

## Web Feature Service GN-DE

### *Search for Geographical Names of Germany*

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## 1 Dataset GN-DE

The dataset “Geographische Namen Deutschlands (GN-DE)“ (Geographical Names Germany) is processed and maintained by the Bundesamt für Kartographie und Geodäsie (Federal Agency for Cartography and Geodesy), and basically includes all geographical objects of Germany designated by names that are contained in the Digital Landscape Models 1:250,000 and 1:1,000,000 of ATKIS<sup>1</sup>, and represented in topographic maps of the scale range 1:200,000 and smaller, respectively.

The dataset comprises the main components:

- Cities and parts of cities,
- Administrative areas (Bundesländer (federal states), Regierungsbezirke (administrative districts), Kreise (districts/counties), municipalities),
- Landscapes, mountain ranges, islands, mountains, and similar,
- Rivers, canals, lakes, seas, and similar

with **attribute data** on:

- Names,
- Administrative division (statistical key number),
- Postcode regions concerned,
- Height,
- River system (hydrological area identification code),
- Major natural units (guide number),

including the **geometric position description** of the objects:

- as smallest circumscribing rectangle (Boundig Box),
- as complete punctiform, linear or areal descriptions.

The full geometric position description is obtained directly from the above-mentioned Digital Landscape Models. For the *postcode regions*, too, the complete areal descriptions are available. *However, these are provided only to federal institutions.*

Figure 1 shows the data model on which are based the GN-DE dataset and, in principle, also the *complex* services described in the following.

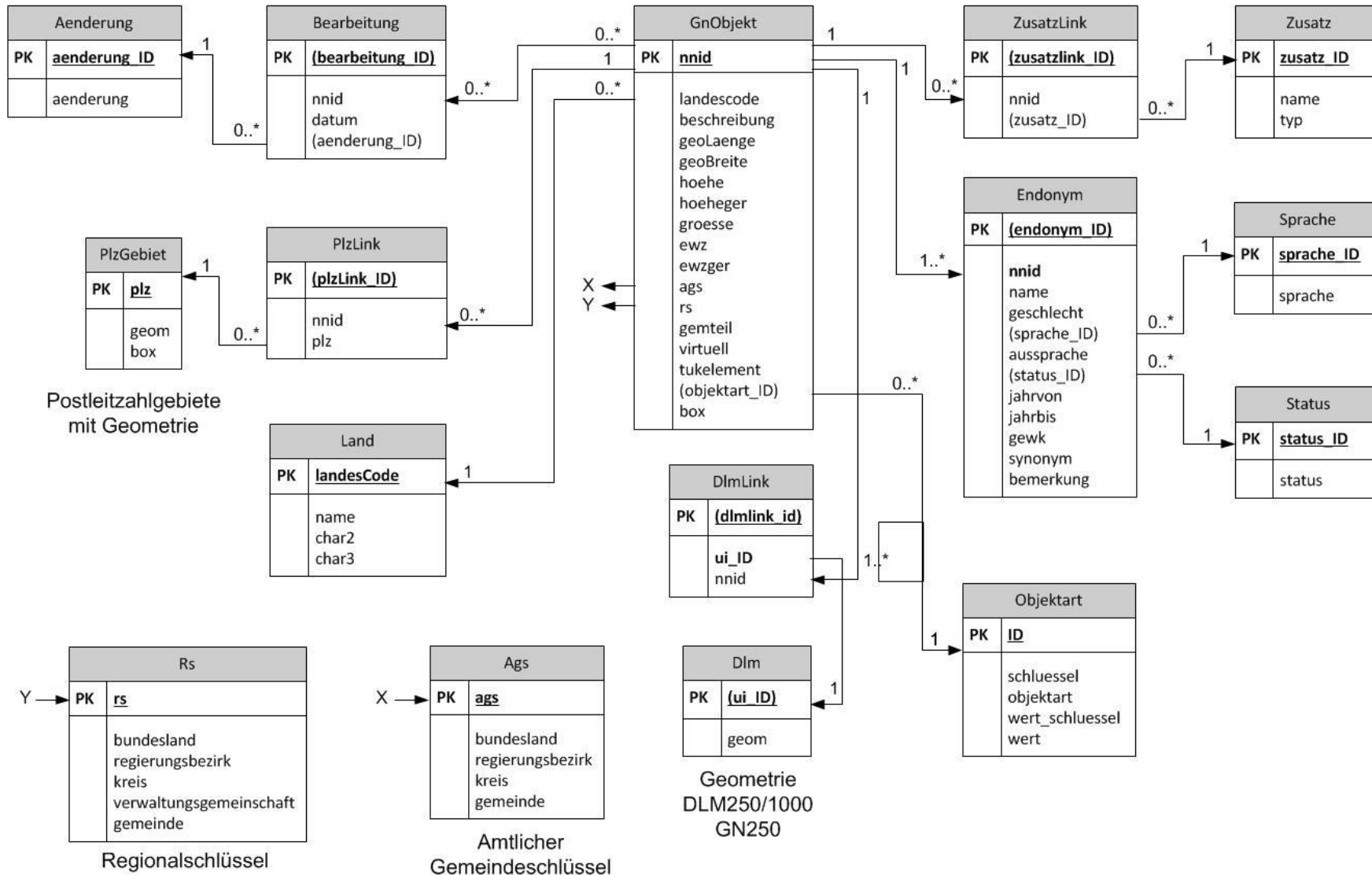
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<sup>1</sup> Amtliches Topographisch-Kartographisches Informationssystem (Official Topographic Cartographic Information System)

