RODA-in
A generic tool for the mass creation of Submission Information Packages

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Context
Msc thesis developed in a software company and jointly supervised


• Provide a normalised and efficient access to the workflows for the three main activities of an archive:
  
  ✴ Acquiring
  
  ✴ Preserving
  
  ✴ Re-using
How should we manage digital information?
Digital Repository. information system able to store, preserve, organize and disseminate digital objects.
OAIS - Open Archival Information Systems
ISO 14721:2012

It defines the **functional components** that should be part of an archival system aimed at digital preservation.

It defines internal and external **interfaces**.

It characterizes digital objects being manipulated.

It determines the **terminology** to be used in a preservation context.
OAIS compliant
OAIS compliant
Ingest scenarios
Records on the file system

Records Management System

Records on a Database
Records on the file system

Records Management System

Connect to API (mostly custom developments)

Records on a Database
Connect to API
(mostly custom developments)
RODA SIP creation tool

Connect to API
(mostly custom developments)

database preservation

EARK SIP

RODA
Long-term digital repository
Long-term digital repository

RODA
SIP creation tool

EARK SIP

RODA
Long-term digital repository
The use case scenario...
A government agency accumulated a large volume of digital files under a shared folder.

That folder served as the office archive and as a backup solution.

The agency needs to send a part of that content to the archives for long-term preservation.

The archive requires the agency to submit content in a set of well-established Submission Information Packages.
Let’s see how it works...
Records on the file system
Records on the file system

Packaging tool

RODA
SIP creation tool
Records on the file system

Packaging tool

RODA
SIP creation tool

EARK SIP
Let's take a closer look at the tools...
It’s a **SIP creation tool**
To be used by producers to prepare data to be sent to the repository

Compatible with the **E-ARK SIP specification**
Also supports the **BagIt format**

**Designed to create thousands of SIPs with just a few clicks**
SIPs can be gigabyte-size
Support for multiple descriptive metadata schemas
Templating system enables the user to create new metadata profiles
Templates provided for EAD 3, EAD 2002 and DC

Multi-language
English, Portuguese, Spanish and Hungarian at the moment

Multi-platform
Windows, Mac OS X, Linux

Offline operation
No network is necessary to operate the tool. Essential for some producers
Information Package

Metadata
  - Descriptive
  - Preservation
  - Other

Representations
  - Representation A
    - Data
    - Metadata
    - ...
  - Representation B
    - Data
    - Metadata
    - ...

Schemas

Documentation

...
Metadata folder: each subfolder holds a different kind of metadata
Representation folder: one subfolder for each representation
Information Package

Metadata
  - Descriptive
  - Preservation
  - Other

Representations

Schemas

Documentation

Optional folder to store used schemas (e.g. EAD.XSD)
Optional folder to store any kind of documentation that helps in package understanding
Figure 9: Example of a simple use of the Common Specification structure
Figure 10: Example of the full use of the Common Specification structure
CREATE ASSOCIATION TO "Root"

CHOOSE THE METADATA METHOD

Create new metadata from a template
Use this option to create metadata from a predefined model. The associated metadata for each SIP will be the same. After the SIP creation, the user should edit the metadata according to the data associated to each packet.

- EAD (2002)

Load from a single file
Use this option to add to each SIP one metadata file of your choice. The selected file will be added to each of the created SIPS.

- Choose File...

Load from each directory
Use this option to include in the SIP a metadata file located in the root of the directory used to create the packet. The metadata file must have a defined pattern (e.g., metadata.xml).

- Pattern: metadata.xml

Type: EAD

Load from one directory
Use this option to select one directory where all the metadata files to include in the SIPS can be found. The association between metadata files and SIPS is done through the file name (ignoring the extension). In the cases where no association can be made, the SIP will not contain metadata.

- Choose Directory...

Type: EAD

Cancel  
Back  
Confirm
CREATE ASSOCIATION TO "Root"

CHOOSE THE ASSOCIATION METHOD

One description item for each selected files or folders
Use this option to create a SIP for each of the selected files or folders. If you selected five files and/or folders, the association will create five SIPs, i.e. five descriptive items. Each one of these items can correspond to a distinct description level.

