Data transfers in Harvester

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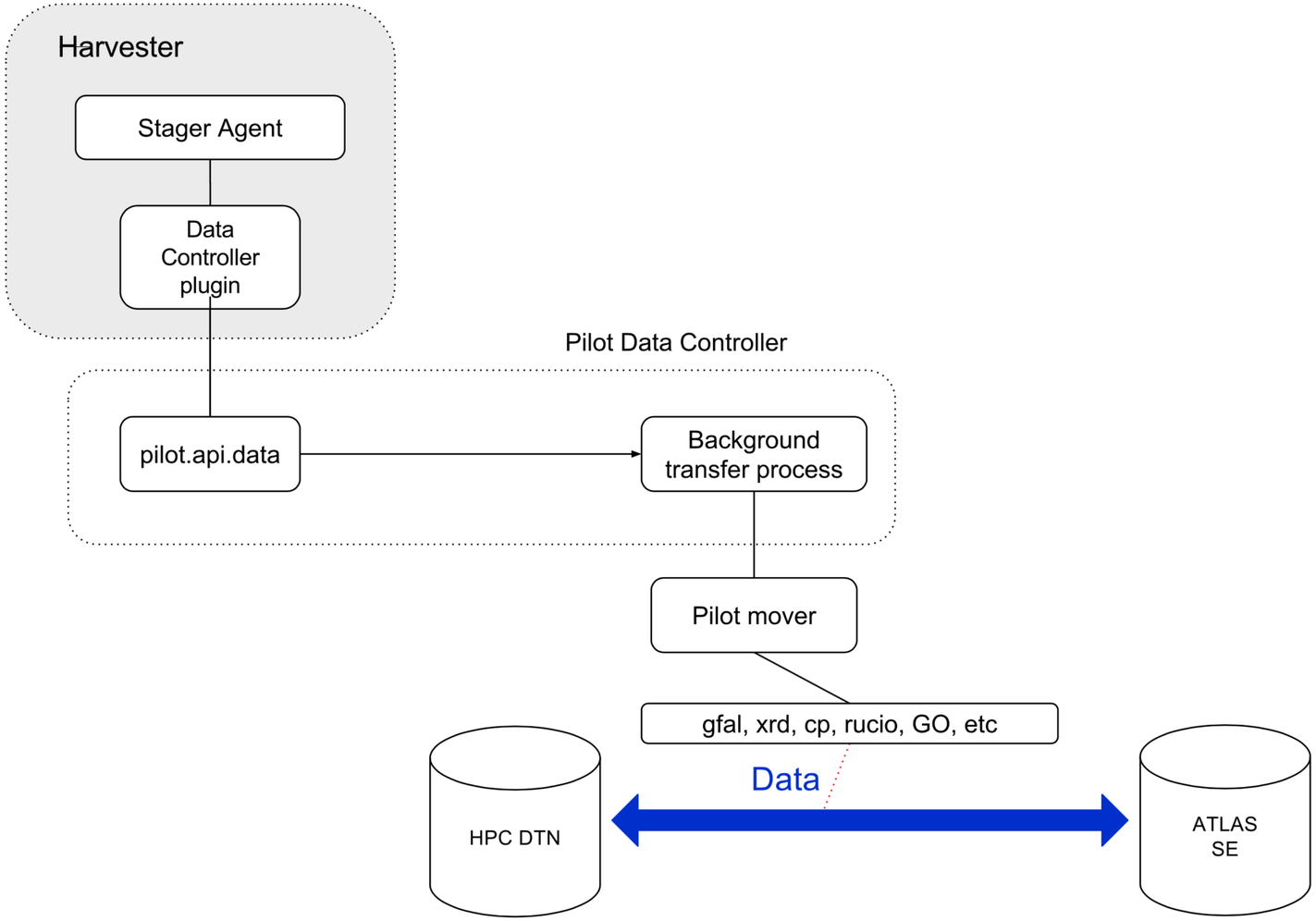
Stage-in/out in Harvester@HPC

