Data Access Interface Control Document

EOEPCA.SDD.xxx

TVUK System Team

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Data Access Interface Control Document

EO Exploitation Platform Common Architecture
Data Access Interface Control Document
EOEPCA.SDD.xxx

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AMENDMENT HISTORY

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

Table 1. Amendment Record Sheet

ISSUE	DATE	REASON
0.1	dd/mm/yyyy	Initial in-progress draft

Chapter 1. Introduction

1.1. Purpose and Scope

This document presents the Data Access Interfaces for the Common Architecture.

1.2. Structure of the Document

Section 2 - Overview

Provides an over of the Data Access component, within the context of the wider Common Architecture design.

Section 3 - [mainDesign]

Provides the design of the Data Access component.

1.3. Reference Documents

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

Reference	Document Details	Version
[EOEPCA-UC]	EOEPCA - Use Case Analysis EOEPCA.TN.005 https://eoepca.github.io/use-case-analysis	Issue 1.0, 02/08/2019
[EP-FM]	Exploitation Platform - Functional Model, ESA-EOPSDP-TN-17-050	Issue 1.0, 30/11/2017
[TEP-OA]	Thematic Exploitation Platform Open Architecture, EMSS-EOPS-TN-17-002	Issue 1, 12/12/2017
[WPS-T]	OGC Testbed-14: WPS-T Engineering Report, OGC 18-036r1, http://docs.opengeospatial.org/per/18-036r1.html	18-036r1, 07/02/2019
[WPS-REST-JSON]	OGC WPS 2.0 REST/JSON Binding Extension, Draft, OGC 18-062, https://raw.githubusercontent.com/opengeospatial/wps-rest-binding/develop/docs/18-062.pdf	1.0-draft
[CWL]	Common Workflow Language Specifications, https://www.commonwl.org/v1.0/	v1.0.2
[TB13-AP]	OGC Testbed-13, EP Application Package Engineering Report, OGC 17-023, http://docs.opengeospatial.org/per/17-023.html	17-023, 30/01/2018

Reference	Document Details	Version
[TB13-ADES]	OGC Testbed-13, Application Deployment and Execution Service Engineering Report, OGC 17-024, http://docs.opengeospatial.org/per/17-024.html	17-024, 11/01/2018
[TB14-AP]	OGC Testbed-14, Application Package Engineering Report, OGC 18-049r1, http://docs.opengeospatial.org/per/18-049r1.html	18-049r1, 07/02/2019
[TB14-ADES]	OGC Testbed-14, ADES & EMS Results and Best Practices Engineering Report, OGC 18-050r1, http://docs.opengeospatial.org/per/18-050r1.html	18-050r1, 08/02/2019
[OS-GEO-TIME]	OpenSearch GEO: OpenSearch Geo and Time Extensions, OGC 10-032r8, http://www.opengeospatial.org/standards/opensearchgeo	10-032r8, 14/04/2014
[OS-EO]	OpenSearch EO: OGC OpenSearch Extension for Earth Observation, OGC 13-026r9, http://docs.opengeospatial.org/is/13-026r8/13-026r8.html	13-026r9, 16/12/2016
[GEOJSON-LD]	OGC EO Dataset Metadata GeoJSON(-LD) Encoding Standard, OGC 17-003r1/17-084	17-003r1/17-084
[GEOJSON-LD-RESP]	OGC OpenSearch-EO GeoJSON(-LD) Response Encoding Standard, OGC 17-047	17-047
[PCI-DSS]	The Payment Card Industry Data Security Standard, https://www.pcisecuritystandards.org/document_library?category=pcidss&document=pci_dss	v3.2.1
[CEOS-OS-BP]	CEOS OpenSearch Best Practise, http://ceos.org/ourwork/workinggroups/wgiss/access/opensearch/	v1.2, 13/06/2017
[OIDC]	OpenID Connect Core 1.0, https://openid.net/specs/openid-connect-core-1_0.html	v1.0, 08/11/2014
[OGC-CSW]	OGC Catalogue Services 3.0 Specification - HTTP Protocol Binding (Catalogue Services for the Web), OGC 12-176r7, http://docs.opengeospatial.org/is/12-176r7/12-176r7.html	v3.0, 10/06/2016
[OGC-WMS]	OGC Web Map Server Implementation Specification, OGC 06-042, http://portal.opengeospatial.org/files/?artifact_id=14416	v1.3.0, 05/03/2006
[OGC-WMTS]	OGC Web Map Tile Service Implementation Standard, OGC 07-057r7, http://portal.opengeospatial.org/files/?artifact_id=35326	v1.0.0, 06/04/2010

