



# German Copernicus Data and Exploitation platform

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## BiDS'19 Munich

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Knowledge for Tomorrow





# CODE-DE: **C**opernicus **D**ata and **E**xploitation Platform – **D**eutschland (Germany)



- initiated 2016-07-01, online since 2017-03
- it is the German national Collaborative Ground Segment
- for public users, research institutions and commercial suppliers in Germany
- easy to use and modern user interface
- standardized OGC API interfaces
- performant free and open access to the Copernicus satellite data
- shared environment for value-added product generation
- compliant to INSPIRE and GDPR regulations



# CODE-DE.org Portal and Marketplace



Discover

Marketplace featuring  
discovery:

- Datasets
- Data Services
- Application Projects
- Processors
- Tools

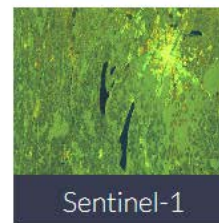
with INSPIRE and DublinCore  
metadata display



The Copernicus Data and Exploitation Platform – Deutschland (CODE-DE) is the German entry point to the Sentinel Satellite Systems, their data products and the products of the Copernicus Services.

[read more >](#)

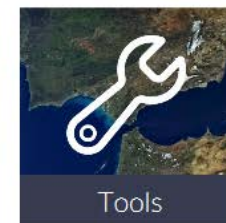
## Featured Content



Sentinel-1



Sentinel-2



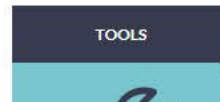
Tools



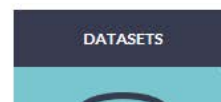
MAP



MARKETPLACE



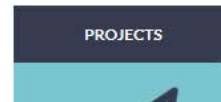
TOOLS



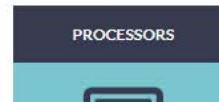
DATASETS



SERVICES



PROJECTS



PROCESSORS

## Latest News



January 16, 2019 - 16:00  
CODE-DE Demo on "big data from space" 2019 Conference, 19th - 21st Feb. 2019, Munich

January 15, 2019 - 11:00  
CODE-DE Training Materials available on Help (German version)

January 15, 2019 - 11:00  
CODE-DE System Update - Downtime: Maintenance/ Update on Thursday, 17th Jan. 2019, from 14:00h to 16:00h (CET)



GET IN CONTACT WITH OUR  
USER-HELPDESK ...

