

CDI Replication: The new ingestion process

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The data ingestion (to the cloud)

demonstration of process, live and via screens

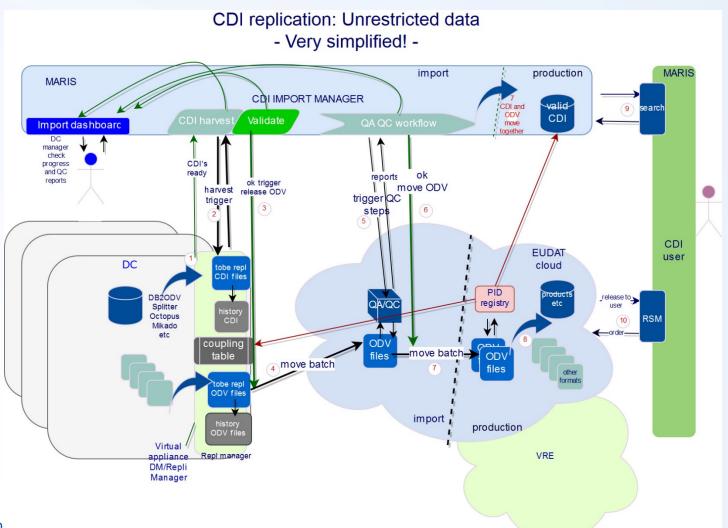


Main components

- Replication manager
- Import manager
- EUDATs HTTP API
- B2SAFE (Cloud storage)



Overview unrestricted dataflow





Remarks unrestricted

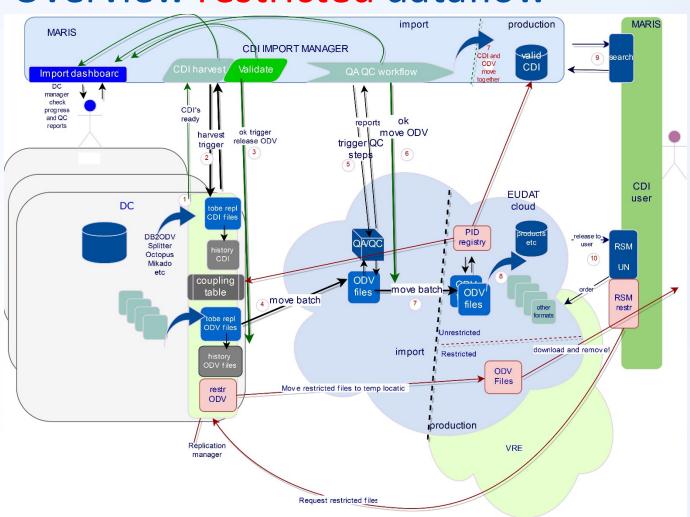
The main solution is designed for Unrestricted (UN/LS) data where the process of QA/QC and file format conversions in the cloud are involved.

Important steps:

- The CDI import manager is guiding the process of CDI and ODV release and QA/QC towards production.
- At data center there is production of CDI and ODV (or one other accepted exchange data format) using the stack of tools produced at IFREMER: DB2ODV, Splitter, Mikado, Octopus etc.
- Replication Manager at the Data Center is triggered by import manager to:
 - Move a batch of CDI files to CDI central server
 - Follow up requests to move a batch of ODV files triggered by import manager. One batch at a time handled by the system.
- After moving a batch it is archived by the RM (history of full situation).
- The EUDAT cloud consists of a area for Import and an area of Production. During import QA/QC processes will be triggered by the CDI import manager after which reports flow back. After an ok the datasets will be made available in production. Again moved after a trigger from the import manager.
- When a dataset moves to production the PID is reported back to import manager and DC (coupling table)
- The DC data manager (and masters) can follow progress and if necessary take actions to get to a next stage, or e.g. discard the set and release a new updated batch.



Overview restricted dataflow





Remarks restricted

Replication Manager at the Data Center is for restricted data triggered by RSM to:

- Follow up requests for releasing and moving a set of restricted data
 - Only when allowed by the DC via confirmation in the RSM
 - Directly to a "user section" in a restricted part of the cloud where it will be available to the user to download it for limited time.
 - After download it will be removed.

Replication of RS data is a sensitive step:

- Trust is needed from the DC in the secure part of the cloud to temporarily store the data
- But, working with the same "trigger and move" process/protocols for each release of data makes it simpler
- The set will be removed in the cloud once downloaded, so it is ready for the next batch.



6 steps in the unrestricted data ingestion process

- 1. Authentication
- 2. Publishing metadata
- 3. Checking metadata
- 4. Uploading a databatch
- 5. Unzip and run data checks
- 6. Move validated metadata and data in production

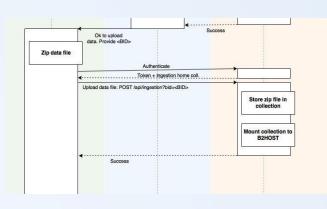


Step 1: Authentication

The problem:

RM needs to access the Import Manager and the EUDAT B2STAGE HTTP-API through a software (RM).

Data center contacts needs to access the IM dashboard.



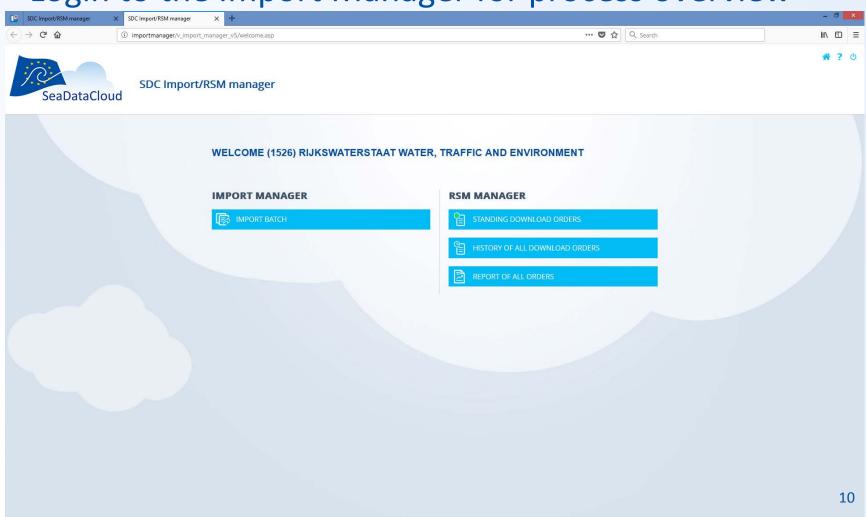
The solution

- 1. Every RM registers to the B2ACCESS web site. MARIS prepared neutral "@sdn-taskmanager.org" addresses. These are forwarded to the RSM contacts marinelD's.
- 2. DC configures the RM to use the credentials
- 3. RM calls /auth/b2accessproxy with credentials
- Data center contacts linked to the IM via their MarineID can contact the IM dashboard





Login to the Import Manager for process overview





Step 2: Publishing the CDI metadata

The problem

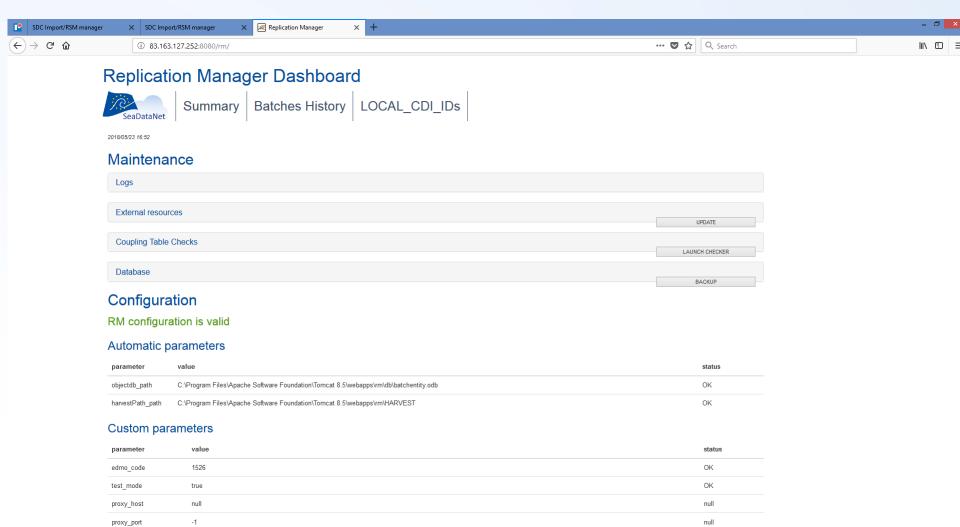
- RM needs to notify the Import Manager a new batch is ready (RM)
- IM will download when ready

The solution

- DC manager puts one or more batches in publish-directory
- 2. RM triggers
- 3. IM downloads the CDI metadata batch
- 4. One batch at a time in the process

