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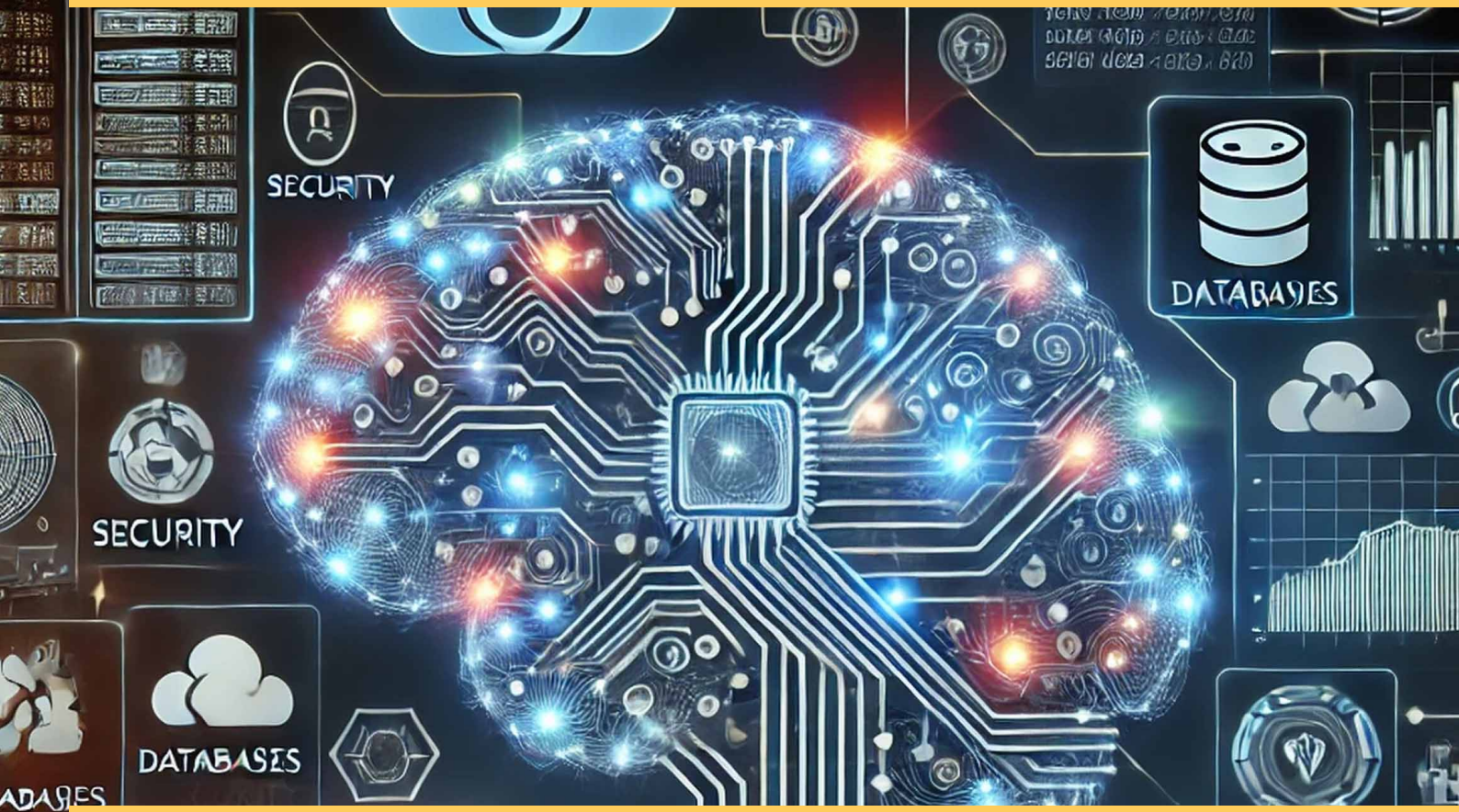

RAPPORTI TECNICI INGV

INGV EIDA-ITALIAN-NODE
Data Management Plan

ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

492

REGISTRAZIONE AL TRIBUNALE DI ROMA N.174 | 2014, 23 LUGLIO

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INGV EIDA-ITALIAN-NODE Data Management Plan

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**Corresponding author*

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Cover Representation of Data Management with a futuristic and technological aesthetic. Graphic processing by © M. Fares with OpenAI-ChatGPT 4.0 | *In copertina Rappresentazione del Data Management con un'estetica futuristica e tecnologica. Elaborazione grafica di © M. Fares con OpenAI-ChatGPT 4.0*

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Abstract

This document outlines the comprehensive framework for managing seismic data at the INGV-EIDA-NODE, adhering to the INGV (Istituto Nazionale di Geofisica e Vulcanologia) Data Policy and incorporating international standards and guidelines to support FAIR data principles. As the Italian node of the European Integrated Data Archive (EIDA), managed under the EPOS ERIC (European Plate Observing System) framework by ORFEUS (Observatories & Research Facilities for European Seismology), INGV collects and archives seismic data from networks across Italy and the Mediterranean region. The document details the entire data lifecycle, from acquisition and curation to long-term preservation and dissemination, highlighting processes such as policy enforcement, quality control, metadata generation, and the assignment of persistent identifiers. It also emphasizes preservation strategies, including archiving and remote replication, and data sharing via web services and computational archives. By integrating robust management policies and resources, this framework ensures the effective handling, accessibility, and reuse of seismic data.

