

Joint Polar Satellite System (JPSS) Common Ground System (CGS) Evolution

Shawn W. Miller, Raytheon JPSS CGS Chief Architect, and Kerry Grant, Raytheon JPSS CGS Chief Scientist, Aurora CO
Michael Jamilkowski, Raytheon JPSS CGS Customer Liaison, Greenbelt MD

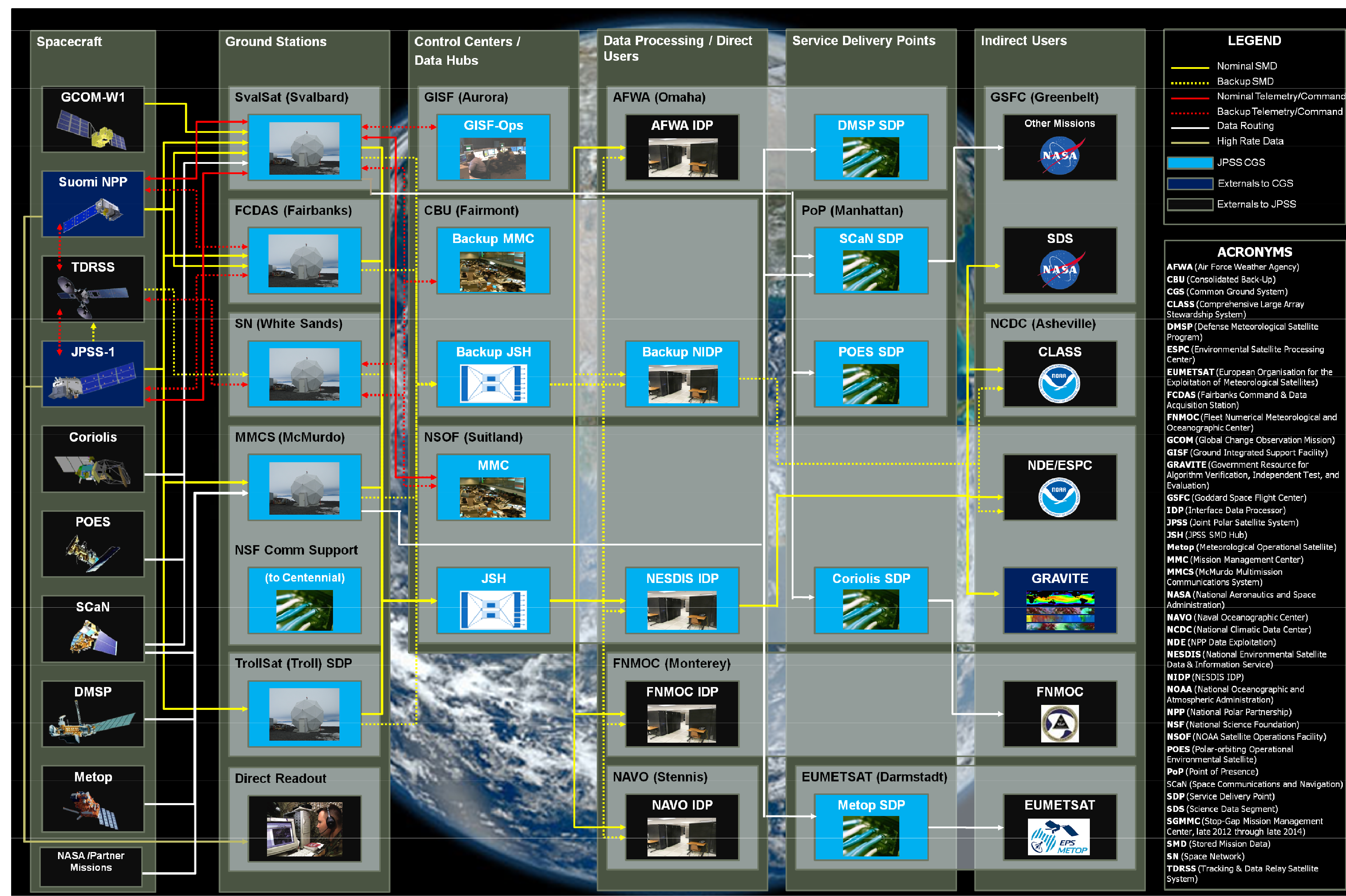


Figure 1. Multi-Mission Architecture and Data Flow.

