Progress report for QoS in DAC21

Paul Millar <paul.millar@desy.de>

Milestone 1: The use-case have been identified

- We currently have information about DAC21 from SKA, CTA, FAIR and LOFAR.

  - FAIR DAC21 use-cases

  - CTA DAC21 use-cases

  - LOFAR DAC21 use-cases

- Documents cover all DAC21 activity, not just QoS-specific.

- Information is rather scattered at the moment: should we consolidate this?

- We're currently missing any indication of how much capacity is needed.

- Interesting additional storage have been identified:

  - SKA – object storage / CEPH

  - CTA – cloud storage / S3

Milestone 2: resources needed are deployed

- Mostly focused on making tape available

    - PIC have already volunteered, but not yet made available

    - Negotiated tape access at DESY, with some caveats.

- SKA (Rohini?) and CTA (Frederic?) are organising the required capacity for Ceph and S3 storage.

Organised tape access at DESY

- ESCAPE has no hardware budget – so we need to be "inventive"

- Negotiated with DESY operations teams that ESCAPE has access to "spare" tapes

  - DESY is willing to run a reduced spare capacity until DAC21 is over.

  - ~100/200 TiB capacity available.

- DESY needs those tapes back – they're only "on loan".

  - We can have them for DAC21, but the stored data will be lost after that.

- So …

  - Don't store data you care about!

  - We should probably think what is the best procedure for removing data/replicas.

Tape commissioning process @ DESY

- Enable tape support in underlying storage & test it works! (2--3 days)

- Identify and create directory that we wish to use for Rucio (1 day)

- Update dCache configuration so files in target directory end up on tape (1 day)

- Update CRIC configuration, adding new tape-based RSE into Rucio (1 day)

- Testing that Rucio can write into tape (1–2 days)

Provided there are no unexpected show-stoppers, the process should be complete by end of August.

We're looking for volunteers who are willing to help out with testing.

Tape commissioning process @ PIC

- Probably follow a similar process as with DESY.

- Expected lead-time of ~2 weeks before storage is available for testing.
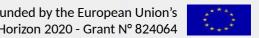
Open questions

- How realistic should the tape activity be?

- Tape drives:
  - Normally, tape drives are shared among users.
    - DESY has some "big hitters" with sporadic access patterns.
    - If they coincide with DAC21 then the performance will suffer.
  - We may be able to reserve some tape-drives for the duration of DAC21.
    - +ve side: tape access would be "faster"
    - -ve side: might not best reflect real-life

- Disk cache: how much do we need?
  - how much data is going to be written and recalled?
  - Should we "wipe" the disk cache, to force tape staging?

Other resources …

- CEPH storage: would likely need to coordinate the QoS labels

- Is this SKA-only storage? How do we do that?

- Similarly for the cloud (S3) storage for CTA: which QoS label? Is it CTA-only?

- Is there interest in trying out erasure-coding (EC) storage as a QoS class?
  - Option offered by CERN / EOS.

Active QoS testing

- Ticket https://jira.skatelescope.org/browse/EDLK-116

- The plan is to provide some high-level verification that QoS is "working".

- Much of the initial work has been done as a lead-up to the FDR

- There is some more work still needed.

QoS monitoring

- Ticket https://jira.skatelescope.org/browse/EDLK-115

- Excellent work from Alba.

- Work is now mostly complete, but some (minor) integration into the monitoring framework is still needed.
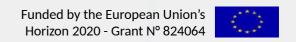
Next steps

- Finish commissioning available tape storage

- Work with SKA (Rohini?) and CTA (Frederic?) to ensure ceph / cloud storage has appropriate QoS classes.

- Work with ESFRI communities to start writing and testing software to drive the DAC21 use-cases: injection, replication, processing. (to achieve Milestone 3)

- Milestones (Further details in this Google docs):
  - M1. **The use-cases have been identified** (due **end of May**)

    All ESFRI communities have a detailed plan on what operations they would like to demonstrate. Any missing features or resources are identified.

  - M2. **The resources needed to support QoS use-cases have been identified and deployed** (due: **end of June**)

    Sites have been identified that will provide access to this hardware, and has been deployed.

  - M3. **The code needed to drive the use-cases is feature-complete** (due: **end of July**)

    This milestone is about developing the code to drive DAC21 QoS and caching use-cases and work-flows. The code is not expected to be feature-complete but not fully tested.

  - M4. **All the QoS use-cases have been exercised at small-scale** (due: **end of August**)

    This milestone is about catching the more obvious problems.

  - M5. **The QoS use-cases have been demonstrated at the desired scale** (due: **end of September**)

    Verify the work-flows work at scale; may require coordinated access.

  - M6. **DAC21 has completed successfully**. (2021-11-xx)