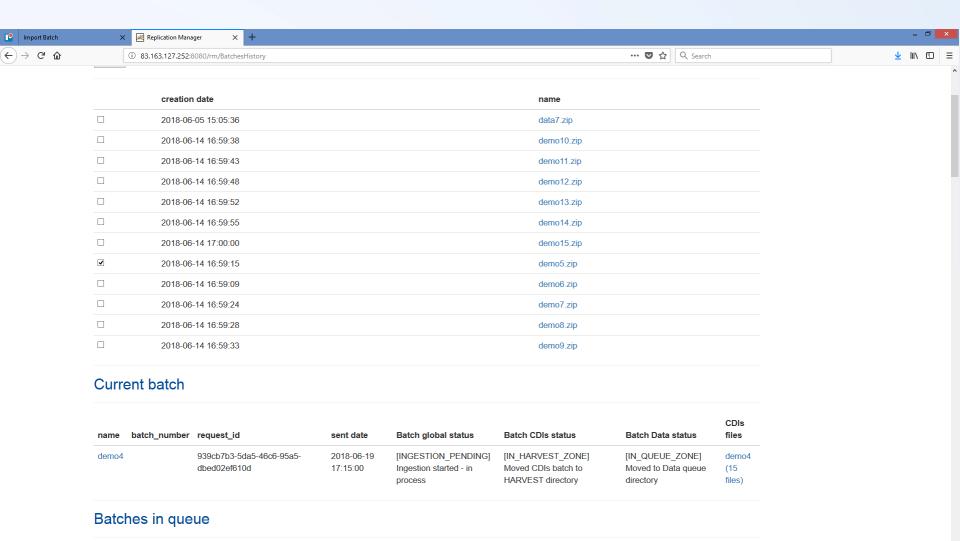


View of RM dashboard



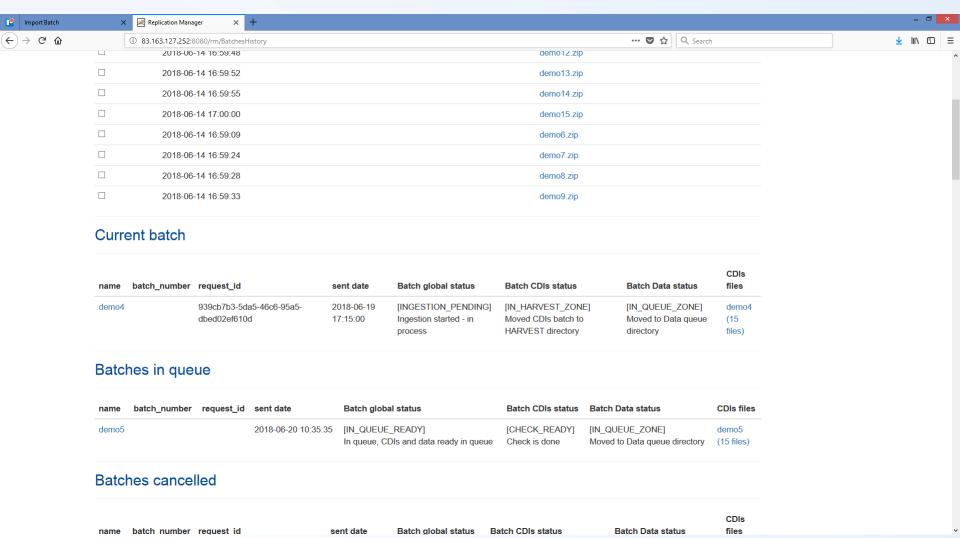


RM: Go to "batches history" to select



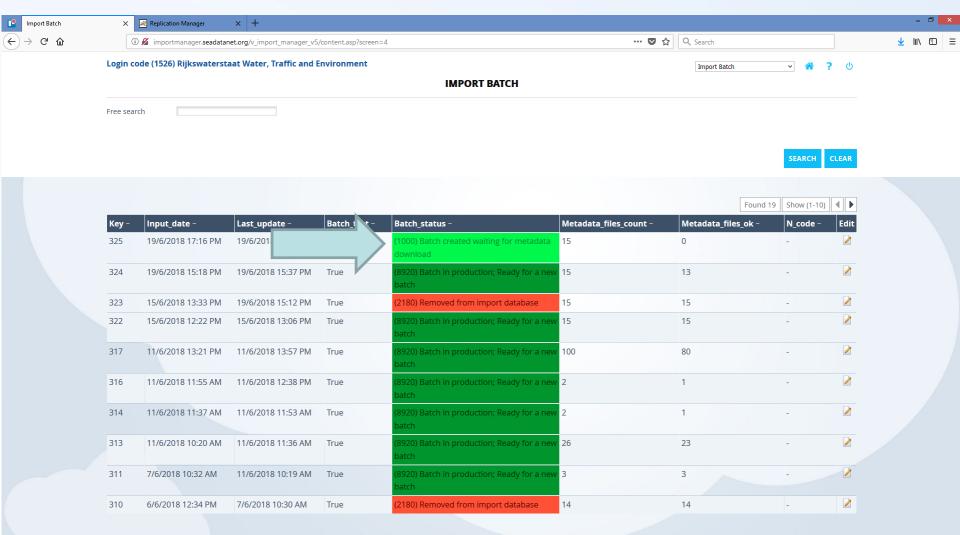


RM dashboard: CDI Batch ready notification submitted



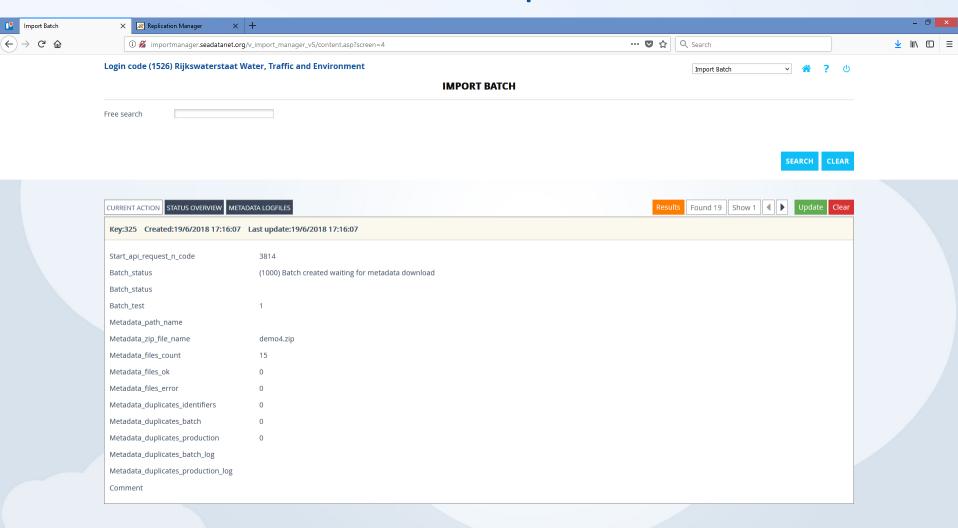


IM: Notification of CDI batch received, waiting for download



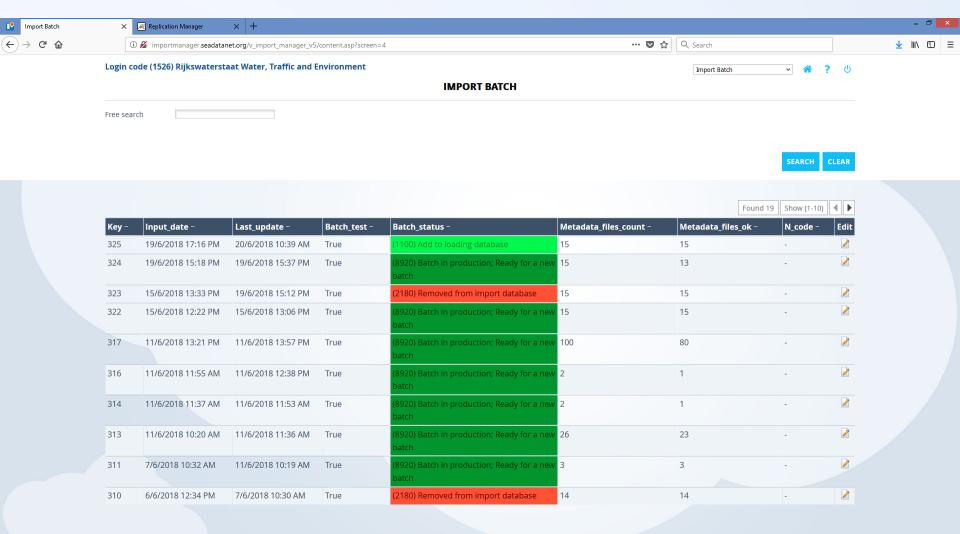


IM: View into the batch specs



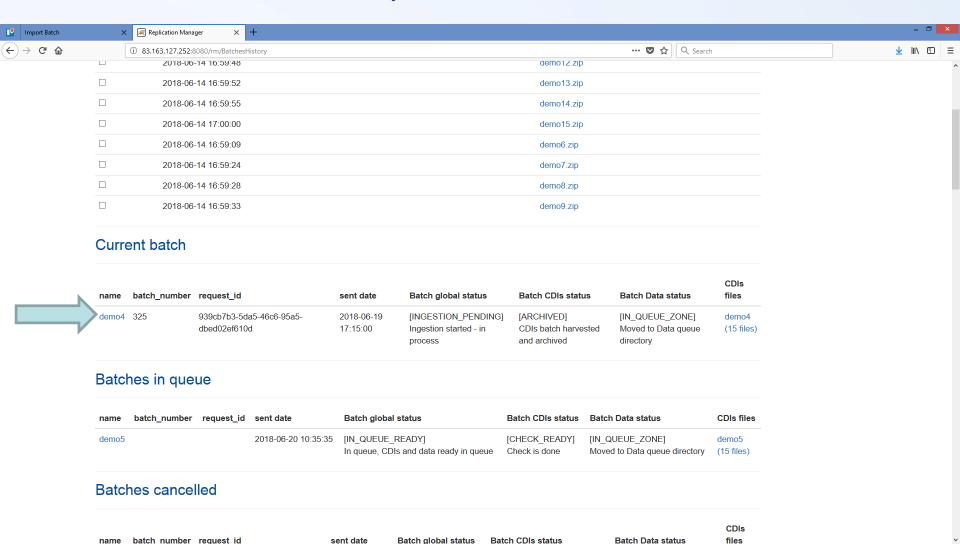


IM: Batch now received, ready to load





RM: Batch received by IM - Now indicates batchnumber





Step 3: Checking the CDI metadata

The problem

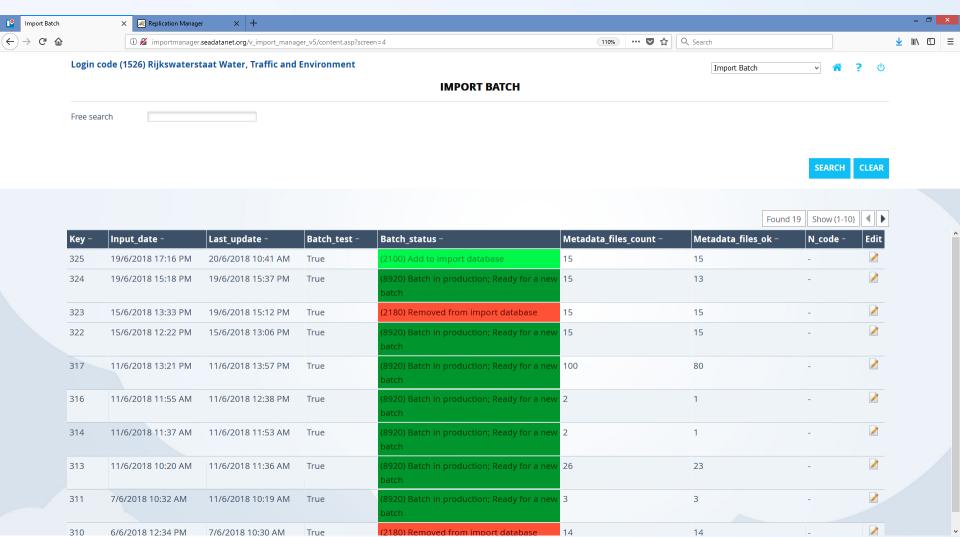
- Import Manager to check the CDI XML and its content
