



STAC (Spatio-Temporal Asset Catalog) – for easy search and download

Spatial data analysis with R, 12.5.2023

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Our special expertise includes for instance research infrastructures, interoperability, and digital transformation



Turnover in 2022

64M€



One of the world's most eco-efficient datacenter in Kajaani



Non-profit state enterprise with special tasks owned by the state of Finland **70 %** and Finnish higher education institutions **30 %**



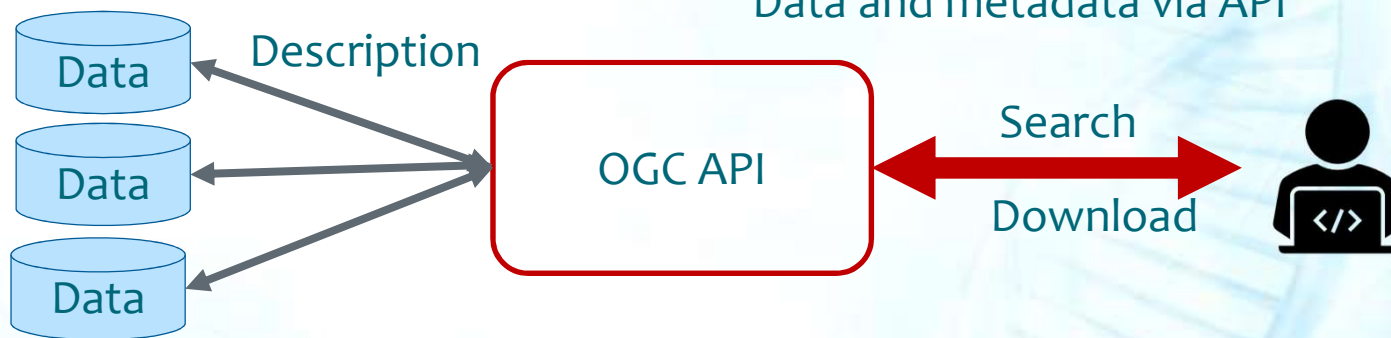
Approx.
618
employees in
2023

STAC - Spatio-Temporal Asset Catalog

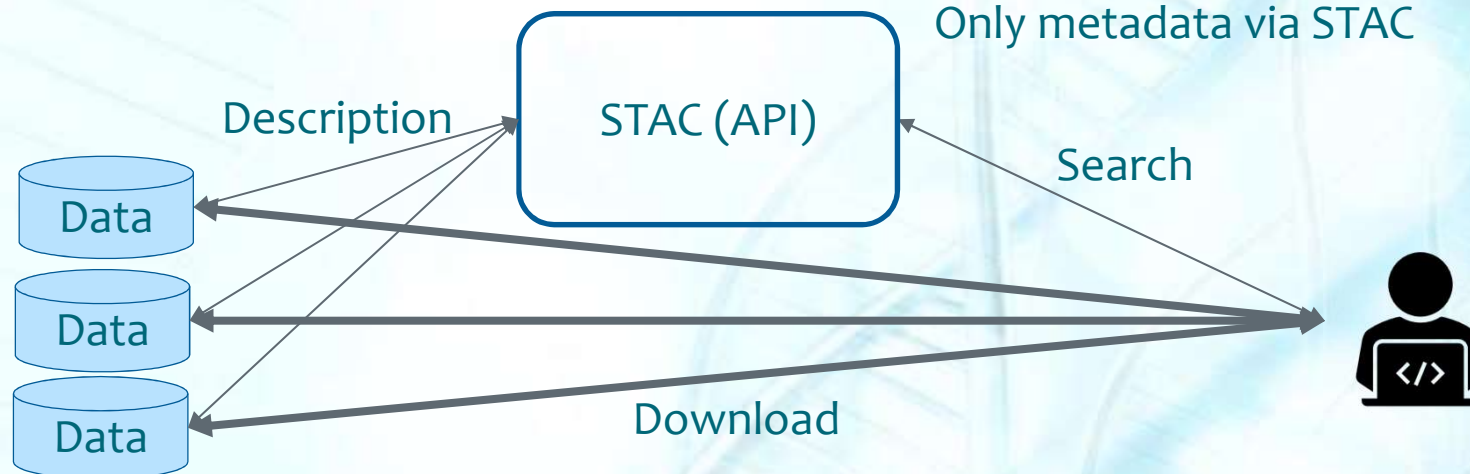
- Started in 2018, rapidly developing
- New de facto metadata and search standard
 - May become an OGC standard in the future.
- Describes datasets at the level of individual files.
- It is most commonly used for remote sensing data, but it is suitable for any data with **time** and **location** information.
- Users: ESA, USGS, Microsoft Planetary computer, Google Earth Engine,
 - FMI and CSC.



