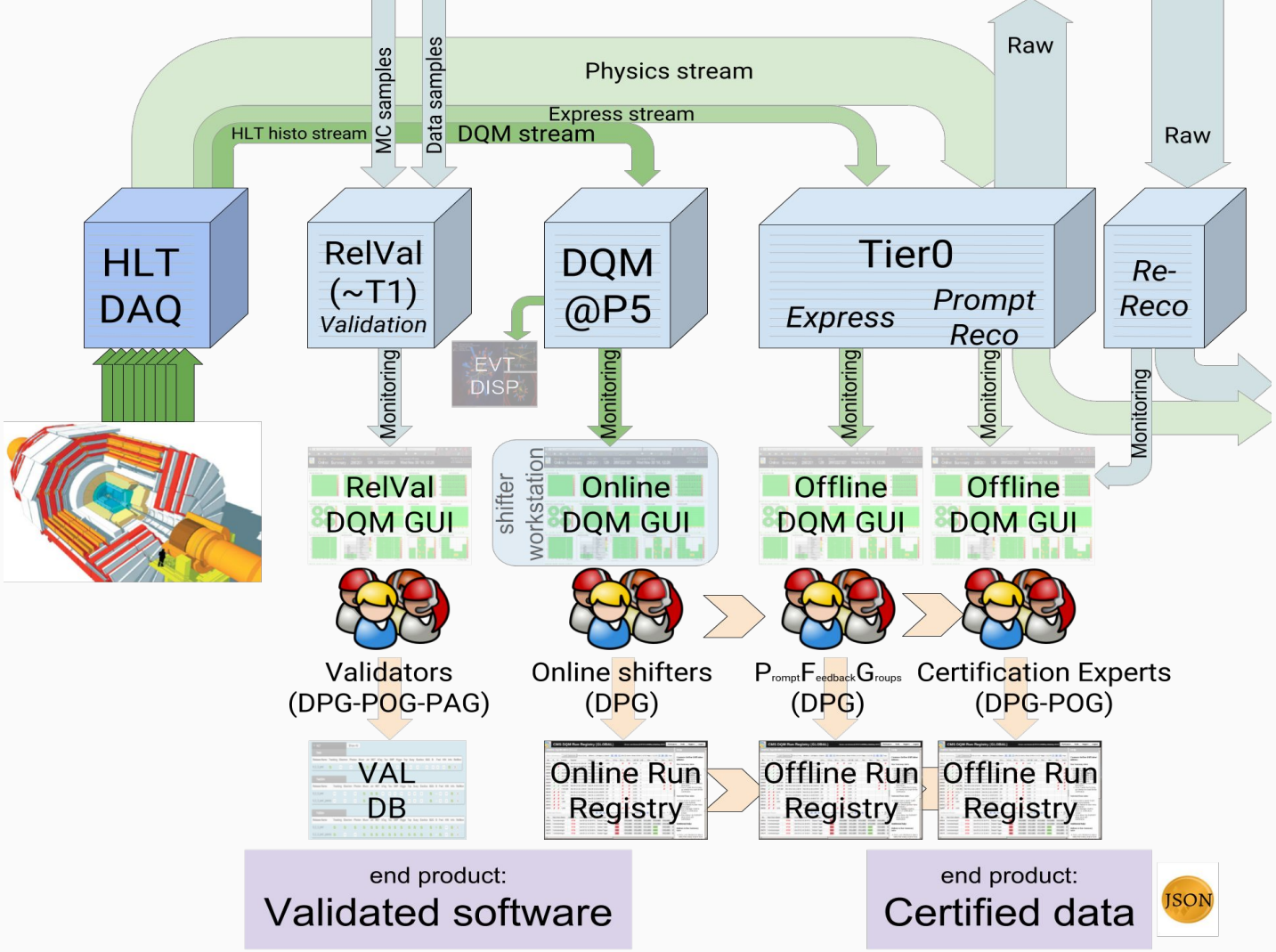
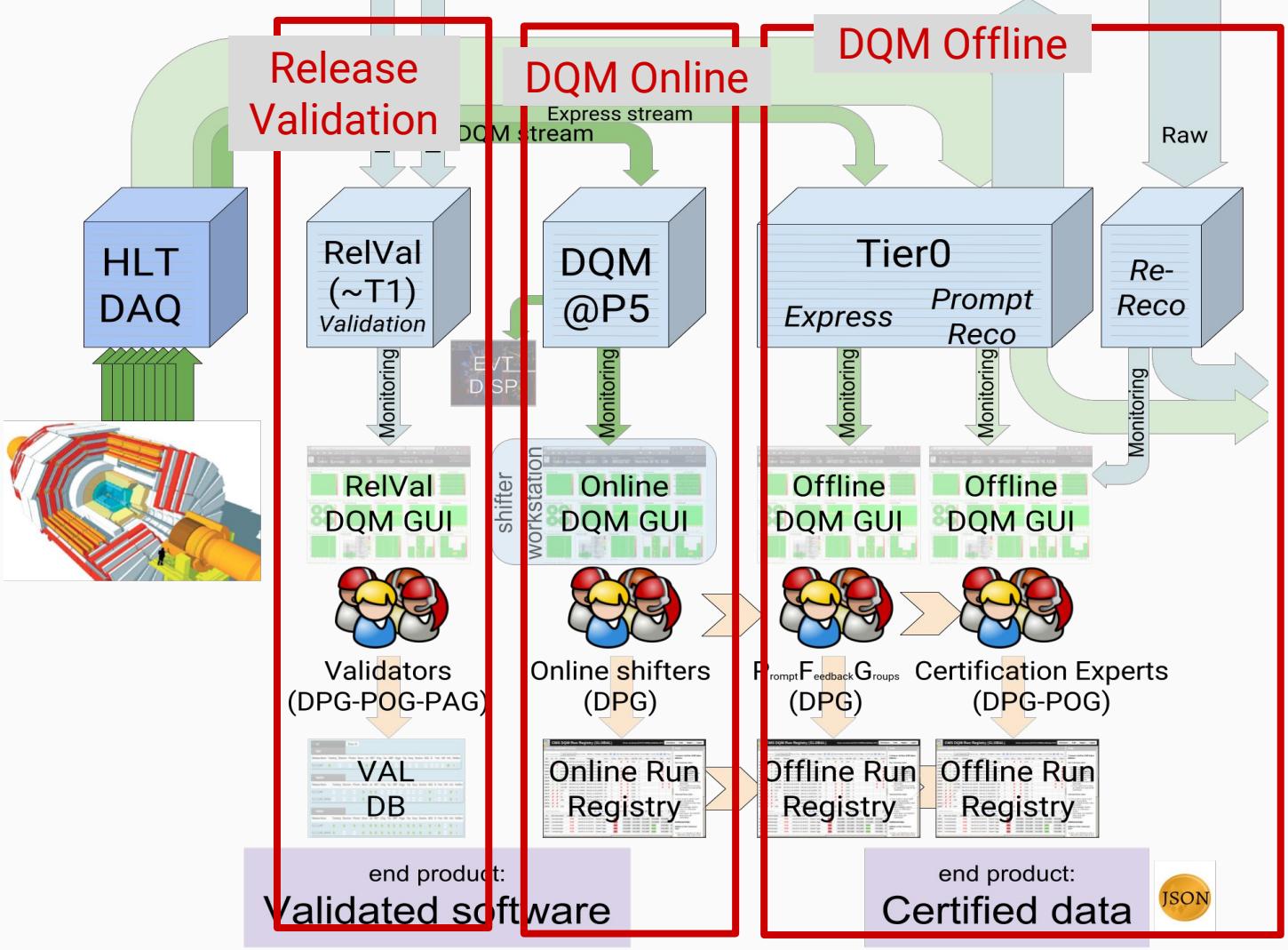
DQM Operations

