
Open Data Science
WORKSHOP
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Introduction into geoprocessing services

Markus Neteler, Markus Metz (mundialis)
Martin Landa, Ondřej Pešek (CTU in Prague)

Why cloud computing?

Markus Neteler

With the tremendous increase of available geospatial and Earth Observation (EO) data lately driven by the European Copernicus programme (esp. the Sentinel satellites) and the increasing availability of open data, the need for computational resources is growing in a non-linear way.

Cloud technology offers a series of **advantages**:

- scalable, distributed, and high performance processing
- large quantities of EO and other geodata provided in dedicated cloud infrastructures
- addressing the paradigm of computing close to the data
- no need to bother yourself with the low-level management of tons of data.

(Ideally) enjoy the **five V's of big data**: Volume, velocity, variety, veracity and value.

Why cloud computing?

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Still, some critical **issues** have to be addressed in the geospatial realm:

- lack of Analysis-Ready-data (ARD) available for consumption in the cloud
- lack of compatibility between different data and processing systems
- an attempt for cross-backend compatibility: the openEO API
- lack of cloud abstraction, needed for easier move between vendors and providers.

OGC Specifications

Martin Landa

OGC Web Processing Service (WPS)

- rules for standardizing how inputs and outputs (requests and responses) for geospatial processing services
- How a client can request the execution of a process
- how the output from the process is handled (XML documents)
- Request examples:
  - *GetCapabilities*: http://157.90.183.85:8080/services/wps?service=wps&request=getcapabilities (link)
  - *DescribeProcess*: http://157.90.183.85:8080/services/wps?service=wps&version=1.0.0&request=describeprocess&identifier=aq-pm-aggregate (link)
  - *Execute*: http://157.90.183.85:8080/services/wps?service=wps&version=1.0.0&request=execute&identifier=aq-pm-aggregate&datainputs=start_date=2018-01-01;end_date=2018-01-14 (link)

OGC Specifications

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OGC API - Processes (OGC API)

- processing interface to communicate over a RESTful protocol using JavaScript Object Notation (JSON) encodings
- leverages concepts from the OGC Web Processing Service (WPS) 2.0
- newer and more modern way of programming and interacting with resources over the web
- Request examples:
  - HOME request: http://tb17.geolabs.fr:8088/ogc-api/
  - GetCapabilities: http://tb17.geolabs.fr:8088/ogc-api/processes
  - JobList: http://tb17.geolabs.fr:8088/ogc-api/jobs
  - Job: http://tb17.geolabs.fr:8088/ogc-api/jobs/6307d20e-cebc-11eb-9242-0242ac190006.html

Rest API

Markus Metz

- https://metzm.github.io/actinia-introduction/2_concepts/#rest-api-and-geoprocessing-basics