wissen wohin
savoir où
sapere dove
knowing where

swisstopo

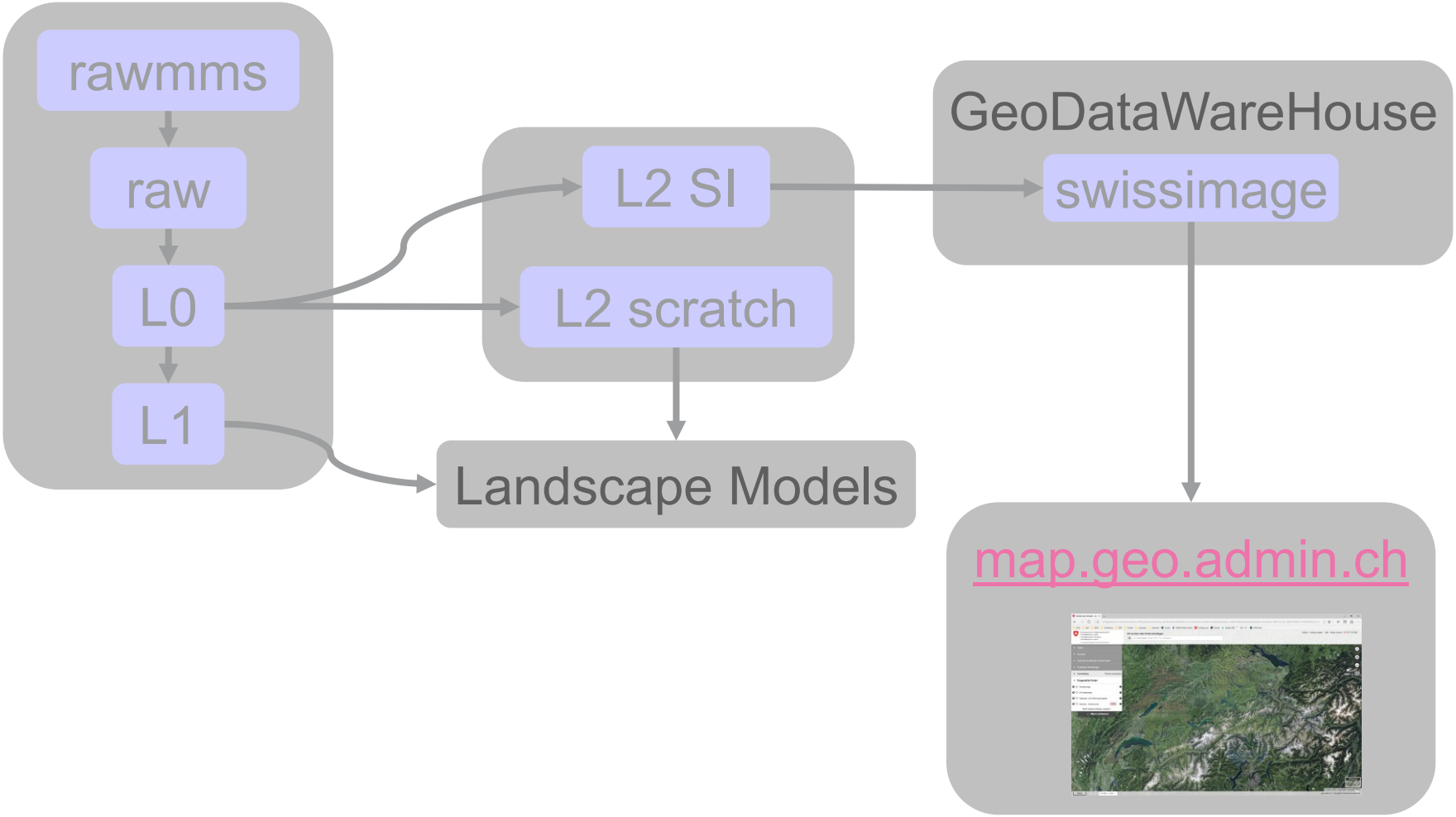
EuroGeographics QKEN Tallinn Automated Data Processes for Aerial Imagery