- **Essentially two asynchronous actions**
  - Transfer → check
- **Transfer action**
  - Actual transfers of data (e.g., direct invocation of copy tools)
  - Or sending transfer requests to something (e.g., sending commands to background data transfer processes, or submitting data transfer jobs to FTS/GO)
- **Check action**
  - Nothing if actual transfers are done in the transfer action
  - Or checking transfer status with something which actually transfers data
- Complicated mechanisms like retry, rerouting, throttling, etc, are not in Harvester but in copy tools or transfer services

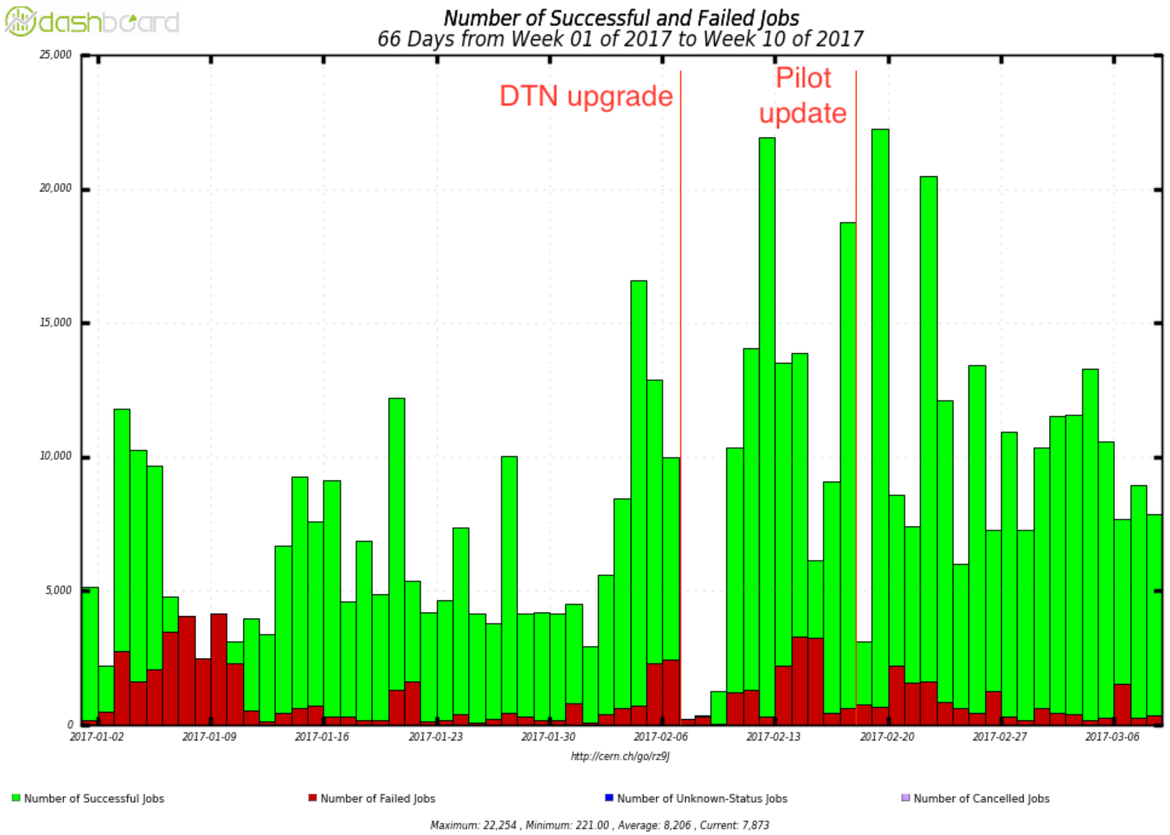
Stage-in/out with Pilot Data Controller

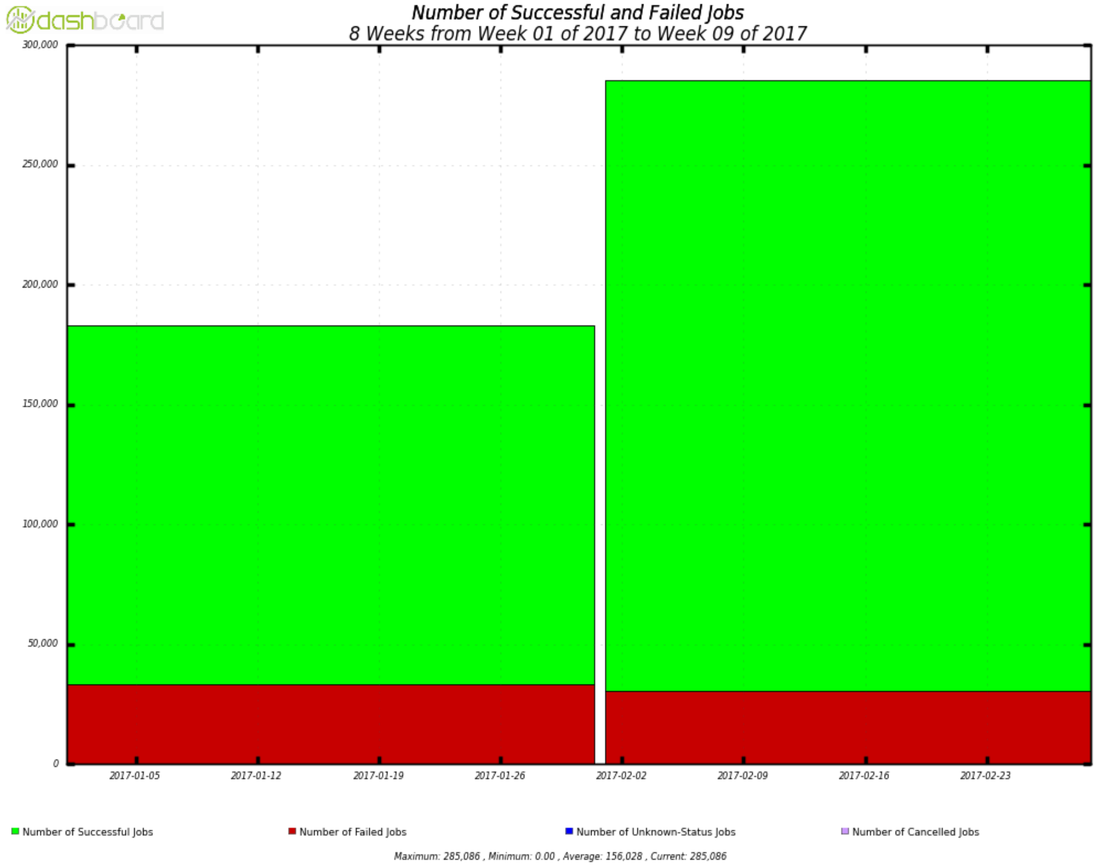


Misc

- **Cleanup**
  - The easiest solution is to delete all input and output files from local DTN disk once stage-out for corresponding job is done
  - Rucio deletion service can be used if Rucio (not rucio-client) can talk to local DTN disk
  - HarvesterDB could be used as local file catalog, which would allow to reuse some input files. Cleanup agent is required in Harvester
- **Local ATLAS SE (transient) at HPC centers**
  - The cleanest solution, but how difficult to have?

New DTN cluster performance





1) Average CPU load on the observed DTNs is light and varies from 1% to 6% over the period of observation 2) Peak CPU loads on some nodes can reach ~30%
3) DTN 37 was the most loaded node with ~6% average load and ~30% load at maximum peak
4) DTN 38 was the least loaded node with ~1% average load and ~10% load at maximum peak
5) Note that these observations did not separate ATLAS activities but included load of all DTN users
6) Over the period of observation ATLAS jobs were using on average ~9k cores, with max peak of ~70k cores and several peaks at ~30k cores