RODEO EDR Profile

The provision of Open Access to Public meteorological Data and Development of Shared federated Data Infrastructure for the Development of information Products and Services

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RODEO project partners[1]

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i. Abstract

The Open Geospatial Consortium (OGC) Environmental Data Retrieval (EDR) API provides a family of lightweight interfaces to access Environmental Data resources. Each resource addressed by an EDR API maps to a defined query pattern. OGC API - EDR identifies resources, captures compliance classes, and specifies requirements which are applicable to OGC Environmental Data Retrieval API's. The specification addresses two fundamental operations; discovery and query. Discovery operations allow the API to be interrogated to determine its capabilities and retrieve information (metadata) about this distribution of a resource. This includes the API definition of the server as well as metadata about the Environmental Data resources provided by the server. Query operations allow Environmental Data resources to be retrieved from the underlying data store based upon simple selection criteria, defined by this standard and selected by the client.

The flexibility of EDR allows for implementation in various environmental domains and communities of practice.

This document defines an EDR profile in support of providing access to meteorological datasets in the RODEO project. This includes, but is not limited to, conventions and constraints on identifiers, metadata parameters and encodings/formats and their related definitions and extensions.

ii. Keywords

The following are keywords to be used by search engines and document catalogues.

rodeo, eumetnet, ogc, api, edr, weather, meteorology, high value datasets

iii. Security Considerations

No additional security considerations have been made for this standard.

iii. Submitters

All questions regarding this submission should be directed to the editor or the submitters:

Name	Affiliation
Håvard Futsæter (editor)	MET Norway
Tom Kralidis (editor)	Meteorological Service of Canada

Chapter 1. Scope

This document defines the conventions, constraints and extensions of EDR in the context of the RODEO project.

The RODEO EDR Profile defined herein is an extension of the International Standard *OGC API - Environmental Data Retrieval - Part 1: Core*.

This specification defines the conformance requirements for the RODEO EDR Profile. Annex A defines the abstract test suite. Annex B provides normative information on schemas. Annex C provides informative examples.

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[1] https://rodeo-project.eu/partners/#project-partners

Chapter 2. Conformance

Conformance with this standard shall be checked using the tests specified in Annex A (normative) of this document.

OGC API - Environmental Data Retrieval (EDR) provides a family of lightweight interfaces to access Environmental Data resources. Each resource addressed by an EDR API maps to a defined query pattern. This standard is a profile/extension of EDR. Conformance to this standard requires demonstrated conformance to the applicable Conformance Classes of *OGC API - Environmental Data Retrieval - Part 1: Core.*

Implementors of EDR API within the RODEO project are required to comply with the RODEO EDR Profile. A RODEO EDR API shall therefore be compliant with OGC API - Environmental Data Retrieval - Part 1: Core.

This standard identifies the following Requirements Classes which define the functional requirements.

- "Core": baseline requirements class required by all other requirements classes in this document
- "Observations": TBD
- "Radar": TBD

Compliant implementation of this profile requires conformance to at least the "Core" Requirements Class.

Chapter 3. References

- OGC: OGC 19-086r6, OGC API - Environmental Data Retrieval Standard - Part 1: Core (2023) [1]

- OGC: OGC 21-069r2, OGC CoverageJSON Community Standard (2023) [2]

- IETF: RFC-7946 The GeoJSON Format (2016) [3]

- IETF: RFC-8259 The JavaScript Object Notation (JSON) Data Interchange Format (2017) [4]

- W3C/OGC: Spatial Data on the Web Best Practices, W3C Working Group Note (2017) [5]

- W3C: Data on the Web Best Practices, W3C Recommendation (2017) [6]

- IANA: Link Relation Types (2020) [7]

- IANA: Media Types (2023) [8]

- IETF: JSON Schema (2022) [9]

- OpenAPI Specification 3.1.0 (2022) [10]

[1] https://docs.ogc.org/is/19-086r6/19-086r6.html

[2] https://docs.ogc.org/cs/21-069r2/21-069r2.html

[3] https://datatracker.ietf.org/doc/html/rfc7946

[4] https://datatracker.ietf.org/doc/html/rfc8259

[5] https://www.w3.org/TR/sdw-bp

[6] https://www.w3.org/TR/dwbp

[7] https://www.iana.org/assignments/link-relations/link-relations.xml

[8] https://www.iana.org/assignments/media-types/media-types.xhtml

[9] https://json-schema.org

[10] https://github.com/OAI/OpenAPI-Specification/blob/3.1.0/versions/3.1.0.md

Chapter 4. Terms and definitions

This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word "SHALL" (not "must") is the verb form used to indicate a requirement to be strictly followed to conform to this Standard and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the 'ModSpec'. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

The following additional terms and definitions also apply.

