2X3 Processing

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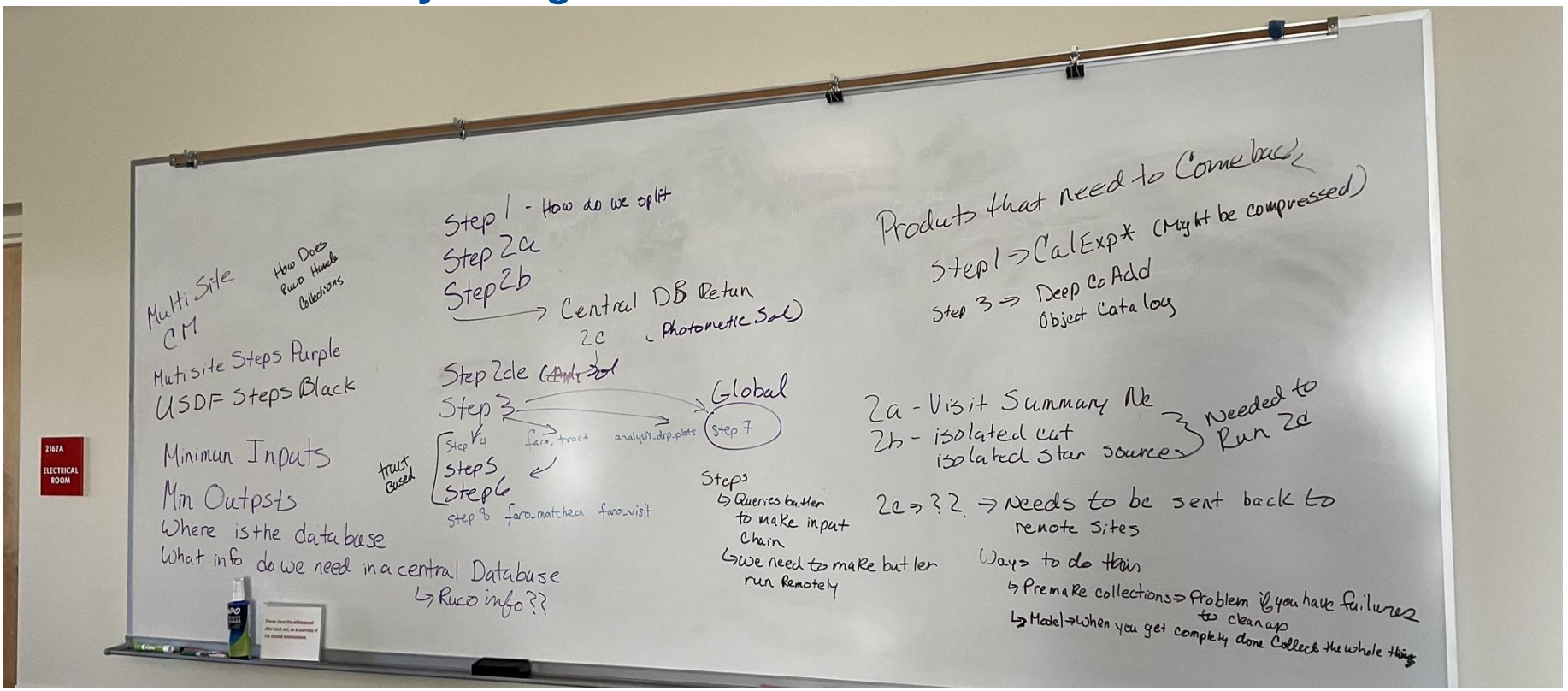
DM/SP Data Facilities and Multi Site Processing

