Technical implementation of the EUMETSAT Data Services Roadmap

16th Workshop on Meteorological operational systems

Background (drivers & objectives)

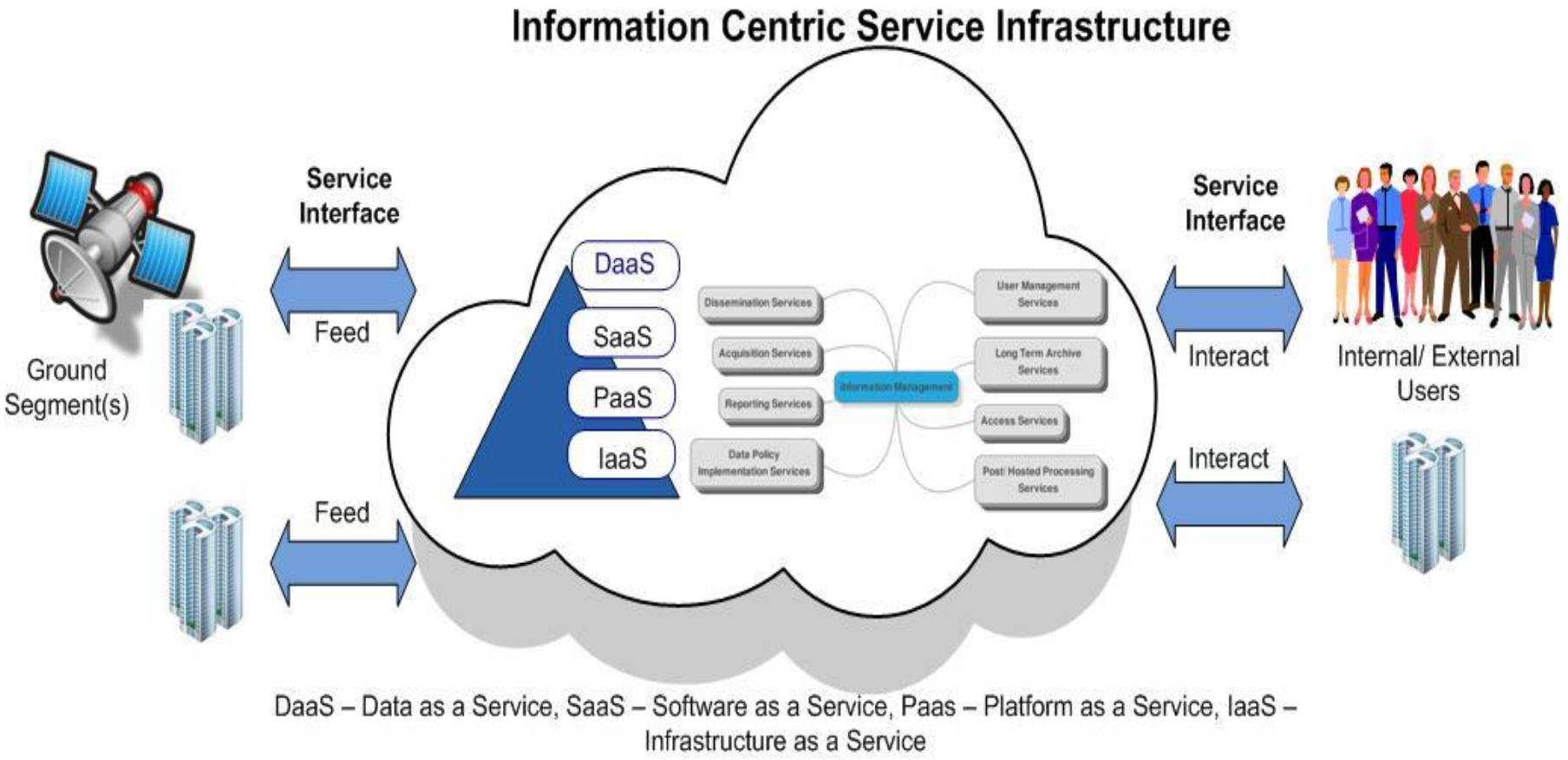
Drivers:

- Evolution of user needs and expectations
- Increase of data volumes
- Availability of “big data” technologies
- Flexibility to address changes
- Future-proof solutions

