WSDS Software Status

October 20, 2009
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IPAC Director's Review – October 20, 2009
WSDS Software Status: Processing Tasks

- **Ingest: MOS**
  - Numerous interfaces
  - Low data volume (a few GB/day)
  - Low processing load (<1 CPU-hr/day)

- **Ingest/Quicklook: HRP**
  - Med. data volume (50 GB/day),
  - Low processing load (40 CPU-hr/day)

- **Scan/frame**
  - High data volume (~500 GB/day)
  - High processing load (1000 CPU-hr/day)

- **Multi-scan**
  - When scans are complete
  - Med. data volume (~100 GB/day)
  - Low processing load (~50 CPU-hr/day)

- **Multi-frame (Coadd)**
  - Wait for multi-scan to complete
  - High data volume (adjustable)
  - High processing load (500 CPU-hr/day)

- **Archive Load**
  - On completed scans
  - High data volume
  - Low processing load

- **FPG**
  - On complete data set at EOM+6 mo.s

- Ingest runs on 4 CPUs, QL on ~100 CPUs, other tasks run on 240 CPUs
- Total of >5000 CPU-hrs/day available on the cluster

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WSDS Software Status: Near-term Milestones

• 3.0: July 29, 2009
  – Launch-ready feature set
• 3.1: Oct. 1, 2009
  – Bug fixes, minor enhancements
  – Release candidates supported ORT2,3
• 3.2: Oct. 23, 2009
  – Bug fixes, minor enhancements
• 3.2.X: As needed
  – Fix bugs as necessary
  – Support IOC, early ops
• Launch: Dec. 7, 2009
• 3.5: Feb. 1, 2010
  – Enhancements and fixes driven by on-orbit data
  – Support preliminary data processing
WSDS Software Status: Ingest

• Ingest development status
  – Critical functions mature and stable
  – To do
    • Some L0 data filtering (SAA etc.) decisions still in flux
    • Need improved MOS data summary reports from ingest (being tested now)
    • Need to work out survey progress report format to MOS and SOC

• Ingest test status
  – MOS->WSDC I/F’s exercised successfully in recent ORT’s and MST’s
  – HRP image data ingest, decompression, deconvolution well exercised on both extensive simulation data and real detector/MUB/HRP data
  – Mating of image data to MOS data to create Level-0 image archive successfully exercised in recent ORT’s and MST’s
WSDS Software Status: Quicklook

• Quicklook development status
  – Critical functions are mature and stable
  – To do
    • QA refinements before and after launch

• Quicklook test status
  – Ingest+Quicklook tested on boresite cal, scan sync cal, and 2-day routine-ops data sets successfully
    • ORT2 C-kernel interface disconnects (fixed in ORT3) did not prevent successful analysis
  – Response time of Ingest through automated QL QA report generation well under required 24 hours

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WSDS Software Status: Scan/Frame Pipelines

• Scan/Frame development status
  – Critical functions are mature and stable
  – To do
    • QA refinements before and after launch
    • Refine dynamic calibration (*nearing completion*)
    • Expect numerous data-driven adaptations to on-orbit data

• Scan/Frame test status
  – Scan/Frame pipeline tested on boresite cal, scan sync cal, and 2-day routine-ops data sets successfully
  – Most failures (1-2%) due to mismatches between C-kernel and simulated images; analogous to settling at scan start
  – A few failures (<0.5%) due to ADCS sim “blips”
    • *Parameter change to SFPRex lowered the failure rate*
WSDS Software Status: Multi-scan Pipeline

- Multi-scan Pipeline development status
  - Multi-scan Pipeline is a refactoring of parts of Scan/frame to serialize most PCal and ArtID components
  - Critical underlying functions come from the Scan/Frame pipeline and are mature and stable
  - To do
    - Refinement of ArtID artifact models before and after launch
    - Expect numerous data-driven adaptations to on-orbit data
    - Ops training (in progress)
    - Not critical to supporting flight ops, but strongly desired

- Multi-scan Pipeline test status
  - Testing on 2-day simulations on-going
    - Daily runs of >=1 day’s-worth of data by ops staff
WSDS Software Status: Multi-frame Pipeline

- Multi-frame (Coadd) Pipeline development status
  - Critical functions mature and stable
  - Large-scale analysis on-going to tune science results
  - To do
    - Need to write coadd ArtID flags
    - Not critical to supporting on-orbit operations but strongly desired

- Multi-frame (Coadd) Pipeline test status
  - Testing on 2-day simulations on-going
WSDS Software Status: Configuration Control 1

• Infrastructure
  – OS stable. Only security/bug-fix patches allowed going forward
    • Patching complete
  – Libraries, utilities, compilers, Perl, etc. stable. Only bug-fix updates allowed
  – System admin scripts, backup processes, kickstart scripts still being exercised and refined; stable once complete and tested
    • Kickstart exercise complete

• Hardware
  – Cluster and server hardware stable (final installations complete)
  – Network stable
  – Ops DB backup hardware stable
  – Raw telemetry backup hardware now installed
WSDS Software Status: Configuration Control 2

- WSDS revision control
  - Subversion-based release branches and tags
  - Code, documents, and run parameters controlled
  - In wide use for >1 year
  - User procedures written and widely used
  - Visibility through a web interface
WSDS Software Status: Configuration Control 3

- Build and Delivery process mature
  - Procedures written and used by ops staff
  - Unit test, RTB processes in place
  - Release builds isolated so multiple builds can co-exist for ops, dev, integration, personal experimentation, etc.
  - Program output and products stamped with release ID for traceability
  - Reversion to previous releases is easy and fast
  - Patching for bug fixes is low overhead and quick when necessary
  - Many fixes/changes can be effected with parameter overrides
    - Parameter deliveries are controlled too
  - Developers can experiment with changes or do testing and analysis outside the operational environment (“sandboxing”)
  - Ops code, parameters and data products protected from inadvertent change by strict file permissions
WSDS Software Status: Configuration Control 4

• Change Control Board
  – Enforce stability and reduce risk from updates during ops
  – Members from WSDC, MOS, and ST
    • Roc, Tim, Davy, Don Royer, Peter Eisenhardt
  – CCB checklist. Allow a proposed change if it is:
    • desirable;
    • important enough to be worth the associated risk;
    • will not interfere with critical ops support functions (e.g. scan sync confirmation);
    • disseminated to WSDC personnel for concurrence;
    • adequately tested (unit and in-situ tests);
    • timely (i.e., do we need it now?).
WSDS Software Status: 
To-do Before Launch

• Ongoing testing and performance measurement and tuning
• Fix any serious bugs discovered by tests
• Multi-scan pipeline ops training
• Complete Frame ArtID development
• Coadd ArtID design and development
• Complete dev-to-ops transition checklist