Sen4CAP Online training
April 2020

System installation: ICT requirements and procedure

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1) System summary
2) ICT requirements
3) Installation procedure
    - Create user accounts on the data provider platforms
    - System download
    - MAJA download and installation
    - System installation
    - Configure data provider accounts
    - Configure data sources

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System summary

- **Open source**
- Can be installed on **cloud** but also on **local servers**
- Can connect to a **variety of data sources** for downloading/importing the lower-level products (SciHub, USGS, DIAS-es, Alaska Satellite Facility (ASF), etc.)
- **Automatic ingestion and pre-processing** of the lower-level products
- **Automatic execution** of advanced processors
- **Manual execution** of processors
- **Modular** and **extensible**

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ICT requirements

- Disk space for system installation -> 80 GB
- Disk space for the resulted products (/mnt/archive/) -> depends on the extent of the site(s) to monitor
- Disk space for the internal directory where data are uploaded from the web interface to be used by the system (/mnt/upload/) -> depends on the extent of the site(s) to monitor
- RAM -> between 64 and 128 GB, depends on the extent of the site(s) to monitor
- Number of CPUs -> between 8 and 16 processors (or more), depends on the extent of the site(s) to monitor
- Operating system: CentOS 7 (minimum version 7.5) 64-bit

ICT requirements – 2019 production (whole season)

	Small site Lithuania - 65,300 km²	Large site Romania - 238,400 km²
ICT requirements		
CPUs	8	16
RAM	64 GB	128 GB
Storage HDD	4 TB	4 TB
Storage SSD	150 GB	250 GB
Object storage	~ 4 TB	~ 12 TB
Products volumetry (including intermediate products)		
S2 L2A	~ 3.5 TB	~ 9 TB
S1 amplitude and coherence	~ 2 TB	~ 4 TB
S2 biophysical indicators	~ 1 TB	~ 2 TB
L4A crop type	~ 2 TB	~ 4 TB
L4B grassland mowing detection	~ 25 GB	~ 50 GB
L4C agricultural practices monitoring	~ 600 GB	~ 2.2 TB
Total products volumetry	*~ 9.1 TB*	*~ 21.3 TB*

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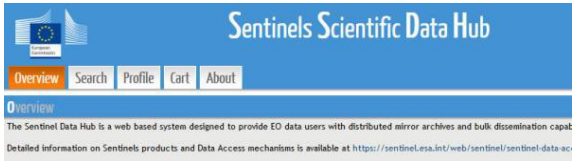
    - **Configure data sources**

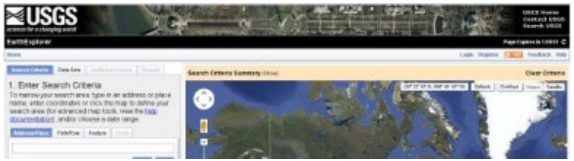
STEP 1
Create user account on data provider platforms

- **To query the list of S1, S2 and L8 acquisitions** and/or **download lower-level products**, the system will need 2 accounts to be provided after the installation

  - An account and a password for the **ESA Sentinels Scientific Data Hub (SciHub)**. This account can be obtained accessing https://scihub.copernicus.eu/dhus/#/home



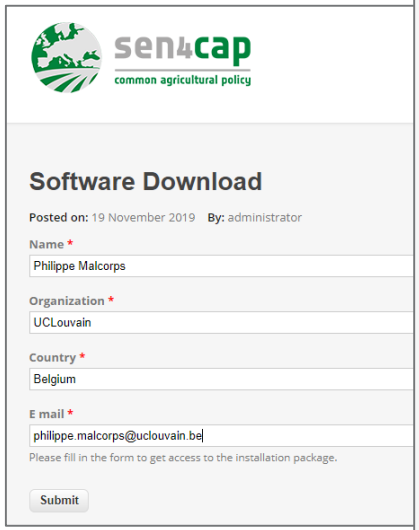
  - An account and a password for the **United States Geological Survey (USGS)** portal. The account can be created accessing the link https://ers.cr.usgs.gov/login/ (if L8 desired)



