

#SDI.Next: WFS 3.0



OpenGeoDag

Thijs Brentjens

2 oktober 2019

@thijsbrentjens

#DataToBuildOn



SDI.Ne~~x~~xt

#SDI.Next: WFS 3.0 OGC API Features



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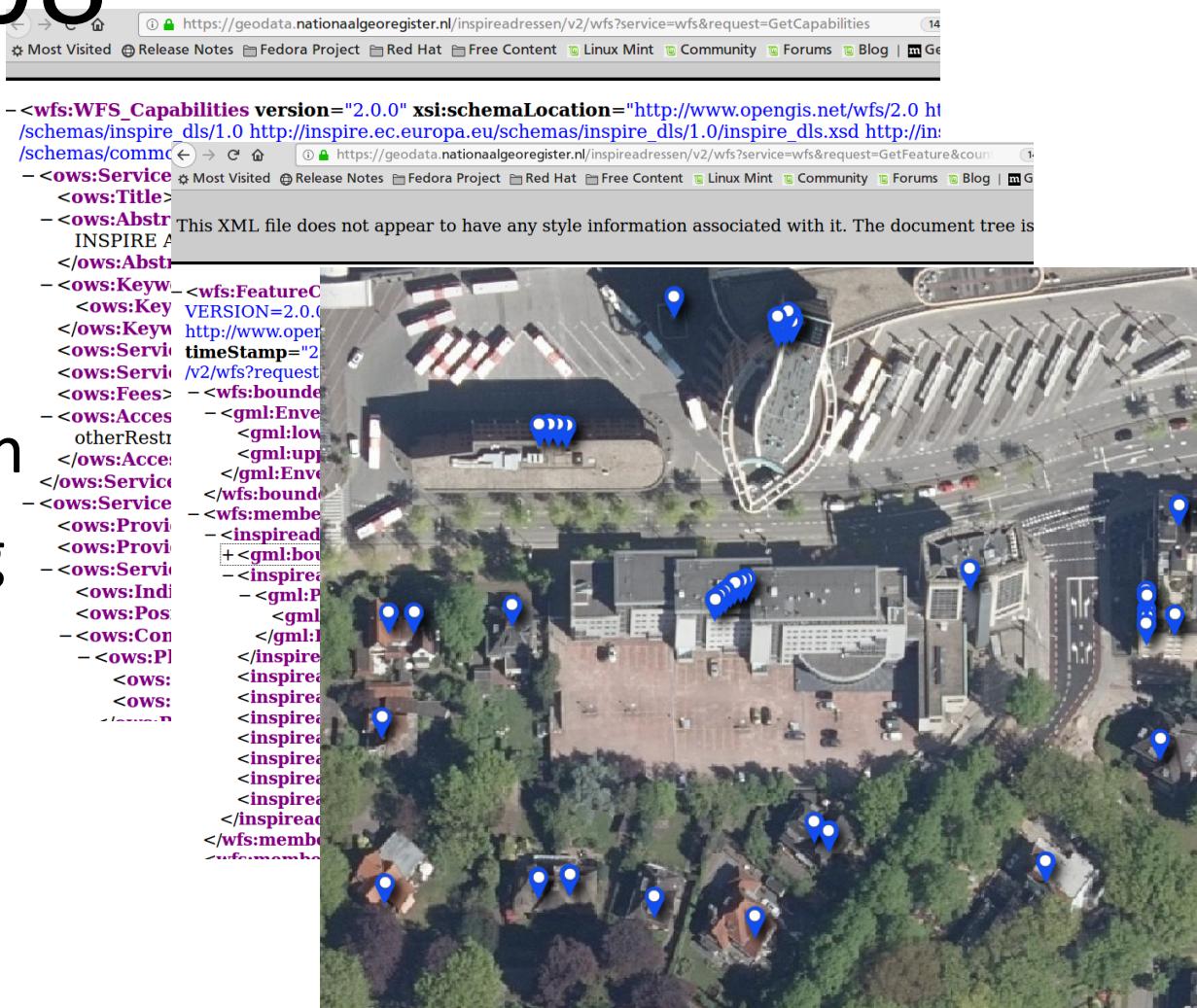


