Open Geospatial Consortium

Datos Geoespaciales en la Web

En la era de REST, JSON y OpenAPI

Joana Simoes - Developer Relations @OGC

Sobre mí

Dr. Joana Simoes
Developer Relations (OGC)

- Data Engineer & Data Scientist.
- PhD en SIG, University College of London.
- +15 años de experiencia en pymes, academia una start-up y una organización internacional (FAO).
- Contribuidora de proyectos FOSS.
- Charter member de OSGeo.

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OSGeo

DevRel Collective

Open Geospatial Consortium (OGC)

- Consorcio industrial internacional.
- Agrupa a más de 560 compañías, agencias gubernamentales y universidades.
- Los miembros colaboran en el desarrollo y mantenimiento de estándares para datos y servicios geospaciales.

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1ª - Generación de Servicios Web OGC (OWS)

- 1990s/00s
- Uso de SOAP/XML

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Servicios W*s

	WMS	WFS	WCS	WPS	SOS	SPS	CSW	WMTS
Use HTTP methods explicitly.	Y	N	Y*	N	N	N	N	Y
Be stateless.	Y	Y	Y	Y	Y	Y	Y	Y
Expose directory structure-like URIs.	N	N	N	N	N	N	N	Y
Use HTTP Error codes	N	N	N	N	N	N	N	N
Transfer XML, JavaScript Object Notation (JSON), or image.	Image	XML	Any	Any	XML	XML	XML	Image

Source: OGC 15-052r1r1

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OGC APIs

👉 https://ogcapi.ogc.org/

- Aseguran que los datos geoespaciales sean “web native”.
- Mejoran la experiencia del desarrollador.
- En última instancia, reemplazarán y mejorarán los estándares de servicio web de OGC (W*s).

{ REST }

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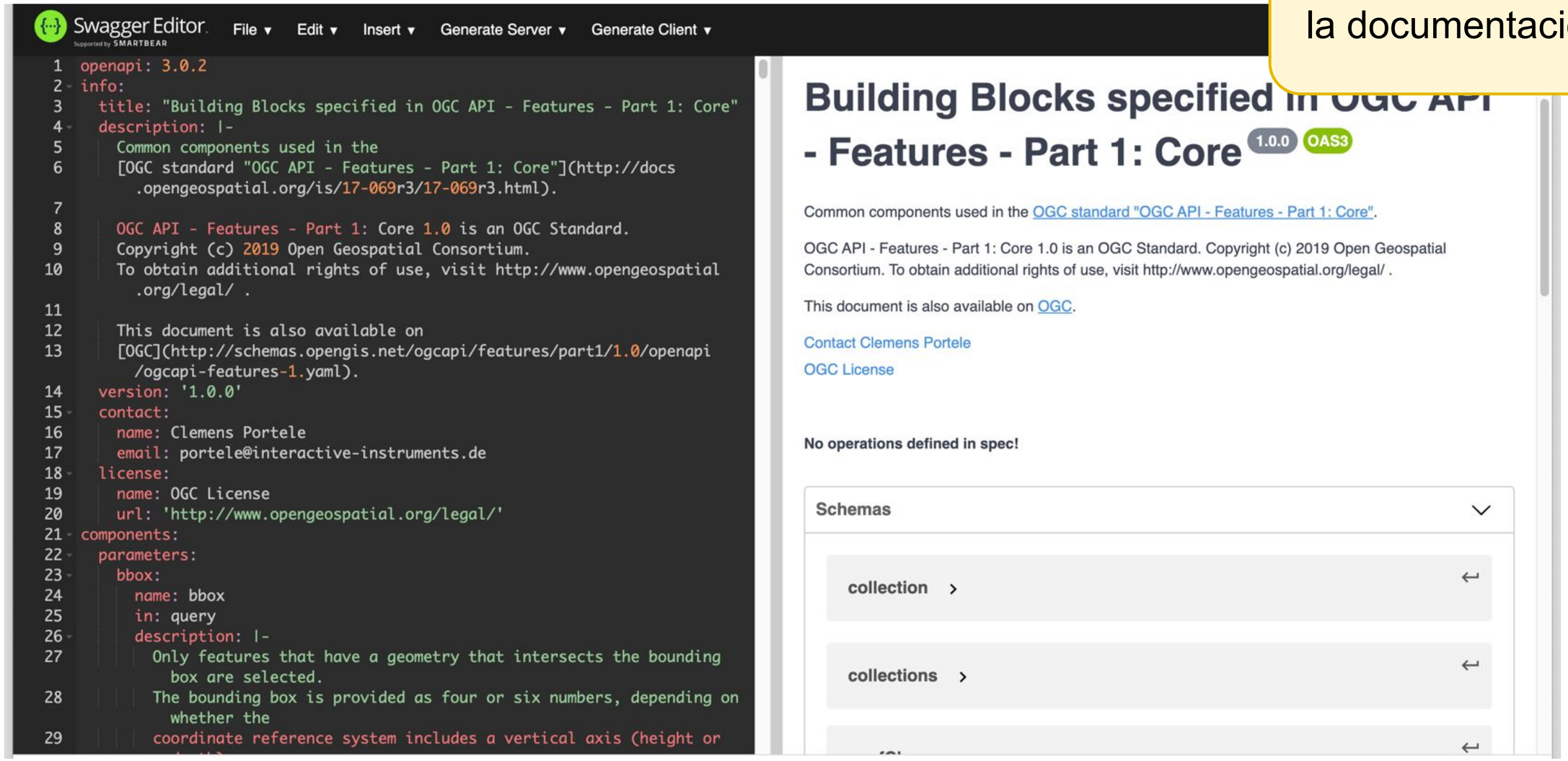
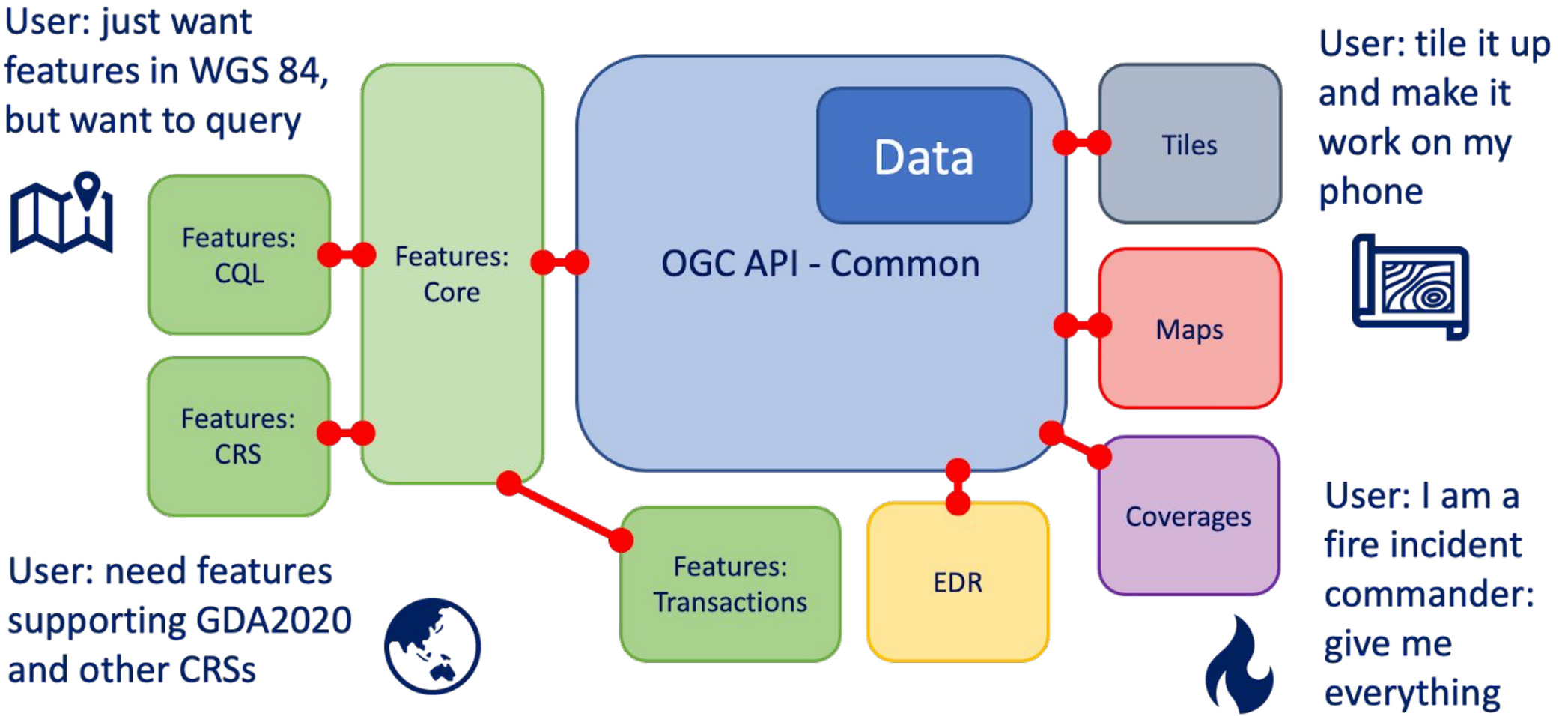
Todo definido en OpenAPI

