

OGC API - Features

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The world's leading and comprehensive
community of experts making location information:

#OGCAPI



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Accessible



Interoperable



Reusable



Current OGC API Features parts

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- Part 1: Core
 - *published in October 2019, conformance test available, same as ISO 19168-1:2020*
 - The API capabilities that almost every one needs
- Part 2: Coordinate Reference Systems by Reference
 - *published in October 2020, conformance test available, same as ISO/DIS 19168-2*
 - Support beyond WGS84 for well-known CRS
- Part 3: Filtering
 - *draft, close to the final release candidate*
 - Filter expressions on features from a single feature collection
- Part 4: Create, Replace, Update and Delete
 - *draft, needs more implementations and testing*
 - Mutations, one feature per request

<https://github.com/opengeospatial/ogcapi-features/blob/master/CHARTER.adoc#scope-of-work>



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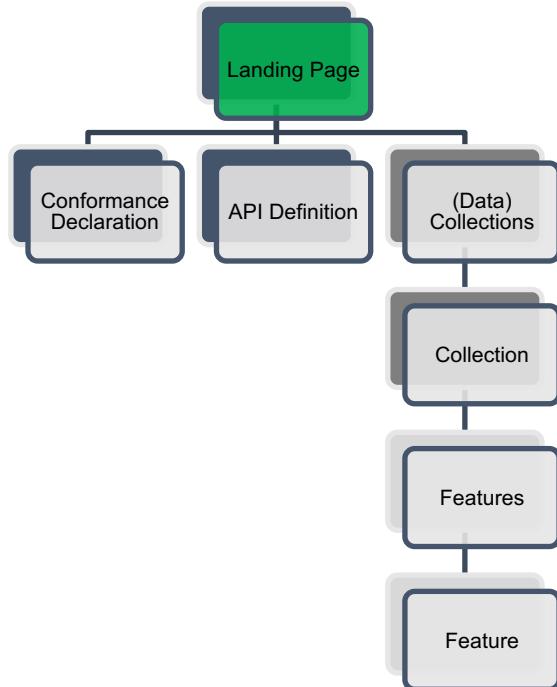
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Resources: Landing Page

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- Starting point to navigate the OGC API resources in this API
- Relative path: /

<https://demo.idproxy.net/zoomstack>



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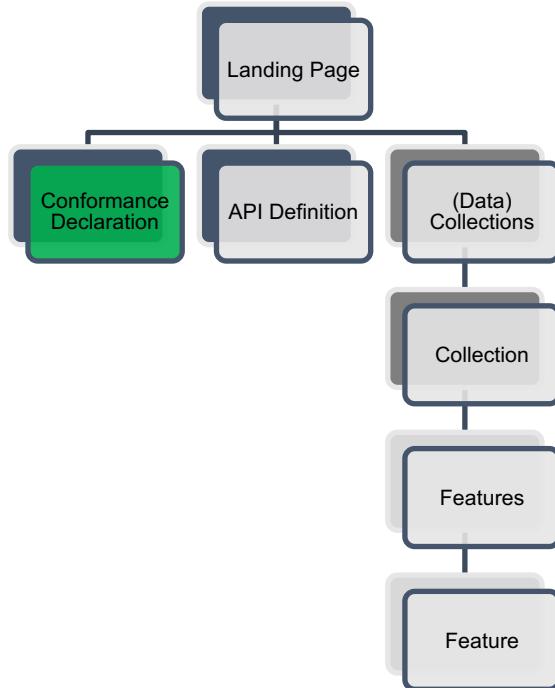
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Resources: Conformance Declaration

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- Lists the conformance classes from standards or community specifications, identified by a URI, that the API conforms to
- Relative path:
/conformance

