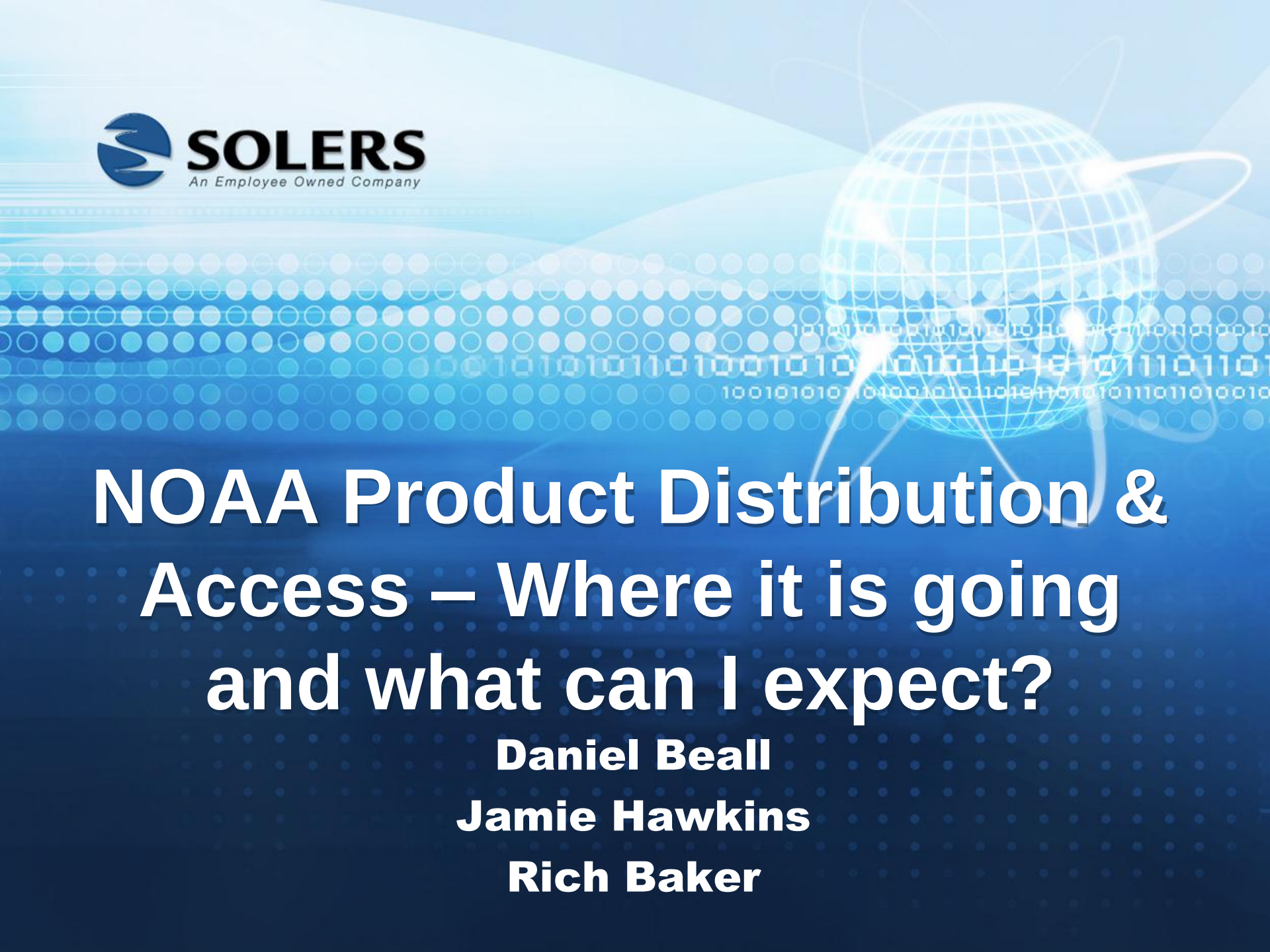


NOAA Product Distribution & Access – Where it is going and what can I expect?