Modernización de la documentación

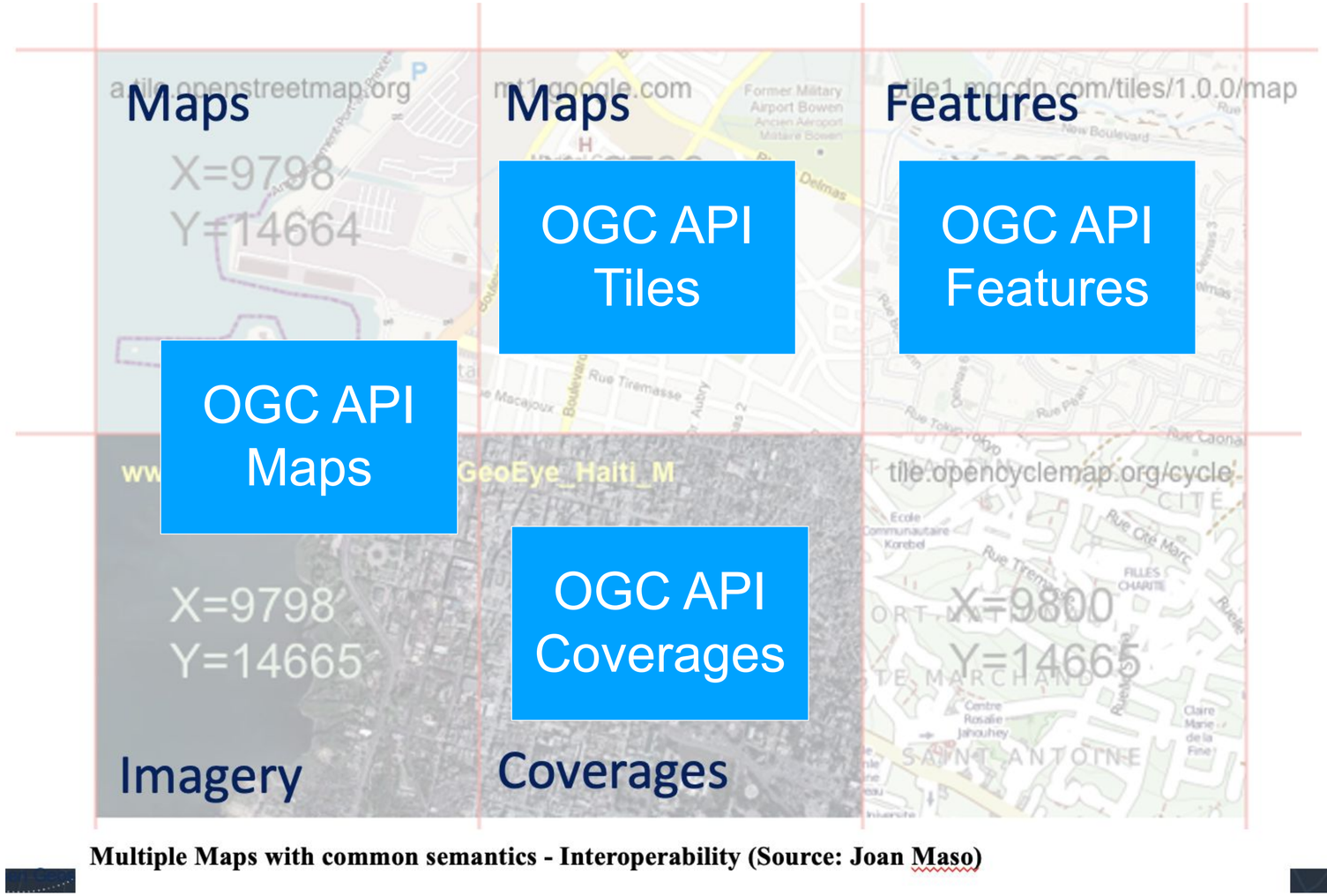


Publicadas en “Bloques de Construcción”



👉 https://opengeospatial.github.io/bblocks/

OWS -> OGC APIs



Multiple Maps with common semantics - Interoperability (Source: Joan Maso)

Discover via

OGC API Records

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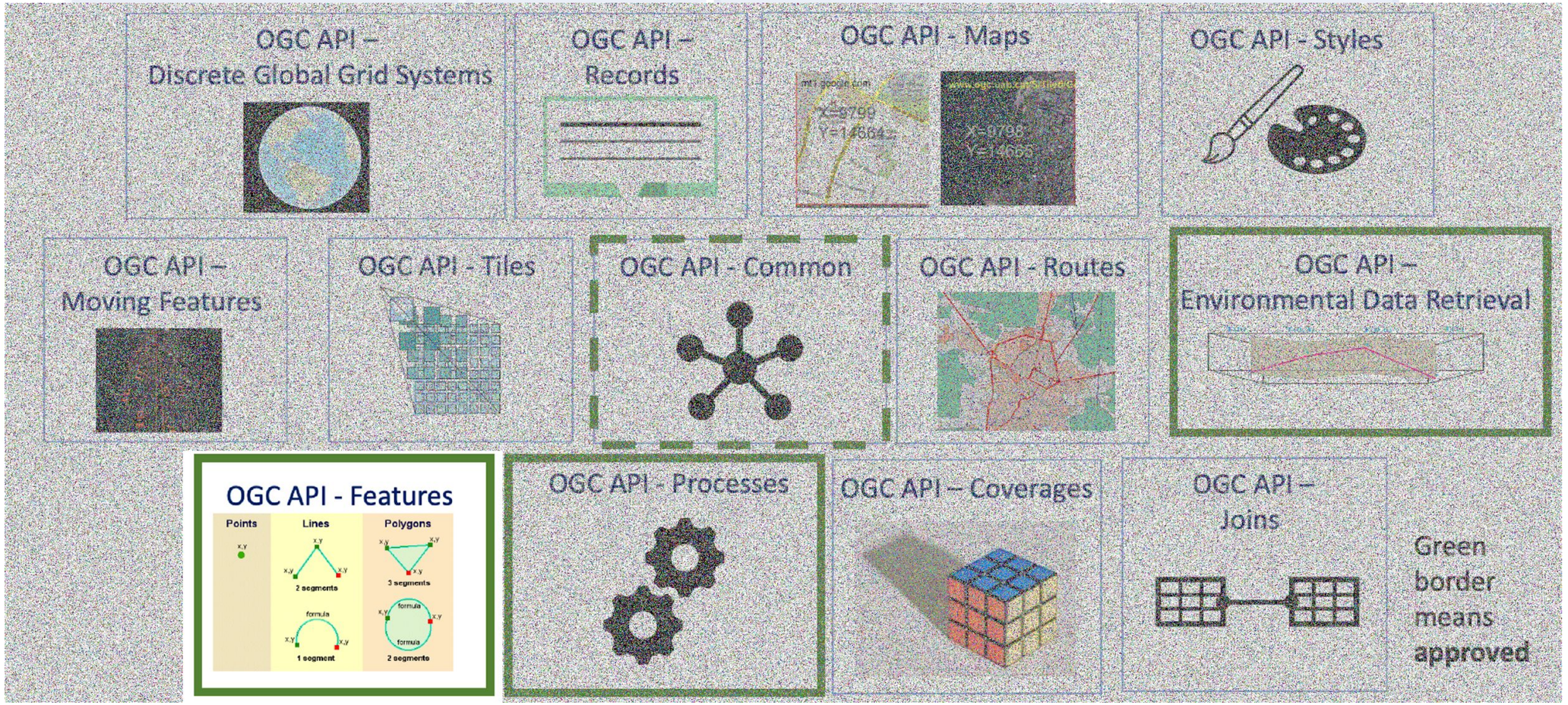
OGC API - Estándares aprobados y candidatos a estándares



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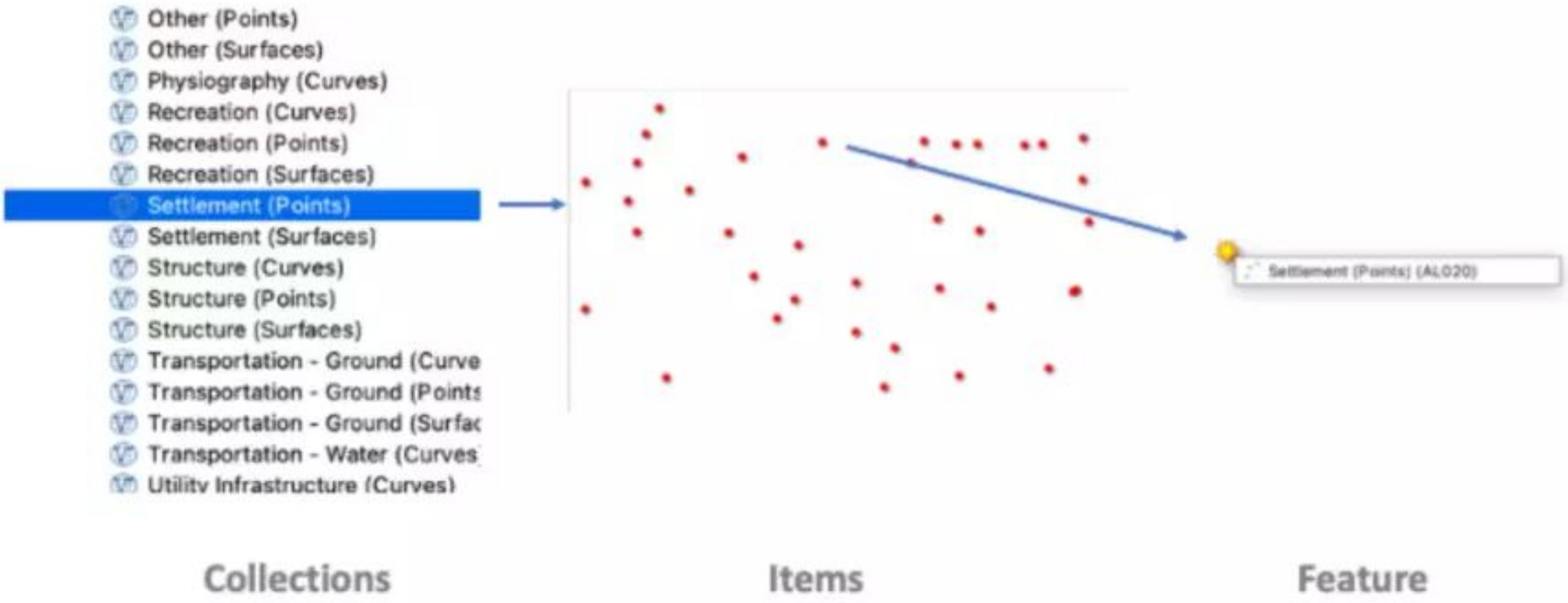
OGC API - Features