- RM manager to check also visually

The solution

- 1. Unzip the batch
- 2. Run sequence of checks (same as current)
- 3. All logs added to IM CMS
- 4. Metadata loaded to import database
- 5. RM notified visual check in import is needed
- 6. RM manager decides which files continue to next steps

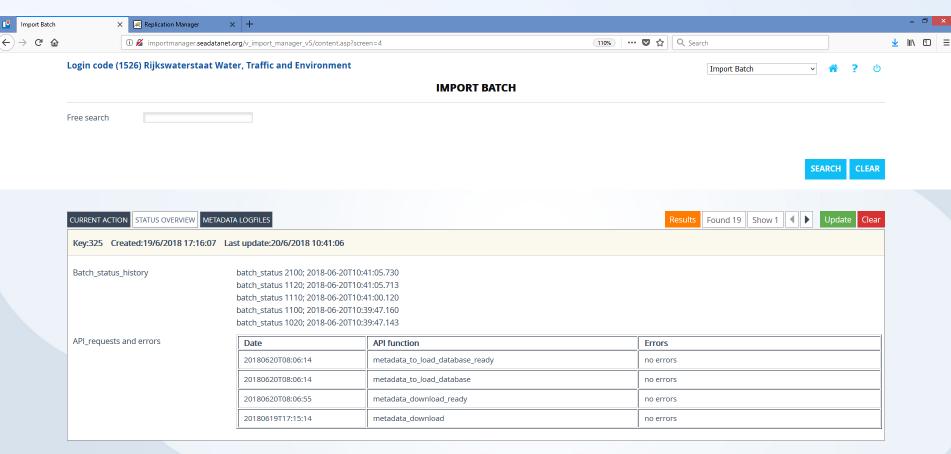


IM: Batch checked and ready to load in import



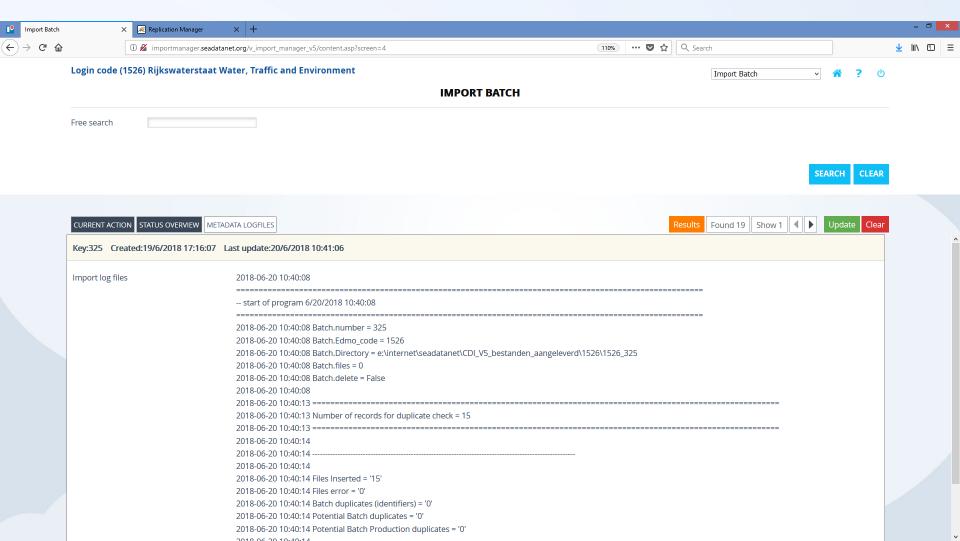


IM: History of steps in process passed



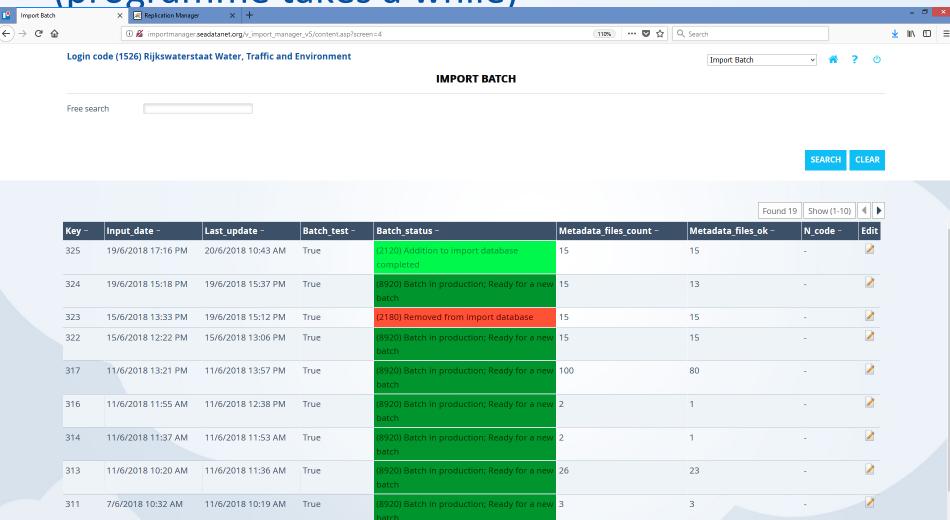


IM: Status progress and logs XML validation available



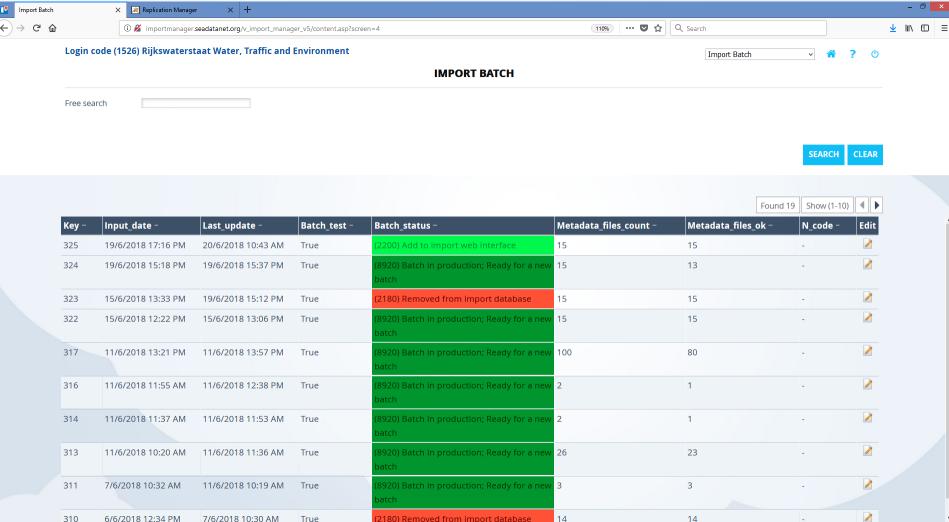


IM: Move to import database and interface (programme takes a while)