Daniel Beall

Jamie Hawkins

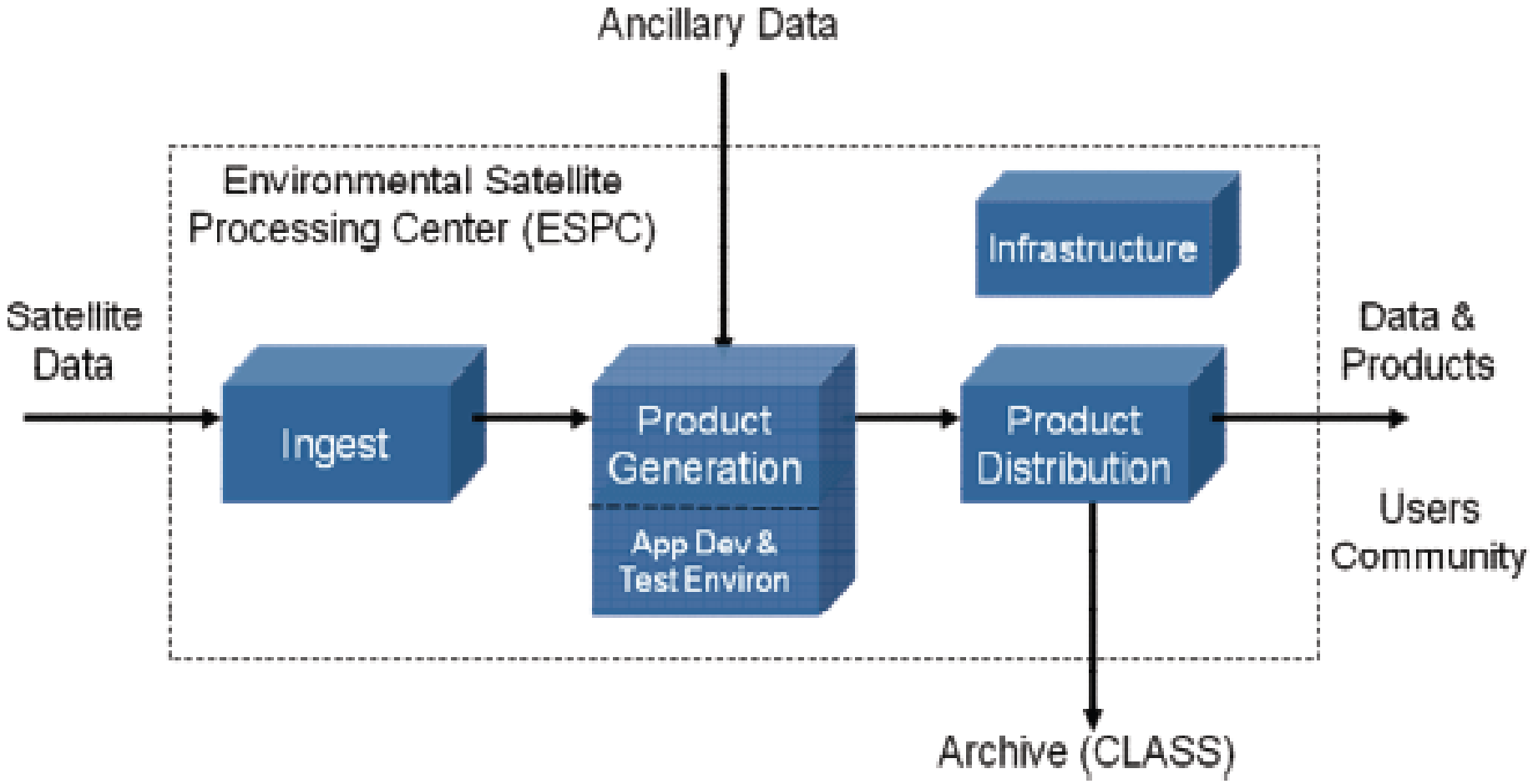
Rich Baker

Presentation Agenda

- **ESPDS Product Distribution & Access (PDA):**
  - ESPC Overview
  - PDA Overview
  - PDA Features & Benefits
  - PDA Architecture Extensibility
  - Summary

ESPDS: Environmental Satellite Processing and Distribution System
ESPC: Environmental Satellite Processing Center
PDA: Product Distribution and Access