- Especifica el comportamiento de las Web APIs que dan acceso a features, de manera independiente de la “data store” subyacente.
- Define las operaciones de descubrimiento y consulta.
- Publicadas: P1 y P2.
- P1 del estándar está alineada con STAC API y ISO 19168-1:2020.

Peticiones 👉

https://app.swaggerhub.com/apis/cportele/opf-features-api/1.0.0



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Implementaciones

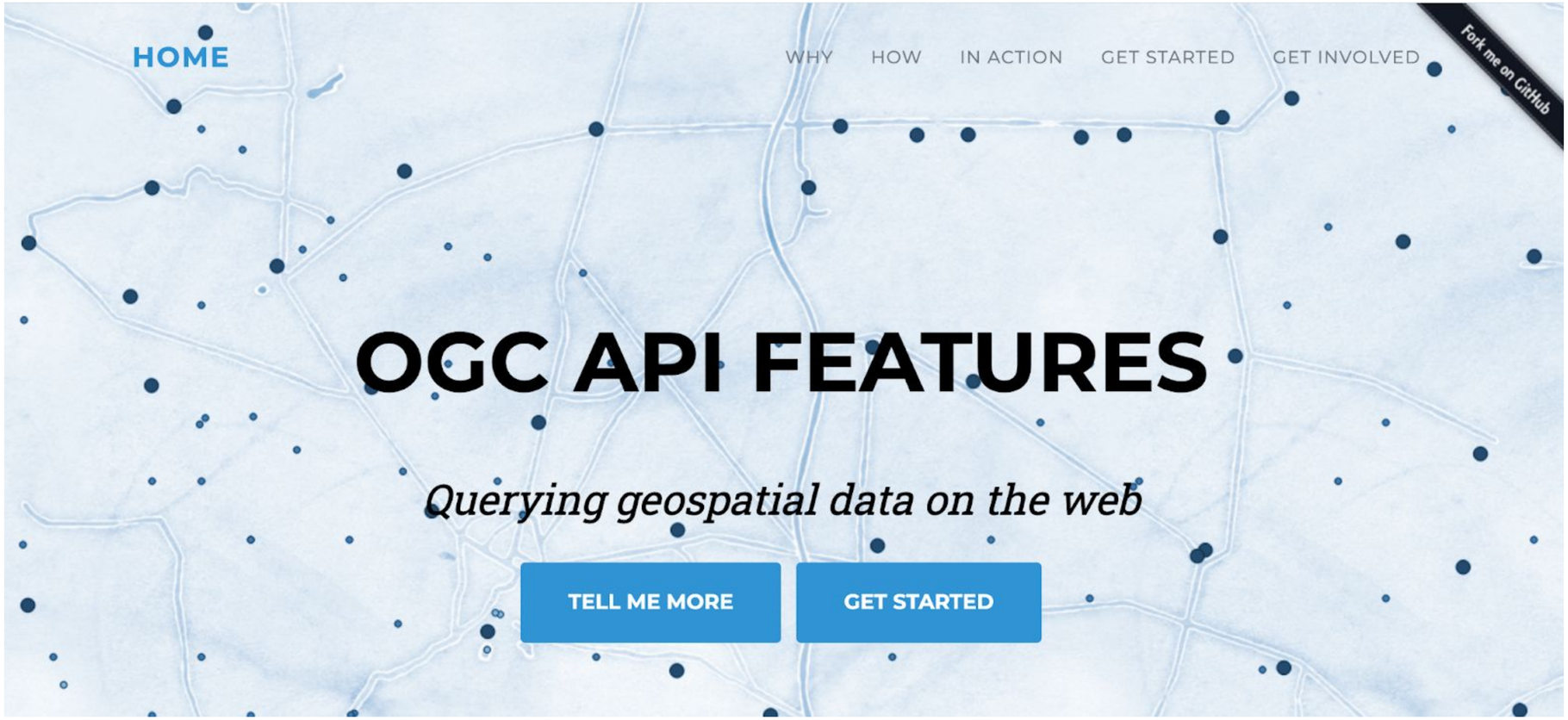
- 10 implementaciones del lado del servidor y 8 implementaciones del lado del cliente.

- Implementaciones adicionales (STAC, GeoJSON).

https://github.com/opengeospatial/ogcapi-features/tree/master/implementations

Más Información

http://ogcapi.ogc.org/dev/features



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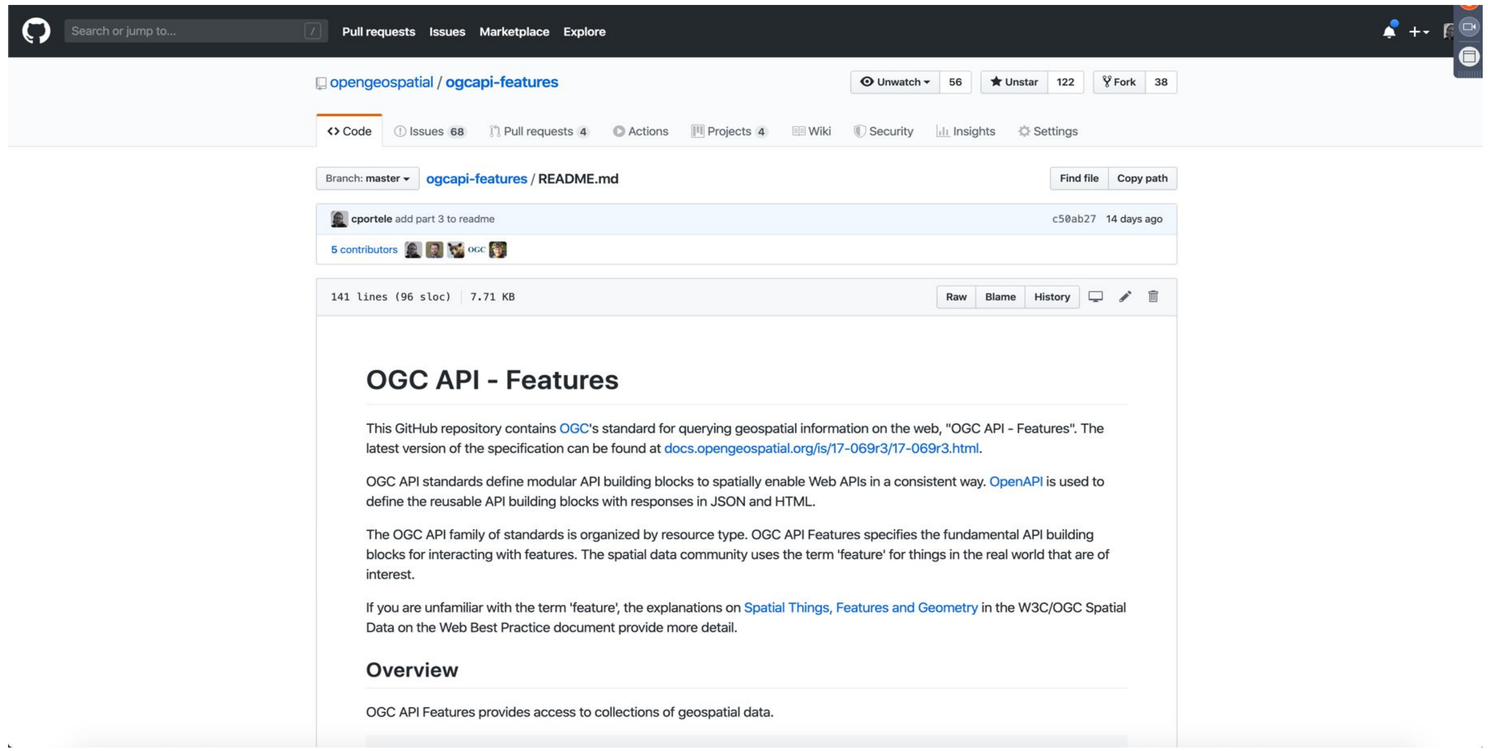
¿Cómo involucrarse en OGC?

