

# Geographic Names as Linked Data

Using WFS as data source

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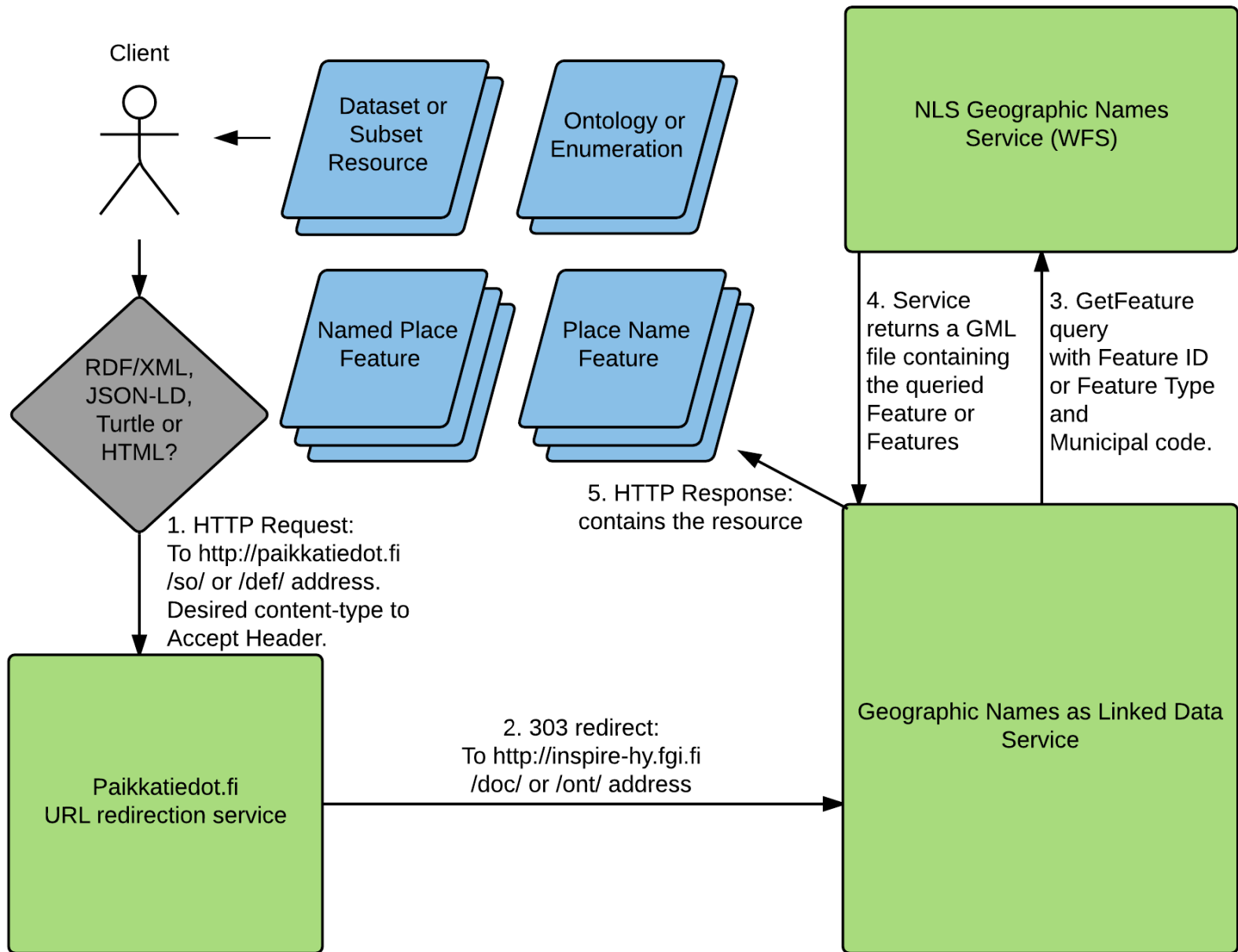


# Original plan:

- To build a prototype service to provide NLS Finland Geographic Names dataset as linked data
  - Dataset contains 800 000 places with names in up to five different languages
  - Goal to improve the accessibility and facilitate the use of the dataset

## With the following ideas:

1. To provide all the spatial objects from the individual URIs given to those objects (Linked data principles)
  - URIs are formed according to the Public Administration Recommendation (JHS 193 Unique identifiers of the geographic information)
2. To use an existing WFS as a data source



# URIs (according to JHS 193)

<http://paikkatiedot.fi>

Domain name for spatial objects. Public redirection service for all spatial data providers.