ESPC Architecture



The ESPC Enterprise: Good Place to Start

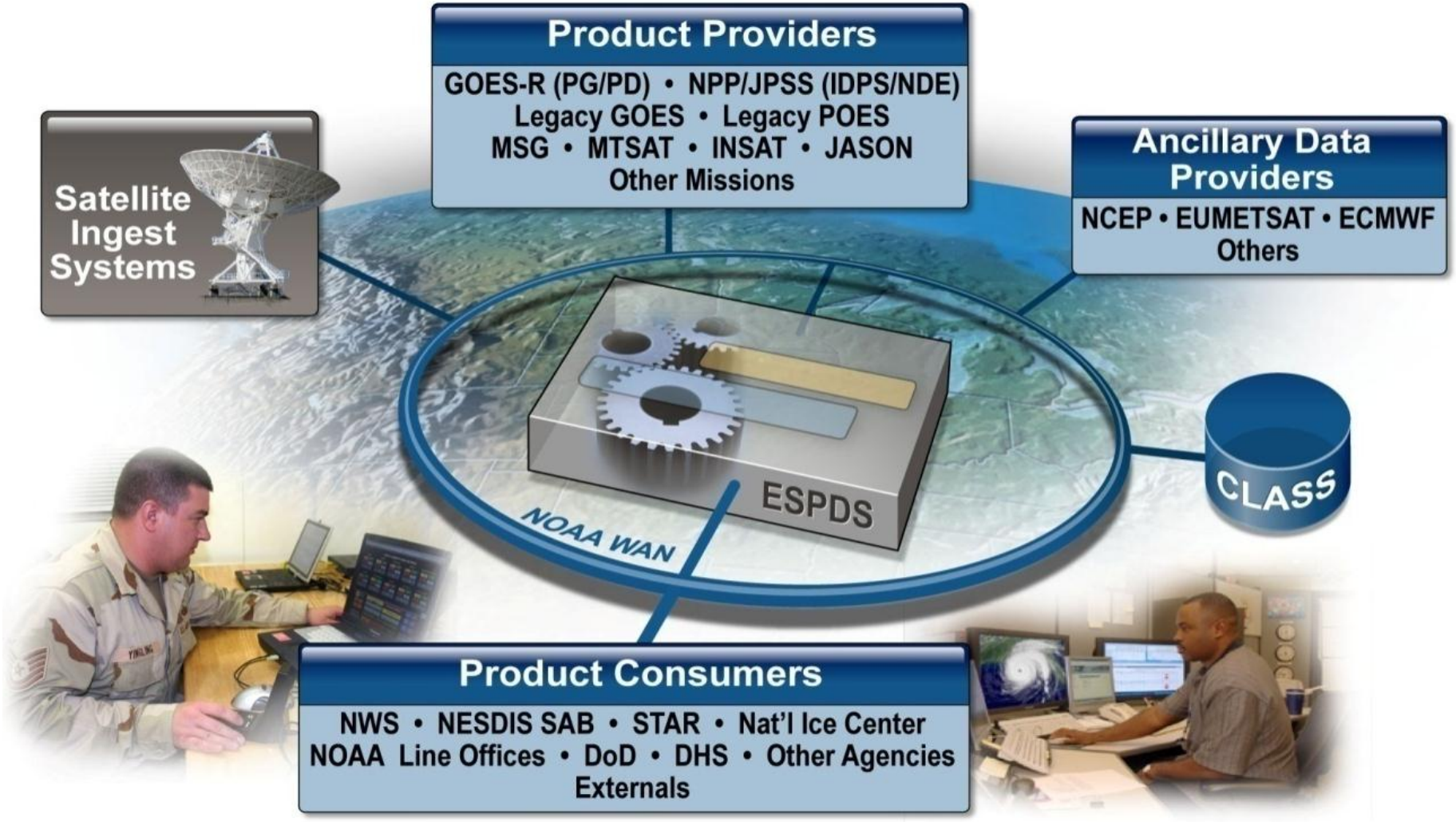
"Objectives" *From the ESPDS SOW*

- ***"The acquisition objective is to evolve the ESPC from its current "stove pipe" systems into an integrated enterprise system capable of meeting technical and performance requirements of future and current satellite ground processing systems.***
- ***The contractor's enterprise solutions shall be flexible, adaptable and expandable to meet the requirements of newly developed or enhanced ESPC functionality."***
- ***"NOAA expects cost-effective, agile enterprise architecture to facilitate NOAA's ability to integrate new functionality over time based on program requirements and availability of future funding."***

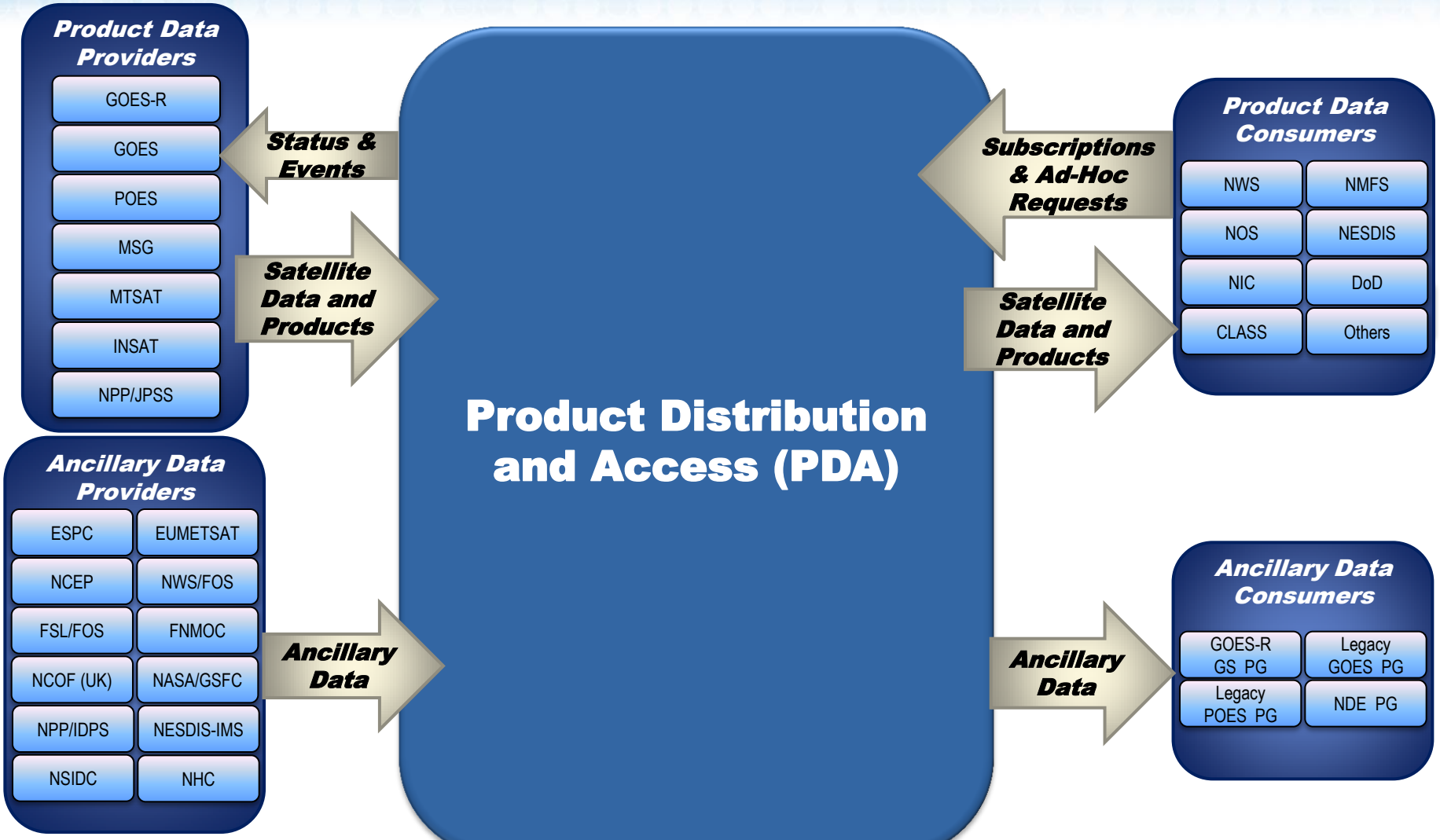
Product Distribution and Access (PDA) Objectives/Benefits