SDI.Ne~~x~~xt

Nu: WFS 2.0 uit 2008

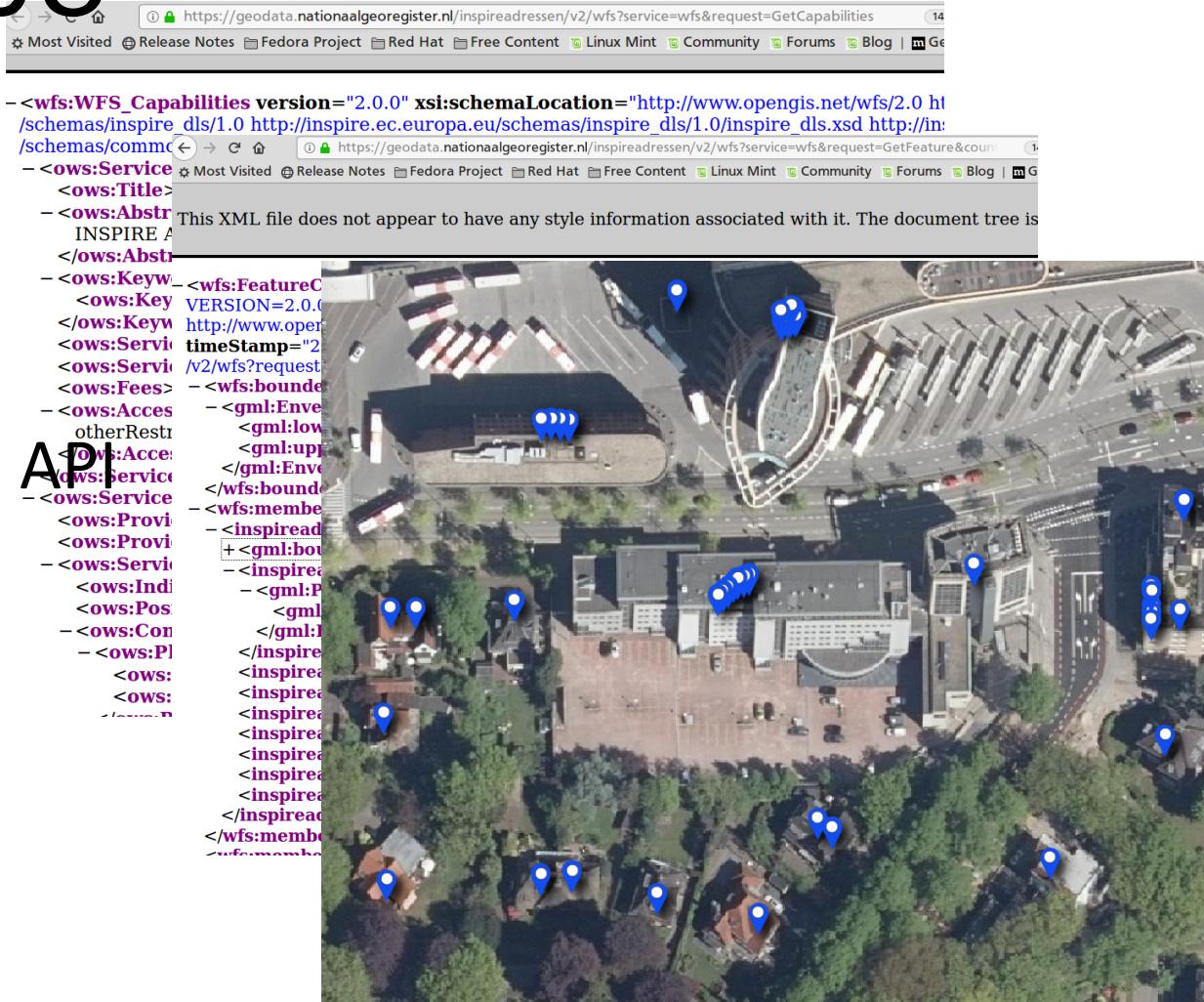
- gestandaardiseerde operaties (OGC)
 - geodata bevragen
 - optioneel geodata bewerken
 - uitgebreide standaard: filtering, CRSen
 - Ondersteuning in allerlei (geo) tooling
 - in NL alleen al: honderden services

Maar....