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so>

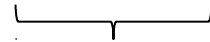
[/def](#)

[/id](#)

Type of the URI  
(spatial object,  
definition or  
real world object)

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772>



**Dataset ID  
(Named Places)**

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772>

Dataset URI (Named Places), not defined in JHS 193

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772/10298104>

Place ID,  
(Village called  
Helsinki  
in Taivassalo  
municipal)



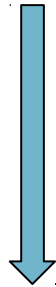
# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772/10298104>

URI for a spatial object  
(Type: Named place,  
Label: Helsinki)

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772/10298104>



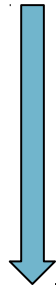
303 Redirect

<http://inspire-hy.fgi.fi/doc/1000772/10298104>

Document URI in data  
provider's domain.  
Defines the spatial object.

# URIs (according to JHS 193)

<http://paikkatiedot.fi/so/1000772/10298104>



303 Redirect

<http://inspire-hy.fgi.fi/doc/1000772/10298104.html>

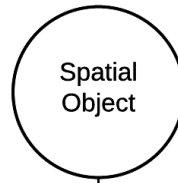
.ttl

.xml



**Content-Location  
for different  
serializations**

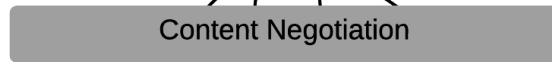
<http://paikkatiedot.fi/so/11111111/10818625>



303 Redirect



<http://inspire-hy.fgi.fi/doc/11111111/10818625>

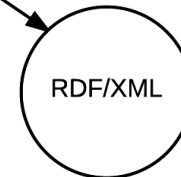
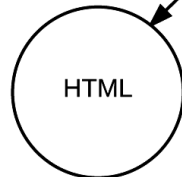


text/html

text/turtle

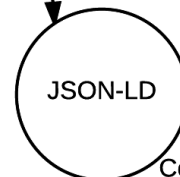
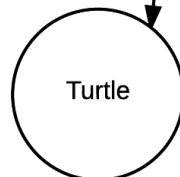
application/ld+json