Contribuir a los repositorios de GitHub de las OGC APIs

- Juntarse a las discusiones.
- Crear issues.
- Submitir PR.



https://github.com/opengeospatial/ogcapi-features/
https://github.com/opengeospatial/ogcapi-tiles
https://github.com/opengeospatial/ogcapi-records

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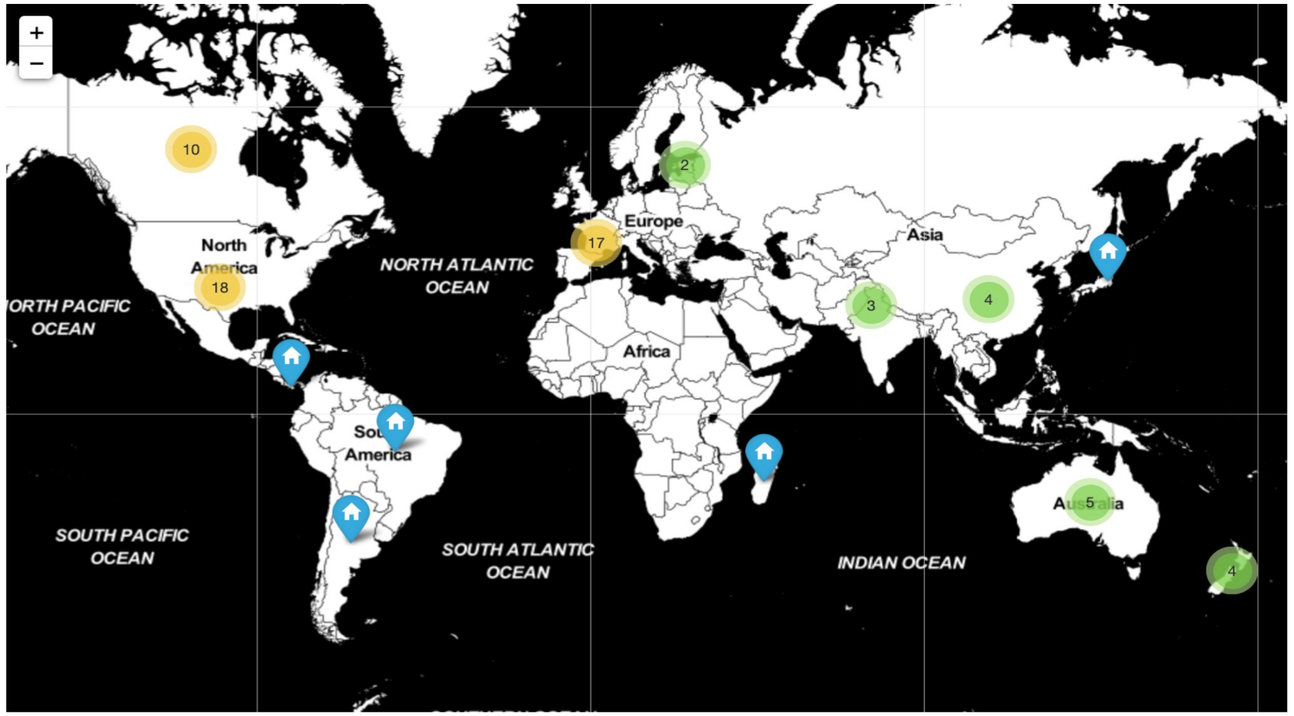
Unirse a los grupos de trabajo de OGC

- Grupos de Trabajo de Estándares (SWGs): grupos que trabajan en estándares (nuevos o revisados) a través del proceso OGC RFC.
- Grupos de Trabajo de Dominio (DWGs): grupos que trabajan en requisitos específicos de tecnología o dominio para la interoperabilidad.
- **Es necesario ser miembro OGC para unirse a los grupos de trabajo.**

https://www.ogc.org/join

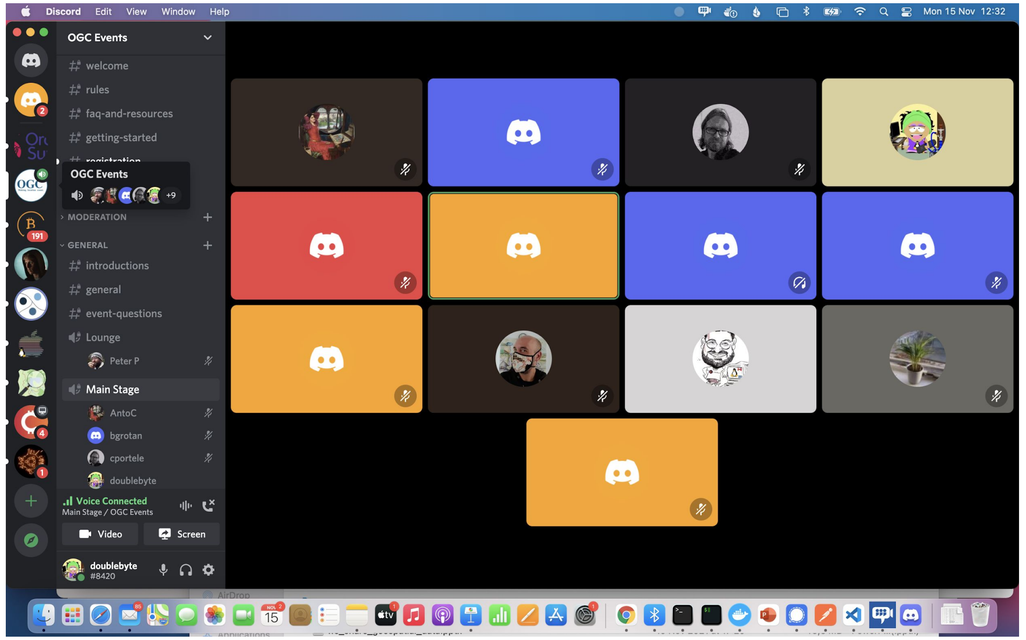
Unirse a los Code Sprints de OGC

- Eventos virtuales/híbridos de tres días.
- Enfoque en un grupo de estándares relacionados.
- La participación esta abierta a todas las personas.
- Habrá un mentor stream para nuevos participantes.



https://github.com/opengeospatial/developer-events/wiki

Servidor de Discord: OGC-events



https://discord.gg/3uyaZZuXr3

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Code Sprint - Datos Vectoriales

- Julio 2022
- Evento virtual
- Estandares: OGC API - Moving Features, OGC API - Routes, OGC API - GeoVolumes, OGC API - Features, y OGC API - Joins

Code Sprint de Septiembre ✓

- Code Sprint de OGC junto con ISO/TC211
- Enfoque en metadatos: OGC API - Records, ISO 19115, JSON-FG y STAC.
- Híbrido

Code Sprint de Diciembre ✓

- Enfoque en mapas web: OGC API - Tiles, OGC API Maps y OGC API - Styles.
- Híbrido

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Seguir el Foro Ibérico y Latino-Americano de OGC

- Quiere abarcar la comunidad de habla hispana y portuguesa interesada en los desarrollos y objetivos de OGC.
- Engloba tanto a los miembros OGC como a los que, sin serlo, compartan intereses con los citados desarrollos y objetivos.
- 👉🏽 17/06: Dia de la interoperabilidad en Madrid

ILAF
Open Geospatial Consortium, Inc.

Suscribirse a la lista: ila.forum@lists.opengeospatial.org

https://external.ogc.org/twiki_public/ILAFpublic/WebHome

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¡Gracias por vuestra atención! 💙

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@doublebyte

joanasimoes

@doublebyte1

https://dev.to/doublebyte

https://community.ops.io/doublebyte

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¿Por qué usar un estándar?