Keywords Data Management; Data Quality; Persistent Identifier; Rich Metadata

Introduction

This document adheres to the INGV Data Policy guidelines [Puglisi et al., 2018], integrating additional recommendations from various sources, including the CoreTrustSeal Trustworthy Data Repositories Requirements: Extended Guidance, the Practical Guide to the International Alignment of Research Data Management, and the Italian guidelines available at https://docs.italia.it/italia/icdp/icdp-pnd-dmp-docs. Together, these resources aim to provide comprehensive guidance for understanding, managing, and ensuring the FAIR classification of the reference archive.

INGV (Istituto Nazionale di Geofisica e Vulcanologia) operates as the Italian node manager for the European Integrated Data Archive (EIDA). This distributed archive of seismic data is coordinated by ORFEUS (Observatories & Research Facilities for European Seismology), a non-profit foundation based in the Netherlands that oversees seismic data infrastructures within the EPOS ERIC (European Plate Observing System). The INGV-EIDA-NODE primarily collects data from seismic networks covering Italy and the Mediterranean region, managed by various organizations referred to as data providers. The processes involved in integrating station data into the archive and distributing it to users are outlined in this document.

The primary objective of this document is to describe the data types, metadata, processes, and management policies underpinning the entire lifecycle of seismic data. This includes its acquisition, long-term preservation, curation, metadata generation, and distribution to users. To achieve this, the document is structured into sections focusing on data description and collection, data documentation and quality, archiving and backup, legal and ethical requirements, data dissemination and preservation, and the responsibilities and resources necessary for effective data management.

The data life cycle at the INGV-EIDA-NODE (Figure 1) begins with its initial generation, where the seismic station acts as the sole data source, internally referred to as the “data-source.” Through various stages of this cycle, the data is prepared for archiving, dissemination, and reuse. The process includes station management and data acquisition, followed by curation activities

such as policy application, quality control, waveform cataloging, persistent identifier assignment, and provenance tracking. Preservation measures involve archiving, utilizing tape units, and ensuring remote replication. Finally, dissemination is achieved through web services, persistent identifier resolvers, and computational archives. Each of these phases is discussed in detail within the document.

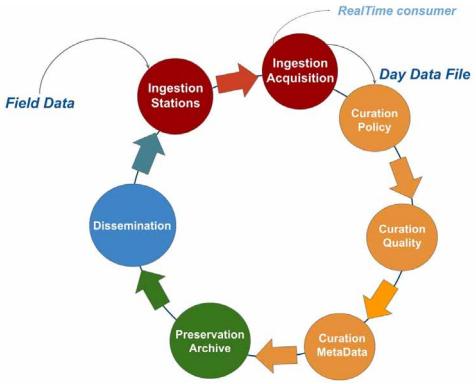

Figure 1 Data life cycle starts from initial generation: the station, hence via the ingestion procedure, goes to the curation phase, then will go into long-term-preservation phase; then data will be ready to be disseminated and reused.

1. Data Description and Collection

The type of data handled by the INGV-EIDA-NODE is seismological data, resulting from the conversion of ground movement recorded by sensors distributed across the national territory into a sequence of physical values. After digitization, this data is collected into data packets within a memory buffer at the station and subsequently transferred telematically (e.g., via the internet or satellite antennas) to the data center. The first key component in this data generation process is the seismic station. This requires precise management of the station's status (new, in testing, in production, maintenance) and the metadata characterizing the stations as the starting point of our data, ensuring a sufficient quality level in data production.

The station management model is based on a tight coupling between a user request and reporting manager ("ticket system") and the seismic data acquisition systems, which are then analyzed and archived (Figure 2). This minimizes human intervention in internal management ("back office"), aiming to expedite and extend the temporal management (24/7) of station insertion and modification within the inventory ("station inventory").

Tuleado is the name of the internally developed software that automates the management and evolution of requests and reports. This software was designed and created in-house based on Business Automation concepts. Tuleado was developed cooperatively, and its source code is available on the open-source platform GitLab for internal use[1].