Kaori and Broen - 2017-01-26

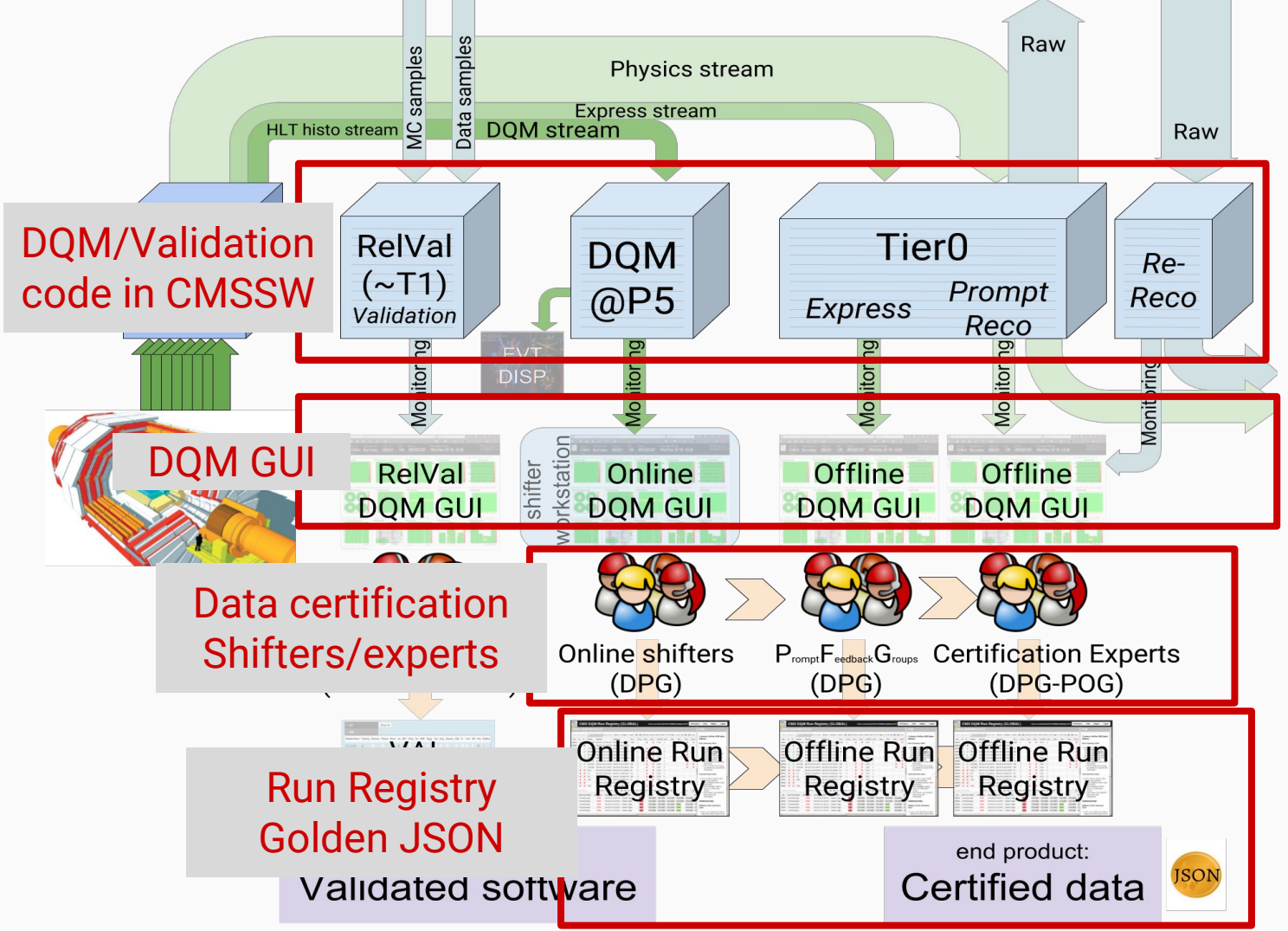
2016 Operations



2016 Operations

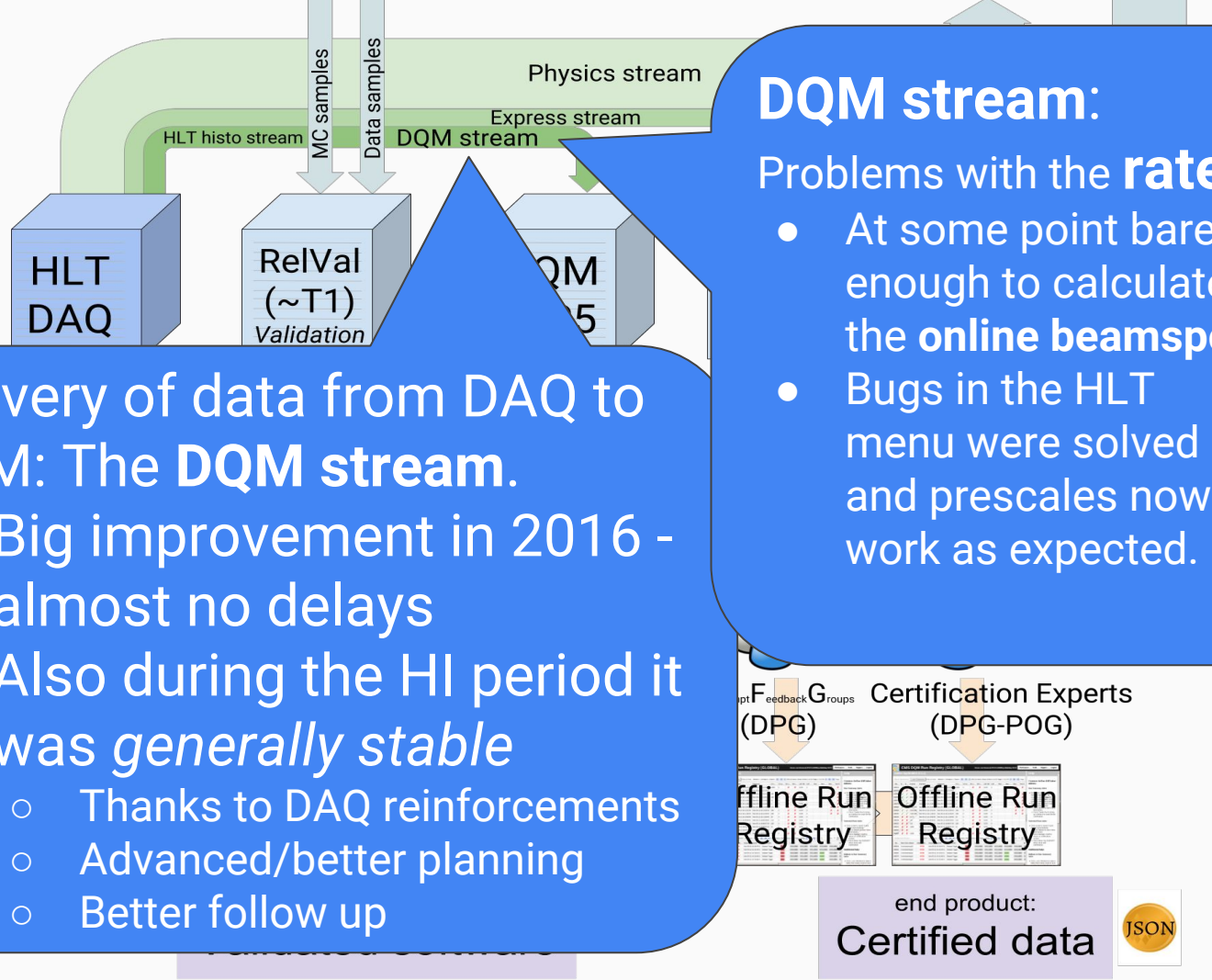


2016 Operations



2016 Operations

2016 Operations



DQM stream:

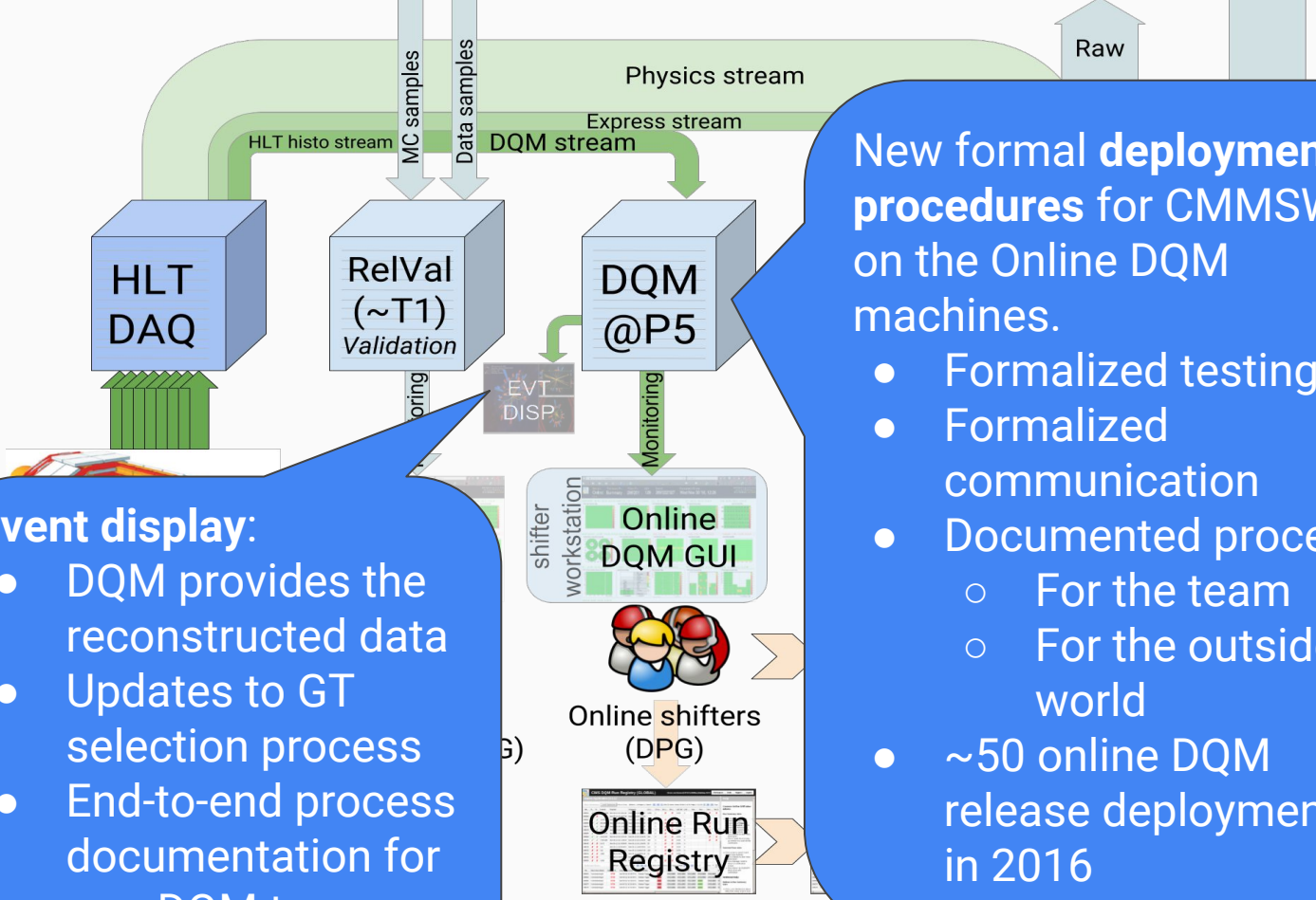
Problems with the **rates**

- At some point barely enough to calculate the **online beamspot**
- Bugs in the HLT menu were solved and prescales now work as expected.

Delivery of data from DAQ to DQM: The **DQM stream**.

- Big improvement in 2016 - almost no delays
- Also during the HI period it was *generally stable*
  - Thanks to DAQ reinforcements
  - Advanced/better planning
  - Better follow up

2016 Operations



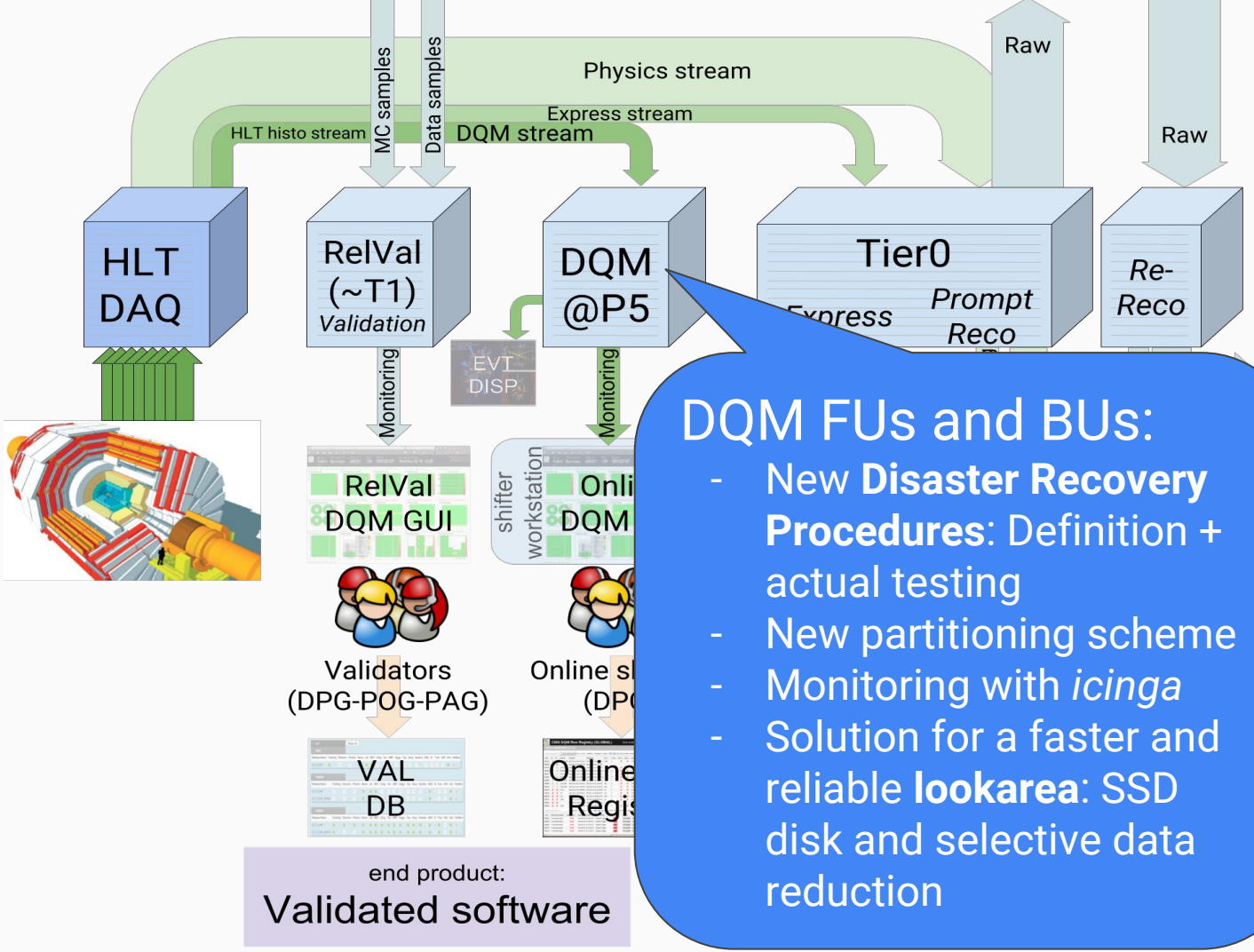
Event display:

- DQM provides the reconstructed data
- Updates to GT selection process
- End-to-end process documentation for
  - DQM team
  - The ORM

New formal **deployment procedures** for CMMSW on the Online DQM machines.