STEP 2
System download

- Go on Sen4CAP website: http://esa-sen4cap.org/

-> Data & Tools -> **Download Software**



Installation package

The installation package of the Sen4CAP system has been split into **4 parts** to ease its download:

- A zip archive containing all the necessary binaries and setup scripts (not considering MAJA, see below) [866MB]:
  - install_script – contains the installation scripts that are used to create the distribution and to install the system and the tool needed for the integration of the Sen4CAP processors in SNAP
  - rpm_binaries – the RPM files for all other system components (SLURM, orchestrator, downloader, processors)
- A zip archive containing the GIPP files [~1.2GB]: files needed by MAJA 3.2.2
- A zip archive containing the SRTM dataset [~16 GB]: files needed by MAJA 3.2.2
- A zip archive containing the SWBD dataset [~900 MB]: files needed by MAJA 3.2.2

IMPORTANT: MAJA 3.2.2 - that is used by the Sen4CAP system for the atmospheric corrections and non-valid pixels masking – is not included in the installation package of the Sen4CAP system and has to be downloaded separately from the CNES site. Nevertheless, MAJA must be installed before running the Sen4CAP installer, as described in the Software User Manual. The Sen4CAP installation script will look for the executable and prompt for its installed path location.

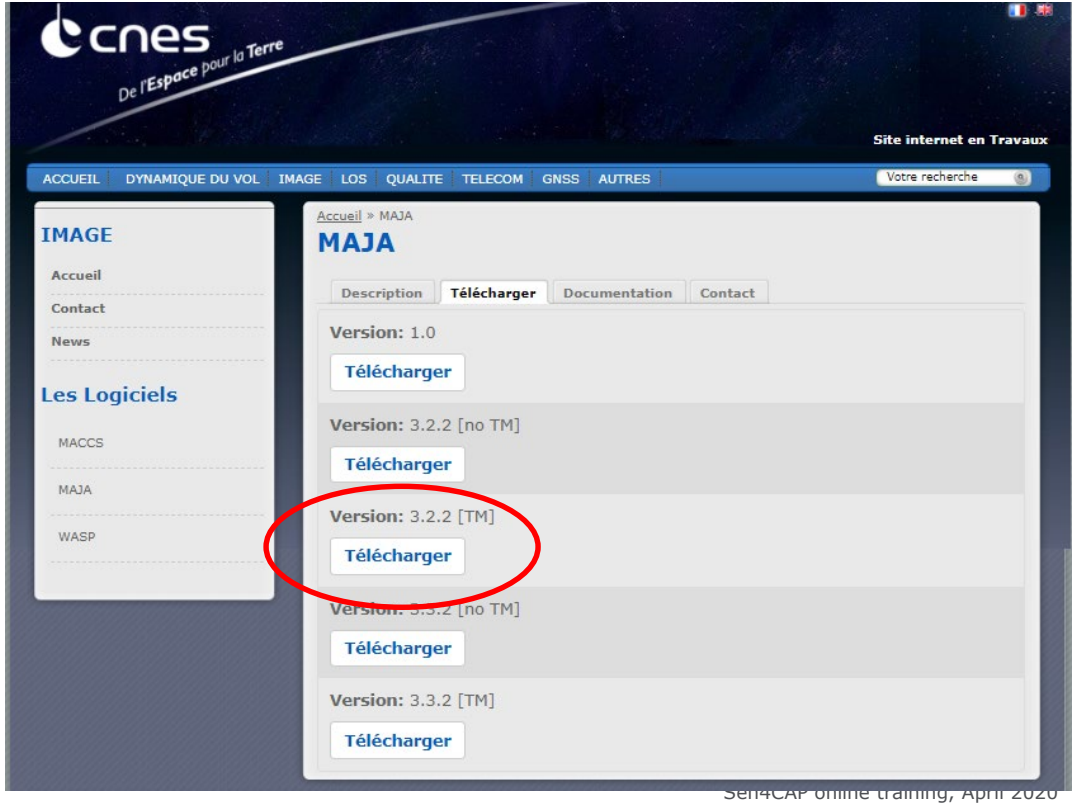
User manuals

Download the latest Software User Manual.

