Application of DoDAF 2.0 for NOAA's JPSS Ground System and Project

Alan Jeffries Presenting

Authors:

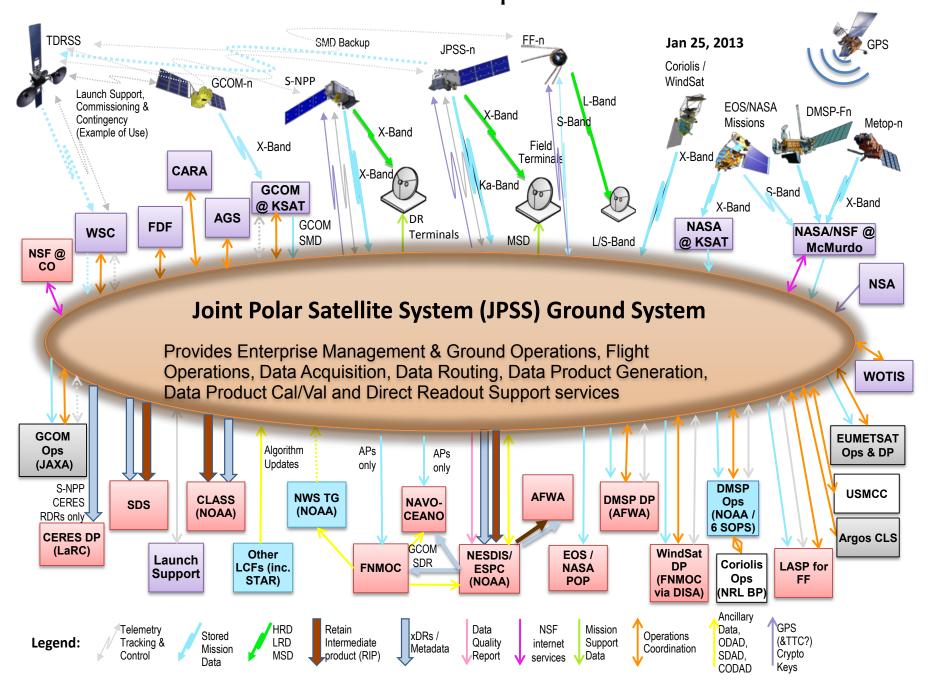
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OV-1 JPSS Ground Systems High Level Operational Concept



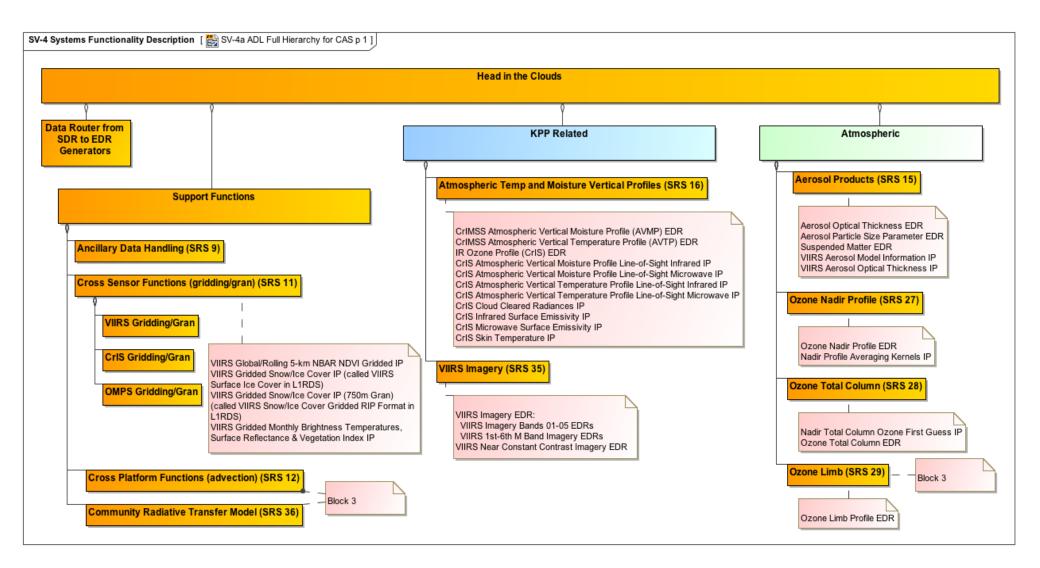
Using DoDAF 2 with UPDM 2 to Describe JPSS Data Reduction Processes

- The systems views prescribed by the Department of Defense Architecture Framework version 2 (DoDAF 2) SV-4 and SV-6 diagrams are used to describe the software object handling of the downloaded JPSS satellite data to produce Environmental Data Records (EDRs).
- The DoDAF 2 views are presented using the Unified Profile for DoDAF and MODAF version 2.0 (UPDM 2).
- The modeling tool used is MagicDraw UML version 17.0.3 with UPDM 2 version 17.0.3.