Reference	Document Details	Version
[OGC-WFS]	OGC Web Feature Service 2.0 Interface Standard – With Corrigendum, OGC 09-025r2, http://docs.opengeospatial.org/is/09-025r2/09-025r2.html	v2.0.2, 10/07/2014
[OGC-WCS]	OGC Web Coverage Service (WCS) 2.1 Interface Standard - Core, OGC 17-089r1, http://docs.opengeospatial.org/is/17-089r1/17-089r1.html	v2.1, 16/08/2018
[OGC-WCPS]	Web Coverage Processing Service (WCPS) Language Interface Standard, OGC 08-068r2, http://portal.opengeospatial.org/files/?artifact_id=32319	v1.0.0, 25/03/2009
[AWS-S3]	Amazon Simple Storage Service REST API, https://docs.aws.amazon.com/AmazonS3/latest/API	API Version 2006-03-01

1.4. Terminology

The following terms are used in the Master System Design.

Term	Meaning
Admin	User with administrative capability on the EP
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.
Analysis Result	The *Products* produced as output of an *Interactive Application* analysis session.
Analytics	A set of activities aimed to discover, interpret and communicate meaningful patters within the data. Analytics considered here are performed manually (or in a semi-automatic way) on-line with the aid of *Interactive Applications*.
Application Artefact	The 'software' component that provides the execution unit of the *Application Package*.
Application Deployment and Execution Service (ADES)	WPS-T (REST/JSON) service that incorporates the Docker execution engine, and is responsible for the execution of the processing service (as a WPS request) within the ‘target’ Exploitation Platform.
Application Descriptor	A file that provides the metadata part of the *Application Package*. Provides all the metadata required to accommodate the processor within the WPS service and make it available for execution.

Term	Meaning
Application Package	A platform independent and self-contained representation of a software item, providing executable, metadata and dependencies such that it can be deployed to and executed within an Exploitation Platform. Comprises the *Application Descriptor* and the *Application Artefact*.
Bulk Processing	Execution of a *Processing Service* on large amounts of data specified by AOI and TOI.
Code	The codification of an algorithm performed with a given programming language - compiled to Software or directly executed (interpretted) within the platform.
Compute Platform	The Platform on which execution occurs (this may differ from the Host or Home platform where federated processing is happening)
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
Data Access Library	An abstraction of the interface to the data layer of the resource tier. The library provides bindings for common languages (including python, Javascript) and presents a common object model to the code.
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.
Discovery	User finds products/services of interest to them based upon search criteria.
Execution	The act to start a *Processing Service* or an *Interactive Application*.
Execution Management Service (EMS)	The EMS is responsible for the orchestration of workflows, including the possibility of steps running on other (remote) platforms, and the on-demand deployment of processors to local/remote ADES as required.
Expert	User developing and integrating added-value to the EP (Scientific Researcher or Service Developer)
Exploitation Tier	The Exploitation Tier represents the end-users who exploit the services of the platform to perform analysis, or using high-level applications built-in on top of the platform's services
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).
Guest	An unregistered User or an unauthenticated Consumer with limited access to the EP's services

Term	Meaning
Home Platform	The Platform on which a User is based or from which an action was initiated by a User
Host Platform	The Platform through which a Resource has been published
Identity Provider (IdP)	The source for validating user identity in a federated identity system, (user authentication as a service).
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 *Analysis Results* 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 *Interactive Application* 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 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.
Interactive Web Application	An Interactive Application for analysis provided as a rich user interface through the user's web browser.
Key-Value Pair	A key-value pair (KVP) is an abstract data type that includes a group of key identifiers and a set of associated values. Key-value pairs are frequently used in lookup tables, hash tables and configuration files.
Kubernetes (K8s)	Container orchestration system for automating application deployment, scaling and management.
Login Service	An encapsulation of Authenticated Login provision within the Exploitation Platform context. The Login Service is an OpenID Connect Provider that is used purely for authentication. It acts as a Relying Party in flows with external IdPs to obtain access to the user's identity.
EO Network of Resources	The coordinated collection of European EO resources (platforms, data sources, etc.).
Object Store	A computer data storage architecture that manages data as objects. Each object typically includes the data itself, a variable amount of metadata, and a globally unique identifier.
On-demand Processing Service	A *Processing Service* whose execution is initiated directly by the user on an ad-hoc basis.
Platform (EP)	An on-line collection of products, services and tools for exploitation of EO data

