GMES Space Component Data Access

Architecture and Operational Scenarios, HMA Implementation Status
Outline of the presentation

GSC Data Access and Pre-Operation Project
- Scope
- Data Sets Definition

GSC Coordinated Data Access (CDS) System
- Overview
- Major Components
- Operational scenarios
- CDS project status

Focus on Heterogeneous Mission Accessibility (HMA)
- Interfaces implementation
- Standardisation and interfaces evolution
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Integration of GMES Contributing Missions (GCMs) and Sentinels data flows for GMES Service Projects through coordination of operational interfaces.
From the data requirements collected from the GMES Service Projects, the Data Access Portfolio (DAP) is generated and accordingly the Coordinated Data access System (CDS) shall:

- Build the data collection across a diversity of Missions product offer
- Operate across a diversity of Missions Ground Segments interfaces
GMES Data Sets Concept

Data sets definition covers:

- Geographical coverage (e.g. European land coverage, pre-defined emergency areas,...)
- Product specifications (instrument types or modes, product level..)
- Availability specification (timeliness, period of acquisition,...)

http://gmesdata.esa.int
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Coordinated Data Access System (CDS):
A large heterogeneous distributed system requiring the integration and coordination of a large number of operational interfaces
Coordinated Data Access System components:

**Service Projects Coordinated Interface:**
- Service Projects interface for data sets and operations advertisement, user management, data ordering interface
- Data set production coordination
- GCMs interface for mission production coordination

**Core Infrastructure:** Products collection and cataloguing for data sets creation

**Reporting and performance:** Overall performance continuous measurement
Operations are based on scenarios triggered by GMES Service Projects needs in terms of data sets performances and operational interfaces e.g.:

- Data streams from global systematic missions scenario
- Geographic Area Coverage scenario
- Emergency Rush Satellite Tasking scenario
Data Streams from Global systematic Missions Scenario

- Coordination of data registration and subscriptions
Geographical Area Coverage scenario:

- Coordination of mission ordering and mission archive interfaces
Emergency Rush Satellite Tasking Scenario

Emergency Rush Satellite Tasking scenario:
• Coordination of mission planning interfaces

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Coordinated Data Access System
Project Context

2008/2009: V1 Scope:
Establish a coordinated technical baseline for GSCDA data flows
“Preliminary” Pre-operations of GMES Services Projects

2009/2012: V2 Scope:
GSP operational interfaces implementation
HMA infrastructure initial operations

2009/2013: V3 Scope:
GSP operations evolutions
CDS operations evolutions
Integration of Sentinels Ground Segments
Coordinated Data Access System Project Status

GSCDA IF reqs for GCMs
Sept 07

CDS System Requirements Review
June 2008

CDS Preliminary Design Review
May 2009

DAP-R 1.0
May 2008

DAP-R 1.1
March 2009

CDS reviews organised with participation of GMES Service Projects

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Coordinated Data Access System Preliminary Architecture has been defined, including:
• CDS sub-components preliminary design
• Integration of EO Data Access Integration Layer
Interface Requirements have been defined for the GMES Contributing Missions concerning
• Interface Operational procedures
• Service performance monitoring and management
• Machine to machine protocols (incl. HMA interfaces)
Unified integration process tailored to specific GCM G/S capabilities

Resulting in:
- Qualified GSC operational baseline through formal engineering process
- Documented operational baseline available to all GSC participants
- Measurable performances against baseline
- Strong basis for improvements and evolution from both GCM and GSP points of view

Within challenging constraints:
- Preliminary operations already on-going
- Very short development life-
Summer integration activities with GCMs

KO

IVRR

ORR

ImageSat&EUSI

June 09

Dec 09

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The large number of different operational scenarios (~15) combined with the number of different data sets (~40) and the number of different external interfaces (~20) lead to operational risks e.g.

- Operational resources involvement
- Overall system performance monitoring and management
- Reliability

HMA shall provide an integrated layer of mission interfaces allowing streamline of operations and therefore general performance increase. The implementation and usage is supported within the CDS environment.
G/S Task Force Recommendation:

*use of standardized interfaces*


**Heterogeneous Mission Accessibility**

*EOP-G presentation to DOSTAG 43. April 2005.*

**Interoperability standards project**

**HMA Implementation**

- **DAIL Implementation**
- **HMA I/F Implementation @ ESA**
- **HMA I/F Implementation @ HMA Contributing Agencies**
- **HMA I/F Implementation @ GCMs**

**HMA Test Bed**

Prototyping and Testing

**HMA Architecture Working Group**

HMA WG Terms of Reference
Ref. GMES-DFPR-EOPG-PR-06-0006

**Standards Evolution**

HMA Standards Interfaces
Initial Specifications

**Operational Implementation Projects**
HMA Implementation Activities

EO DAIL  KO  ORR

2009  2010

Catalogue Ordering Programming

Catalogue

UM Catalogue Ordering Programming

Catalogue Ordering

Catalogue

Catalogue Ordering User Management WMS
Impact of HMA on GSC Ground Segment

- GSC Data Access fully relies on a coordinated approach of the Earth Observation data provision
- HMA architecture and standards will improve the performance and reliability of operations. Complete availability of this solution depends on GCMs readiness
- GSC HMA implementation is not specific and can be easily reused within other Earth Observation missions context (e.g. scientific missions and user community)