- **No More Stovepipes:**
  - First foundational wall of a modern, sustainable distribution enterprise
- **Build for tomorrow:**
  - A “Private Cloud” with processing speed of modular architectures; loosely-coupled and abstracted services; high bandwidth
  - Align with real user-access and data use paradigms of other 21st century data systems. (Secure; standards-based; intuitive; intelligent product servicing)
- **Super Benefits**
  - Common “Self Serve” user portal for distribution of all satellite holdings and ancillary data
  - Build once, build generic (ONE Consumer ICD)
  - No specialized access clients needed
  - Universal selectivity functions
  - No re-architecting for new data families
  - Built on Enterprise SOA with common infrastructure services

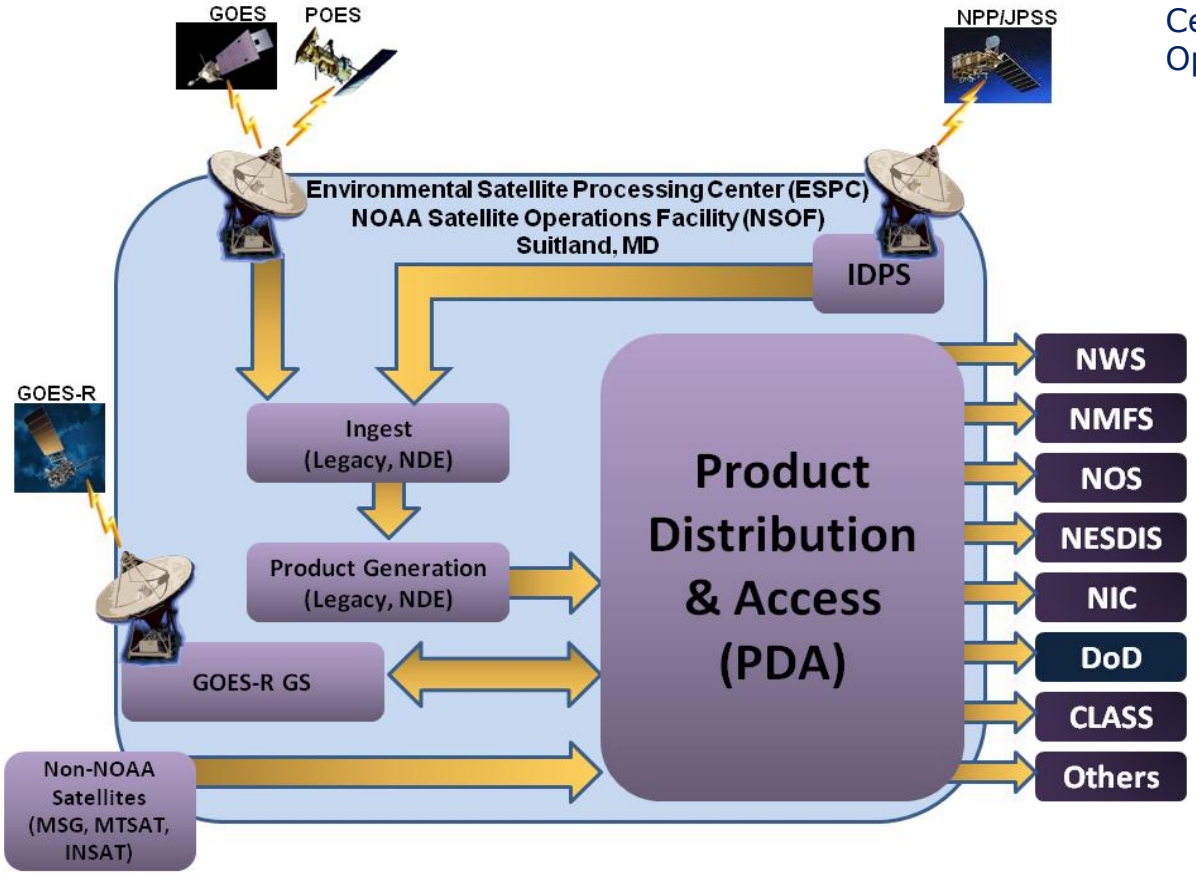
Product Distribution Users



PDA "Provider/Consumer" Context



PDA Interfaces and Protocols



PDA, which resides within the Environmental Satellite Processing Center (ESPC) in the NOAA Satellite Operations Facility (NSOF) at Suitland

- PDA is a consolidated system for distribution of:
  - Satellite Products
  - Ancillary Data
  - Satellite Mission Data
- PDA provides the following capabilities needed to meet product data distribution requirements:
  - Receive files from multiple sources using standards-based interfaces ([S]FTP[S], NFS)
  - Store and index them based upon well-known metadata fields
  - Provide the ability for users to subscribe-to/search-for them based upon these well-known metadata fields
  - Distribute them to users via standards-based interfaces ([S]FTP[S], HTTP[S], others)

