



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

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Presentation Agenda

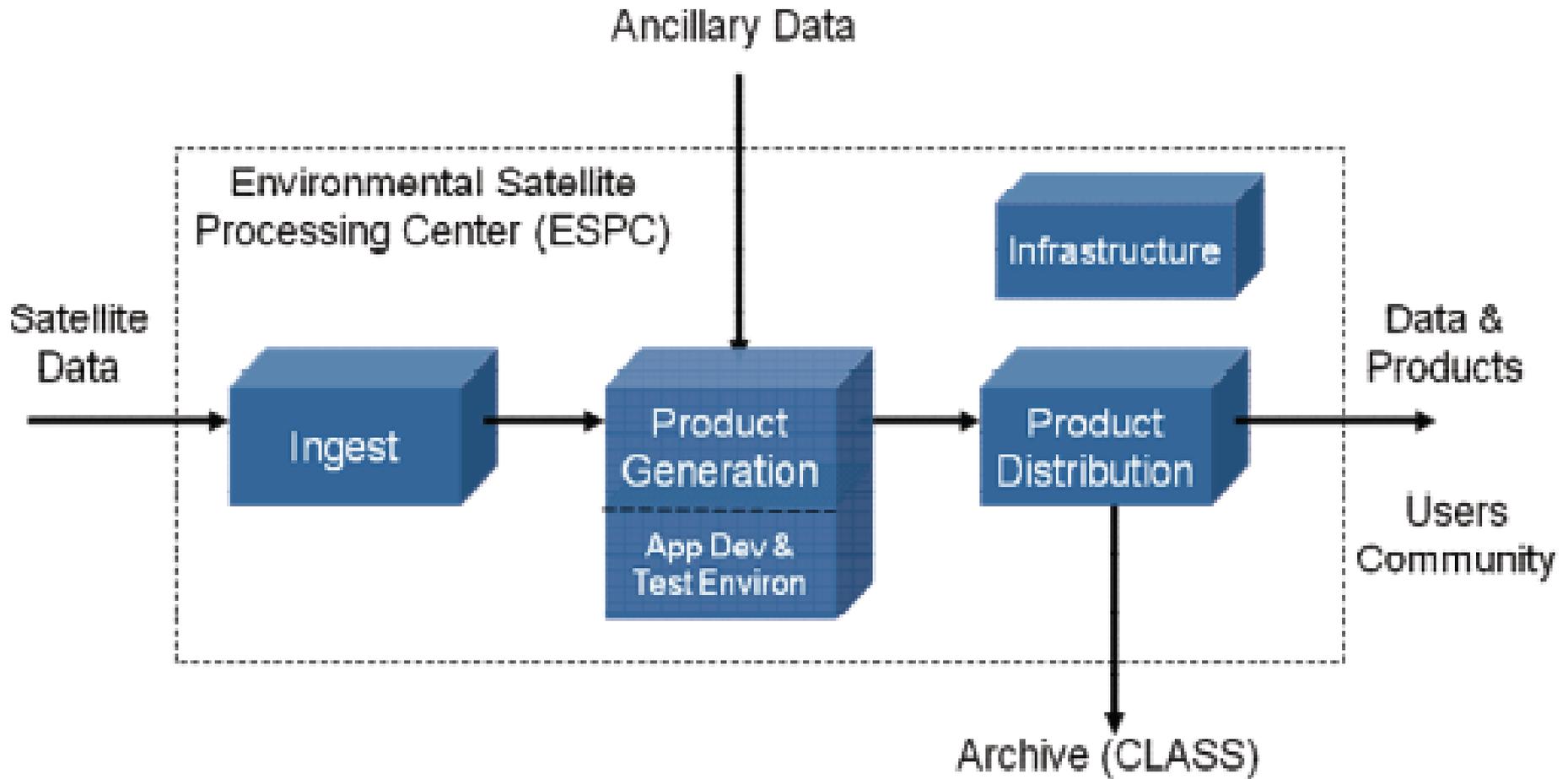
- **ESPDS Product Distribution & Access (PDA):**
 - ESPC Overview
 - PDA Overview
 - PDA Features & Benefits
 - PDA Architecture Extensibility
 - Summary