Lyon, France 13 Feb 2025

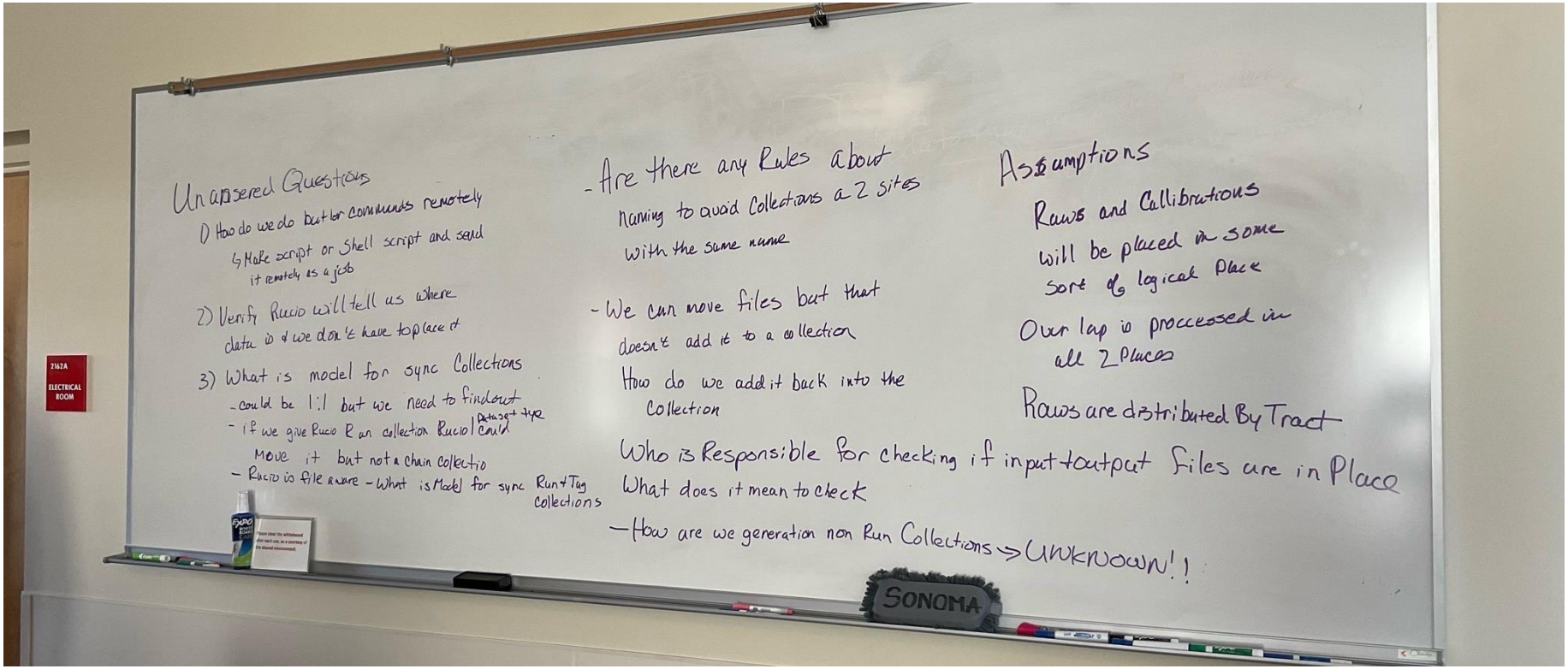
In partnership with:

Where we were a year ago



At last years JTM at SLAC we gathered people in a room to map out what needed to happen for Multisite processing to work.

Unanswered questions and assumptions



And then we came up with our list of unanswered questions and assumptions. And started to figure out who could answer each of these questions and what we needed to get done before we were ready to try processing.

