate>2016-12-08</inspire_common:MetadataDate>
```

# Vyhľadávacia služba

## Operácia GetRecords(Discover Metadata)

- QUERY
- LANGUAGE

**Implementation Requirement 10** The language parameter shall be implemented by using the Language queryable in a filter statement as defined by [CSW ISO AP]. With that a client can request metadata records in a specific metadata language.

**Implementation Requirement 11** The query parameter shall be implemented by the filter statement of the GetRecords-Request itself. The query has to support all search attributes defined in Section 4.4.

**Implementation Recommendation 2** To ensure a common response structure for a Discover Metadata request, the value of the following request parameters shall be set as follows:

- resultType = "results"
- outputFormat = "application/xml"
- outputSchema = <http://www.isotc211.org/2005/gmd>
- ElementSetName = "full"

# Vyhľadávacia služba

## Operácia GetRecords(Discover Metadata)

- QUERY - OGC FILTER
- <http://schemas.opengis.net/filter/1.1.0/filter.xsd>

```
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
xmlns:apiso="http://www.opengis.net/cat/csw/apiso/1.0"
xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gmd="http://www.isotc211.org/2005/gmd"
service="CSW" resultType="results"
outputFormat="application/xml"
outputSchema="http://www.isotc211.org/2005/gmd"
startPosition="1" maxRecords="10">
  <csw:Query typeName="gmd:MD_Metadata">
    <csw:ElementSetName
typeName="gmd:MD_Metadata">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0">
      <ogc:Filter xmlns:ogc="http://www.opengis.net/ogc">
        <ogc:And>
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>apiso:Language</ogc:PropertyName>
            <ogc:Literal>eng</ogc:Literal>
          </ogc:PropertyIsEqualTo>
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>apiso:ServiceType</ogc:PropertyName>
            <ogc:Literal>wms</ogc:Literal>
          </ogc:PropertyIsEqualTo>
        </ogc:And>
      </ogc:Filter>
    </csw:Constraint>
  </csw:Query>
</csw:GetRecords>
```

# Vyhľadávacia služba

## Queryable

```

</ows:Parameter>
  <ows:Constraint name="SupportedISOQueryables">
    <ows:Value>RevisionDate</ows:Value>
    <ows:Value>Abstract</ows:Value>
    <ows:Value>Title</ows:Value>
    <ows:Value>Type</ows:Value>
    <ows:Value>AlternateTitle</ows:Value>
    <ows:Value>CreationDate</ows:Value>
    <ows:Value>PublicationDate</ows:Value>
    <ows:Value>OrganisationName</ows:Value>
    <ows:Value>HasSecurityConstraints</ows:Value>
    <ows:Value>Language</ows:Value>
    <ows:Value>ResourceIdentifier</ows:Value>
    <ows:Value>ParentIdentifier</ows:Value>
    <ows:Value>TopicCategory</ows:Value>
    <ows:Value>ResourceLanguage</ows:Value>
    <ows:Value>GeographicDescriptionCode</ows:Value>
    <ows:Value>DistanceValue</ows:Value>
    <ows:Value>DistanceUOM</ows:Value>
    <ows:Value>TempExtent_begin</ows:Value>
    <ows:Value>TempExtent_end</ows:Value>
    <ows:Value>ServiceType</ows:Value>
    <ows:Value>ServiceTypeVersion</ows:Value>
    <ows:Value>Operation</ows:Value>
    <ows:Value>CouplingType</ows:Value>
    <ows:Value>Denominator</ows:Value>
    <ows:Value>OperatesOn</ows:Value>
    <ows:Value>OperatesOnIdentifier</ows:Value>
    <ows:Value>OperatesOnName</ows:Value>
    <ows:Value>KeywordType</ows:Value>
    <ows:Value>BoundingBox</ows:Value>
  </ows:Constraint>
  <ows:Constraint name="AdditionalQueryables">
    <ows:Value>Degree</ows:Value>
    <ows:Value>AccessConstraints</ows:Value>
    <ows:Value>OtherConstraints</ows:Value>
    <ows:Value>Classification</ows:Value>
    <ows:Value>ConditionApplyingToAccessAndUse</ows:Value>
    <ows:Value>Lineage</ows:Value>
    <ows:Value>ResponsiblePartyRole</ows:Value>
    <ows:Value>SpecificationTitle</ows:Value>
    <ows:Value>SpecificationDate</ows:Value>
    <ows:Value>SpecificationDateType</ows:Value>
  </ows:Constraint>
</ows:Operation>

```

Table 4: INSPIRE search criteria (queryables)

INSPIRE queryable metadata elements [INS NS, Table 1]	INSPIRE Discovery Service (CSW ISO AP) queryable properties	Is mandatory for INSPIRE Discovery Service? <sup>2</sup>
Keyword	Subject	Yes
Topic category	TopicCategory	Yes, if resources of type 'dataset' or 'series' are supported by the catalogue service instance
Spatial data service type	ServiceType	Yes, if resources of type 'service' are supported by the catalogue service instance.
Lineage	-(not supported)	Yes
Spatial resolution	SpatialResolution	Yes, if resources of type 'dataset' or 'series' are supported by the discovery service instance
Specification	-(not supported)	Yes
Degree	-(not supported)	Yes
Geographic bounding box	BoundingBox	Yes, if resources of type 'dataset' or 'series' are supported by the catalogue service instance
Conditions applying to access and use	-(not supported)	Yes
Limitations on public access	-(not supported)	Yes
Responsible party	OrganisationName	Yes
Responsible party role		Yes
Resource Title	Title	Yes
Resource Abstract	Abstract	Yes
Resource Type	Type	Yes
Unique resource identifier	ResourceIdentifier	Yes
Temporal Reference	TemporalExtent PublicationDate RevisionDate CreationDate	Yes

**Implementation Requirement 20** The only queryable that is not defined above, but is required to comply with [INS MDTG] is "Metadata language". This is a mandatory queryable for INSPIRE Discovery Service to support the "Language" query parameter as defined in [INS NS, Annex II, Part B, Section 3.1].

**Implementation Requirement 21** Table 5 identifies the additional queryables that are not supported by [CSW ISO AP], but required by [INS NS]. X-Path expression and data types are taken from [INS MDTG].

# Vyhľadávacia služba

## Jazykové požiadavky

**Implementation Requirement 23** A network service metadata response shall contain a list of the natural languages supported by the service. This list shall contain one or more languages that are supported.

**Implementation Requirement 24** A client may specify a specific language in a request. If the requested language is contained in the list of supported languages, the natural language fields of the service response shall be in the requested language. If the requested language is not supported by the service, then this parameter shall be ignored.

**Implementation Requirement 25** The name of this parameter shall be "LANGUAGE". The parameter values are based on ISO 639-2/B alpha 3 codes as used in **[INS MDTG]**.

```
<inspire common:SupportedLanguages>
  <inspire_common:DefaultLanguage>
    <inspire_common:Language>fre</inspire_common:Language>
  </inspire_common:DefaultLanguage>
  <inspire_common:SupportedLanguage>
    <inspire_common:Language>eng</inspire_common:Language>
  </inspire_common:SupportedLanguage>
</inspire common:SupportedLanguages>
<inspire common:ResponseLanguage>
  <inspire common:Language>eng</inspire_common:Language>
</inspire_common:ResponseLanguage>
```

# Vyhľadávacia služba

## Požiadavky na kvalitu

- Doba odpovede na zaslanie počítačovej odpovede na požiadavku vyhľadávacej služby je v bežnej situácii najviac 3 sekundy.
- Minimálny počet simultánne vybavených požiadaviek na vyhľadávaciu službu je 30 požiadaviek za sekundu na dosiahnutie naplnenia kvalitatívnych kritérií.
- Pravdepodobnosť dostupnosti sieťovej služby je 99 % času.

To options exist for the measurements of Quality of Services:

1. Quality of Services requirements are measured at the service side exposed to the Internet.
2. Quality of Services requirements are measured from a central network node within the infrastructure.

# Vyhľadávacia služba

## Požiadavky na kvalitu

- Doba odpovede na zaslania počítačovej odpovede na požiadavku vyhľadávacej služby je v bežnej situácii najviac 3 sekundy.

Structure of the sample reference request:

- Performance shall be measured using the Discovery Metadata operation.

The structure of the sample reference request is recommended to:

- Search metadata with filter `PropertyName=AnyText, Literal=dataset`, and with varying BBOX requests.

Evaluation and assessment criteria:

- The initial response time of 3 seconds refer to first byte returned by the service to the internet.

# Vyhľadávacia služba

## Požiadavky na kvalitu

- Doba odpovede na zaslania počítačovej odpovede na požiadavku vyhľadávacej služby je v bežnej situácii najviac 3 sekundy.
