



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

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# Presentation Agenda

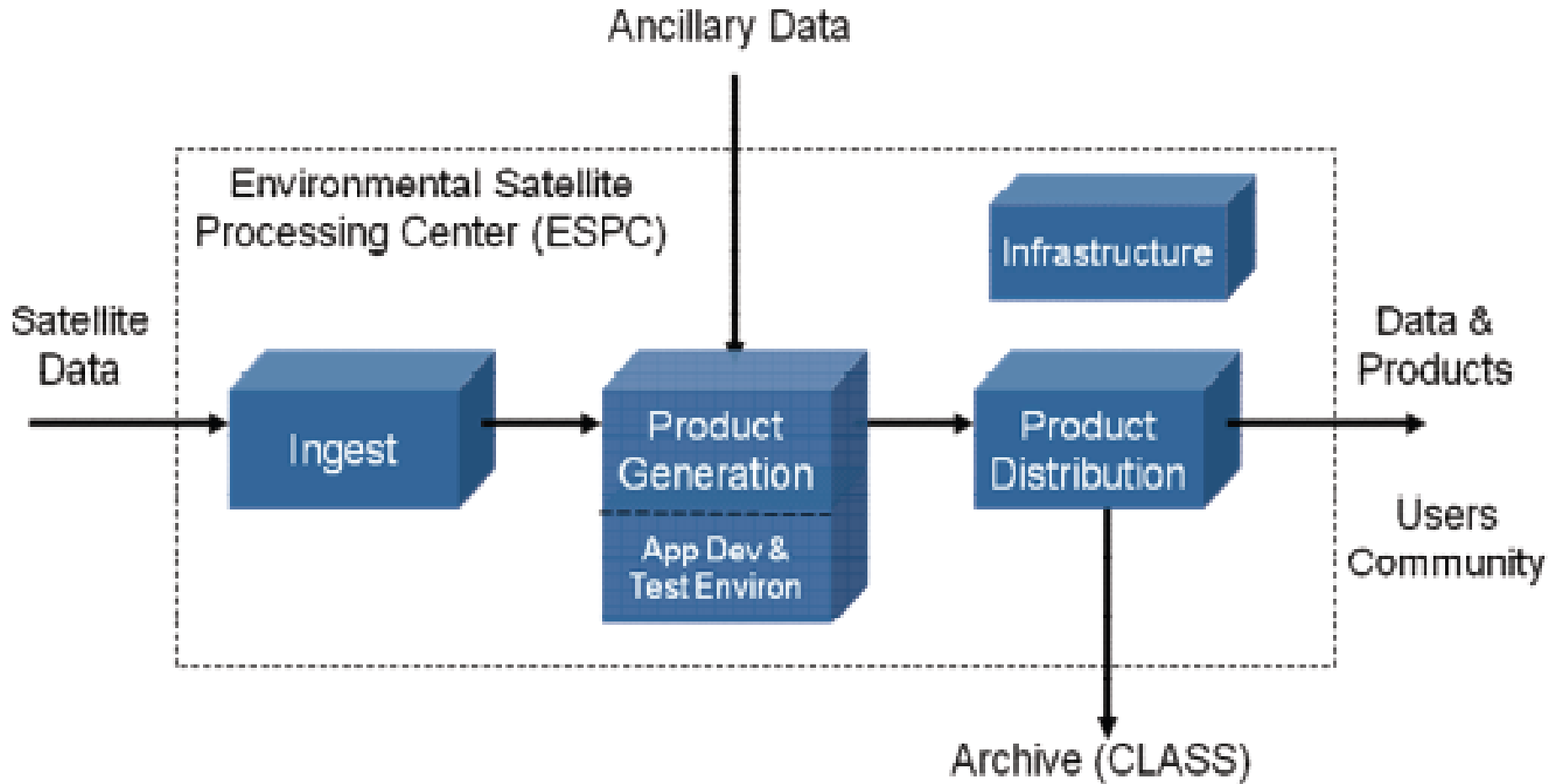
- **ESPDS Product Distribution & Access (PDA):**
  - ESPC Overview
  - PDA Overview
  - PDA Features & Benefits
  - PDA Architecture Extensibility
  - Summary