Defining development needed for multisite processing

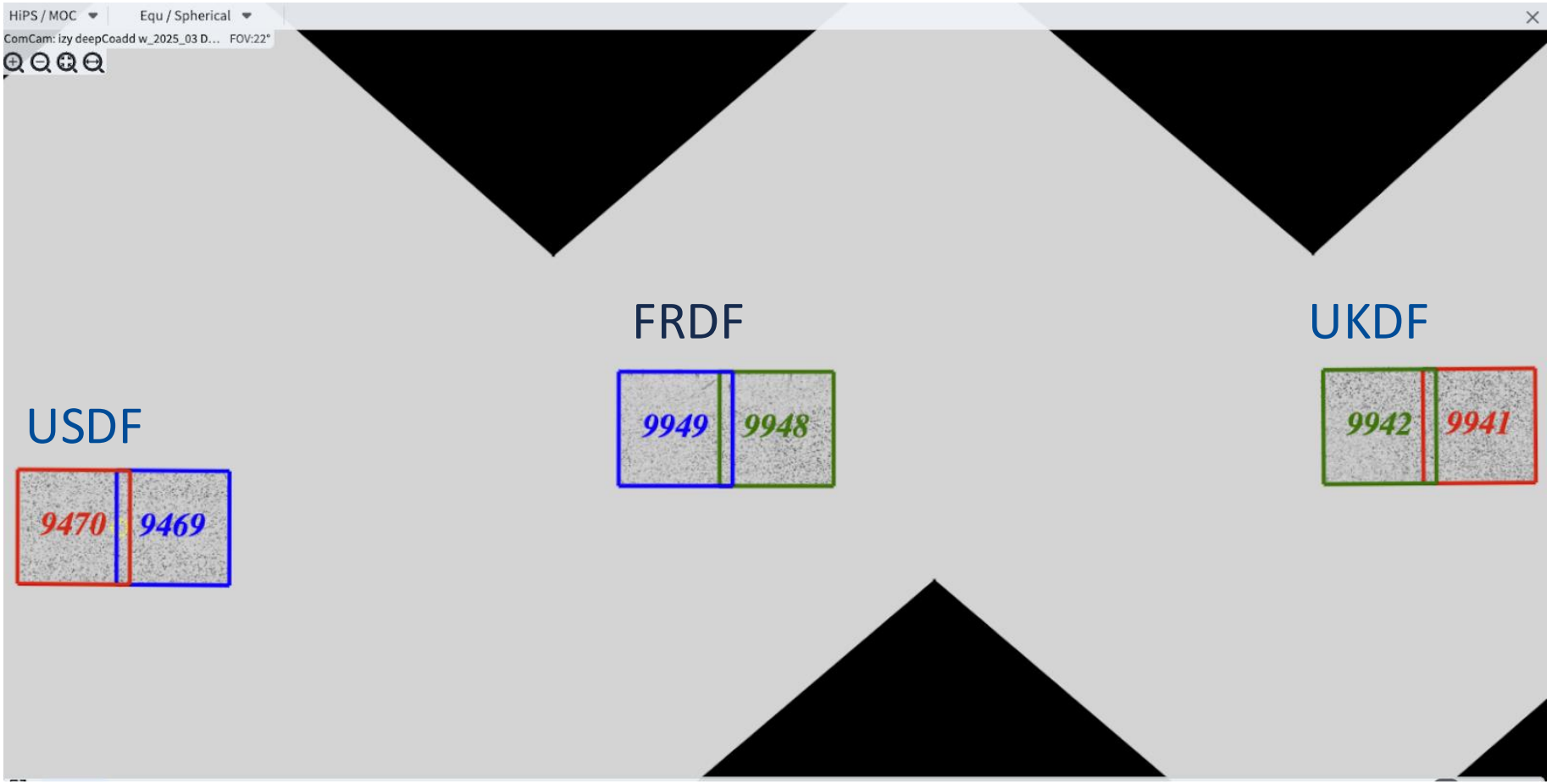
- Running Jobs at remote sites with Panda
- Butler – Michelle bps enhancements
  - Needed to figure out how to register remote jobs
  - Needed to get remote butlers working at each site
- Rucio – Brandon, Yuyi, Fabio and Peter,
  - practice moving data between sites
  - Rucio register, ingestd tools by connecting butlers and Rucio - Steve P
  - Need to figure out the minimum amount of data that needs to be at a site for processing
  - Need to figure out what data needs to be moved back and forth from SLAC for calibration
- Custom Job (can be tacked on as final job) – Michelle, Mikolaj
  - There are “between step steps” that when we are running at just one site, where we login and run we run locally instead of running in Panda.
  - needed a way to run collect steps remotely

Preparation for Multisite Processing

Moving the bi-weekly pipeline validation to UKDF and FRDF

- Moved DC and RC weekly processing to UKDF and FRDF
  - This allowed us to practice moving the data
  - Forced the development of custom job running to do collect steps
  - Start exploring data structure at remote sites
  - Gave us experience using Butler on remote sites
- Learned and practiced how to run obs remotely in Panda using BPS
- Practiced bringing results back to the USDF
- Standardized running weeklies remotely until it became routine enough to easily hand off (Thank you Dave and Quentin!)
- This was done by creating template yaml files that we can create on demand using a simple shell script running SED.