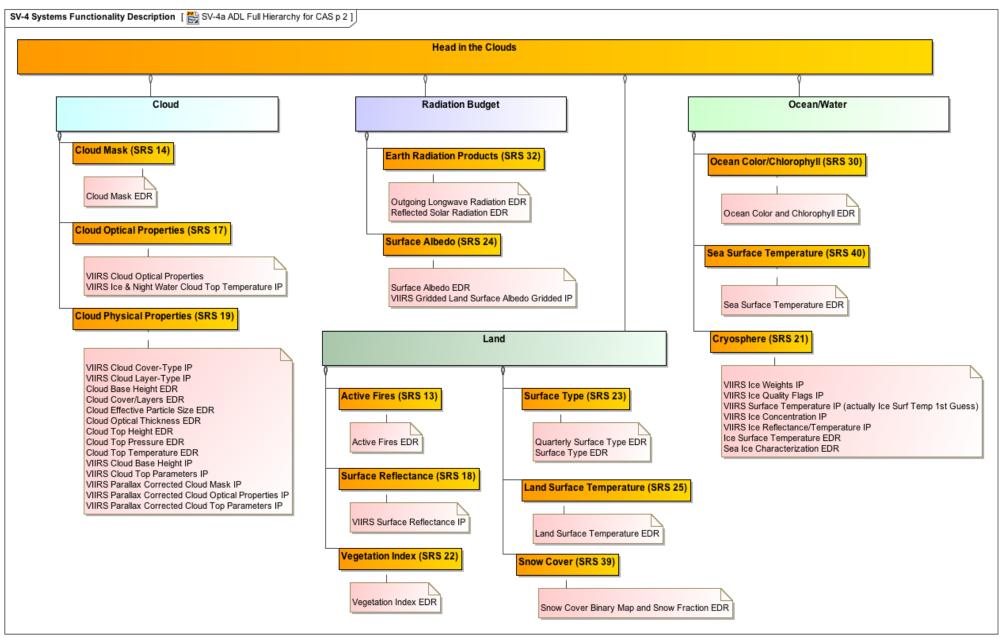
SV-4 System Functionality Description Diagrams

- Provide hierarchical views of the systems with their included functions.
- Documentation of the systems and functions are captured in the properties of those systems and functions.
- Show the lower level system and software functions used to process the data captured by the JPSS Project.
- Identify the system and software functional process flows that generate each deliverable data product.
- Assist in Systems Engineering requirements tracking.
- Identify the lower level specifications and verification plans defined in the Software Requirements Specification (SRS) that govern the JPSS data products.
- Identify the software algorithms contained in the lower level specifications

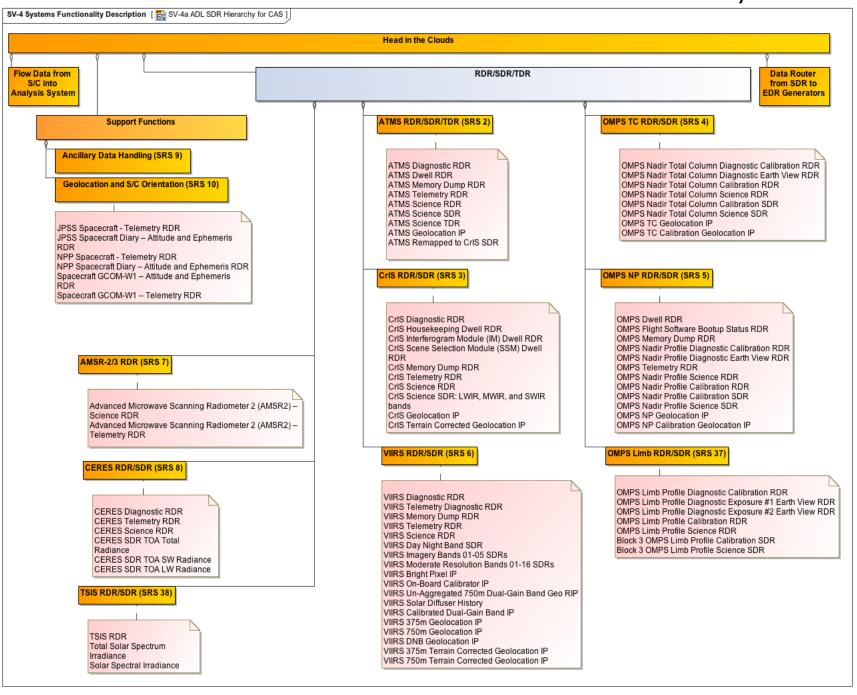
SV-4 System Functionality Description, ADL Full Hierarchy (1)