Nu: WFS 2.0 uit 2008

- Technisch gedateerd
 - Redelijk complex
 - Vooral voor geo-wereld
 - XML encodings: GML, Capabilities
 - HTTP, maar geen REST, geen mode



Nu: technologie van het moderne web

- URLs en links
- HTML, indexeerbare data, zoekmachines
- APIs met JSON, HTTP, REST, Content negotiation



OGC API – Features

- “WFS, maar dan op een web manier”
- Opgesteld via Github, open proces
 - Bijna officieel (release candidate)
- **Eenvoudige basis + modulair**
 - Data bevragen: meest simpele scenario
 - Uit te breiden met extensies (CRS bijv)
 - Inbedden in andere APIs
- 1 API = 1 dataset bevragen

*“In de trein van
Amsterdam naar Utrecht
gelezen en begrepen”*
– Just



OGC API – Features

- Moderne API: content negotiation, “puur”
HTTP, REST, JSON, HTML, links, ...
- Functionaliteit:
 - Opvragen van alle data
 - Opvragen van data op basis van id, bbox, time
 - Paginering
 - (optioneel) eenvoudige alfanumerieke filtering
- Encodings: vaak HTML en (Geo)JSON (ook GML)



OGC API Features beloftes

- Beter te gebruiken door allerlei ontwikkelaars:
 - Makkelijker aan te roepen en in te bouwen
 - Sneller
 - Beter te begrijpen
 - (leuker?)
- APIs en data beter te vinden via zoekmachines
- Minder zware software nodig voor aanbieden data en voor verwerken data (clients / apps)
- Toekomstvast



OGC API Features in 1 slide

- / → landing page (html of json)
- /api → API beschrijving (Open API)
- /conformance → Welke modules zijn ondersteund
- /collections → Lijst van feature collections
- /collections/{collectionId} → Feature collection metadata
- /collections/{collectionId}/items → Alle items (“features”) (gepagineerd)
- /collections/{collectionId}/items/{featureId} → 1 feature



OGC API Features voorbeelden

<https://demo.pygeoapi.io/master/>



<https://demo.pygeoapi.io/master/?f=json>

A screenshot of a web browser showing the JSON representation of the OGC API Features. The title bar says "https://demo.pygeoapi.io/master/?f=json". The main content area displays a JSON object with the "links" key expanded, showing five entries for self-links and one entry for the OpenAPI definition.

OGC API Features voorbeelden

<https://.../collections?f=html>

Collections in this service

| Name | Description |
|-----------------------------------|---|
| Observations | Observations |
| Large Lakes | lakes of the world, public domain |
| Windmills within The Netherlands | Locations of windmills within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider. |
| Castles within The Netherlands | Locations of castles within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider. |
| Dutch Georef Stations via OGR WFS | Locations of RD/GNSS-reference stations from Dutch Kadaster PDOK a.k.a RDInfo. Uses MapServer WFS v2 backend via OGRProvider. |