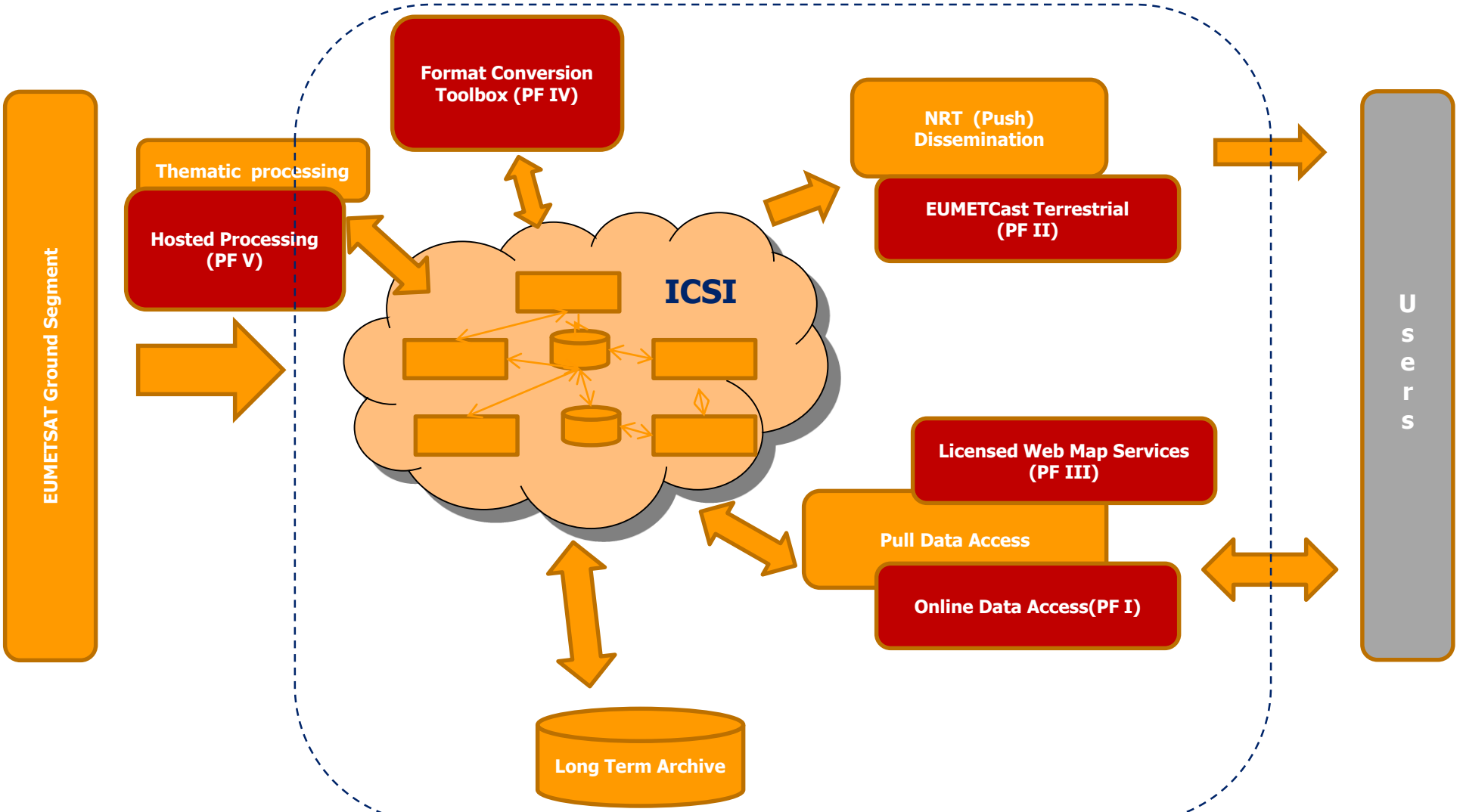
Objectives:

- Establish a new Data Services Portfolio
- Service-oriented interfaces to users
- Using an interoperable, and generic IT infrastructure
- Based on well established standards
- Support “data to the users” as well as “users to the data” services

Vision


Information Centric Service Infrastructure
Ground Segment(s)
Service Interface
Feed
Feed
DaaS
SaaS
PaaS
IaaS
Dissemination Services
Acquisition Services
Reporting Services
Data Policy Implementation Services
Information Management
User Management Services
Long Term Archive Services
Access Services
Post/ Hosted Processing Services
Service Interface
Interact
Interact
Internal/ External Users
DaaS – Data as a Service, SaaS – Software as a Service, Paas – Platform as a Service, IaaS – Infrastructure as a Service