One description item with all selected files and/or folders
Use this option to create one and only one SIP containing all selected files and folders. If you selected five folders and/or files the association will result in one SIP corresponding to one item with a set description level.

One description item for each file under the selected folder(s)
Use this option to create one SIP for each file under the selected folder(s). This operation will create a set of SIPs equal to the number of files under the selected folder(s).

One classification scheme from folder structure
This option creates description objects in addition to submission packages. It should be used when the folder structure is well organized and resembles the desired output plan. If a folder only has sub-folders, it creates a Series. When a folder’s children are just files, the whole folder will be used to create one submission package. In a situation where a folder has a mixed content, files and sub-folders, each file will be a submission package and each sub-folder will be a Series.

[Options: Cancel, Continue]
Where can I find it?
RODA-In

RODA-In is a tool specially designed for producers and archivists to create Submission Information Packages (SIP) ready to be submitted to an Open Archival Information System (OAIS). The tool creates SIPs from files and folders available on the local file system.

In version 2 we revolutionized the way SIPs are created to satisfy the need for mass processing of data. In this version you can create thousands of valid SIPs with just a few clicks, complete with data and metadata.
RODA-In

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E-Ark SIP moving towards standardisation

RODA-in: in use at Hungarian National Arch and DGLAB

RODA: in use at European Publications Office, DGLAB, and soon in other large institutions

www.dasboard.eu
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www.dasboard.eu
What about documentation?
In this section you may find a few video tutorials on how to use the RODA-in tool to create Submission Information Packages (SIP).

How to download and run the application

RODA-in Tutorial: How to download and run the application

RODA-In

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The tool includes features such as:

- Create, load and edit classification schemas
- Automatic association of files/folders to SIP
- Automatic association of metadata to SIP
- Definition of metadata templates
- Support for various metadata formats (EAD, DC, etc.)
- Creation of SIP of unlimited size
- Creation of SIP in various formats: BagIt and E-ARK

This application was part of the RODA project and now has been released as a project by its own due to the increasing interest in its particular functionality. It is now being further developed in the EARK project.

Supported SIP formats

RODA-in supports several Submission Information Package formats. At the moment we have included support for:

- BagIt, a hierarchical file packaging format for storage and transfer of arbitrary digital content. A “bag” has just enough structure to encode descriptive “tags” and a “payload” but does not require knowledge of the payload’s internal semantics. This BagIt format should be suitable for disk-based or network-based storage and transfer. BagIt is widely used in the practice of digital preservation. The specification of BagIt can be found here.
- E-ARK SIP format, specification here.

Requirements

How to create SIPs from local files and folders

RODA-in Tutorial: How to create SIPs from local files and folders
1. Choose the folders that contain your data.

Choose folder

File Explorer

Menu

Associate
Association method
Classification scheme
Creating SIPS first step
Creating SIPS second step
Export
File Explorer
Inspection panel
Inspection: Associations
Inspection: Data / Documentation
Inspection: Metadata
Metadata method
Templating system

HELP

File Explorer

An item can be in one of three states: normal, ignored or mapped. Normal is the default state of the items and the only state from which SIPS can be created.

Items in the ignored state will not be used to create packages. They can be ignored based on rules defined in the configuration of the application, or manually using the "Ignore" button. These items are hidden by default, but can be made visible by turning on a menu option.

Mapped items are the ones that have already been added to an SIP. The goal is to implement a "map and forget" strategy in which users drag n’ drop items from their file system to create SIPS after which they disappear from the user interface. This enables users to fully focus on the remaining items and thus be more productive in their SIP creation project.
Open source
Vendor freedom, no licensing costs

Turn-key solution
Ready to be used by archivists, producers and consumers

Preservation and authenticity
Preservation metadata
Preservation actions
Risk management
User-friendly design
The system was developed having end-users in mind

Blazing fast search
Supported by horizontally scalable search technologies

Custom descriptive metadata
Supports any XML based metadata schema

Multiple SIP formats
BagIt, E-ARK, EUPO SIP

Customisable ingest workflows
Ingest tasks can be turned on/off and parameters can be set right at the UI
Welcome to RODA!