4.1. Abbreviated terms

Table 1. Symbols and abbreviated terms

Abbreviation	Term
API	Application Programming Interface
EU	European Union
EUMETNET	European National Meteorological and Hydrological Services
FAIR	Findable, Accessible, Interoperable, Reusable
FEMDI	Federated European Meteo-hydrological Data Infrastructure
GIS	Geographic Information System
HVD	High Value Datasets
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force
ISO	International Organization for Standardization
JSON	JavaScript Object Notation
MIME	Multipurpose Internet Mail Extensions
NMHS	National Meteorological and Hydrological Service
NWP	Numerical Weather Prediction
OGC	Open Geospatial Consortium

Abbreviation	Term
REST	Representational State Transfer
ROA	Resource-oriented architecture
RODEO	The provision of open access to public meteorological data and development of shared federated data infrastructure for the development of information products and services
S3	Simple Storage Service
SEO	Search engine optimization
SOA	Service-oriented architecture
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
W3C	World Wide Web Consortium
XML	eXtensible Markup Language

Chapter 5. Conventions

This section provides details and examples for any conventions used in the document. Examples of conventions are symbols, abbreviations, use of JSON and / or JSON schema, or special notes regarding how to read the document.

5.1. Identifiers

The normative provisions in this Standard are denoted by the URI:

https://rodeo-project.eu/spec/rodeo-edr-profile/1

All requirements and conformance tests that appear in this document are denoted by partial URIs which are relative to this base.

5.2. Examples

Examples provided in this specification are encoded as JSON, GeoJSON or CoverageJSON.

5.3. Schema representation

JSON Schema [1] objects are used throughout this standard to define the structure of metadata records. These schema objects are also typically represented using YAML [2]. YAML is a superset of JSON, and in this standard are regarded as equivalent.

5.4. Use of HTTPS

For simplicity, this document only refers to the HTTP protocol. This is not meant to exclude the use of HTTPS and simply is a shorthand notation for "HTTP or HTTPS." In fact, most servers are expected to use HTTPS, not HTTP.

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[1] https://json-schema.org
[2] https://en.wikipedia.org/wiki/YAML

Chapter 6. Introduction

RODEO, the Provision of Open Access to Public Meteorological Data and Development of Shared Federated Data Infrastructure for the Development of Information Products and Services, is a joint effort by eleven European National Meteorological and Hydrological Services (NMHS), the European Centre for Medium-Range Weather Forecasts (ECMWF) and the network of 31 European National Meteorological and Hydrological Services (EUMETNET). The Project Partners are listed in the page Partners [1].

The RODEO project develops a user interface and Application Programming Interfaces (API) for accessing meteorological datasets declared as High Value Datasets (HVD) by the EU Implementing Regulation (EU) 2023/138 under the EU Open Data Directive (EU) 2019/1024. The project also fosters the engagement between data providers and data users for enhancing the understanding of technical solutions being available for sharing and accessing the HVD datasets.

Surface weather observations, climate data, weather warnings, radar data and numerical weather prediction (NWP) data are defined as meteorological high value datasets. The distribution of these datasets is going to be made available under an open licence, in machine-readable formats using APIs and bulk downloads following the FAIR principles (usability, accessibility, interoperability and reusability).

The project is funded by the EU Digital Europe Program (DIGITAL) and EUMETNET.

6.1. Project Aims & Goals

The project makes meteorological High Value Datasets easily available with an aim to bring new data to businesses, public administrations and citizens. It reinforces the European public meteorological data infrastructure and enhances the providers' digital capacity to share data. Furthermore, the project also fosters the engagement between data providers and data users for enhancing the understanding of technical solutions to be available for sharing and accessing the datasets.

The project strengthens the capacity of the European meteorological data providers to comply with the HVD Implementing Regulation by:

- Developing a user interface
- Developing APIs for accessing weather observation data, climate data, weather radar data, warnings, and Artificial Intelligence (AI) datasets
- Developing a data catalogue for making data discoverable
- Engaging with the data owners and user communities
- Supporting the deployment of national data portals and APIs
- Making HVDs available from the project partners

6.2. Impact on users

The increased availability of data boosts entrepreneurship and potentially results in the creation of new companies. New open datasets are an important resource for small and medium-sized enterprises to develop new digital products and services. Reuse of data opens business opportunities for several sectors ultimately leads attracting more investors. By making data much easier to use, reseach, academia, AI applications and many other application areas can utilize the data more efficiently.

Overall, better data availability leads to better warnings, forecasts, and services to the public and weather-critical industries, and contributes to the safe and efficient functioning of society with multiple benefits across the European economy, industry, and society.