- Formalized testing
- Formalized communication
- Documented process
  - For the team
  - For the outside world
- ~50 online DQM release deployments in 2016

2016 Operations



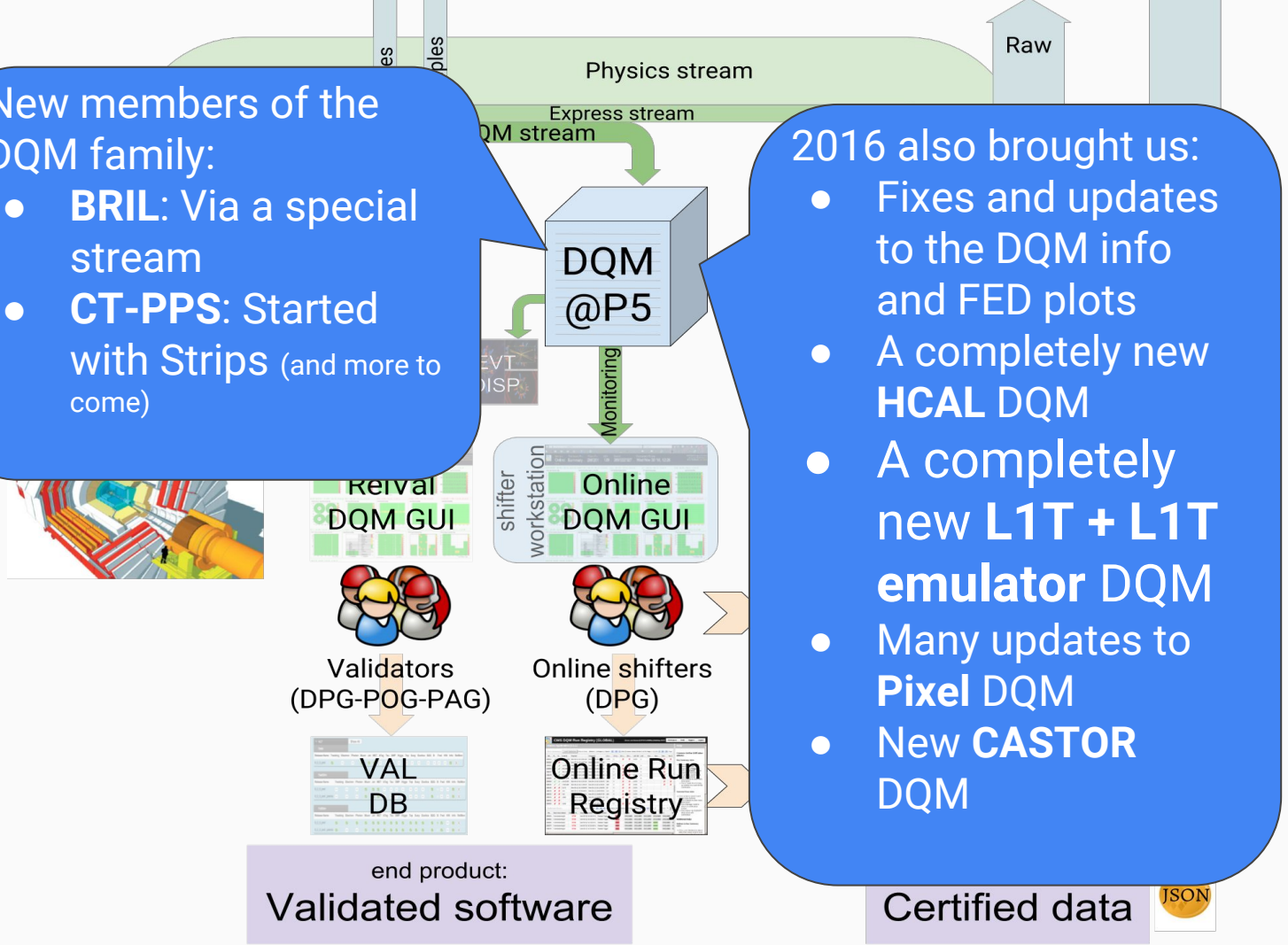
DQM FUs and BUs:

- New **Disaster Recovery Procedures**: Definition + actual testing
- New partitioning scheme
- Monitoring with *icinga*
- Solution for a faster and reliable **lookarea**: SSD disk and selective data reduction

2016 Operations

New members of the DQM family:

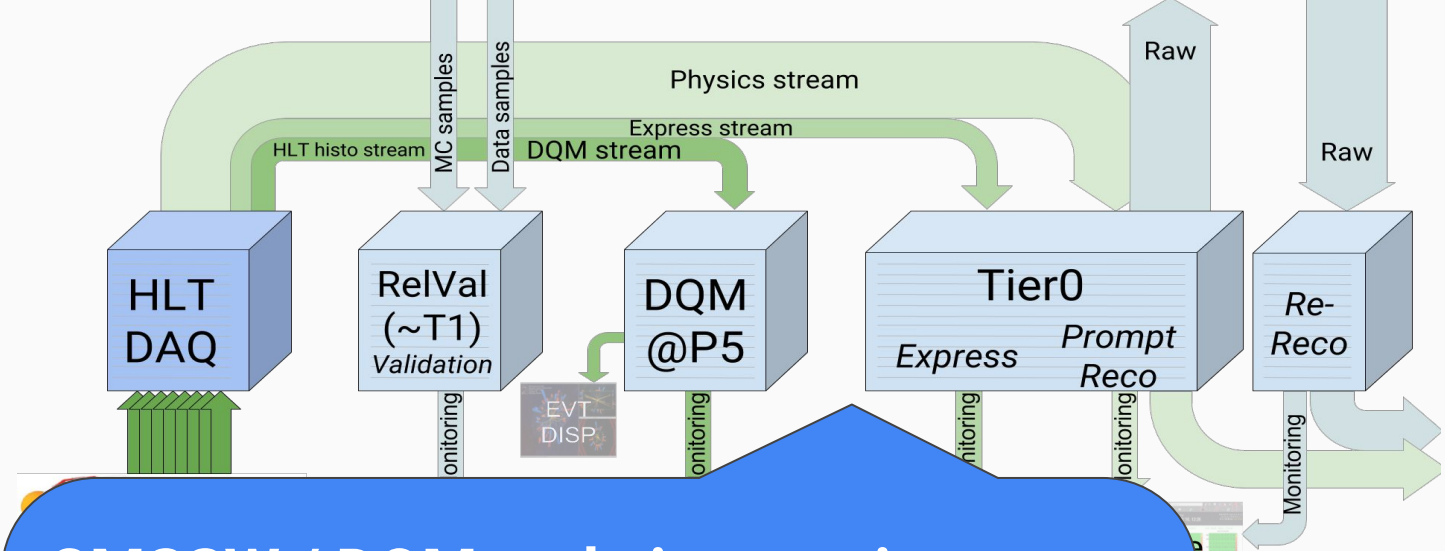
- **BRIL**: Via a special stream
- **CT-PPS**: Started with Strips (and more to come)



2016 also brought us:

- Fixes and updates to the DQM info and FED plots
- A completely new **HCAL** DQM
- A completely new **L1T + L1T emulator** DQM
- Many updates to **Pixel** DQM
- New **CASTOR** DQM

2016 Operations



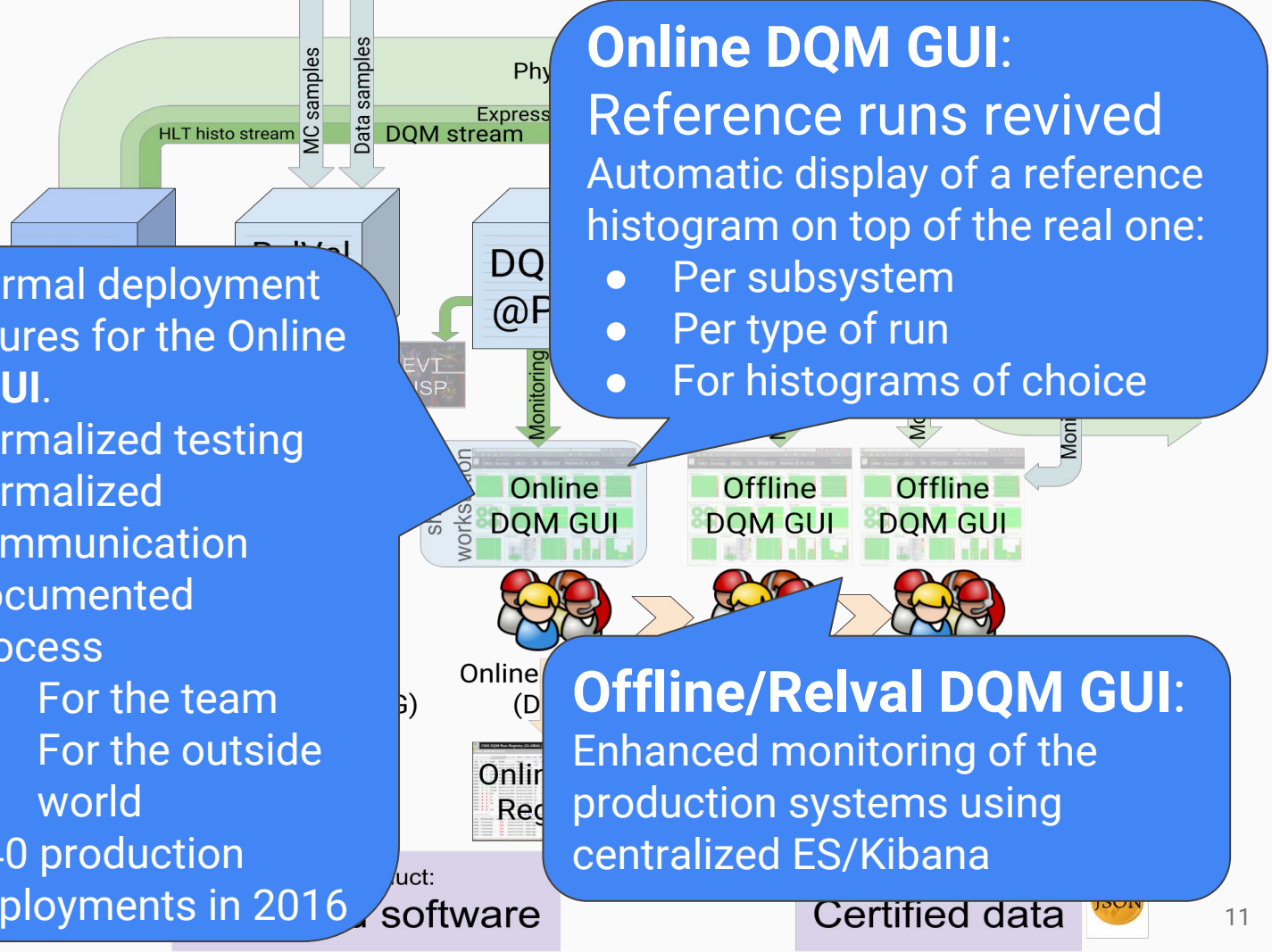
CMSSW / DQM code integration:

- Automated memory profiling for DQM on PR submission
- New guidelines (TWiki) for Validation/DQM developers to ease the process

2016 Operations

New formal deployment procedures for the Online **DQM GUI**.