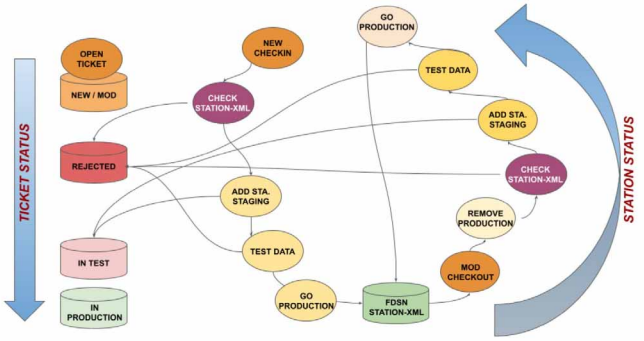

Figure 2 Station management model based on coupling between ticket system and acquisition system give the capabilities to trace the status of the station into stations inventory.

[1] https://gitlab.rm.ingv.it/UF3/tuleadogroup/tuleado_framework

Tuleado has a modular structure and leverages existing open-source solutions, particularly a customized implementation of a ticketing system, a Graphical User Interface (GUI) that uses Grafana[2], and other open-source software components.
Each request opened in *Tuleado* is associated with a station's progress status within the ticketing management system. This status guides the station management process through all data center systems, from data acquisition at the station to its distribution to external users. All these steps are managed through Tuleado, which can follow the criteria governing various actions within the data center, performing appropriate automatic and manual checks, and ultimately allowing fundamental actions such as adding (modifying, maintaining, etc.) a seismic station in the acquisition system.
Once the station is present in the system, the waveform acquisition process is executed by the SeisComP[3] software, which, using the seedlink[4] data transfer protocol, establishes the client-server connection between the station and the data center and stores the data streams from each station or data provider in miniseed files[5]. At the end of the day, these files undergo the completion process.
After acquisition with the aid of SeisComP, the data files enter the "completion" process (Figure 3), which involves integrating, where possible, data from the stations requested directly from them to fill in data gaps that may be present due to connection issues. This step is carried out through synchronization operations based on standard Linux software (rsync; qmerge; copy). It is important to note that the completion operation does not alter the data from the stations; it merely attempts to fill in missing data due to transmission-reception issues.

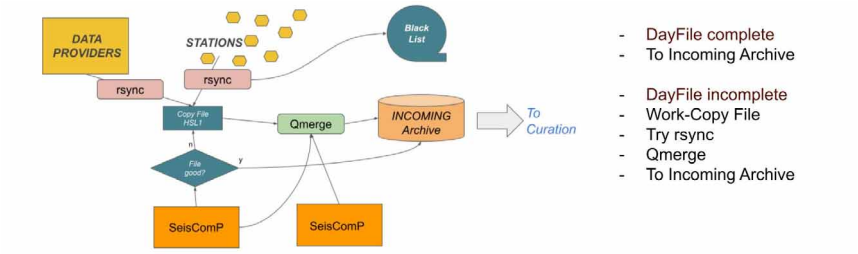

Figure 3 After acquisition, data files go to a completion process. This step is done via some simple operations on the data file and following the relevant policy.

1.1 Data Encoding Formats

The data is archived at the EIDA node in the form of files using various encoding formats[6] listed below:

- **SEED** The Standard for the Exchange of Earthquake Data (SEED) is a data format primarily intended for the storage and exchange of seismological time series data and associated metadata. SEED is designed for archiving rather than processing, so most use cases should employ a different format such as SAC.
- **MiniSEED** MiniSEED is a reduced version of SEED containing only waveform data. Station and channel metadata are not included.

[2] https://grafana.com/oss/grafana/
[3] https://github.com/SeisComP
[4] http://ds.iris.edu/ds/nodes/dmc/services/seedlink/
[5] http://docs.fdsn.org/projects/miniseed3/en/latest/
[6] https://ds.iris.edu/ds/nodes/dmc/data/formats/

- **Dataless SEED** A dataless SEED volume is the metadata counterpart to MiniSEED. It contains only station and channel metadata, without time series values.
- **SAC** This format is defined by the SAC software suite, although it is now supported by many other tools. It is widely used and constitutes a good starting point for data processing activities. The SAC data format itself includes only waveform data and is usually accompanied by separate metadata files in Poles and Zeros (SACPZ) format.
- **CSV** A comma-separated values (CSV) file is a delimited text file that uses a comma to separate values. Each line of the file is a data record. Each record consists of one or more fields, separated by commas.

Currently, as of the writing of this document, INGV-EIDA-NODE exclusively handles data files in MiniSEED format. The other formats are for internal use and are not distributed externally.

