

Discussion paper on INSPIRE IR's for Network Services mapping with WFS 3.0

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Introduction

The Web Feature Service 3 (WFS3) is the new version of the OGC's Web Feature Service standard for querying geospatial information on the web. It is a complete rewrite of previous versions, focusing on a simple RESTful core specified as reusable OpenAPI components with responses in JSON, HTML and other encodings. The first release of the standard is available at [OGC Web Feature Service 3.0 - Part 1: Core, First Draft Release](#).

More information about WFS3 can be found from here:

<https://webgate.ec.europa.eu/fpfis/wikis/display/InspireMIG/SDW-3:+WFS+3.0>

The purpose of this discussion paper is to analyse how WFS3 could fit with the implementation of INSPIRE's download services, and to possibly be added as a new Annex of the “[Technical Guidance for the implementation of INSPIRE Download Services](#)”.

The following chapters provide preliminary ideas on how the current WFS3 draft could meet the legal requirements of the implementation rules.

A. Get Download Service Metadata operation

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Download Service shall at least provide a Get Download Service Metadata operation that provides all necessary information about the service, the available Spatial Data Sets, and describes the service capabilities and supports the following request and response parameters:</p>		
<p>2.1. Get Download Service Metadata request 2.1.1. Get Download Service Metadata request parameter The Get Download Service Metadata request parameter shall indicate the natural language to be used for the content of the Get Download Service Metadata response.</p>	<p>The request is mapped to a request to the landing page of the service (/), which contains links to the following:</p> <pre>/api /conformance /collections</pre> <p>For discussion: Is this required, given that each of the individual response parameters can be accessed directly?</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/</p> <p>Response:</p> <pre>{ "links" : [{ "href" : "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/", "rel" : "self", "type" : "application/json", "title" : "This document" }, { "href" : "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/api", "rel" : "service", "type" : "application/json", "title" : "The API definition" }, { "href" : "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/conformance", "rel" : "conformance", "type" : "application/json", "title" : "WFS 3.0 conformance classes implemented by this server" }, { "href" : "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections", "rel" : "data", "type" : "application/json", "title" : "Metadata about the feature collections" }] }</pre>
<p>2.2. Get Download Service Metadata response</p>		

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Get Download Service Metadata response shall contain the following sets of parameters:</p> <p>2.2.1. Download Service Metadata parameter The Download Service Metadata parameters shall at least contain the INSPIRE metadata elements of the Download Service.</p>	<p>Basic information about the service is provided in the “info” property of the OpenAPI document available in the /api path.</p> <p>For discussion: Is this sufficient, or should a dedicated service metadata document / link be added in the landing page response document (see also discussion at https://github.com/opengeospatial/WFS_FES/issues/160).</p>	<p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/api</p> <p>Response:</p> <pre>{ "openapi" : "3.0.1", "info" : { "title" : "Hakuna WFS3 Server", "description" : "Hakuna WFS3 Server v0.0.1", "contact" : { "name" : "Janne Heikkilä", "url" : "http://www.nls.fi", "email" : "janne.heikkila@nls.fi" }, "license" : { "name" : "CC-BY 4.0 License", "url" : "https://creativecommons.org/licenses/by/4.0/" }, "version" : "0.0.1" }, "servers" : [{ "url" : "https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1", "description" : "Development" }], --cut-- }</pre>
<p>2.2.2. Operations Metadata parameter The Operations metadata parameter provides metadata about the operations implemented by the Download Service. It shall at least provide a description of each operation, including as a minimum a description of the data exchanged and the network address.</p>	<p>The operations metadata are provided in the “paths” property of the OpenAPI description available in the /api path.</p>	<p>https://beta-paikkatiेतo.maanmittauslaitos.fi/inspire-gn/wfs3/v1/api</p> <p>Response:</p> <pre>{ "openapi" : "3.0.1", "info" : { ... }, "servers" : [...], "tags" : [...], "paths" : { "/" : { "get" : { "tags" : ["Capabilities"], "summary" : "Landing page of this API", "description" : "The landing page provides links to the API definition, the Conformance statements and the metadata about the feature data in this dataset.", "operationId" : "getLandingPage", </pre>