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

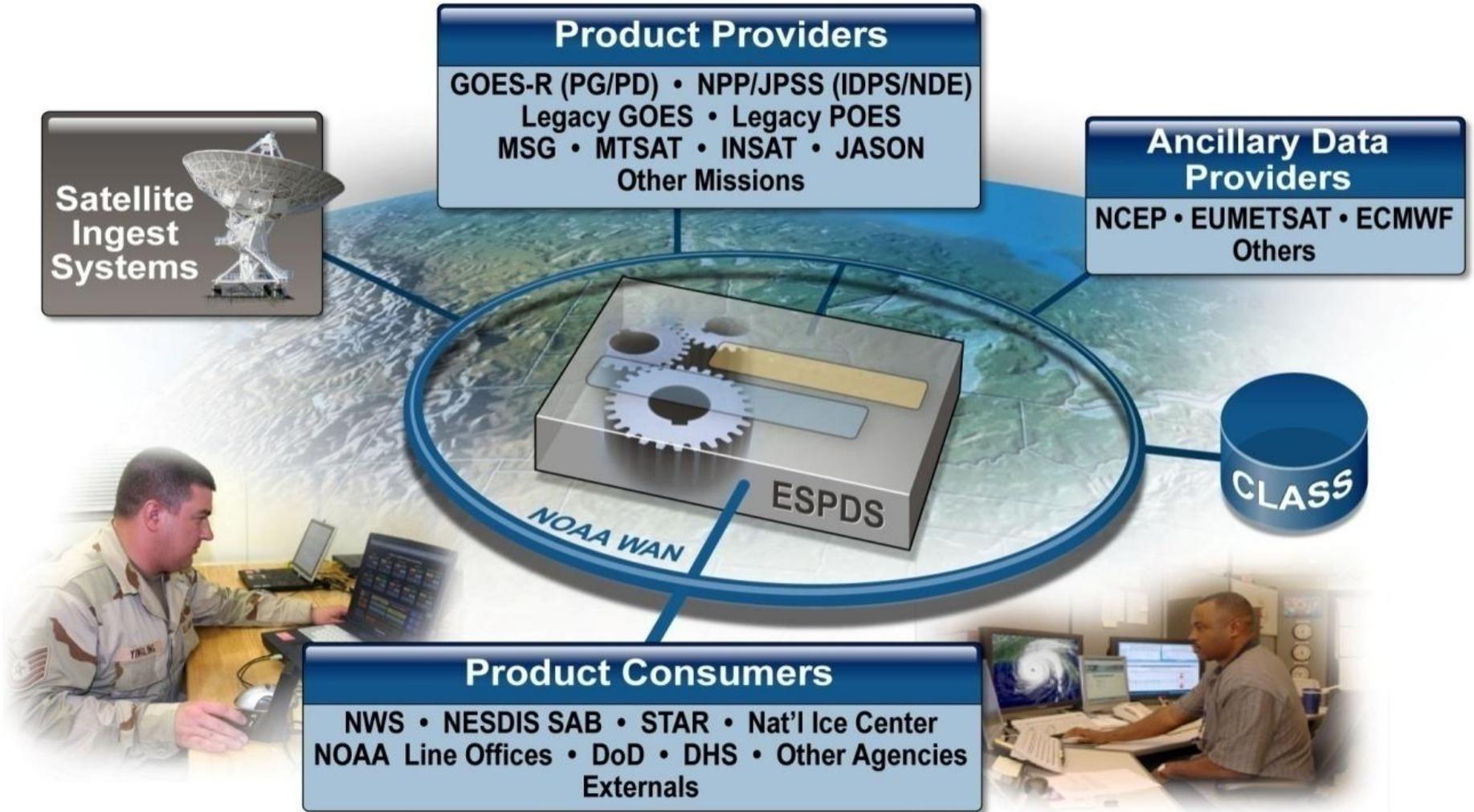
“Objectives” From the ESPDS SOW

- ***“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 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