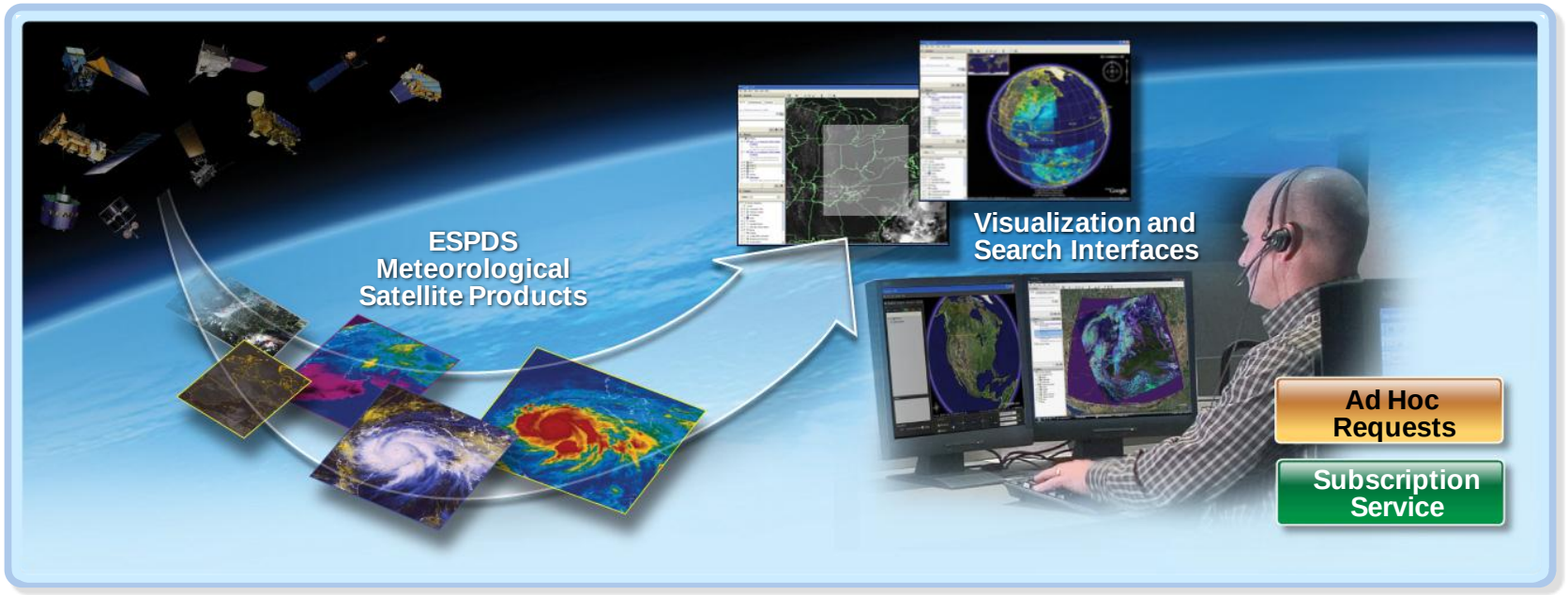
Performance Requirements & Extensibility

- **Rapid Elasticity**
  - Services are elastically provisioned in response to changes in system load.
- **On-Demand Self Service**
  - The computing capabilities are provisioned as needed based upon the data volume and system load demands.
- **Resource Pooling**
  - The computing resources are pooled across a cluster of commercially available x86 blade computing hardware
  - Compute resources are managed using commercial and open source virtualization and resource management technologies
  - Storage resources may be dynamically increased to meet future demands using scalable, clustered Network Attached Storage (NAS)
- **Broad Network Access**
  - User and Operation/Administrator functions are exposed via a web-based Portal
  - Machine-to-machine APIs are network-accessible via standard web service interfaces, such as SOAP and REST, over HTTP(S)
  - Legacy system integration is accomplished by using current legacy standards, such as FTP, FTPS, and SFTP
  - Storage is network-accessible via Network File System (NFS)
- **Measured Service**
  - The system's monitoring and reporting capabilities provide up-to-date status of resource allocations and availability.
  - Resource management measures resource allocations in response to changes in active user sessions and connections, memory and processor utilization, storage availability, etc.

PDA Estimated Daily Product Volume

- **2014: 14 TB (Legacy GOES, POES, NPP, foreign)**
- **2020: 30 TB**
- **~10 Satellite Product Generation *Data Sources***
  - GOES E/W
  - NPP/JPSS
  - DMSP
  - MSG
  - Metop
  - Himawari
  - Jason
  - COSMIC
- **~25 Ancillary *Data Sources (inc. NWS GDAS, GFS, NAM, Raobs, Bouys)***

Product Subscriptions

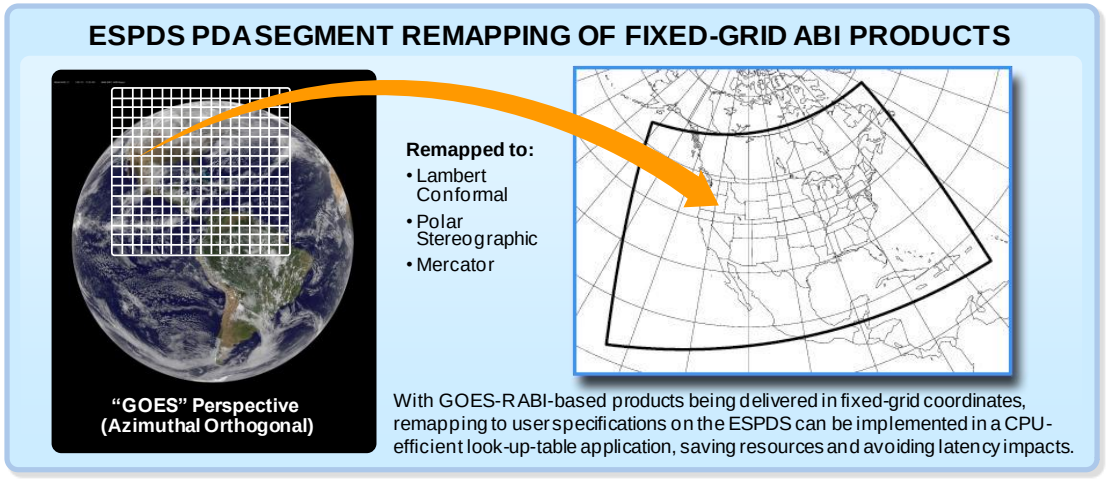


Subscription Parameters:

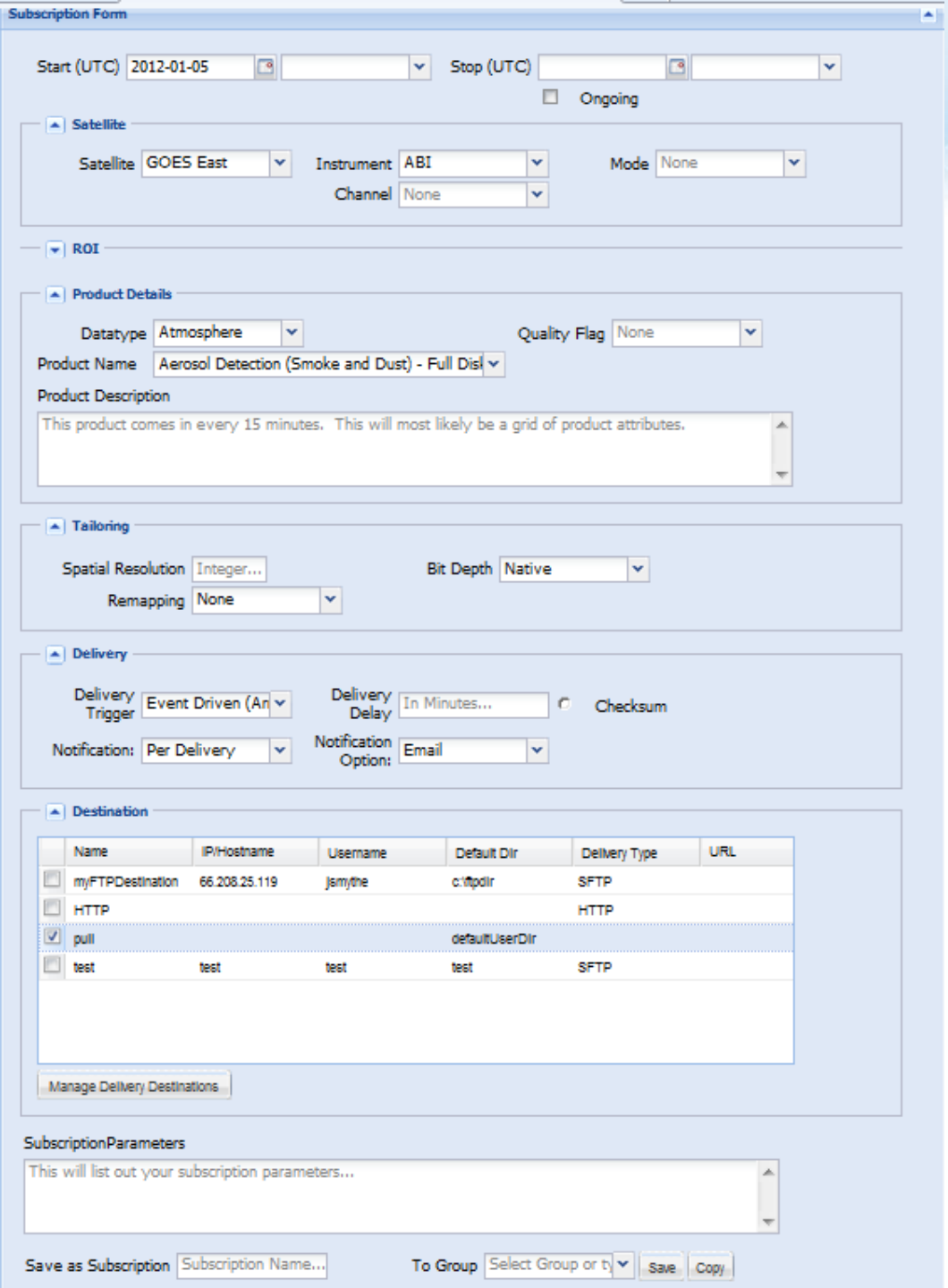
- **Date/Time/Periodicity**
- **Product/Product type**
- **Spacecraft and Instrument**
- **Geographic area**
- **Others…**

Product Tailoring

"Tailoring"
Sectorizing
Remapping
Translation
Aggregation



- **Sectorizing (Geographic sub-setting)**
- **File sub-setting**
- **Remapping and Resolution Reduction**
- **Bit-depth scaling**
- **File translation**



Subscription and Delivery Detail

**** - Note GUIs shown depict functional requirements, not final "form and feel" (art, visual texture, arrangement, etc***