- Minimálny počet simultánne vybavených požiadaviek na vyhľadávaciu službu je 30 požiadaviek za sekundu na dosiahnutie naplnenia kvalitatívnych kritérií.
- Pravdepodobnosť dostupnosti sieťovej služby je 99 % času.

To options exist for the measurements of Quality of Services:

1. Quality of Services requirements are measured at the service side exposed to the Internet.
2. Quality of Services requirements are measured from a central network node within the infrastructure.



# Vyhľadávacia služba

## Požiadavky na kvalitu

- Doba odpovede na zaslanie počítačovej odpovede na požiadavku vyhľadávacej služby je v bežnej situácii najviac 3 sekundy.
- Minimálny počet simultánne vybavených požiadaviek na vyhľadávaciu službu je 30 požiadaviek za sekundu na dosiahnutie naplnenia kvalitatívnych kritérií.
- Pravdepodobnosť dostupnosti sieťovej služby je 99 % času.

To options exist for the measurements of Quality of Services:

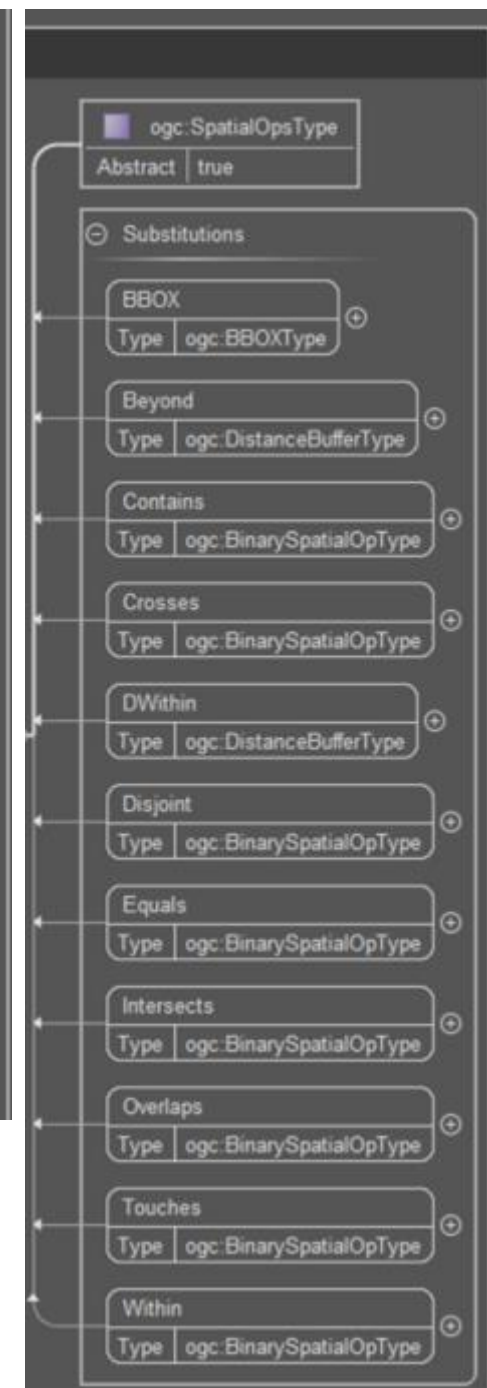
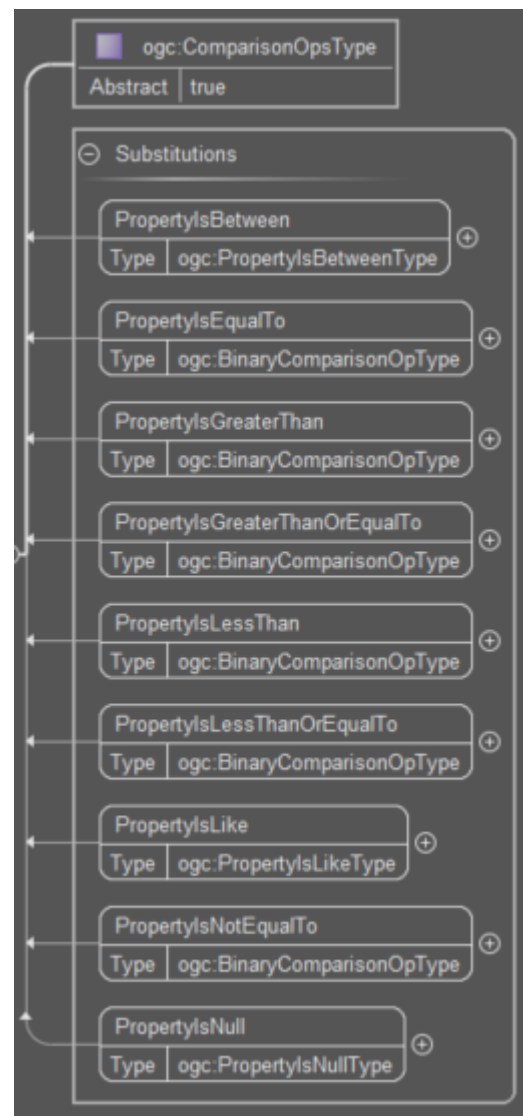
1. Quality of Services requirements are measured at the service side exposed to the Internet.
2. Quality of Services requirements are measured from a central network node within the infrastructure.

# OGC FILTER

Štandard pre filtrovanie údajov a služieb

- Priestorové operátory
- Porovnávacie operátory
- Logické operátory (and, or, not)

```
<ogc:Filter>
  <ogc:And>
    <ogc:PropertyIsLike wildCard="%" singleChar=" " escapeChar="/">
      <ogc:PropertyName>apiso:OrganisationName</ogc:PropertyName>
      <ogc:Literal>org1</ogc:Literal>
    </ogc:PropertyIsLike>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>dc:type</ogc:PropertyName>
      <ogc:Literal>dataset</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:And>
</ogc:Filter>
```



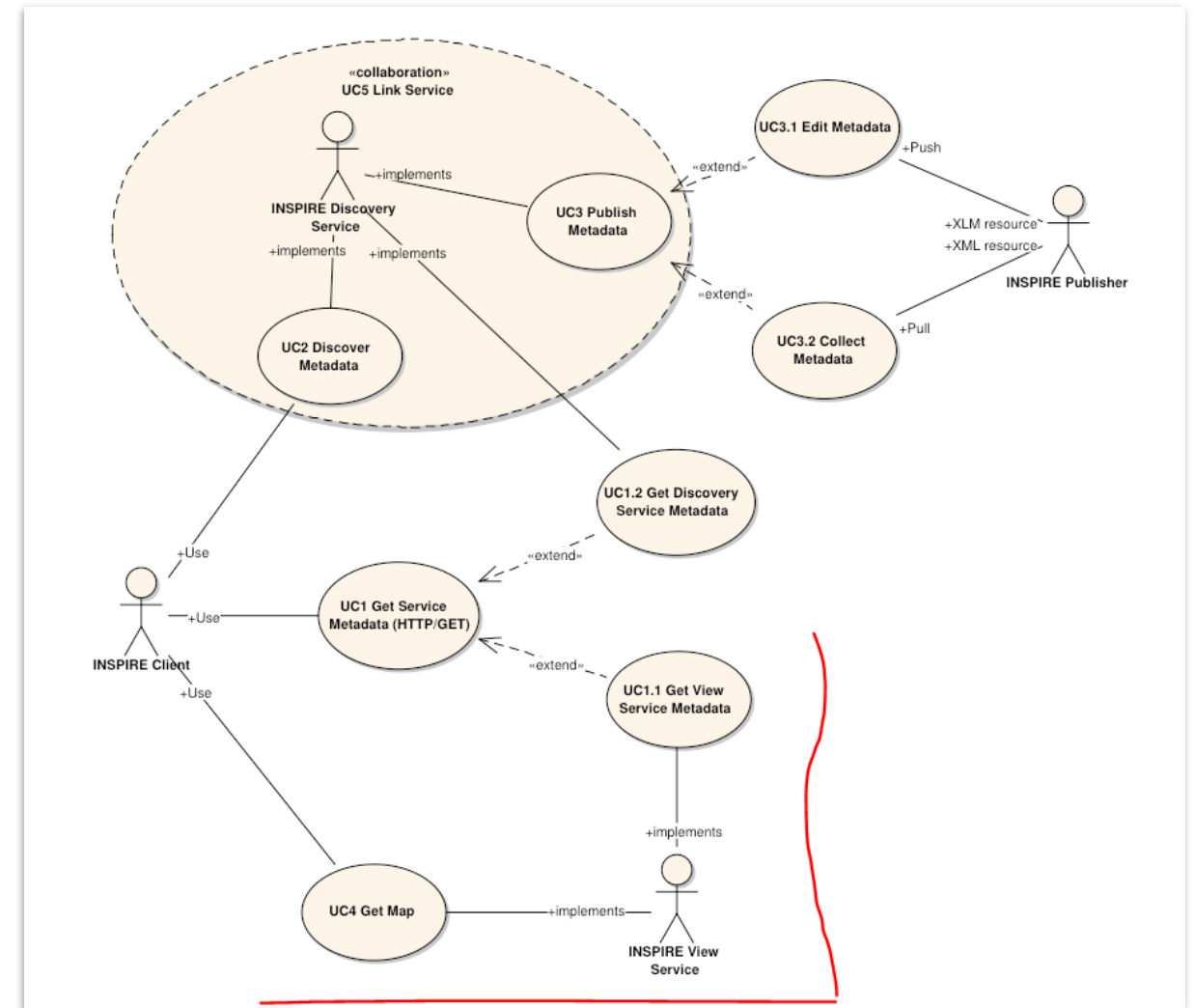
# Zobrazovacie služby

ISO 19128 (Web map server interface)

OGC WMS 1.3.0

INSPIRE View Service operations	ISO 19128 WMS operations
Get View Service Metadata	GetCapabilities
Get Map	GetMap

<https://github.com/INSPIRE-MIF/technical-guidelines/blob/2022.2/services/view-wms/ViewServices.adoc>



# Zobrazovacia služba

Operácia GetCapabilities (Get View Service Metadata)

- `URL?service=WMS&request=GetCapabilities&version=2.0.2`
- INSPIRE rozširuje túto operáciu o jazykové požiadavky
- Odpoveď na požiadavku musí obsahovať:
  - metaúdaje služby (musí zahŕňať všetky metaúdajové položky pre INSPIRE zobrazovacie služby)
  - metaúdaje operácii služby
  - jazyky - podporované jazyky a jazyky odpovede
  - metaúdaje jednotlivých vrstiev

# Zobrazovacia služba

Odpoveď na GetCapabilities (Get Discovery Service Metadata) musí obsahovať rozšírené informácie (metaúdaje)

spôsobu implementácie cez Extended Capabilities:

- referenčná URL na metaúdajový záznam

<https://maps.geocloud.sk/geoserver/ps/ows?service=WMS&version=1.3.0&request=GetCapabilities>

- vyplnenie všetkých požadovaných metaúdajov v odpovedi GetCapabilities

[https://zbgisws.skgeodesy.sk/inspire\\_administrative\\_units\\_wms/service.svc/get?service=wms&request=GetCapabilities](https://zbgisws.skgeodesy.sk/inspire_administrative_units_wms/service.svc/get?service=wms&request=GetCapabilities)