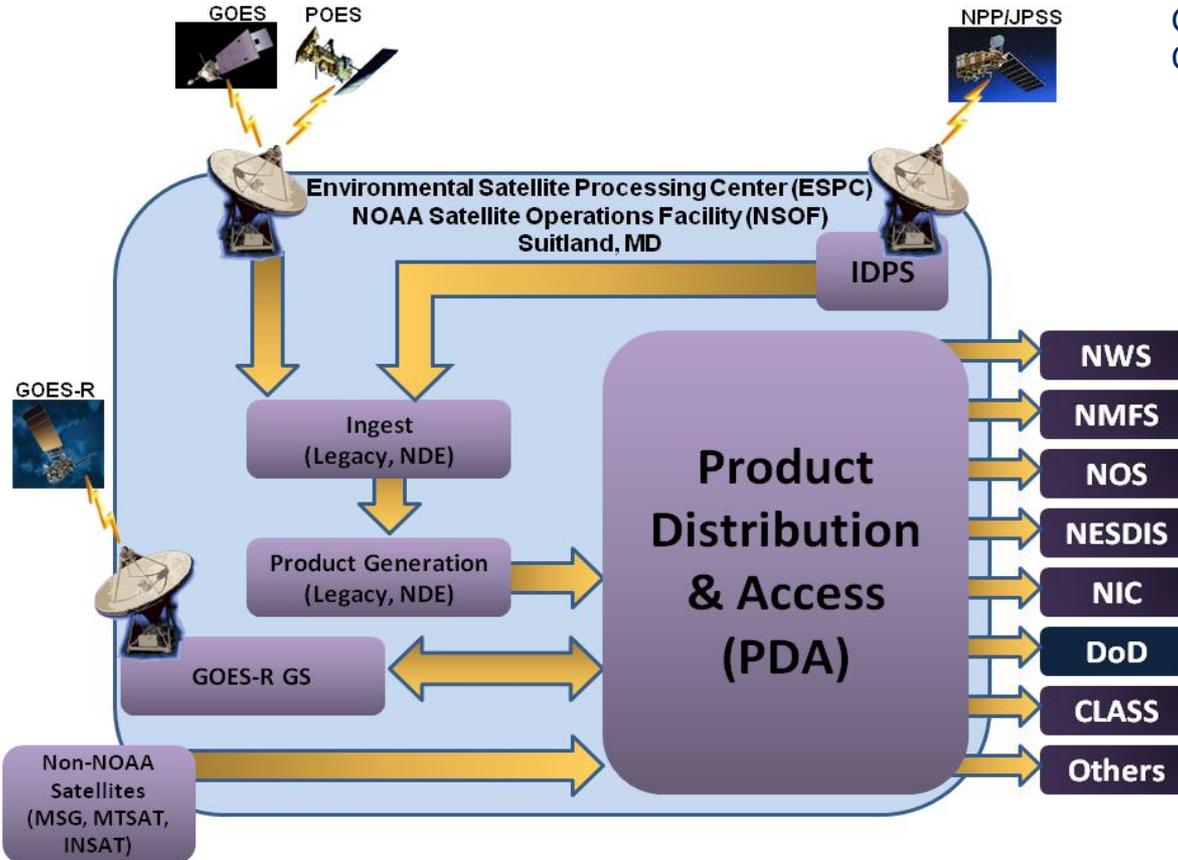
Product Distribution Users



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)