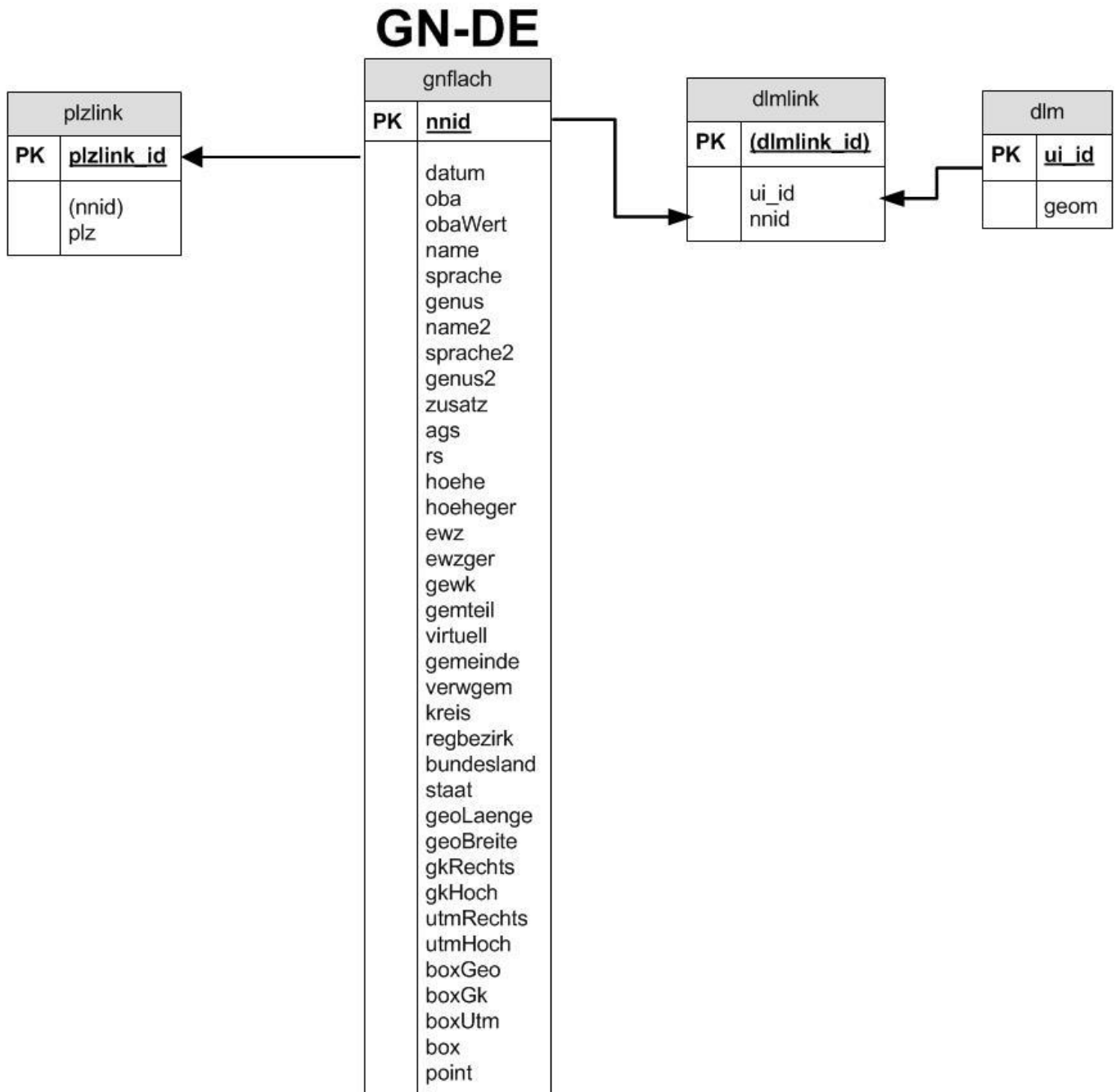
For the provision of a simplified service the dataset's most important information was made available in a flat data structure, as illustrated in Figure 2. For the description of the services please note the hints given under item 3.