# Zobrazovacia služba

## Názvoslovie vrstiev:



Implementation Requirement 39 Name shall be mapped with the <wms:Name> element.



Implementation Requirement 39 bis In case a layer is a harmonised layer according to [INS DS], the layer name shall comply with the harmonised layer name defined in Article 14 of [INS DS].

- kapitola 11 technických návodov Inspire témy

### 11.1 Layers to be provided by INSPIRE view services

Layer Name	Layer Title	Spatial object type(s)	Keywords
AD.Address	Addresses	Address	Address

[https://zbgisws.skgeodesy.sk/inspire\\_administrative\\_units\\_wms/service.svc/get?service=wms&request=GetCapabilities](https://zbgisws.skgeodesy.sk/inspire_administrative_units_wms/service.svc/get?service=wms&request=GetCapabilities)

Table 5: Annexes I harmonised name examples

Theme	Examples of layer names
Geographical names	GN.GeographicalNames
Administrative units	AU.AdministrativeUnit
Addresses	AD.Address
Cadastral parcels	CP.CadastralParcel
Transport networks	TN.RoadTransportNetwork.RoadArea
Hydrography	HY.Network
Protected sites	PS.ProtectedSite

# Zobrazovacia služba

## Názvoslovia manových štýlov



**Implementation Requirement 41** A Style shall be composed of a Title and a Unique Identifier.



**Implementation Requirement 42** For each harmonised layer according to [INS DS] an <inspire\_common:DEFAULT> style shall be as defined in the "Portrayal" section of the [INS DS, Article 14].



**Implementation Requirement 43** For layers with no associated default style, the INSPIRE Generic Conceptual Model [INS GCM] defines simple styles shall be used in data portrayal, derived from Symbology Encoding Implementation Specification [OGC SEIS]:  
Point: grey square, 6 pixels; Curve: black solid line, 1 pixel; Surface: black solid line, 1 pixel, grey fill.

- kapitola 11 technických návodov pre Inspire tému
- SLD špecifikácia

Style Name	AD.Address.Default
Default Style	yes
Style Title	Address Default Style
Style Abstract	6 pixel square with black (#000000) border and <ul style="list-style-type: none"> <li>- white (#FFFFFF) fill, if the position of the address represents the postal delivery point, a point of utility service, the access point from the thoroughfare, or the entrance door or gate,</li> <li>- 75% grey (#C0C0C0) fill, if the position of the address represents the building or parcel,</li> <li>- 50% grey (#808080), if the position of the address represents the related segment of a thoroughfare, and</li> <li>- 25% grey (#404040), otherwise.</li> </ul>

# Zobrazovacia služba

## Súradnicové systémy



**Implementation Requirement 40** It is mandatory to use geographical coordinate system based on ETRS89 in continental Europe and ITRS outside continental Europe.

```
<wms:WMS_Capabilities version="1.3.0"
  xmlns:wms="http://www.opengis.net/wms">
  <wms:Service>
    ...
  </wms:Service>
  <wms:Capability>
    ...
    <wms:Layer>
      <wms:Name>TN.ROADTRANSPORTNETWORK.ROADAREA</wms:Name>
      <wms:Title>Transport networks : Road Area</wms:Title>
      <wms:Abstract>As defined by TWG</wms:Abstract>
      <wms:KeywordList>
        <wms:Keyword vocabulary="GEMET">GEMET keyword</wms:Keyword>
        ...