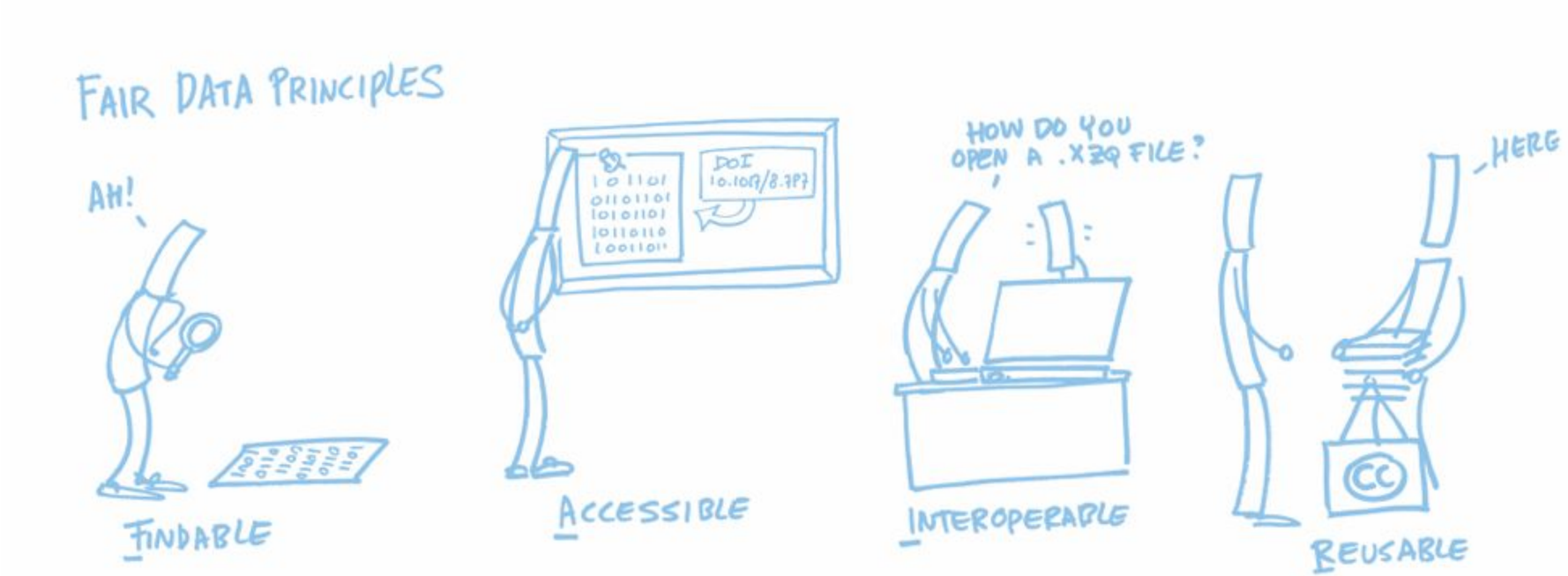
Cápsula de Café Estándar

Easy Serving Espresso
pod (E.S.E. pod)
standard

Mi Maquina ❤️

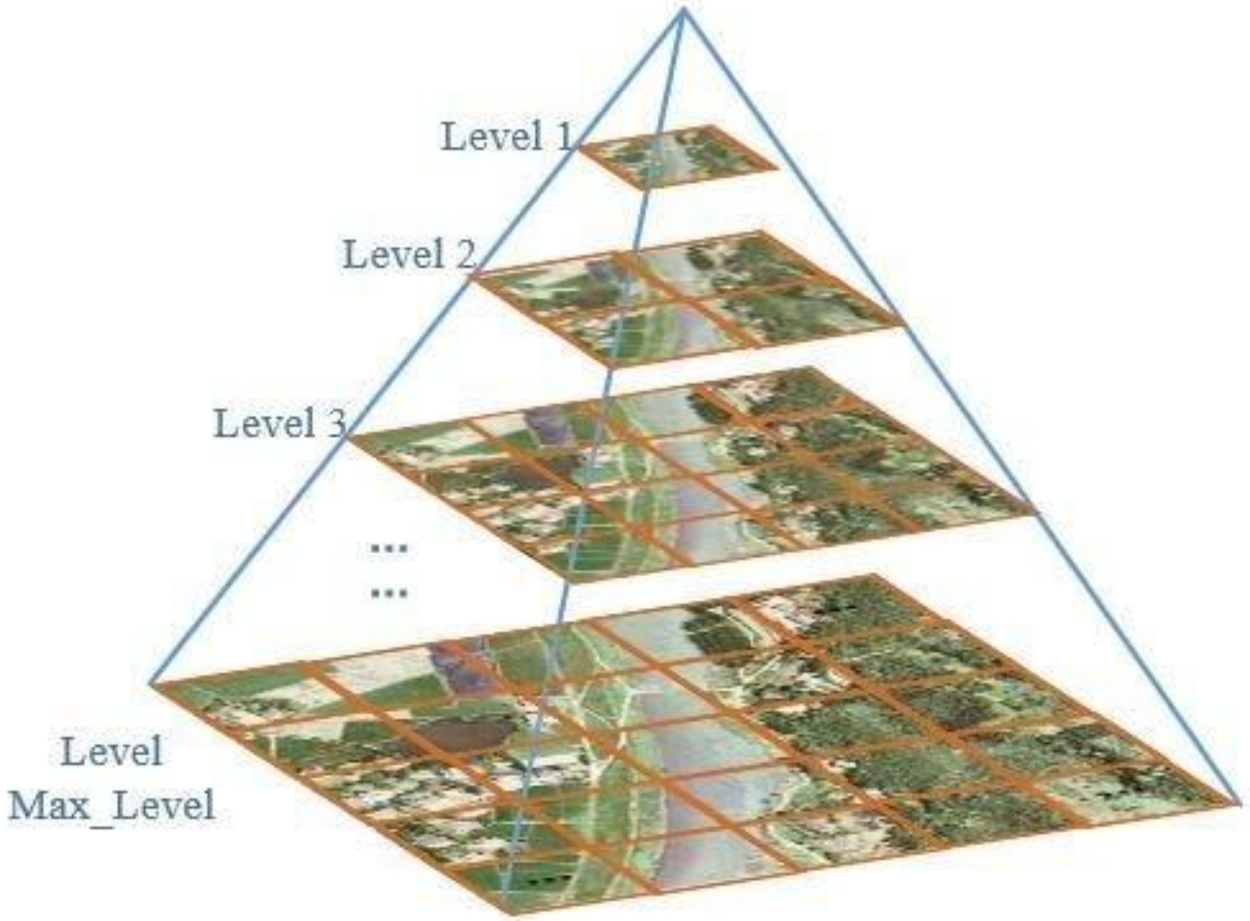
¿Por qué usar estándares para compartir información geoespacial?

- Para optimizar el intercambio y la reutilización de datos por parte de humanos y máquinas.

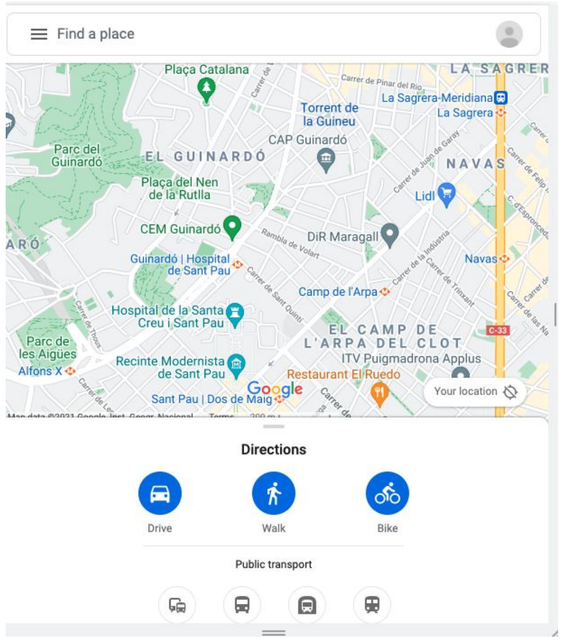


Source: https://www.openaire.eu/how-to-make-your-data-fair

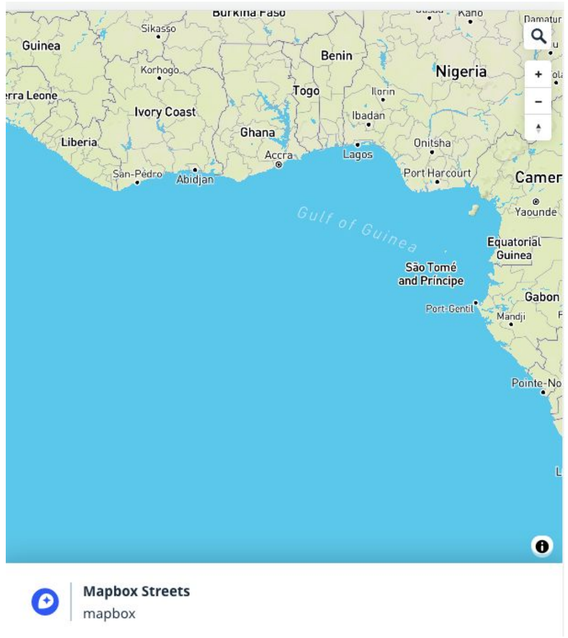
Web Maps



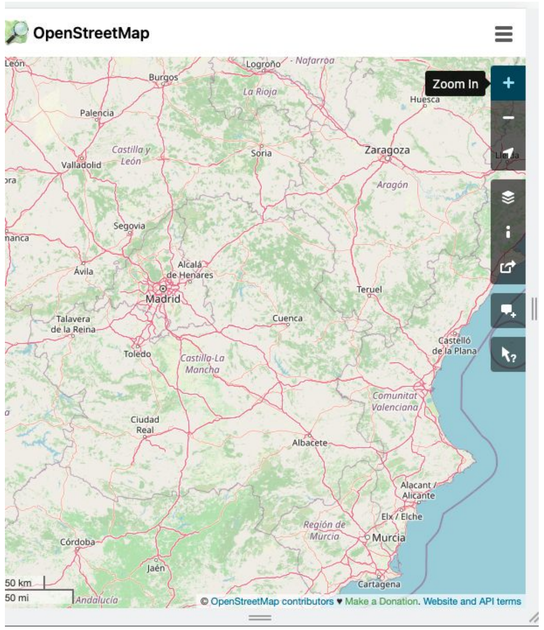
Web Maps



https://www.google.com/maps/vt?pb=!1m5!1m4!1i15!2i16583!3i12236!4i256&pb=!2m3!1e0!2sm!3i574299180&pb=!3m10!2sen!3ses!5e1249!12m1!1e18!12m4!1e68!2m2!1sset!2sRoadmap!4e0!5m4!1e3!5f2!7m1!1b1!23i1381033!23i1368782!23i1368785!23i1385853!23i46990830!23i137505 0!23i4536287