04.11.2018, Stefan Flury

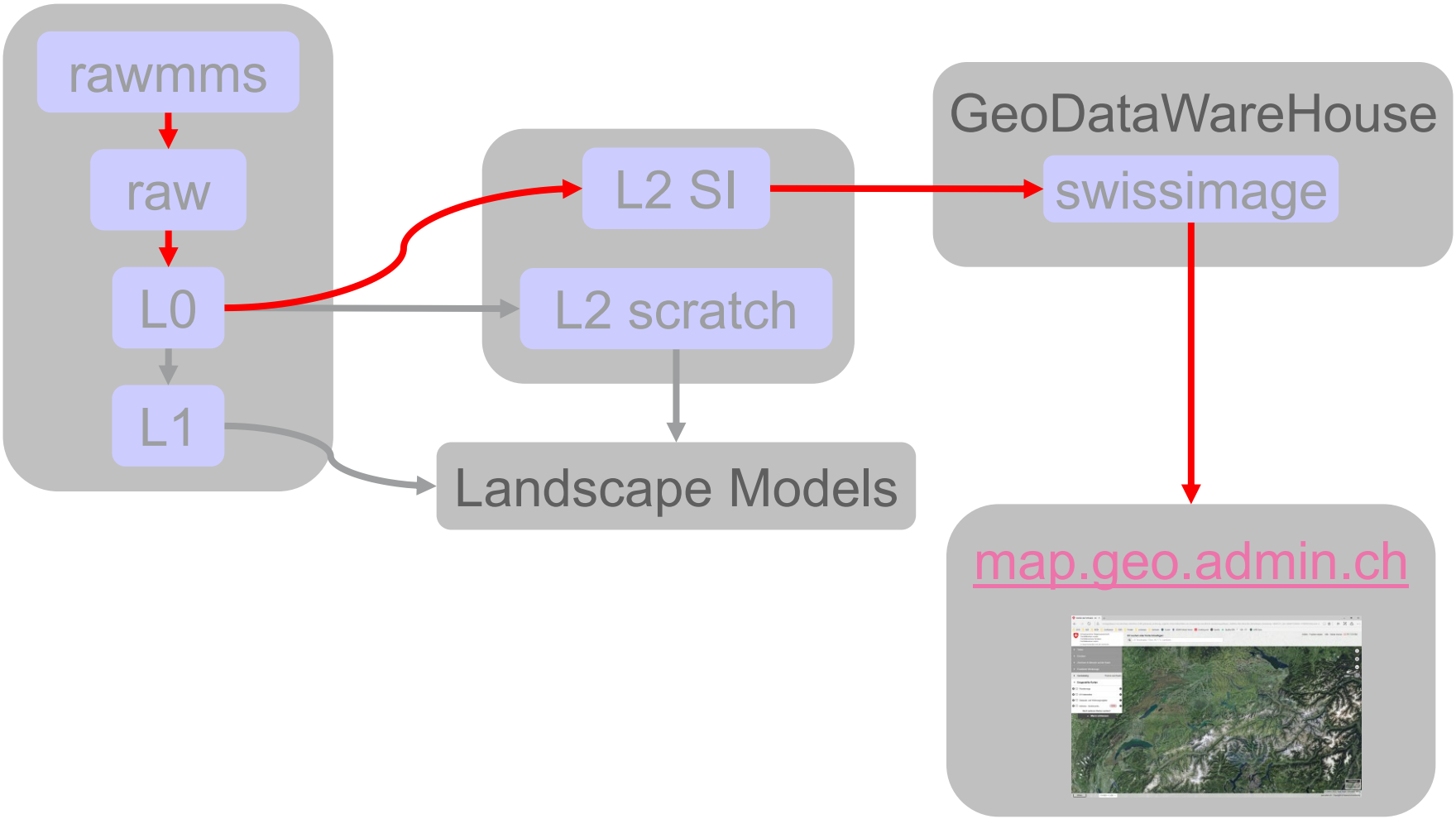
Agenda

1. A view on the process / business case
2. Raw data to orthoimage
3. Orthoimage to the geodatawarehouse
4. Geodatawarehouse to geo.admin.ch
5. Conclusion