1.2 Data Collection

The Dataset, which refers to the collected data, consists of seismological waveforms gathered from 1990 to the present by the Italian National Seismic Network and other monitoring networks associated with INGV-EIDA-NODE. As of the writing of this document, the complete Dataset occupies approximately 150 TB, with a daily increase of about 50 GB distributed across around 3,500 files archived on a daily basis.
The archive is structured in SDS (Seiscomp Data Structure[7]) format, which follows this hierarchy:
Directories: → YEAR → NETWORK → STATION → CHANNEL → <datafile>
Example path: **`/2020/IV/ACER/HHN.D/<filename>`**

The data file names also follow a standardized format within the seismological community ("community standard"), defined as:
`<network>.<station>.<location>.<channel>.<type>.<year>.<julian_day>`
Example: **`IV.ACER.00.HHN.D.2020.259`**

2. Data Documentation and Quality

Incoming data is subject to specific policies (Figure 4) that enable automatic quality checks, ensuring that only files passing these tests are included in the production archive (Trusted-Archive). Files that do not pass the tests are discarded and moved to "quarantine" folders, where they are flagged for further manual and/or automatic review.

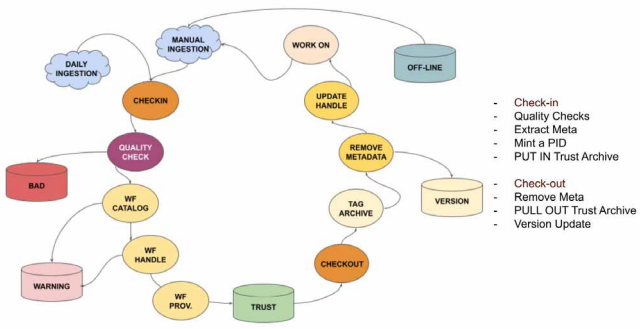

Figure 4 A "Policy Enforcement Point" is deployed in order to execute our policies, expandable as needed, on data files.

[7] https://www.seiscomp.de/seiscomp3/doc/applications/slarchive/SDS.html

2.1 INGV-EIDA-NODE Persistent Identifiers and Metadata Schemas

To manage data in compliance with the FAIR principles (Findable, Accessible, Interoperable, Reusable), the INGV-EIDA-NODE adopts key concepts such as Persistent Identifier (PID), Digital Object (DO), and FAIR Digital Object (FAIR DO).
A PID is a long-lasting reference to a digital object, such as documents, files, or web pages, ensuring unique and persistent identification linked to the metadata or current content. A DO, as defined by Kahn and Wilensky [1995], is a data structure combining digital material with a unique identifier. A FAIR DO is a stable, actionable unit containing sufficient information for the reliable interpretation and processing of the data it encapsulates [De Smedt et al., 2020].
The data management process includes a Policy Enforcement Point (PEP) implemented through an internally developed tool called *RUM*[8]. This tool allows modular, expandable, and configurable checks on files. Once files pass quality checks and community-standard metadata is extracted, they are transformed into Digital Objects (Figure 5).

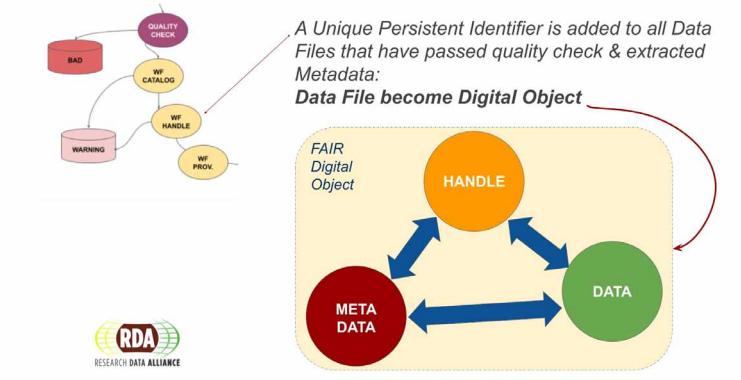

Figure 5 A persistent identifier is minted and coupled with a data-file, in this way we have a digital object retrievable via the pid's resolution.

Metadata Standards

Metadata is encoded following the FDSN (Federation of Digital Seismograph Networks) standard, widely adopted by the seismological community. INGV-EIDA-NODE also employs two additional metadata schemes (WF-Handle and WF-Provenance) developed internally to complement community standards and address specific needs:

- StationXML[9]: An XML schema defining the most commonly used metadata structures for describing digital seismological data. It inherits many features from the SEED 2.4 format.
- WF-Catalog[10]: A service that hosts characteristics of seismological waveform data, supporting queries based on waveform features, sensor geolocation, and temporal specifications.
- WF-Handle[11]: Based on the Dublin Core schema, this metadata set links data to PIDs, allowing broader access by non-seismological communities.
- WF-Provenance[12]: Provides detailed information about the origin and evolution of data, including full version tracking (Versioning) to enhance citation and reproducibility.
- Human-readable documentation: Published on institutional websites (EIDA-ITALIA: eida.ingv.it) and accessible for each Digital Object (DO) via PID resolution with the appropriate tag (&urlappend=document).