An open-source digital repository designed for preservation

RODA is a complete digital repository solution that delivers functionality for all the main functional units of the OAIS reference model. RODA is capable of ingesting, managing, and providing access to the various types of digital content produced by large corporations or public bodies. RODA is based on open-source technologies and is supported by existing standards such as the Open Archival Information System (OAIS), Metadata Encoding and Transmission Standard (METS), Encoded Archival Description (EAD), Dublin Core (DC) and PREMIS (Preservation Metadata).

Conforms to open standards
RODA follows open standards using EAD for description metadata, PREMIS for preservation metadata, METS for structural metadata, and several standards for technical metadata (e.g. NISO 239.87 for digital still images).

Vendor independent
RODA is 100% built on top of open-source technologies. The entire infrastructure required to support RODA is vendor independent. This means that you may use the hardware and Linux distributions that best fit your institutional needs.

Scalable
The service-oriented nature of RODA's architecture allows the system to be highly scalable, enabling the distribution of the processing load between several servers. Furthermore, the use of advanced indexing components enable RODA's discovery services to be spread through various servers on a cluster for even greater performance.

Embedded preservation actions
Preservation actions and management within RODA is handled by a job execution module. The job execution module allows the repository manager to run preservation tasks over a given set of data. Preservation actions include format conversions, checksum verifications, reporting (e.g. to automatically send SIP acceptance/rejection emails), virus checks, etc.

Authenticity
RODA uses preservation metadata (PREMIS) to create a trust chain between all format migrations and content verifications. The preservation metadata, together with the establishment of trust of its surrounding environment (ISO 16363) ensures reliability of the service and authenticity of the enclosed digital records.

Support for multiple formats
RODA is capable of ingesting all sorts of content types. Migration action components support migrating text documents, raster images, relational databases, video, and audio into normalized formats for long-term preservation. A plug-in mechanism enables RODA to easily support additional format migrations.

Copes with the rapid changing nature of technology
The plug-in and job execution module allows an easy way to add more functionality to the system (e.g. new preservation actions, alerts, tools, etc.). Also, the service oriented architecture of RODA allows the easy updating of the functions in the job execution module.

Advanced access control
Users must be authenticated before accessing the repository. All user actions are logged for future accountability. Permissions are granular and can be defined at repository level, all the way down to individual data objects.
## Ingest process

The **Ingest process** contains services and functions to accept **Submission Information Packages (SIP)** from Producers, prepare **Archival Information Packages (AIP)** for storage, and ensure that **Archival Information Packages** and their supporting **Descriptive Information** become established within the repository. This page lists all the ingest jobs that are currently being executed, and all the jobs that have been run in the past. On the right side panel, it is possible to filter jobs based on their state, user that initiated the job, and start date. By clicking on an item from the table, it is possible to see the progress of the job as well as additional details.

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<th>Name</th>
<th>Creator</th>
<th>Start date</th>
<th>Duration</th>
<th>Status</th>
<th>Progress</th>
<th>Total</th>
<th>Successful</th>
<th>Failed</th>
<th>Processing</th>
<th>Waiting</th>
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</tbody>
</table>

1-20 of 47
AIP Virus check
Scans Information Package(s) for malicious software using the Antivirus application ClamAV. Clam AntiVirus (ClamAV) is a free and open-source, cross-platform antivirus software toolkit able to detect many types of malicious software, including viruses. If malicious software is detected a report will be generated and a PREMIS event will record this occurrence.

AIP metadata validation
Checks if the descriptive and preservation metadata included in the information Package is present, and if it is valid according to the XML Schemas installed in the repository. A validation report is generated indicating which AIPs have valid and invalid metadata.

AIP fixity information computation
Computes file fixity information (also known as checksum) for all data files within an AIP and stores this information in PREMIS objects within the corresponding AIP. This task uses SHA-256 as the default checksum algorithm, however, other algorithms can be configured in "roda-core.properties". File fixity is the property of a digital file being fixed, or unchanged. "AIP corruption risk assessment" is the process of validating that a file has not changed or been altered from a previous state. In order to validate the fixity of an AIP or file, fixity information has to be generated beforehand.