Term	Meaning
Platform Tier	The Platform Tier represents the Exploitation Platform and the services it offers to end-users
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.
Processing Result	The *Products* produced as output of a *Processing Service* execution.
Processing Service	A non-interactive data processing that has a well-defined set of input data types, input parameterisation, producing *Processing Results* with a well-defined output data type.
Products	EO data (commercial and non-commercial) and Value-added products and made available through the EP. *It is assumed that the Hosting Environment for the EP makes available an existing supply of EO Data*
Resource	A entity, such as a Product, Processing Service or Interactive Application, which is of interest to a user, is indexed in a catalogue and can be returned as a single meaningful search result
Resource Tier	The Resource Tier represents the hosting infrastructure and provides the EO data, storage and compute upon which the exploitation platform is deployed
Reusable Research Object	An encapsulation of some research/analysis that describes all aspects required to reproduce the analysis, including data used, processing performed etc.
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.
Software	The compilation of code into a binary program to be executed within the platform on-line computing environment.
Systematic Processing Service	A *Processing Service* 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).
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.
Transactional Web Processing Service (WPS-T)	Transactional extension to WPS that allows adhoc deployment / undeployment of user-provided processors.

Term	Meaning
User	An individual using the EP, of any type (Admin/Consumer/Expert/Guest)
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
Visualisation	To obtain a visual representation of any data/products held within the platform - presented to the user within their web browser session.
Web Coverage Service (WCS)	OGC standard that provides an open specification for sharing raster datasets on the web.
Web Coverage Processing Service (WCPS)	OGC standard that defines a protocol-independent language for the extraction, processing, and analysis of multi-dimentional coverages representing sensor, image, or statistics data.
Web Feature Service (WFS)	OGC standard that makes geographic feature data (vector geospatial datasets) available on the web.
Web Map Service (WMS)	OGC standard that provides a simple HTTP interface for requesting geo-registered map images from one or more distributed geospatial databases.
Web Map Tile Service (WMTS)	OGC standard that provides a simple HTTP interface for requesting map tiles of spatially referenced data using the images with predefined content, extent, and resolution.
Web Processing Services (WPS)	OGC standard that defines how a client can request the execution of a process, and how the output from the process is handled.
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

1.5. Glossary

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

Term	Definition
AAI	Authentication & Authorization Infrastructure
ABAC	Attribute Based Access Control
ADES	Application Deployment and Execution Service
ALFA	Abbreviated Language For Authorization
AOI	Area of Interest
API	Application Programming Interface
CMS	Content Management System
CWL	Common Workflow Language

Term	Definition
DAL	Data Access Library
EMS	Execution Management Service
EO	Earth Observation
EP	Exploitation Platform
FUSE	Filesystem in Userspace
GeoXACML	Geo-specific extension to the XACML Policy Language
IAM	Identity and Access Management
IdP	Identity Provider
JSON	JavaScript Object Notation
K8s	Kubernetes
KVP	Key-value Pair
M2M	Machine-to-machine
OGC	Open Geospatial Consortium
PDE	Processor Development Environment
PDP	Policy Decision Point
PEP	Policy Enforcement Point
PIP	Policy Information Point
RBAC	Role Based Access Control
REST	Representational State Transfer
SSH	Secure Shell
TOI	Time of Interest
UMA	User-Managed Access
VNC	Virtual Network Computing
WCS	Web Coverage Service
WCPS	Web Coverage Processing Service
WFS	Web Feature Service
WMS	Web Map Service
WMTS	Web Map Tile Service
WPS	Web Processing Service
WPS-T	Transactional Web Processing Service
XACML	eXtensible Access Control Markup Language

Chapter 2. Overview

TBD

Chapter 3. Data Access Interfaces

3.1. Enpoints

3.1.1. Cache

3.1.1.1. GET Capabilities

`GET /cache/ows/wmts/1.0.0/WMTSCapabilities.xml`

3.1.1.1.1. Description

Returns the WMTS capabilities document, detailing all available tilesets, their respective grids and formats.