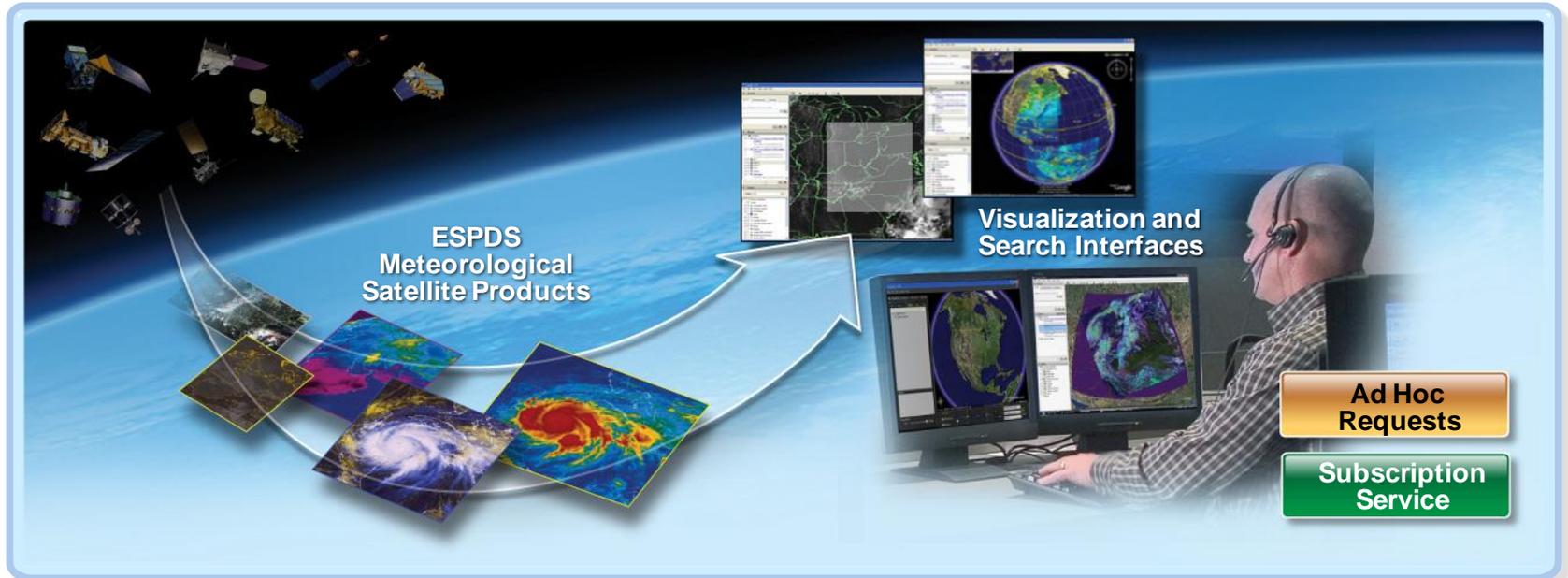
- **Measured Service**

- 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



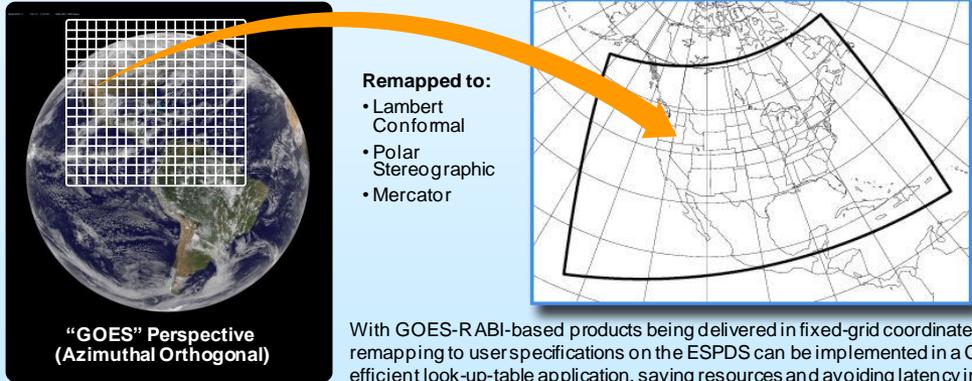
Subscription Parameters:

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

Product Tailoring

“Tailoring”
Sectorizing
Remapping
Translation
Aggregation

ESPDS PDASEGMENT REMAPPING OF FIXED-GRID ABI PRODUCTS



Remapped to:

- Lambert Conformal
- Polar Stereographic
- Mercator

With GOES-RABI-based products being delivered in fixed-grid coordinates, remapping to user specifications on the ESPDS can be implemented in a CPU-efficient look-up-table application, saving resources and avoiding latency impacts.

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

Subscription Form

Start (UTC) 2012-01-05 [calendar icon] [dropdown] Stop (UTC) [calendar icon] [dropdown]

Ongoing

Satellite

Satellite: GOES East [dropdown] Instrument: ABI [dropdown] Mode: None [dropdown]

Channel: None [dropdown]

ROI

Product Details

Datatype: Atmosphere [dropdown] Quality Flag: None [dropdown]

Product Name: Aerosol Detection (Smoke and Dust) - Full Dis [dropdown]

Product Description

This product comes in every 15 minutes. This will most likely be a grid of product attributes.

Tailoring

Spatial Resolution: Integer... [dropdown] Bit Depth: Native [dropdown]

Remapping: None [dropdown]

Delivery

Delivery Trigger: Event Driven (An [dropdown]) Delivery Delay: In Minutes... [input] Checksum

Notification: Per Delivery [dropdown] Notification Option: Email [dropdown]

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	

Manage Delivery Destinations

SubscriptionParameters

This will list out your subscription parameters...