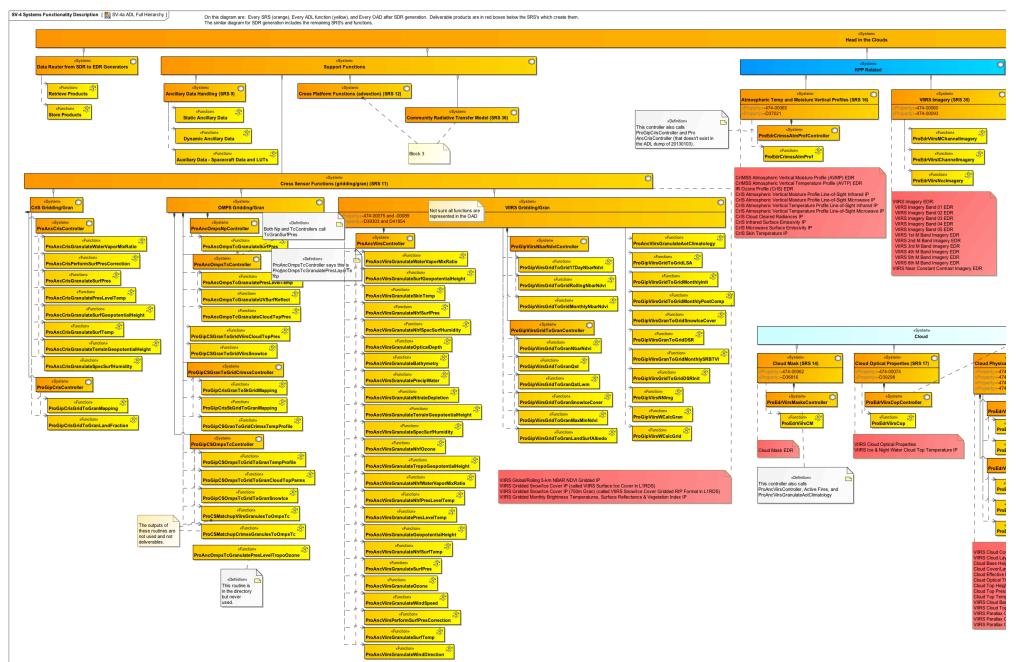
SV-4 System Functionality Description, ADL Full Hierarchy (2)



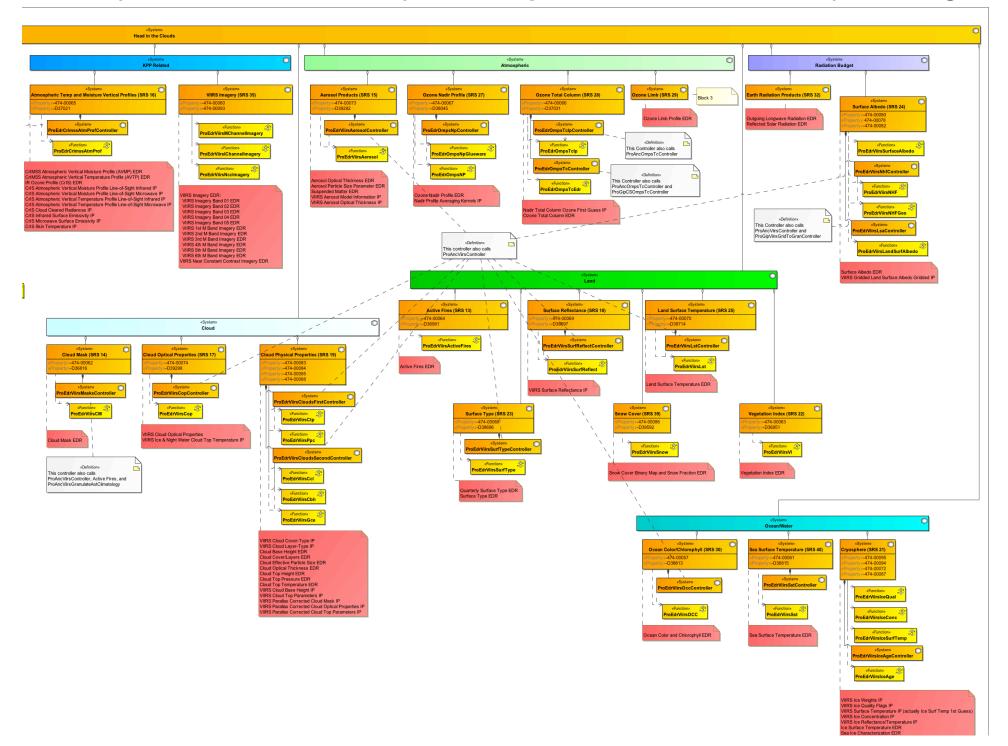
SV-4 System Functionality Description, Sensor Data Record (SDR) Hierarchy