[8] https://gitlab.rm.ingv.it/UF3/rum_group/rum_framework
[9] https://www.fdsn.org/xml/station/
[10] https://www.fdsn.org/media/wg/III/2015/3-WGIII-EIDA-QC.pdf
[11] Attachment A
[12] Attachment B

The Importance of the Digital Object

A cornerstone of the INGV-EIDA-NODE approach is transitioning from a system-centric to an information-centric environment. This shift offers several advantages, including abstracting implementation details and providing a uniform interface for information access. Through the assignment of PIDs and the application of the metadata standards described above, data files are transformed into FAIR Digital Objects. This framework ensures effective data management and dissemination, guaranteeing long-term accessibility, traceability, and reuse.

3. Archiving and Backup

A Storage Area Network (SAN) solution is used to archive data in three local copies within the storage itself to ensure sufficient hardware fault tolerance. Original copies are backed up daily in:

- Another storage space (different data center room in Rome).
- Tape units (data center room CED-ONT in Rome).
- Replicated at over 200 km off-site (data center at Osservatorio Vesuviano - NA).

The backup workflow follows the 3-2-1 backup rules coined by Peter Krogh[13]:

- **Have at least 3 copies of the data.**
- **Store copies on 2 different types of media.**
- **Keep 1 backup copy off-site.**

The data recovery process from backups is tested on a monthly basis.
Hardware, file systems, and operating systems are regularly updated to ensure their usability over time (currently, the last 3 decades are available).
A series of tests on the data subjected to backup is conducted regularly.

4. Legal and Ethical Requirements, Codes of Conduct

The data handled is not subject to privacy concerns and is not sensitive, as it does not pertain to individuals. Therefore, no protections such as encryption or other forms of data obfuscation are required. The data is open and accessible without restrictions, except for any embargo periods.
Embargo refers to the period during which one or more data access services are suspended. The embargo period can range from six months to a maximum of three years, depending on the type of data, as defined in the institutional Data Policy. For data obtained through national or international initiatives in which the Institute officially participates, and which involve different embargo rules, the Institute adheres to those rules. Embargoes are applied only if appropriately justified. Metadata related to embargoed data are available and publicly accessible to facilitate discoverability.
An embargo period may apply to certain data, such as those from temporary experiments, where data will be available only to authenticated and authorized users through an access system (EUDAT-B2ACCESS[14] - EIDA: EAS[15]).

[13] https://www.uschamber.com/co/run/technology/3-2-1-backup-rule

[14] https://www.eudat.eu/catalogue/b2access

[15] https://geofon.gfz-potsdam.de/eas/EIDAAuthenticationService.pdf

5. Data Dissemination and Long-Term Preservation

According to the Data Policy[16] A fundamental principle for INGV is **Open Access** to scientific information, meaning ensuring access without additional costs to the end user.
In line with this principle, the following rules apply:
The service, where "service" refers to any operation applicable to a database that enables searching, viewing, transferring, transforming, modifying, and/or updating data, can be **Open** (freely available and accessible to anyone without restrictions) or **Restricted** (available under conditions set or agreed upon by the intellectual property rights holder); in the latter case, the restriction must be defined and justified.

Specifically:

- The metadata search service will always be open to ensure maximum visibility of the data (findability).
- The data viewing service will be open.
- Data transfer (download) might be subject to limitations for specific user groups and/or defined periods (embargo).

5.1 Long-Term Preservation

INGV-EIDA-NODE is committed to the persistent preservation of data and descriptive metadata for all datasets deposited in the Archive, regardless of the structure/path of the data files and/or metadata files/databases.

INGV-EIDA-NODE provides:

- **A reliable preservation environment** for published datasets.
- **Reliable and consistent access** to published datasets through services available to the research community and the public according to dissemination policies.

5.2 Data Dissemination

Ensuring the dissemination of published datasets is central to the mission of the Institute and, therefore, INGV-EIDA-NODE. To support its commitment to facilitating data access and use, INGV-EIDA-NODE distributes its content through as many channels as possible, including:

- **Providing URLs and assigning persistent identifiers (PIDs)** to ensure reliable citation and discovery of published datasets.
- **Registering descriptive metadata** (WF-CATALOG, WF-HANDLE, WF-PROVENANCE) to facilitate content discovery by harvesters and/or individuals seeking public information about datasets.