Figure 1: Data model of the GN-DE (status: 10 January 2018). Please take note of the hints in section 3.

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**Figure 2: Data model of the GN-DE in a flat structure.** (status: 10 January 2018). Please take note of the hints in section 3



## Basic information on the Web Feature Service GN-DE

### 1.1 Web Feature Service (WFS) according to OGC

The dataset GN-DE is provided as a standardized Web Feature Service (WFS) according to the specification of the Open Geospatial Consortium (OGC). The applicable documentation is retrievable under

<http://www.opengeospatial.org>.

According to the OGC specification the currently supported WFS versions as well as all other technical details can be determined via a **GetCapabilities** request of the service. The service's concrete data model is supplied as an XML schema definition through a **DescribeFeatureType** request.

### 1.2 On the implementation of the WFS GN-DE

The WFS GN-DE has been realized exclusively on the basis of Open-Source-Software and internal developments of the GeoDatenZentrum (GDZ) (GeoDataCentre) using Java technology.

The Web service comprises the following components:

- **Safety component** for authorized access:  
Java Servlet *SecurityGate*  
(a development of the GDZ)
- **WFS** of the Open Source Project *deegree3*  
(see <http://deegree.org/>)
- **Open Source Database** *PostgreSQL* with the extension *PostGIS*  
(see <http://www.postgresql.org> and <http://www.postgis.org>)

Besides the four Web services, BKG offers a **graphical Web application** for the search of geographical names, see

[www.geodatenzentrum.de](http://www.geodatenzentrum.de) → *Web-Anwendungen (Web applications)* → *Geographische Namen (Geographical Names)*.

In the background, the purely HTML-based search requests the service *wfs\_gnde* and is coupled with a server-side generation of the appertaining map graphics. The search results are represented through visualization of the relevant map sections as well as by a choice of attributes of the name objects. For reasons of safety, active contents (e.g. JavaScript) are dispensed with. Therefore, the search and navigation functionality within the map has been limited to elementary methods. Interested parties can view the request to the WFS and its response (both in XML format).

