LANTMÄTERIET

2024-02-07

PRODUCT DESCRIPTION

Boundary Point Direct

DOCUMENT VERSION: 2.2
CONCERNING THE INTERFACE VERSION OF THE SERVICE: 2.0.0

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1 General description

In this document, the structure of the service Boundary Point Direct is described, along with the information it includes. The information is not suitable for direct display in a web browser and needs to be retrieved and displayed in a system or application. The service has REST interface, and the answers are delivered either in XML or JSON format.

Detailed information about this is available in the technical description for Boundary Point Direct, where there is also an interface definition with valid WSDL and XML schema. When retrieving a boundary point, the entire object is always delivered.

Boundary point refers to a point determined in a real property legal decision, which defines the boundary between real property areas or for rights and joint facilities, as well as regulations. The boundary point defines the boundary whether marked or unmarked. Boundary points are included in the digital Cadastral Index Map which is a part of the general section of the Real Property Register. A boundary point is identified by its designation which is unique within Lantmäteriet's base data storage. Boundary points also includes national boundary markers and witness marks.

For each boundary point, information about its location in the plane is provided in SWEREF 99, specifying Northing and Easting. Additionally, information about several other characteristics can be found, such as type of marking, positional accuracy and marking position. Boundary point information includes:

- Identity
- Designation
- Type
- Coordinate

1.1 Geographic coverage

The information covers the entire Sweden.

1.2 Coordinate system

Plane: SWEREF 99.

2 Quality description

It is important to remember that the content in the Cadastral Index Map do not have any legal effect. It is the cadastral dossier, along with decisions and protocols, which constitutes the legal documents. These documents are archived at Lantmäteriet.

If the boundary points in Boundary Point Direct is to be used as the basis for use or authority decision requiring the highest level of updating and positional accuracy, it is recommended to contact Lantmäteriet's customer

centre to obtain access to the current plan decision documents. Refer to Lantmäteriets website for more information.

2.1 Purpose and utility

Boundary Point Direct provides access to information about boundary points included in the digital Cadastral Index Map, which is a part of the Real Property Register. To use the service, you need an application or software capable of managing it.

The service has two search options:

- Retrieve one or more boundary points with all attributes by specifying the identity, UUID or birth number.
- Find references to boundary points using geometry or designation filters. These references can then be used to retrieve complete information about the boundary points.

The purpose of providing a direct access service with information about boundary points is to enable users to obtain information about these points and integrate them into their own system/software.

Examples of possible use cases include:

- Lantmäteriet - cadastral operations, archive investigations
- Municipalities – detailed development plan work, building permit processing.
- Government agencies - infrastructure planning, GIS analyses
- State-owned companies – forestry, property management
- Forestry companies – GPS and machine guidance
- Private companies – construction and infrastructure projects, real estate agency, forestry, etc.

2.2 Data capture

2.2.1 LINEAGE

The property boundaries in Cadastral Index Map's property have been established over a long period using widely different methods. This means that the content has a very mixed quality There are boundaries in rural areas that date back to the reforms from the mid-1800s. These boundaries may have a margin of error of several metres. Today new boundary points are surveyed using satellite positioning which can have an accuracy of a few centimetres.

2.3 Maintenance

The boundary points are updated by cadastral authorities in connection with real property formation. In addition to the national authority, Lantmäteriet, there are municipal cadastral authorities (KLM) responsible for real property formation.

2.3.1 MAINTENANCE FREQUENCY

The Cadastral Index Map is updated continuously by Lantmäteriet and municipal cadastral authorities (KLM), in connection with real property formation. Within some KLM, updates are done periodically, meaning that they submit changes monthly.

After the information is updated in the Cadastral Index Map, it takes approximately one hour before it reflected in the service.

2.4 Data quality

2.4.1 COMPLETENESS

Many boundary points are missing in the Cadastral Index Map. This especially applies to older boundary points which have not been stored in the database. These can be found in dossiers and old registers. Efforts are under way to supplement the database, partly with boundary points from municipalities and partly by transforming older boundary points into the correct coordinate system. Thus, completeness is continuously improving.

Text for boundary points sometimes includes a marking type indicating the type of marking on the ground. This marking type exists for approximately 35% of the boundary points.

2.4.2 LOGICAL CONSISTENCY

There can be deficiencies in logical consistency, meaning that the data structure is not correct. Logical consistency is continuously checked and corrected. Some errors are due to insufficient synchronization between databases cannot be avoided. However, they are corrected within a few days.

The coordinates of the boundary point and the coordinates of the breaking points on the boundary line should correspond.

2.4.3 THEMATIC ACCURACY

The thematic accuracy is high.

2.4.4 POSITIONAL UNCERTAINTY

The boundaries have their origin over a long period of time and have been established using widely different methods. The positional accuracy of the boundaries can vary from a few centimetres to several metres.

Positional accuracy depends on the measurement method used during data capture and describes how well a given position corresponds to the actual position in the terrain for the chosen object.

Positional uncertainty is stored in the form of a mean square error. The mean square error is specified with millimetre accuracy and refers to the positional uncertainty in relation to the coordinate system, e.g., SWEREF 99 TM, in which it is presented. In cases where the boundary points of a real property are correct positioned in relation to each other, i.e., high internal positional uncertainty, they may still be incorrect positioned in relation to the principal coordinate system, i.e., lower external positional uncertainty.

The mean square error is almost always calculated or estimated based on the measurement methods used in data capture. The value may be considered as an assumed value for the applied measurement method. The value may be better or worse, but it provides a certain understanding of the positional uncertainty of boundaries and boundary points.