How to get there …



EUMETSAT

Pathfinder/ Projects

PF-I: Online data access (OLDA)

PF-II: High volume data delivery via EUMETCast Terrestrial

PF-III: Licensed Web Map Services

PF-IV: Format conversion toolbox

PF-V: Hosted processing

PF-VI: SAF Data Access (study)

VII: EUMETSAT & Partner DIAS

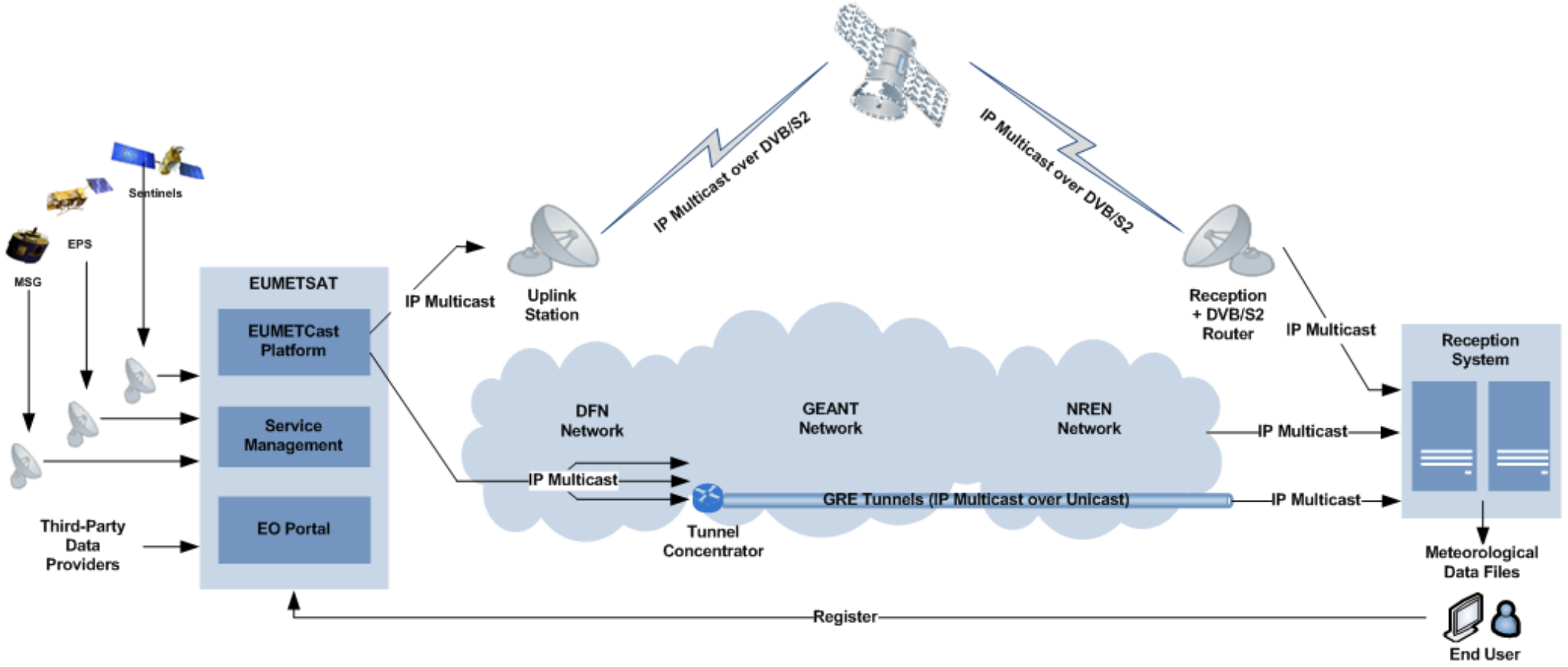
PF-I: Online Data Access (OLDA)

High level specification & requirements:

- Provide immediate direct download of real time data and products “as is”
- Provide direct download access to Climate Data Records
- Simple User Interface
- Simple registration & Single-Sign-On (SSO)
- Exploring aspects of spatial subset & regional data access
- Demonstrating monitoring & reporting capabilities
- Assess how various Service Level Agreements, with different user communities could be managed
- Ensuring access to the data through a service layer, i.e. transparent from actual internal implementation
- Providing access on demand to end users via interfaces for manual (human) or automated (computer based API) interactions, using the pull principle