**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**

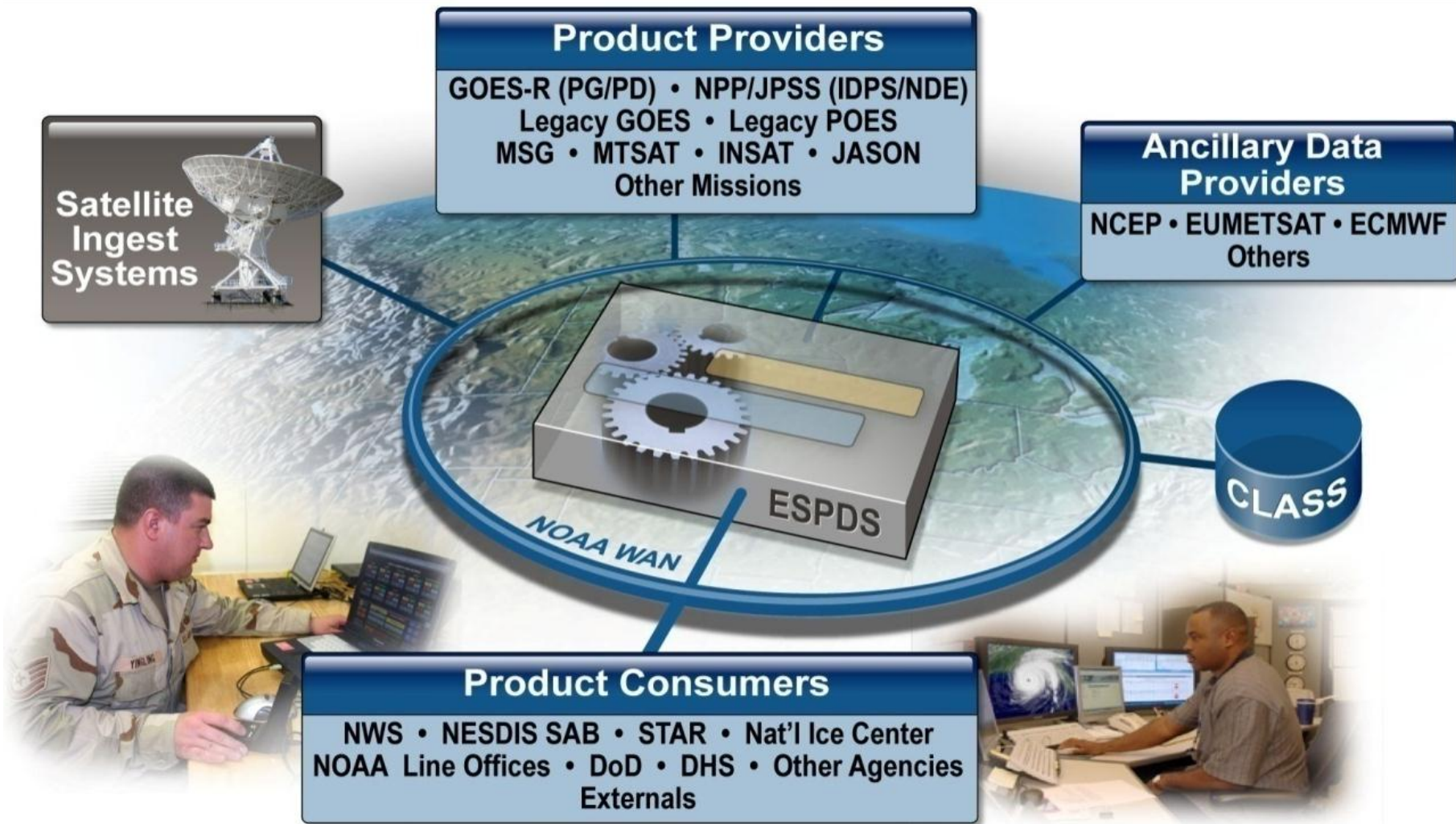
- ***“The acquisition **objective** is to evolve the ESPC from its current “stove pipe” systems into an **integrated enterprise system** capable of meeting technical and performance requirements of future and current satellite ground processing systems.*”**
- ***The contractor’s enterprise solutions 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