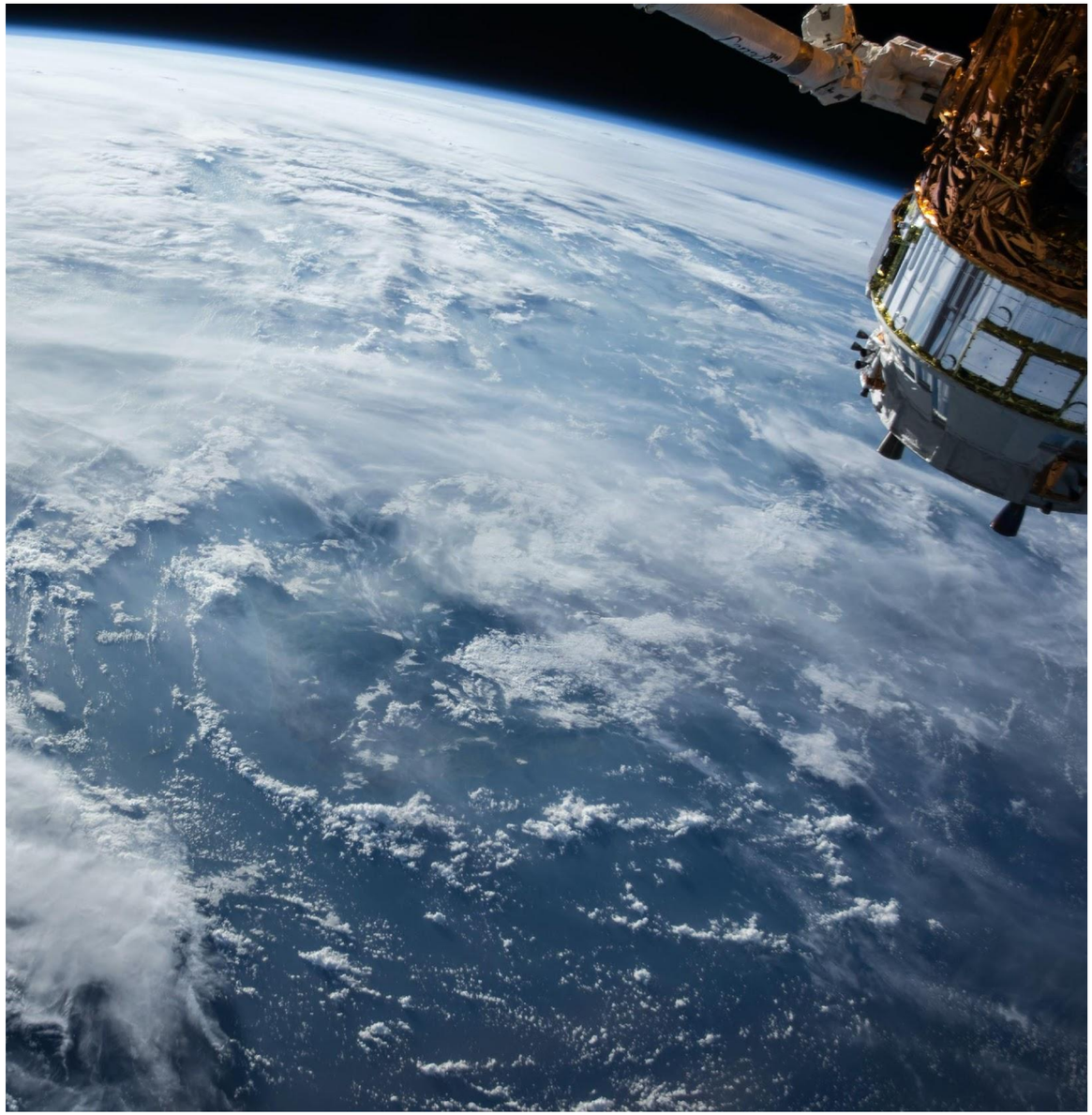
https://api.mapbox.com/v4/mapbox.mapbox-streets-v8,mapbox.mapbox-terrain-v2/4/8/7.vector.pbf?sku=101m93BNZYKAm&access_token=pk.eyJ1IjoibWFwYm94IiwiYSI6ImNpejY4M29iazA2Z2gycXA4N2pmbDZmangifQ.-g_vE53SD2WrJ6tFX7QHmA



https://tile.openstreetmap.org/7/63/49.png

Agenda

- Introducción
- Estándares & OGC
- OGC APIs
- OGC API - Features
- Cómo involucrarse con OGC



Key Takeaways

- APIs are a very effective and popular enabler of rapid software development.
- API variations without standardized elements can degrade interoperability.
- Open Standards improve interoperability between independent implementations.
- OGC API Standards enhance geospatial interoperability between Web APIs.
- OGC welcomes developers to use contribute to these standards.

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Don’t reinvent the wheel!

Just perfect it.

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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

Quarterly Tech Trends monitoring

Standards

65+ Adopted Standards

300+ products with 1000+ certified implementations

1,700,000+ Operational Data Sets

Using OGC Standards

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How can I share geospatial data?

File

- Use a format that supports storing geometry and CRS information.

Advantages ✓

- Simple to use.

Drawbacks ✗

- Redundancy.
- Lack of consistency.

Database

- Databases are designed to share information in an efficient and secure manner.

Advantages ✓

- Integrity.
- Security.
- Concurrency.

Drawbacks ✗

- Complexity.

Pulling data from a database

```
# Connection String
conn = psycopg2.connect("host=%s port=%s dbname=%s password=%s
user=%s" % (host,
port,dbname, db_password, db_user))

# SQL Query
sqlSelect = "SELECT city.name, state.name, city.geom FROM city JOIN
state ON ST_Intersects(city.geom, state.geom)

cur.execute(sqlSelect)
```

Web API

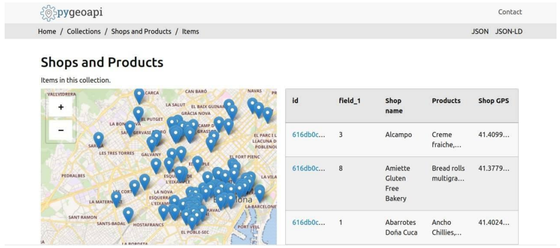
- Used to communicate with the browser using the HTTP protocol.

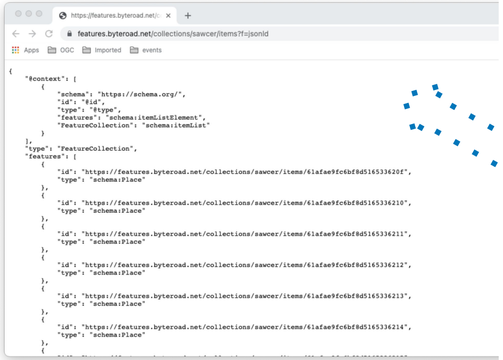
Advantages

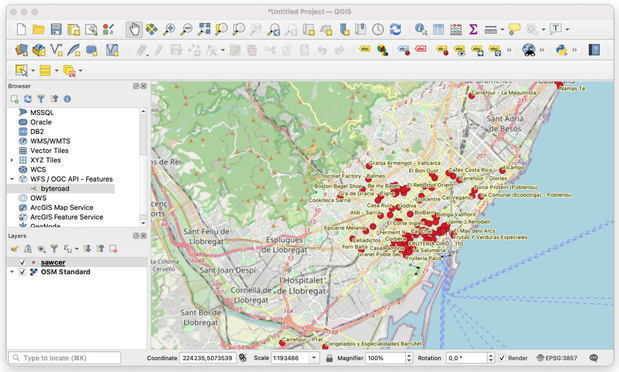
- Simplicity.
- Scalability.
- Flexibility.
- Independence.

Source: https://res.infoq.com/presentations/spring-security-rest-api/en/slides/sl29.jpg

