USDF Update
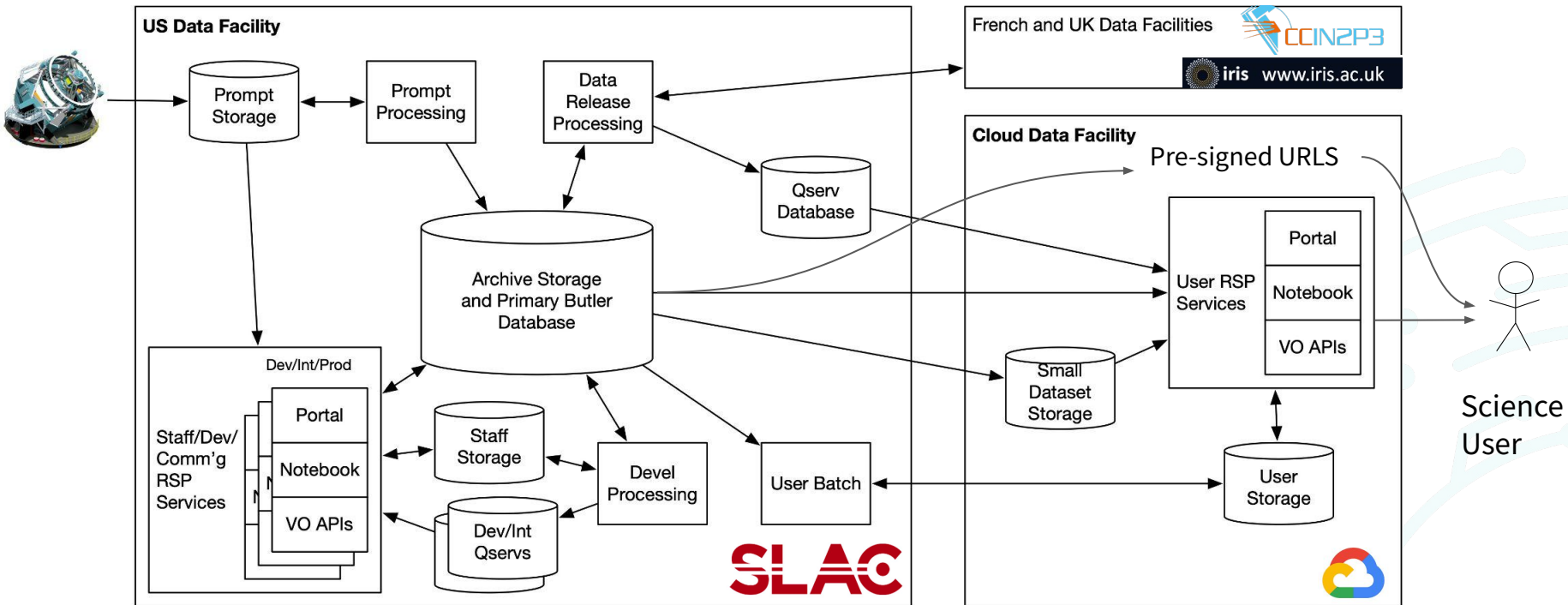
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USDF and Data Flow

RSP = Rubin Science Platform

Cloud-SLAC Division of Scope

Cloud

- Science users, with access provided by the Rubin Science Platform
- Provide personal storage/CPU + cloud access to coadds
  - Effective 500 cores added each year + 2 PB → 10 PB storage

SLAC

- Prompt and DRP processing
- Qserv catalogue server
- Storage archive for all data: cutouts, image access
- Serving alerts to the community
- Home for developers and staff (and commissioners)
- What about user batch? Work submitted from the cloud and run at SLAC… ?

USDF Status

- Resources in place or arriving soon:
  - 10k batch cores; 30 PB disk. 50 kubernetes nodes. Various servers etc
- Ready for ComCam (actually AuxTel) Milestone completed (AuxTel is a 1 CCD camera used for atmosphere tracking)
  - Auto transfer and process AuxTel data from summit
  - Routine processing is happening; available for analysis in Rubin science platform
  - "Long Haul Network" between Summit and SLAC in use - combo of leased lines + ESNet
    - Early throughput testing underway
- Start of Hybrid model
  - Contract in place with Google - planning when the IDF transition actually needs to happen (IDF: already-running cloud instance spun up while the USDF came to be)
  - Production Qserv running with DC2 catalog; access from Google cloud demonstrated
  - DP0.3 worked
- Prompt Processing; Alerts distribution in place - scales to full rate; MPC mirroring in place.
- Supporting ~300 staff and commissioners
- Supporting Full Camera Testing in IR2
  - automated transfers of test data to France, using Rucio/FTS, are in place