application/rdf+xml



Content-Location:  
<http://inspire-hy.fgi.fi/doc/11111111/10818625.html>

Content-Location:  
<http://inspire-hy.fgi.fi/doc/11111111/10818625.xml>

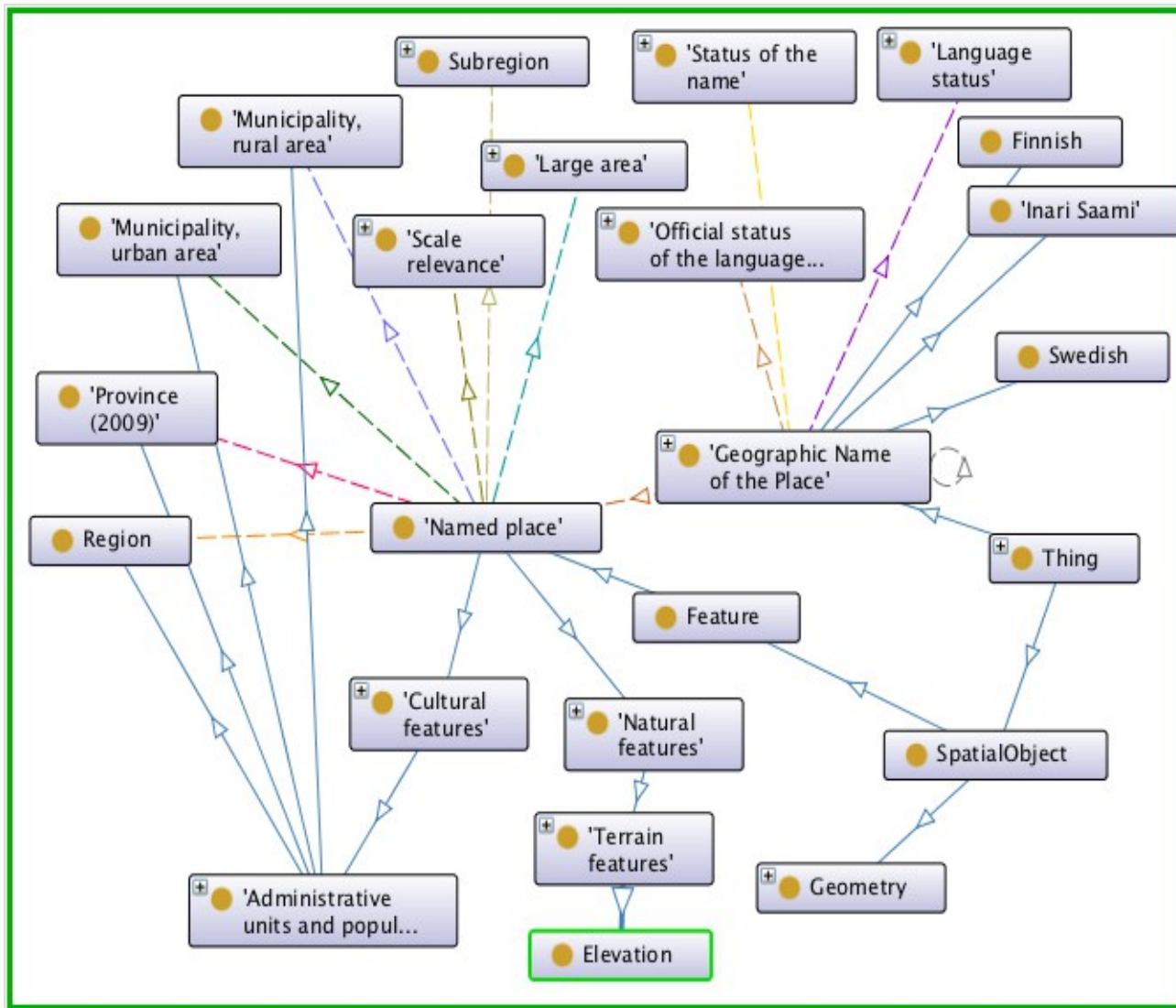


Content-Location:  
<http://inspire-hy.fgi.fi/doc/11111111/10818625.ttl>

Content-Location:  
<http://inspire-hy.fgi.fi/doc/11111111/10818625.json>

# Ontology

- Created with Web Ontology Language (OWL)
- Used vocabularies:
  - OGC GeoSPARQL for geometries
  - Vocabulary of Interlinked Datasets (VOID)
    - To create links between the features in the dataset
    - Uses Dublin Core Vocabulary for metadata
  - Schema.org
    - Simplified description of the features
    - To have potentially larger user base for the dataset
      - E.g. Search Engines like Google support this vocabulary
    - <http://schema.org/Place> -type



### Arc Types

type filter text

- 'For named place' (Domain>Range)
- 'Located in city' (Domain>Range)
- 'Located in municipality' (Domain>Range)
- 'Located in province' (Domain>Range)
- 'Located in region' (Domain>Range)
- 'Parallel name' (Domain>Range)
- has individual
- has subclass
- kieliEnemmisto (Domain>Range)
- kieliVirallisuus (Domain>Range)
- mittakaavarelevanssi (Domain>Range)
- paikannimiLahde (Domain>Range)
- paikannimiStatus (Domain>Range)
- seutukunta (Domain>Range)
- suuralue (Domain>Range)

# Implementation

- Platform:
  - Ubuntu Server
- Tools:
  - Python / Django Web Framework
  - RDFLib - Python Library