For all point objects, a value for positional accuracy is specified. Continuous quality improvement is ongoing, and for certain boundary points, new measurements with higher positional accuracy are conducted.

3 Functions

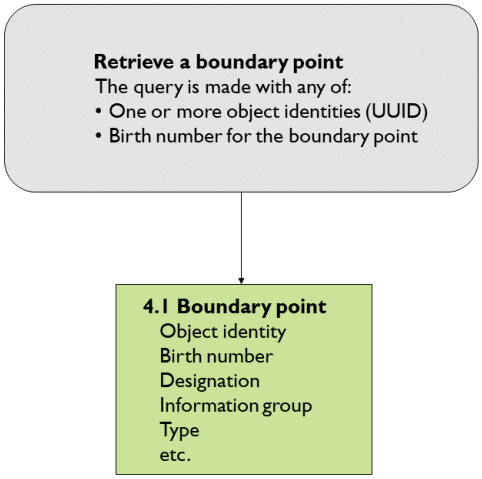
Detailed description of how the images should be interpreted can be found at Lantmäteriet's website under This is how the direct access services work.

3.1 Retrieve boundary point with all attributes

The query is asked by specifying one or more identities, object identity (UUID) or birth number for a boundary point. The response always includes all attributes related to the boundary point. For a description of the attributes refer to Chapter 4 - Information content.

The function supports coordinate transformation to local SWEREF systems. A list of coordinate systems is available in the technical description.

Figure 1 Illustration of how the information is connected, how queries are asked, and what information is provided in the answer.



3.2 Find boundary point

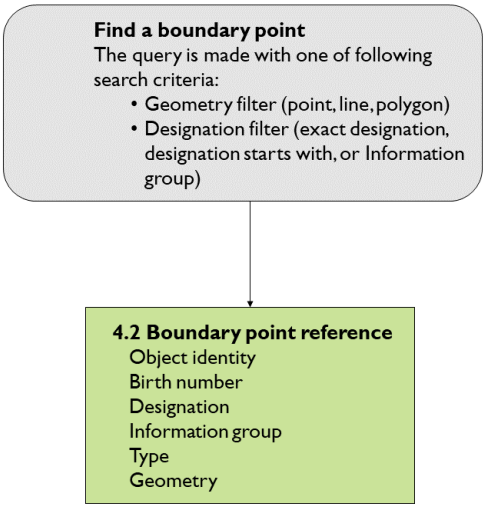
References to boundary points can be searched using conditional queries. The search conditions can be types of geometry filter or designation filter. The responses contain references to boundary points. These references can then be used to retrieve complete information about the boundary points.

Using **geometry filter,** boundary points can be found by being "hit by" or located within a geometry. Searches can be conducted with a point, line, or polygon. A buffer can also be specified in combination with the geometry so that matches can be obtained for all boundary points within a certain distance from the specified geometry.

The function supports coordinate transformation to local SWEREF systems. A list of coordinate systems is available in the technical description.

With **designation filter** boundary point references whose designation matches the filter be found. The filter includes exact designation, designation starting with (at least four characters), and which information group the boundary point belongs to (real property, right or regulation).

Figure 2 Illustration of how the information is connected, how queries are asked, and what information is provided in the answer.



4 Information content

The service provides information about boundary point, both as boundary points reference and as complete information about the boundary point.

4.1 Boundary point reference

Contains information that identifies a boundary point, enabling the retrieval of complete information about the object.

Table 1. Attribute list for Boundary point reference.

Attribute	Description
objektidentitet	Globally unique identifier
födelsenummer	Internal identity in Lantmäteriet's basic data storage
beteckning	Unique designation in Lantmäteriet's basic data storage
informationsgrupp	Specifies whether the object is a boundary point for real property, right, or regulation.
typ	Specifies whether the boundary point is a boundary point, a witness mark, or a national boundary marker.
geometri	A point whose position is specified in the selected reference system, SWEREF 99, in the order of Northing, Easting.

4.2 Boundary point

Contains complete information about a boundary point.

Table 2. Attribute list for Boundary point

Attribute	Description
objektidentitet	Globally unique identifier
födelsenummer	Internal identity in Lantmäteriet's basic data storage
beteckning	Unique designation in Lantmäteriet's basic data storage
informationsgrupp	Specifies whether the object is a boundary point for real property, right, or regulation.

Attribute	Description
typ	Specifies whether the boundary point is a boundary point, a witness mark (is used in the cases where it, for some reason, is not possible to mark in a boundary point or a boundary line) or national boundary marker (a marking indicating the location of national border on land).
markering	Type of marking in the ground, examples include *peg in rock*, *pipe in ground* and *hoar stone*. The value "*unmarked boundary point"* also occurs.
skapad	Date when the boundary point was created in Lantmäteriet's basic data storage
ändrad	Date when the boundary point was last modified in Lantmäteriet's basic data storage
medelfelplan	Positional accuracy in plane, stated as mean square error in metres.
mätmetodplan	Surveying methods used in capturing the position in plane.
flyghöjd	Flying height during photogrammetric measurement.
insamlingsskala	Document scale factor during digitization.
geografiskt kommunid	Geographically derived municipality code.
geometri	A point whose position is specified in the selected reference system, SWEREF 99, in the order of Northing, Easting.
kvalitetsförbättring	Indicates if the boundary points position has been improved through a quality enhancing action. The action can be *new measurement or transformation* using points with higher accuracy as control points. If no action has been done, the value *no information* is provided.
markeringsläge	Indicates the position of the boundary point in relation to the real property boundary.

5 List of changes

Table 3. Table for list of changes.

Version	Date	Reason and change from previous version
2.2	2024-02-07	First version in English