SUM

STEP 3
MAJA download and installation

- Go on CNES website: https://logiciels.cnes.fr/
- Download version 3.2.2 TM
- MAJA installation **prior to the Sen4CAP system installation**
- Instructions for installation are provided by CNES inside of the MAJA installation package



STEP 4
System installation

- Before the installation, some **default directories** have to be created in the system either physically or mounted. The default directories are:
  - **/mnt/archive** = working directory for the system
  - **/mnt/upload** = where the files are uploaded from the web interface
- **Copy installation package** on the machine
- **Copy srtm.zip and swbd.zip** in the root folder of the installation package
- Run the following commands:

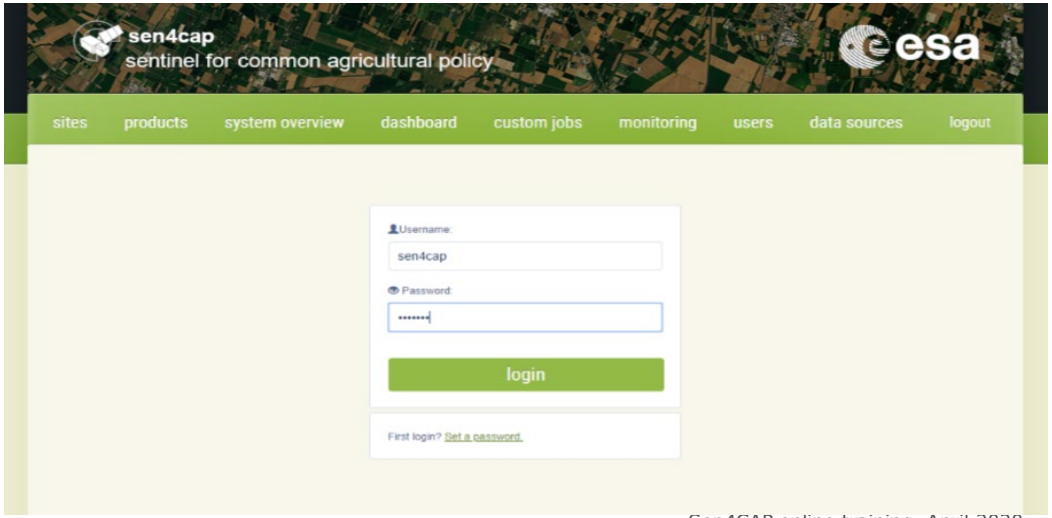
```
## open a terminal -- go into /install_script folder:

cd /path/to/Sen4CAPDistribution/install_script

## Run the install script

sudo ./sen4capPlatformInstallAndConfig.sh
```