      </wms:KeywordList>
      <wms:CRS>EPSG:4258</wms:CRS>

      <wms:CRS>EPSG:4326</wms:CRS>
      <wms:CRS>CRS:84</wms:CRS>
      <wms:EX_GeographicBoundingBox>
        <wms:westBoundLongitude>-31.2</wms:westBoundLongitude>
        <wms:eastBoundLongitude>69.1</wms:eastBoundLongitude>
        <wms:southBoundLatitude>27.2</wms:southBoundLatitude>
        <wms:northBoundLatitude>90</wms:northBoundLatitude>
      </wms:EX_GeographicBoundingBox>
    </wms:Layer>
  </wms:Capability>
</wms:WMS_Capabilities>
```

Coordinate reference system	Short name	http URI identifier
3D Cartesian in ETRS89	ETRS89-XYZ	<a href="http://www.opengis.net/def/crs/EPSPG/0/4936">http://www.opengis.net/def/crs/EPSPG/0/4936</a>
3D geodetic in ETRS89 on GRS80	ETRS89-GRS80h	<a href="http://www.opengis.net/def/crs/EPSPG/0/4937">http://www.opengis.net/def/crs/EPSPG/0/4937</a>
2D geodetic in ETRS89 on GRS80	ETRS89-GRS80	<a href="http://www.opengis.net/def/crs/EPSPG/0/4258">http://www.opengis.net/def/crs/EPSPG/0/4258</a>
2D LAEA projection in ETRS89 on GRS80	ETRS89-LAEA	<a href="http://www.opengis.net/def/crs/EPSPG/0/3035">http://www.opengis.net/def/crs/EPSPG/0/3035</a>
2D LCC projection in ETRS89 on GRS80	ETRS89-LCC	<a href="http://www.opengis.net/def/crs/EPSPG/0/3034">http://www.opengis.net/def/crs/EPSPG/0/3034</a>
2D TM projection in ETRS89 on GRS80, zone 26N (30°W to 24°W)	ETRS89-TM26N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3038">http://www.opengis.net/def/crs/EPSPG/0/3038</a>
2D TM projection in ETRS89 on GRS80, zone 27N (24°W to 18°W)	ETRS89-TM27N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3039">http://www.opengis.net/def/crs/EPSPG/0/3039</a>
2D TM projection in ETRS89 on GRS80, zone 28N (18°W to 12°W)	ETRS89-TM28N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3040">http://www.opengis.net/def/crs/EPSPG/0/3040</a>
2D TM projection in ETRS89 on GRS80, zone 29N (12°W to 6°W)	ETRS89-TM29N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3041">http://www.opengis.net/def/crs/EPSPG/0/3041</a>
2D TM projection in ETRS89 on GRS80, zone 30N (6°W to 0°)	ETRS89-TM30N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3042">http://www.opengis.net/def/crs/EPSPG/0/3042</a>
2D TM projection in ETRS89 on GRS80, zone 31N (0° to 6°E)	ETRS89-TM31N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3043">http://www.opengis.net/def/crs/EPSPG/0/3043</a>
2D TM projection in ETRS89 on GRS80, zone 32N (6°E to 12°E)	ETRS89-TM32N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3044">http://www.opengis.net/def/crs/EPSPG/0/3044</a>
2D TM projection in ETRS89 on GRS80, zone 33N (12°E to 18°E)	ETRS89-TM33N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3045">http://www.opengis.net/def/crs/EPSPG/0/3045</a>
2D TM projection in ETRS89 on GRS80, zone 34N (18°E to 24°E)	ETRS89-TM34N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3046">http://www.opengis.net/def/crs/EPSPG/0/3046</a>
2D TM projection in ETRS89 on GRS80, zone 35N (24°E to 30°E)	ETRS89-TM35N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3047">http://www.opengis.net/def/crs/EPSPG/0/3047</a>
2D TM projection in ETRS89 on GRS80, zone 36N (30°E to 36°E)	ETRS89-TM36N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3048">http://www.opengis.net/def/crs/EPSPG/0/3048</a>
2D TM projection in ETRS89 on GRS80, zone 37N (36°E to 42°E)	ETRS89-TM37N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3049">http://www.opengis.net/def/crs/EPSPG/0/3049</a>
2D TM projection in ETRS89 on GRS80, zone 38N (42°E to 48°E)	ETRS89-TM38N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3050">http://www.opengis.net/def/crs/EPSPG/0/3050</a>
2D TM projection in ETRS89 on GRS80, zone 39N (48°E to 54°E)	ETRS89-TM39N	<a href="http://www.opengis.net/def/crs/EPSPG/0/3051">http://www.opengis.net/def/crs/EPSPG/0/3051</a>
Height in EVRS	EVRS	<a href="http://www.opengis.net/def/crs/EPSPG/0/5730">http://www.opengis.net/def/crs/EPSPG/0/5730</a>
3D compound: 2D geodetic in ETRS89 on GRS80, and EVRS height	ETRS89-GRS80-EVRS	<a href="http://www.opengis.net/def/crs/EPSPG/0/7409">http://www.opengis.net/def/crs/EPSPG/0/7409</a>



# Zobrazovacia služba

## Operácia GetMap

Request parameter	Mandatory/optional	Description
VERSION=1.3.0	M	Request version
REQUEST=GetMap	M	Request name
LAYERS=name,name	M	Comma-separated list of one or more map layers names. Names are harmonized INSPIRE layers names.
STYLES=name,name	M	Comma-separated list of one rendering style per layer requested. When the STYLES parameter is left blank in the GetMap request, the INSPIRE default styling applies in the GetMap response to all layers (inspire_common:DEFAULT)
CRS=namespace:identifier	M	Coordinate reference system
BBOX=minx,miny,maxx,maxy	M	Bounding box corners (lower left, upper right) in CRS units and in the axis order of the CRS
WIDTH=output_width	M	Width in pixels of map picture
HEIGHT=output_height	M	Height in pixels of map picture
FORMAT=output_format	M	Output format of map. At least supported : Portable Network Graphics format(PNG; MIME type "image/png") or the GIF (Graphics Interchange Format) without LZW compression (MIME type "image/gif")

# Zobrazovacia služba

## Operácia GetMap

[https://zbgisws.skgeodesy.sk/inspire\\_administrative\\_units\\_wms/service.svc/get?SERVICE=WMS&REQUEST=GetMap&FORMAT=image/png&TRANSPARENT=TRUE&STYLES=&VERSION=1.3.0&LAYERS=AU.AdministrativeUnit,AU.AdministrativeBoundary&WIDTH=1685&HEIGHT=457&CRS=EPSG:4326&BBOX=48.1080118694362,17.888427299703263,48.514836795252215,19.388427299703263](https://zbgisws.skgeodesy.sk/inspire_administrative_units_wms/service.svc/get?SERVICE=WMS&REQUEST=GetMap&FORMAT=image/png&TRANSPARENT=TRUE&STYLES=&VERSION=1.3.0&LAYERS=AU.AdministrativeUnit,AU.AdministrativeBoundary&WIDTH=1685&HEIGHT=457&CRS=EPSG:4326&BBOX=48.1080118694362,17.888427299703263,48.514836795252215,19.388427299703263)

3

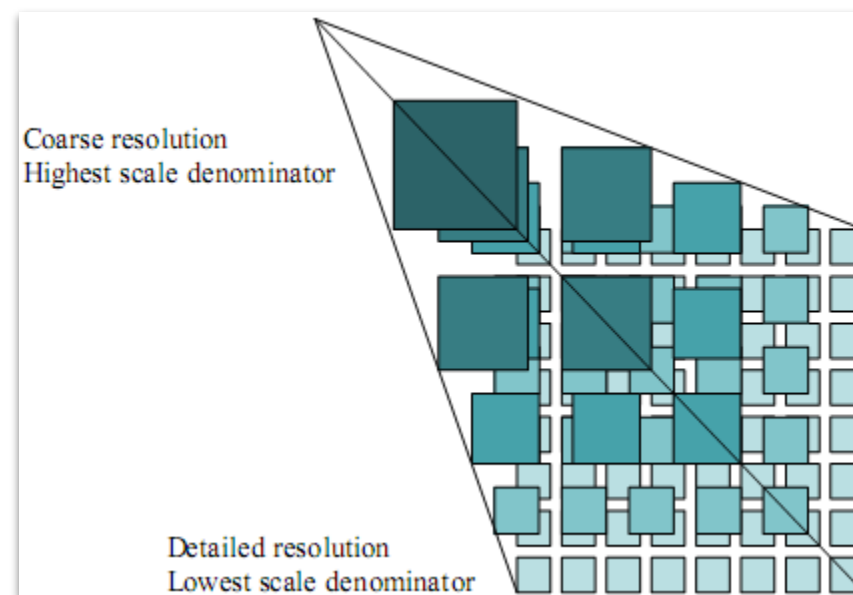


# Zobrazovacie služby

## OGC WMTS 1.0.0

INSPIRE View Service operations	OCG WMTS operations
Get View Service Metadata	GetCapabilities
Get Map	GetTile

<https://github.com/INSPIRE-MIF/technical-guidelines/blob/2022.2/services/view-wms/ViewServices.adoc>



# Zobrazovacie služby

## OGC WMTS 1.0.0 - Get Tile

Request parameter	Mandatory/optional	Description
VERSION=1.0.0	M	Request version
REQUEST=GetTile	M	Request name
LAYER=name	M	Identifier that is defined in the ServiceMetadata document
STYLE=name	M	Identifier that is defined in the ServiceMetadata document. When the STYLES parameter is left blank in the GetTile request, the INSPIRE default styling applies in the GetMap response to all layers (inspire_common:DEFAULT)
FORMAT=image/png	M	Value that is defined in theServiceMetadata document
TILEMATRIXSET=InspireCRS84Quad	M	Identifier that is defined in theServiceMetadata document
TILEMATRIXSET=integer	M	Value that is defined in theServiceMetadata document
TILEROW=integer	M	value between 0 and MatrixHeight-1 of this tile matrix defined in the ServiceMetadata document
TILEROW=integer	M	value between 0 and MatrixWidth-1 of this tile matrix defined in the ServiceMetadata document

# Zobrazovacie služby

## OGC WMTS 1.0.0 - Tilematrix



**Implementation Recommendation 21** Every layer offered by a INSPIRE WMTS should use the InspireCRS84Quad MatrixSet

CRS: <http://www.opengis.net/def/crs/OGC/1.3/CRS84>

TILING ORIGIN: (-180, 90)

EXTENT: (-180,180); (-90,90)

PIXEL SIZE FORMULA:  $(180 / 2^{(8+i)})$

TILE HEIGHT: 256 pixels

TILE WIDTH: 256 pixels +

Level 0 of *InspireCRS84Quad* is similar to level 1 of *GoogleCRS84Quad* ↵

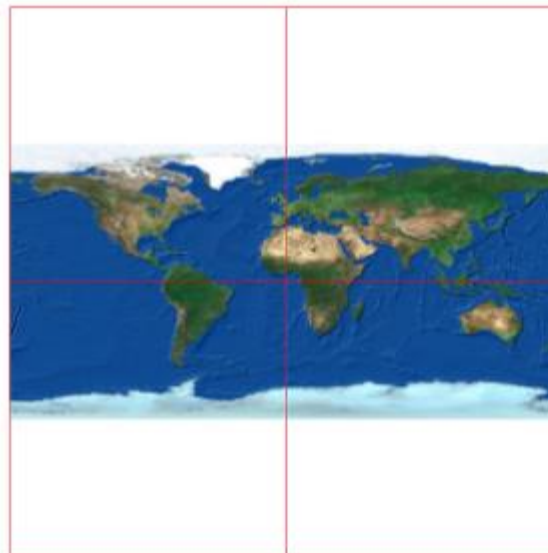


Figure 11: Level 1 GoogleCRS84Quad, Four 256x256 pixels tiles

# Zobrazovacie služby

## Požiadavky na kvalitu

- Pri 470 kilobajtovej snímke (napr. 800 × 600 pixlov s 8-bitovou hĺbkou farby) je čas odpovede na odoslanie počítačovej odpovede na požiadavku zobrazovacej služby „získať mapu“ (Get Map) v bežnej situácii najviac 5 sekúnd.