### 1.3 The data model and FeatureTypes of the WFS

For better understanding of the WFS GN-DE and its FeatureType-Model (visible via evaluation of GetCapabilities and DescribeFeatureType, see item 2.1) the following principles have been realized in implementing the WFS:

- Each table name of the data model indicated in Figure 1, Figure 2 and Figure 3 corresponds to a FeatureType of the WFS GN-DE.
- Each attribute specified in the data model not displayed in brackets corresponds to an attribute of the related FeatureType of the WFS.  
Bracketed attributes have only a purely database-technical significance and are therefore not offered in the WFS.
- The spellings used in Figures 1 to 3 are identical with the names of the XML tags in the GML (Geography Markup Language) exchange format.
- Each relation to be displayed according to the GML specification as an attribute between two tables (FeatureTypes) named A and B bears the name "hatB". The "hat" relations displayed in the model are indicated in Figures 1 and 2 by directional arrows.

From this can be systematically derived the following examples of qualified PropertyName information with XML-based requests ("gn" be the acronym for the NameSpace indication). For further explanations cf. specifications "Web Feature Service", "Filter Encoding" and "Geographic Markup Language" under <http://www.opengeospatial.org>.

#### Exemplary consideration starting from the FeatureType GnObject:

- Attribute nnid of the FeatureType GnObject:  
gn:GnObjekt/gn:nnid
- Attribute name of the assigned FeatureType Endonym to the FeatureType GnObject:  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:name
- Attribute language of the FeatureType language to the Endonym of the FeatureType GnObject:  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:hatSprache/gn:Sprache/gn:sprache

#### Exemplary consideration starting from the FeatureType Endonym:

- Attribute name of the FeatureType Endonym  
gn:Endonym/gn:name
- Attribute language of the FeatureTypes language to the Endonym  
gn:Endonym/gn:hatSprache/gn:Sprache/gn:sprache

**Annex 1** includes a list of all PropertyNames for the FeatureType GnObject. The special GML identifiers do not appear in this list, given that in relevant requests they are neither handled as PropertyNames, but are instead requested via the **FeatureId**.

In **Annex 2** you can find a list of the GML identifiers and the appropriate generation rules used in this context.

**Annex 3** contains a list of all PropertyNames for the FeatureType GnFlach with explanations on its contents.

## Variants of the WFS GN-DE

### 1.4 Web Feature Service *wfs\_gnde*

The **wfs\_gnde** provides circumscribing rectangles as geometry. In this variant all information of the GN-DE is available, with the exception of the following restrictions:

:

- The tables **PlzLink** and **PlzGebiet** are omitted. These data cannot be directly specified in enquiries, and are therefore neither contained in the respective replies.

Figure 3 shows the concretized data model for this service.

### 1.5 Web Feature Service *wfs\_gnde\_geom*

The **wfs\_gnde\_geom** provides the complete geometry of the name objects, thus allowing also full access to the punctiform, linear and areal geometries of the DLM250 and DLM1000, respectively. In this variant all data of the GN-DE according to Figure 1 are available, except for the following restriction:

- In table **Plz** the column **geom** is dropped. This information cannot be directly specified in the respective requests and is not included in the responses. Instead of this, only the smallest circumscribing rectangle is comprised in the responses.

### 1.6 Web Feature Service *wfs\_gnde\_full*

The **wfs\_gnde\_full** provides also externally the whole geometry of the name objects. In this version all GN-DE data according to Figure 1 are available, except for indication of the processor of the table Processing.

Thus, this WFS also allows full access to the punctiform, linear or areal geometries of the DLM250 and the DLM1000, respectively.