INGV-EIDA-NODE is dedicated to exploring and implementing new methods for further dissemination over time and with future technologies to ensure ongoing accessibility and utility of its content.

[16] Puglisi et al., (2018). The INGV Data Policy. OA Earth-prints Repository. https://hdl.handle.net/2122/14886

5.3 Data Access

Here are the access points for currently published datasets.

Website

EIDA Italia Website (https://eida.ingv.it/): A frontend for browsing and downloading data and metadata for Italian stations belonging to the Italian EIDA node.

Web Services

- **FDSN WebServices:**
  - **FDSN StationXML**[17]: This XML-based NoSQL DB system (eXist-db) provides APIs for downloading station metadata based on the FDSN standard.
  - **FDSN Dataselect**[18]: This SeisComP-based system offers APIs for downloading waveform data in MiniSEED format.
  - **FDSN Availability**[19]: Provides data availability for a specific time range.
- **EIDA WebServices:**
  - **Routing Service**[20]: Finds the correct URL for download within the EIDA federation.
  - **WF-Catalog**[21]: Offers data metrics, data quality, and data availability information.

Handle Resolver

- **A Digital Object Approach:**
  - Provides a uniform "informative" interface.
  - User-friendly.
  - Digital Object (DO) citation (ePIC-PID-Handle).
  - Long-term availability ensured.
  - Hides system details.

For each Digital Object, the following information can be retrieved:

- Latest version.
- Specific version.
- DC metadata (WF-HANDLE).
- W3C provenance (WF-PROV).
- Documentation of this DO (Human-readable).
- List of PIDs in that area at the given time window.

Computational Archive

- **Processing As A Service.**

To better meet user needs, significant computational resources and an appropriate processing and analysis framework have been added, combining Apache Spark and ObsPy to create a "computational archive". This in-house implementation, called 'SeiSpark,' merges storage and computational resources.
To avoid transferring large volumes of data for big datasets, users can, for example, explore, analyze, and reduce data via an online interface.

[17] https://www.fdsn.org/webservices/fdsnws-station-1.1.pdf
[18] https://www.fdsn.org/webservices/fdsnws-dataselect-1.1.pdf
[19] https://www.fdsn.org/webservices/fdsnws-availability-1.0.pdf
[20] http://routing.readthedocs.io/en/latest/
[21] http://www.orfeus-eu.org/documents/WFCatalog_Specification-v0.22.pdf

6. Responsibilities and Resources for Data Management

Primary Responsibility

This **Data Management Plan** (DMP) is overseen by **UF3** (Functional Unit 3: Data Acquisition, Control, and Distribution) within the **ONT** (National Earthquake Observatory) section of INGV. UF3 is responsible for the overall management of the seismic data lifecycle handled by the INGV-EIDA-NODE, including data collection, quality control, archiving, and distribution.

Duties of UF3

1. **Management of Physical Resources:**
   - **Personnel:** Coordination and supervision of the technical and support team responsible for daily operations and maintenance activities.
   - **Hardware:** Maintenance and management of physical infrastructure necessary for data storage and processing, such as servers, storage units, and backup devices.
2. **Management of Software Resources:**
   - **Tools and Applications:** Implementation and maintenance of software solutions used for data processing, including systems for quality control, metadata management, and data analysis.
3. **Economic Sustainability:**
   - **Financial Planning:** Oversight of expenses related to data management, ensuring effective allocation of financial resources and long-term sustainability of the data management system.

Available Infrastructure

1. **Data Center (CED) in Rome (ONT Section):**
   - **Functions:** Manages the storage, processing, and distribution of seismic data at the national level. Provides operational support for all data management activities.
   - **Funding:** Fully supported by the Institute, ensuring adequate resources for infrastructure management and updates.
2. **Data Center (CED) in Naples (OV Section - Vesuvius Observatory):**
   - **Functions:** Supports data management and archiving operations, contributing to the distribution and analysis of seismic data. Provides support to the node's activities.
   - **Funding:** Also funded by the Institute, contributing to operational coverage in the region.

Commitment of the Italian EIDA Node

The Italian EIDA Node (INGV-EIDA-NODE), managed by UF3, is dedicated to ensuring that seismic data is managed and distributed according to best practices and international standards. This includes collaboration with national and international partners to ensure that the data remains accessible and usable according to defined policies and standards.

In summary, UF3 is responsible for ensuring the sustainability and effectiveness of the seismic data management system by coordinating human and hardware resources, managing software and financial resources, and ensuring that necessary infrastructure is maintained and updated.

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Krogh P., (2009). *The DAM Book: Digital Asset Management for Photographers*, 2nd Edition, p. 207. O'Reilly Media.