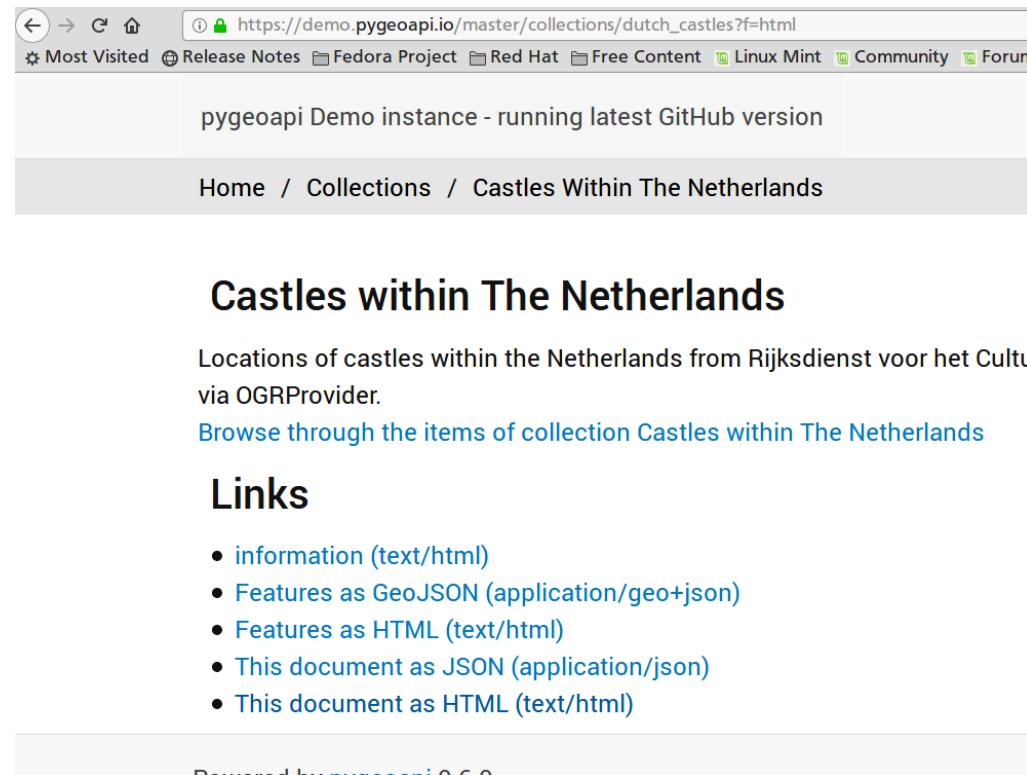
<https://.../collections?f=json>

```
https://demo.pygeoapi.io/master/collections?f=json
{
  "collections": [
    {
      "links": [
        {
          "type": "text/csv",
          "rel": "canonical",
          "title": "data",
          "href": "https://github.com/mapserver/mapserver/blob/branch-7-0/msautotest/wxs/data.csv",
          "hreflang": "en-US"
        },
        {
          "type": "text/csv",
          "rel": "alternate",
          "title": "data",
          "href": "https://raw.githubusercontent.com/mapserver/mapserver/branch-7-0/msautotest/wxs/data.csv",
          "hreflang": "en-US"
        },
        {
          "type": "application/geo+json",
          "rel": "item",
          "title": "Features as GeoJSON",
          "href": "https://demo.pygeoapi.io/master/collections/obs/items?f=json"
        },
        {
          "type": "text/html",
          "rel": "item",
          "title": "Features as HTML",
          "href": "https://demo.pygeoapi.io/master/collections/obs/items?f=html"
        },
        {
          "type": "application/json",
          "rel": "item",
          "title": "Features as JSON",
          "href": "https://demo.pygeoapi.io/master/collections/obs/items?f=json"
        }
      ]
    }
  ]
}
```