What is 3X2 Processing campaigns (DM-48353, DM-48570)



How we set it up (where we are now)

I was going to go into details here, but most of that can be found in the following tickets:

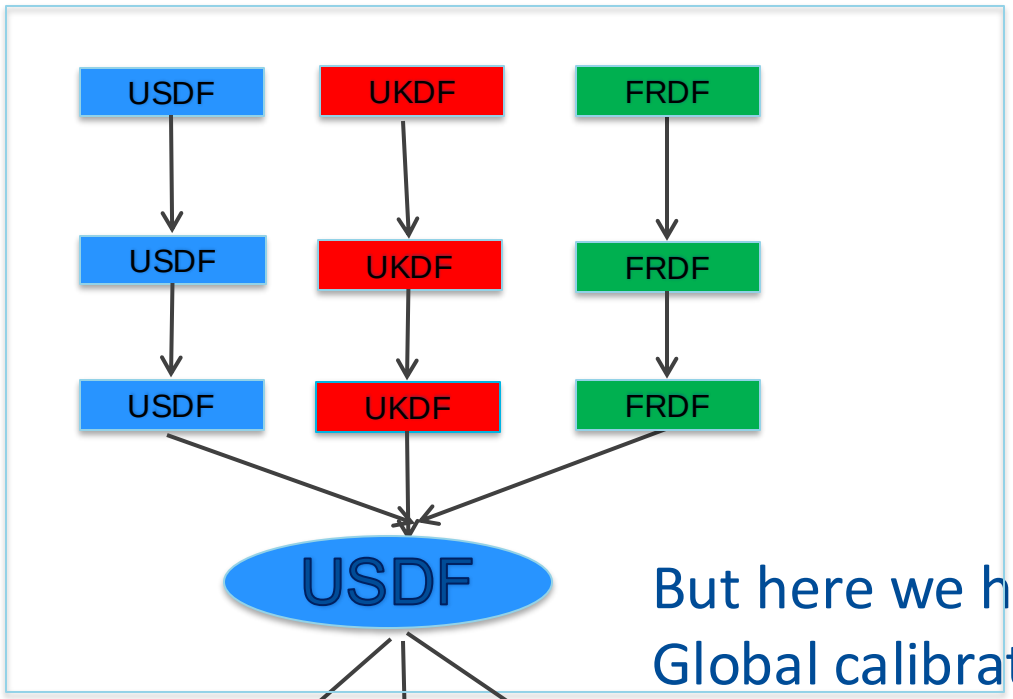
- https://rubinobs.atlassian.net/browse/DM-48570
- https://rubinobs.atlassian.net/browse/DM-48353

BUT after Yusra, Orion and Toby's talks. We need to focus on the "when and how to move data steps"

The plan is to make this run smoothly

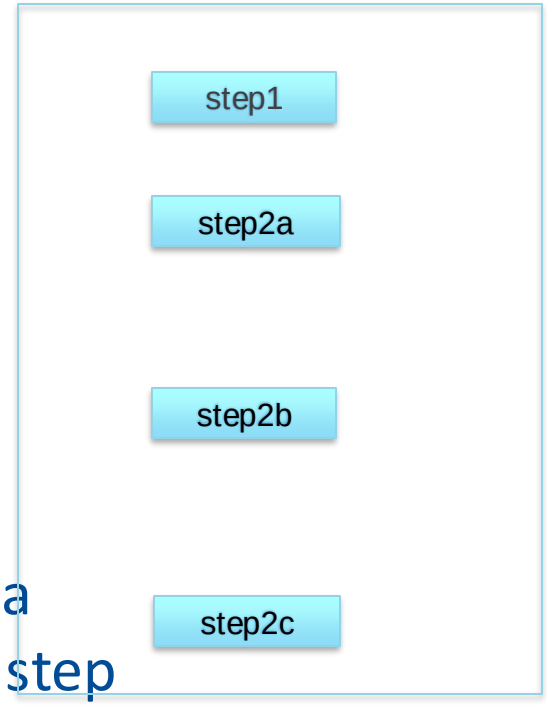
- Panda, Rucio tools and cm-service will work together
- cm-service will create and track the groups that will be submitted to Panda which in turn runs jobs at all 4 sites
- Rucio register and ingestd will be used between the butlers and Rucio to move data