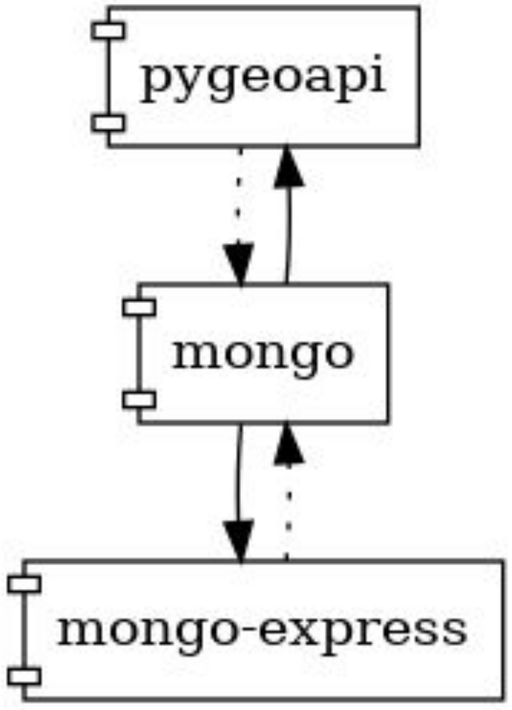
Example







Standard



API

Database

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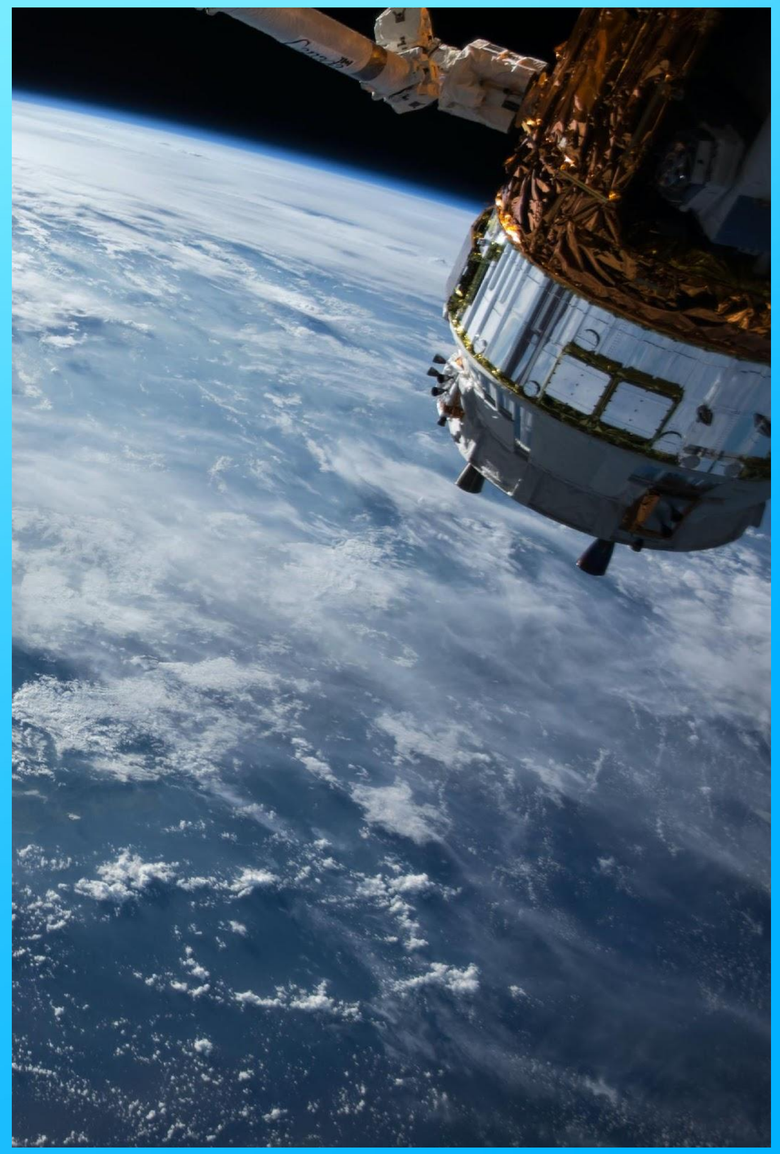

What is OGC?

A hub for thought leadership, innovation, and standards for all things related to location

Our Vision

Building the future of location with community and technology for the good of society

Our Mission

Make location information Findable, Accessible, Interoperable, and Reusable (FAIR)

Our Approach

A proven collaborative and agile process combining consensus-based standards, innovation project, and partnership building

What is an OGC Standard?

- A document, established by consensus and approved by the OGC Membership, that provides rules and guidelines, aimed at the optimum degree of interoperability in a given context.

Photo taken March 2018

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What's in an OGC Standard?

Specification Elements

- Requirements Classes
- Requirements
- Conformance Classes
- Conformance Tests

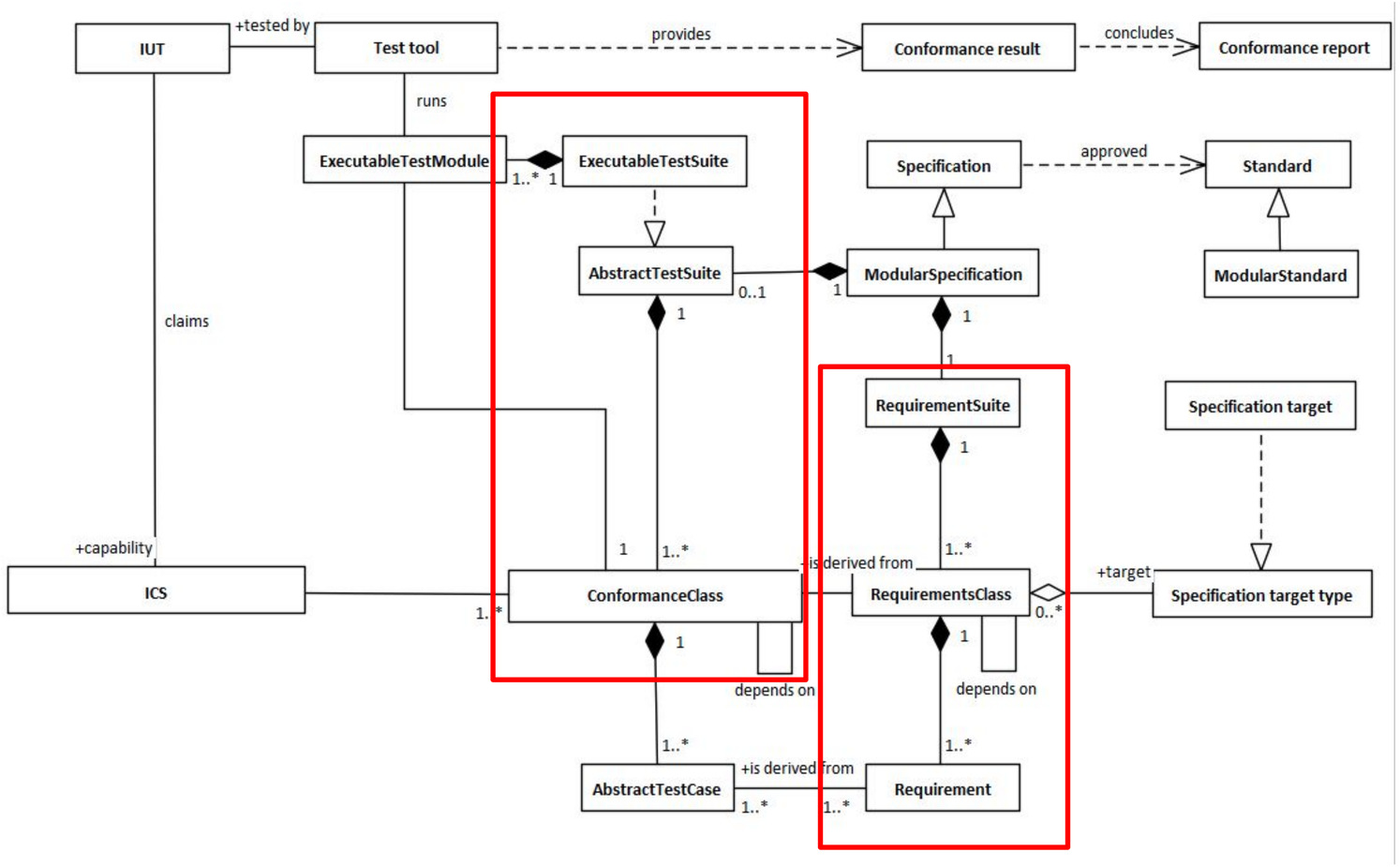

Image source: ISO 19105

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Example Specification Elements

Taken from OGC API – Features – Part 1: Core

Requirement 10	**/req/core/crs84**
A	Unless the client explicitly requests a different coordinate reference system, all spatial geometries SHALL be in the coordinate reference system http://www.opengis.net/def/crs/OGC/1.3/CRS84 (WGS 84 longitude/latitude) for geometries without height information and http://www.opengis.net/def/crs/OGC/0/CRS84h (WGS 84 longitude/latitude plus ellipsoidal height) for geometries with height information.

Abstract Test 2	**/ats/core/crs84**
Test Purpose	Validate that all spatial geometries provided through the API are in the CRS84 spatial reference system unless otherwise requested by the client.
Requirement	/req/core/crs84
Test Method	1. Do not specify a coordinate reference system in any request. All spatial data should be in the CRS84 reference system. 2. Validate retrieved spatial data using the CRS84 reference system.