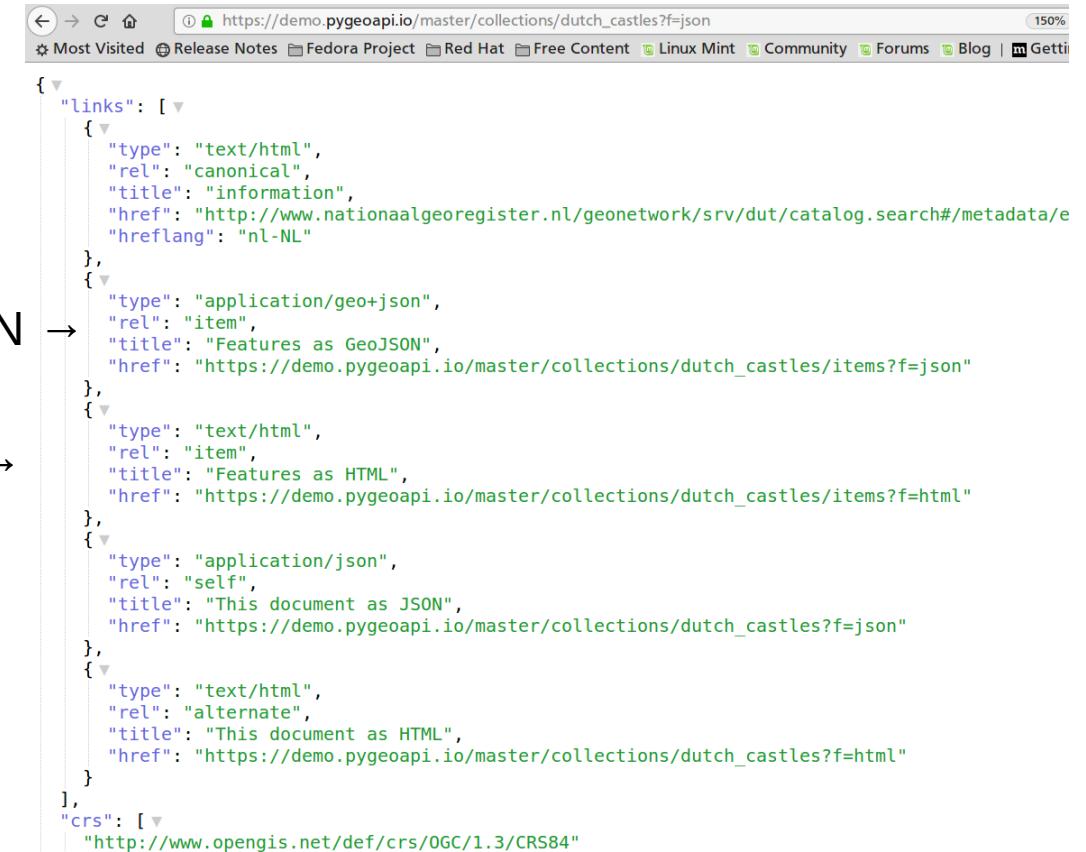
OGC API Features voorbeelden

https://.../collections/dutch_castles?f=json



A screenshot of a web browser displaying the OGC API Features response in HTML format. The URL in the address bar is https://demo.pygeoapi.io/master/collections/dutch_castles?f=json. The page title is "pygeoapi Demo instance - running latest GitHub version". Below the title, there are navigation links: "Home / Collections / Castles Within The Netherlands". The main content section is titled "Castles within The Netherlands" and describes the collection as "Locations of castles within the Netherlands from Rijksdienst voor het Cultuurhistorisch Erfgoed via OGRProvider". It includes a link to "Browse through the items of collection Castles within The Netherlands". A "Links" section lists several options: "information (text/html)", "Features as GeoJSON (application/geo+json)", "Features as HTML (text/html)", "This document as JSON (application/json)", and "This document as HTML (text/html)". At the bottom, it says "Powered by pygeoapi 0.6.0".

.../collections/dutch_castles?f=json



A screenshot of a web browser displaying the OGC API Features response in JSON format. The URL in the address bar is https://demo.pygeoapi.io/master/collections/dutch_castles?f=json. The JSON object contains a "links" array with five entries, each representing a different format and type of link. The "links" array is as follows:

```
{ "links": [ { "type": "text/html", "rel": "canonical", "title": "information", "href": "http://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/metadata/e", "hreflang": "nl-NL" }, { "type": "application/geo+json", "rel": "item", "title": "Features as GeoJSON", "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json" }, { "type": "text/html", "rel": "item", "title": "Features as HTML", "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json" }, { "type": "application/json", "rel": "self", "title": "This document as JSON", "href": "https://demo.pygeoapi.io/master/collections/dutch_castles?f=json" }, { "type": "text/html", "rel": "alternate", "title": "This document as HTML", "href": "https://demo.pygeoapi.io/master/collections/dutch_castles?f=json" } ], "crs": [ { "type": "text/html", "rel": "alternate", "title": "This document as HTML", "href": "https://demo.pygeoapi.io/master/collections/dutch_castles?f=json" } ] }
```