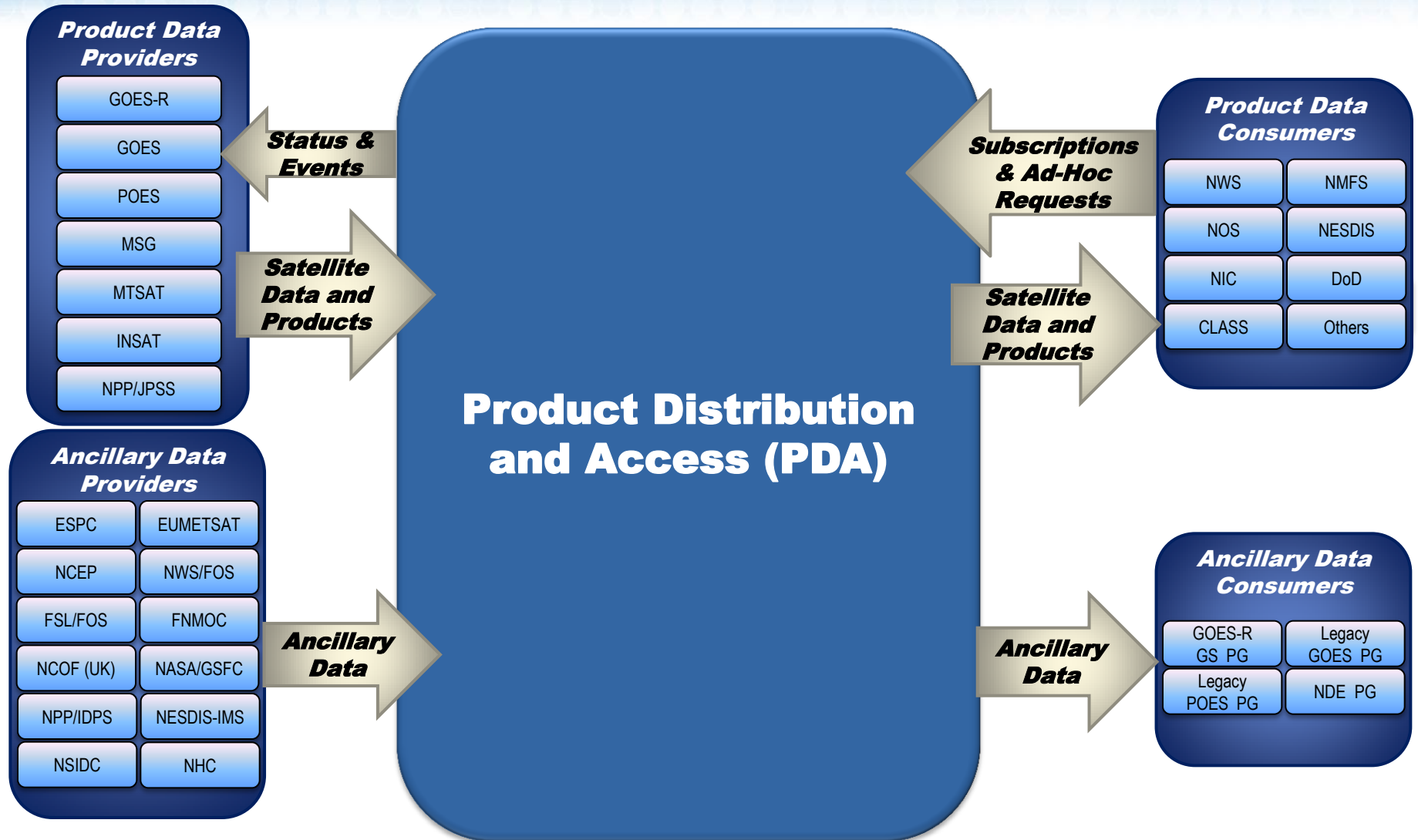
- **No More Stovepipes:**
  - First foundational wall of a modern, sustainable distribution enterprise
- **Build for tomorrow:**
  - A “Private Cloud” with processing speed of modular architectures; loosely-coupled and abstracted services; high bandwidth
  - Align with real user-access and data use paradigms of other 21<sup>st</sup> 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