3.1.1.1.2. Content Type

- text/xml

3.1.1.1.3. Responses

Code	Message	Datatype
200	The WMTS Capabilities Document	text/xml

3.1.1.2. GET Tile

`GET /cache/ows/wmts/1.0.0/{layer}/{style}/{starttime}--{endtime}/{tilematrixset}/{tilematrix}/{tilerow}/{tilecol}.{extension}`

3.1.1.2.1. Description

Returns the specified tile from the given layer in the specified style from the

3.1.1.2.2. Parameters

Path Parameters

Name	Description	Required
layer	The data layer to retrieve tiles from	X
style	The layer rendering style	X
starttime	The start time of the time-dimension to include tiles from	X
endtime	The end time of the time-dimension to include tiles from	X
tilematrixset		X
tilematrix	The used tile matrix set	X

Name	Description	Required
tilematrix	The tile matrix (zoom level) to get the tiles from	X
tilerow	The tiles Y coordinate (row)	X
tilecol	The tiles X coordinate (column)	X
extension	The filename extension. Use `.jpg` to get JPEG encoded images and `.png` for PNG.	X

3.1.1.2.3. Content Type

- image/jpeg
- image/png

3.1.1.2.4. Responses

Code	Message	Datatype
200	The resulting image tile.	image/jpeg / image/png
404	The tile was not found. Returns an empty image.	image/jpeg / image/png
500		

3.1.2. Renderer

3.1.2.1. OpenSearch Description

`GET /opensearch/`

3.1.2.1.1. Description

Returns the root OpenSearch Description document of the Renderer.

3.1.2.1.2. Content Type

- application/opensearchdescription+xml

3.1.2.1.3. Responses

Code	Message	Datatype
200		application/opensearchdescription+xml
404		
500		

3.1.2.2. OpenSearch Collection Search

`GET /opensearch/{format}/`

3.1.2.2.1. Description

Performs a collection search of all collections on the Renderer using the search parameters provided.

3.1.2.2.2. Parameters

Path Parameters

Name	Description	Required
format	The format to encode the search result in. One of `atom`, `rss`, `json`, `kml`, or `html`	X

Query Parameters

3.1.2.2.3. Content Type

- application/atom+xml
- application/rss+xml
- application/vnd.google-earth.kml+xml
- application/vnd.geo+json
- text/html

3.1.2.2.4. Responses

Code	Message	Datatype
200		
404		
500		

3.1.2.3. OpenSearch Collection Description

`GET /opensearch/collections/{collection}`

3.1.2.3.1. Description

Returns the description OpenSearch Description document of the Renderer.

3.1.2.3.2. Parameters

Path Parameters

Name	Description	Required
collection	The collection to generate the description document	X

3.1.2.3.3. Content Type

- application/opensearchdescription+xml

3.1.2.3.4. Responses

Code	Message	Datatype
200		application/opensearchdescription+xml
404		
500		

3.1.2.4. OpenSearch Record Search

`GET /opensearch/collections/{collection}/{format}`

3.1.2.4.1. Description

Returns the root OpenSearch Description document of the Renderer.

3.1.2.4.2. Parameters

Path Parameters

Name	Description	Required
collection	The collection to perform the record search on	X
format	The format to encode the search result in. One of `atom`, `rss`, `json`, `kml`, or `html`	X

Query Parameters

q		
count	The maximum amount of elements to be returned in one single response.	
startIndex	The used start index when used when paging through bigger result sets	
product		
parentIdentifier		
productionStatus	One of `ARCHIVED`, `ACQUIRED`, `CANCELLED`	