... or check out our USER MANUAL

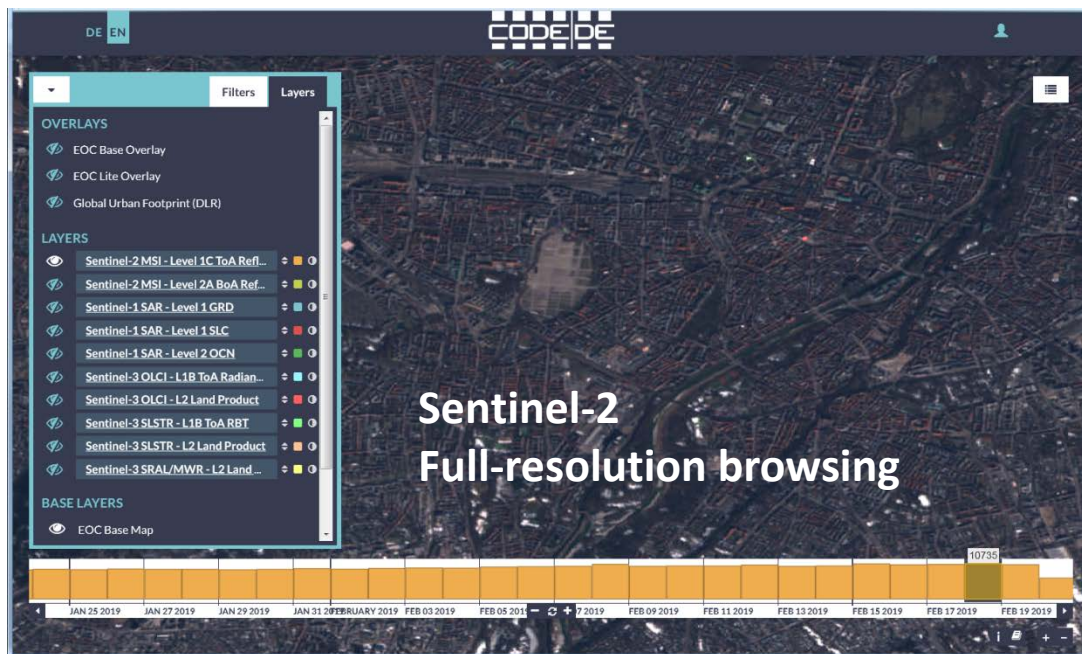


# CODE-DE.org

## Online Data Discovery and Access (1/3)

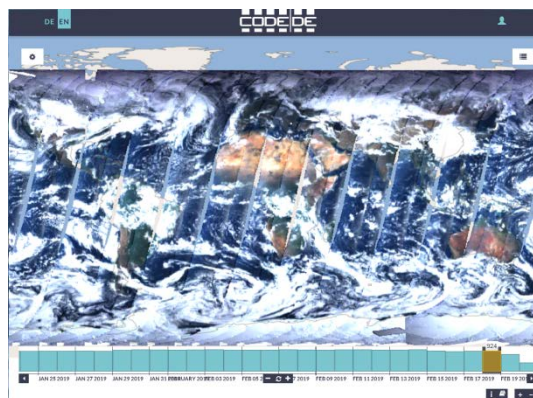


Browse



- View Service with product catalogue
  - Sentinel-1 browse and query on the fly
  - Sentinel-2 and -3 full-resolution browsing
  - Timeline with catalog population
  - Direct interface to download and processing services

S2FRB/S3FRB generated on processing platform (docker on VM/processing nodes)



