Testing

Delivery Validation

WSDS Verification

Ops Practice Schedule

- Delivery Validation with Regression Test Baselines
  - When
    - As part of the formal delivery process
    - Starting between versions 2 and 3
  - Goal: Confirm readiness to proceed with operations
    - Successful code delivery
    - All important functions
    - Resource (CPU, disk) usage still acceptable
  - RTB contents
    - Input: A simulated mini-delivery (~4 scans = ~ 1000 framesets)
      - Initially with simulated data, then with real data during flight ops
      - Generate fake image telemetry from simulated images
      - Fake ancillary data for simulated images; arbitrary format
    - Output: Level-0,1b archive, frame meta-data

- Delivery Validation with Regression Test Baselines (continued)
  - RTB test procedure
    - Select RTB data. Massage as required. Assign version. Archive.
    - Using a trusted ops delivery, process RTB data using parameters as close to normal as possible
    - Version and archive resulting data
    - Select key comparison metrics
      - Pipeline return codes as expected
      - Presence of all expected products
      - Key trend statistics, e.g. SFPRex corrections, catalog statistics, image statistics
      - Be sure products from scan/frame pipeline, multi-frame pipeline, quicklook, and QA are included
    - Write code to compare key metrics and display results
    - Time passes …

Testing

- Delivery Validation with Regression Test Baselines (continued)
    - RTB test procedure (cont.)
        - Using integration ("int") delivery, run RTB data using same parameters as archived RTB run
        - Run comparison code
        - Manually examine comparison results as well as side-by-side image comparisons for a subset of images
        - Consult with subsystem engineers regarding differences
        - Present results to CCB
        - Repeat with ops delivery, except compare to int delivery: Results should identical except for timestamps, release strings, etc.
        - If there is a failure at any point, back up to previous successful step, debug, fix problem, proceed

- **WSDS Verification**
  - When
    - Begin test runs after version 2
    - Official run prior to ORR
    - As needed to re-verify
  - Simulation Test Data Characteristics
    - Up to 30 continuous orbits (60 scans) = ~2 days' data = ~1% of mission = ~700 coadds
      - Now have 73 frames of test data on hand for prototype testing
    - Varying pixel response, dark current, hot/dead pixels
    - 2MASS sources with modeled fluxes
    - Galactic model
    - Extra-galactic model
    - Some solar system objects
    - Complex backgrounds (cirrus etc.)
    - Extended objects
    - Truth: supplied flats, darks, source list with positions/fluxes

Testing

- **Pre-flight WSDS Verification (continued)**
  - Success criteria
    - Key performance requirements
      - Completeness, reliability, photometry, astrometry
      - Scan sync misalignment detection sensitivity
      - QA effectiveness
    - Key throughput requirements
      - Ingest, scan/frame, multi-frame run times
      - Data volumes

- **Pre-flight WSDS Verification (continued)**
  - Procedure
    - Standardize measurement tools for evaluating success criteria
    - Test prep
      - Acquire simulated data
      - Generate level-0 test archive (including meta-data)
      - Document simulation characteristics, locate truth data
    - Confirm suitability of desired delivery
      - Consult subsystem cogE's and cogSci's
      - Confirm success of RTB
    - Run scan/frame pipeline
    - Run multi-frame pipeline
    - Confirm success of runs

- ## Pre-flight WSDS Verification (continued)

  - Procedure (continued)

    - Collect and examine QA data

    - Run QA measurement tools

    - Internal+external science team support

    - Prepare report

    - In case of failure to meet one or more performance goals, consult with relevant cogE's, cogSci's, science team, project, and form a plan of action

- Volume data flow testing
  - Prior to version 3 release
  - 2-days of sim data (30 consecutive orbits)
  - HRP to WSDC using flight network setup
  - Ingest → scan/frame pipeline, QA, multi-frame pipeline, dynamic calibration

WSDC Ops Practice

- ## External
  - Mission Scenario Tests: late '08 to early '09
  - Load Volume HRP transfer tests: mid '09
  - Operational Readiness Tests: late '09

- ## Internal
  - Bulk frame pipeline runs: now to launch
  - Scan/frame through coadd with QA: late '08 to launch
  - Ingest through coadd with QA: spring '09 through launch