IRs for Network Services	Possible implementation using WFS 3.0	An example
		<pre> "responses" : { "200" : { "description" : "Links to the API capabilities", "content" : { "application/json" : { "schema" : { "\$ref" : "#/components/schemas/root" } } } }, "default" : { "description" : "An error occurred", "content" : { "application/json" : { "schema" : { "\$ref" : "#/components/schemas/exception" } } } } } }, "/collections" : { "get" : { "tags" : ["Capabilities"], "summary" : "Describe the feature collections in the dataset", "description" : "Metadata about the feature collections shared by this API", "operationId" : "describeCollections", "responses" : { "200" : { "description" : "Metadata about the feature collections shared by this API", "content" : { "application/json" : { "schema" : { "\$ref" : "#/components/schemas/content" } } } } } }, "default" : { "description" : "An error occurred", "content" : { "application/json" : { "schema" : { "\$ref" : "#/components/schemas/exception" } } } } } </pre>

IRs for Network Services	Possible implementation using WFS 3.0	An example
		<pre> } } } }, "/collections/{collectionId}" : { "get" : { "tags" : ["Capabilities"], --cut-- </pre>
<p>2.2.3. Languages parameter Two language parameters shall be provided:</p> <ul style="list-style-type: none"> the response Language parameter indicating the natural language used in the Get Download Service Metadata response parameters, the Supported languages parameter containing the list of the natural languages supported by the Download Service. 	<p>For discussion: Meeting this obligation requires an extension to WFS3 Core.</p> <p>A possible solution would be to support content negotiation (see: https://github.com/opengeospatial/WFS_FES/issues/161).</p> <p><u>OPTION 1.</u> The extension might add a query parameter <code>lang={code}</code> to the <code>/api</code> and <code>/collections</code> metadata requests. Landing page responses would include additional links to <code>/api?lang={code}</code> and <code>/collections?lang={code}</code> with all natural languages supported by the Download Service. The list of supported natural languages would be obtained by parsing the links which is not that pretty.</p> <p><u>OPTION 2.</u> Another solution would be to modify the Landing page response to include a list of the supported natural languages. This solution has the problem that the landing page would contain extra elements compared to the Core version of the document and would be sent to the client before the client has access to <code>/conformance</code>.</p> <p><u>OPTION 3.</u> Yet another solution would be to add the <code>?lang={code}</code> parameter to the Landing page request as well. The client would first access the API as usual. Then when it finds out that the <code>/conformance</code></p>	

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	<p>includes the “Languages” extension it would request the Landing page with the <code>?lang={code}</code> parameter and only then would there be language specific links and the extra “languages” array in the response. This solution has the benefit that clients unaware of the “Languages” extension would not notice anything out of the ordinary.</p>	
<p>2.2.4. Spatial Data Sets Metadata parameters The INSPIRE metadata elements of the available Spatial Data Sets shall be provided. In addition, for each Spatial Data Set, the list of those Coordinate Reference Systems referred to in Regulation (EU) No 1089/2010 which are available shall also be provided.</p>	<p>INSPIRE Metadata can be provided as a link in the “links” array of type “describedBy” in the response Feature Collection metadata response document retrieved either through a request to <code>/collections</code> or <code>/collections/{collectionId}</code>.</p> <p>NOTE According to requirement 16 of WF3, the content of the response for <code>/collections/{collectionId}</code> SHALL be the same as the content for the feature collection in the <code>/collections</code> response.</p> <p>Support to additional Coordinate Reference Systems is added by the upcoming “CRS” extension (see https://github.com/opengeospatial/WFS_FES/blob/master/extensions/crs/clause_06_crs.adoc and https://github.com/opengeospatial/WFS_FES/issues/151).</p>	<p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections</p> <p>Response:</p> <pre>{ "links" : [{ "href" : "https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections", "rel" : "self", "type" : "application/json", "title" : "This document" }], "collections" : [{ "name" : "namedplace", "title" : "NamedPlaces", "description" : "NLS Finland GNR: INSPIRE GN NamedPlaces", "links" : [{ "href" : "https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items", "rel" : "item", "type" : "application/geo+json" }], { "href": "http://example.org/metadata.xml", "rel": "describedBy", "type": "application/xml", "title": "Metadata for NLS Finland GNR: INSPIRE GN NamedPlaces" }], "crs" : ["http://www.opengis.net/def/crs/EPSG/0/3067", "http://www.opengis.net/def/crs/EPSG/0/3035", "http://www.opengis.net/def/crs/EPSG/0/4258", "http://www.opengis.net/def/crs/OGC/1.3/CRS84", "http://www.opengis.net/def/crs/EPSG/0/3857"] }] }</pre>