PF-II: High Volume Data Delivery via EUM Terrestrial

EUMETCast is a **near real-time data** dissemination service which is based on an IP multicast "push" concept and implemented using the TelliCast server and client applications



PF-II: High Volume Data Delivery via EUM Terrestrial

High level specification & requirements

Assess/confirm the relevance of the EUMETCast-Terrestrial concept for:

- The **delivery of high volume** of data to international partners (best effort basis)
- The **cost efficient** delivery of large Data sets needed by limited number of users
- The **delivery of temporary, trial or project-related** time / non-time critical datasets to NMSs or expert user groups (e.g. MTG study data, Climate data sets for evaluation, etc.)
- Demonstrate the capability of the system to **serve as a backup** to EUMETCast-Satellite (compare this capability with OLDA)
- Provide a **single and harmonized user interface** for EUMETCast-Terrestrial and EUMETCast-Satellite
- Explore **contractual arrangements** where GEANT acts as a single point of contact for users as regards matters related to connection to GEANT and national research networks
- Definition of the preferred usage of the current GEANT-based system, including successful demonstration of its use as a back-up for time-critical data sets

PF-III: Web Map Services via EUMETView

High level specification & requirements:

- Provide on line access to Full disc (0 degree & IODC) and Rapid Scan MSG Level 1.5 imagery in full spatial and temporal resolution (5 minutes at its most frequent), holding images online for at least 6 months and allowing users to go back in time and access/download those images (licensed data)
- Develop a new user interface incorporating a Single Sign On registration service
- Demonstrate access to numerical data and products through new types of web services such as Web Coverage Services & Web Feature Services
- Define a validation approach for web imagery
- Assess of technical and legal aspects of cascading services (Up and Down cascading)
- Assess the scalability of the services and the possibility to manage different Service Level Agreements per user community, in relation to tailored licensing arrangements
- This will include provision of tailoring capabilities, allowing users to customize and personalize the EUMETSAT visualisations to their own purpose

PF-IV: Format Conversion Toolbox

High level specification & requirements:

- Conversion of EUMETSAT proprietary formats MSG Native, MTP Native, Metop Native and some BUFR, GRIB products to other community-desired formats (NetCDF, geoTiff) and vice versa, including the conversion into well known projections (WGS84)
- Implementation of the NetCDF format following the Climate and Forecast conventions for metadata
- Inclusion of specific geographic sub-setting functions in synergy with Pathfinder-V on hosted processing
- Verification of converted formats with a selected set of GIS tools
- Provision of a web service supporting user access to the toolbox in synergy with Pathfinder-I/-V
- The library and its functions should be usable by non-expert user

VII: DIAS – Background Information

EC Rationale:

- Copernicus Data & Information attract a large number of users
- Maximise usage of Copernicus Data & Information
- Create level playing field throughout Europe
- Stimulate innovation and new buisness models

Process:

- Creation of the IGS Task Force (March 2015)
- Drafting of IGS roadmap and annexes
- Drafting of the Operational Implementation Plan (OIP)
- Approval by Copernicus Committee of the roadmap, annexes and OIP (July 2016)
- Drafting of Functional Requirements to
  1. Improve traditional data and information distribution services
  2. Copernicus Data and Information Access services to all member states on equal basis using BigData paradigm