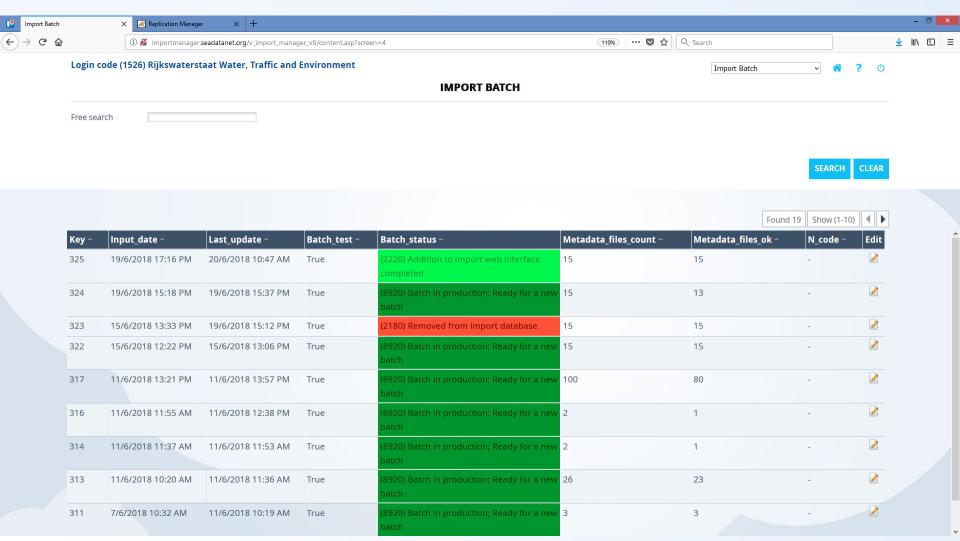


IM: All ok, ready to load to webinterface (build up tables, elastic search, etc)



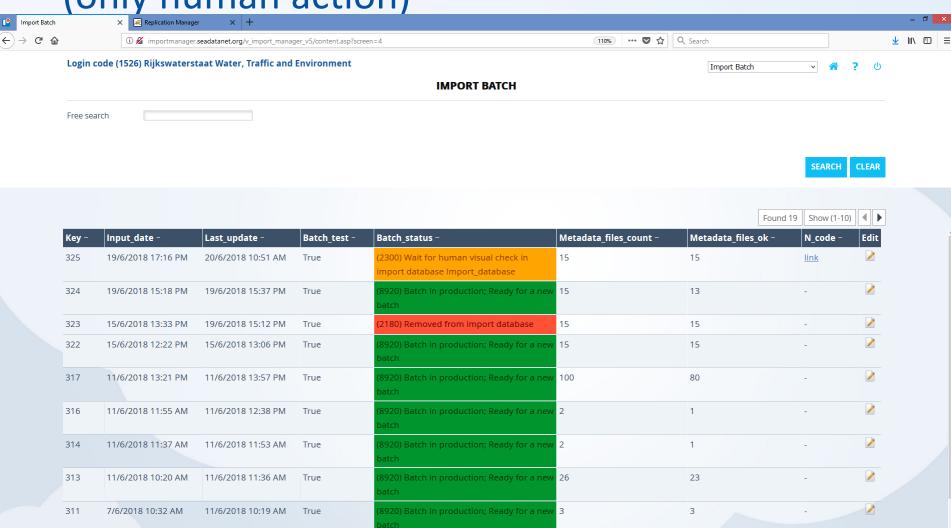


IM: Almost ready ... (preparing links)



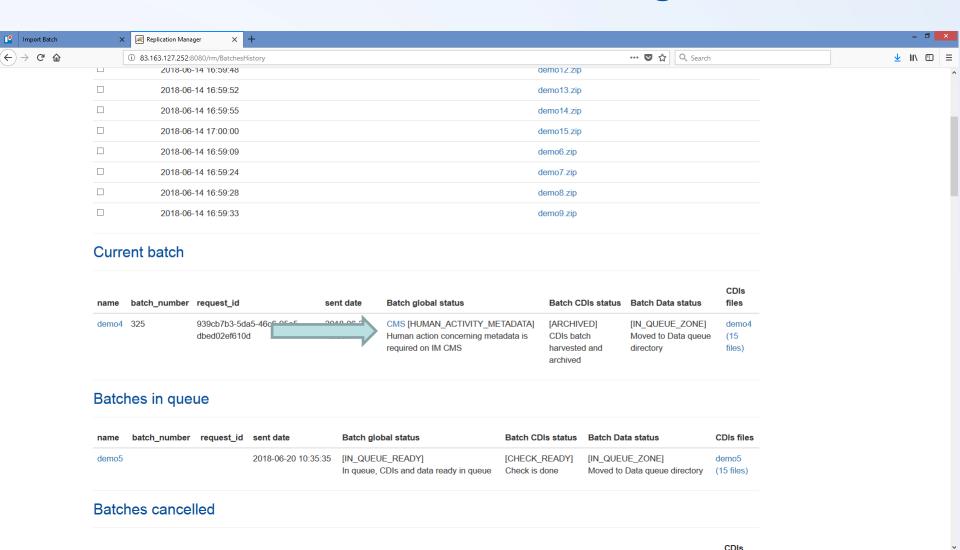


IM: Ready to visually check logs and interface (only human action)



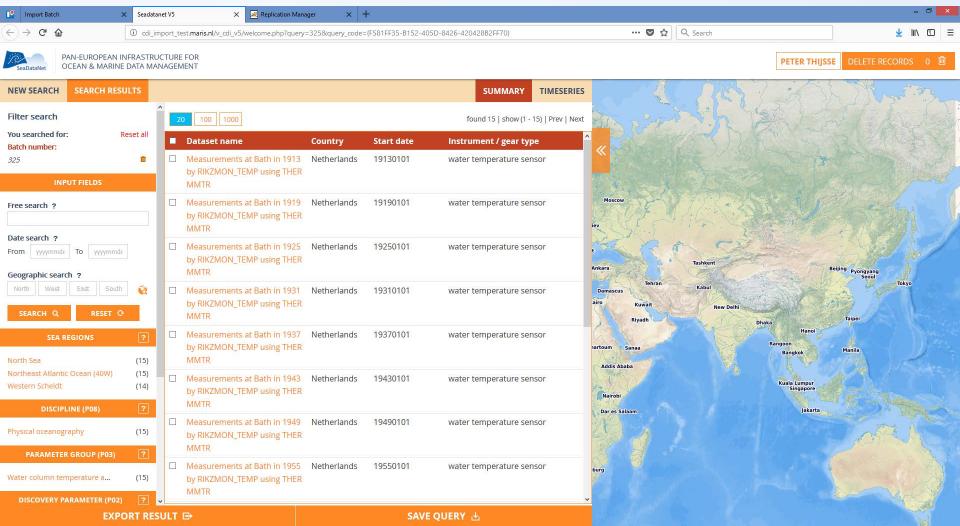


RM: Notification calls datamanager to action



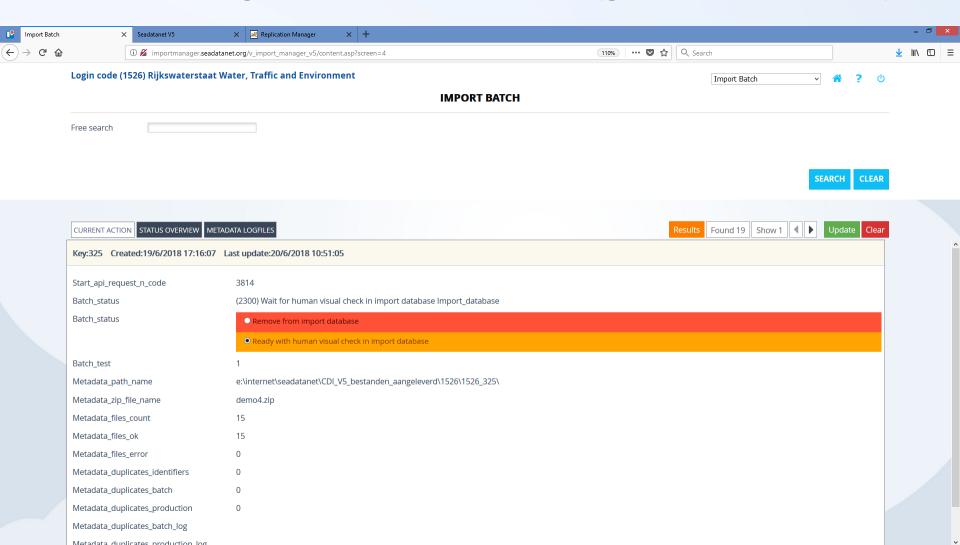


IM: Visual check - Individual records can be removed (check live!)



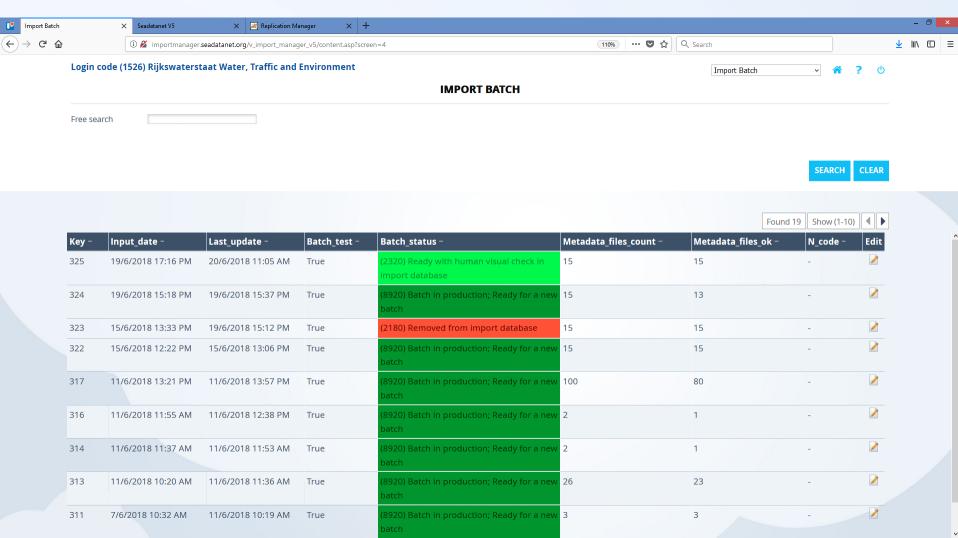


IM: RM manager indicates check is done (go on or cancel batch)