<http://paikkatiedot.fi/def/1001010/pnr>

<http://paikkatiedot.fi/so/11111111/10818625>

<http://paikkatiedot.fi/def/1001010/Suuralue>

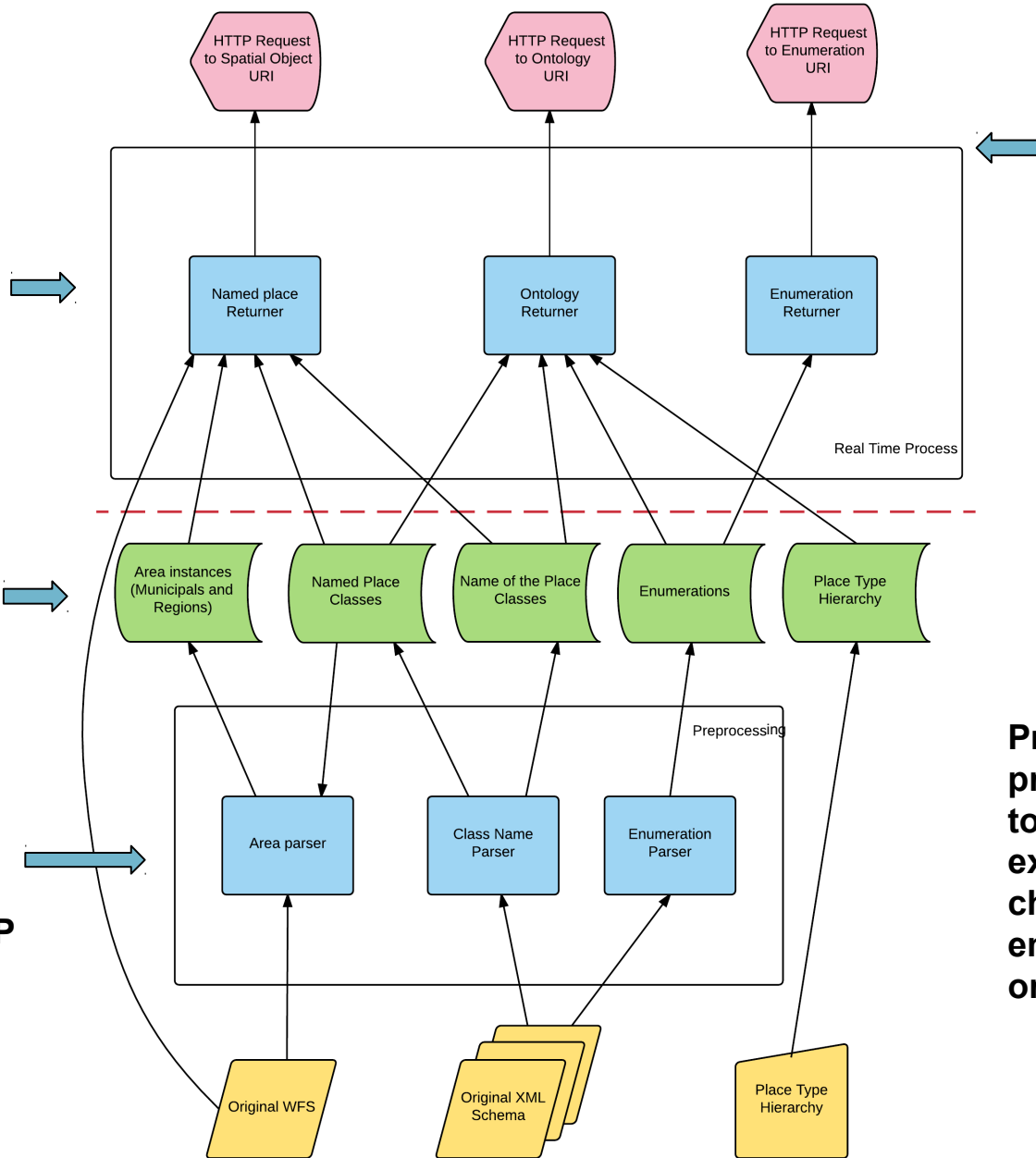
Real Time Process is executed with every HTTP Request to an URI

Linked data in files on the server as Turtle format

Preliminary process to reduce the amount of HTTP Requests to WFS at Real Time Process

Output in RDF format

Preliminary process needs to be re-executed only if changes in enumerations, or municipals.





# Advantages of the Service

- Service is up to date with the WFS all the time
- Permanent URIs allows the features to be referred from other datasets:
  - Permanent URIs work as unique ID:s for different places. E.g. Tens of different lakes can have the same name
  - Referring can be used in scientific papers, news articles, national Wiki of Lakes etc.
- In addition, providing the data as RDF-format simplifies the use of data content in Web services
  - E.g. reader of the news article or scientific paper can have additional information from the referred URI.
- In the future, advanced queries are possible when the Geographic Names are linked more with other Linked Data on the Web.
- Search Engines (e.g. Google) indexes all the separate features
  - (and could possibly show them on the map because of Schema.org vocabulary)