- Minimálny počet simultánne vybavených požiadaviek na zobrazovaciu službu je 20 požiadaviek za sekundu na dosiahnutie naplnenia kvalitatívnych kritérií.
- Pravdepodobnosť dostupnosti sieťovej služby je 99 % času.

To options exist for the measurements of Quality of Services:

1. Quality of Services requirements are measured at the service side exposed to the Internet.
2. Quality of Services requirements are measured from a central network node within the infrastructure.

# Ukladacie služby

- Implementácia:
  - Preddefinované Atom Feed
  - Preddefinované WFS 2.0.0 (StoredQuery)
  - WFS 2.0.0 s priamym prístupom



**Atom Feed**

Operácie INSPIRE Ukladacej služby (M)	Operácie ISO 19142 WFS
Získať metaúdaje ukladacej služby (Get Download Service Metadata)	GetCapabilities
Získať súbor priestorových údajov (Get Spatial Dataset)	GetFeature
Opísať súbor priestorových údajov (Describe Spatial Dataset)	DescribeFeatureType
Prepojiť ukladaciu službu (Link Download Service)	Využitím operácií vyhľadávacej služby



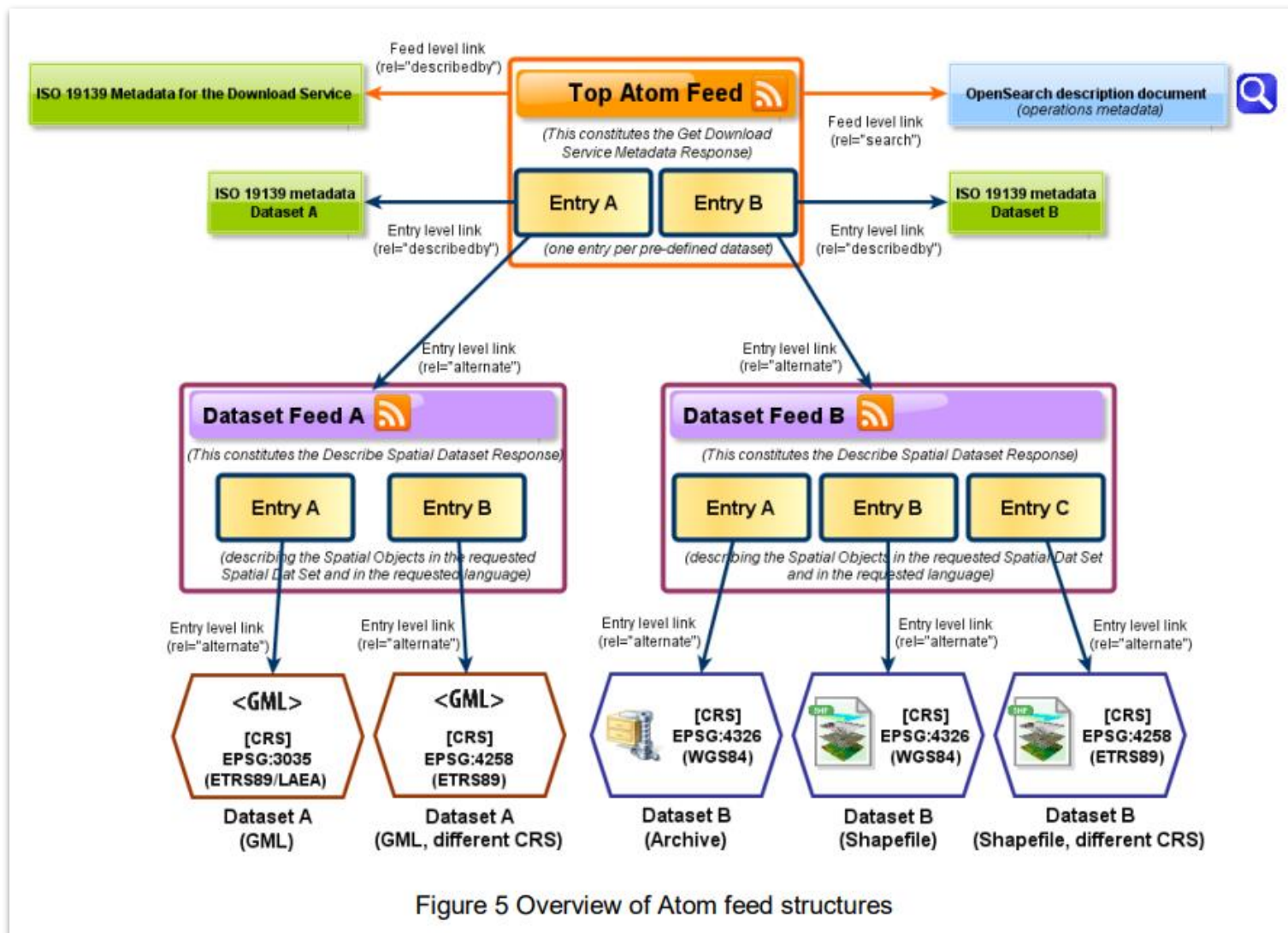
# Ukladacie služby - ATOM

- najjednoduchší spôsob publikovania harmonizovaných údajov
- stiahnutie preddefinovaného súboru z URL adresy
- vo vybraných súradnicových systémoch
- vo vybraných distribučných formátoch





# Ukladacie služby - ATOM



# Ukladacie služby - ATOM príklad 1

ČÚZK INSPIRE administratívne členenie

Feed

<https://atom.cuzk.cz/AU/AU.xml>

Entry

[https://atom.cuzk.cz/AU/datasetFeeds/CZ-00025712-CUZK\\_AU\\_1.xml](https://atom.cuzk.cz/AU/datasetFeeds/CZ-00025712-CUZK_AU_1.xml)

# Ukladacie služby - ATOM príklad 2

ČÚZK INSPIRE Adresy

Feed

<https://atom.cuzk.cz/AD/AD.xml>

Entry

[https://atom.cuzk.cz/AD/datasetFeeds/CZ-00025712-CUZK\\_AD\\_584061.xml](https://atom.cuzk.cz/AD/datasetFeeds/CZ-00025712-CUZK_AD_584061.xml)

# Ukladacie služby - WFS

Operácia GetCapabilities (Get Download Service Metadata)

Odpoveď na požiadavku musí obsahovať:

- metaúdaje služby (musí zahŕňať všetky metaúdajové položky pre INSPIRE ukladacie služby)
- metaúdaje operácii služby
- jazyky - podporované jazyky a jazyky odpovede
- metaúdaje jednotlivých vrstiev

# Ukladacie služby - WFS

Odpoveď na GetCapabilities (Get Download Service Metadata) musí obsahovať rozšírené informácie (metaúdaje)

spôsob implementácie cez Extended Capabilities:

- referenčná URL na metaúdajový záznam

<http://46.229.225.194/geoserver/ad/ows?service=WMS&version=1.3.0&request=GetCapabilities>

- vyplnenie všetkých požadovaných metaúdajov v odpovedi GetCapabilities

[https://zbgisws.skgeodesy.sk/inspire\\_administrative\\_units\\_wfs/service.svc/get?service=wfs&version=2.0.0&request=GetCapabilities](https://zbgisws.skgeodesy.sk/inspire_administrative_units_wfs/service.svc/get?service=wfs&version=2.0.0&request=GetCapabilities)

# Ukladacie služby - WFS

Operácia Opísať súbor priestorových údajov

WFS describe feature type:

<http://46.229.225.194/geoserver/ad/ows?SERVICE=WFS&REQUEST=DescribeFeatureType&VERSION=2.0.0>

Odpoveď na požiadavku vracia popis štruktúry objektov

- XSD schéma podľa príslušnej témy INSPIRE

# Ukladacie služby - WFS

Získať súbor priestorových údajov (Get Spatial Dataset)

WFS GetFeature:

<http://46.229.225.194/geoserver/ad/ows?service=WFS&version=2.0.0&request=GetFeature&typeName=ad%3AAddress&outputFormat=gml32&count=10>

Odpoveď na požiadavku vracia údaje podľa požadovanej XSD štruktúry

# Ukladacie služby - WFS

## StoredQuery

- súčasť štandardu WFS
- zjednodušenie dopytovania WFS
- preddefinovaná štruktúra požiadaviek

```
<wfs:CreateStoredQuery service='WFS' version='2.0.0'
  xmlns:wfs='http://www.opengis.net/wfs/2.0'
  xmlns:fes='http://www.opengis.net/fes/2.0'
  xmlns:gml='http://www.opengis.net/gml/3.2'
  xmlns:st='http://www.stations.org/1.0' >
  <wfs:StoredQueryDefinition id='stationsStoredQuery' >
    <wfs:Parameter name='mail' type='string' />
    <wfs:QueryExpressionText
      returnFeatureTypes='st:Station'
      language='urn:ogc:def:queryLanguage:OGC-WFS::WFS_QueryExpression'
      isPrivate='false' >
      <wfs:Query typeNames='st:Station' >
        <fes:Filter >
          <fes:PropertyIsEqualTo >
            <fes:ValueReference>st:contactMail</fes:ValueReference >
            <fes:Literal>${mail}</fes:Literal >
          </fes:PropertyIsEqualTo >
        </fes:Filter >
      </wfs:Query >
    </wfs:QueryExpressionText >
  </wfs:StoredQueryDefinition >
</wfs:CreateStoredQuery >
```



# Ukladacie služby - WFS

```
<?xml version="1.0" encoding="UTF-8"?>
<wfs:ListStoredQueriesResponse
  xmlns:geosolutions="http://www.geo-solutions.it/workshop"
  xmlns:sf="http://www.geo-solutions.it/sf"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:fes="http://www.opengis.net/fes/2.0"
  xmlns:wfs="http://www.opengis.net/wfs/2.0"
  xmlns:gml="http://www.opengis.net/gml/3.2"
  xmlns:ows="http://www.opengis.net/ows/1.1"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.w3.org/2001/XMLSchema-instance"
  >
  <wfs:StoredQuery id="urn:ogc:def:query:OGC-WFS::GetFeatureById">
    <wfs>Title xml:lang="en">Get feature by identifier</wfs>Title>