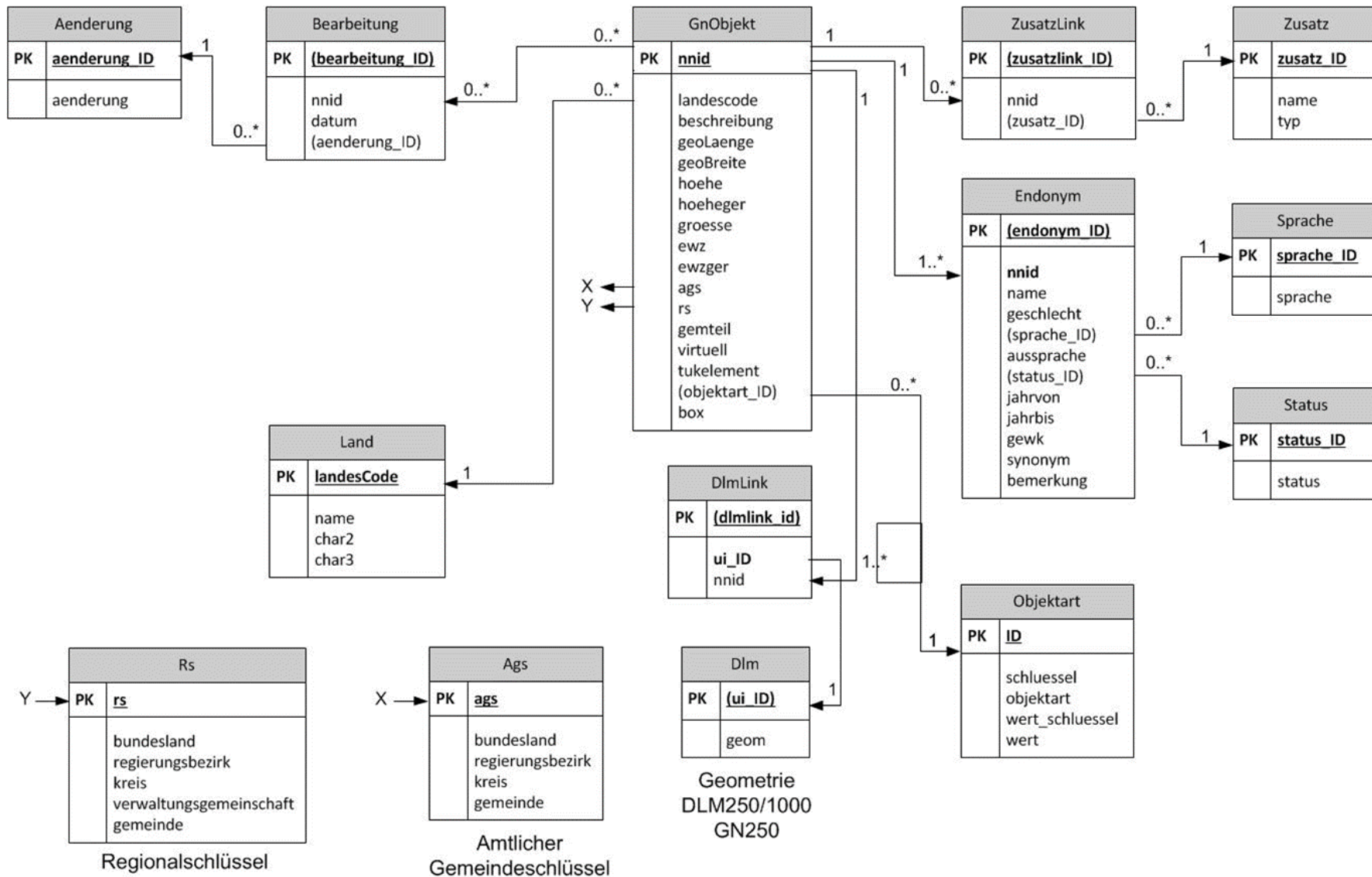
### 1.7 Web Feature Service *wfs\_gnde\_flat*

The **wfs\_gnde\_flat** provides in the form of a flat Featuretype the most important information of the GN-DE dataset. Further, the WFS supplies both circumscribing rectangles as geometry, and point coordinates describing the corresponding name object.

The data model is given under Figure 2.