Multisite & Reprocessing Status

- HSC PDR2 used to shake out USDF use of PanDA and s3df

- PanDA and Rucio servers in production at SLAC (supplanting CERN DOMA for PanDA)

- Gearing up for Multisite HSC campaign
  - Raw data (via Rucio) and calibs in place in all 3 DFs
  - Testing Rucio/butler connections now
  - Steps 1 and 2 of DRP will be manually submitted

USDF Issues 1

- Still not fully recovered from loss of EFD in May
  - Open source influxdb has made it impossible to restore old data to a live EFD version (also true at the base)
  - We are gearing up to get the Enterprise version which brings proper backups and HA operation. May need to retreat to local disk for the database for performance reasons. MIght repurpose 2 Qserv nodes
  - Targeted for November.
- Later than expected access to SRCF-II
  - Making do trying to expedite embargo rack provision. Only flash server + Arista switches go there. Likely will split across 2 physical racks.
  - Encourages spending hardware budget early to allow for installation delays - we have $2M of $4.3M in hand for FY24 already (unusual).

USDF Issues 2 - USDF/S3DF reliability

- Not there yet…
  - Ideally must be (more) reliable for ComCam commissioning data taking
- USDF
  - Embarking on program to review and document k8s services, starting with PanDA and Rucio
  - Not all our upgrades work either…
  - Limping along with no real DBA - maybe being addressed with IT contract company
  - Bulking up monitoring to get early warning of problems
    - Mobu is running, but errors not being tracked yet
- S3DF
  - Lots of moving parts, and more errors than I'd like to see
    - I keep Amedeo apprised of the issues
  - Many barn doors *are* being closed - hopefully becoming one-time problems
  - ingress/egress may still be issues, especially when we start exercising cloud access to USDF services and multi-site processing hits servers at SLAC

Staffing Issues

- DBA
  - No luck at Fermilab for operations DBA effort
  - Investigating local-to-SLAC IT company (erginc.com) : first resume is in
  - Will need SOW and contract <$250k (to avoid having to compete)

- Full stack dev-ops
  - K-T to turn into pumpkin after ORR…
  - Developing job ad now

- Replace Richard
  - May 31 deadline
  - Job ad in prep for quick release

Looking ahead

- Current list of USDF epics [here](#) for FY24Q1-Q2, roughly organized as:
  - Multi-site processing and scaling; WAN throughput testing
  - US DAC prep for transition from IDF and access to SLAC services
  - Embargo rack implementation; LHN throughput testing
  - Consolidated db, LFA exchanged with summit: LSE-72-required publication of events and metrics to the Summit
  - embargo_transfer (post-embargo data movement out of embargo rack)
  - Backup and disaster recovery strategies
  - Monitoring
  - Acquire hardware for next round
- Issues
  - Need client-server butler to test out DAC services; user batch?
  - What additional services need to be set up? (see Life of Photon)
  - Will Cassandra be up to the task?
  - Waiting on secret satellite catalogue
  - Still need to iterate on who looks after what in day-to-day operations

Past Activity

- Over the Last few Months
  - Rucio data transfers
  - Rucio Hermes Daemon deployed; Kafka connectivity between USDF/UKDF/FrDF
  - HTCondor at the Summit in progress
  - MTHeaderService created
  - MTOODS created
  - OODS container deployment handed off to T&S

Upcoming Activities

- Continued development
    - BPS & BPS plugin additions/changes/fixes (Michelle, Nick)
    - OODS updates for S3 (Steve)
    - Rucio automatic butler ingestion (ingestd, Rucio registration merge job code) (Steve)
    - MTHeaderService additions (Felipe)
- Support and updates
    - HeaderServices (Felipe)
    - Rucio transfers (Greg)
    - OODS for Auxtel, ComCam, LSSTCam (Steve)
    - BPS (Michelle, Nick)
    - HTCondor at SLAC and Summit (Greg, consulting with Michelle and Steve)
    - New NCSA employee talking to A2 about commissioning work