    <wfs:ReturnFeatureType>sf:restricted</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>sf:roads</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>sf:streams</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:BoulderCityLimits</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:Counties</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:Parcels</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:Trails</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:Wetlands_regulatory_area</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:WorldCountries</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:bbuildings</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:blakes</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:bplandmarks</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:bptlandmarks</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:bptlandmarks_2876</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:brivers</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:bstreets</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:poi</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:restricted</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:states</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:storm_obs</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>geosolutions:streams</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>st:Observation</wfs:ReturnFeatureType>
    <wfs:ReturnFeatureType>st:Station</wfs:ReturnFeatureType>
  </wfs:StoredQuery>
  <wfs:StoredQuery id="stationsStoredQuery">
    <wfs>Title xml:lang="en"/>
    <wfs:ReturnFeatureType>st:Station</wfs:ReturnFeatureType>
  </wfs:StoredQuery>
</wfs:ListStoredQueriesResponse>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<wfs:DescribeStoredQueriesResponse
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:fes="http://www.opengis.net/fes/2.0"
  xmlns:wfs="http://www.opengis.net/wfs/2.0"
  xmlns:gml="http://www.opengis.net/gml/3.2"
  xmlns:ows="http://www.opengis.net/ows/1.1"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.w3.org/2001/XMLSchema-instance"
  >
  <wfs:StoredQueryDescription id="stationsStoredQuery">
    <wfs:Parameter name="mail" type="geosolutions:string"/>
    <wfs:QueryExpressionText isPrivate="false" language="urn:ogc:def:queryLanguage:OGC-WFS::SQL"
      <wfs:Query wfs:typeNames="st:Station">
        <fes:Filter>
          <fes:PropertyIsEqualTo>
            <fes:ValueReference>st:contactMail</fes:ValueReference>
            <fes:Literal>${mail}</fes:Literal>
          </fes:PropertyIsEqualTo>
        </fes:Filter>
      </wfs:Query>
    </wfs:QueryExpressionText>
  </wfs:StoredQueryDescription>
</wfs:DescribeStoredQueriesResponse>
```

[http://localhost:8083/geoserver/wfs?service=wfs&version=2.0.0&request=GetFeature&typeNames=st%3AStation&StoredQuery\\_ID=stationsStoredQuery&mail=other%40other.com](http://localhost:8083/geoserver/wfs?service=wfs&version=2.0.0&request=GetFeature&typeNames=st%3AStation&StoredQuery_ID=stationsStoredQuery&mail=other%40other.com)

# Ukladacie služby - WFS stored query požiadavky

**TG Requirement 50** Any possible (i.e. available) combinations of CRS/DataSetIdCode/DataSetIdNamespace/language shall be made available through pre-defined stored queries.

**TG Recommendation 13** The following identifier should be used to identify the Stored Query for serving pre-defined Spatial Data Sets:  
<http://inspire.ec.europa.eu/operation/download/GetSpatialDataSet>

**TG Requirement 51** Pre-defined Stored Queries shall use the parameter names "CRS", "DataSetIdCode", "DataSetIdNamespace" and "Language" to identify the CRS, dataset ID code, dataset ID namespace and language components of a query.

```
http://www.myinspirewfs.com/request=getFeature&storedquery_id=  
http://inspire.ec.europa.eu/operation/download/GetSpatialDataSet  
&DataSetIdCode=mycode&DataSetIdNamespace=mynamespace&CRS=EPSG:4326&Language  
=eng
```

# Ukladacie služby

## Požiadavky na kvalitu

- Pri operácii ‚získať metaúdaje ukladacej služby‘ je doba odpovede pri odoslaní počítačovej odpovede v bežnej situácii najviac 10 sekúnd.
- Pri operáciách ‚získať súbor priestorových údajov‘ a ‚získať priestorový objekt‘ a pri dopyte, ktorý pozostáva výlučne z ohraničenia, je doba odpovede pri odoslaní počítačovej odpovede v bežnej situácii najviac 30 sekúnd a potom, stále v bežnej situácii, si ukladacia služba zachová udržateľnú odpoveď prevyšujúcu 0,5 megabajtu za sekundu alebo 500 priestorových objektov za sekundu.
- Pri operáciách ‚opísať súbor priestorových údajov‘ a ‚opísať typ priestorového objektu‘ je doba odpovede pri odoslaní počítačovej odpovede v bežnej situácii najviac 10 sekúnd a potom, stále v bežnej situácii, si ukladacia služba zachová udržateľnú odpoveď prevyšujúcu 0,5 megabajtu za sekundu alebo 500 priestorových objektov za sekundu.
- Minimálny počet simultánne vybavených požiadaviek na ukladaciu službu v súlade s výkonnostnými kritériami kvality služby je 10 požiadaviek za sekundu. Počet paralelne spracovávaných požiadaviek je možné obmedziť na 50.

# Ukladacie služby

**TG Requirement 70** Performance shall be measured using the Get Download Service Metadata, Get Spatial Data Set, Get Spatial Object, Describe Spatial Data Set and Describe Spatial Object Type operations.

**TG Recommendation 18** The structure of the sample reference request packages is recommended to be composed of: 10% Get Download Service Metadata requests, 10% Describe Spatial Data Set or Describe Spatial Object Type and 80% Get Spatial Data Set or Get Spatial Object. At least 2% of the requests should be Get Spatial Data Set.

NOTE: This composition is assumed to represent a “normal situation”.

**TG Requirement 71** For Get Spatial Object operations, the sample reference request shall Contain a BBOX parameter.

**TG Requirement 72** If a download service serves more than one feature type, only one feature type shall be requested by a Get Spatial Object operation.