Puglisi G. et al., (2018). *The INGV Data Policy*. OA Earth-prints Repository. https://hdl.handle.net/2122/14886

Strawn G., (2019). *Open Science, Business Analytics, and FAIR Digital Objects*. https://doi.org/10.1109/COMPSAC.2019.10283

ATTACHMENTS

Attachment “A”

WF-HANDLE

Metadata Schema


```
{
   “@context”: {
      “dc”: “http://purl.org/dc/elements/1.1/”,
      “dcterms”: “http://purl.org/dc/terms/”,
      “schema”: “http://schema.org/”,
      “file”: “http://schema.org/DigitalDocument”
   },
   “@type”: “WFCatalog”,
   “dc:identifier”: “11099/1234567890-asdfg”,
    “dc:creator”: “Network Operator, University of Genoa. (1967). Regional Seismic Network of North Western Italy. [https://doi.org/10.7914/SN/GU](https://doi.org/10.7914/SN/GU)”,
   “dc:date”: “2019-01-08T12:45:16Z”,
   “dc:format”: “MSEED”,
   “dc:publisher”: “INGV EIDA NODE”,
   “dc:rights”: “https://creativecommons.org/publicdomain/zero/1.0/”,
   “dc:subject”: “Seismological data, waveform, earthquake”,
   “dc:title”: “INGV_WF_Repository”,
   “dc:type”: “Dataset, seismic waveform”,
   “dc:hasVersion”: “0”,
    “dc:description”: “Detailed documentation available at [http://hdl.handle.net/11099//1234567890-asdfg?urlappend=document](http://hdl.handle.net/11099//1234567890-asdfg?urlappend=document)”,
    “dc:provenance”: “Provenance information available at [http://hdl.handle.net/11099//1234567890-asdfg?urlappend=provenance](http://hdl.handle.net/11099//1234567890-asdfg?urlappend=provenance)”,
   “dcterms:temporal”: {
      “dcterms:start”: “2016-09-15T00:00:00Z”,
      “dcterms:end”: “2016-09-16T00:00:00Z”
   },
   “dcterms:spatial”: {
      “schema:latitude”: 48.728694,
      “schema:longitude”: 16.590442,
      “schema:altitude”: 0
   },
   “dcterms:available”: “2019-01-08T12:45:16Z”,
   “dcterms:dateAccepted”: “2019-01-08T12:45:16Z”,
   “dcterms:isPartOf”: “wfmetadata_catalog”,
   “file”: {
      “schema:name”: “Z3.A001A.00.HHZ.D.2016.259”,
      “schema:url”: “http://hdl.handle.net/11099/1234567890-asdfg”
   }
}
```

Attachment “B”

WF-PROV

Metadata Schema


```
{
 “@type”: “WFCatalog”,
 “@context”: {
  “dc”: “http://purl.org/dc/elements/1.1/”,
  “dcterms”: “http://purl.org/dc/terms/”,
  “prov”: “http://www.w3.org/ns/prov#”,
  “schema”: “http://schema.org/”
 },
 “dc:identifier”: “11099/1234567890-asdfg”,
 “dcterms:isPartOf”: “wf_handle”,
 “prov:generatedAtTime”: “Tue, 15 Sep 2016”,
 “prov:wasAttributedTo”: “EIDA node”,
 “prov:usage”: {
  “schema:SoftwareApplication”: [
   “https://my.nice.program/obspy-ver-1.1”,
   “https://my.other.program/QTTools”
  ]
 },
 “prov:wasRevisionOf”: [
  {
   “dc:hasVersion”: 1,
   “schema:startDate”: “Tue, 18 Sep 2018”,
   “schema:Organization”: “INGV-ONT-uf3-quality-team”,
   “prov:SoftwareAgent”: “https://my.nice.program/obspy-ver-1.1”,
   “dcterms:spatial”: {
    “x”: 48.728694,
    “y”: 16.590442,
    “z”: 0
   },
   “schema:file”: {
    “name”: “Z3.A001A.00.HHZ.D.2016.259”,
    “position”: “http://hdl.handle.net/11099//1234567890-asdfg&urlappend=version=1”
   },
   “prov:wasGeneratedBy”: {
                                                “prov:hadPrimarySource”:
“https://webservices.ingv.it/eidaws/station/1/net=Z3&sta=A001A&level=resp”,
    “schema:SoftwareApplication”: [
     “https://site.of.program/SeedLink-ver-1.1”
    ],
    “schema:Organization”: “name of network operator”,
    “dcterms:accrualPeriodicity”: “Continuous”
   }
  },
```

```
    {
      "dc:hasVersion": 0,
      "schema:startDate": "Tue, 15 Sep 2016",
      "schema:Organization": "INGV-ONT-uf3-quality-team",
      "prov:SoftwareAgent": "https://my.other.program/QTTools",
      "dcterms:spatial": {
        "x": 48.728694,
        "y": 16.590442,
        "z": 0
      },
      "schema:file": {
        "name": "Z3.A001A.00.BHZ.D.2016.259",
        "position": "http://hdl.handle.net/11099/1234567890-asdfg&urlappend=version=0"
      },
      "prov:wasGeneratedBy": {
                                                    "prov:hadPrimarySource":
"https://webservices.ingv.it/eidaws/station/1/net=Z3&sta=A001A&level=resp",
        "schema:SoftwareApplication": [
          "https://site.of.program/SeedLink-ver-1.1"
        ],
        "schema:Organization": "network operator",
        "dcterms:accrualPeriodicity": "Continuous"
      }
    }
  ]
}
```