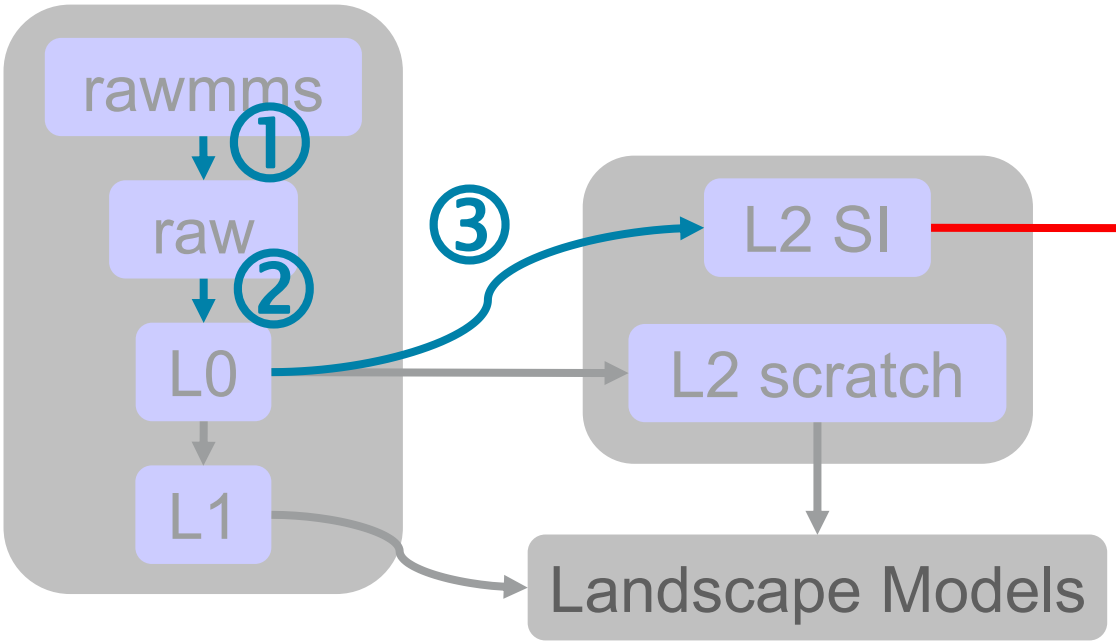
Automation from raw data to web



Let us look at this path