Storage retention time

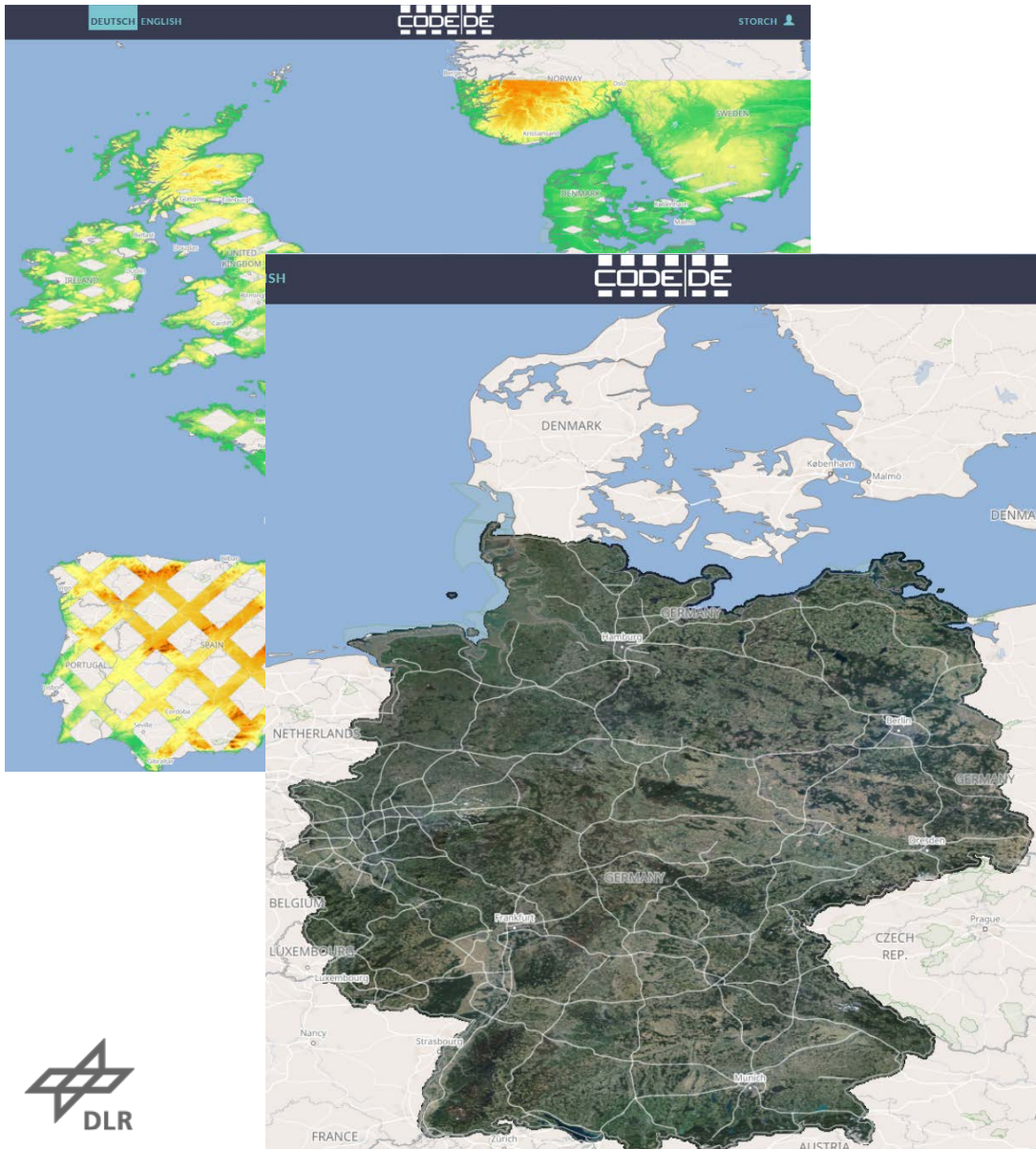
- Global: 1 month (S1 SLC 0,25 month)
- Europe: 12 months
- Germany: 36 months



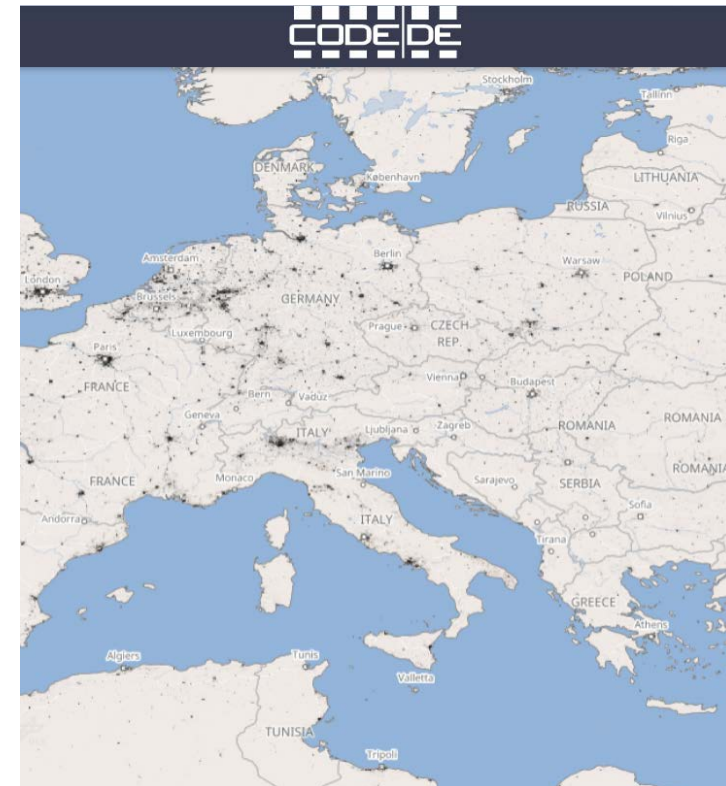


# CODE-DE.org

## Online Data Discovery and Access (2/3)



- GeoService including RapidEye Science Archive (RESA) and SRTM X-Band DEM, Global Urban Footprint, etc...