acquisitionType	One of `NOMINAL`, `CALIBRATION`, `OTHER`	
orbitNumber		
orbitDirection	One of `ASCENDING`, `DESCENDING`	
track		
frame		
swathIdentifier		
productVersion		
productQualityStatus	One of `NOMINAL`, `DEGRAGED`	
productQualityDegradationTag		
processorName		
processingCenter		
creationDate		
modificationDate		
processingDate		
sensorMode		
archivingCenter		
processingMode		
availabilityTime		
acquisitionStation		
acquisitionSubType		
startTimeFromAscendingNode		
completionTimeFromAscendingNode		
illuminationAzimuthAngle		
illuminationZenithAngle		
illuminationElevationAngle		
polarisationMode	One of `single`, `dual`, `twin`, `quad`, `UNDEFINED`	
polarizationChannels	One of `HV`, `HV, VH`, `VH`, `VV`, `HH, VV`, `HH, VH`, `HH, HV`, `VH, VV`, `VH, HV`, `VV, HV`, `VV, VH`, `HH`, `HH, HV, VH, VV`, `UNDEFINED`	
antennaLookDirection	One of `LEFT`, `RIGHT`	
minimumIncidenceAngle		
maximumIncidenceAngle		
acrossTrackIncidenceAngle		
alongTrackIncidenceAngle		

dopplerFrequency		
incidenceAngleVariation		
cloudCover		
snowCover		
lowestLocation		
highestLocation		
bbox	The 4-tuple of a WGS84 bounding box for geospatial filters.	
geom	A WKT encoded geometry to use in a geospatial filter.	
lon	The longitude of a point/radius search	
lat	The latitude of a point/radius search	
r	The radious for	
georel	One of `intersects`, `contains`, `disjoint`. Defines the behavior of the `geom`, `bbox` and `lon`/`lat`/`r` parameters.	
uid	A specific product ID.	
start	The start date-time for a specified time interval encoded in an ISO8601 datetime string	
end	The end date-time for a specified time interval encoded in an ISO8601 datetime string	
timerel	One of `intersects`, `contains`, `disjoint`, `equals`. Defines the behaviour of the `start` and `end` parameters	
cql	A CQL encoded filter	

3.1.2.4.3. Content Type

- application/atom+xml
- application/rss+xml
- application/vnd.google-earth.kml+xml
- application/vnd.geo+json
- text/html

3.1.2.4.4. Responses

Code	Message	Datatype
200		
404		

Code	Message	Datatype
500		

3.1.2.5. WMS Map Rendering

`GET /ows`

3.1.2.5.1. Description

Renders a map from the specified parameters.

3.1.2.5.2. Parameters

Query Parameters

Name	Description	Required
service	The OWS service to use. Fixed to 'WMS' in this request.	X
version	The OWS service version to use. One of '1.0.0', '1.1.0', or '1.3.0'.	X
request	The OWS request type to use. Fixed to 'GetMap' in this request.	X
layers	The comma-separated list of layers to be rendered. Layers specified later will be drawn over layers set earlier in the list	X
styles	A comma separated list of rendering styles (one for each layer). Can be left empty to use default styles.	X
format	The format to encode the render result in. One of `image/jpeg`, `image/tiff`, or `image/png`.	X
srs or crs	Version 1.3 uses `crs`, whereas other versions use `srs` as the parameter name. Specifies the output projection of the image and how the `bbox` is encoded.	X
bbox	The image bounding box to render the layer from. Expressed in the units of the `crs`/`srs`.	X
width	The width of the resulting image.	X
height	The height of the resulting image.	X
transparent	Whether or not to use transparency for not filled areas. Only usable with formats supporting transparency (e.g PNG). Use `true` to enable, `false` to disable. Default is disabled.	

Name	Description	Required
bgcolor	The background color to use for non-filled areas encoded as a hexadecimally encoded RGB sextuplet: RRGGBB. Default is `FFFFFF` (white)	
time	The time-filter to apply when rendering an image. Use two ISO8601 encoded datetime strings, separated with a '/' to denote the start and the end time bounds.	X

3.1.2.5.3. Content Type

- image/png
- image/jpeg
- image/tiff

3.1.2.5.4. Responses

Code	Message	Datatype
200	The rendered map image	image/png / image/jpeg / image/tiff
400	Wrong parameter values.	
500		

3.1.2.6. WCS Coverage Description

`GET /ows`

3.1.2.6.1. Description

Returns the coverage description of a specified coverage.