- Formalized testing
- Formalized communication
- Documented process
  - For the team
  - For the outside world
- ~40 production deployments in 2016



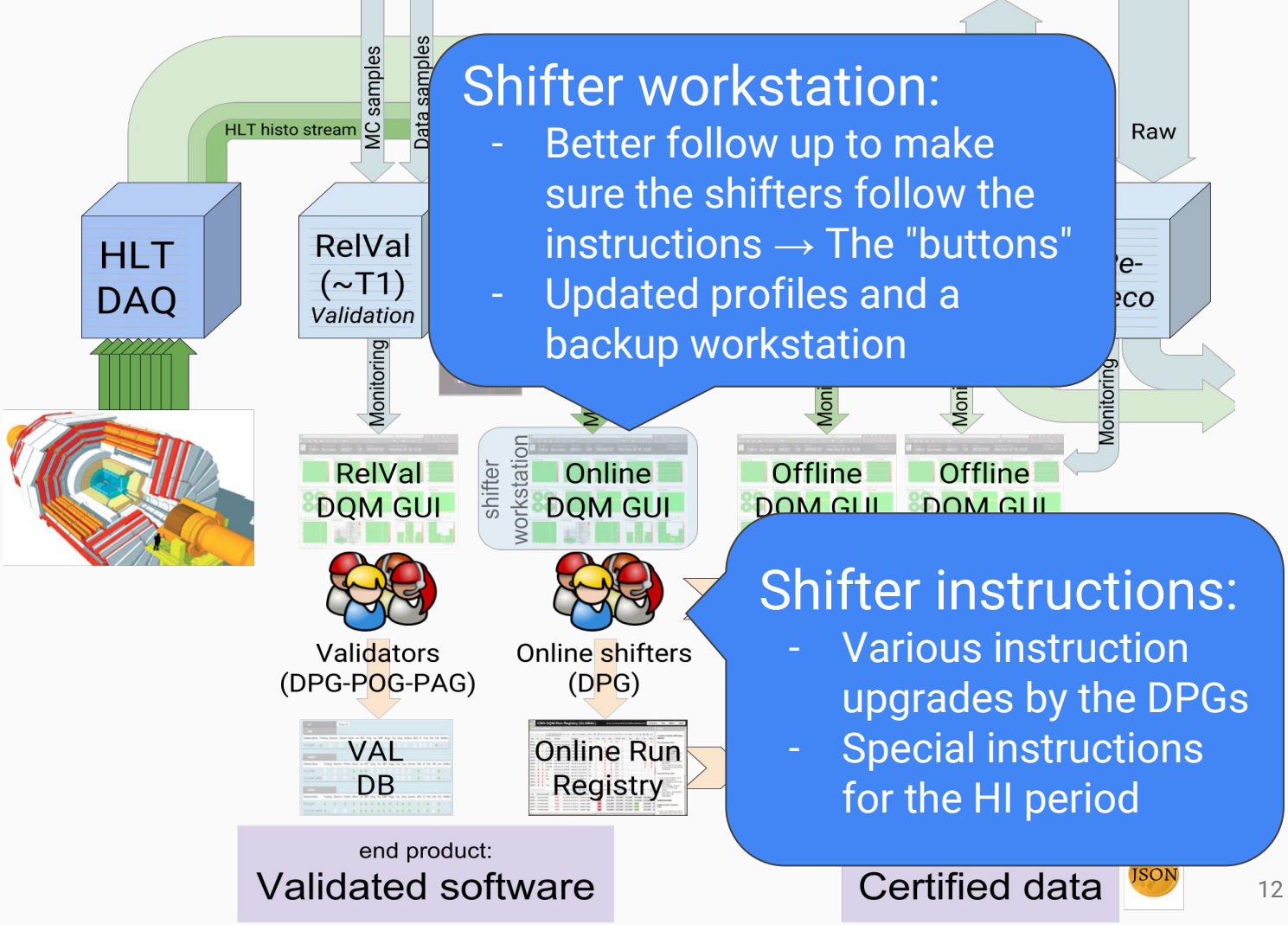
Online DQM GUI:
Reference runs revived

Automatic display of a reference histogram on top of the real one:

- Per subsystem
- Per type of run
- For histograms of choice

Offline/Relval DQM GUI:
Enhanced monitoring of the production systems using centralized ES/Kibana

2016 Operations

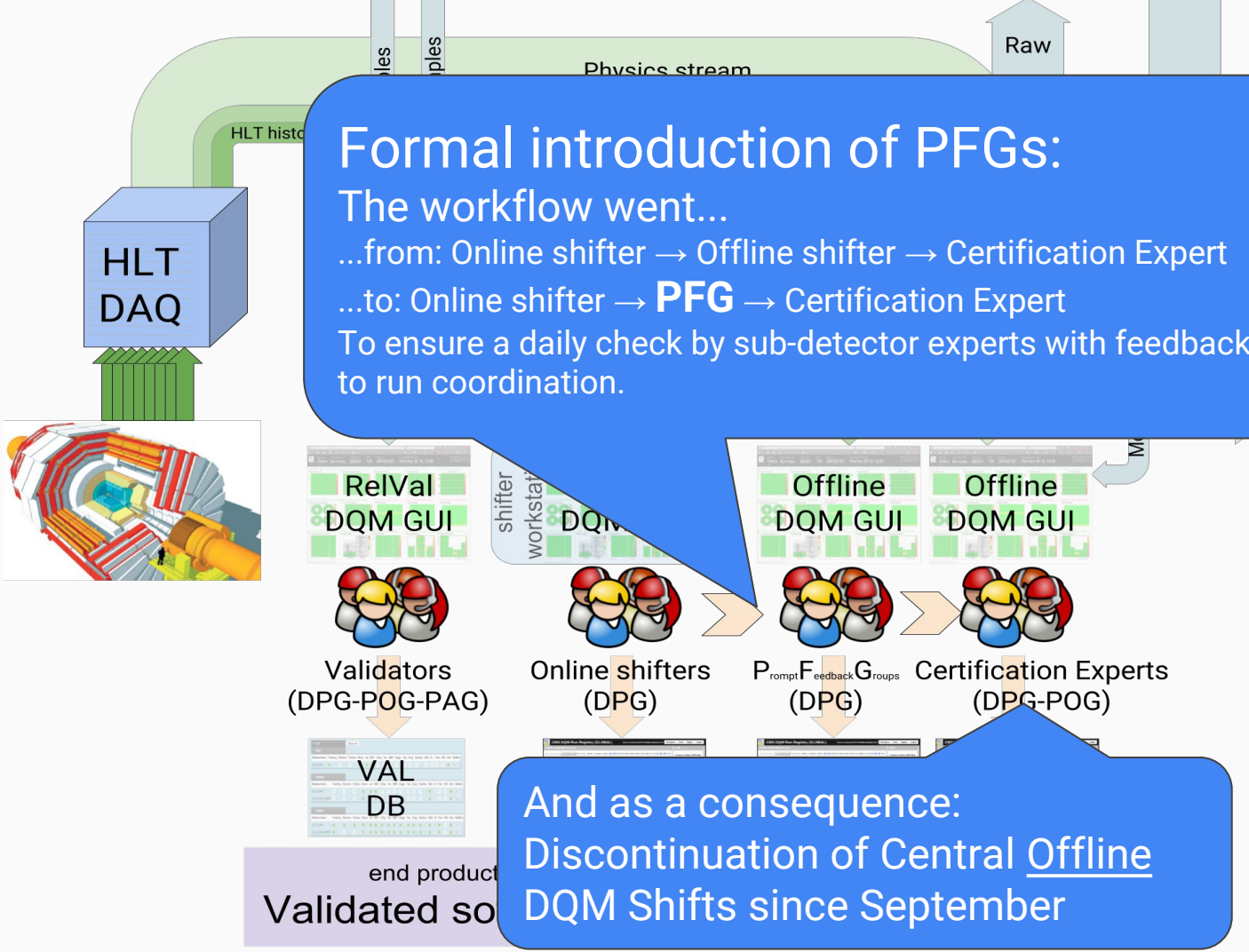


Shifter workstation:

- Better follow up to make sure the shifters follow the instructions → The "buttons"
- Updated profiles and a backup workstation

Shifter instructions:

- Various instruction upgrades by the DPGs
- Special instructions for the HI period



Formal introduction of PFGs:

The workflow went...

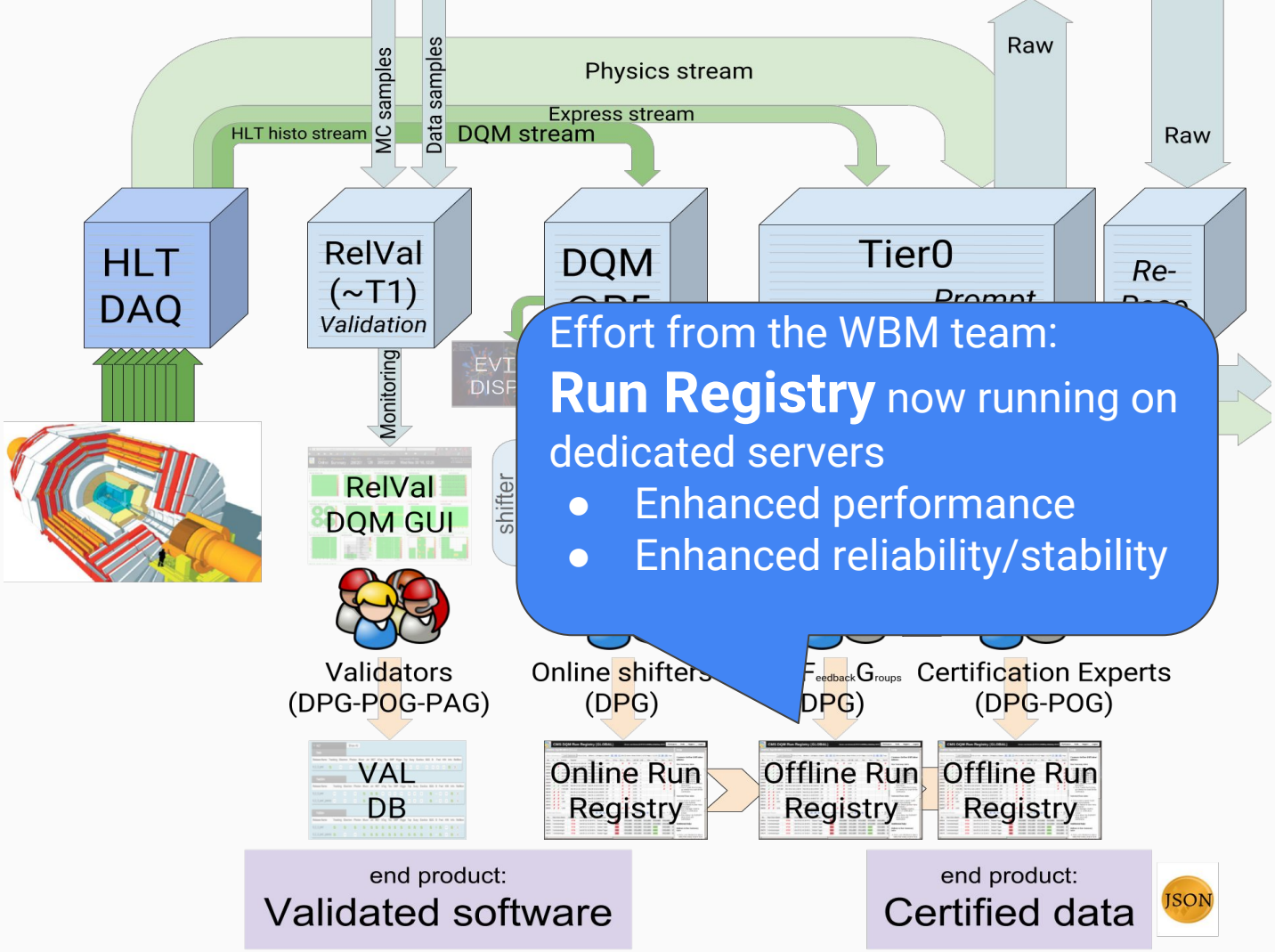
...from: Online shifter → Offline shifter → Certification Expert