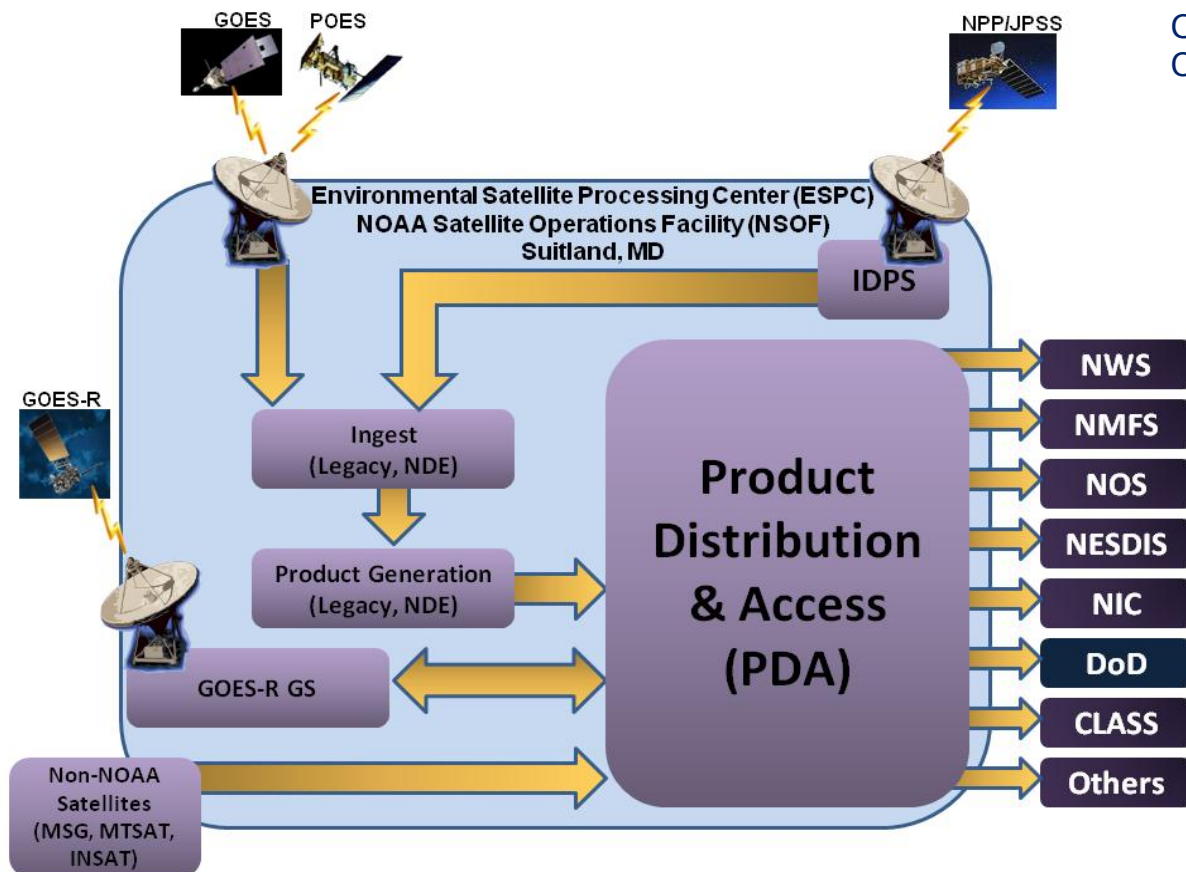
# Product Distribution Users



# 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)

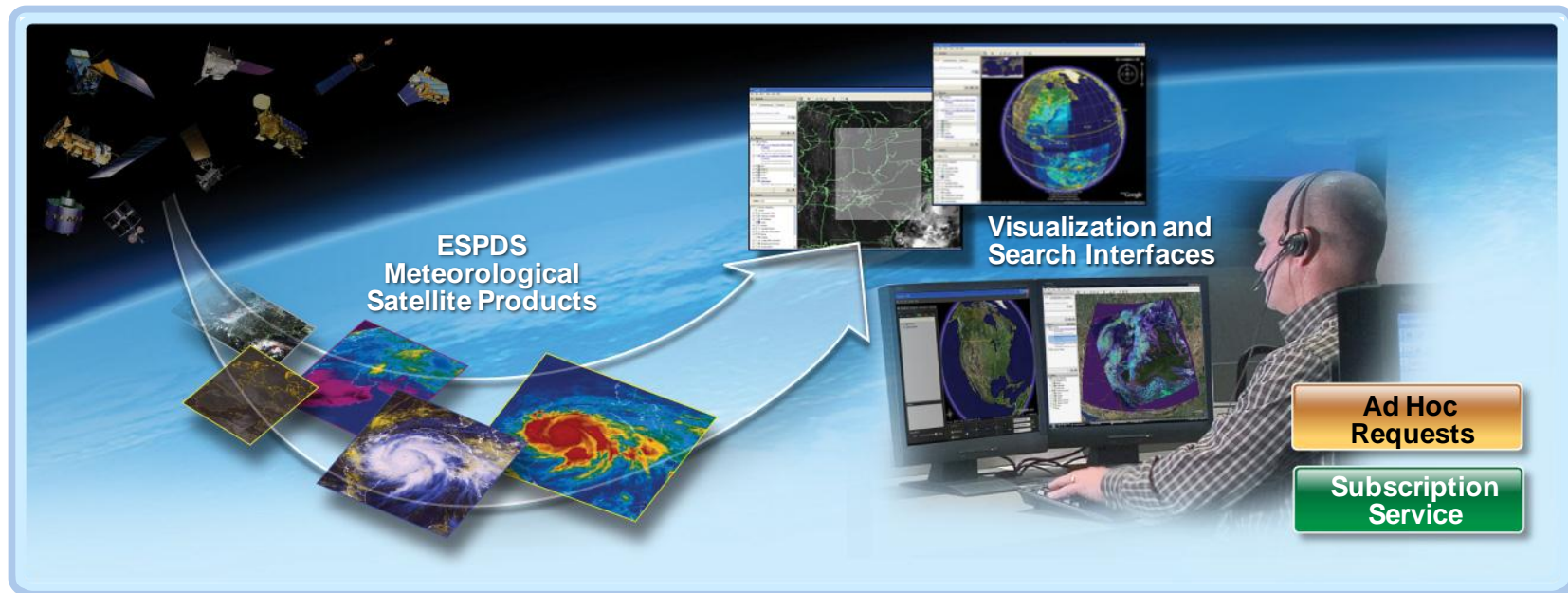
- **Measured Service**

- 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

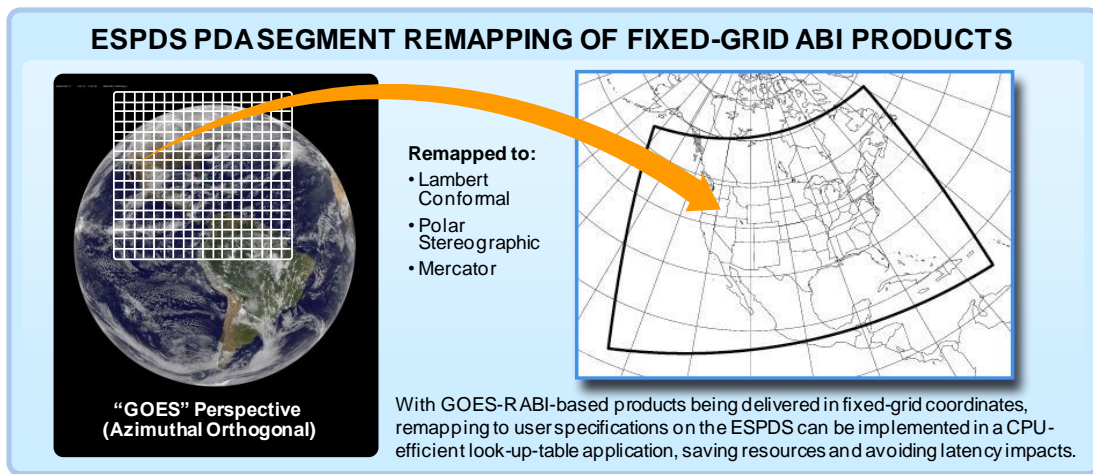


## Subscription Parameters:

- 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 Form

Start (UTC) 2012-01-05  Stop (UTC)  ☐ Ongoing

**Satellite**

Satellite GOES East Instrument ABI Mode None  
Channel None

**ROI**

**Product Details**

Datatype Atmosphere Quality Flag None  
Product Name Aerosol Detection (Smoke and Dust) - Full Disk  
Product Description  
This product comes in every 15 minutes. This will most likely be a grid of product attributes.

**Tailoring**

Spatial Resolution Integer... Bit Depth Native  
Remapping None

**Delivery**

Delivery Trigger Event Driven (An) Delivery Delay In Minutes... ☐ Checksum  
Notification: Per Delivery Notification Option: Email

**Destination**

Name	IP/Hostname	Username	Default Dir	Delivery Type	URL
<input type="checkbox"/> myFTPDestination	66.208.25.119	jsmythe	c:\ftpdir	SFTP	
<input type="checkbox"/> HTTP				HTTP	
<input checked="" type="checkbox"/> pull			defaultUserDir		
<input type="checkbox"/> test	test	test	test	SFTP	

SubscriptionParameters  
This will list out your subscription parameters...

Save as Subscription Subscription Name... To Group Select Group or type

# Subscription and Delivery Detail

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



# Product Search

Search

Start (UTC) 2012-01-05  Stop (UTC)

Product Name

Product Description When a product is selected, the product description is populated

