

Master System Design

TVUK System Team

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Design Document

Master System Design for the Common Architecture

COMMENTS and ISSUES

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1. Introduction

1.1. Purpose and Scope

This document presents the Master System Design for the Common Architecture.

1.2. Structure of the Document

TBD

1.3. Reference Documents

The following is a list of Reference Documents with a direct bearing on the content of this document.

[EOEPCA-UC]

EOEPCA - Use Case Analysis, EOEPCA.TN.005 (<https://eopca.github.io/use-case-analysis>), Issue TBD, dd/mm/yyyy

[EP-FM]

Exploitation Platform - Functional Model, ESA-EOPSDP-TN-17-050, Issue 1.0, 30/11/2017

1.4. Terminology

The following terms are used in the Master System Design.

Term	Meaning
Platform (EP)	An on-line collection of products, services and tools for exploitation of EO data
User	An individual using the EP, of any type (Admin/Consumer/Expert/Guest)
Admin	User with administrative capability on the EP
Consumer	User accessing existing services/products within the EP. Consumers may be scientific/research or commercial, and may or may not be experts of the domain
Expert	User developing and integrating added-value to the EP (Scientific Researcher or Service Developer)
Scientific Researcher	Expert user with the objective to perform scientific research. Having minimal IT knowledge with no desire to acquire it, they want the effort for the translation of their algorithm into a service/product to be minimised by the platform.
Service Developer	Expert user with the objective to provide a performing, stable and reliable service/product. Having deeper IT knowledge or a willingness to acquire it, they require deeper access to the platform IT functionalities for optimisation of their algorithm.

Term	Meaning
Guest	An unregistered User or an unauthenticated Consumer with limited access to the EP's services
Discovery	User finds products/services of interest to them based upon search criteria.
Products	EO data (commercial and non-commercial) and Value-added products and made available through the EP. <i>It is assumed that the Hosting Environment for the EP makes available an existing supply of EO Data</i>
Value-added products	Products generated from processing services of the EP (or external processing) and made available through the EP. This includes products uploaded to the EP by users and published for collaborative consumption
Processing Service	A non-interactive data processing that has a well-defined set of input data types, input parameterisation, producing <i>Processing Results</i> with a well-defined output data type.
On-demand Processing Service	A <i>Processing Service</i> whose execution is initiated directly by the user on an ad-hoc basis.
Systematic Processing Service	A <i>Processing Service</i> whose execution is initiated automatically (on behalf of a user), either according to a schedule (routine) or triggered by an event (e.g. arrival of new data).
Bulk Processing	Execution of a <i>Processing Service</i> on large amounts of data specified by AOI and TOI.
Processing Result	The <i>Products</i> produced as output of a <i>Processing Service</i> execution.
Reusable Research Object	An encapsulation of some research/analysis that describes all aspects required to reproduce the analysis, including data used, processing performed etc.
Interactive Application	A stand-alone application provided within the exploitation platform for on-line hosted processing. Provides an interactive interface through which the user is able to conduct their analysis of the data, producing <i>Analysis Results</i> as output. Interactive Applications include at least the following types: console application, web application (rich browser interface), remote desktop to a hosted VM.
Interactive Console Application	A simple <i>Interactive Application</i> for analysis in which a console interface to a platform-hosted terminal is provided to the user. The console interface can be provided through the user's browser session or through a remote SSH connection.
Interactive Web Application	An Interactive Application for analysis provided as a rich user interface through the user's web browser.
Interactive Remote Desktop	An Interactive Application for analysis provided as a remote desktop session to an OS-session (or directly to a 'native' application) on the exploitation platform. The user will have access to a number of applications within the hosted OS. The remote desktop session is provided through the user's web browser.
External Application	An application or script that is developed and executed outside of the Exploitation Platform, but is able to use the data/services of the EP via a programmatic interface (API).

Term	Meaning
Analysis Result	The <i>Products</i> produced as output of an <i>Interactive Application</i> analysis session.
Execution	The act to start a <i>Processing Service</i> or an <i>Interactive Application</i> .
Visualisation	To obtain a visual representation of any data/products held within the platform - presented to the user within their web browser session.
Processing	A set of pre-defined activities that interact to achieve a result. For the exploitation platform, comprises on-line processing to derive data products from input data, conducted by a hosted processing service execution.
Algorithm	A self-contained set of operations to be performed, typically to achieve a desired data manipulation. The algorithm must be implemented (codified) for deployment and execution on the platform.
Code	The codification of an algorithm performed with a given programming language - compiled to Software or directly executed (interpreted) within the platform.
Software	The compilation of code into a binary program to be executed within the platform on-line computing environment.
Analytics	A set of activities aimed to discover, interpret and communicate meaningful patterns within the data. Analytics considered here are performed manually (or in a semi-automatic way) on-line with the aid of <i>Interactive Applications</i> .
Development	The act of building new products/services/applications to be exposed within the platform and made available for users to conduct exploitation activities. Development may be performed inside or outside of the platform. If performed outside, an integration activity will be required to accommodate the developed service so that it is exposed within the platform.
Workspace	A user-scoped 'container' in the EP, in which each user maintains their own links to resources (products and services) that have been collected by a user during their usage of the EP. The workspace acts as the hub for a user's exploitation activities within the EP
Terms & Conditions (T&Cs)	The obligations that the user agrees to abide by in regard of usage of products/services of the platform. T&Cs are set by the provider of each product/service.

1.5. Glossary

The following acronyms and abbreviations have been used in this report.

Term	Definition
AOI	Area of Interest
API	Application Programming Interface
EO	Earth Observation
EP	Exploitation Platform

Term	Definition
SSH	Secure Shell
TOI	Time of Interest
VNC	Virtual Network Computing