# CODE-DE.org

## Online Data Discovery and Access (3/3)



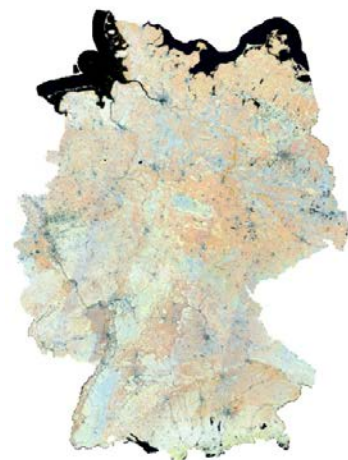
Download

Index of /S2\_Temporal\_Features/2017/

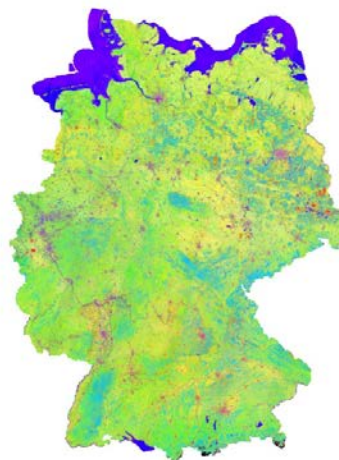
File Name ↓	File Size ↓	Date ↓
Parent directory/	-	-
<a href="#">S2_DLR_2017_N1_T31UFS_201704231400.zip</a>	3144246363	2018-04-27 07:07
<a href="#">S2_DLR_2017_N1_T31UFT_201704231400.zip</a>	2774418728	2018-04-27 07:09
<a href="#">S2_DLR_2017_N1_T31UGO_201704231400.zip</a>	3164030373	2018-04-27 07:12
<a href="#">S2_DLR_2017_N1_T31UGR_201704231400.zip</a>	1598385591	2018-04-27 07:13
<a href="#">S2_DLR_2017_N1_T31UGS_201704231400.zip</a>	1077129523	2018-04-27 07:14
<a href="#">S2_DLR_2017_N1_T31UGT_201704231400.zip</a>	1535401519	2018-04-27 07:15
<a href="#">S2_DLR_2017_N1_T31UGU_201704231400.zip</a>	2176682679	2018-04-27 07:16
<a href="#">S2_DLR_2017_N1_T31UGV_201704231400.zip</a>	244403533	2018-04-27 07:17
<a href="#">S2_DLR_2017_N1_T32TLT_201704231400.zip</a>	3718265979	2018-04-27 07:19
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		2018-04-27 07:28
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		2018-04-27 07:31
		2018-04-27 07:32
		2018-04-27 07:34
		2018-04-27 07:36
		2018-04-27 07:36

- WCS (INSPIRE)
- HTTP based
  - Directory view
  - high performance direct download
  - LTA historical data retrieval
  - access control, quotas

- Value-added Products
  - Maritime Products



RGB NDVI max-mean-min 2014-2015

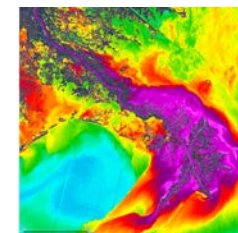


RGB NDBI-max, NDVI-max and NDWI-mean 2014-2015

- Urban
- Water
- Coniferous
- Deciduous
- Grassland
- Cropland
- Wetland
- Open Soil
- Permanent Crops



- [30STE/](#)
- [30TXQ/](#)
- [30TXR/](#)
- [32UME/](#)
- [32UMF/](#)
- [32UNF/](#)
- [32UPD/](#)
- [32UPE/](#)
- [32UPF/](#)
- [33XWH/](#)
- [33XWJ/](#)
- [50RMC/](#)