[1] https://eurodeo.github.io/partners

Chapter 7. Core

7.1. Requirements Class "Core"

URI	https://rodeo-project.eu/spec/rodeo-edr-profile/1/req/core
Target type	Web API
Dependency	OGC API - Environmental Data Retrieval Standard - Part 1: Core (2023) [1]
Pre-conditions	The API conforms to OGC API - Environmental Data Retrieval - Part 1: Core, Requirements Class: Core and Requirements Class: Collections

7.2. OpenAPI

An OpenAPI specification provides a machine-readable description of the API interface

Requirement 1	/req/core/openapi
A	An API definition SHALL be described using an OpenAPI document (version 3.1 or higher).
B	The OpenAPI document SHALL be encoded as JSON.
C	The OpenAPI document SHALL be made available in the API Landing Page as a link object with a relation type of `service-desc`.
D	API documentation SHALL be made available in the API Landing Page as a link object with a relation type of `service-doc` and content type of `text/html`.

7.3. Collection identifier

A collection identifier provides a mechanism to uniquely identify a given collection in an OGC API.

Requirement 2	/req/core/collection_identifier
A	A collection identifier SHALL be formatted in the following notation: TBD.

7.4. Collection title

A collection title provides a human readable short description of the given collection.

Requirement 3	/req/core/collection_title
A	A title SHALL be set for all collections.
B	A title SHALL NOT have more than 50 characters.
C	A title SHOULD be written in English.

D	A title SHOULD have the most important information first, guarding against truncated presentation of the value.	
E	A title SHOULD describe the collection in a way understandable also for non-experts. Usually mention both topic/domain and geographical area.	

[1] https://docs.ogc.org/is/19-086r6/19-086r6.html

Annex A: Conformance Class Abstract Test Suite (Normative)

A.1. Conformance Class: Core

label

https://rodeo-project.eu/spec/rodeo-edr-profile/1/conf/core

subject

Requirements Class "core"

classification

Target Type:Web API

A.1.1. OpenAPI

label

/conf/core/openapi

subject

/req/core/openapi

test-purpose

Validate that a RODEO EDR Profile provides an API definition using an OpenAPI document

Construct a path for a landing page.

Issue an HTTP GET request on that path.

Check that the value of the returned HTTP status header is 200.

In the `links` array in the landing page response, find the object with `rel` set to `service-desc` and `type` set to `application/vnd.oai.openapi+json;version=3.1`.

Issue an HTTP GET request using the value of `href` for that object.

Check that the value of the returned HTTP status header is 200 and check that the response body is a valid OpenAPI document of version 3.1 or higher.

In the `links` array in the landing page response, find the object with `rel` set to `service-doc`.

Issue an HTTP GET request using the value of `href` for that object.

Check that the value of the returned HTTP status header is 200 and that the HTTP response header `Content-Type` contains `text/html`.

A.1.2. Collection identifier

label
  /conf/core/collection_identifier

subject
  /req/core/collection_identifier

test-purpose
  Validate that a RODEO EDR Profile provides a valid collection identifier

Construct a path for a landing page.

Issue an HTTP GET request on that path.

Check that the value of the returned HTTP status header is 200.

In the `links` array, find the collections link identified with `rel=data`.

Issue an HTTP GET request on that link.

Check that the value of the returned HTTP status header is 200.

In the `collections` array, check each collection object's `id` property is valid to notation TBD.

A.1.3. Collection title

label
  /conf/core/collection_title

subject
  /req/core/collection_title

test-purpose
  Validate that a RODEO EDR Profile provides a valid collection title

Issue an HTTP GET request to path `/collections`.

Check that the value of the returned HTTP status header is 200.

In the `collections` array, check that the `title` property is present for all array elements.

For each `title` value, check that the value is less than or equal to 50 characters.

Annex B: Schemas (Normative)

Annex C: Examples (Informative)

C.1. Examples

Annex D: Bibliography

- W3C/OGC: Spatial Data on the Web Best Practices, W3C Working Group Note 28 September 2017, https://www.w3.org/TR/sdw-bp

- W3C: Data on the Web Best Practices, W3C Recommendation 31 January 2017, https://www.w3.org/TR/dwbp

- W3C: Data Catalog Vocabulary, W3C Recommendation 16 January 2014, https://www.w3.org/TR/vocab-dcat

- IANA: Link Relation Types, https://www.iana.org/assignments/link-relations/link-relations.xml

- Linux Foundation: SPDX License List, https://spdx.org/licenses

Annex E: Revision History

Date	Release	Editor	Primary clauses modified	Description
2024-09-16	Template	Tom Kralidis	all	initial template