Save as Subscription: Subscription Name... [input] To Group: Select Group or ty [dropdown] [Save] [Copy]

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) Stop (UTC)

Product Name

Product Description

Satellite	GOES West POES N POES O DMSP JSON NDSP		Instrument	ABI CrIS EXIS GLM Magnetometer	
Channel	Channel 1 Channel 2 Channel 3 Channel 4 Channel 5 Channel 6		Mode	Mode 3 Mode 4	
Data Type	Ancillary Atmosphere --Air --Cloud Cover --Lightning		Data Format	JPG McIDAS AREA McIDAS GRID McIDAS MD Native	

Or, choose a saved ROI

NW Corner
Lat Lon

SE Corner
Lat Lon

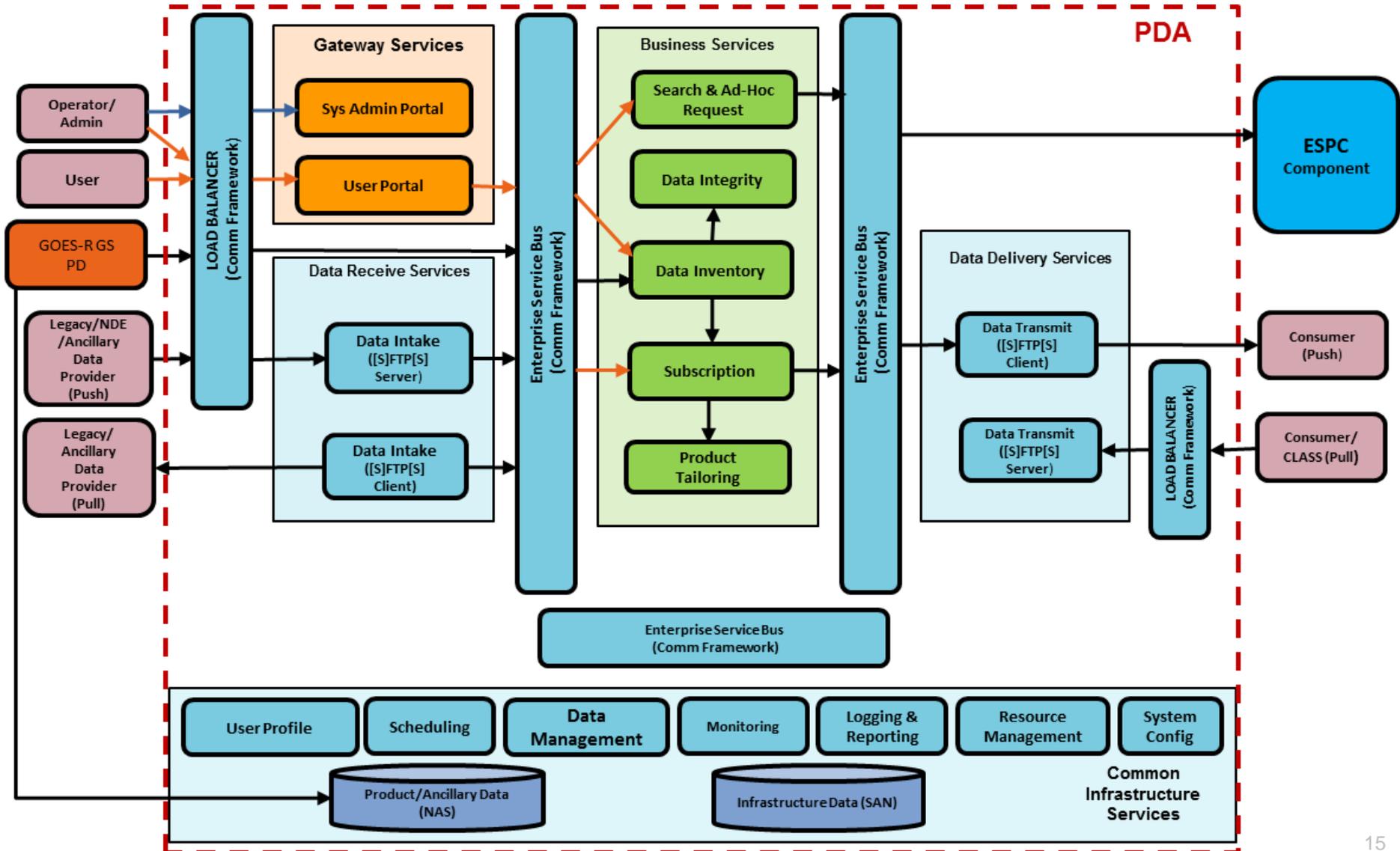
Exists Within Overlaps

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

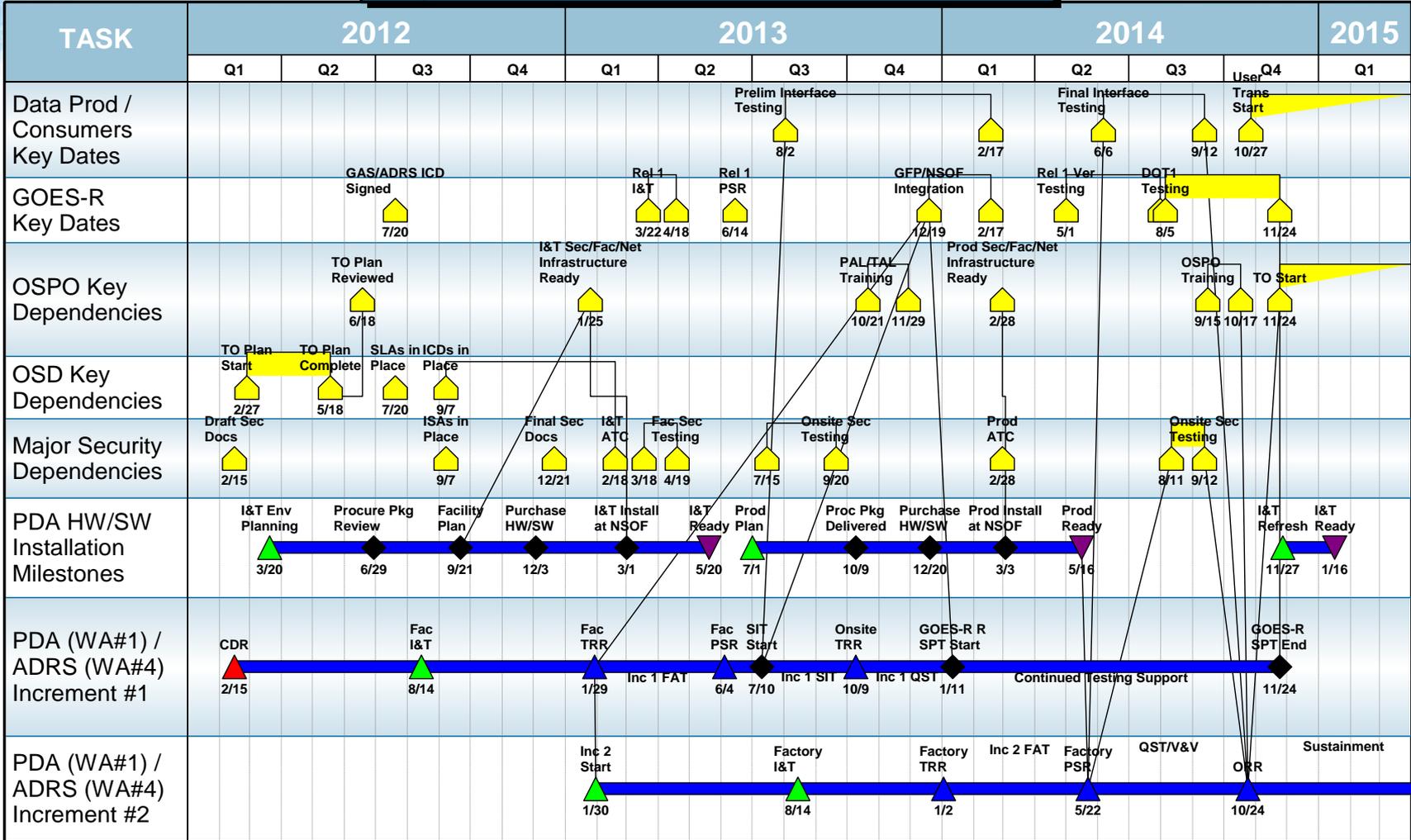
Save Search



PDA Services Data Flow View



High Level PDA/ADRS Schedule



▲ Pre-Development Reviews

◆ Internal Milestone

▲ Internal/External Milestone

▲ Major Event Start

▲ Major Release Review

▲ Major Event

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**