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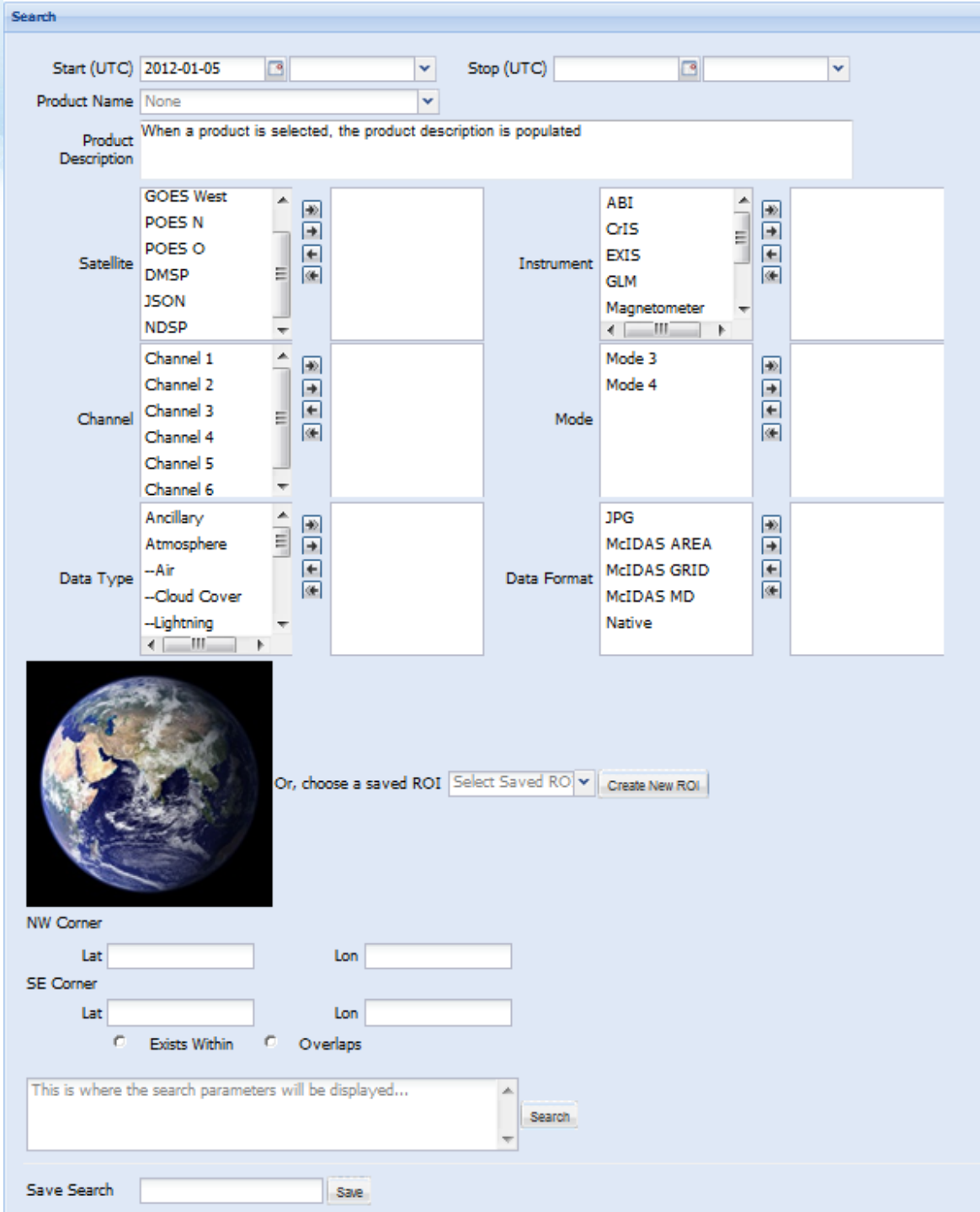
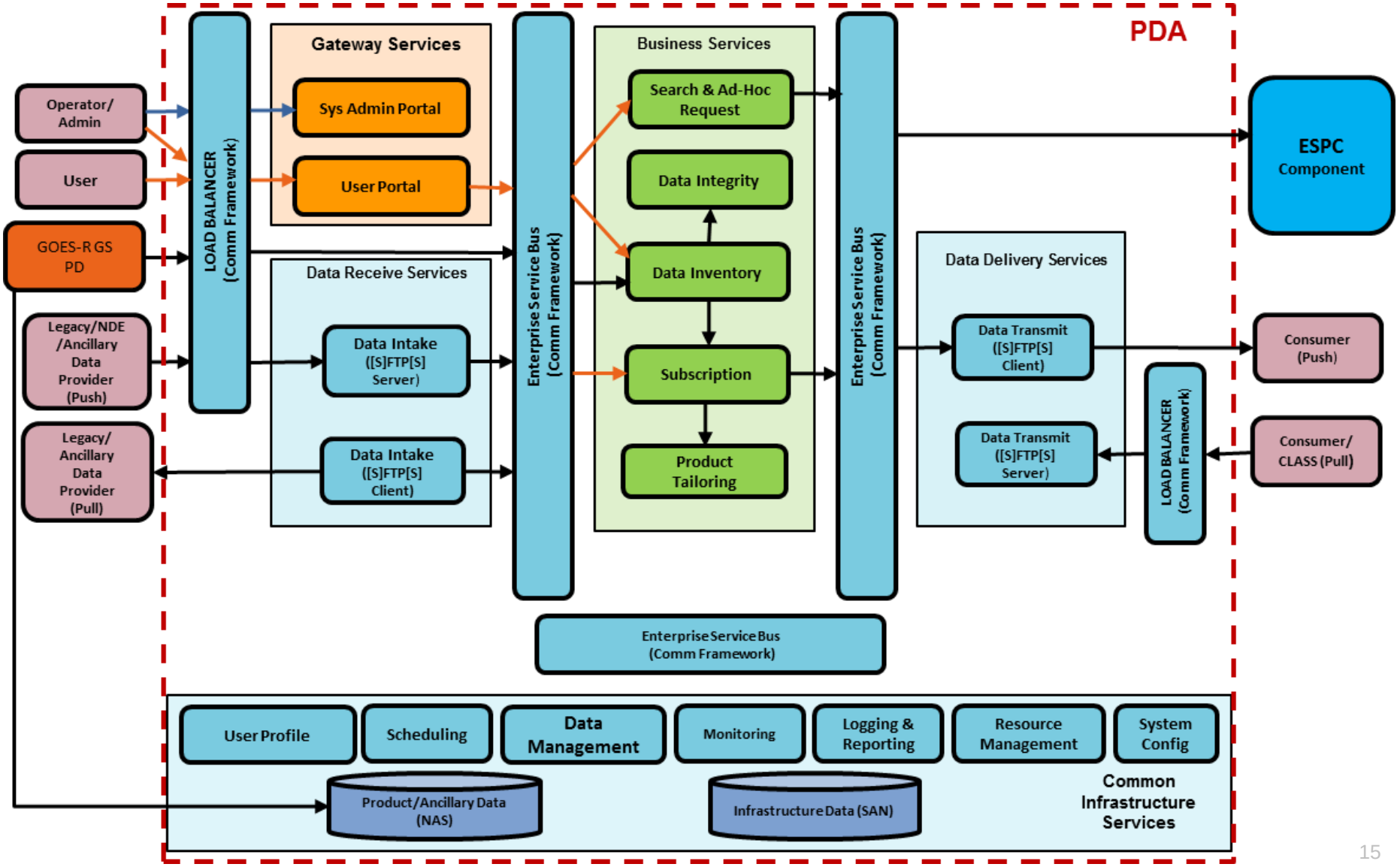
Product Search