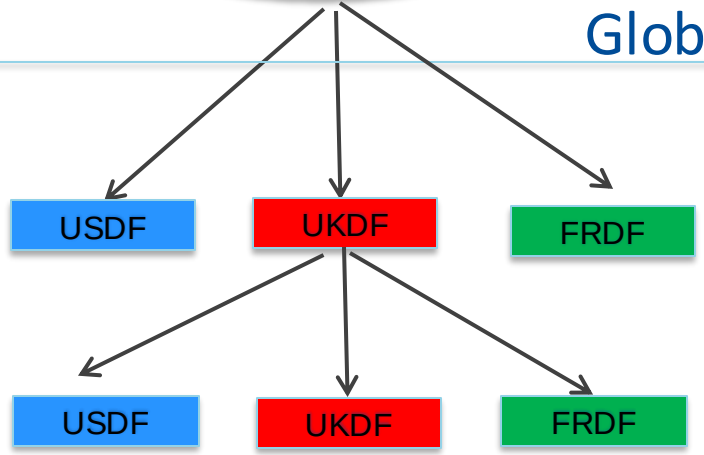
How to setup the yaml files for the various steps current



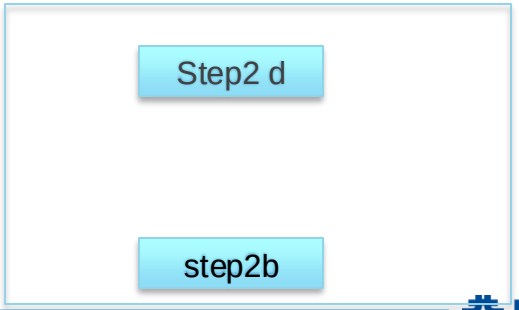
But here we have a
Global calibration step

Stage 1





Stage 2



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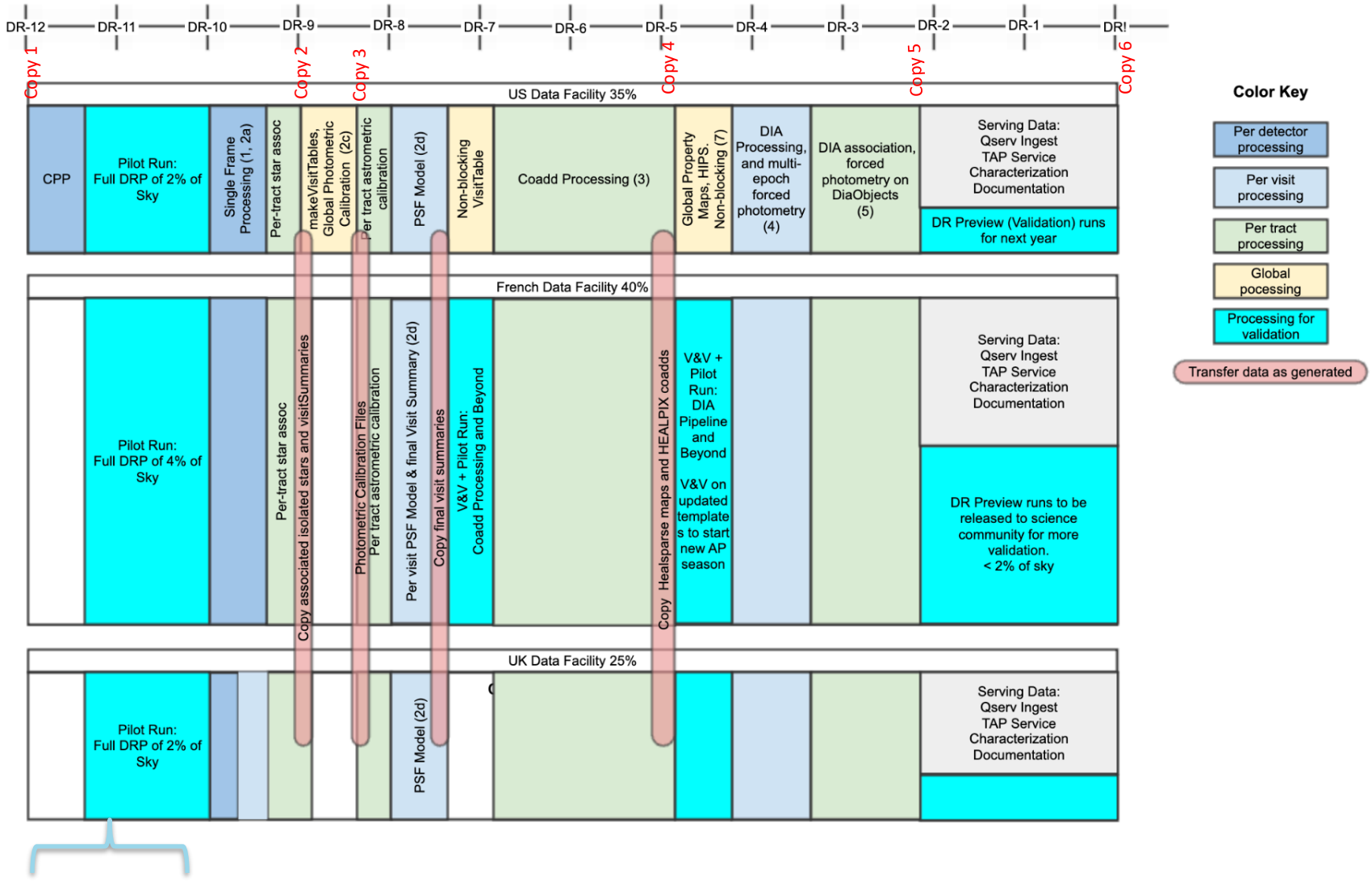
New Stages way of production