But not at these steps

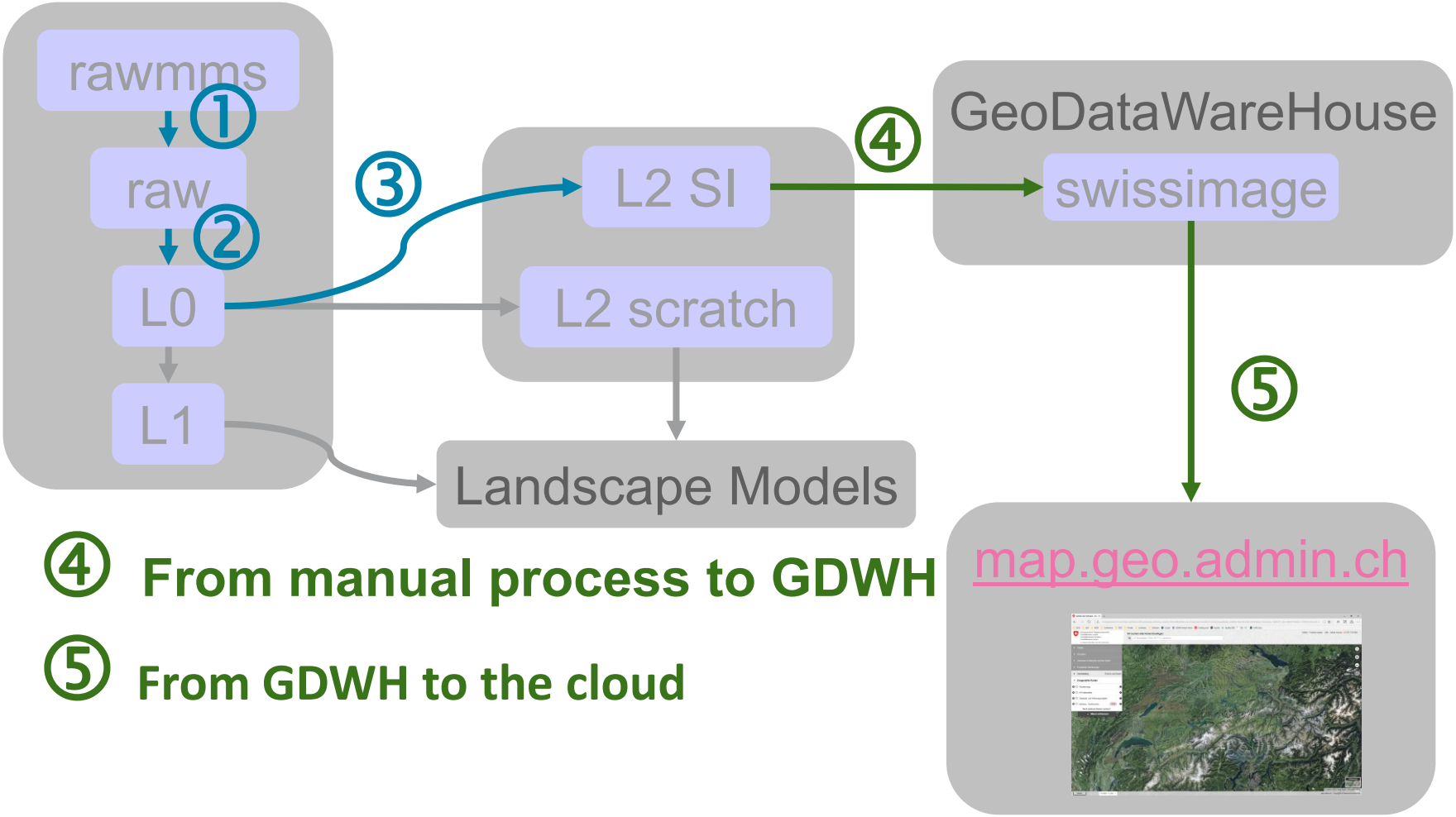


① Camera to local storage

② georeferencing an AT….