3.1.2.6.2. Parameters

Query Parameters

Name	Description	Required
service	The OWS service to use. Fixed to 'WCS' in this request.	X
version	The OWS service version to use. One of '2.0.0' or '2.1.0'.	X
request	The OWS request type to use. Fixed to 'DescribeCoverage' in this request.	X
coverageId	The coverage to get the description for.	X

3.1.2.6.3. Content Type

- application/xml

3.1.2.6.4. Responses

Code	Message	Datatype
200	The coverage description	application/xml
400	Wrong parameter values.	
500		

3.1.2.7. WCS EO Coverage Set Description

`GET /ows`

3.1.2.7.1. Description

Returns the coverage description of a specified coverage.

3.1.2.7.2. Parameters

Query Parameters

Name	Description	Required
service	The OWS service to use. Fixed to 'WCS' in this request.	X
version	The OWS service version to use. One of '2.0.0' or '2.1.0'.	X
request	The OWS request type to use. Fixed to 'DescribeEOCoverageSet' in this request.	X
eoId	The dataset series identifier or coverage identifier to explore.	X
eoId	The dataset series identifier or coverage identifier to explore.	X
subset	The spatial and/or temporal subset in the form: `<axis>(<low>,<high>)` to limit the search.	
containment	Whether the subsets shall be applied as intersections or overlaps. Values are one of `overlaps`, or `contains`.	
count	Limit the maximum number of returned records to this amount.	

3.1.2.7.3. Content Type

- application/xml

3.1.2.7.4. Responses

Code	Message	Datatype
200	The EO coverage set description	application/xml
400	Wrong parameter values.	
500		

3.1.2.8. WCS Coverage Rendering

`GET /ows`

3.1.2.8.1. Description

Renders the specified coverage according to the parameters

3.1.2.8.2. Parameters

Query Parameters

Name	Description	Required
service	The OWS service to use. Fixed to 'WCS' in this request.	X
version	The OWS service version to use. One of '2.0.0' or '2.1.0'.	X
request	The OWS request type to use. Fixed to 'GetCoverage' in this request.	X
coverageId	The input coverage to use	X
format	The format to encode the rendered coverage in. One of `image/tiff`, `image/tiff`, or `image/png`.	X
mediatype		
subset	Specifying a dimension-trim or -slice along a given axis. Must be in the form of either `<axis>(<low>,<high>)` for trims or `<axis>(<value>)` for slices. Can be specified multiple times, each for a separate axis.	
subsettingCrs	The coordinate reference system the subsets are expressed in. Also defines the output CRS when not explicitly overridden.	
outputCrs	The output coordinate reference system to use. If necessary, the output coverage will be transformed to that CRS.	

Name	Description	Required
scaleFactor	Specifies a scale factor to be applied on all axes. The size of each axis will be increased (or decreased) by that factor.	
scaleAxes	A comma-separated list of items in the form: `<axis>(<scaleFactor>)` to define an axis specific scale factor.	
scaleSize	A comma-separated list of items in the form: `<axis>(<size>)` to define the output size for a specific axis.	
scaleExtent		
interpolation	Define the interpolation method when reprojecting or scaling data. One of http://www.opengis.net/def/interpolation/OGC/1/nearest-neighbour (default), http://www.opengis.net/def/interpolation/OGC/1/average, or http://www.opengis.net/def/interpolation/OGC/1/bilinear	
geotiff:compression	Define the internal compression method when output format `image/tiff` is chosen. One of: None, PackBits, Huffman, LZW, JPEG, or Deflate.	
geotiff:jpeg_quality	Define the compression quality when JPEG compression is defined.	
geotiff:predictor	Define the used compression predictor method for LZW or Deflate compression methods. One of: None, Horizontal, or FloatingPoint	
geotiff:interleave	Specify whether the internal sample planes of TIFF results shall be pixel or band interleaved. Value must be one of Pixel, or Band.	
geotiff:tiling	Defines whether or not the resulting TIFF file shall be internally tiled or stripped. Values must either be `true` or `false`.	
geotiff:tilewidth	Specifies the width of each internal tile when `image/tiff` format is used.	
geotiff:tileheight	Specifies the height of each internal tile when `image/tiff` format is used.	

3.1.2.8.3. Content Type

- image/png
- image/jpeg
- image/tiff

3.1.2.8.4. Responses

Code	Message	Datatype
200	The rendered map image	image/png / image/jpeg / image/tiff
400	Wrong parameter values.	
500		

<< End of Document >>