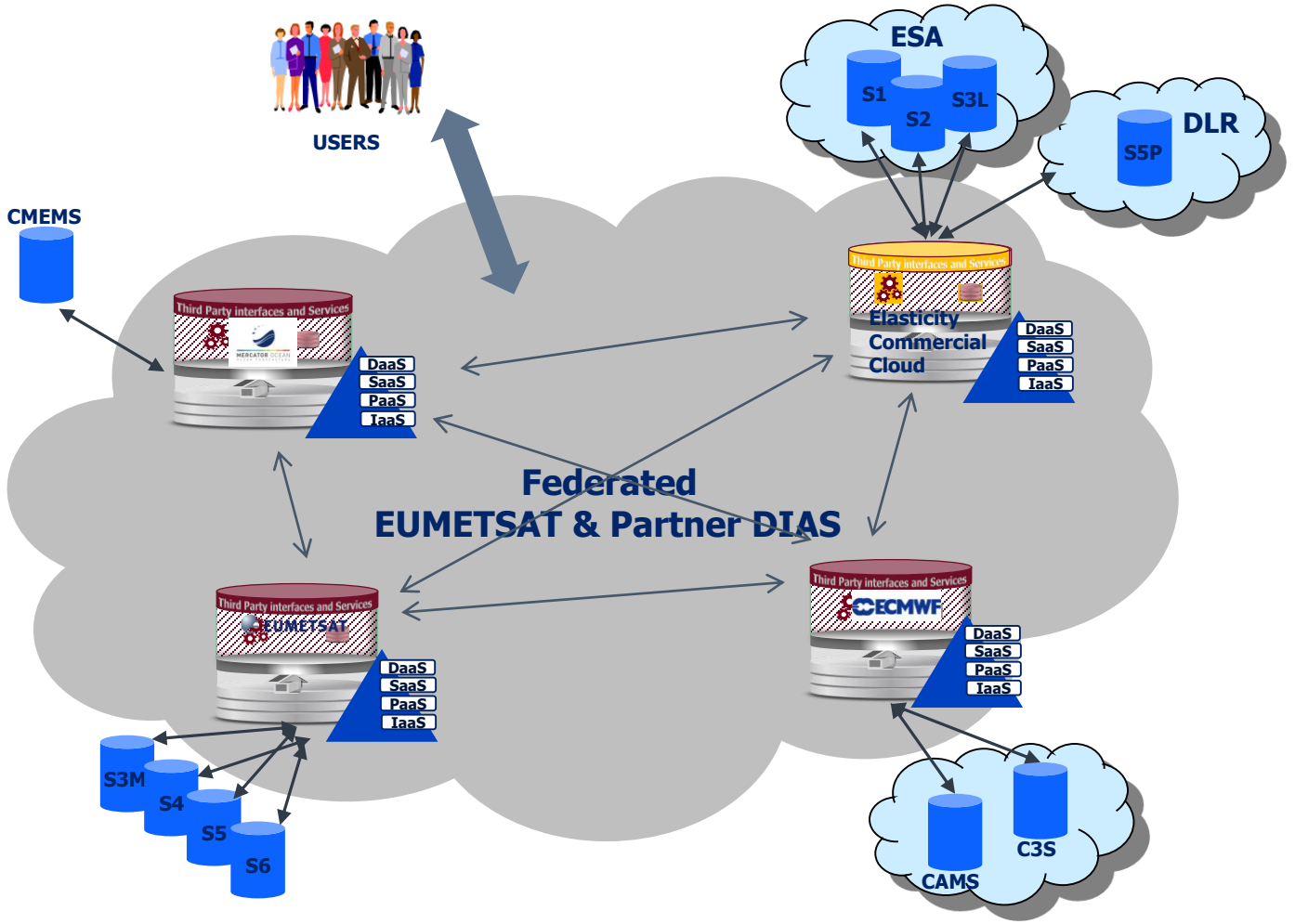
VII: DIAS - Implementation

- EC envisaged to procure at least 3 DIAS platforms for:
  - Risk management
  - Competition
  - Different concepts
  - First operational version by Q1/2 2018

- ESA will procure two DIAS
  - Outsource entire industrial DIAS services
  - Award independent contract with two DIAS consortia

- EUMETSAT: one DIAS
  - Joint initiative by EUMETSAT, ECMWF and Mercator Ocean
  - Several procurements
  - Decentralised architecture with outsourced cloud for 3rd party users

VII: DIAS based on Federation



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Data Services Roadmap - Scope & Approach

Scope:

→To have everything in place that allows demonstration of the services & concepts to selected EUMETSAT users by Q1 2018

Approach:

- To work with industry partners to define an architecture, engineer and implement a solution including its physical integration;
- Procurements will be grouped in blocks (ITTs)
- For each block it is the intention to place service contracts of an initial duration of two (2) years potentially with one or two yearly options
- Applying a work package-based mechanism for the overall activity within those contracts to allow gradual progress

Roadmap Schedule

- Roadmap definition and approval phase Q2 2015 – Q3 2016
- Pathfinder phase start Q4 2016
- Industry support tenders Q1 2017
- Pathfinder phase project execution start Q1 2017
  - Architecture Checkpoint (May)
  - Design Review (June)
  - Platform readiness Review (October)
  - User Validation Readiness Review (December)
- User Validation Phase Q1 – Q2 2018
- Final Service Specification and System level requirements for approval by Member States Q4 2018
- Q1 2019 Start of Operational Implementation Project with ramp up allowing hosting of operational scale services
- Q1 2020 Operational Readiness


Questions?