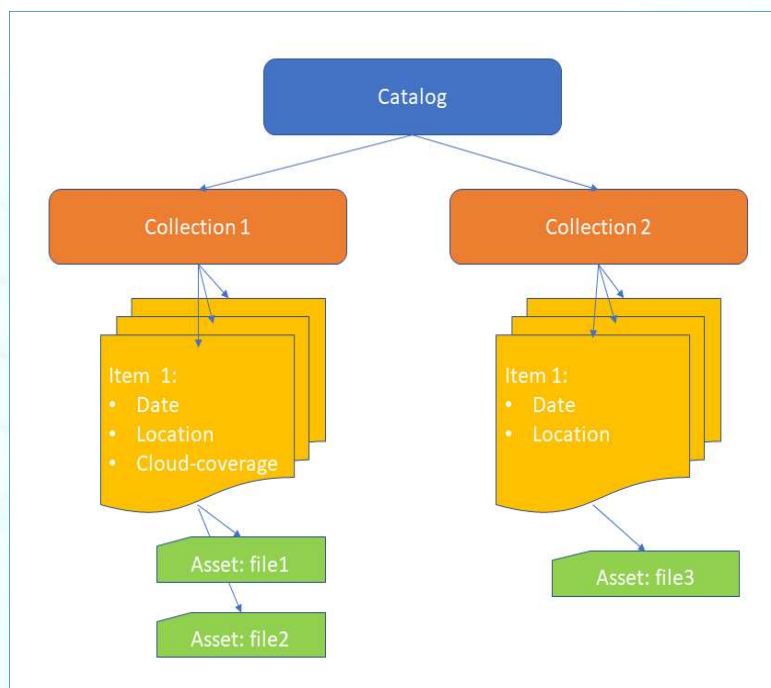
Data and metadata via API



Only metadata via STAC



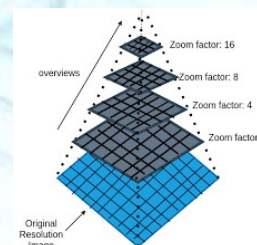
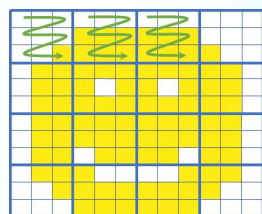
STAC terminology



- Luettelo
- Kokoelma
- Tuote
- Resurssi

Cloud-optimized file formats

- Enables partial loading of data
 - Only loads data for a specific area
 - Generalized version of the data is available
- Rasters: Cloud-Optimized GeoTiff (COG)
- Point clouds: Cloud-Optimized Point Clouds (COPC)
- Vectors: ?



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STAC API

- Search API
- Fits big datasets
- Main focus on Item level
- Search criteria:
 - **Collection**
 - **Location**: point, bbox, GeoJSON polygon
 - **Time**
 - Optional other Item values, for example cloud coverage

Tools for working with STAC

- Catalog search: [STAC Index](#)
- In web browser: [STAC Browser](#)
- QGIS: [STAC plugin](#)
- Python: [pystac-client](#), [stackstac](#), [xarray](#) and dask
- R: [rstac](#), [gdalcubes](#)
- PDAL: [STAC reader](#)
- ArcGIS for Python API
- Java, Julia, Ruby, Scala...



CSC Paituli STAC, Finnish spatial datasets

- ESA, Sentinel-2 products, Level-2A
- ESA/FMI, Sentinel-1 daily and 11 days backscatter mosaics: VV and VH polarisation.
- ESA/FMI, Sentinel-2 11-days and annual surface reflectance mosaics.
- ESA/SYKE, Sentinel-2 monthly index mosaics: NDVI, NDBI, NDMI, NDSI, NDTI.
- ESA, Sentinel-1 backscatter tiles: VV and VH polarisation.
- USGS/SYKE, Landsat (4 and 5) yearly index mosaics: NDVI, NDBI, NDMI, NDSI, NDTI.
- NLS, Digital terrain model products: DTM, aspect, slope.
- Finnish Forest center, Canopy height model.
- LUKE, Multi-source forest inventory products.
- LUKE, Forest wind damage risk map.
- FMI, Daily wind damage risk map.

Lisää aineistoja
tulossa lähiaikoina

CSC Paituli STAC

- Description: <https://paituli.csc.fi/stac.html>
- End-point: <https://paituli.csc.fi/geoserver/ogc/stac>
- [STAC Browser Paituli STAC:lle](#)
- Example scripts:
 - [Python](#)
 - [R](#)
- Feedback: servicedesk@csc.fi

Workshop: STAC - how to find and use spatiotemporal data easily?



- Topics of the workshop:
 - General introduction to STAC
 - Data contents of Paituli STAC
 - Hands-on exercise, how to use STAC from Python and R.
- 13.6.2023 at 13-15
- Open to everyone, for free. Online
- https://ssl.eventilla.com/stac_2023



Finnish Geospatial
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Location
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LUMI-supertietokone paikkatietoalan yrityksille

8.6.2023 09-11

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