B. Get Spatial Data Set operation

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Download Service shall at least provide a Get Spatial Data Set operation that allows the retrieval of a Spatial Data Set ... and supports the following request and response parameters:</p>		
<p>3.1. Get Spatial Data Set request The Get Spatial Data Set request contains the following parameters:</p>	<p><code>/collections/{collectionId}/items?limit={highEnoughNumber}</code></p> <p>For discussion: WFS3 states that a “<i>server that implements the WFS API provides access to the features in a dataset. In other words, the API is a distribution of that dataset. A file download, for example, would be another distribution. More specifically, each WFS has a single LandingPage (path /) ...</i>”.</p> <p>This means that the landing page represents the (whole) data set, which is structured into collections. A data set can consist of only one or several collections, which can be accessed through <code>/collections/{collectionId}/items</code>. Thus, to retrieve all features inside the data set, a client would have to retrieve all collections.</p> <p>Another option would be to provide another link (with a different “rel” property, e.g. “direct-download”) in the landing page of the data set.</p> <p>Yet another option would be to have a <code>/items</code> path (directly under the landing page) that is the virtual aggregate of all the other collections that the server offers (see https://github.com/opengeospatial/WFS_FES/issues/170).</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?limit=10000</p>

IRs for Network Services	Possible implementation using WFS 3.0	An example
	<p>For discussion: To request the whole dataset must require the servers to set the maximum limit to high enough number. See: https://github.com/opengeospatial/WFS_FES/issues/152. Is it necessary to be able to retrieve the whole data set in one request to meet the INSPIRE legal requirements, or is it ok to page through the results?</p>	
<p>3.1.1. Language parameter The Language parameter shall indicate the natural language requested for the Spatial Data Set.</p>	<p><code>/collections/{collectionId}/items?crs={crs-uri}&limit={highEnoughNumber}&lang={code}</code></p> <p>For discussion: The “&lang=” parameter requires the additional “Languages” extension. Possible solution to support content negotiation (for further details see https://github.com/opengeospatial/WFS_FES/issues/161).</p>	
<p>3.1.2. Spatial Data Set Identifier parameter The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the Spatial Data Set.</p>	<p>For discussion: Each landing page provides access to one data set. Therefore, the spatial data set identifier does not need to be mapped (or it would have to be mapped to or included in the URI of the landing page).</p>	
<p>3.1.3. Coordinate Reference System parameter The Coordinate Reference System parameter shall contain one of the Coordinate Reference Systems included in the list of available Coordinate Reference Systems referred to in point 2.2.4.</p>	<p><code>/collections/{collectionId}/items?crs={crs-uri}&limit={highEnoughNumber}&lang={code}</code></p> <p>The CRS extension is needed in order to satisfy the INSPIRE requirement. The “&crs=” parameter is added by the extension. See: https://github.com/opengeospatial/WFS_FES/blob/master/extensions/crs/clause_06_crs.adoc#parameter-crs</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?limit=10&crs=http://www.opengis.net/def/crs/EPSSG/0/3067</p>
<p>3.2. Get Spatial Data Set response 3.2.1. Get Spatial Data Set response parameter The Get Spatial Data Set response parameter shall be the requested Spatial Data Set in the requested language and in the requested Coordinate Reference System.</p>	<p>The request returns the requested feature collection.</p> <p>The <i>Core</i> conformance class does not mandate a specific encoding or format for representing features or feature collections. Four requirements classes depend on the <i>Core</i> and specify representations for these resources in commonly used encodings for spatial data on the web:</p> <ul style="list-style-type: none"> • HTML, • GeoJSON, 	<p>Request for one item available in EPSG:3067:</p> <p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?limit=10&crs=http://www.opengis.net/def/crs/EPSSG/0/3067</p> <p>Response:</p> <pre>{ "type": "FeatureCollection",</pre>