STEP 4
System installation

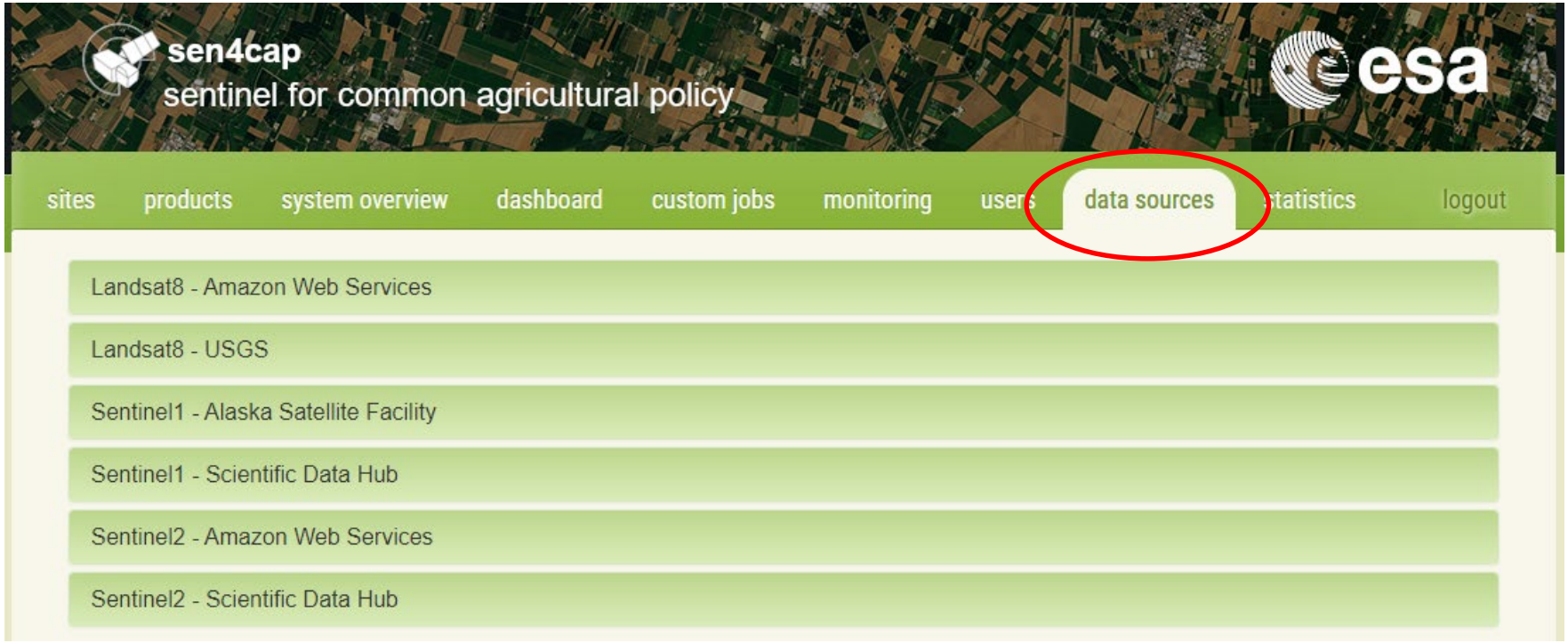
- And then, this **script will install the system**
  - SLURM, orchestrator, downloader, processors, database, web interface, and all other dependencies
  - **completely automatic**, requiring minimum interaction from the user

STEP 5
Configure data sources

- After the installation is finished, the web **Graphical User Interface (GUI)** of the system can be accessed from any web browser
- The following addresses allow the **access**:
  - If the user is connected to the same machine as the Sen4CAP system: http://localhost
  - If not: http://{ipadress}



STEP 5
Configure data sources



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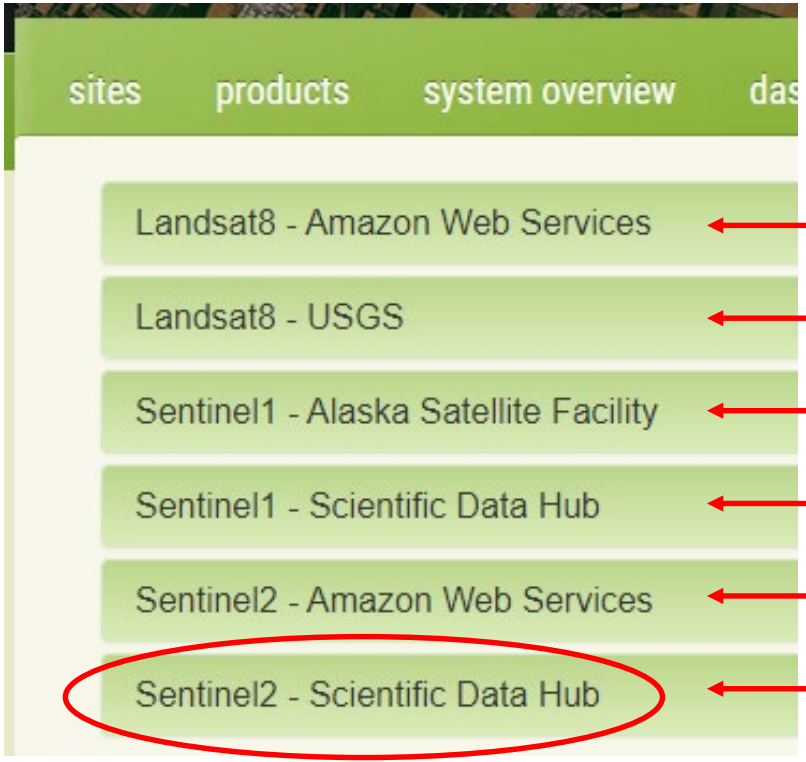