<https://demo.idproxy.net/zoomstack/conformance>



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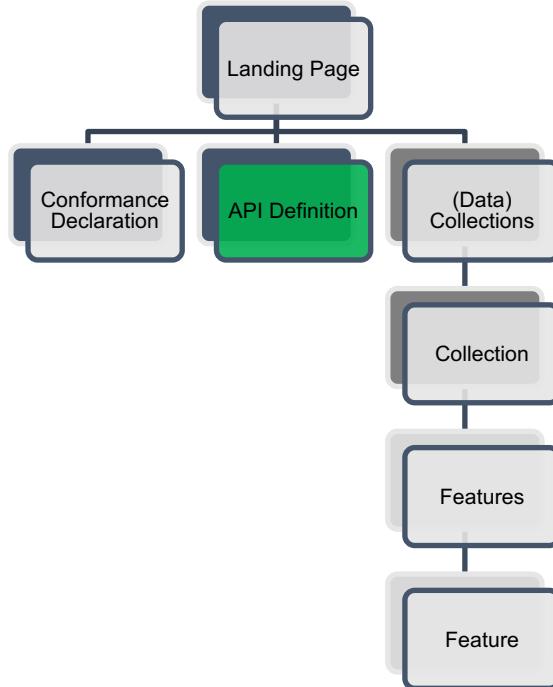
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Resources: API Definition

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- Description/documentation of the API including the Landing Page and its sub-resources
- No fixed path
 - often /api
 - may also be external, e.g. on SwaggerHub
- OpenAPI document or an alternative service description

<https://demo.ldproxy.net/zoomstack/api?f=html>

<https://demo.ldproxy.net/zoomstack/api?f=json>

<https://demo.ldproxy.net/zoomstack/api?f=yaml>



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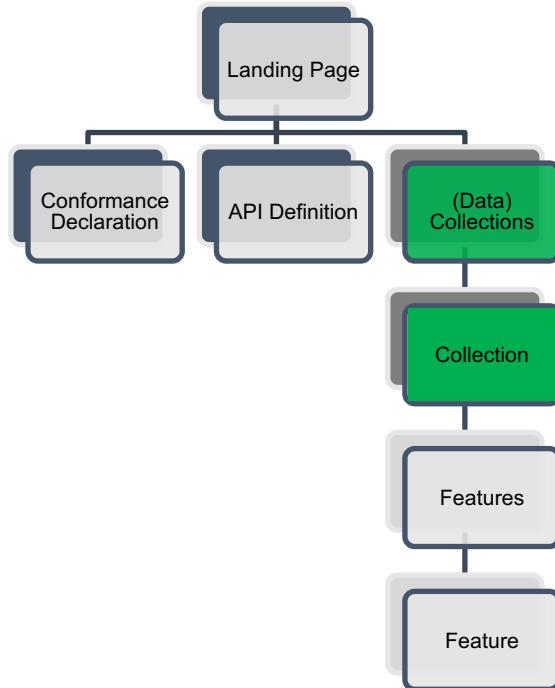
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Resources: Collections

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- The data in a dataset is organized into one or more collections
 - Information to generate meaningful requests to features (spatial/temporal extent, CRS, etc.)
- Relative path:
`/collections/{collectionId}`

<https://demo.idproxy.net/zoomstack/collections>

<https://demo.idproxy.net/zoomstack/collections/airports>



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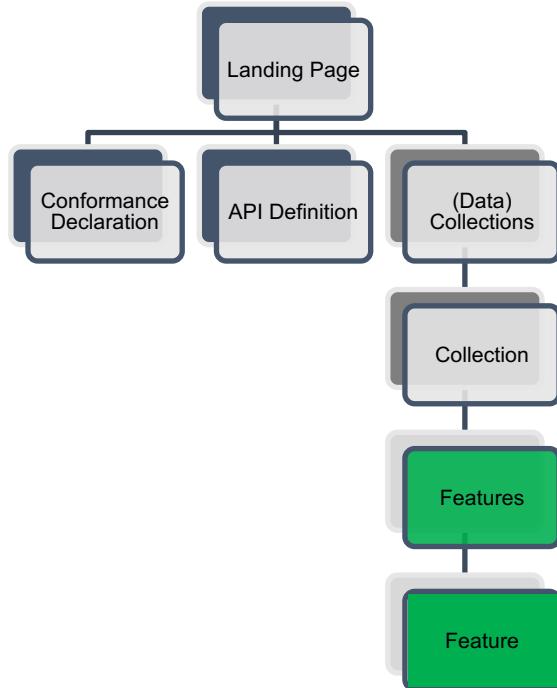
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Resources: Features