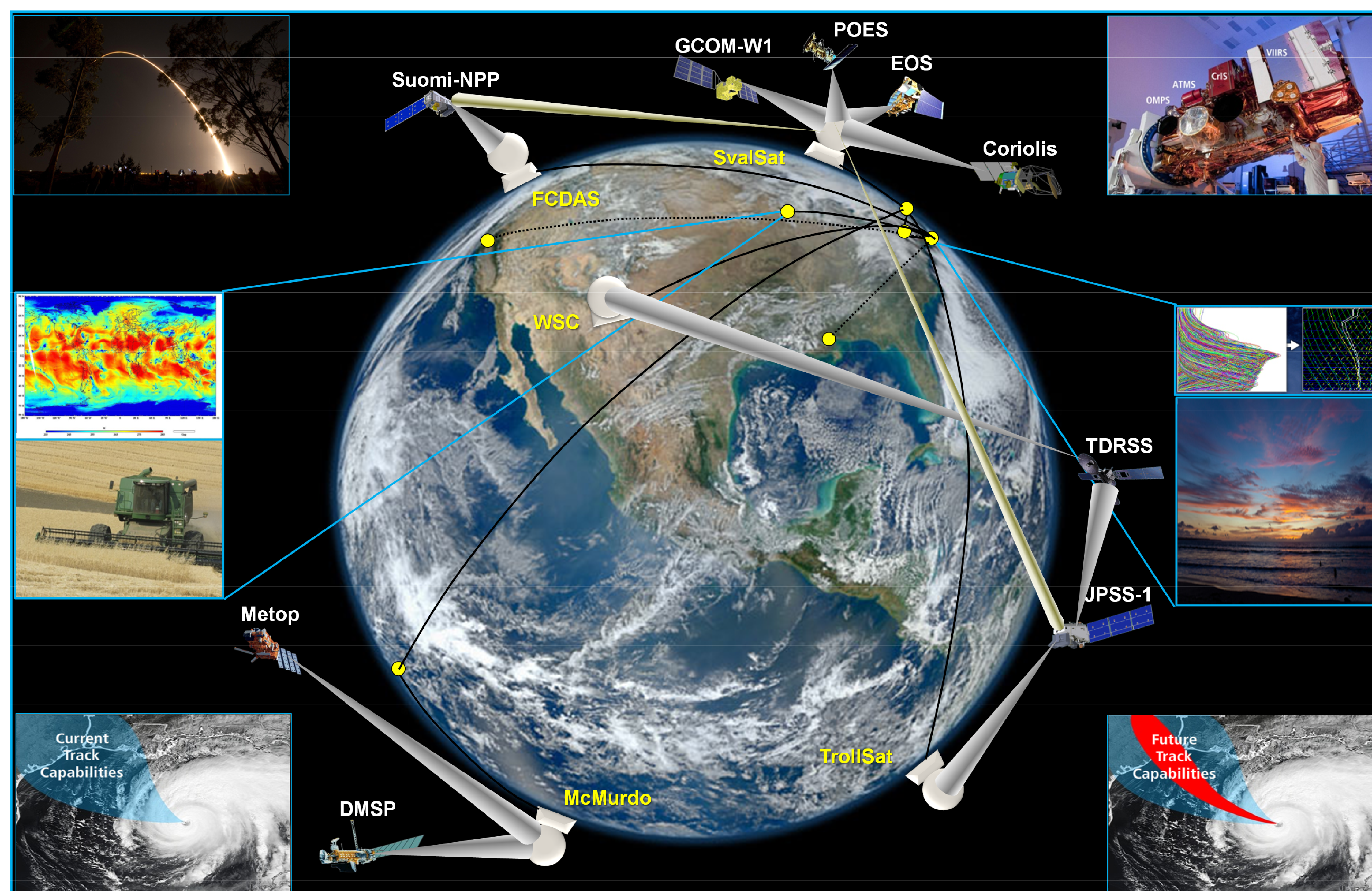


Figure 2. Multi-Mission Operations Concept.

Multi-Mission Support for Current and Future Systems

The Joint Polar Satellite System (JPSS) Common Ground System (CGS), developed and deployed by Raytheon Intelligence and Information Systems (IIS), manages and supports numerous missions, as shown in Figures 1 and 2. (JPSS-1 will launch in 2017). The CGS architecture is evolving over the next few years to:

- 1) “Operationalize” Suomi NPP (S-NPP) for critical weather forecasting
- 2) Leverage S-NPP lessons learned for latency and availability performance
- 3) Take advantage of newer, more reliable and efficient technologies for delivering key environmental data products to end users

Reliable Data Transport from Current and Future Ground Stations

The front end architecture for CGS mission data transport is being re-architected to increase reliability and address the incorporation of new ground stations. Figure 3 below illustrates the new architecture. A reliable data transport protocol will be employed to converge the data from multiple ground stations to a JPSS Stored Mission Data (SMD) Hub (JSH). The JSH will then distribute the data to multiple users for generation of environmental products, instrument performance and health analyses, and telemetry analysis for CGS-managed satellites.