LINKS →

GeoJSON →

HTML →

OGC API Features voorbeelden

https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json

```
{  
  "type": "FeatureCollection",  
  "features": [  
    {  
      "type": "Feature",  
      "geometry": {  
        "type": "Point",  
        "coordinates": [  
          5.890354808676677,  
          50.922380105241835  
        ]  
      },  
      "properties": {  
        "gid": 1,  
        "cchin": "000007",  
        "naam": "De Dael / Oelsbroeck",  
        "plaats": "Nuth",  
        "info_link": "https://www.cchin.nl/index.xql?object=000007",  
        "datering": "1382",  
        "rijksmonnr": "30919",  
        "provincie": "Limburg",  
        "foto_thumb": "https://images.memorix.nl/rce/thumb/350x350/51a5f4c2-020d-bba3-c332-65647254a522.jpg",  
        "foto_groot": "https://images.memorix.nl/rce/thumb/1600x1600/51a5f4c2-020d-bba3-c332-65647254a522.jpg",  
        "bijschrift": "Albert Speelman",  
        "zichtbaar": "J",  
        "legenda": "Intact",  
        "typering": "Intact"  
      },  
      "id": "kastelen.1"  
    },  
    {  
      "type": "Feature",  
      "geometry": {  
        "type": "Point",  
        "coordinates": [  
          6.122757898978117,  
          51.90362875467979  
        ]  
      },  
      "properties": {}  
    }  
  ]  
}
```



OGC API Features voorbeelden

https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json

https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json&startindex=10

```
https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json
150% ... 🔍
Most Visited Release Notes Fedora Project Red Hat Free Content Linux Mint Community Forums Blog Getting Started ⓘ
  "id": "kastelen.10",
  "info_link": "https://www.cchin.nl/index.xql?object=000021",
  "datering": "1272",
  "rijksmonnr": "9293",
  "provincie": "Gelderland",
  "foto_thumb": "https://images.memorix.nl/rce/thumb/350x350/8eca0f5b-7b30-5047-38ae-174a43ed9540.jpg",
  "foto_groot": "https://images.memorix.nl/rce/thumb/1600x1600/8eca0f5b-7b30-5047-38ae-174a43ed9540",
  "bijfschrift": "Albert Speelman",
  "zichtbaar": "J",
  "legenda": "Intact",
  "typering": "Intact"
},
{
  "id": "kastelen.10"
},
"links": [
  {
    "type": "application/geo+json",
    "rel": "self",
    "title": "This document as GeoJSON",
    "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json"
  },
  {
    "type": "text/html",
    "rel": "alternate",
    "title": "This document as HTML",
    "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items?f=json"
  },
  {
    "type": "application/geo+json",
    "rel": "prev",
    "title": "items (prev)",
    "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items/?startindex=0"
  },
  {
    "type": "application/geo+json",
    "rel": "next",
    "title": "items (next)",
    "href": "https://demo.pygeoapi.io/master/collections/dutch_castles/items/?startindex=10"
  }
]
```

Paginering links in GeoJSON output!



OGC API Features werkweek

- Resultaten uit WFS 3 werkweek:
 - er is al software om API aan te bieden (ook voortbouwend op bestaande infrastructuur, bijv met WFS 2 als bronstelsel)
 - API gebruiken:
 - Snel in te bouwen in client applicatie
 - Al (beperkte) ondersteuning in sommige pakketten
 - Zoekmachines: API indexeerbaar, zelfs de data (= voordeel en nadeel)



OGC API Features werkweek

Niet afgemaakt / uitgezocht:

- Linked data: JSON-LD ?
- WFS3 voor INSPIRE? (→ inmiddels nadere analyse gedaan)
- Beveiliging
- OGC API Features ↔ NL API Strategie?
- 3D, 4D?



OGC API Features werkweek

Aandacht nodig:

- Spec: CRS ondersteuning
- Tips voor aanbieden API uitwerken: documentatie voor ontwikkelaars, configuratie API limieten, identifiers
- Ondersteuning in standaard (geo)software en bibliotheken