TUR (°FUS)  
0.1  
0.3  
-1.0  
-2.0  
-4.5  
10  
30  
100

- Temporal Feature Extraction
- Cloud-filtered mosaic of Germany
- TerraSAR-X Supersites





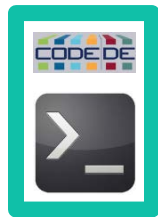
# CODE-DE.org Big Data Processing



Process



Upload



Command

Processor

## Private Cloud with

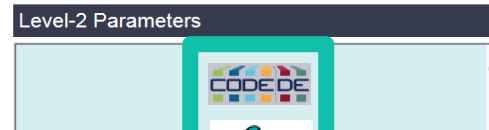
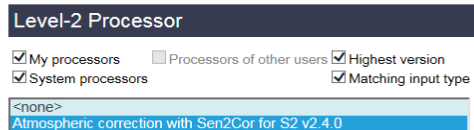
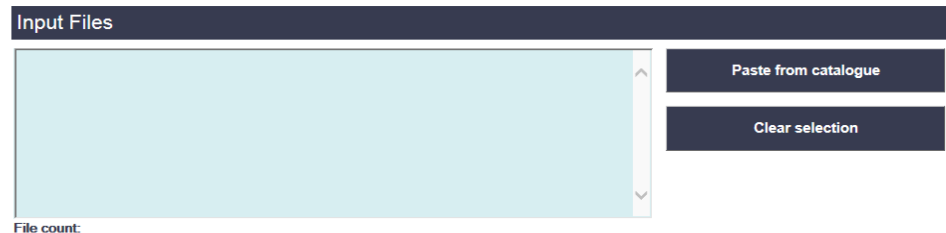
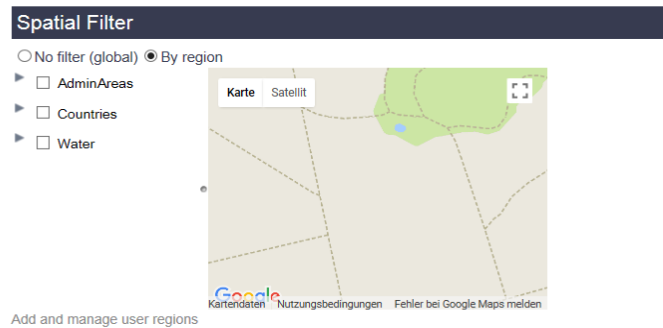
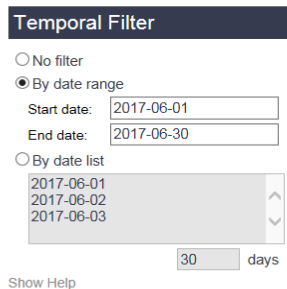
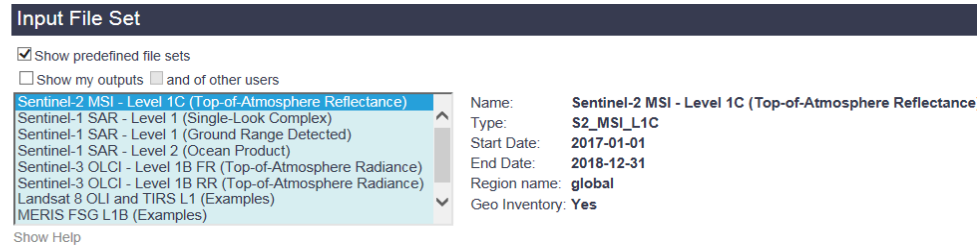
- web user interface
- command-line interface
- WPS

## Processor selection from

- system-provided processors
- user-provided processors

## Features

- fair queue scheduling for processing cluster
- runs binaries and docker containers
- direct and high performance access to online data archive
- Application hosts for developers



Work

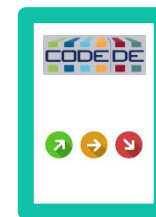


# CODE-DE.org Helpdesk and FAQ



## Help/FAQ

and much more ...