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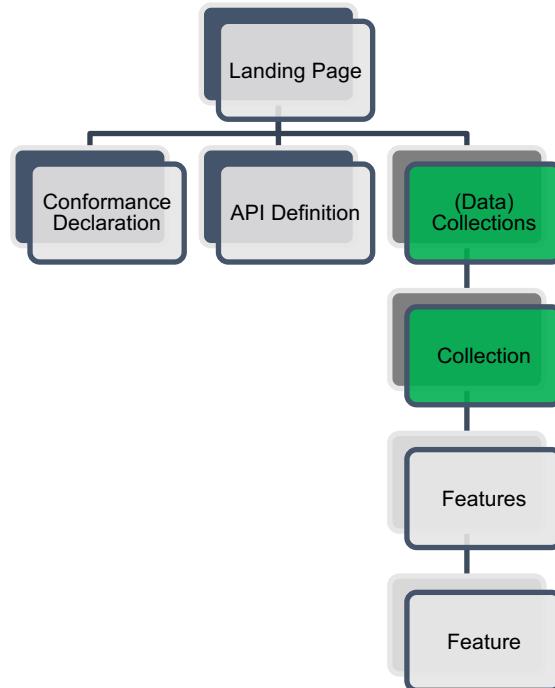


- Paged access to features in a collection and a URI for every feature
- Relative path:
`/collections/{collectionId}/items/{featureId}`
- Parameters: `bbox`, `datetime`, `limit`, collection-specific parameters
 - All filtering predicates are combined with an implicit AND

<https://demo.ldproxy.net/zoomstack/collections/airports/items>

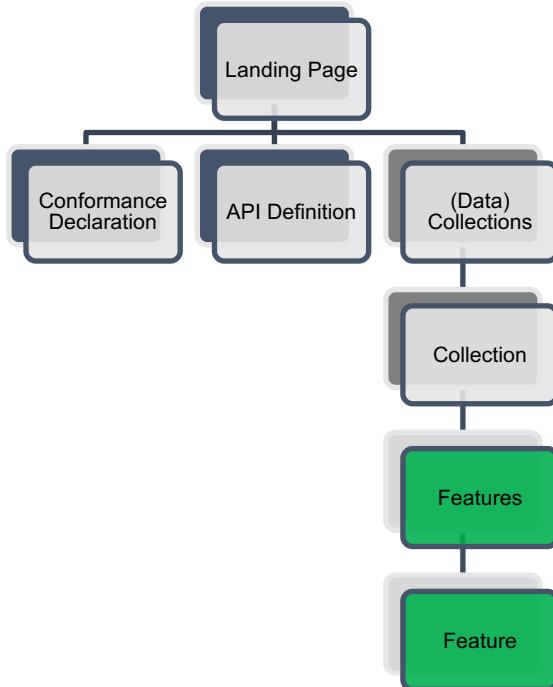
<https://demo.ldproxy.net/zoomstack/collections/airports/items/1>

https://demo.ldproxy.net/daraa/collections/CulturePnt/items?datetime=../2012-12-31T23:59:59Z&bbox=36.09,32.6,36.1,32.61&F_CODE=AL030



Adds

- the list of CRSs in which geometries can be requested,
- the CRS in which the data is stored (no transformation) and
- the epoch (in case of dynamic datums)



- **Parameters:**

- `crs`: URI of the CRS to use in the response
- `bbox-crs`: URI of the CRS in which the coordinates are in the `bbox` parameter; axis order follows the axis order in the CRS

- **HTTP headers:**

- `Content-Crs`: Identifies the CRS used in the response

<https://demo.liproxy.net/zoomstack/collections/airports/items?crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2FEPSG%2F0%2F27700&f=json>