IM: Confirmed and programmes take over again





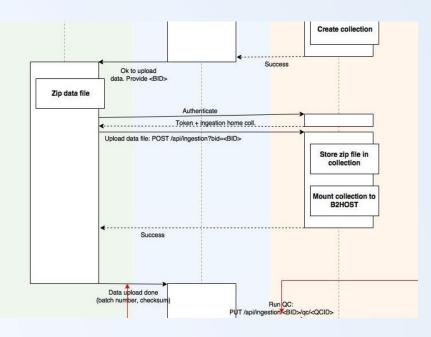
Step 4: Uploading a databatch

The problem

IM requests to RM to upload specified datafiles (matching CDI's with datafiles). RM has one zip file with data (!) to upload

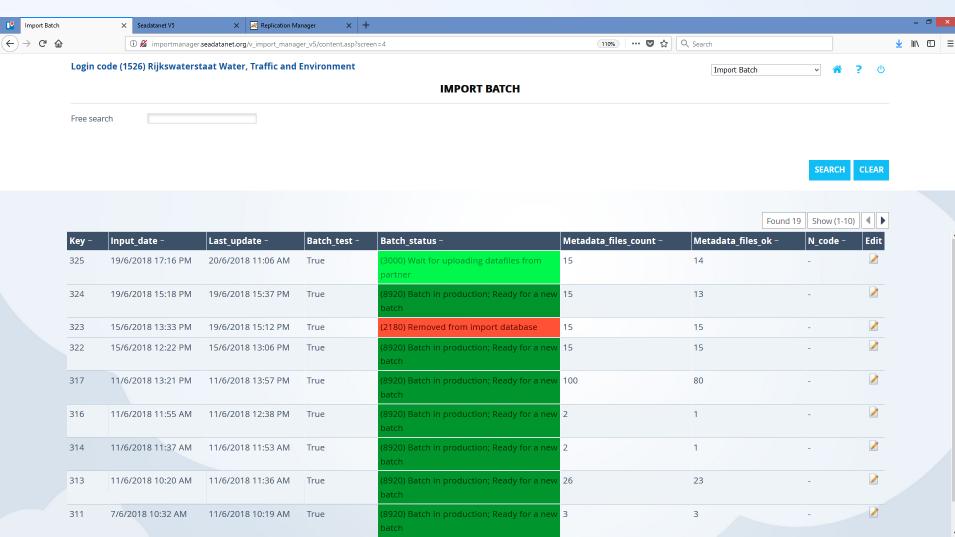
The solution

- RM holds files in a folder
- RM receives from IM a Batch ID (BID), CDI_identifiers, and formats to use for upload
- 3. IM creates BID and creates the virtual folder on cloud
- 4. RM uploads the zip file to the folder in cloud
- 5. HTTP API confirms upload completed to RM
- 6. RM notifies Import Manager that upload is ready.



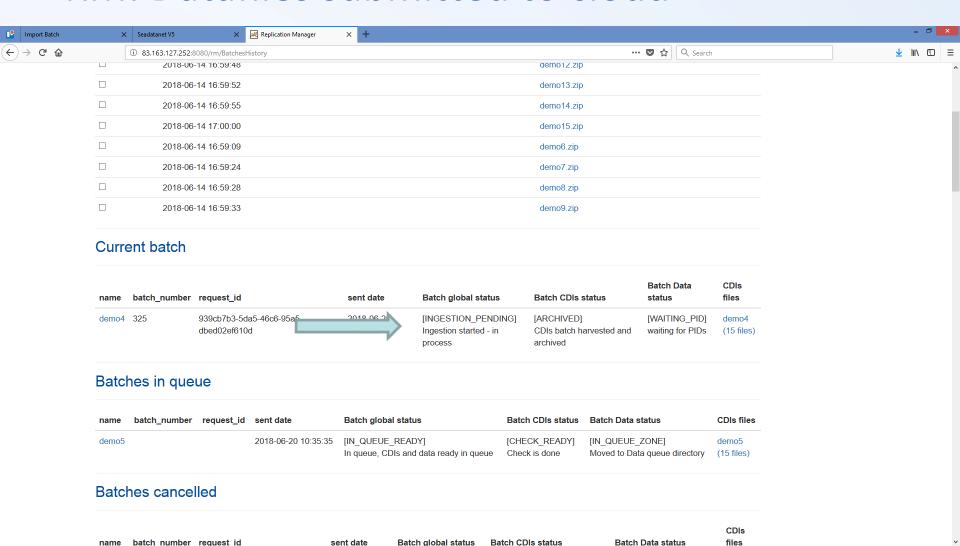


IM: Import manager triggers RM to upload data



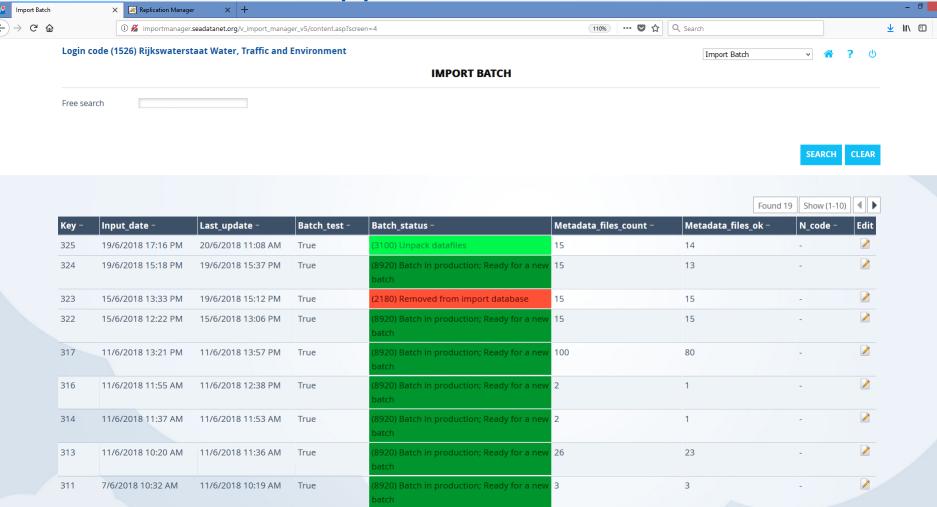


RM: Datafiles submitted to cloud





IM: Datafiles on cloud, now ready to unzip and moved – Docker application on cloud





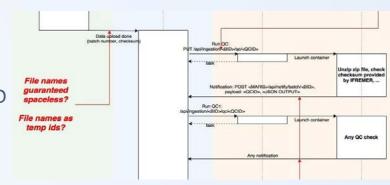
Step 5: Unzip and run datachecks

The problem

QC developer wants to run an action (unzip/quality check) on every uploaded batch

The solution

- QC Developer writes a program to test each file of a specific folder
 - QC developers pushes the container for this binary to EUDAT HUB
 - 2. QC identifier available in the end (QCID)
- 2. Import Manager calls PUT on /api/ingestion/BID/qc/QCID
- HTTP API runs an asynchronous task T for QCID mounting BID folder
- T ends and calls POST on MARIS API with:
 - 1. The JSON output from the task/JAVA code incl QCID
- 5. Next action



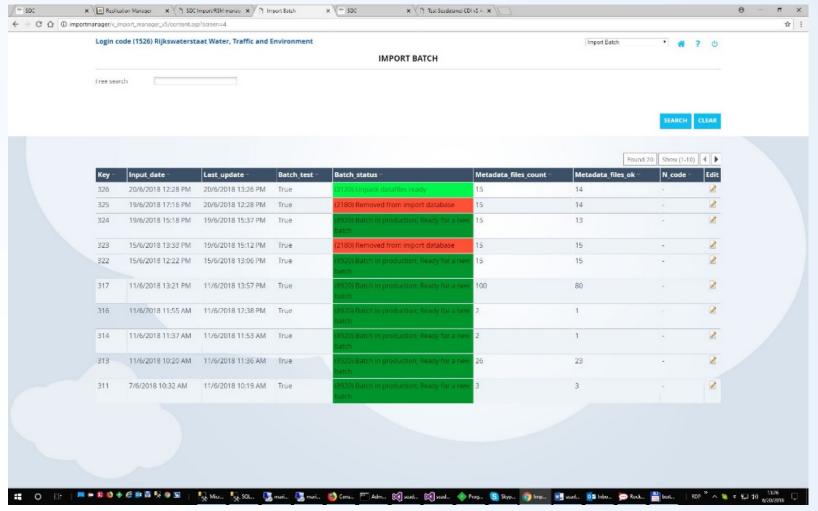


Technical QC implementation status

- Checks implemented:
 - Compare checksum of file
 - Compare length of file
 - Unzip file
 - Compare nr of files
 - Check length of files > 0
 - Check for each CDI_identifier if requested files and formats exist
- All errors reported back to IM, logs are user and shown in CMS.
- Erroneous records removed from batch, but batch moves forward as long as ok records exist.
- No more records, or batch cancelled by data manager, start again.