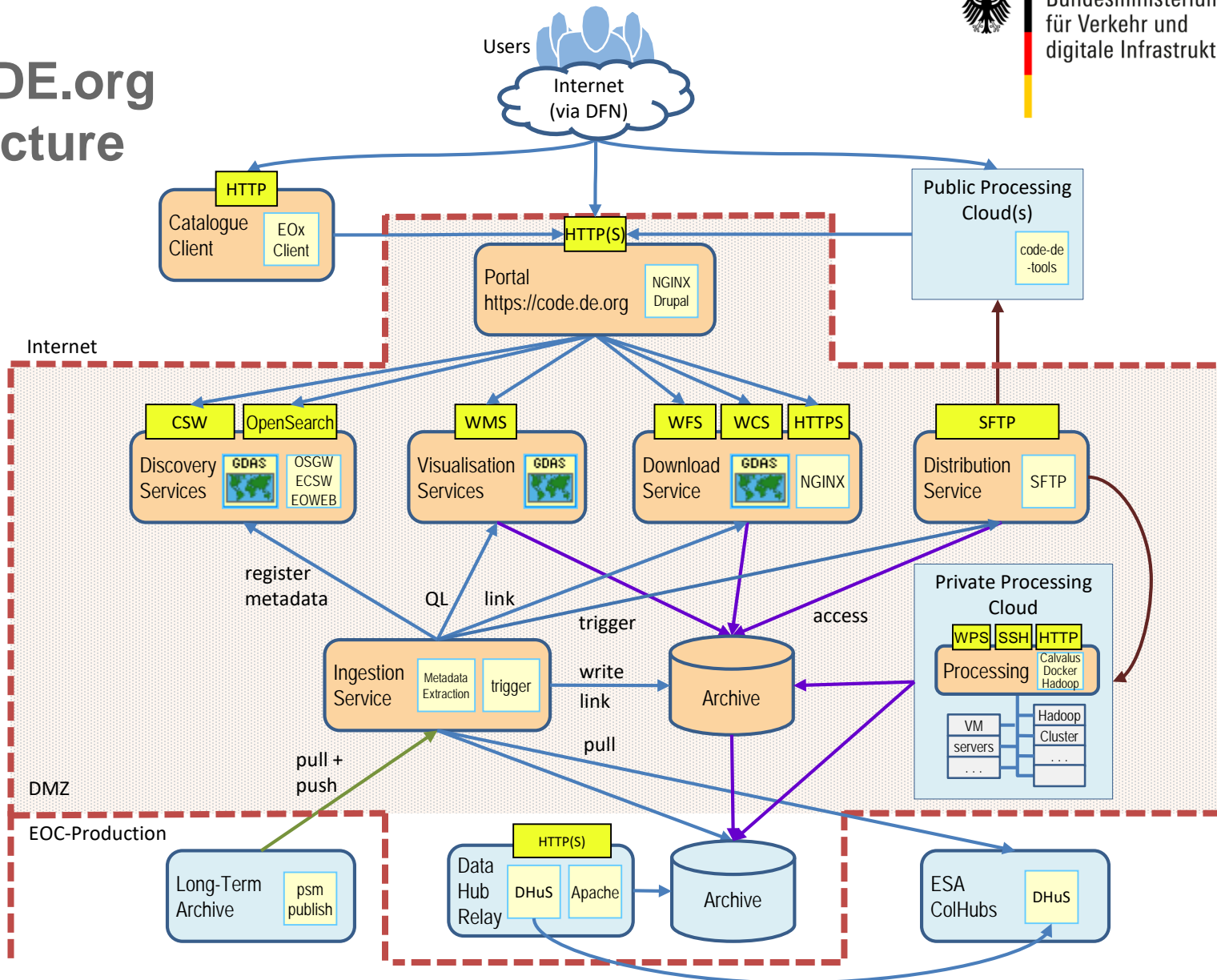
Monitor





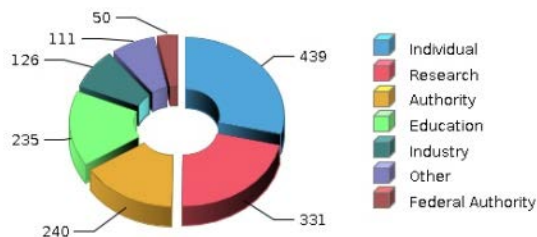
# CODE-DE.org Architecture

- Governance
- User Management
- Monitoring
- Reporting
- Help Desk



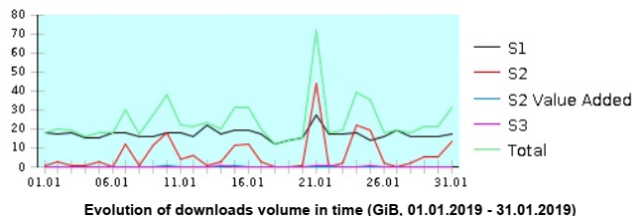
# Current Usage – some statistics (Jan. 2019)

## Users



1.469 Users  
(1.256 German)

## Data/product download



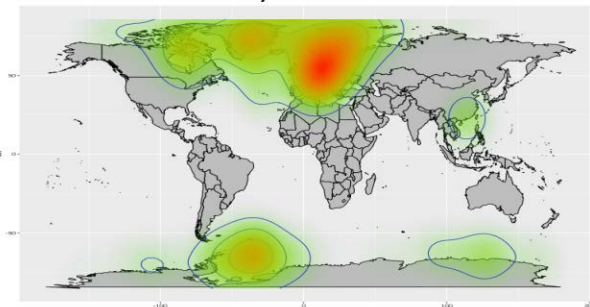
Since start:

S1: 62867

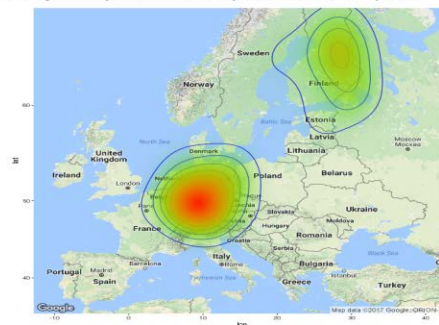
S2: 54761

S3: 1503

## Areas of Interest



The density of complete downloaded products worldwide (01.01.2019 - 31.01.2019)



The density of complete downloaded products over Europe (01.01.2019 - 31.01.2019)

## Processing (since April 2018)

Processing	Input products (number)	Output products (number)	Processing time (sec)	Core Hours	RAM hours (GiB hours)	Jobs executions
April	423.585	173.482	2.846.329	11.578	65.440	2.588
May	519.236	135.671	6.598.847	17.776	63.520	3.425
June	294.910	28.670	5.284.009	25.152	61.821	2.414
July	373.988	30.849	2.140.886	6.826	25.577	2.726
Aug	483.470	158.579	3.510.536	16.620	65.271	3.977
Sep	394.837	60.652	9.437.989	13.638	55.372	5.438
<b>Total</b>	<b>2.490.026</b>	<b>587.903</b>	<b>29.818.596</b>	<b>91.590</b>	<b>337.001</b>	<b>20.568</b>





# Data and Exploitation Platform

## The way forward:

- Current service until end 2019
  - Improvements of Catalog Client
  - Integration of
    - Sentinel-5P
    - Value-adding processors
- CODE-DE Next Generation Operational Platform integrated into DIAS for national authorities
  - sharing product online archive with DIAS
  - flexible provisioning
  - elastic processing cloud
  - automate deployment
  - ...



Bundesministerium  
für Verkehr und  
digitale Infrastruktur





<https://code-de.org>

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