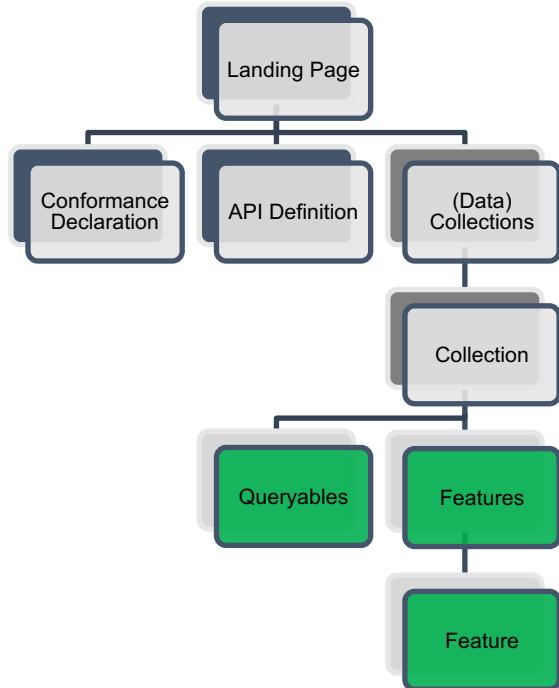
<https://demo.liproxy.net/zoomstack/collections/airports/items/1?crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2FEPSG%2F0%2F27700&f=json>

[https://demo.liproxy.net/zoomstack/collections/airports/items?bbox=50,-1,52,1&bbox-crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2FEPSG%2F0%2F4326&crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2FEPSG%2F0%2F27700&f=json](https://demo.liproxy.net/zoomstack/collections/airports/items?bbox=50,-1,52,1&bbox-crs=http%3A%2F%2Fwww.opengis.net%2Fdef%2Fcrs%2FEPSG%2F0%2F27700&f=json)

Common Query Language (CQL2) Filtering (Part 3)

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- Composed of 2 specs; generic part (CQL2) and feature-specific part (Part 3)
- Part 3 defines:
 - Queryables:
 - List of properties that can be used in filter expressions
 - Parameters:
 - `filter`: the filter expression
 - `filter-crs`: the CRS of geometries in the filter expression, default is WGS 84 longitude, latitude
 - `filter-lang`: the language used in the filter expression, default is cql2-text
- Common Query Language (CQL2) defines:
 - Basic CQL2 (literals, logical op's, comparison op's, property-value comparisons)
 - Advanced Comparison Operators (LIKE, BETWEEN, IN)
 - Case Insensitive Comparisons (ICASE, IACCENT)
 - Basic Spatial Operators (S_INTERSECTS)
 - Spatial Operators (all the others)
 - Temporal Operators (T_AFTER, T_OVERLAPS, etc.)
 - Array Operators (A_CONTAINEDBY, A_CONTAINS, etc.)
 - Property-Property Comparisons
 - Custom Functions
 - Arithmetic Expressions
 - 2 encodings defined: TEXT and JSON

Select all motorways changed after 2011:

```
F_CODE='AP030' AND  
T AFTER(ZI001 SDV, DATE('2011-12-31')) AND  
RTY IN (1,2)
```



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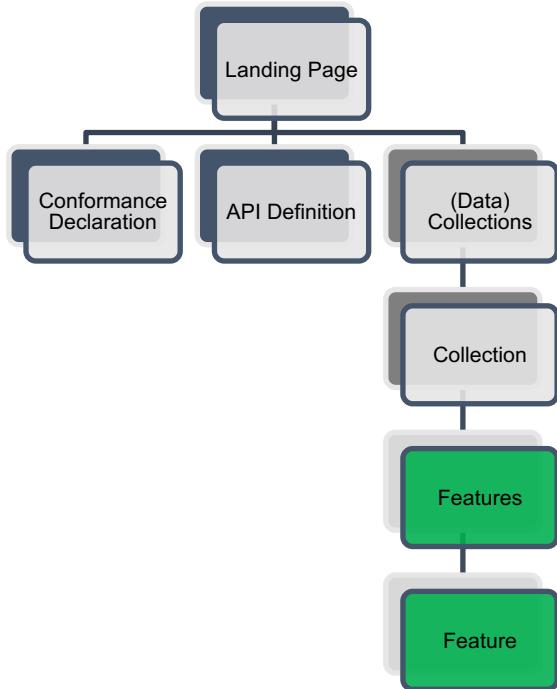
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Create, Replace, Update, Delete (Part 4)