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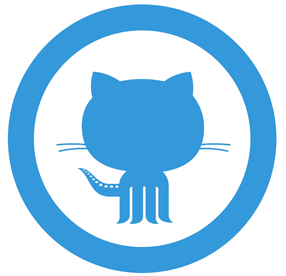
OGC API Key Characteristics

Spatially enable Web APIs in a consistent way

- Flexibility
- Leverages existing web practices
- Improves discoverability of geospatial data
- Self-documented
- Open development
- Multi-part

{ REST }



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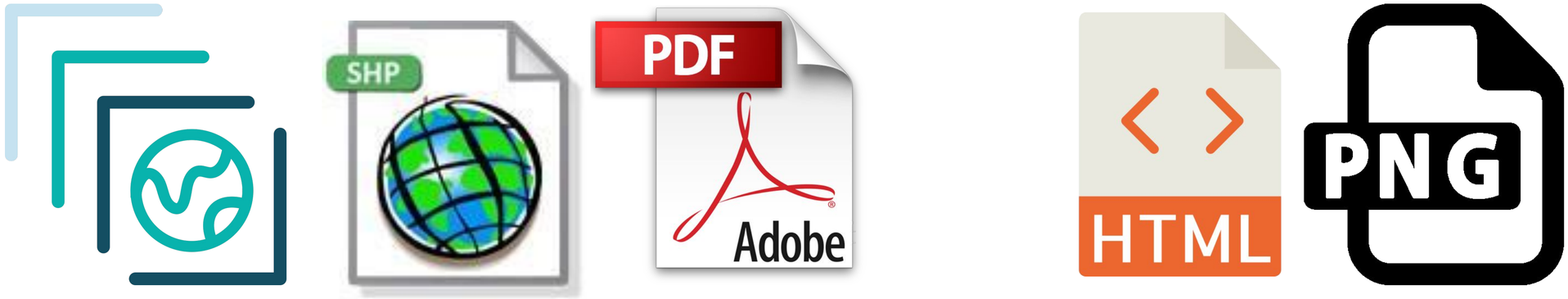
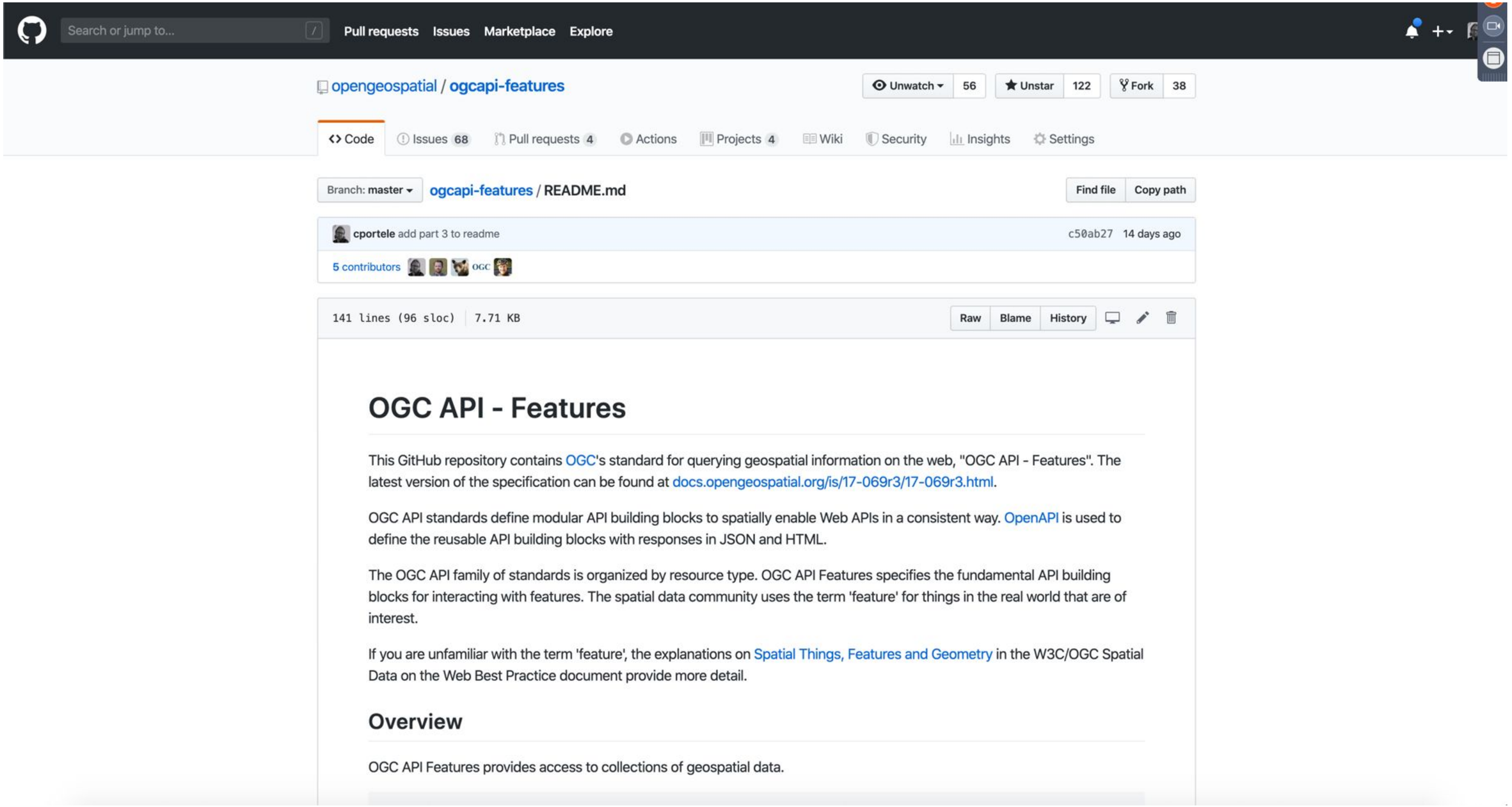
Formatos Abiertos vs Estándares

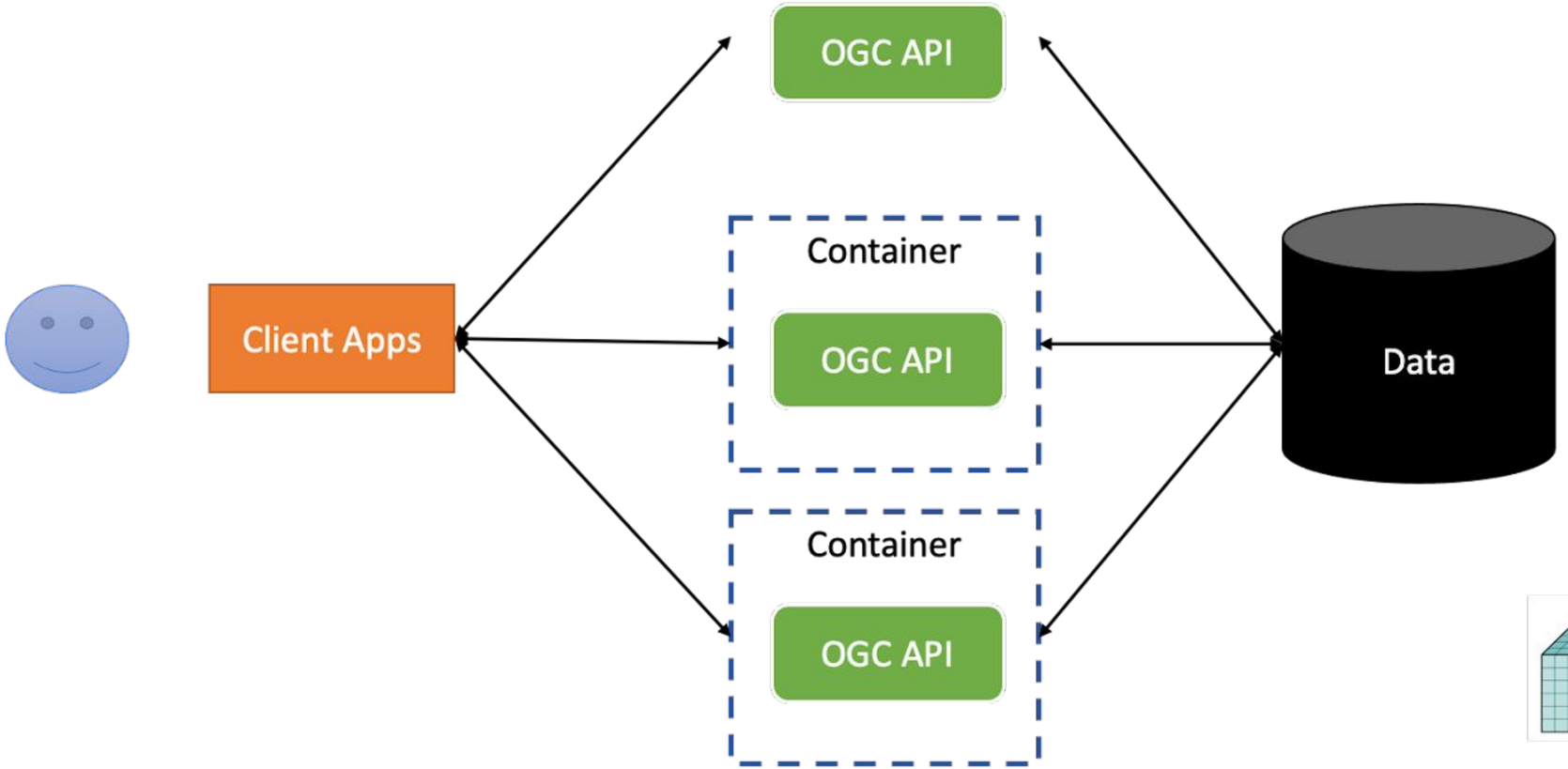
- Los formatos abiertos no tienen restricciones y están definidos por una especificación publicada.
- Los estándares son publicados y mantenidos por una organización de expertos, **no comercial**.



Everything is on GitHub, including the discussions

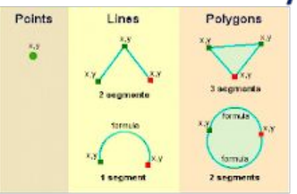


Deployment of OGC APIs as Microservices

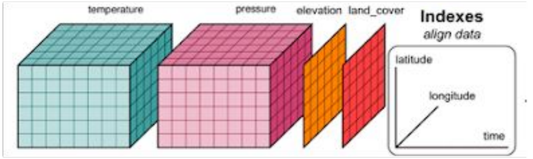


Map and Map Tile

Feature Geometry



Tiled Data and Coverage



Improved Developer Experience

Quicker onboarding for non OGC experts.