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	<ul style="list-style-type: none"> • Geography Markup Language (GML), Simple Features Profile, Level 0, and • Geography Markup Language (GML), Simple Features Profile, Level 2. <p>The number of features returned depends on the server and the parameter limit:</p> <ul style="list-style-type: none"> • The client can request a limit value. • The server likely has a default value for the limit, and a maximum limit. • If the server has more results available than it returns (the number it returns is more than or equal to the requested/default/maximum limit) then the server will include a link to the next set of results. <pre>/collections/{collectionId}/items?crs=http://www.opengis.net/def/crs/epsg/0/3035&limit={highEnoughNumber}</pre> <p>Feature collections responses are required to contain a self-link with <code>rel="self"</code> which includes the <code>{collectionId}</code>. An addition to WFS3 Core would be to add a link to the Feature Collection Metadata request.</p>	<pre>"timeStamp":"2019-01-30T10:45:58.943Z", "links":[{ "href":"https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2Fepsg%2F0%2F3067&limit=1", "rel":"self", "type":"application/geo+json", "title":"This document" }, { "href":"https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items.html?crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2Fepsg%2F0%2F3067&limit=1", "rel":"alternate", "type":"text/html", "title":"This document as HTML" }, { "href":"https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2Fepsg%2F0%2F3067&limit=1&minId=10000002", "rel":"next", "type":"application/geo+json", "title":"Next page" }], "numberReturned":1, "features":[{ "type":"Feature", "id":"FI.NLS.GNR.10000001", "properties":{ "beginLifespanVersion":"2016-12-30T09:31:22Z", "inspireId:{ "Identifier":{ "localId":"10000001", "namespace":"FI.NLS.GNR" } } }, "localType":[{ "locale":"en-GB", "value":"Island" }, { "locale":"fi-FI", "value":"Saari" }, { "locale":"sv-SE",</pre>

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		<pre> "value": "Ä- eller holme" }], "name": [{ "language": "fin", "nativeness": "endonym", "nameStatus": "standardised", "sourceOfName": "Geographical Names Register of the National Land Survey of Finland", "pronunciation": null, "spelling": [{ "text": "Isokloppa", "script": "Latn" }] }], "type": "http://inspire.ec.europa.eu/codelist/NamedPlaceTypeValue/landform" }, "geometry": { "type": "Point", "coordinates": [198937.16, 6819690.452] } }] </pre>

C. Describe Spatial Data Set operation

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Download Service shall at least provide a Describe Spatial Data Set operation that returns the description of all the types of Spatial Objects contained in the Spatial Data Set ... and supports the following request and response parameters:</p>		
<p>4.1 Describe Spatial Data Set request</p>	<p>/collections?lang={code}</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections?lang=en</p>

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Describe Spatial Data Set request shall contain the following parameters:</p>		
<p>4.1.1. Language parameter The Language parameter shall indicate the natural language requested for the description of the Spatial Objects type.</p>	<p><code>/collections?lang={code}</code></p> <p>For discussion: The “&lang=” parameter requires the additional “Languages” extension. Possible solution to support content negotiation (for further details see https://github.com/engeospatial/WFS_FES/issues/161).</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections?lang=en</p>
<p>4.1.2. Spatial Data Set Identifier parameter The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the Spatial Data Set.</p>	<p>For discussion: Each landing page provides access to one data set. Therefore, the spatial data set identifier does not need to be mapped (or it would have to be mapped to or included in the URI of the landing page).</p>	
<p>4.2. Describe Spatial Data Set response 4.2.1. Describe Spatial Data Set response parameter The Describe Spatial Data Set response parameter shall be the description of the Spatial Objects in the requested Spatial Data Set and in the requested language.</p>	<p>The description of the spatial object types can be retrieved from the “collections” property of the response document.</p> <p>A YAML document describing the metadata about a feature collection is available at https://github.com/engeospatial/WFS_FES/blob/master/core/openapi/schemas/collectionInfo.yaml</p> <p>For discussion: Do we need to add specific requirements on the elements (in particular links) to be</p>	<p>https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/</p> <p>Response:</p> <pre>{ "links": [{ "href": "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections", "rel": "self", "type": "application/json", "title": "This document" }], "collections": [{ "name": "namedplace", "title": "NamedPlaces", "description": "NLS Finland GNR: INSPIRE GN NamedPlaces", "links": [{ "href": "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items", "rel": "item", "type": "application/geo+json" }] }], "crs": ["http://www.opengis.net/def/crs/EPSG/0/3067",</pre>