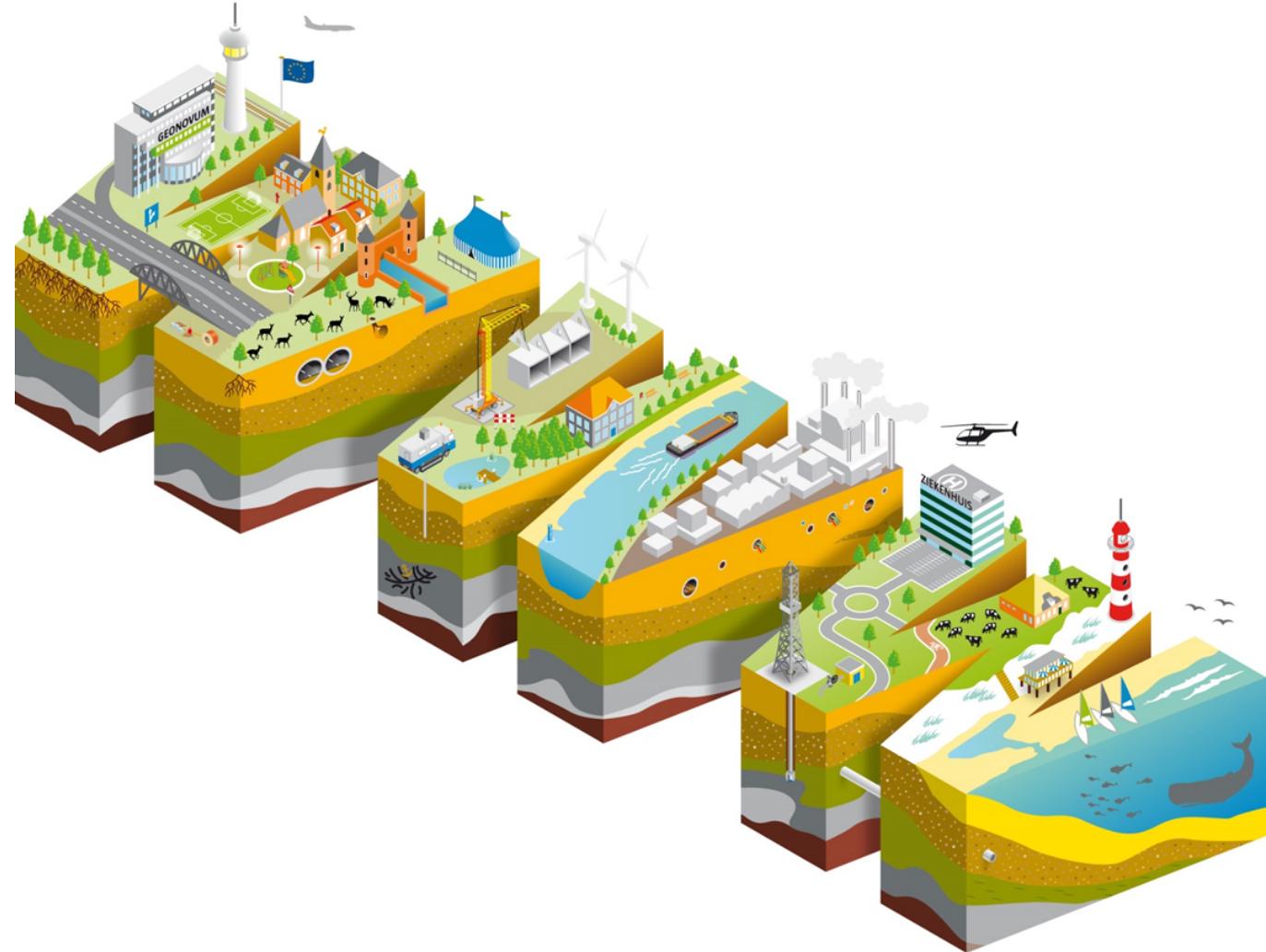


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OGC API Features referenties

- Specificatie: <http://docs.opengeospatial.org/DRAFTS/17-069r1.html>
- Github: https://github.com/opengeospatial/WFS_FES/
- Implementaties:
https://github.com/opengeospatial/WFS_FES/blob/master/implementations.md
- Checklist implementatie:
https://github.com/opengeospatial/WFS_FES/blob/master/guide/conformance_checklist.md
- WFS 3 werkweek: <https://geonovum.github.io/wfs3-experiments/>



OGC API – Features

- Extensies die waarschijnlijk volgen:

“The OGC Features API SWG has identified the following extensions to Part 1 (Core) as the highest priority:

- *support for Coordinate Reference Systems (Part 2);*
- *filter / query capabilities;*
- *simple transactions.”*