# Dataset and subsets resources


- Defined with VOID, Vocabulary of Interlinked Datasets
- Needed e.g. to make 800 000 spatial objects browsable with Web browser

The root URI

Division to first level subsets according to the municipals (~300):

```
<http://paikkatiedot.fi/so/1000772/> a void:Dataset;  
void:subset <http://paikkatiedot.fi/so/1000772:009/>  ← Municipal code  
    <http://paikkatiedot.fi/so/1000772:010/>,  
    <http://paikkatiedot.fi/so/1000772:016/>,...
```

Division to second level subsets according to the place types (~50):

```
<http://paikkatiedot.fi/so/1000772:009/> a void:Dataset;  
void:subset <http://paikkatiedot.fi/so/1000772:009550/>  ← Place type code  
    <http://paikkatiedot.fi/so/1000772:009560/>,  
    <http://paikkatiedot.fi/so/1000772:009570/>,...
```

In a biggest second level subset there are less than 3000 places.

A second level subset URI e.g.

"<http://paikkatiedot.fi/so/1000772:009110/>" returns also the URIs, types and labels of the contained spatial objects:

```
<http://paikkatiedot.fi/so/1000772:009570/> a void:Dataset ;  
  dcterms:title "Places: Alavieska, House"@en,  
    "Paikat: Alavieska, Talo"@fi,  
    "Orterna: Alavieska, Hus eller gård"@sv ;  
  void:inDataset <http://paikkatiedot.fi/so/1000772:009/> ;  
  rdfs:isDefinedBy <http://inspire-hy.fgi.fi/doc/1000772/009570/> .
```

← **Second  
level  
Subset**

```
<http://paikkatiedot.fi/so/1000772/10082163/> a pnr:House ;  
  rdfs:label "Esperi"@fi ;  
  void:inDataset <http://paikkatiedot.fi/so/1000772:009570/> .
```

← **All the  
spatial  
objects  
in that  
subset  
are  
listed  
here**

```
<http://paikkatiedot.fi/so/1000772/10082164/> a pnr:House ;  
  rdfs:label "Haapala"@fi ;  
  void:inDataset <http://paikkatiedot.fi/so/1000772:009570/> .
```

```
<http://paikkatiedot.fi/so/1000772/10082165/> a pnr:House ;  
  rdfs:label "Mäntyoja"@fi ;  
  void:inDataset <http://paikkatiedot.fi/so/1000772:009570/> .
```

**Backward  
link to  
subset** ...

# Further requirements

- Providing the data from the URI-addresses is only one part of the linked data service
- (Geo)SPARQL-endpoint is needed for queries.
- Solution to download the whole dataset or part of it in RDF format is also needed.
- However, lot of interesting applications can be built on the top of this kind of service

## Named places of Place Name Register

## Dataset information

Description	Named places of Place Name Register as linked data
-------------	--

License	<a href="http://creativecommons.org/licenses/by/4.0/">http://creativecommons.org/licenses/by/4.0/</a>
---------	---

Subject	<a href="http://dbpedia.org/resource/Place_(geography)">http://dbpedia.org/resource/Place_(geography)</a>
---------	---

feature	<a href="http://www.w3.org/ns/formats/RDF_XML">http://www.w3.org/ns/formats/RDF_XML</a> <a href="http://www.w3.org/ns/formats/JSON-LD">http://www.w3.org/ns/formats/JSON-LD</a> <a href="http://www.w3.org/ns/formats/Turtle">http://www.w3.org/ns/formats/Turtle</a>
---------	---

## Contains following subsets

Places: Akaa	<a href="http://paikkatiedot.fi/so/1000772:020/">http://paikkatiedot.fi/so/1000772:020/</a>
--------------	---

Places: Alajärvi	<a href="http://paikkatiedot.fi/so/1000772:005/">http://paikkatiedot.fi/so/1000772:005/</a>
------------------	---

Places: Alavieska	<a href="http://paikkatiedot.fi/so/1000772:009/">http://paikkatiedot.fi/so/1000772:009/</a>
-------------------	---

Places: Alavus	<a href="http://paikkatiedot.fi/so/1000772:010/">http://paikkatiedot.fi/so/1000772:010/</a>
----------------	---

Places: Asikkala	<a href="http://paikkatiedot.fi/so/1000772:016/">http://paikkatiedot.fi/so/1000772:016/</a>
------------------	---