In Words – When does data have to move

1. Setup ‘defaults’ at each site: Before step1 (before stage 1)
    1. These run at all 4 DF’s
    2. New remote butlers – named consistently (DM-48746)
    3. Transmit raws with dimension records
    4. Transmit calibs, refcats, skymaps, cnn-models, look up tables fgcm, photo-z models, skyCorr skyFrames with consistent mechanism (DM-48769)
        1. Can also setup ingested at Summit to enable more automated transmission of new calibs to summit.
        2. Can also serve as prototype for IDAC data movement and transfer.

2. catalogs from all DF’s -> USDF before step2c (end of new stage 1)
    1. This runs at USDF only!
    2. outputs of three dataset types with star catalogs and visit Summaries sent back to USDF for global final calibration.
3. fgcm solution USDF -> All DF’s before 2d (beginning of stage 2)

More words on when to move data

4. Final visit summary All DF's -> USDF – Raws USDF -> all DF's (also calibrations)
    1. Before step2d end of Stage 2
    2. These steps/stage run at all 4 DF's

5. Global property maps from All DF's -> USD before step 7 (end of stage 3)
    1. transmit global 'footprint' 'depth' metrics info back to USDF for running of step7

6. Plots, metrics, retained final outputs All-DF's -> USDF after step 6 (end of stage 4)
    1. Transmit final outputs back from DFs to USDF for archival (to Tape Robot)

What's Next for CM multisite (where are we going?)

0. continue HSC-RC2 campaigns as needed to support DP1 (if possible to use CCMS1 dataset at remote sites – we will do that). [Integrate with cm-service]

1. prepare a 'rinse-and-repeat' 2x4 campaign which runs end-to-end, including removing old butler/rucio info, create new butler from scratch, loading in raws and calibs, run the campaign, including 'move jobs' in the right places in finalJob [Integrate with cm-service]

2. test zipping of files, returning final outputs to USDF, putting outputs on tape at USDF. (DM-48915)

3. do an OR5 scale (5600 DP0.2 LSSTCam-imSIm exposures) campaign to run at FRDF or UKDF (but maybe not both) -- single DF campaign. [Integrate with cm-service]

4. do a scaled up version of 1. increasing from 2 tracts at 4 sites to perhaps 70 tracts at 4 sites (the original PDR-VVDS DM-40654 test). [Integrate with cm-service]