③ Cut in peaces process image

But at this steps



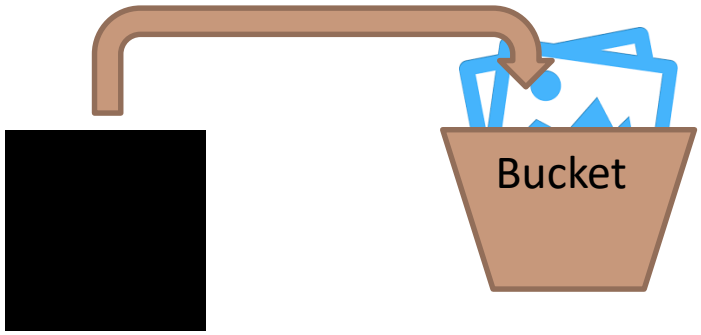
④ **From manual process to GDWH**

⑤ **From GDWH to the cloud**

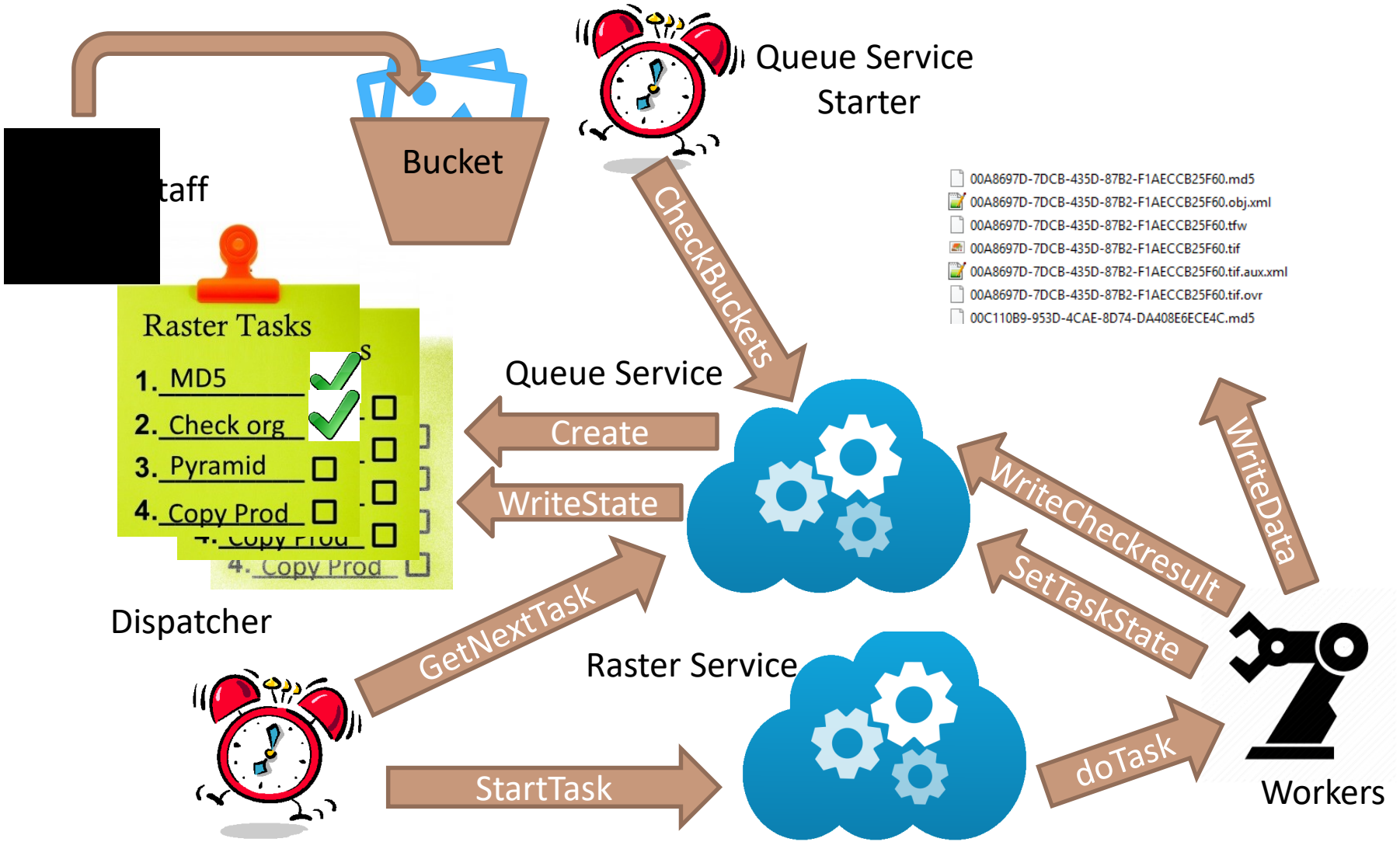
From a manual process to the GDWH

GeoDataWareHouse (GDWH)

- Make high quality orthoimages and put them to our GeoDataWareHouse (GDWH); our safe
- The GDWH is a place to store standardized, quality approved geodata
- If our staff finished the manual work the start the automated integration process.
- Put data in a bucket and the integration starts



From a manual process to GDWH



The integration process

- Our staff is excellent but sometimes the delivered product is not completely «bug free»
  - There are some tags in the tiff
  - The structure in the tiff is not 100% «accurate»
  - …..

  Nothing severe but if we fix that kind of problems immediately future processes will have fewer problems
  → no handling of exception

There are two rules
→ The import standardises the delivered raster data
→ The import itself never changes the data
The result is:
Data with their metadata in a standardised structure in our safe

From the GDWH to geo.admin.ch

GeoDataWareHouse (GDWH)

- The GDWH is the single source of verified geodata → a safe
- Nobody has a direct access to the data → security

The GDWH provide data via interfaces

- Our employees have access via a graphical user interface
- The graphical user interface (GUI) encapsulates web services
- The web services implement the business logic and the access to the geodata
- The web services are also used for machine to machine communication (M2M). Example:
  update orthoimage SWISSIMAGE at geo.admin.ch

How to update SWISSIMAGE

In the following example, DOP10_LV95 is synonymous with SWISSIMAGE

Ask the GDWH: Are there imports for a specific product (SWISSIMAGE respectively DOP10_LV95)?