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- Like Part 3 there is a generic components and a feature-specific part.
- The generic part defines:
 - **create/replace/delete** for inserting, replacing and deleting resources
 - **update** for modifying parts of resources
 - **optimistic locking** for handling concurrency
- The feature specific part maps methods to features resources:

| | POST | PUT | PATCH | DELETE |
|-----------|------------------------|-------------------------|------------------------|------------------------|
| Features: | create | n/a | n/a | n/a |
| Feature: | n/a | replace | update | delete |

Next OGC API Features work items

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- **Schemas**
 - Schema resources for the features in a feature collection; will consider multiple types of schemas
- **Queries/Search**
 - Query resource supporting GET and POST; the Query resource at path “/search” will support multi-collection queries, the Query resource at path “/collections/{collectionId}/search” will support queries on a single collection; support for stored/persistent queries will be considered
- **Property Selection**
 - One or more query parameters to reduce the properties that are returned for a feature (resources Features and Features)
- **Geometry simplification**
 - A query parameter to indicate a scale or zoom level at which the features will be displayed (resources Features and Features)
- **OpenAPI 3.1**
 - Add support for OpenAPI 3.1 including JSON Schema 2020-12

<https://github.com/opengeospatial/ogcapi-features/blob/master/CHARTER.adoc#scope-of-work>

<https://github.com/opengeospatial/ogcapi-features/tree/master/proposals>



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More information

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- OGC resources
 - <https://ogcapi.ogc.org/features/>
 - <https://github.com/opengeospatial/ogcapi-features>
- Implementations
 - <https://www.ogc.org/resource/products/compliant?specid=1022>
 - <https://github.com/opengeospatial/ogcapi-features/tree/master/implementations>
- Example APIs in production
 - <https://api.weather.gc.ca/>
 - <https://ogc-api.nrw.de/>



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Related topic: JSON-FG

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- Developers today prefer JSON over XML
- GeoJSON popular and widely supported
- OGC API Features implementations typically support GeoJSON
- But intentional limitations exist in GeoJSON that are an issue for some use cases:
 - Restricted to WGS 84 as Coordinate Reference System
 - Ellipsoidal metrics not supported
 - Points, line strings and polygons – no support for solids
 - Supports spatial, but not temporal geometries



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JSON-FG – Approach

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- Develop an OGC Features and Geometries JSON standard addressing the identified limitations
 - Avoid edge cases, focus on capabilities that are useful for many spatial experts
 - Additional capabilities could be added in the future, if there is broad support for the initial OGC Features and Geometries JSON in implementations
- Specify as a superset of GeoJSON
 - i.e., valid GeoJSON is also valid OGC Features and Geometries JSON
 - adding additional top-level members and links in the JSON objects (feature and feature collection)
- No dependency on JSON-LD
 - but for those that want to use JSON-LD, avoid conflicts
- GitHub repository:
 - <https://github.com/opengeospatial/ogc-feat-geo-json>



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JSON-FG – Current extensions

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- "**featureType- "**when- "**where- "**coordRefSys- "**links**********



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OGC Features API SWG Sprint Goals

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Discussion and implementation feedback on topics that we are currently working on, in particular:

- JSON-FG: Develop proposal for a new conformance class (e.g., how to select fallback geometry or not), feedback on the proposed JSON-FG extensions
- Schemas: Work on guidance for client-friendly JSON schemas
- Geometry simplification: Use the current proposal and [issues](#) as a starting point
- CQL2: Additional implementations and feedback



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Thank You!

Community

- 500+ International Members
- 110+ Member Meetings
- 60+ Alliance and Liaison partners
- 50+ Standards Working Groups
- 45+ Domain Working Groups
- 25+ Years of Not for Profit Work
- 10+ Regional and Country Forums

Innovation

- 120+ Innovation Initiatives
- 380+ Technical reports
- Technology Forecasting to drive innovation

Standards

- 65+ Adopted Standards
- 300+ products with 1000+ certified implementations
- 1,800,000+ Operational Data Sets Using OGC Standards

Contact info@ogc.org to schedule a meeting for an in-depth discussion with OGC staff and join our community today!