...to: Online shifter → **PFG** → Certification Expert

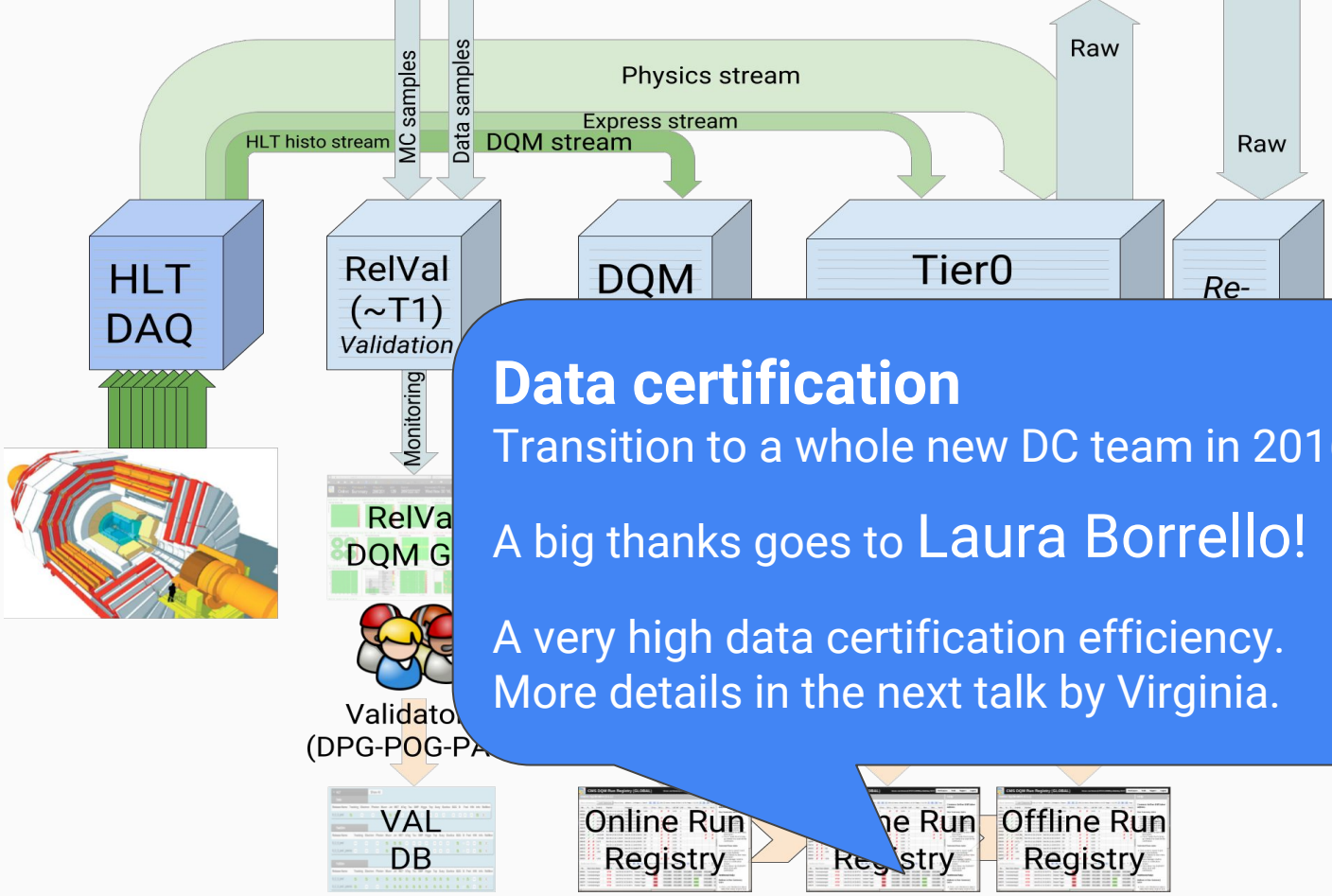
To ensure a daily check by sub-detector experts with feedback to run coordination.

And as a consequence:
Discontinuation of Central Offline DQM Shifts since September

2016 Operations



2016 Operations



Data certification

Transition to a whole new DC team in 2016.

A big thanks goes to Laura Borrello!

A very high data certification efficiency.
More details in the next talk by Virginia.

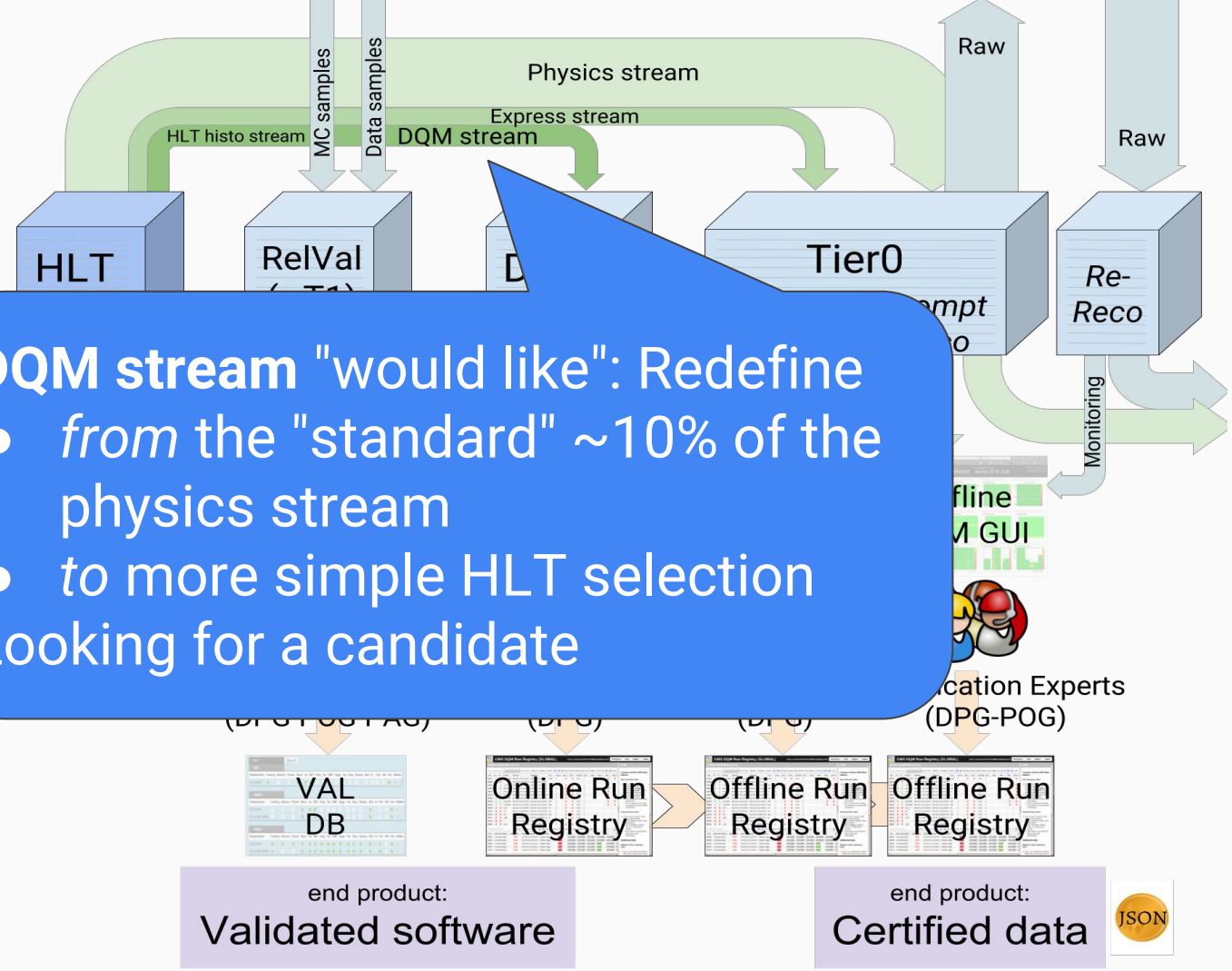
end product:
Validated software

end product:
Certified data

JSON

2017 Plans

2017 Plans

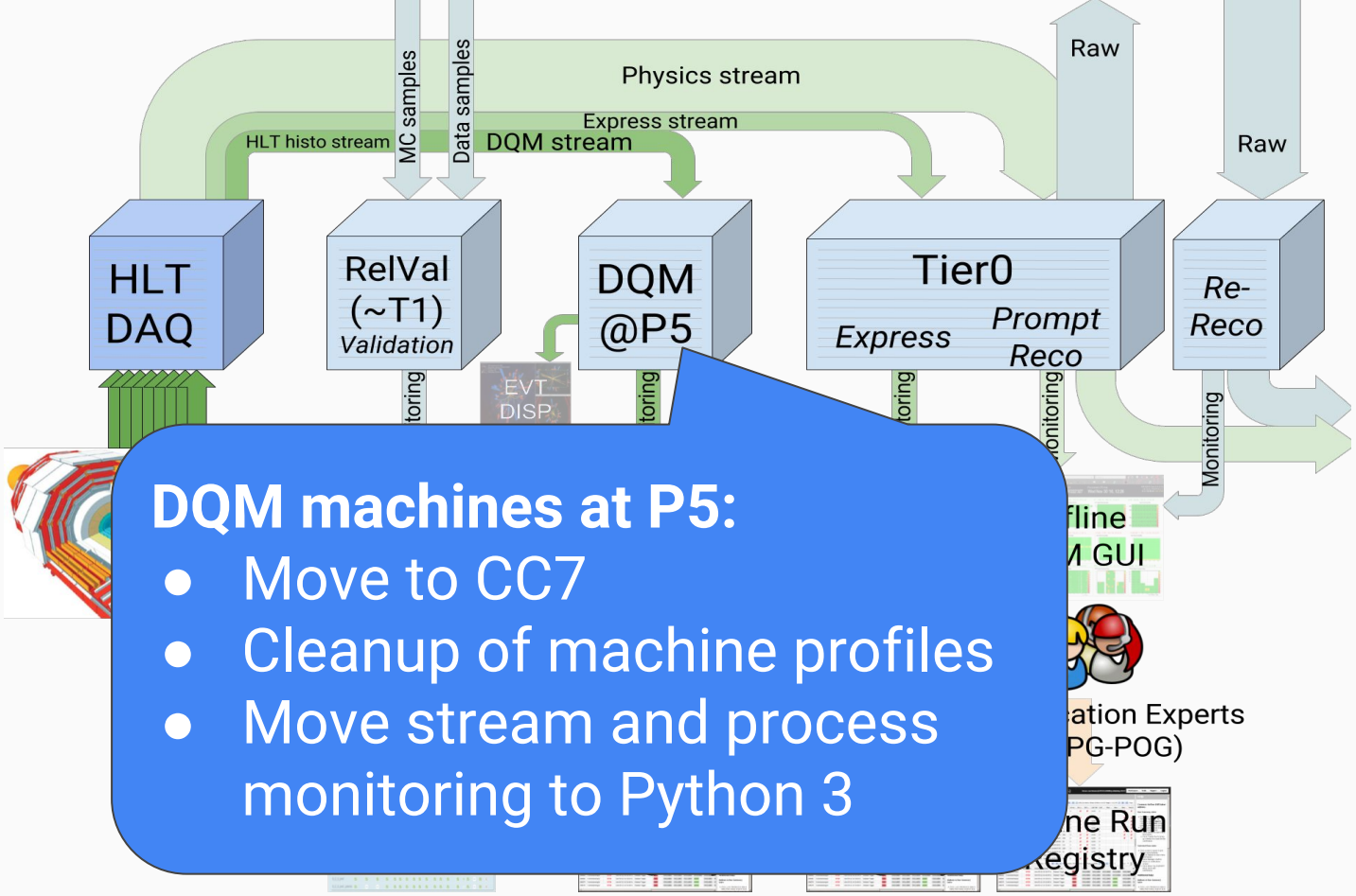


DQM stream "would like": Redefine

- *from* the "standard" ~10% of the physics stream
- *to* more simple HLT selection

Looking for a candidate

2017 Plans



DQM machines at P5:

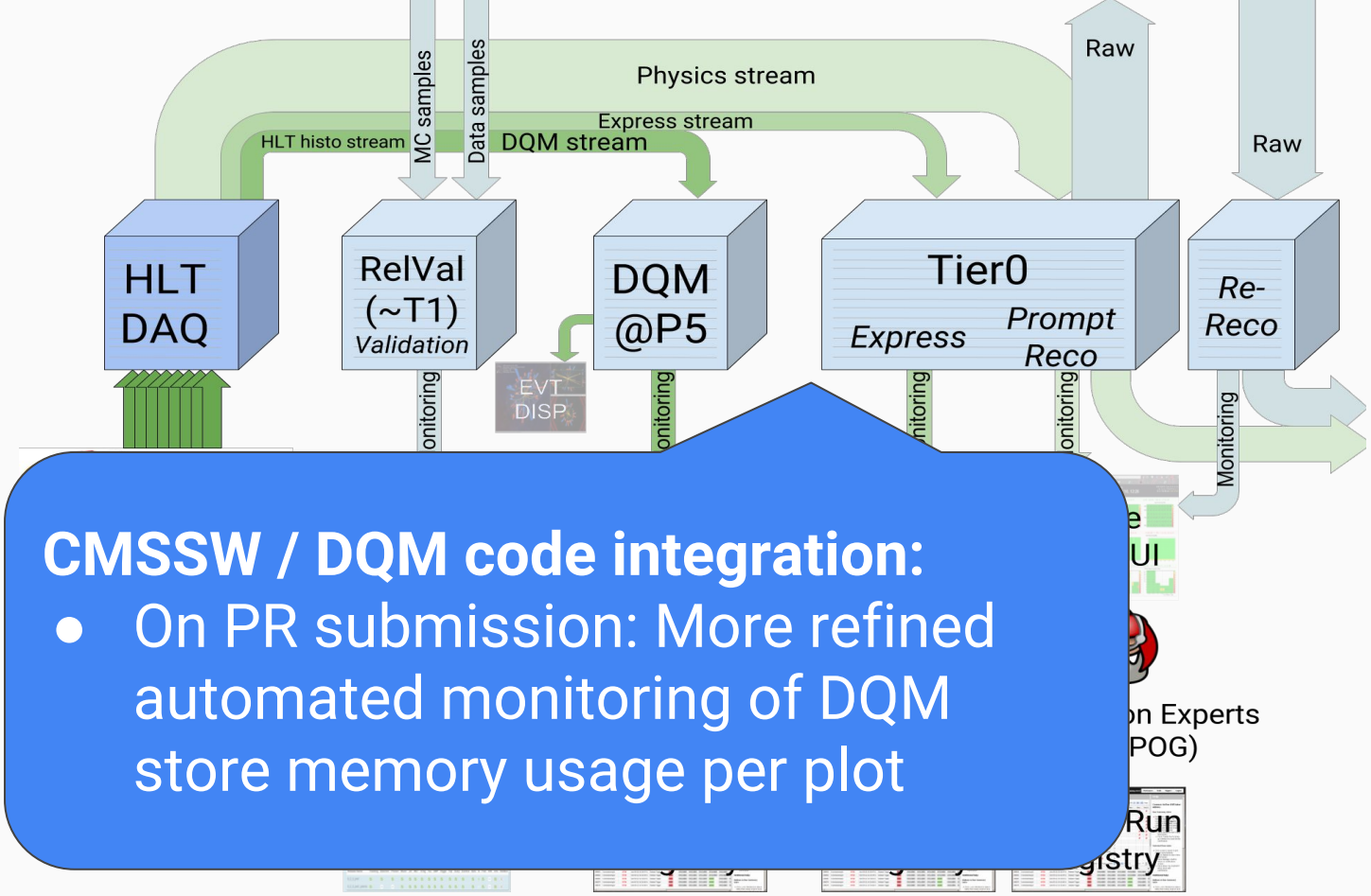
- Move to CC7
- Cleanup of machine profiles
- Move stream and process monitoring to Python 3

end product:
Validated software

end product:
Certified data

JSON

2017 Plans



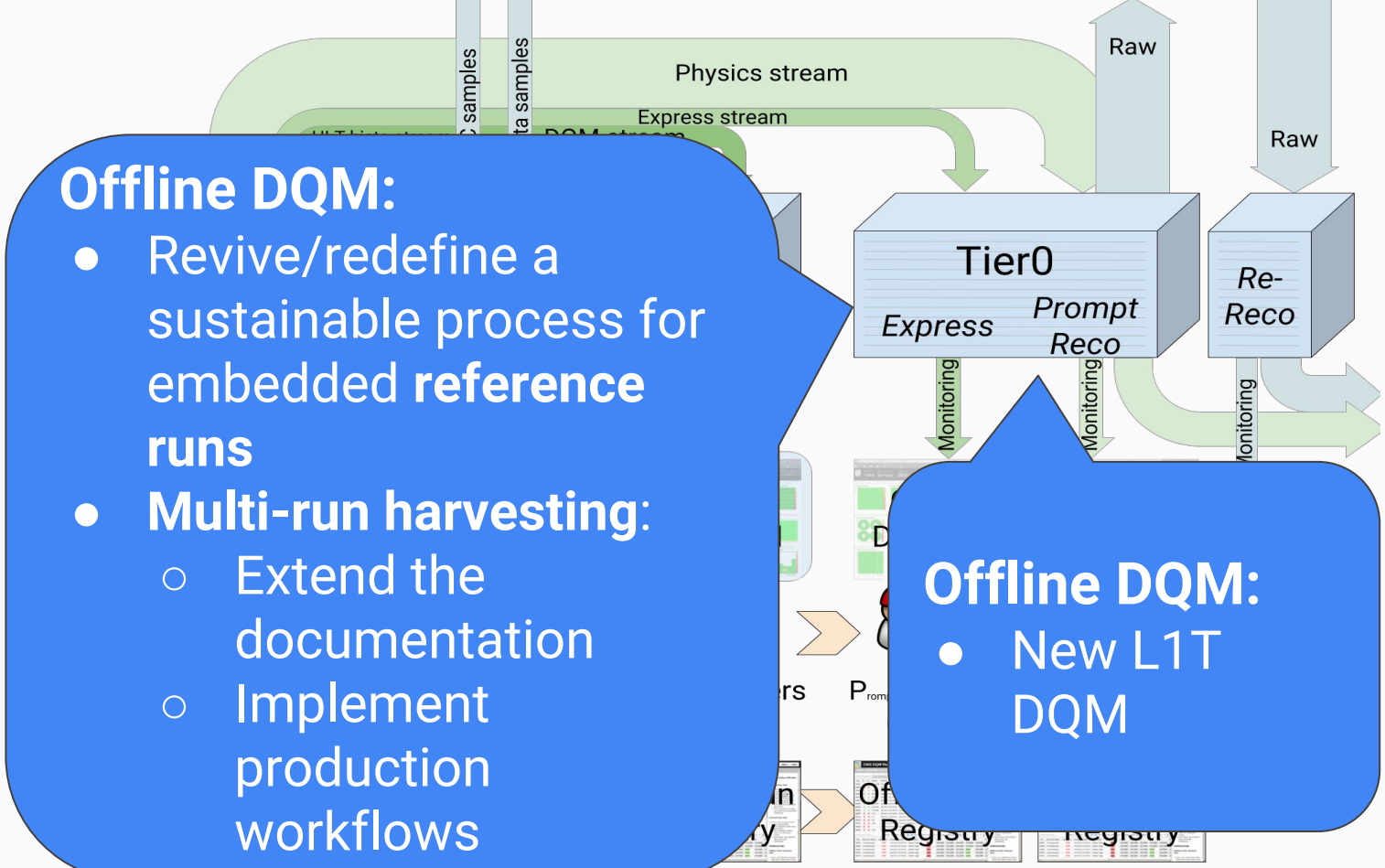
CMSSW / DQM code integration:

- On PR submission: More refined automated monitoring of DQM store memory usage per plot

end product:
Validated software

end product:
Certified data

2017 Plans



Offline DQM:

- Revive/redefine a sustainable process for embedded **reference runs**
- **Multi-run harvesting**:
  - Extend the documentation
  - Implement production workflows

end product:
Validated software

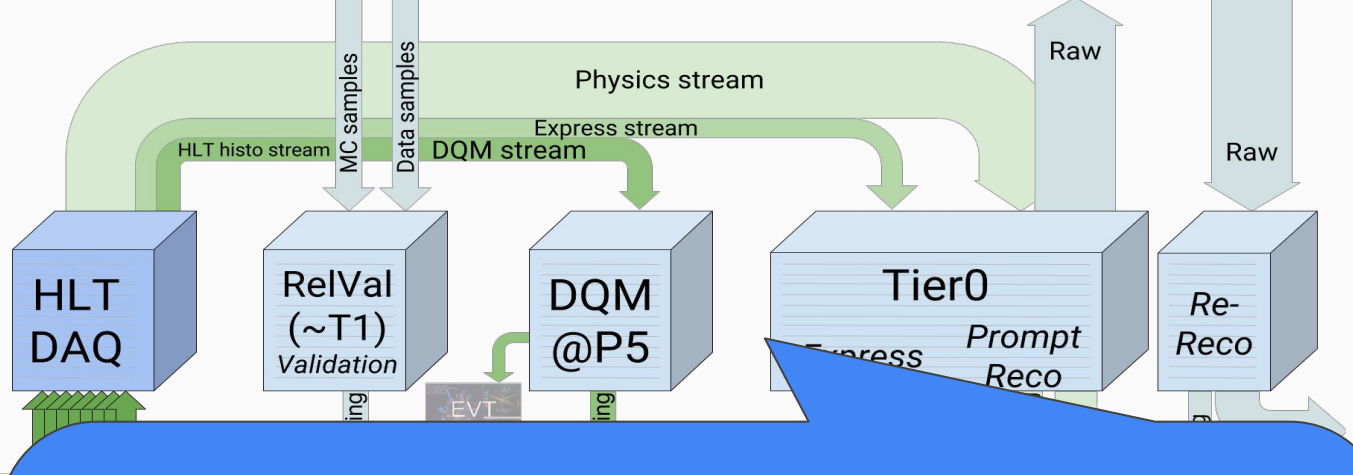
Offline DQM:

- New L1T DQM

end product:
Certified data

JSON

2017 Plans



Plan for the phase1 upgrade:

- **Pixel**: Addition of a new standalone application
  - To allow easy transition
  - To reduce the risk for the others
  - To encourage *early* testing with full DQM
- **HCAL**: Most is already there. Only small modifs needed
- New **CT-PPS** parts: Same approach as Pixel
- Ready to be fast and flexible like in 2016

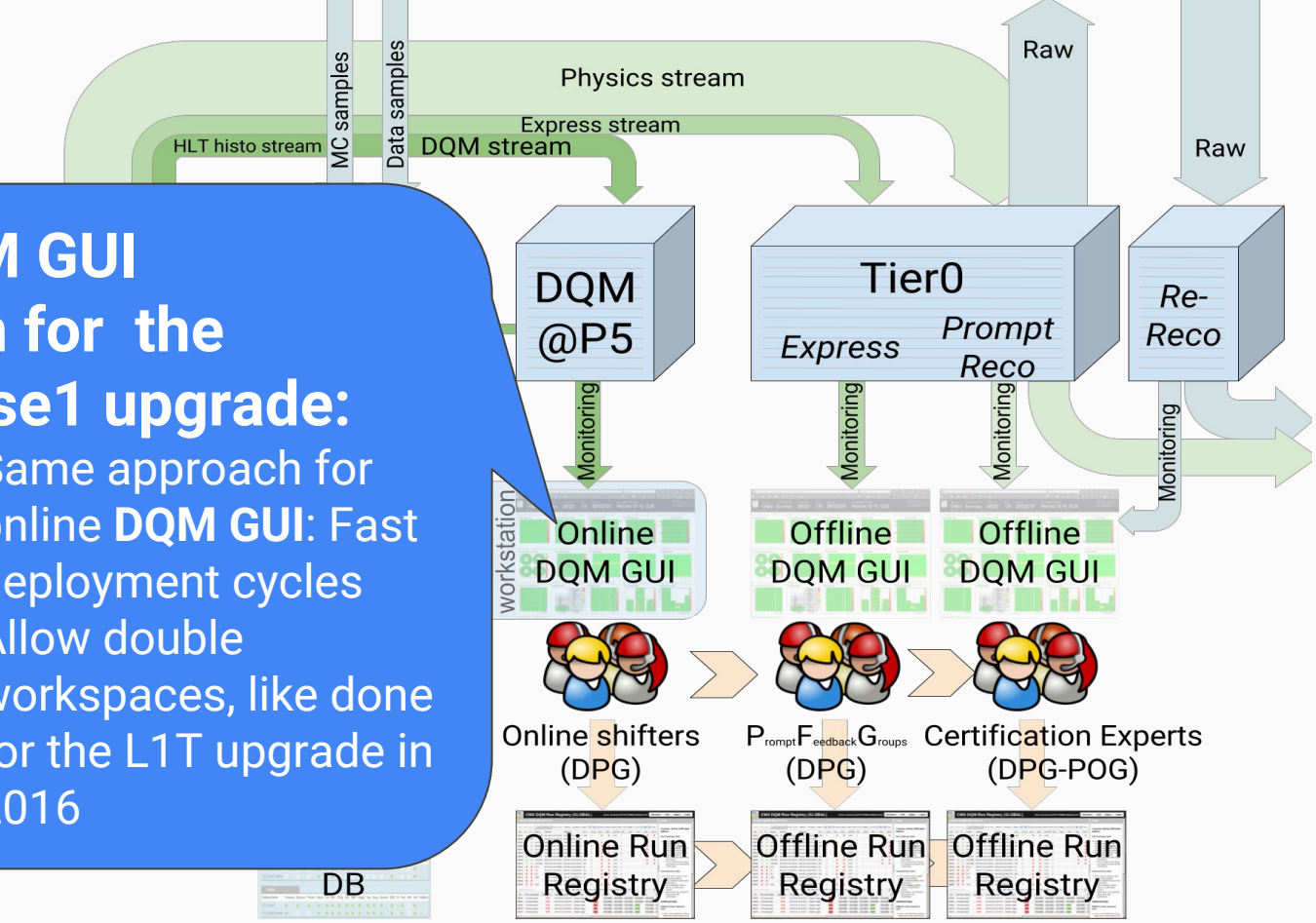
Validated software

Certified data

2017 Plans

DQM GUI Plan for the phase1 upgrade:

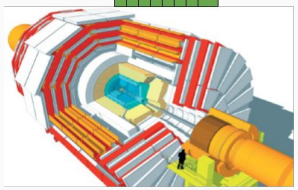
- Same approach for online **DQM GUI**: Fast deployment cycles
- Allow double workspaces, like done for the L1T upgrade in 2016

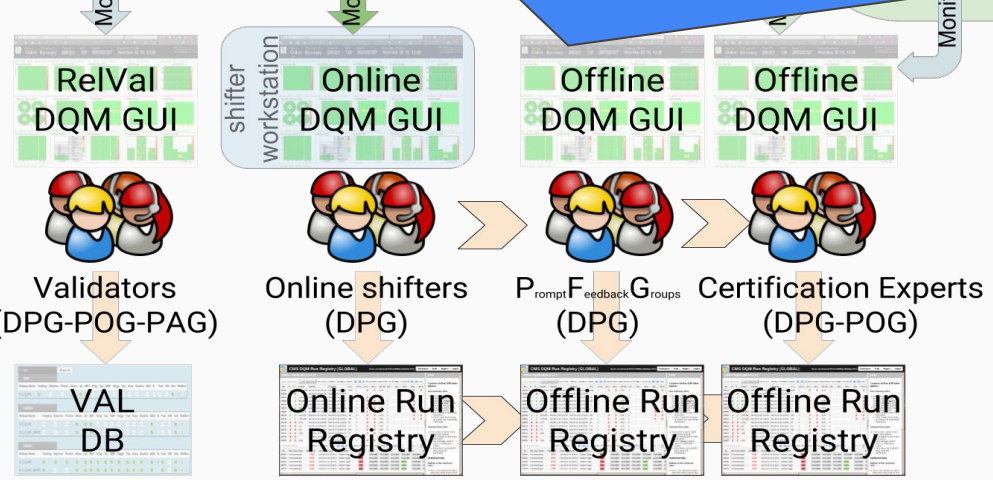


2017 Plans

DQM GUI:

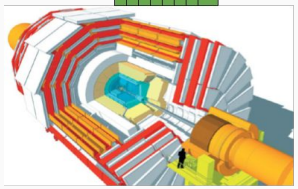
- **Upgrade to CC7**. Will be for summer 2017, in close collaboration with CMS WEB / http group. Experience from SLC6: Offline and relval server migration is far from trivial.
- *Would like*: upgrade to Python3

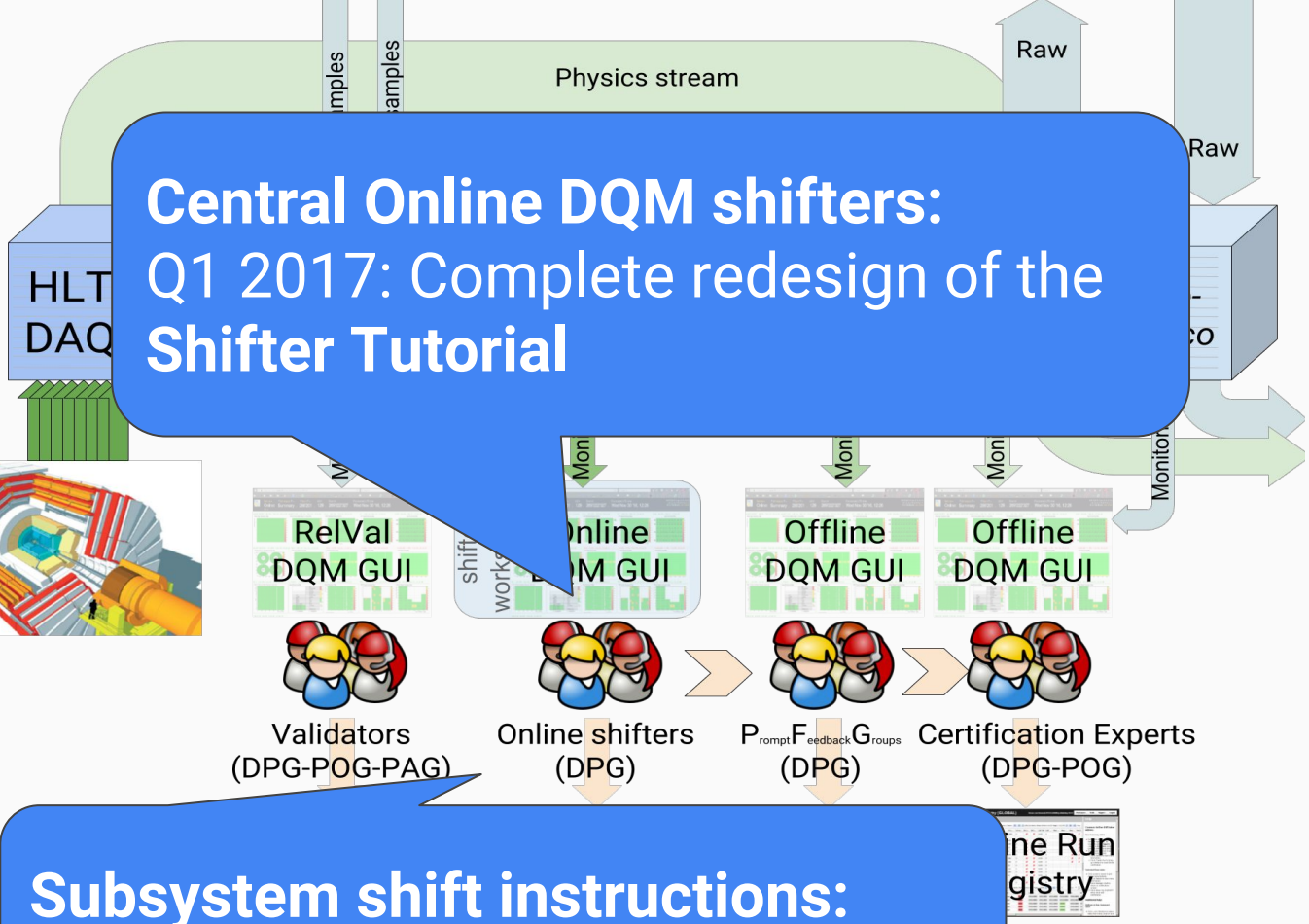




2017 Plans

Central Online DQM shifters:
Q1 2017: Complete redesign of the **Shifter Tutorial**

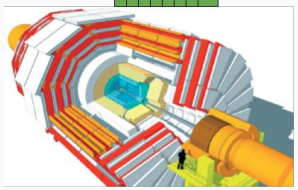


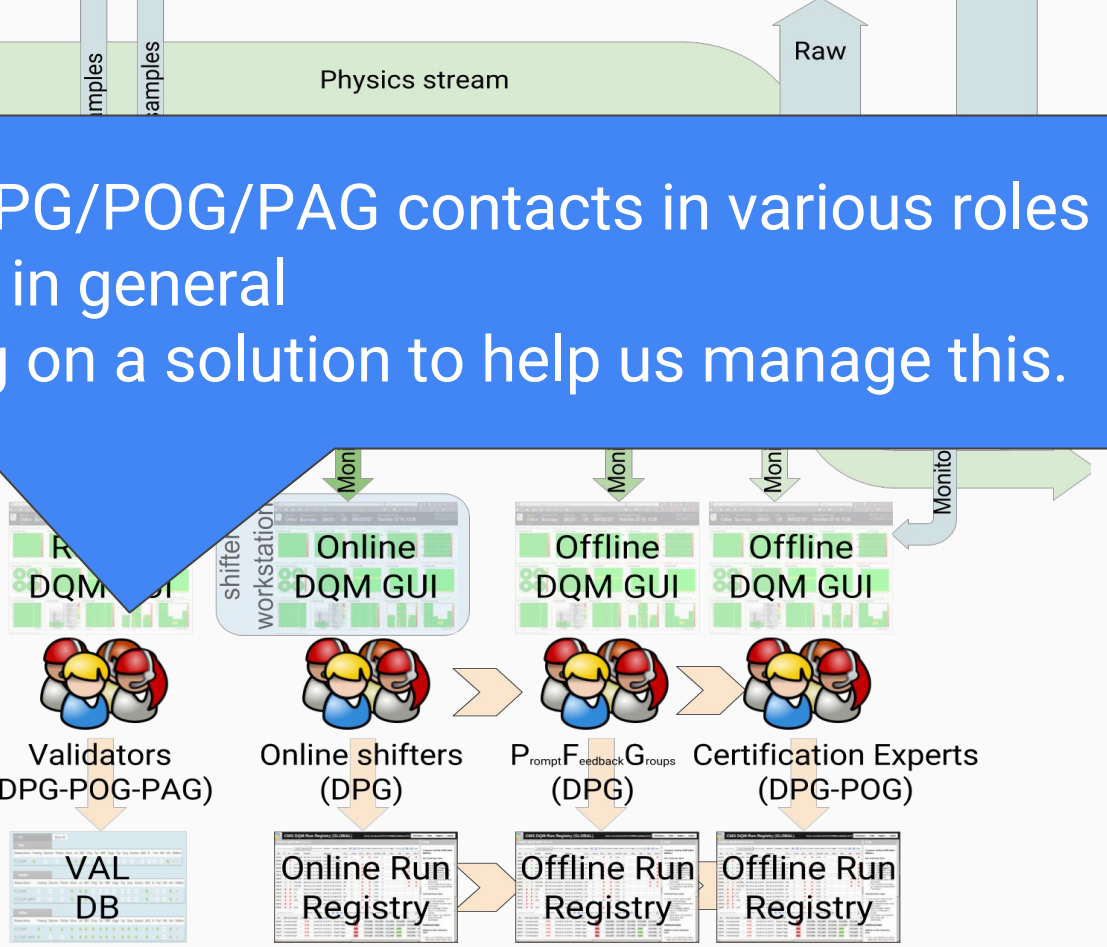


Subsystem shift instructions:
Cleanup of short term instructions needed

2017 Plans

CRM: DPG/POG/PAG contacts in various roles for PPD in general
Working on a solution to help us manage this.