Figure 3: Data model of the wfs\_gnde (status: 10 January 2018). Please take note of the hints in section 3

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## Terms of use and access parameters of the WFS

The Web Feature Service **wfs\_gnde** is according to the [Geodatenzugangsgesetz \(right to access spatial data\)](#) provided exempted from payment for online use.

Utilization of the geodata and geodata services exempted from payment is regulated by the [Verordnung zur Festlegung der Nutzungsbestimmungen für die Bereitstellung von Geodaten des Bundes \(GeoNutzV\) vom 19. März 2013 \(Bundesgesetzblatt Jahrgang 2013 Teil I Nr. 14\) \(Ordinance on the determination of the terms of use for the provision of geodata of the Federal Government \(GeoNutzV\) of 19 March 2013 \(Federal Law Gazette Year 2013, Part I, No 14\)\)](#).

Further information can be found under

[www.geodatenzentrum.de](http://www.geodatenzentrum.de) → *Auskunft über Daten & Dienste (information on data & services)*  
→ *Dokumentation Dienste (documentation services)*

and under

[www.geodatenzentrum.de](http://www.geodatenzentrum.de) → *Open Data*

Utilization of the extended versions of the WFS GN-DE – **wfs\_gnde\_geom**, **wfs\_gnde\_full** and **wfs\_gnde\_flach** is for licensing reason exclusively reserved for Federal institutions.

Federal institutions and authorities can convey their interest in the provision of a service to BKG under

[www.geodatenzentrum.de](http://www.geodatenzentrum.de) → *Online-Shop* → *Dienste-Shop (services shop)*

The relevant services will be activated for you on a contractual basis.

## Contact

Orders and enquires can be sent to the following address:

Bundesamt für Kartographie und Geodäsie  
Referat GI5 - Dienstleistungszentrum  
Karl-Rothe-Straße 10-14  
D-04105 Leipzig

Tel.: +49(0)341 5634 333

Fax: +49(0)341 5634 415

E-Mail: [dlz@bkg.bund.de](mailto:dlz@bkg.bund.de)

Further information and services are available under [www.geodatenzentrum.de](http://www.geodatenzentrum.de).

## Annex 1:

### List of all PropertyNames for the FeatureType GnObject available in the public WFS GN-DE

Below, the PropertyNames of all attributes of the FeatureType GnObject are summarized. For further explanations see item 2.4.

gn:GnObjekt/gn:nnid  
gn:GnObjekt/gn:landesCode  
gn:GnObjekt/gn:beschreibung  
gn:GnObjekt/gn:geoLaenge  
gn:GnObjekt/gn:geoBreite  
gn:GnObjekt/gn:hoehe  
gn:GnObjekt/gn:hoeheger  
gn:GnObjekt/gn:groesse  
gn:GnObjekt/gn:ewz  
gn:GnObjekt/gn:ewzger  
gn:GnObjekt/gn:ags  
gn:GnObjekt/gn:rs  
gn:GnObjekt/gn:gemteil  
gn:GnObjekt/gn:virtuell  
gn:GnObjekt/gn:tukelement  
gn:GnObjekt/gn:box

gn:GnObjekt/gn:hatLand/gn:Land/gn:landesCode  
gn:GnObjekt/gn:hatLand/gn:Land/gn:name  
gn:GnObjekt/gn:hatLand/gn:Land/gn:char2  
gn:GnObjekt/gn:hatLand/gn:Land/gn:char3

gn:GnObjekt/gn:hatAgs/gn:Ags/gn:ags  
gn:GnObjekt/gn:hatAgs/gn:Ags/gn:bundesland  
gn:GnObjekt/gn:hatAgs/gn:Ags/gn:regierungsbezirk  
gn:GnObjekt/gn:hatAgs/gn:Ags/gn:kreis  
gn:GnObjekt/gn:hatAgs/gn:Ags/gn:gemeinde