Modularity and Flexibility for New Algorithms and Missions

Since S-NPP launch in October 2011, the CGS Interface Data Processing Segment (IDPS) has successfully undergone a significant technology refresh to more efficiently support S-NPP and Global Change Observation Mission (GCOM) operations. This includes addressing requirements to deliver 95% of S-NPP data products to end users within 140 minutes, with 99.9% data availability for long-term archival. To extend this capability to JPSS-1 and an array of other potential new missions, we are enhancing key areas of the IDPS to address a wider range of inputs, a higher volume of data delivery, and plug-n-play algorithm insertion and upgrades.

Comprehensive Situational Awareness to Maximize Efficiency and Availability

Finally, through continual communication and coordination with the CGS operators, a solution for comprehensive situational awareness across the CGS is being developed to increase operational efficiency and facilitate quicker and more efficient identification and resolution of system anomalies.

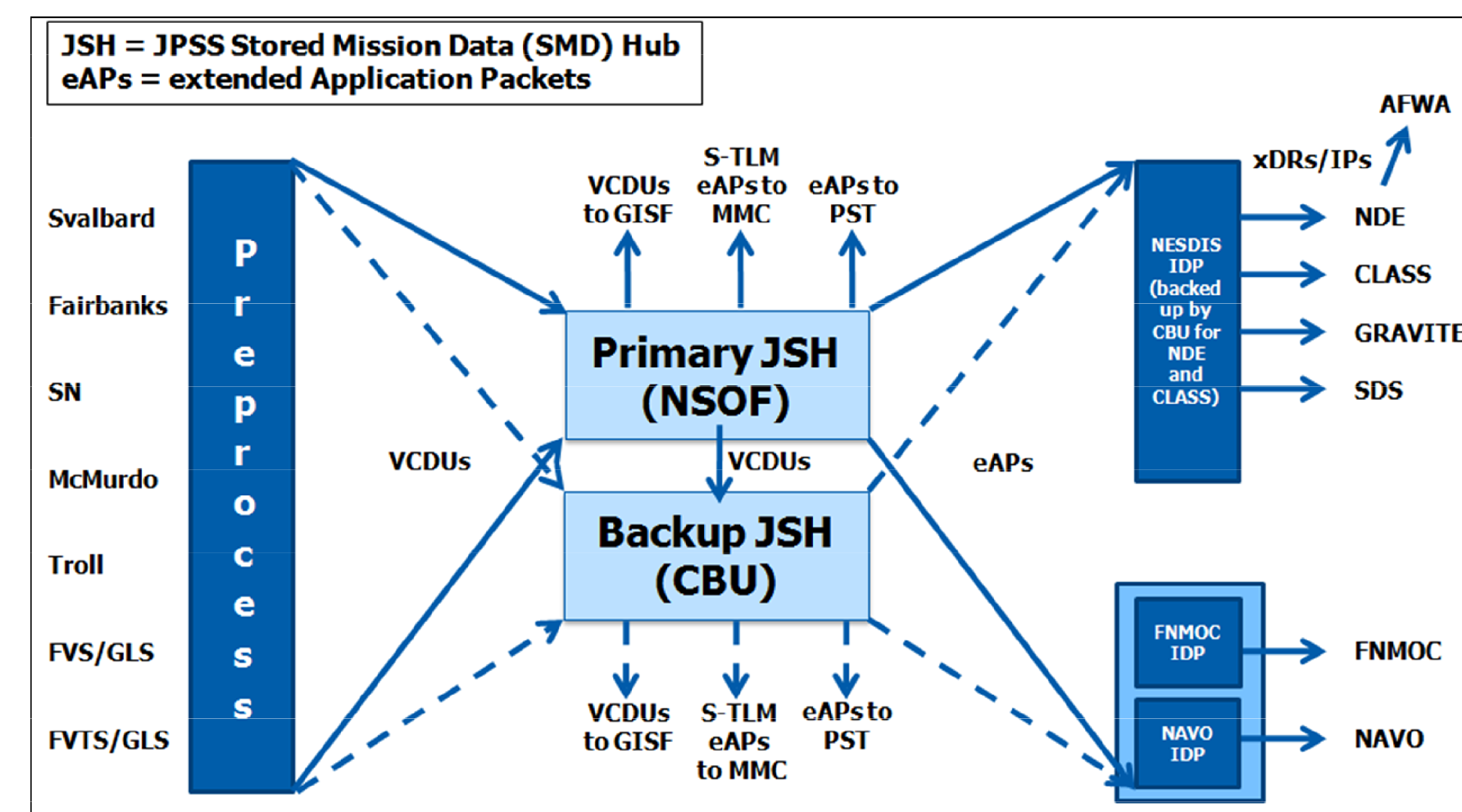


Figure 3. “Bowtie Architecture” for Reliable Data Delivery.