IM: Unpack datafiles done, plus technical checks (number of files, file names, etc)





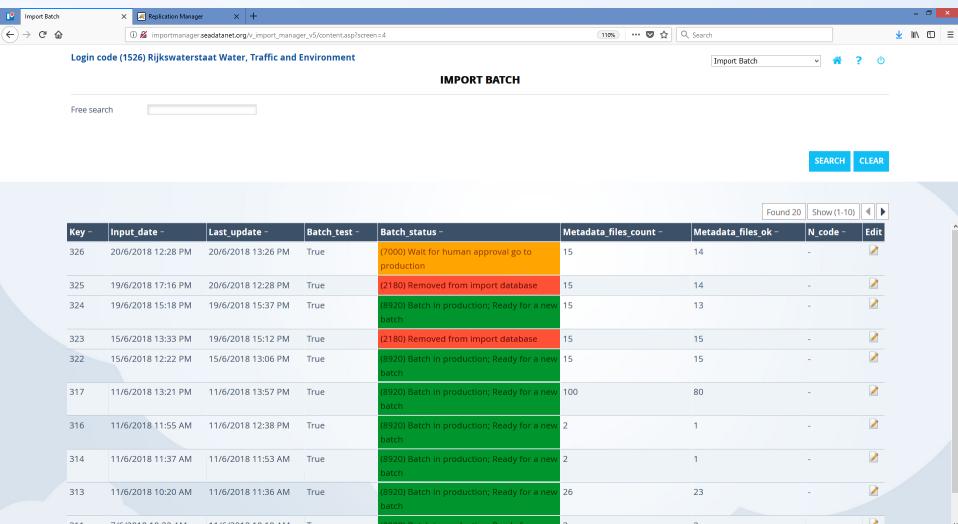
Now a sequence of additional QC checks will run

- ODV quality checks
- Conversion to other formats
- Validation
- Etc.
- Facilitated by Octopus, plus additional programmes

=> Ready to integrate, in progress



IM: Unzip and checks are done, left-over files ready to be moved. RM manager should check logs and confirm (Live!)





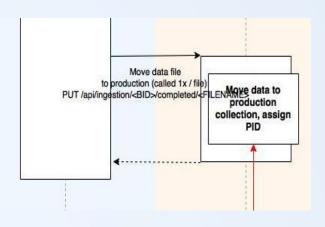
Step 6: Move validated data in production

The problem

- Import manager has a matrix of Quality checks for the batch
- All batch records that passed all quality checks is to move in production

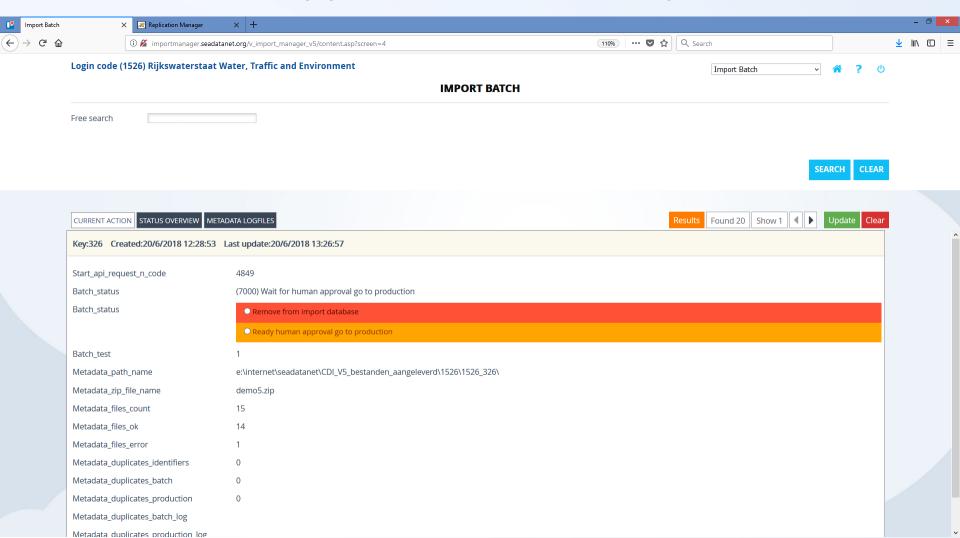
The solution

- 1. IM calls HTTP API with the filename for each approved file
- HTTP API asynchronously triggers the ingestion process of IRODS
- 3. iRODS moves the collection to Production
- Automatic irules are triggered for each file to generate the PID
- HTTP API supplies IM a JSON with filenames and their PIDs (per format)



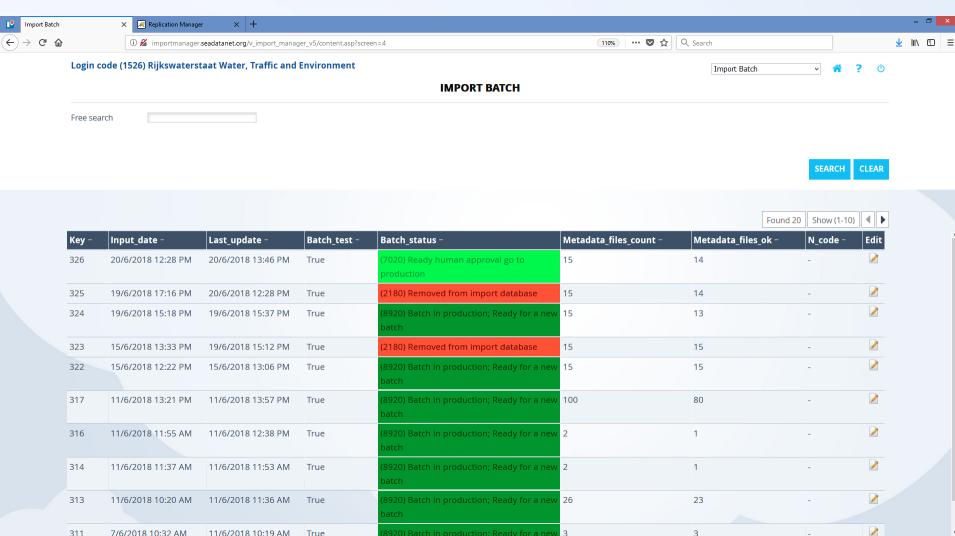


IM: Human approval to move to production



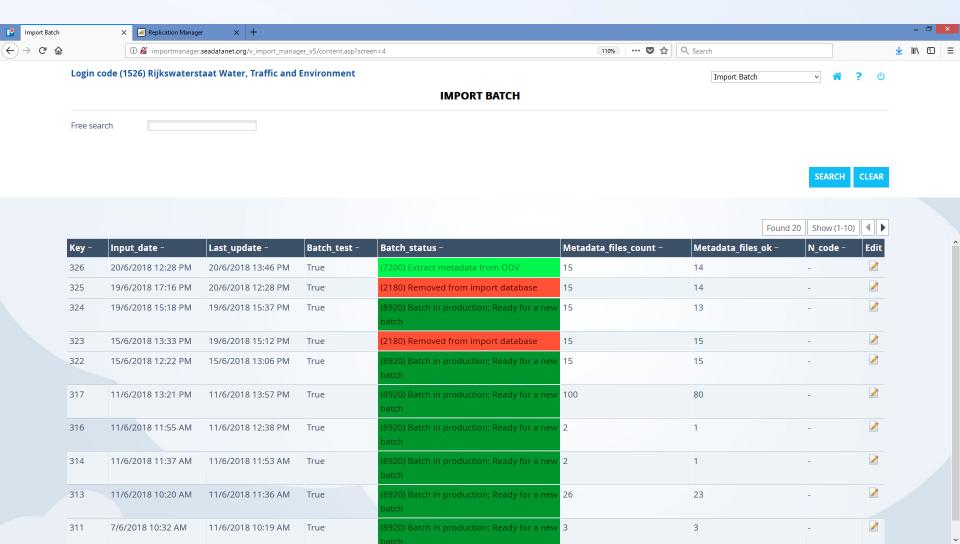


IM: Ready to go for final steps



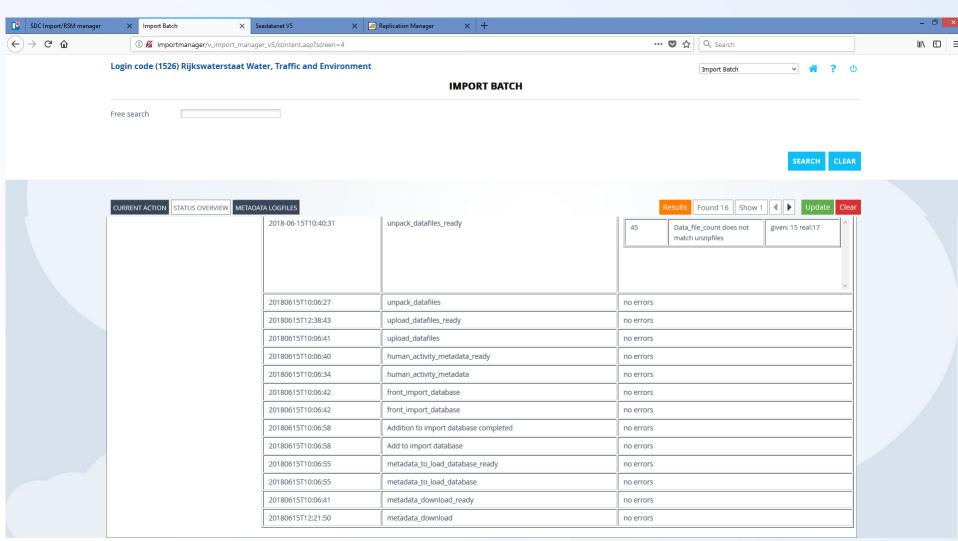


IM: Extract metadata from ODV for CDI search



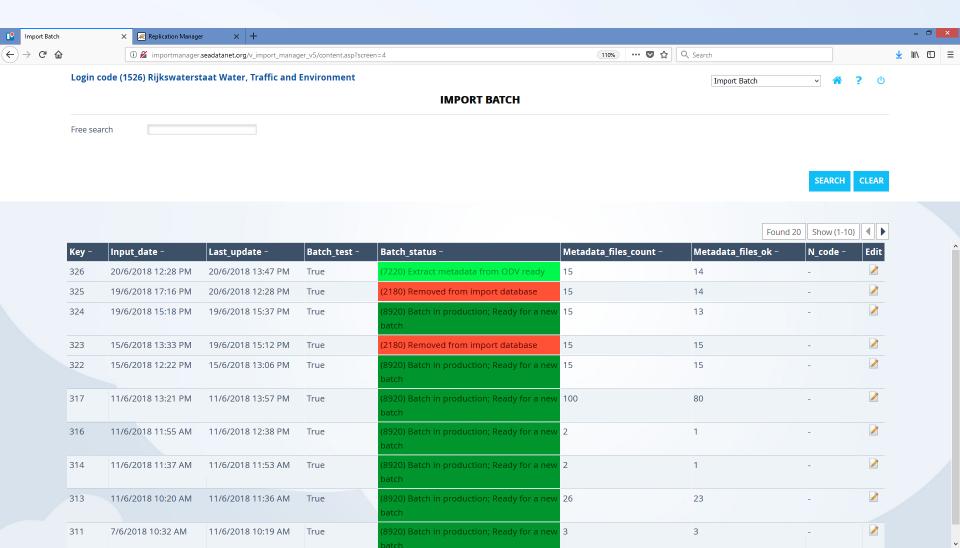


IM: View of all steps sofar – always available (1 error)