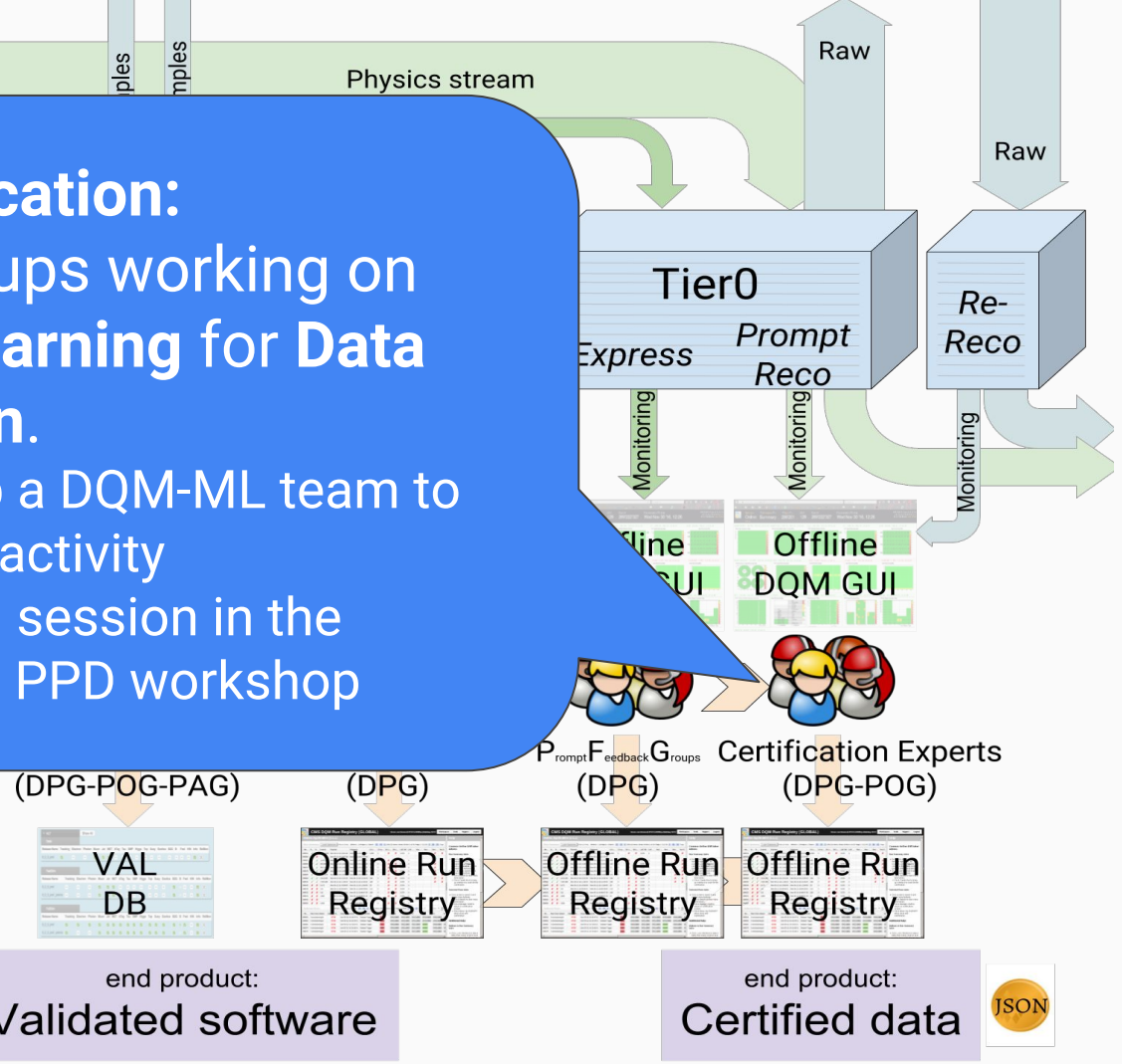




2017 Plans

Data certification:
Several groups working on **Machine Learning** for **Data Certification**.

- Setting up a DQM-ML team to steer this activity
- Dedicated session in the upcoming PPD workshop

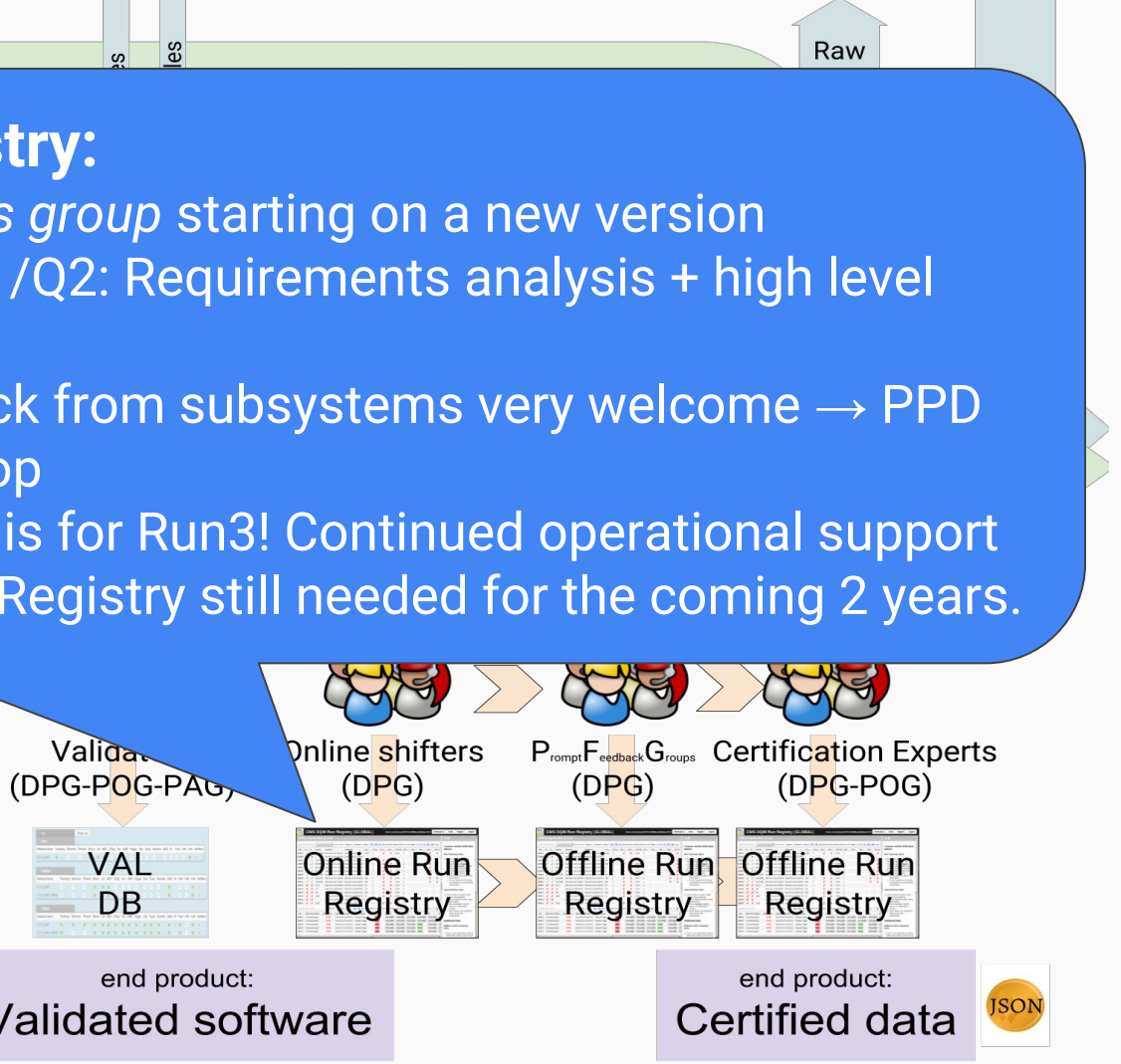


2017 Plans

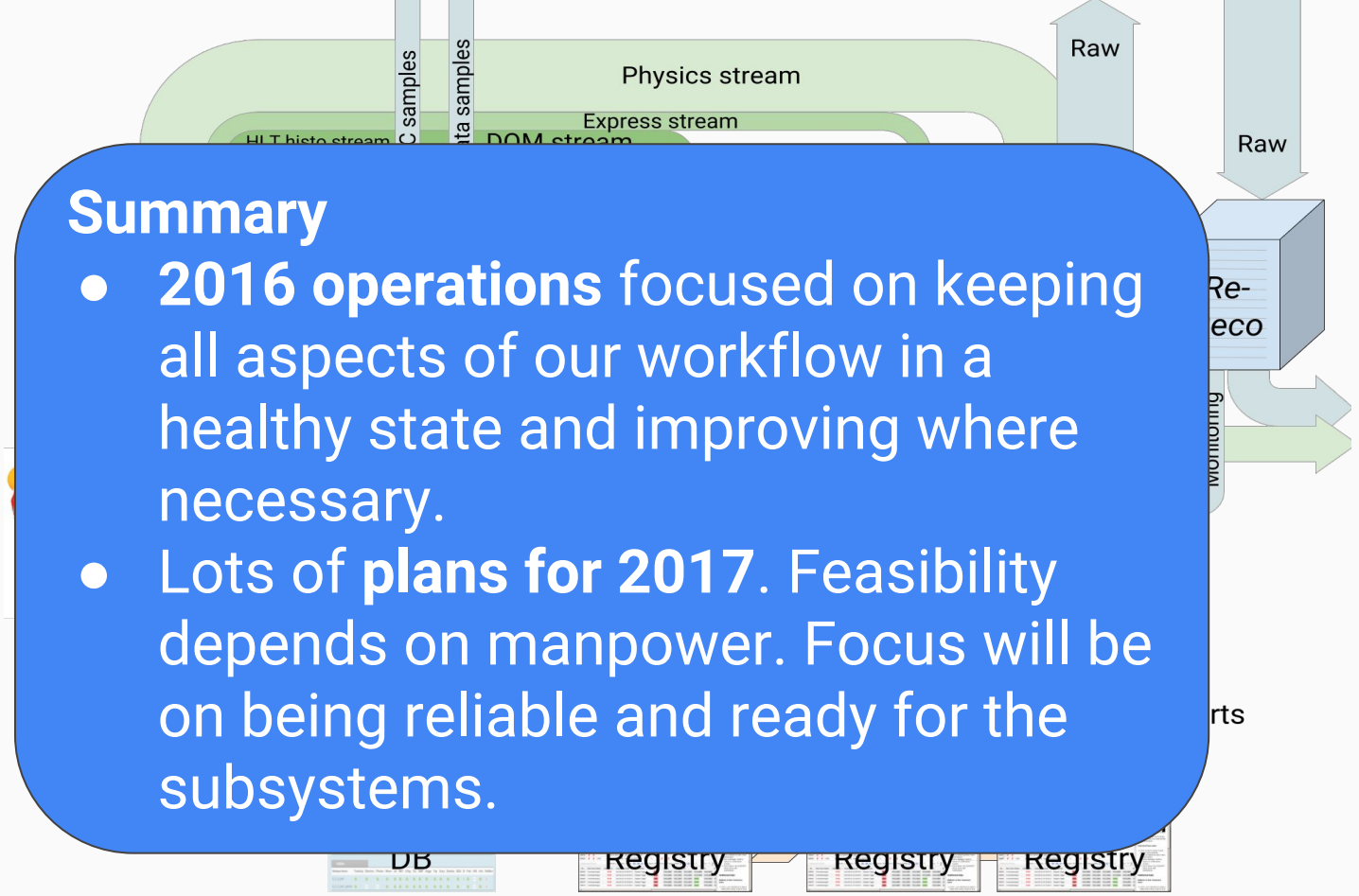
Run Registry:

WBM/Vilnius group starting on a new version

- 2017 Q1/Q2: Requirements analysis + high level design
- Feedback from subsystems very welcome → PPD workshop
- But this is for Run3! Continued operational support for Run Registry still needed for the coming 2 years.



Summary



Summary

- **2016 operations** focused on keeping all aspects of our workflow in a healthy state and improving where necessary.
- Lots of **plans for 2017**. Feasibility depends on manpower. Focus will be on being reliable and ready for the subsystems.

Questions

Backup / extra

DQM - Info

What is DQM-DC? https://twiki.cern.ch/twiki/bin/view/CMS/DQM

Documentation about the DQM-DC coordination areas:

- DQM Shifts Operations and Instructions: https://twiki.cern.ch/twiki/bin/view/CMS/DQMShiftInstructions
- Data Certification: https://twiki.cern.ch/twiki/bin/view/CMS/DQMDataCertification
- Online Operations: https://twiki.cern.ch/twiki/bin/view/CMS/DQMOnline
- Framework and Offline Development: https://twiki.cern.ch/twiki/bin/view/CMS/DQMOffline
- DQM GUI: https://twiki.cern.ch/twiki/bin/view/CMS/DQMGui