...../Service/Info/GetImportDates?g=DOP10_LV95


```
{"Error":null,"Success":true,"Values":
  [
    "2018-11-05T10:32:27.0000000",
    "2018-10-15T13:27:30.0000000",
    "2018-10-12T13:43:52.0000000",
    "2018-10-10T16:00:52.0000000",
    "2018-09-25T12:30:28.0000000",
    "2018-09-24T16:49:23.0000000",
    "2018-09-20T13:10:04.0000000",
    "2018-09-20T12:45:08.0000000",
    "2018-09-19T13:36:31.0000000",
    "2018-09-19T13:24:23.0000000",
    "2018-09-18T13:03:22.0000000",
    "2018-08-27T17:45:33.0000000",
    "2018-08-20T16:26:31.0000000",
    "2018-08-13T15:15:38.0000000",
  .... ]}
```


→ Yes there are

How to update SWISSIMAGE

Ask the GDWH: Are there imports in DOP10_LV95 since my last update (2018-11-01T07:00:00)?

…./Service/Info/GetRastersChangedSince?st=2018-11-01T07:00:00&g=DOP10_LV95


```
[{"ImportDate":"02.11.2018 13:00:40","LastModification":"06.11.2018
08:00:17","LayerKey":"","MapSheetName":"2633_1086","MapSheetNumber":"2633_1086","Re
leaseKey":"2017","TemporalKey":2017,"TileKey":"2633_1086","TileStatus":"valid","Til
eVersion":1,"UUID":"4131480D-1EAE-408F-89A7-371F8854A45"},{"ImportDate":"02.11.2018
13:01:21","LastModification":"06.11.2018
08:00:17","LayerKey":"","MapSheetName":"2638_1107","MapSheetNumber":"2638_1107","Re
leaseKey":"2017","TemporalKey":2017,"TileKey":"2638_1107","TileStatus":"valid","Til
eVersion":1,"UUID":"41241C95-F8B8-4343-90C8-C21E9F94474"},{"ImportDate":"02.11.2018
13:01:53","LastModification":"06.11.2018
08:00:17","LayerKey":"","MapSheetName":"2624_1107","MapSheetNumber":"2624_1107","Re
leaseKey":"2017","TemporalKey":2017,"TileKey":"2624_1107","TileStatus":"valid","Til
eVersion":1,"UUID":"AEEC33CE-A1C3-494D-8EB8-C97128AACE4"},{"ImportDate":"02.11.2018
13:02:30","LastModification":"06.11.2018
08:00:17","LayerKey":"","MapSheetName":"2627_1089","MapSheetNumber":"2627_1089","Re
leaseKey":"2017","TemporalKey":2017,"TileKey":"2627_1089","TileStatus":"valid","Til
eVersion":1,"UUID":"855BBB9D-F97A-462E-A96D-E0ED4D67B097"},……]
```


→ Yes there are a lot

How to update SWISSIMAGE

The result is a list (json)


```
[
 {"ImportDate …} … },
 {"ImportDate":"02.11.2018 17:23:34",
  "LastModification":"06.11.2018 08:00:17",
  "LayerKey":"",
  "MapSheetName":"2623_1095",
  "MapSheetNumber":"2623_1095",
  "ReleaseKey":"2017",
  "TemporalKey":2017,
  "TileKey":"2623_1095",
  "TileStatus":"valid",
  "TileVersion":1,
  "UUID":"E9B2DCA6-BB31-493F-A1E4-DB6FDF10CA8B"
 },
 {"ImportDate …} … }
]
```

How to update SWISSIMAGE

Let's download the image(s) by **TileKey(s)**
http://ltgdwhraster.adr.admin.ch/Service/Export

Let's prepare a json with the order

```
{
   "Environment":"P",
   "GdsKey":"DOP10_LV95",
   "FullExportConfiguration":
   {
      "OutputPath": "c:\export",
      "Layers": [],
      "DoClipping":"false",
      "TileKeys":["2623_1095", …],
      "ExportFormat":"GeoTIFF_JPEG,95",
      "DoMosaik":"false",
      "DoAutoMosaik":"false",
      "RasterOrganisation":"Tiled,256"
      "ResamplingFactor":"2",
      "ResamplingMethod":"Near"
   }
}
```