Only used for systems installed on an Amazon Web Services VM

Landsat 8 configuration

When using Alaska Satellite Facility provider

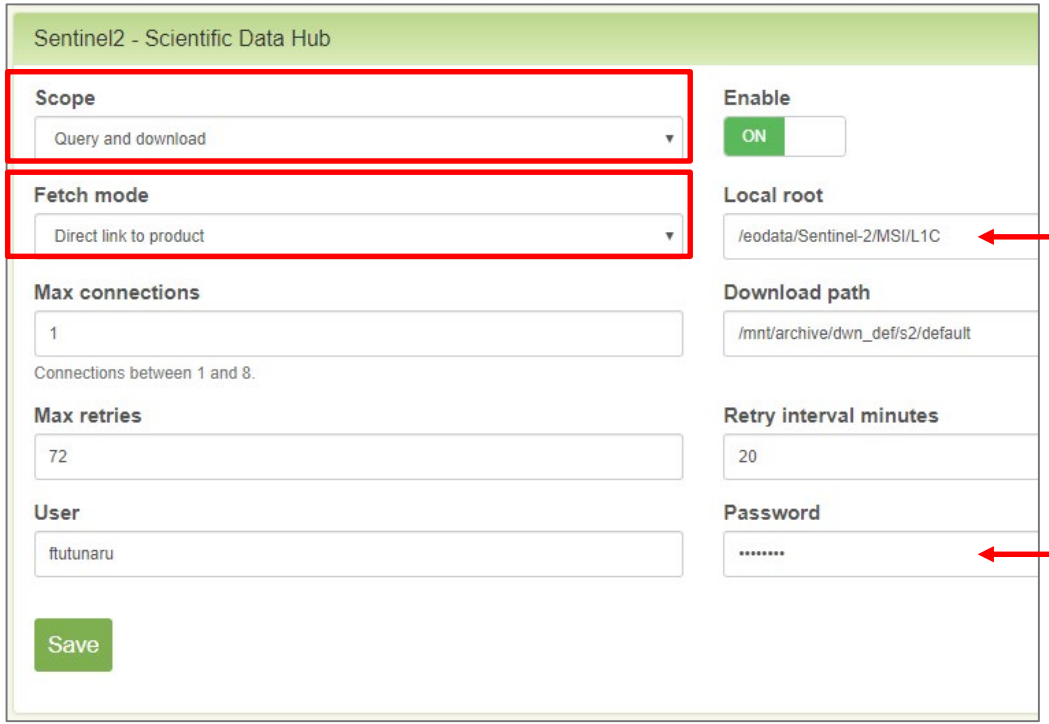
Sentinel 1 configuration

Only used for systems installed on an Amazon Web Services VM

Sentinel 2 configuration

STEP 5
Configure data sources

- Typical configuration when system installed on a DIAS VM (CreoDIAS)



Where the system will look for S2 L1C data, if local archive available

User account and password to connect to **SciHub**
-> mandatory for all configurations