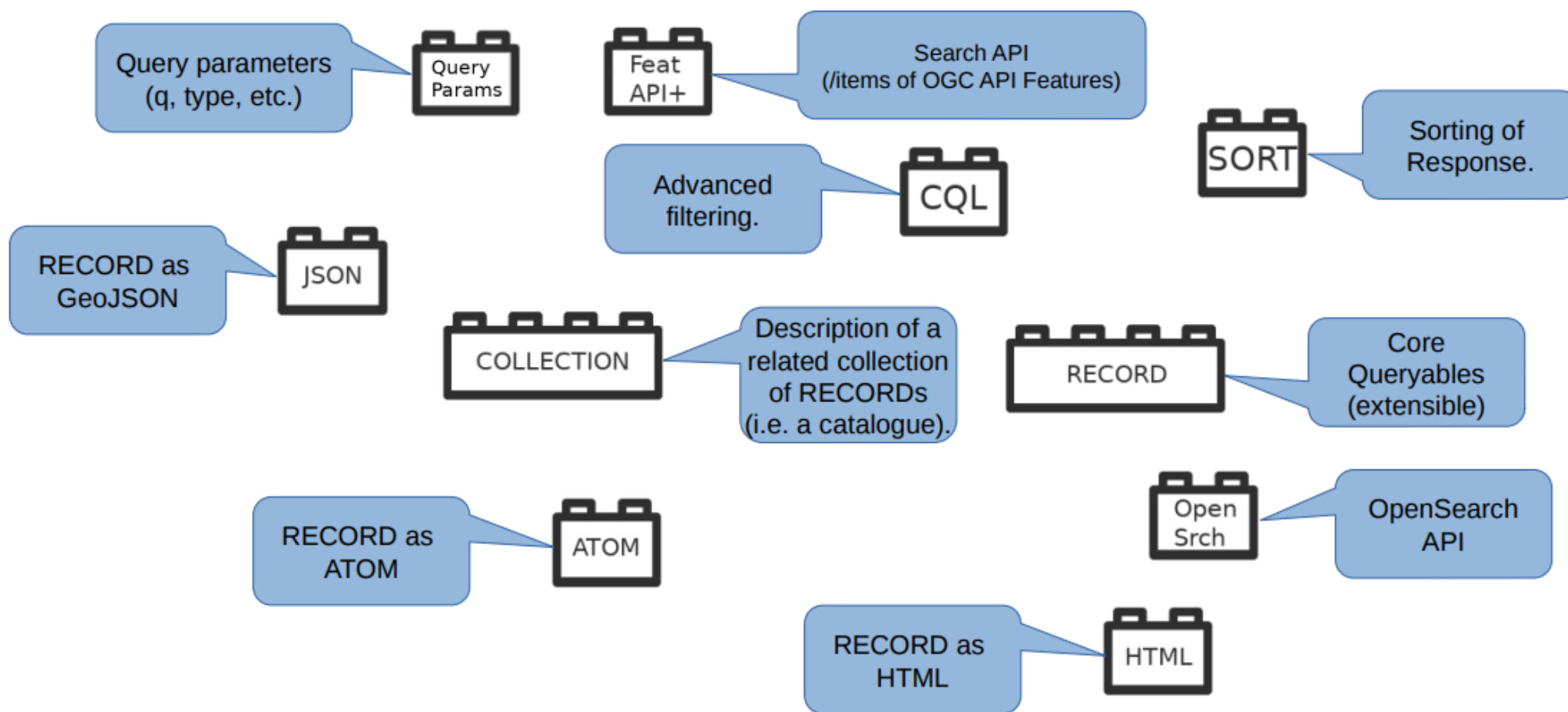


**ESPUS**

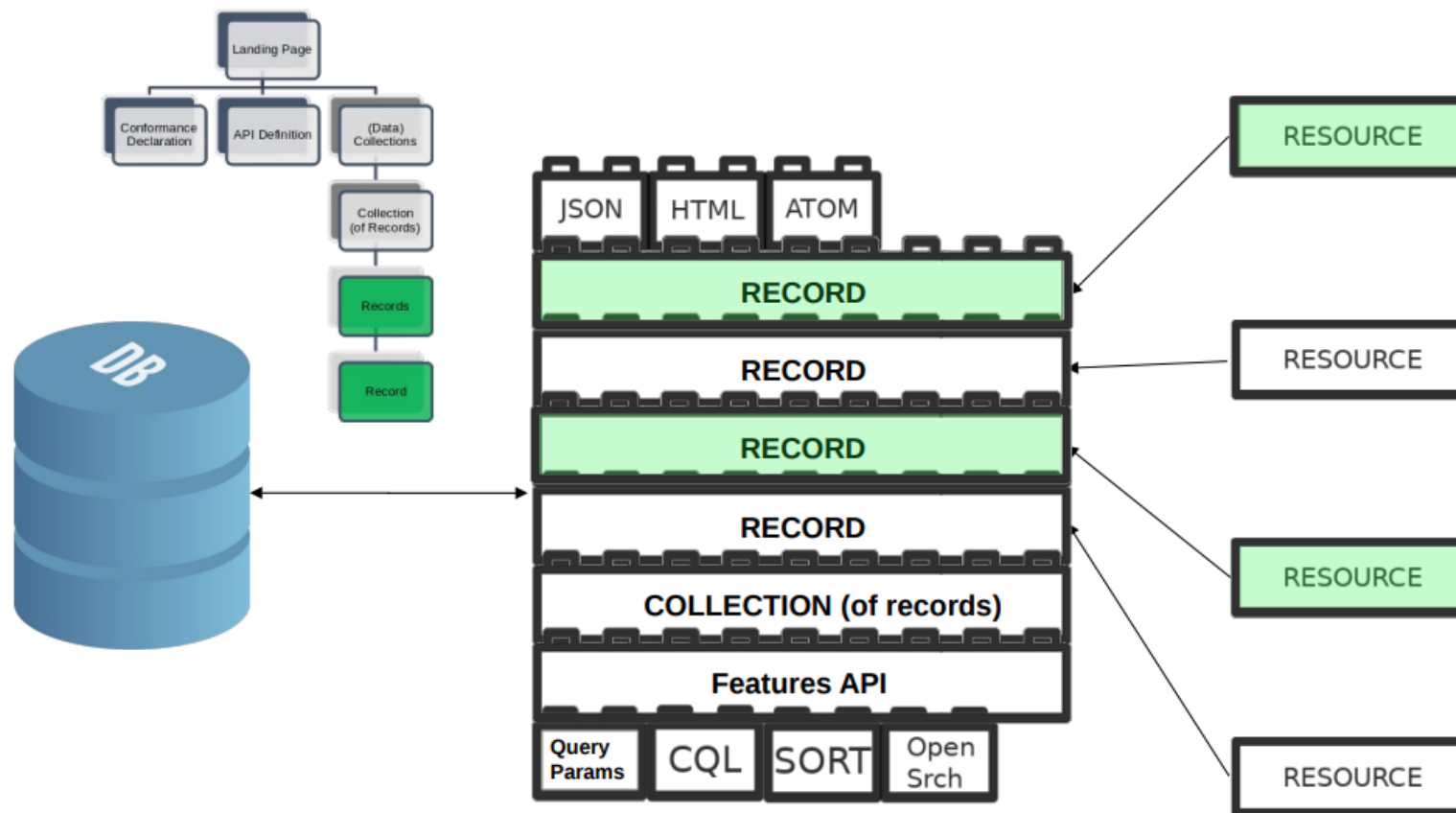
Efektívna správa priestorových údajov a služieb

## Používanie OGC API

# OGC API RECORDS



# OGC API RECORDS



GET /collections/MyCat/items?bbox=-69.64,37.76,-56.12,46.63&datetime=2020-01-11T00:00:00/2020-01-12T00:00:00

# OGC API RECORDS

ACCESS PATH	DESCRIPTION
/	GET: Landing page
/api	GET: Service or API description document (OpenAPI)
/conformance	GET: conformance statement
/collections	GET: list of catalogue identifiers with hypermedia controls to each catalogue
/collections/{catalogueId}	GET: Metadata about the specific catalogue including hypermedia controls to other resources POST: create a new catalogue
/collections/{catalogueId}/item	GET: query the catalogue (simple) POST: create a new record
/collections/{catalogueId}/items/{recordId}	GET: get the record PUT: update the record DELETE: remove the record
/collections/{catalogueId}/queryables	GET: list of queryables that can be used in a filter



# OGC API RECORDS

Table 2. Conformance class URIs

Conformance class	URI
<a href="#">Crawable Catalogue</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/crawable-catalogue">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/crawable-catalogue</a>
<a href="#">Searchable Catalogue</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/searchable-catalogue">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/searchable-catalogue</a>
<a href="#">Local Resources Catalogue</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/local-resources-catalogue">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/local-resources-catalogue</a>
<a href="#">Record</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-core">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-core</a>
<a href="#">Record Collection</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-collection">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-collection</a>
<a href="#">Record API</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-api">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/record-api</a>
<a href="#">Sorting</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/sorting">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/sorting</a>
<a href="#">CQL</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/cql">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/cql</a>
<a href="#">OpenSearch</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/opensearch">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/opensearch</a>
<a href="#">JSON-Record</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/json">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/json</a>
<a href="#">ATOM-Record</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/atom">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/atom</a>
<a href="#">HTML-Record</a>	<a href="http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/html">http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/html</a>

RECORD  
Building Block

Query  
Parameters  
Building Block

CQL  
Building Block

JSON  
RECORD  
Building Block

HTML  
RECORD  
Building Block

Collection  
Building Block

Sort  
Building Block

OpenSearch  
Building Block

ATOM  
Record  
Building Block

# OGC API RECORDS - porovnanie volaní

- OGC API:

<https://demo.pycsw.org/gisdata/collections/metadata:main/items/urn:uuid:dc9b6d52-932a-11ea-ad6f-823cf448c401?f=json>

- OGC CSW:

[https://rpi.gov.sk/rpi\\_csw/service.svc/get?request=GetRecordById&service=CSW&version=2.0.2&elementSetName=full&outputschema=http://www.isotc211.org/2005/gmd&Id=https://data.gov.sk/set/rpi/gmd/31364501/MV\\_DEF\\_USEK\\_PUBLIC](https://rpi.gov.sk/rpi_csw/service.svc/get?request=GetRecordById&service=CSW&version=2.0.2&elementSetName=full&outputschema=http://www.isotc211.org/2005/gmd&Id=https://data.gov.sk/set/rpi/gmd/31364501/MV_DEF_USEK_PUBLIC)

# OGC API RECORDS - príklad swagger rozhrania

<https://demo.pycsw.org/gisdata/openapi?>

**Capabilities** essential characteristics of this API

- GET / Landing page
- GET /conformance Conformance page
- GET /collections Collections page
- GET /collections/{collectionId} Collection page

**Metadata** access to metadata (records)

**metadata**

- GET /collections/{collectionId}/items Records search items page
- POST /collections/{collectionId}/items Adds Records items
- GET /search Records search items page
- POST /search Adds Records items
- GET /collections/{collectionId}/items/{recordId} Records item page
- PUT /collections/{collectionId}/items/{recordId} Updates Records items
- DELETE /collections/{collectionId}/items/{recordId} Deletes Records items

# OGC API RECORDS - príklad implementácií

- <https://pygeoapi.io/>
- Geonetwork
- <https://github.com/interactive-instruments/ldproxy>
- PyCSW
- Geoportal Server OGC API Records provider

# OGC API FEATURES

- náhrada standardu WFS
- schválený standard (Part 1, Part 2)
  - OGC API - Features - Part 1: Core
  - OGC API - Features - Part 2: CRS by Reference
  - OGC API - Features - Part 3: Filtering
  - OGC API - Features - Part 4: Create, Replace, Update and Delete
- výmenný formát JSON