gn:GnObjekt/gn:hatRs/gn:Rs/gn:rs  
gn:GnObjekt/gn:hatRs/gn:Rs/gn:bundesland  
gn:GnObjekt/gn:hatRs/gn:Rs/gn:regierungsbezirk  
gn:GnObjekt/gn:hatRs/gn:Rs/gn:kreis  
gn:GnObjekt/gn:hatRs/gn:Rs/gn:verwaltungsgemeinschaft  
gn:GnObjekt/gn:hatRs/gn:Rs/gn:gemeinde

gn:GnObjekt/gn:hatObjektart/gn:Objektart/gn:schluesel  
gn:GnObjekt/gn:hatObjektart/gn:Objektart/gn:objektart  
gn:GnObjekt/gn:hatObjektart/gn:Objektart/gn:wert\_schluesel  
gn:GnObjekt/gn:hatObjektart/gn:Objektart/gn:wert  
gn:GnObjekt/gn:hatBearbeitung/gn:Bearbeitung/gn:nnid

gn:GnObjekt/gn:hatBearbeitung/gn:Bearbeitung/gn:datum  
gn:GnObjekt/gn:hatBearbeitung/gn:Bearbeitung/gn:hatAenderung/gn:Aenderung/gn:aenderung\_ID  
gn:GnObjekt/gn:hatBearbeitung/gn:Bearbeitung/gn:hatAenderung/gn:Aenderung/gn:aenderung

gn:GnObjekt/gn:hatZusatzLink/gn:ZusatzLink/gn:nnid  
gn:GnObjekt/gn:hatZusatzLink/gn:ZusatzLink/gn:hatZusatz/gn:Zusatz/gn:zusatz\_ID  
gn:GnObjekt/gn:hatZusatzLink/gn:ZusatzLink/gn:hatZusatz/gn:Zusatz/gn:name  
gn:GnObjekt/gn:hatZusatzLink/gn:ZusatzLink/gn:hatZusatz/gn:Zusatz/gn:typ

gn:GnObjekt/gn:hatDlmLink/gn:DlmLink/gn:ui\_ID  
gn:GnObjekt/gn:hatDlmLink/gn:DlmLink/gn:nnid

gn:GnObjekt/gn:hatDlmLink/gn:DlmLink/gn:hatDlm/gn:Dlm/gn:ui\_ID  
gn:GnObjekt/gn:hatDlmLink/gn:DlmLink/gn:hatDlm/gn:Dlm/gn:geom

gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:nnid  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:name  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:geschlecht  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:aussprache  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:jahrVon  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:jahrBis  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:gewk  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:synonym  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:bemerkung  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:hatSprache/gn:Sprache/gn:sprache\_ID  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:hatSprache/gn:Sprache/gn:sprache  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:hatStatus/gn:Status/gn:status\_ID  
gn:GnObjekt/gn:hatEndonym/gn:Endonym/gn:hatStatus/gn:Status/gn:status

## Annex 2:

### Formation rule for the special GML identifiers gml:id

List of the GML identifiers gml:id and the prefixes used in the WFS GN-DE. The prefix is followed by a unique identifier for the respective FeatureType.

FeatureType	Prefix for gml:id
GnObjekt	Gno_
Endonym	End_
Zusatz	Zus_
ZusatzLink	Zusl_
Dlm	Dlm_
DlmLink	Dlml_
Aenderung	Aen_
Bearbeitung	Bea_
Status	Sta_
Sprache	Spr_
Objektart	Obj_
Ags	Ags_
Land	Lan_
Rs	Rs_