SV-4 System Functionality Description, Full Hierarchy (1- Left)



SV-4 System Functionality Description, Full Hierarchy (2- Right)

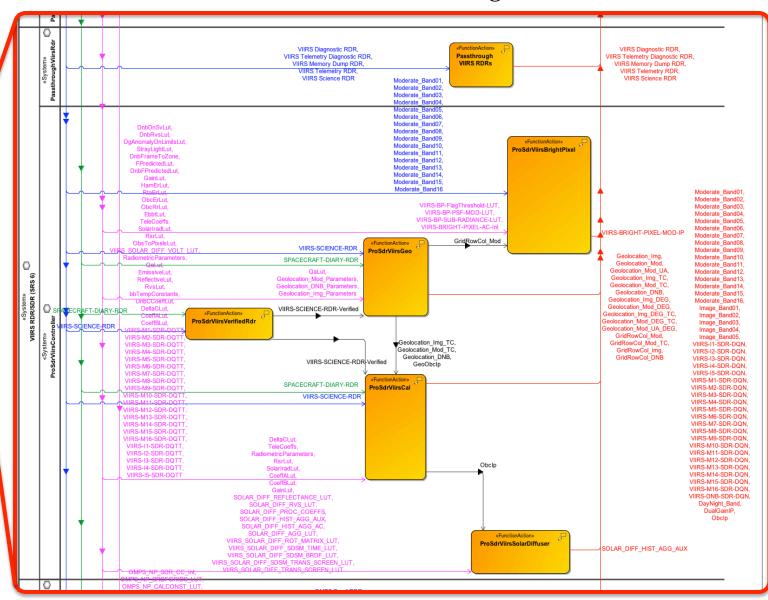


SV-4 System Functionality Flow Diagrams

- Used to describe system and software functional process flow to assist management and end user understanding of end product production.
- Inputs, outputs, and interdependencies are shown for each software process.
- Each horizontal swim lane is a system identified by the specification in the swim lane header
 - Input data flows from the top processes to each specification's swim lane.
 - The data production process flows from FunctionAction (software object) to FunctionAction to produce each swim lane's data products
 - The deliverable products are at the far right of each swim lane.
- The SDR flow shows the analysis chain through SDRs, and the EDR flow shows the remainder of the chain through to the data products to be delivered to the Comprehensive Large Array-data Stewardship System, (CLASS).
 - Analysis of the interdependencies among the systems, software, and functional flows help to identify downstream impacts when considering the scope of proposed changes or product degradation.

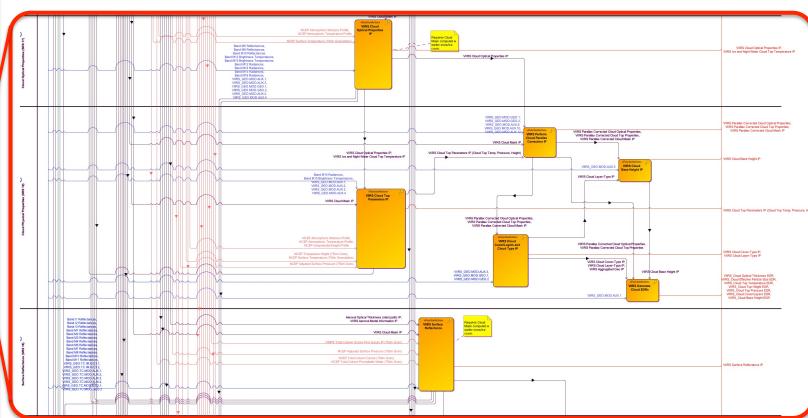
SV-4 Function Flow Diagram for Sensor Data Record (SDR) Algorithm Processing

VIIRS Processing



SV-4 Function Flow Diagram for Environmental Data Record (EDR) Algorithm Processing

Cloud Optical Properties portion of the diagram



SV-6 Systems Resource Flow Matrix

- Provides a tabular representation of the crossswim lane resource traffic.
- Tracks resource flows from one swim lane's FunctionAction to a FunctionAction in a different swim lane.
 - The flowing resources are identified
 - The resource producing and consuming swim lanes are identified as well as the producing and consuming FunctionActions.
- The SV-6 provides a human-readable format of the input and output dependencies for each algorithm module.

SV-6 For VIIRS SDR (SRS 6)

#	#	Interaction ID	Resource Interaction Item	Sending Performer	Receiving Performer	Producing Function	Consuming Function
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