Places: Askola	<a href="http://paikkatiedot.fi/so/1000772:018/">http://paikkatiedot.fi/so/1000772:018/</a>
----------------	---

Places: Aura	<a href="http://paikkatiedot.fi/so/1000772:019/">http://paikkatiedot.fi/so/1000772:019/</a>
--------------	---

Places: Brändö	<a href="http://paikkatiedot.fi/so/1000772:035/">http://paikkatiedot.fi/so/1000772:035/</a>
----------------	---

Places: Eckerö	<a href="http://paikkatiedot.fi/so/1000772:043/">http://paikkatiedot.fi/so/1000772:043/</a>
----------------	---

Places: Enonkoski	<a href="http://paikkatiedot.fi/so/1000772:046/">http://paikkatiedot.fi/so/1000772:046/</a>
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## Places, Alajärvi

### Dataset information

in dataset <http://paikkatiedot.fi/so/1000772/>

### Contains following subsets

Places: Alajärvi, Ancient relic <http://paikkatiedot.fi/so/1000772:005614/>

Places: Alajärvi, Basin <http://paikkatiedot.fi/so/1000772:005520/>

Places: Alajärvi, Boulder <http://paikkatiedot.fi/so/1000772:005305/>

Places: Alajärvi, Boulder in water <http://paikkatiedot.fi/so/1000772:005310/>

Places: Alajärvi, Boundary mark <http://paikkatiedot.fi/so/1000772:005710/>

Places: Alajärvi, Building <http://paikkatiedot.fi/so/1000772:005510/>

Places: Alajärvi, Building <http://paikkatiedot.fi/so/1000772:005500/>

Places: Alajärvi, Cape <http://paikkatiedot.fi/so/1000772:005345/>

Places: Alajärvi, Cemetery <http://paikkatiedot.fi/so/1000772:005205/>

Places: Alajärvi, Depression <http://paikkatiedot.fi/so/1000772:005340/>

Places: Alajärvi, Dumping place <http://paikkatiedot.fi/so/1000772:005210/>

Places: Alajärvi, Elevation <http://paikkatiedot.fi/so/1000772:005335/>

Places: Alajärvi, Field or meadow <http://paikkatiedot.fi/so/1000772:005320/>

Places: Alajärvi, Forest <http://paikkatiedot.fi/so/1000772:005325/>

## Places: Alajärvi, House

## Dataset information

in dataset <http://paikkatiedot.fi/so/1000772:005/>

## Contains following geographic features

Aalto <http://paikkatiedot.fi/so/1000772/10625712>

Aatila <http://paikkatiedot.fi/so/1000772/10893249>

Aho <http://paikkatiedot.fi/so/1000772/10321862>

Aho <http://paikkatiedot.fi/so/1000772/10625805>

Aho <http://paikkatiedot.fi/so/1000772/10320696>

Aho <http://paikkatiedot.fi/so/1000772/10339621>

Aho <http://paikkatiedot.fi/so/1000772/10321827>

Aho <http://paikkatiedot.fi/so/1000772/10321526>

Aho <http://paikkatiedot.fi/so/1000772/10321538>

Ahokumpu <http://paikkatiedot.fi/so/1000772/10321871>

Ahola <http://paikkatiedot.fi/so/1000772/10893292>

Ahola <http://paikkatiedot.fi/so/1000772/10321456>

Ahola <http://paikkatiedot.fi/so/1000772/10340274>

Ahola <http://paikkatiedot.fi/so/1000772/10321873>

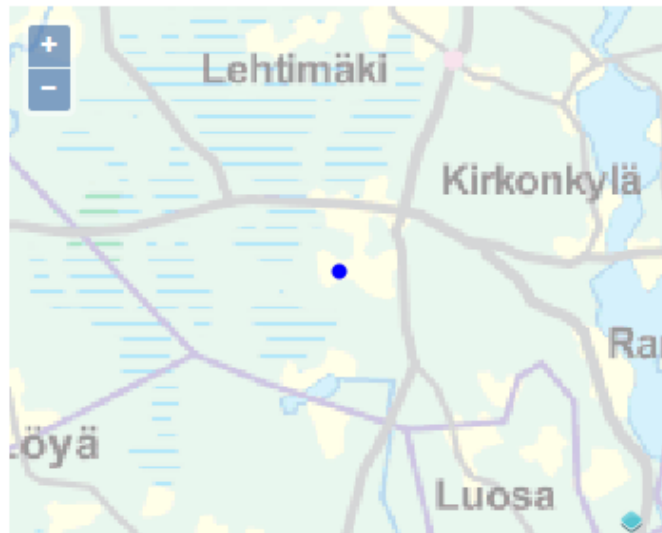
# NLS Geographic Names as linked data

unofficial beta service

<http://paikkatiedot.fi/so/1000772/10625712>

Named place

**Aalto** House



## Place name

Finnish: [Aalto](#)

