02C.06 Science Data Archive and Application Services

This WBS element is a summary element that includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement Science Data Archive and Application Service capabilities.

The Science Data Archive and Data Access Services provides the ability to ingest, index, federate, query, and administer DMS data products on distributed, heterogeneous storage system and data server architectures. All services will be implemented to provide reasonable fault-tolerance and autonomous recovery in the event of software and hardware failures.

The Pipeline Execution Services provide portable, astronomy-optimized services to applications pipelines to enable their organization, logging, communication, and fault tolerance.

02C.06.00 Science Data Archive and Application Services Management Engineering and Integration

This WBS element includes activities related to integrating the Science Data Archive and Application Services with the other applications and middleware elements.

02C.06.01 Science Data Archive

This WBS element is a summary element that includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement structures and tools to manage the LSST Data Products in databases and files, including defining schemas and ingesting tables and files and their metadata and provenance into the archive.

02C.06.01.01 Database Catalogs, Alerts and Metadata

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement Database Catalogs, Alerts and Metadata capabilities.

Comment [1]: Everything related to structure and manipulation of databases and metadata, but not building the underlying "RDBMS". Building such RDBMS (e.g., Qserv) elsewhere

It implements all database catalogs: L1 Alert Production and User Database, L2 Internal DRP internal, L2 Data Release Catalogs, Level 3 Catalogs, Calibration Database, and Deep Drilling Database. It includes schemas and structures (partitioning, replication, distribution models, L1 production/user, L2 swap/release), and tools for manipulating the catalogs, such as managing ingest, replication, hot swap, recovery and import/export.

It implements data-product-specific Metadata and Provenance for all LSST data products: Database Catalogs and Images. It includes schemas and structures (partitioning, replication, distribution models), and tools for manipulating the Metadata, such as managing ingest, replication, hot swap, recovery and import/export. Global metadata that spans multiple data products is handled through 02C.06.02.05.

It implements structure for Alerts, as well as tools for persisting and efficiently retrieving them.

02C.06.01.02 Image and File Archive

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement the Image and File Archive.

Comment [2]: Everything image related

It implements tools for managing image and files (ingestion, import/export).

02C.06.02 Data Access Services

This WBS element is a summary element that includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement Data Access Service capabilities. All services will be implemented to provide reasonable fault-tolerance and autonomous recovery in the event of software and hardware failures.

02C.06.02.01 Data Access Client Framework

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement overall Client Framework for Data Access Services.

It implements capability to store and retrieve LSST Data Products in terms of their application level "astronomical" semantics, mapping those semantics to physical, persistent versions of those data products in databases and files.

It provide capabilities to run user data analysis close to the data .

Comment [3]: Butler. Db

02C.06.02.02 Web Services

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement overall Framework for running Database, Metadata and Image Cutout Services, wrapped into a RESTful (or RESTful-like) WebService.

Comment [4]: Webserv. All shared things: RESTful API, error handling, security, interfacing with VO, with NCSA

02C.06.02.03 Query Services

This WBS element includes work needed to come up with a DBMS that meets LSST user query analysis needs. Such DBMS should include standard off-the-shelf DBMS capabilities including advanced features such as scalability to petabytes, incremental scaling, parallel queries, shared scans, fault tolerance, resource management, as well as LSST-specific features such as efficient support for spatial and temporal data at scale.

The work involves customizing, optimizing, improving and gluing together relevant components, building missing features, configuration files, unit tests, integration tests, and documentation. It also includes building tools for maintaining, configuring, and administering such system.

Comment [5]: Implementing RDBMS that will handle Query Services

02C.06.02.04 Image and File Services

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation that implement image and file services. Image and File Services provide the capability to access and manipulate image and file-based data, manage file caches, and recreate images on demand.

Comment [6]: Imgserv (cutout service, image stitching etc)

02C.06.02.05 Catalog Services

This WBS element includes software programs, database tables, configuration files, unit tests, component integration tests, and documentation needed to build common RESTful-based services on top of all LSST *database* products (all levels, all metadata).

It includes work on global metadata structures for all LSST data products, including all data releases, L3 user data and all images. Data-product-specific metadata is handled through 02C.06.01.01.

Comment [7]: Dbserv. Metaserv