IRs for Network Services	Possible implementation using WFS 3.0	An example
		<pre> "http://www.opengis.net/def/crs/EPSG/0/3035", "http://www.opengis.net/def/crs/EPSG/0/4258", "http://www.opengis.net/def/crs/OGC/1.3/CRS84", "http://www.opengis.net/def/crs/EPSG/0/3857" } } } </pre>

D. Link Download Service operation

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>The Download Service shall at least provide a Link Download Service operation that allows the declaration, by a Public Authority or a Third Party, of the availability of a Download Service for downloading Spatial Data Sets or, where practicable, Spatial Objects, through the Member State’s Download Service while maintaining the downloading capability at the Public Authority or the Third Party location and supports the following request and response parameters:</p>	TBD	
<p>5.1. Link Download Service request 5.1.1. Link Download Service request parameter The Link Download Service request parameter shall provide all information about the Public Authority’s or Third Party’s Download Service compliant with this Regulation, enabling the Member State Download Service to provide access to Spatial Data Sets and, where practicable, to Spatial Objects from the Public Authority’s or Third Party’s Download Service.</p>	TBD (same as WFS2?)	

E. Get Spatial Object operation

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>Where the Download Service gives direct access to spatial data sets, it shall provide, in addition to the operations listed above, a Get Spatial Object operation that allows the retrieval of Spatial Objects based upon a query ... and supports the following request and response parameters:</p>	<p><code>/collections/{collectionId}/items</code></p> <p>For discussion: Spatial objects are accessed directly in WFS3 through the collections they belong to. WFS3 <i>“does not include any requirements about how the features in the dataset have to be aggregated into collections. A typical approach is to aggregate by feature type but any other approach that fits the dataset or the applications using this distribution may also be used.”</i></p> <p>Should we give recommendations or requirements for how to build collections in INSPIRE or simply note that the <code>{collectionId}</code> becomes a de facto query parameter that always has to be included?</p>	
<p>6.1.1. Language parameter The Language parameter shall indicate the natural language requested for the Spatial Objects.</p>	<p><code>/collections/{collectionId}/items?lang={code}</code></p> <p>For discussion: The <code>&lang=</code> parameter requires the additional “Languages” extension. Possible solution to support content negotiation (for further details see https://github.com/opengeospatial/WFS_FES/issues/161).</p>	