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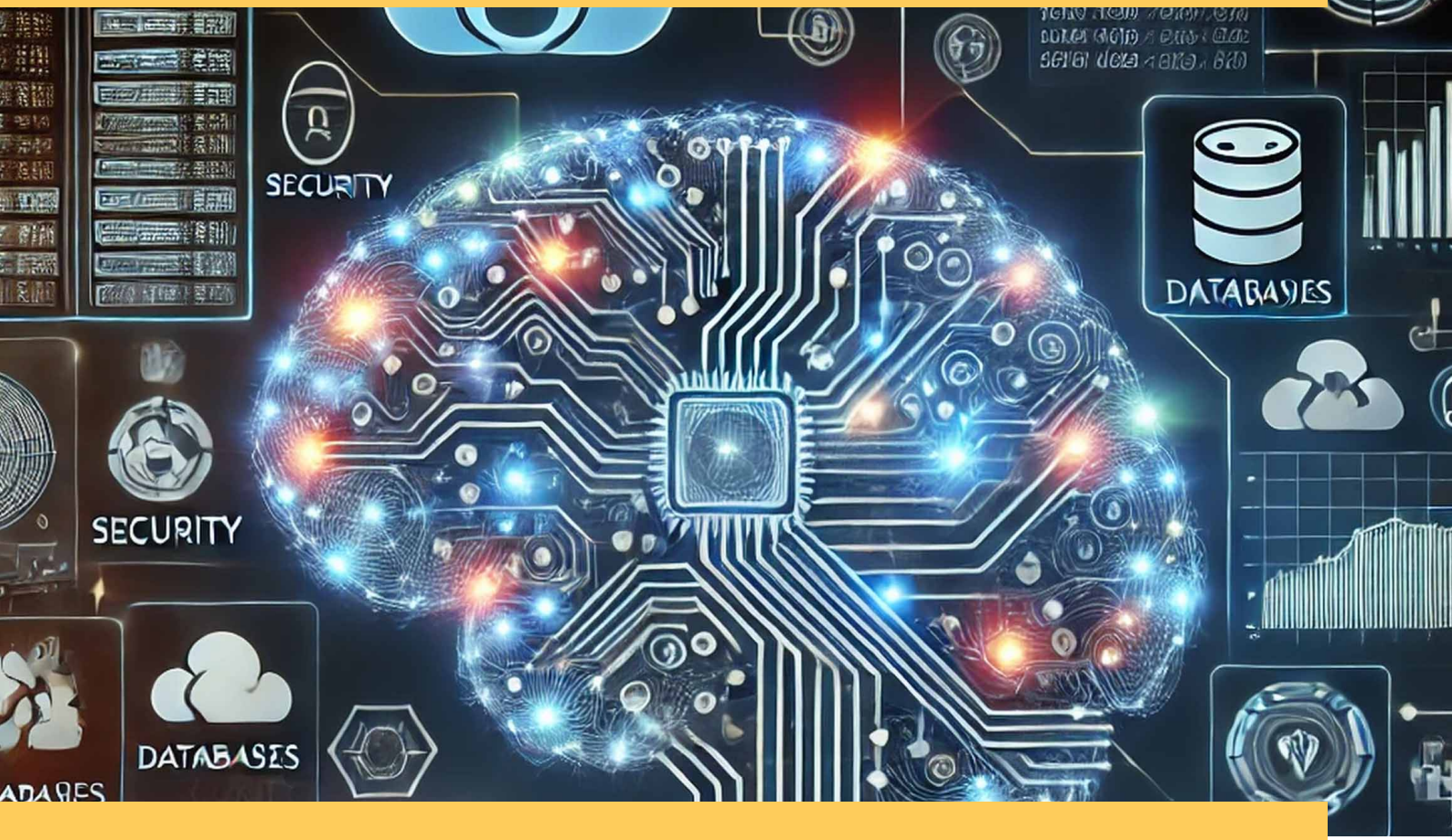

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