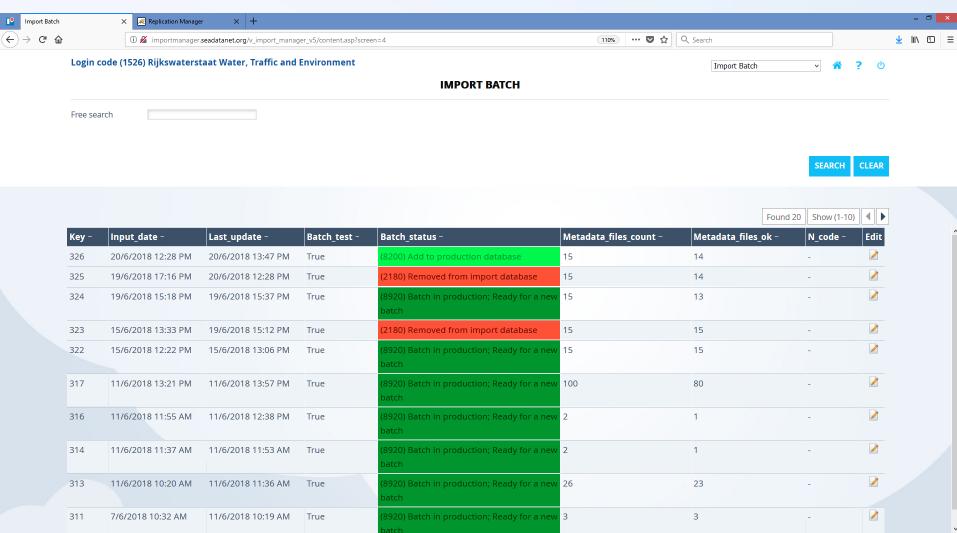


IM: Extraction ready (later add consistency between ODV and CDI checks)



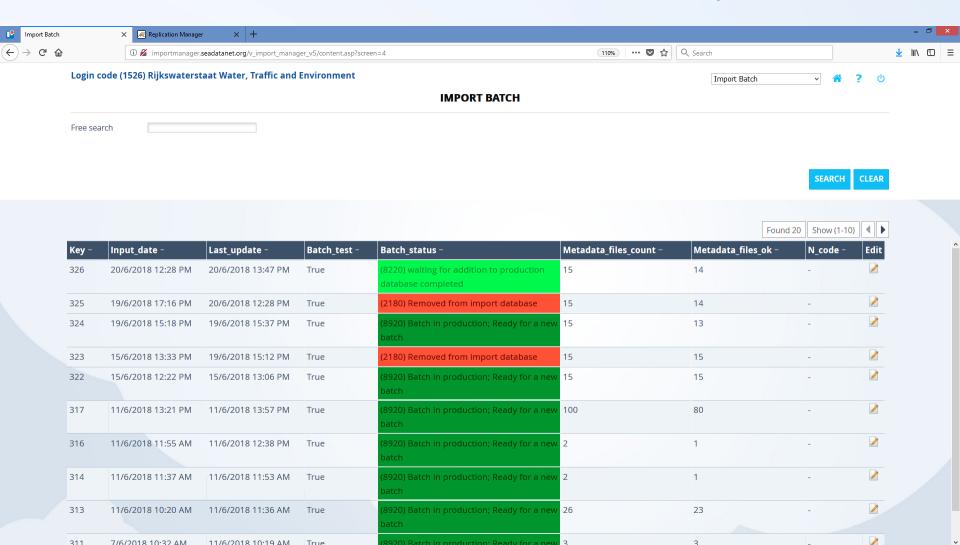


IM: Ready to add to cloud production - retrieve PID's!