IRs for Network Services	Possible implementation using WFS 3.0	An example
<p>6.1.2. Spatial Data Set Identifier parameter</p> <p>The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the required Spatial Data Set. Where the parameter is not provided, it shall be assumed that all available Spatial Data Sets have been selected.</p>	<p>For discussion: Each landing page provides access to one data set. Therefore, the spatial data set identifier does not need to be mapped (or it would have to be mapped to or included in the URI of the landing page).</p> <p>The latter part of the requirement is currently not possible with WFS3. There is an on-going discussion about adding a way to query features from multiple feature collections (spatial data sets) implemented like:</p> <pre>/items?collectionId={collectionId1},{collectionIdN}</pre> <p>See: https://github.com/opengeospatial/WFS_FES/issues/170</p>	
<p>6.1.3. Coordinate Reference System parameter</p> <p>The Coordinate Reference System parameter shall contain one of the Coordinate Reference Systems included in the list of Coordinate Reference Systems set out in Regulation (EU) No 1089/2010.</p>	<pre>/collections/{collectionId}/items?crs={crs-uri}</pre> <p>The CRS extension is needed in order to satisfy the INSPIRE requirement. The “&crs=” parameter is added by the extension. See: https://github.com/opengeospatial/WFS_FES/blob/master/extensions/crs/clause_06_crs.adoc#parameter-crs</p>	<pre>.../inspire-gn/wfs3/v1/collections/namedplace/items?limit=10&crs=http://www.opengis.net/def/crs/EPSS/0/3067</pre>
<p>6.1.4. Query parameter</p> <p>The query parameter shall support the following search criteria:</p> <ul style="list-style-type: none"> • Unique Resource Identifier of Spatial Data Set, • all relevant key attributes and the relationship between Spatial Objects as set out in Regulation (EU) No 1089/2010; in particular the Unique Identifier of Spatial Object and the temporal dimension characteristics, including the date of update, 	<pre>/collections/{collectionId}/items/{featureId}</pre> <p>provides access to single uniquely identifiable feature.</p> <pre>/collections/{collectionId}/items?bbox=x1,y1,x2,y2&bbox-crs=URI</pre> <p>provides bounding box functionality (bbox-crs requires CRS extension)</p> <pre>/collections/{collectionId}/items?time=start/end</pre> <p>provides support for temporal queries. This points to date of update (beginLifespanVersion) automatically, in the same way as the bbox= points to the “main” geometry of the feature.</p>	<p>Request of a uniquely identifiable feature</p> <p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items/FI.NLS.GNR.10000001</p> <p>Attribute searches (JSON and HTML):</p> <p>JSON:</p> <p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items?name.spelling=Turku</p> <p>HTML:</p>

IRs for Network Services	Possible implementation using WFS 3.0	An example
<ul style="list-style-type: none"> • bounding box, expressed in any of the Coordinate Reference Systems listed in Regulation (EU) No 1089/2010, • Spatial Data Theme. <p>To allow for discovering spatial objects through a combination of search criteria, logical and comparison operators shall be supported.</p>	<p>Other relevant search criteria can be added by the service provider within the WFS3 Core. For example for a Building the “function” of the building might be deemed relevant and thus made filterable for example like this: /collections/Building/items?function=123</p> <p>However, WFS3 Core does not support full searching capabilities. bbox, time and other relevant search criteria can be combined, but only by an implicit AND, e.g. &bbox=x1,y1,x2,y2&time=start/end means (bbox) AND (time).</p> <p>Support for full search criteria functionality is under discussion. See OGC Testbed-14 Engineering Report recommendations: https://rawgit.com/opengeospatial/D040-Complex_Feature_Handling_Engineering_Report/master/18-021.html#rec-1a</p> <p>For discussion: /collections/{collectionId}/items?time=start/end provides support for temporal queries. This points to date of update (beginLifespanVersion) automatically, in the same way as the bbox= points to the “main” geometry of the feature.</p>	<p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items.html?name.spelling=Turku</p> <p>BBOX-query: https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items/?&bbox=50000,6700000,510000,6710000&bbox-crs=http://www.opengis.net/def/crs/EPSSG/0/3067</p> <p>Temporal query: https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items/?&time=2010-01-01T00:00:00Z/2011-01-01T00:00:00Z</p>
<p>6.2 Get Spatial Object response The Get Spatial Object response shall contain the following parameters:</p>		
<p>6.2.1. Spatial Objects Set parameter The Spatial Objects Set parameter shall be the set of Spatial Objects which complies with Regulation (EU) No 1089/2010 and fulfils the search criteria in the query, in the requested language and in the Coordinate Reference System.</p>	<p>The actual Feature collections Response.</p> <p>The <i>Core</i> conformance class does not mandate a specific encoding or format for representing features or feature collections. Four requirements classes depend on the <i>Core</i> and specify representations for these resources in commonly used encodings for spatial data on the web:</p> <ol style="list-style-type: none"> 1. HTML, 	