How to update SWISSIMAGE

Let's download the image(s) by **Qualifiers**

http://ltgdwhraster.adr.admin.ch/Service/Export

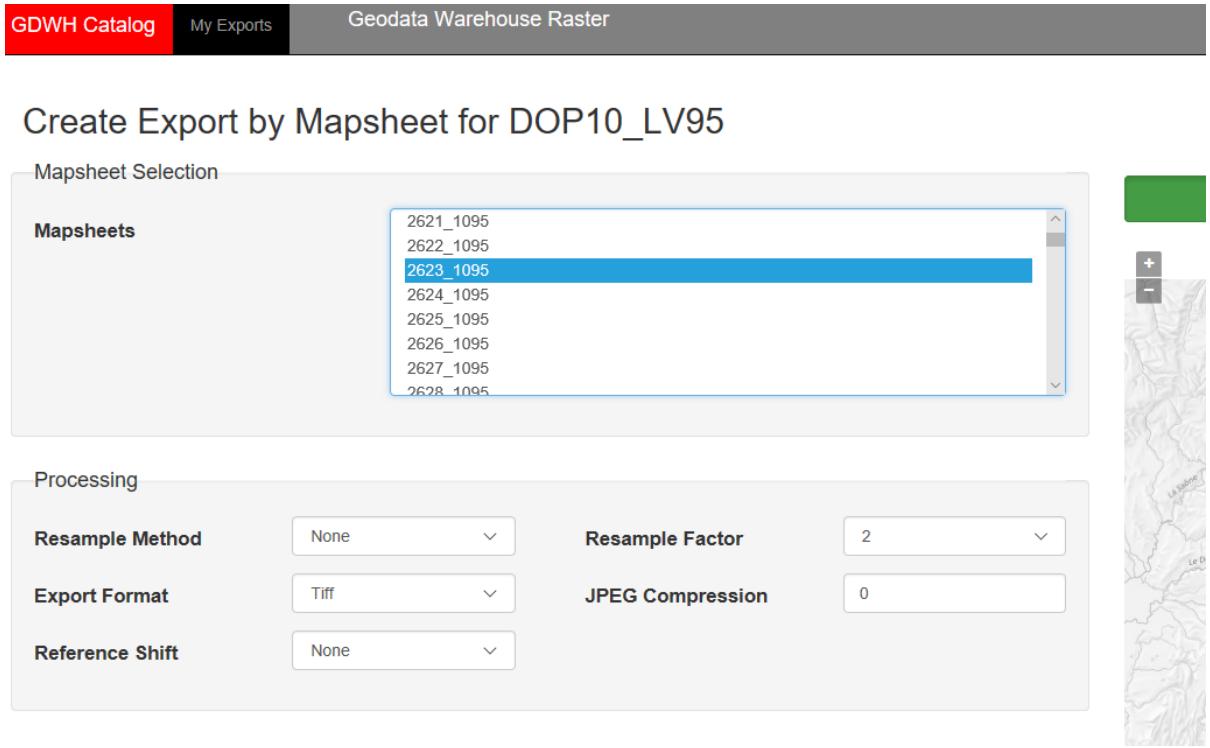
Let's prepare another json with the order

```
{
   "Environment":"P",
   "GdsKey":"DOP10_LV95",
   "FullExportConfiguration":
   {
      "OutputPath": "c:\ex
      "Layers": [],
      "DoClipping":"false",
      "Qualifiers":["DOP10_LV95/2017/2623_1095/1", …],
      "ExportFormat":"GeoTIFF_JPEG,95",
      "DoMosaik":"false",
      "DoAutoMosaik":"false",
      "RasterOrganisation":"Tiled,256",
      "ResamplingFactor":"2",
      "ResamplingMethod":"Near"
   }
}
```