## Annex 3:

### List of all PropertyNames available in the wfs\_gnde\_flat for the FeatureType GnFlach

PropertyName at the WFS	Meaning
gn:GnFlach/gn:nnid	National names identifier
gn:GnFlach/gn:datum	Date of the last modification of the name object (JJJJMMDD)
gn:GnFlach/gn:oba	Name of the ATKIS object type to which the name object belongs
gn:GnFlach/gn:obaAtt	Name of the attribute of oba which, if necessary, underpins the classification of the name object (applies only to the object type "Verwaltungseinheit") (administrative unit)
gn:GnFlach/gn:obaWert	Attribute value on obaAtt (only for the object type "Verwaltungseinheit")
gn:GnFlach/gn:name	Name of the geographical name object (official name of the LANGUAGE 'GERMAN')
gn:GnFlach/gn:sprache	Language to which the "NAME" is to be assigned
gn:GnFlach/gn:genus	Gender of the geographical object (m, f, n, pl)
gn:GnFlach/gn:name2	Synonym of the object name (among others, Sorbian or Frisian or Danish name)
gn:GnFlach/gn:sprache2	Language to which the "NAME2" is to be assigned
gn:GnFlach/gn:genus2	Gender of the geographical object (m, f, n, pl)
gn:GnFlach/gn:zusatz	Name affix [in the case of several affixes one is randomly selected]
gn:GnFlach/gn:ags	Official municipality key
gn:GnFlach/gn:rs	Regional key
gn:GnFlach/gn:hoehe	Height above sea level NN (m)
gn:GnFlach/gn:ewz	Population of municipalities (only for the object type "Verwaltungseinheit")
gn:GnFlach/gn:gewk	Code number of waters
gn:GnFlach/gn:gemteil	Yes/No – is part of a city or not
gn:GnFlach/gn:gemeinde	Name of the municipality
gn:GnFlach/gn:verwgem	Name of the administrative association
gn:GnFlach/gn:kreis	Name of the district/county
gn:GnFlach/gn:regbezirk	Name of the administrative district
gn:GnFlach/gn:bundesland	Name of the Land (federal state)
gn:GnFlach/gn:staat	Two-letter code (ISO 3166, DIN-NABD 10.2 2-92)
gn:GnFlach/gn:geoLaenge	Geographic longitude [degree, minutes, seconds (GGMMSS) ]
gn:GnFlach/gn:geoBreite	Geographic latitude [degree, minutes, seconds (GGMMSS) ]
gn:GnFlach/gn:gkRechts	Gauß-Krüger easting (m)
gn:GnFlach/gn:gkHoch	Gauß-Krüger northing(m)
gn:GnFlach/gn:utmRechts	UTM easting (m)
gn:GnFlach/gn:utmHoch	UTM northing (m)
gn:GnFlach/gn:boxGeo	Smallest circumscribing rectangle for the object given in geographical coordinates, for punctiform objects artificial rectangle 0,00001 degrees x 0,00001 degrees with (geolongitude, geolatitude) as central point OGC Well Known Text (WKT) Format

gn:GnFlach/gn:boxGk	Smallest circumscribing rectangle for the object given in geographical coordinates, for punctiform objects artificial rectangle 1m x 1 m with (gkEasting, gkNorthing) as central point OGC Well Known Text (WKT) Format
gn:GnFlach/gn:boxUtm	Smallest circumscribing rectangle for the object given in geographical coordinates, for punctiform objects artificial rectangle 1m x 1 m with (gkEasting, gkNorthing) as central point OGC Well Known Text (WKT) Format
gn:GnFlach/gn:box	Geometry column with boxGeo coordinates
gn:GnFlach/gn:point	Point coordinate with geoLongitude and geoLatitude
gn:GnFlach/gn:hatPlzLink/gn:PlzLink/gn:nnid	
gn:GnFlach/gn:hatPlzLink/gn:PlzLink/gn:plz	Post code
gn:GnFlach/gn:hatDlmLink/gn:DlmLink/gn:ui_ID	
gn:GnFlach/gn:hatDlmLink/gn:DlmLink/gn:nnid	Unique geometry identifier on geometries of the DLM250 and DLM1000
gn:GnFlach/gn:hatDlmLink/gn:DlmLink/gn:hatDlm/gn:Dlm/gn:geom	DLM250 geometry