PDA Services
Data Flow View



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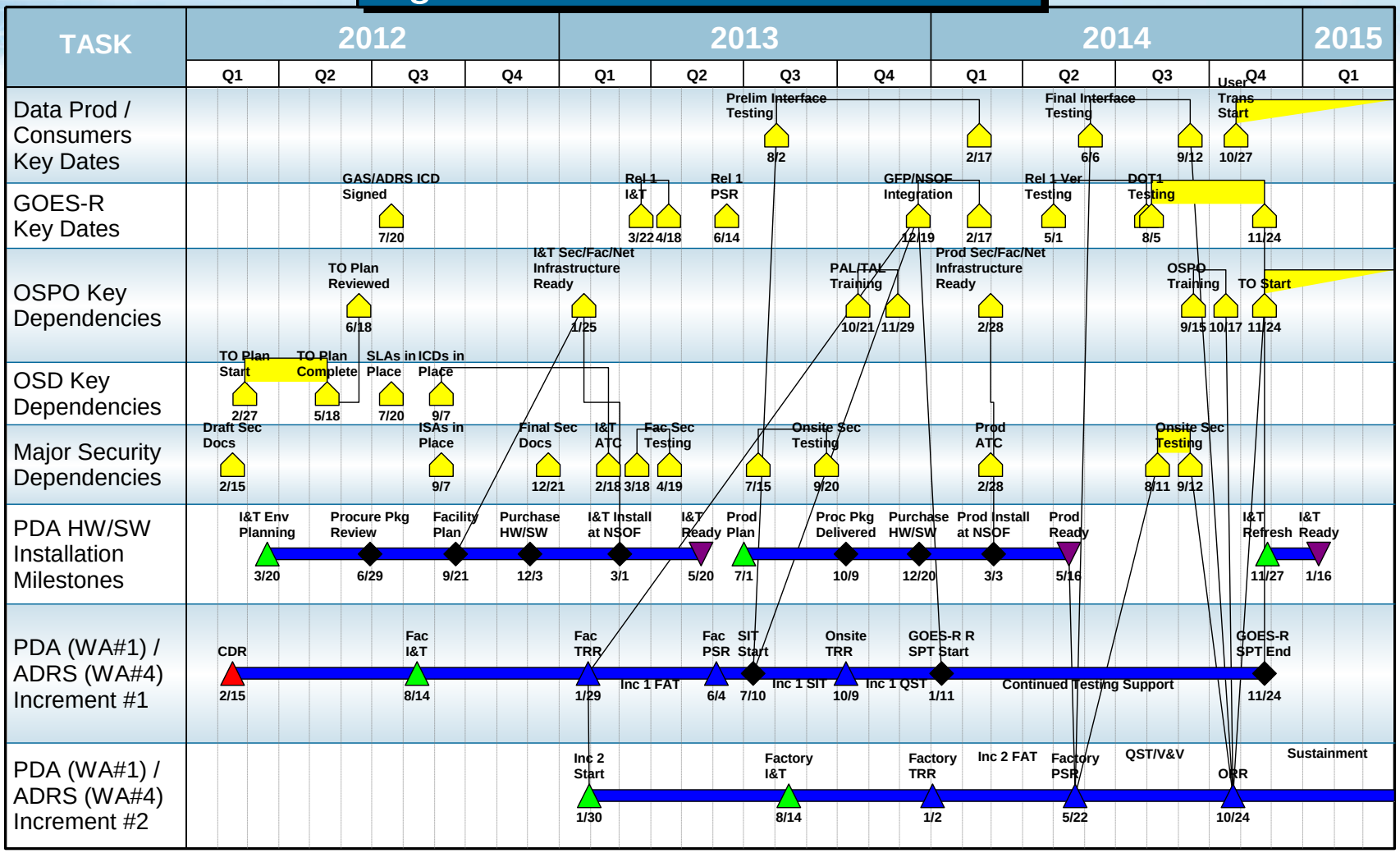
High Level PDA/ADRS Schedule



Pre-Development Reviews

Internal Milestone

Internal/External Milestone

Major Event Start

Major Release Review

Major Event

Milestones Professional Trial Version (http://www.kidasa.com).

Summary

- **User-Controlled Distribution**
- **Build Once, Build Generic**
  - **ONE Consumer ICD**
- **No Specialized Access Clients Needed**
- **Universal Selectivity Functions**
- **No Re-architecting for New Data Families**
- **Wide Variety of Product Tailoring and Data Delivery Options**