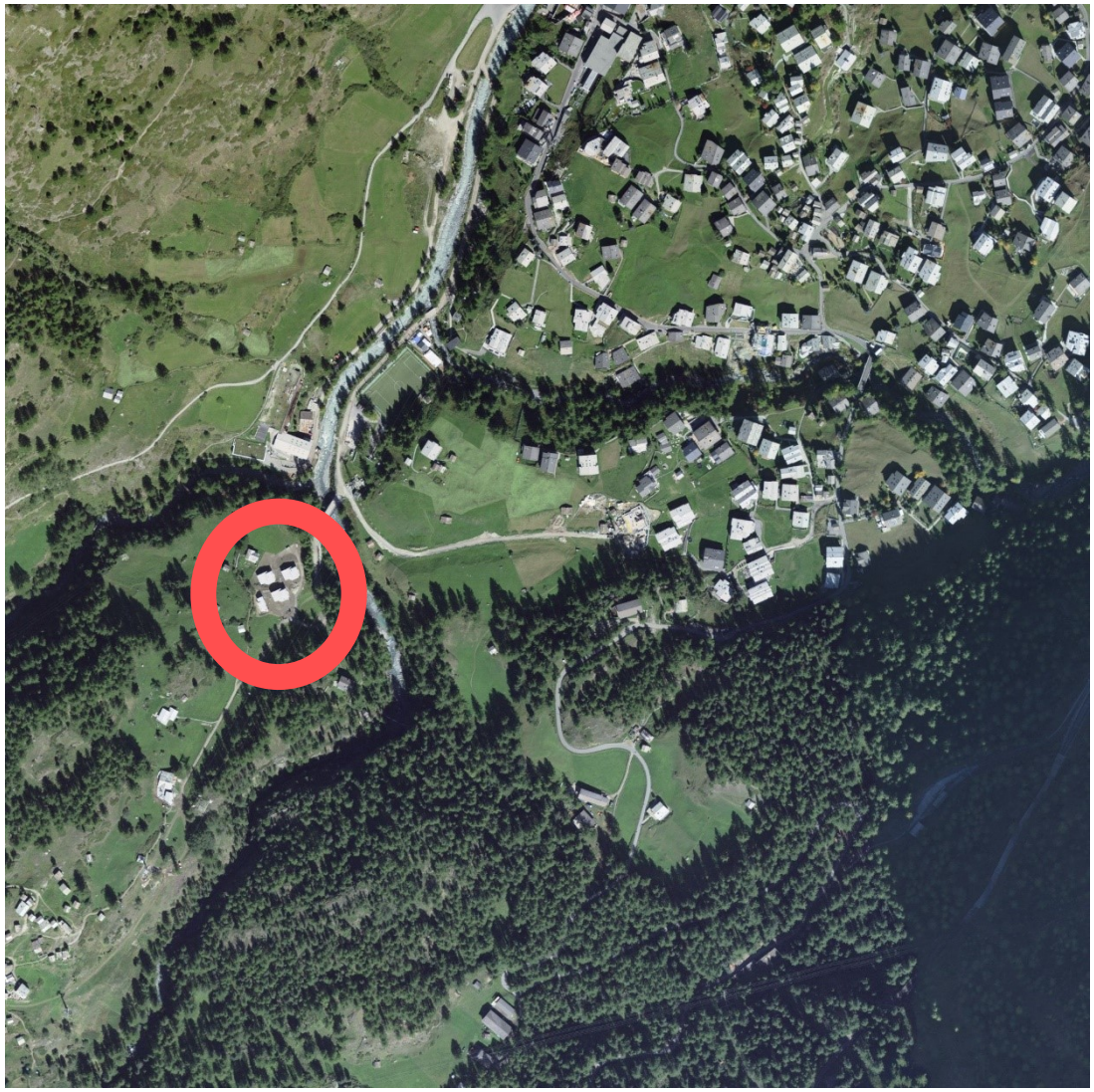
GdsKey/ReleaseKey/TileKey/TileVersion

How to update SWISSIMAGE

- To create json is easy for machines but not so comfortable for humans
- So let us use the GDWH Catalog



The result



And the old Image?

Is geo.admin.ch up-to-date?

https://map.geo.admin.ch/?topic=ech&lang=de&bgLayer=ch.swisstopo.swissimage&layers=ch.swisstopo.swissimage-product&layers_visibility=false&layers_timestamp=2016&E=2623264.98&N=1095462.87&zoom=12

→ **Yes**

Conclusion

- If you want to automate, you have to understand the process (business case)
- All your geodata has to be standardised and structured, normed, for example TIFF in the case of aerial images
- The metadata are important and must be analysable, ISO 19115 for the hole dataset and more for each element in the dataset like the
  - *ReleaseKey* : Relation to the time axis
  - *TileKey* : Boundingbox of a specific aerial image
  - Tileversion: The version number in specific release at e specific area
  - ….
- You have to monitor the automated processes, the quality of your processes will improve.

Timeseries

https://s.geo.admin.ch/7e898f04c4