IRs for Network Services	Possible implementation using WFS 3.0	An example
	<p>2. GeoJSON,</p> <p>3. Geography Markup Language (GML), Simple Features Profile, Level 0, and</p> <p>4. Geography Markup Language (GML), Simple Features Profile, Level 2.</p> <p>The number of features returned depends on the server and the parameter limit:</p> <ul style="list-style-type: none"> • The client can request a limit value. • The server would likely have a default value for the limit, and a maximum limit. • If the server has any more results available than it returns (the number it returns is more than or equal to the requested/default/maximum limit) then the server will include a link to the next set of results. 	
<p>6.2.2. Spatial Objects Set Metadata parameter The Spatial Objects Set Metadata parameter shall contain at least the INSPIRE metadata elements of the set of Spatial Objects.</p>	INSPIRE Metadata can be provided as a link in the “links” array of type “describedBy” in the response Feature Collection response document.	

F. Describe Spatial Object Type operation

IRs for Network Services	Possible implementation using WFS 3.0	Example
Where the Download Service gives direct access to spatial data sets, it shall provide, in addition to the operations listed above, a Describe Spatial Object Type operation that returns the description of the specified Spatial Objects types ...	<pre>/collections/{collectionId}</pre> <p>See WFS3 Core draft-1 Recommendation 7: Feature Collection Metadata response to request <code>/collections/{collectionId}</code> SHOULD contain a link with <code>rel="describedBy"</code> if an external schema or description for the dataset exists.</p>	<p>Request of a namedplace collection metadata document:</p> <p>https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/</p> <pre>{ "links" : [{ "href" : "https://beta-paikkatiето.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace",</pre>

IRs for Network Services	Possible implementation using WFS 3.0	Example
<p>and supports the following request and response parameters:</p>	<p>For discussion: Should we make this a requirement for INSPIRE? (see also: https://github.com/opengeospatial/WFS_FES/issues/56)</p>	<pre> "rel" : "self", "type" : "application/json", "title" : "This document" }, { "href" : "https://example.com/namedplace-schema", "rel" : "describedBy", "type" : "application/json", "title" : "Named Place JSON schema" }], "collections" : [{ "name" : "namedplace", "title" : "NamedPlaces", "description" : "NLS Finland GNR: INSPIRE GN NamedPlaces", "links" : [{ "href" : "https://beta-paikkatieto.maanmittauslaitos.fi/inspire-gn/wfs3/v1/collections/namedplace/items", "rel" : "item", "type" : "application/geo+json" }], "crs" : ["http://www.opengis.net/def/crs/EPSG/0/3067", "http://www.opengis.net/def/crs/EPSG/0/3035", "http://www.opengis.net/def/crs/EPSG/0/4258", "http://www.opengis.net/def/crs/OGC/1.3/CRS84", "http://www.opengis.net/def/crs/EPSG/0/3857"] }] } </pre>
<p>7.1. Describe Spatial Object Type request The Describe Spatial Object Type request shall contain the following parameters:</p>		
<p>7.1.1. Language parameter The Language parameter shall indicate the natural language requested for the description of the Spatial Object type.</p>	<p><code>/collections/{collectionId}?lang={code}</code></p> <p>For discussion: The "&lang=" parameter requires the additional "Languages" extension. Possible solution to support content negotiation (for further details see https://github.com/opengeospatial/WFS_FES/issues/161).</p>	
<p>7.1.2. Spatial Object Type parameter The Spatial Object Type parameter shall contain the language-neutral name of the Spatial Object Type as specified in Regulation (EU) No 1089/2010. Where the parameter is not provided, it shall be</p>	<p><code>/collections/{collectionId}</code></p> <p>For discussion: This would require that each collection contains only one spatial object type. Should we therefore make this a requirement for INSPIRE?</p>	

IRs for Network Services	Possible implementation using WFS 3.0	Example
assumed that all types of Spatial Objects have been selected.		
<p>7.2. Describe Spatial Object Type response</p> <p>7.2.1. Describe Spatial Object Type response parameter</p> <p>The Describe Spatial Object type response parameter shall be the description of the spatial object type, in conformity with Regulation (EU) No 1089/2010.</p>	<p>For discussion: The response to a <code>/collections/{collectionId}</code> request contains a link to but does not directly return the description of the spatial object type. Is this an issue?</p>	u