## Type of place

House

[Administrative units and populated places](#)

[Cultural features](#)

## Location

[Alajärvi](#)

[Etelä-Pohjanmaa](#)

[Länsi-Suomi](#)

## Coordinates

ETRS-TM35FIN: [341944, 6964743](#)

WGS84: [23.90214, 62.77878](#)

## Additional information

Large area: [Western Finland](#)

Sub-region: [Järviseu tu](#)

Relevance at scale: [1:25 000 and larger scales](#)

in dataset: [Places: Alajärvi, House](#)



Named place

**Inari** Municipality, rural area

## Place name

Finnish: [Inari](#)Swedish: [Enare](#)Skolt Saami: [Aanar](#)Inari Saami: [Aanaar](#)North Saami: [Anár](#)

## Type of place

[Municipality, rural area](#)[Administrative units and populated places](#)[Cultural features](#)

## Location

[Lappi](#)[Lappi](#)

## Coordinates

ETRS-TM35FIN: [500707, 7643822](#)WGS84: [27.0176, 68.90547](#)

## Additional information

Large area: [Northern and Eastern Finland](#)



Noin 321 000 tulosta (0,32 sekuntia)

### Uimarannat ja -paikat - Heinola

[www.heinola.fi/uimarannat-ja-paikat](http://www.heinola.fi/uimarannat-ja-paikat) ▾

Heinolan sijainnin ansioista kaupungissa on useita uimarantoja ja –paikkoja. EU -vesidirektiivin mukaisesti valvottuja uimarantoja on seitsemän: Kylpylän ...

### Esiopetuspaikat - Heinola

[www.heinola.fi/esiopetuspaikat](http://www.heinola.fi/esiopetuspaikat) ▾

Päiväkodeissa tai päiväkotien kouluilla toimivissa ryhmissä lukuunottamatta Myllyojan ryhmäperhepäiväkotia tarjotaan maksutonta esiopetusta lapsille vuotta ...

### Päijät-Hämeen TET-paikkoja - Peda.net

[peda.net/veraja/tori/paijat-hame/kaikki](http://peda.net/veraja/tori/paijat-hame/kaikki) ▾

Päijät-Hämeen TET-paikkoja. Logo ... Elämänkaaritalo, Heinola - Erstan koulun keittiö, Nastola ... Heinolan kaupunki ATK -palvelut - Heinolan kaupunki/ ...

### Paikat: Heinola, Metsäalue

[inspire-hy.fgi.fi/doc/11111111:111325/](http://inspire-hy.fgi.fi/doc/11111111:111325/) ▾

<http://paikkatiedot.fi/so/11111111:111325/> - Paikat: Heinola, Metsäalue. Tietoaineiston kuvaus. in dataset - <http://paikkatiedot.fi/so/11111111:111/>. Sisältää ...

### Paikat: Heinola, Niemi - FGI

[inspire-hy.fgi.fi/doc/11111111:111345/](http://inspire-hy.fgi.fi/doc/11111111:111345/) ▾

RDF-tietoaineisto. <http://paikkatiedot.fi/so/11111111:111345/> - Paikat: Heinola, Niemi. Tietoaineiston kuvaus. in dataset - <http://paikkatiedot.fi/so/11111111:111/>.

### Paikat, Heinola

[inspire-hy.fgi.fi/doc/11111111:111/](http://inspire-hy.fgi.fi/doc/11111111:111/) ▾

Paikat: Heinola, Allas, <http://paikkatiedot.fi/so/11111111:111520/>. Paikat: Heinola, Autotie, <http://paikkatiedot.fi/so/11111111:111100/>. Paikat: Heinola, Erämaa- ...

# More information

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