Implementation and impacts of DM scope options.

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1 Introduction

DM have been asked how we can save 10% of remaining DM cost (≈ $7M). The official scope options which one might invoke are in LPM-72, but there are other options. Furthermore that does not really explain how this might be enacted hence this brief note.

We have identified three viable cost saving options in 2018— two were not in scope options document:

- Eliminate portal aspect of science platform (DM-10) Section 2.
- Reduce quality of data facility services provided to the construction project (DM15)Section 2.
- Move staff from institutions to AURA posts (DM16) Section 4.

In addition there are other tasks which may be delayed thus keeping them as options for later namely:

- Delay base center operation in Chile (keeps DM13 available plus once we start it cost money to run it).
- Delay development of the mini broker.
- Return some budget from DAX.

All of this will be rolled up in one or more LCRs in the not to distant future.

2 DM10 Science Platform Portal

A detailed run through specific requirements for the portal is given in Appendix C.

Concretely we would drop the portal and firefly support from IPAC to about 0.2 FTE over a period of four to five months. We would continue the IPAC support for DM Architecture and the Science Platform scientist.

If we follow DM10 to the letter we would eliminate the portal and this would mean a reduction in support of the broad science community, especially the less capable and casual users. Hence we would rather keep the portal we have, pause development, and restart closer to the initial need date for a portal (DR1). After a two year pause we could reevaluate available portal technology.

Within LSST EPO also need a portal and already decided Firefly was not a suitable technology, hence the search for alternatives is already underway within LSST. Within the AURA family STScI and NOAO have portals, admittedly they are not very good ones, but perhaps that could change with appropriate directives from AURA and provide potential synergy.

When to start up again is an interesting question - we should make some commissioning data available for example. The existing portal should be ok for that so the suggestion would be target DR1 for an updated portal. The other area of potential concern is the front end for the alert subscription in the mini broker - this should be thin veneer on the mini broker API and is also not needed until start of operations.

Given the above we would keep $1M for the later development of an updated portal for DR1. We would not go to zero immediately to allow IPAC to adjust accordingly. Plus we would keep some level of effort like 0.2 for bug fixes on the existing portal. An LCR would give the exact numbers but this should save $2M or more. We believe the final impact on science is minimal.

3 DM15 Reduce Institutional overheads

If we could identify perhaps ten individuals who would move to AURA posts thus eliminating institutional overheads we could save potentially $100k per individual or $1M per year. It will take months to put this in place of course so we would not get three years of savings. The institutes may complain but should not this is a scientifically and functionally painless way to trim the budget. It can cause some disruption for the individuals concerned.

Potential saving of $2M or more to end of construction.

4 DM16 Reduce LDF service level

NCSA has been asked to do an impact analysis of a reduction in budget by 20%. This can only be achieved by reducing the staffing level from 20FTE to 16. This may result in a lower service level for DM development it probably has no impact on science except in the realm of reliability. We continue to find it difficult to track effort and deliverables from NCSA this also needs to improve with better milestones.

The cloud maystill yield further savings. We are in discussion with Google on cloud deployments - assessing the actual cost of this relative to ownership of machines at NCSA is difficult. See DMTN-072 for a rough cost comparison with cloud services.

A 20% reduction in NCSA costs for the remaining four years of construction is worth about $3.5M.

A References

[1] **[LDM-554]**, Dubois-Felsmann, G., Ciardi, D., Mueller, F., Economou, F., 2018, *Science Platform Requirements*, LDM-554, URL https://ls.st/LDM-554

[2] **[DMTR-52]**, Dubois-Felsmann, G.P., 2018, *LDM-503-01 (WISE Data Loaded in PDAC) Test Report*, DMTR-52, URL https://ls.st/DMTR-52

[3] **[LPM-72]**, Krabbendam, V., 2015, *Scope Options*, LPM-72, URL https://ls.st/LPM-72

[4] **[DMTN-072]**, O'Mullane, W., Swinbank, J., 2018, *Cloud technical assesment*, DMTN-072, URL https://dmtn-072.lsst.io,
LSST Data Management Technical Note

B Acronyms

The following is a complete list of acronyms used in this document.

Acronym	Description
AURA	Association of Universities for Research in Astronomy
DAX	Data access services
DM	Data Management
DMTN	DM Technical Note
LPM	LSST Project Management (Document Handle)
TN	Technical Note

C Overview of requirements affected by DM-10

LDM-554 enumerates science platform requirements the labels used here are from that document and are the requirements affected by the scope option. DMTR-52 is a test report on the platform.

Note: There are no SUI/Firefly needs for commissioning.

- DMS-LSP-REQ-0008, DMS-PRTL-REQ-0004 Semantic linkage - logical links between data shown in portal (ok)
  - Have this but its going to have to evolve with the data .. more work for users if we do not do it
- DMS-LSP-REQ-0010 Transfer between portal and notebook (ok)
- User Storage - implication of UI for DMS-LSP-REQ-0011 to 18 - some of this is done.
- Portal aspect
  - DMS-PRTL-REQ-0001 Browser access (ok)
  - DMS-PRTL-REQ-0002 Discovery (ok)
  - DMS-PRTL-REQ-0005,6 Calibration and Coadd and Single Epoch access (ok)
  - DMS-PRTL-REQ-0007 access to other VO services (On the list of things to do in ramp down)
- Query support

  - DMS-PRTL-REQ-0009 to 38, Async Queries, Spatial, Id etc.
    * Mainly backend but need some interface - some done
    * other possibilities exist, EPO will have to do many of these as well
  - DMS-PRTL-REQ-0040 to 46 - visualize based in images meta data (ok)

- Alert and tabular data
  - DMS-PRTL-REQ-0048 to 54 - showing alerts and tabular data
    * mostly done - also others tools exist (e.g. Topcat)
  - DMS-PRTL-REQ-0055 to 74 - Graphing, scatter plots, histograms, uncertainties etc ..
    * Arguably we *should NOT* provide this in the portal
    * notebooks and other tools are already better for this.
    * We should look more critically at requirements like this.
  - DMS-PRTL-REQ-0075 to 77 - image overlay and color adjustment (ok)
    * Need in portal questionable (most scientists will use their own tools)
    * There are other tools that do this like Visiomatic.
  - All Sky DMS-PRTL-REQ-0078 to 88 (ok)
    * There are also other tools (Aladin lite) - may not be as nicely integrated

- Exploration and Analysis DMS-PRTL-REQ-0089 to 108
  - Many nice to have things like table filtering, selection from plots, linked plots
  - Again questionable we *need* this in the portal and there are other tools.

- Control and Management DMS-PRTL-REQ-0115 to 118 (some of this is implemented)
  - Preferences, API , quotas ..

- Alert support DMS-PRTL-REQ-0119 to 21,27
  - This is not done - mainly since the alert mini broker is not done
  - Worst case the simple interface coming with the mini broker is used and not well integrated.

- Documentation DMS-PRTL-REQ-0122 to 24
  - Can claim this with `www.lsst.io`
  - This may not perhaps be as tightly integrated as may be liked.