Satellite

- GOES West
- POES N
- POES O
- DMSP
- JSON
- NDSP

Channel

- Channel 1
- Channel 2
- Channel 3
- Channel 4
- Channel 5
- Channel 6

Data Type

- Ancillary
- Atmosphere
- Air
- Cloud Cover
- Lightning

Instrument

- ABI
- CrIS
- EXIS
- GLM
- Magnetometer

Mode

- Mode 3
- Mode 4

Data Format

- JPG
- McIDAS AREA
- McIDAS GRID
- McIDAS MD
- Native

Or, choose a saved ROI

NW Corner

Lat  Lon

SE Corner

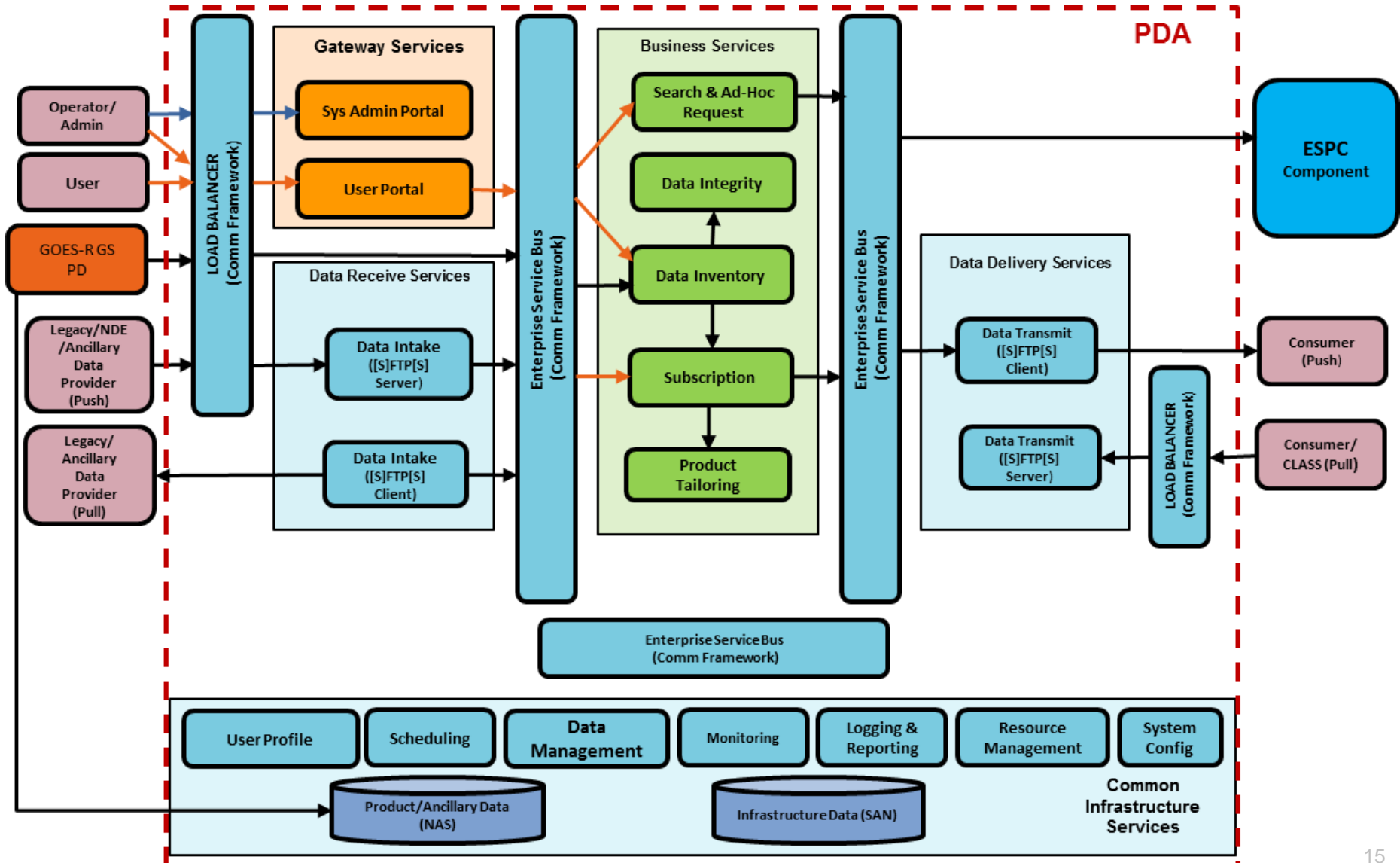
Lat  Lon

☐ Exists Within ☐ Overlaps

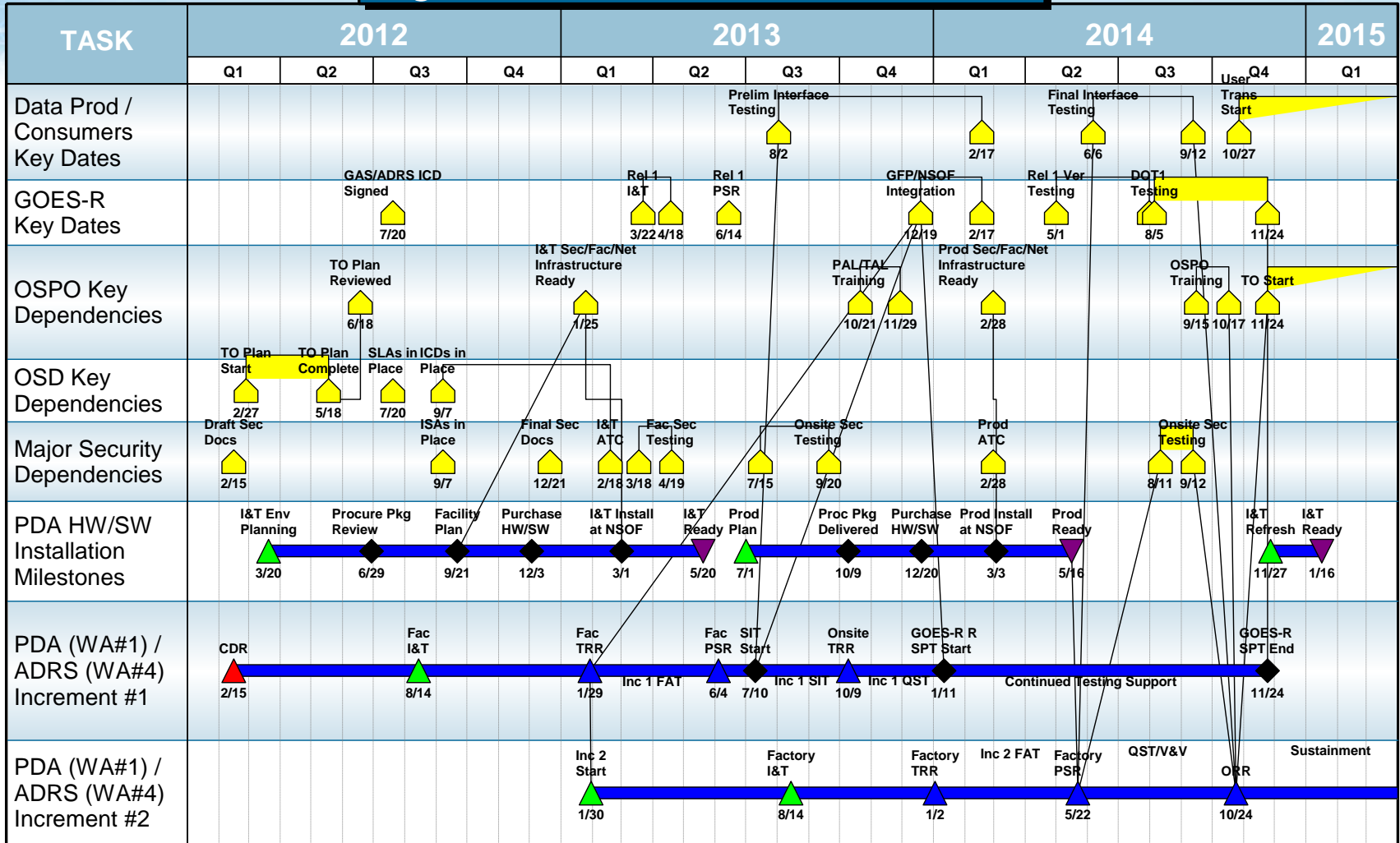
This is where the search parameters will be displayed...

Save Search

# PDA Services Data Flow View



# High Level PDA/ADRS Schedule



▲ Pre-Development Reviews

▲ Major Event Start

◆ Internal Milestone

▲ Major Release Review

▲ Internal/External Milestone

▲ 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**