# OGC API FEATURES

## Resource Oriented Data Access

Landing page (HTML):

```
GET /
```

Information about the collections of data offered:

```
GET /collections
```

Each feature referenced with a simple permanent URL

```
GET /collections/{collectionId}/items/{featureId}
```

Simple queries supported in the core standard:

```
GET /collections/{collectionId}/items?bbox=160.6,-55.95,-170,-25.89
```

# OGC API FEATURES

<http://46.229.225.194/geoserver/ogc/features>

[Home](#) / [Collections](#)

## GeoServer Feature Collections

This document lists all the collections available in the Features service.  
This document is also available as [application/x-yaml](#), [application/json](#), [application/cbor](#).

<p><a href="#">olm:fp_uprava</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> Funkční plochy GF1</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 17.151, 49.528, 17.41, 49.672.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>	<p><a href="#">olm:vyuzitie_uzemia</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> Funkční plochy</li><li>• <b>Description:</b> vyuzitie_uzemia</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 17.151, 49.528, 17.41, 49.672.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>	<p><a href="#">up:vyuziti_uzemi</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> vyuziti_uzemi</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 17.162, 49.535, 17.396, 49.662.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>
<p><a href="#">ra:Obec3Feature</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> Obec3Feature</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 16.833, 47.731, 22.566, 49.614.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>	<p><a href="#">ra:Okres3Feature</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> Okres3Feature</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 16.833, 47.731, 22.566, 49.614.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>	<p><a href="#">test:okres_3</a></p> <ul style="list-style-type: none"><li>• <b>Title:</b> okres_3</li><li>• <b>Geographic extents:</b><ul style="list-style-type: none"><li>◦ 16.661, 47.645, 22.618, 49.714.</li></ul></li><li>• Queryables as <a href="#">HTML</a>.</li></ul> <p>Data as <a href="#">HTML</a> or choose another format: <input type="text" value="-- Please choose a format --"/></p>

# OGC API MAPS

- náhrada WMS štandardu
- v procese tvorby

GET /collections

A list of collections of all maps available from this API.

GET /collections/{collectionId}

Description of a collection {collectionId} available from this API. It defines what is possible to do with it to generate a map.

GET /collections/{collectionId}/map

Retrieves the maps description for this collection including the links to get a map, and the infoTemplate.

GET /map

Retrieves the maps description for this collection including the links to get a map, and the infoTemplate.

GET /collections/{collectionId}/map/{styleId}

Retrieves a map in the requested crs, on the requested bbox designed to be shown in a rendering device of a width and a height. Some formats require to apply a style on the server side (e.g. png, jpeg, gif) and some others might include a reference to a style to be applied in the client side.

GET /collections/{collectionId}/map/{styleId}/info

Retrieves a information about a feature presented on the map in the requested crs, on the requested bbox designed to be shown in a rendering device of a width and a height. Some formats require to apply a style on the server side (e.g. png, jpeg, gif) and some others might include a reference to a style to be applied in the client side.

GET /map/{styleId}

Retrieves a map in the requested crs, on the requested bbox designed to be shown in a device of a width and a height. Some formats require to apply a style on the server side (e.g. png, jpeg, gif) and some others might include a reference to a style to be applied in the client side.

GET /map/{styleId}/info

Retrieves a information about a feature presented on the map for collections in the requested crs, on the requested bbox desigend to be shown in a rendering device of a width and a height. Some formats require to apply a style on the server side (e.g. png, jpeg, gif) and some others might include a reference to a style to be applied in the client side.



# Manuály ku službám a ich publikácií

## Publikovanie INSPIRE služieb cez Geoserver

<https://gitlab.com/mzpsr/minzp/podpora-inspire-implement-cie/ostatn-t-my/navody/-/wikis/Publikovanie-INSPIRE-slu%C5%BEieb-cez-Geoserver>

## Príklad konfigurácie Geoserver Application Schema

<https://gitlab.com/mzpsr/podpora-inspire-implement-cie/ostatn-t-my/navody/-/wikis/Geoserver-Application-schema-konfigur%C3%A1cia>

## Prepájanie INSPIRE zdrojov

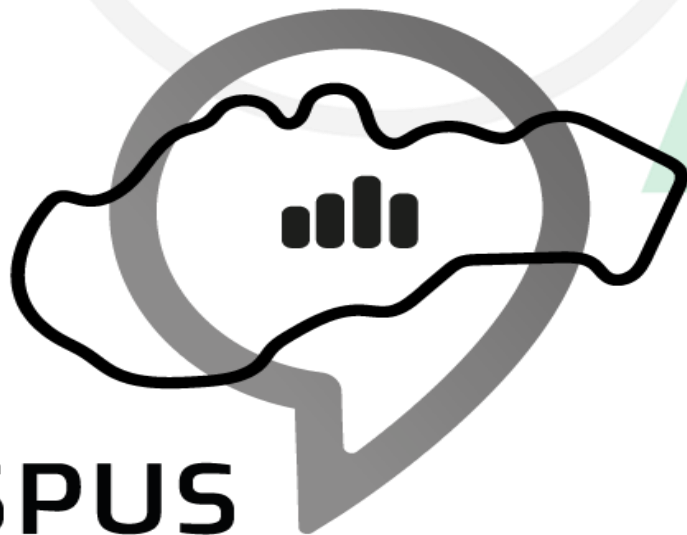
<https://gitlab.com/mzpsr/podpora-inspire-implement-cie/ostatn-t-my/navody/-/wikis/Home/N%C3%A1vod-na-prepojenie-INSPIRE-zdrojov>



Ďakujem za pozornosť!

**Mgr. Radoslav Chudý PhD.**  
[rado.chudy@gmail.com](mailto:rado.chudy@gmail.com)

# ESPUS



## ESPUS

Efektívna správa priestorových údajov a služieb

<https://inspire.gov.sk/projekty/espus>