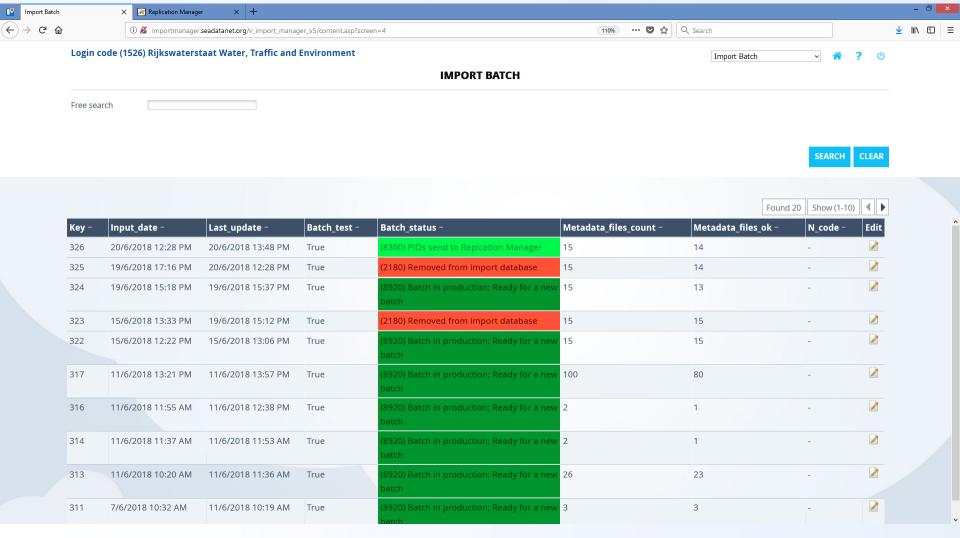


IM: PID's received from cloud - and move CDI's to production



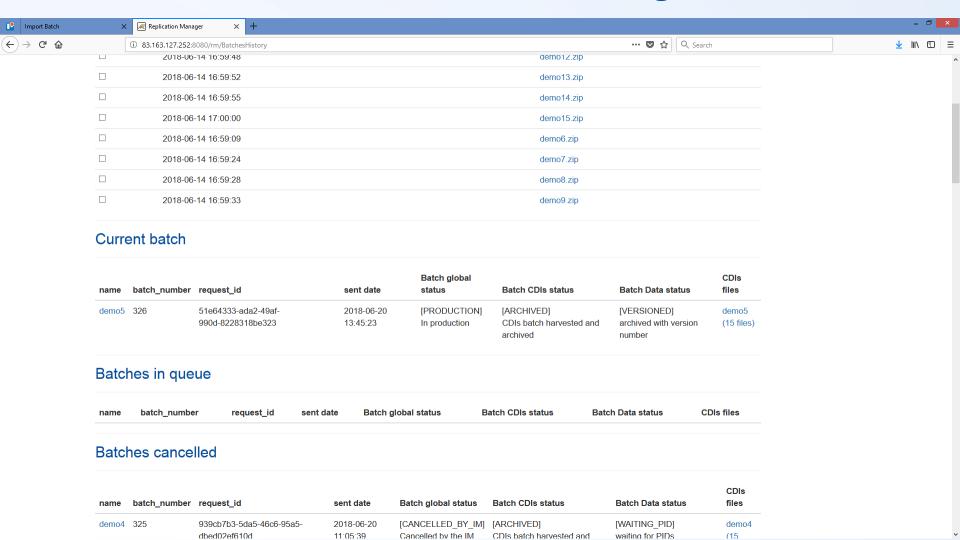


IM: PID's sent to RM, version assigned, archived



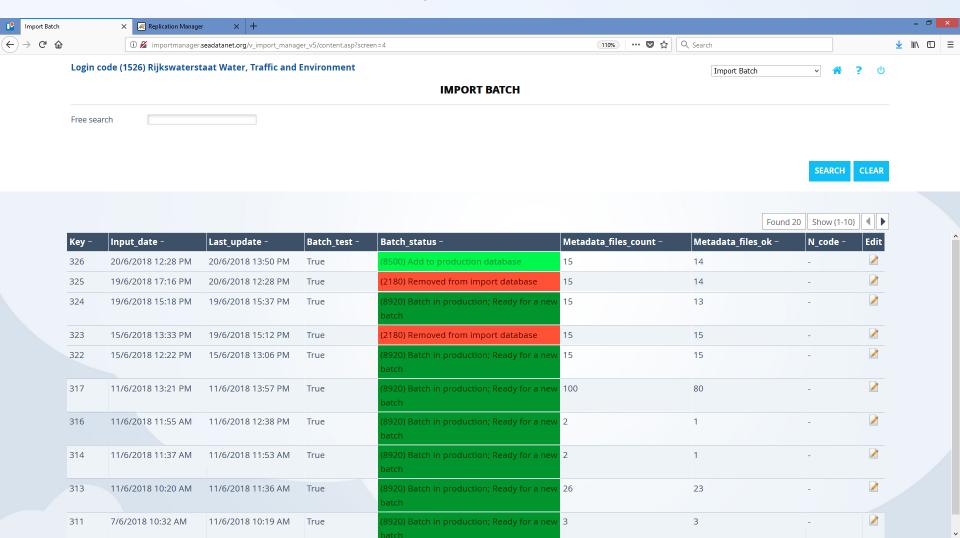


RM: PID's sent to RM, version assigned, archived



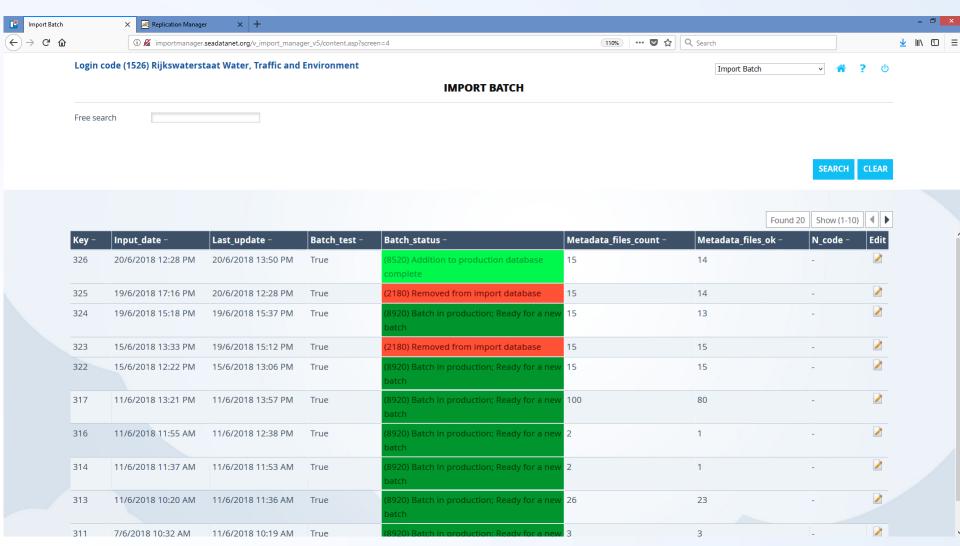


IM: CDI's loaded in production database



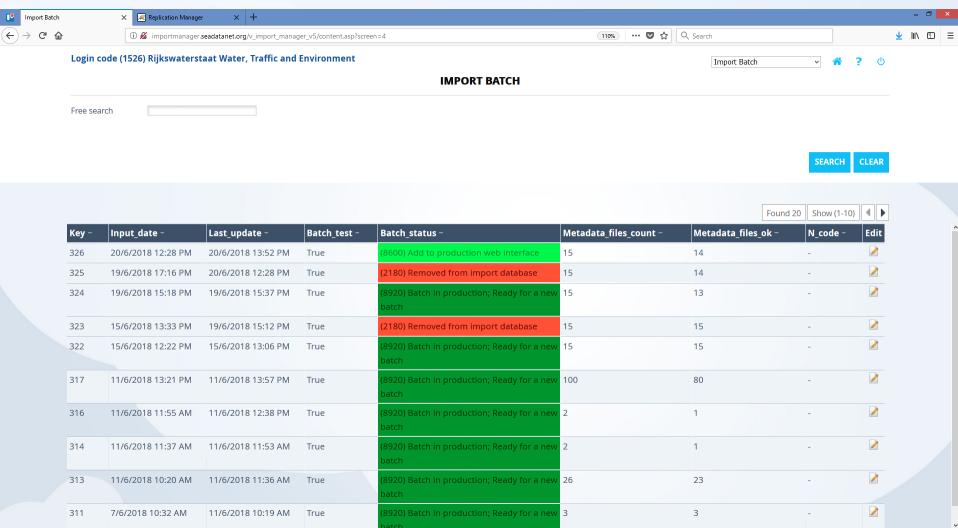


IM: CDI's loading to production database complete



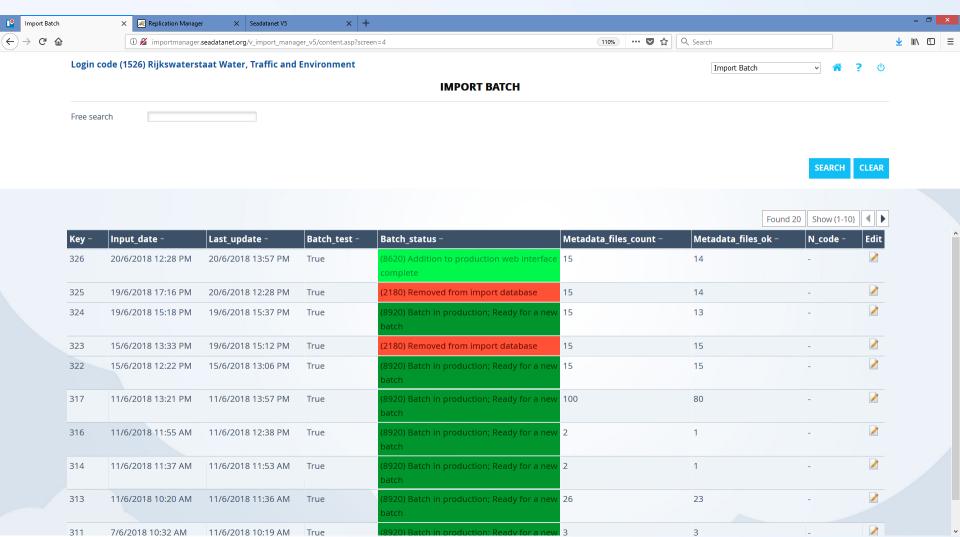


IM: Database loaded, now going to create search tables, elastic indexes, layers, etc – once per day at night – this takes some hours



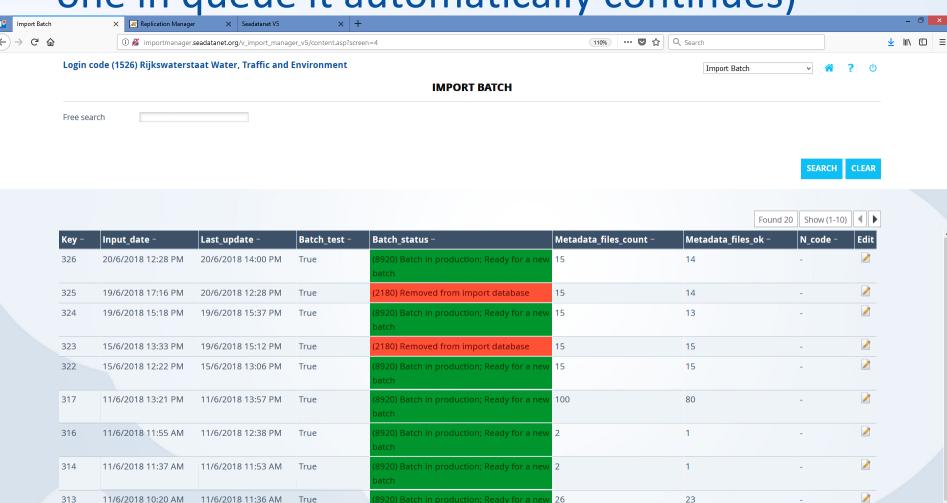


IM: Done, ready for a last message to RM!



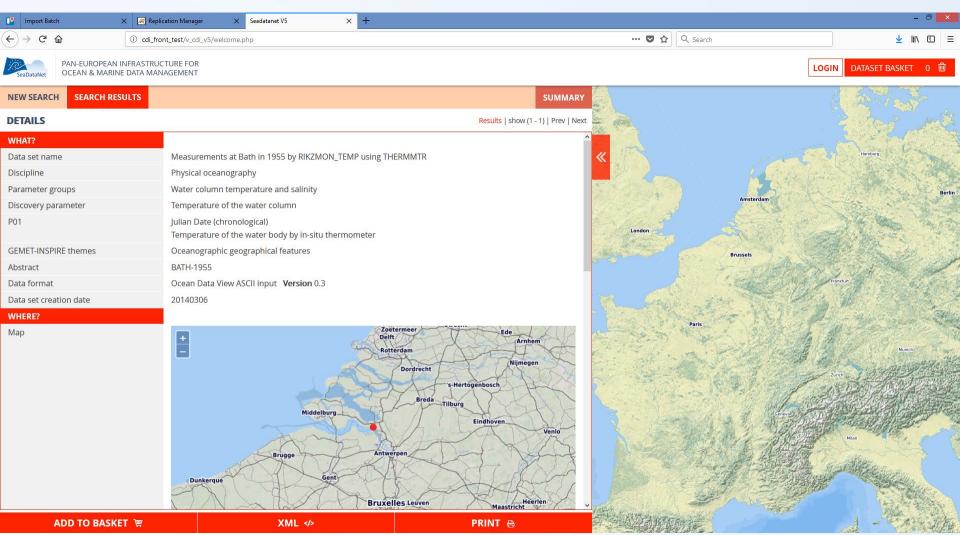


IM: Success! Ready for a new batch! (if next one in queue it automatically continues)





Batch active in interface (example record – in test)





Restricted data (in development)

- CDI metadata same flow
- Data files extracted at same time as metadata. Copy stored (for each version)
- Files will be temporarily released to cloud directory of user upon request RSM



Next steps

- Finalise integration tests and restricted data flow
- Focus on errors what if a system is down, a service does not respond, crashes etc
- Fool (or full) proof version
- Create documentation
- Planning:
 - See implementation plan



- END -