AIP file format identification (Siegfried)
Identifies the file format and version of data files included in Information Packages using the Siegfried tool (a signature-based file format Identification tool that supports PRONOM identifiers and Mime types). The task updates PREMIS objects metadata in the Information Package to store the results of format identification. A PREMIS event is also recorded after the task is run.

Feature extraction
Extraction of technical metadata using Apache Tika

Full-text extraction
Extraction of full-text using Apache Tika

Verify producer authorization
Checks if the producer has enough permissions to place the AIP under the desired node in the classification scheme

Auto accept
Adds information package to the inventory without any human appraisal. After this point, the responsibility for the digital content's preservation is passed on to the repository

AIP remote replication
Copies AIPs and all its files to a secondary RODA instance for redundancy purposes (e.g., Active-passive high-availability architecture). This task makes use of "rsync" to synchronize AIP folders between two servers (storage level replication) and calls the secondary API to re-index the replicated AIPs (index level replication). The task can only be used if the appropriate configuration settings are defined in the "roda-core.properties".

Ingest finished notification
Send a notification after finishing the ingest process to one or more e-mail addresses (comma separated)
Users are capable of finding Archival Information Packages (AIP), Representations and Files by making use of the discovery services available in this page. The discovery services are divided by resource type and use different properties to support its discovery and location. For example, AIPs can be found by searching on descriptive metadata (multiple schemas are supported per AIP). Representations can be found by ID, type, size, and number of files. Files can be found using technical attributes such as mimetype, PRONOM Identifier, size, etc.

<table>
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<th>Intellectual entities</th>
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<tr>
<td>Original reference</td>
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<td>Title</td>
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<td>Description</td>
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<tr>
<td>Scope and content</td>
<td></td>
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<tr>
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**Search Results**

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<td>DC</td>
<td>CABIMENTO 1686 REQUISIÇÃO EXTERNA 2714 E 2715 LEASE PLAN FACTURA 12/1 03679 OPF 3746 - LEASEPLAN PORTUGAL LDA</td>
<td>2015-07-02 to 2015-07-02</td>
</tr>
<tr>
<td>DC</td>
<td>CABIMENTO 159 REQUISIÇÃO EXTERNA 2003, 2391, 2390, 2528 E 2751 BE WATER CONSUMO DE MAIO OPF3738, 3739, 3740 E 3741 - BE WATER, S,A.</td>
<td>2015-07-01 to 2015-07-02</td>
</tr>
<tr>
<td>DC</td>
<td>CABIMENTO2405 ESTORNO 36REQUISIÇÃO EXTERNA 476 ECOBIZ, LDAFACTURA 84 OPF 1688</td>
<td>2015-01-06 to 2015-03-30</td>
</tr>
<tr>
<td>DC</td>
<td>CABIMENTO 11 REQUISIÇÃO EXTERNA 62 FERNANDO CARLOS FRADINGO GASPAR FACTURA 82/2015A OPF 1673/2015</td>
<td>2015-01-06 to 2015-03-30</td>
</tr>
<tr>
<td>DC</td>
<td>CABIMENTO 3 E 779 REQUISIÇÃO EXTERNA 6 E 1162 NORTEL SUL - COMERCIO E EQUIPAMENTOS HOTELEIROS, LDA FACTURAS 15100104, 15100010 OPF 1617/2015</td>
<td>2015-01-06 to 2015-03-30</td>
</tr>
</tbody>
</table>
CABIMENTO 150 E 151 REQUISIÇÃO EXTERNA 2196 E 2198
PETRÓLEOS DE PORTU GAL-PETROGAL, SA FACTURA
2232585764 OPF 4027 - PETRÓLEOS DE PORTUGAL -
PETROGAL SA


CompleteUnitId
PT/AMM/CMMFR/10-1/37/(2015)1641

Username
lurdas

level
DC
dateInitil
2015-07-02

RepositoryCode
AMM
CountryCode
PT
Preservation events

Obrigação de Pedro Lourenço, morador em Machico, Ilha da Madeira, por vinte alqueires de trigo das Ilhas, pelos quais pagará $533 e 2 ecus.

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Detail</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-05-19 20:55:21</td>
<td>ingest end</td>
<td>The ingest process has ended.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:55:15</td>
<td>accession</td>
<td>Added package to the inventory. After this point, the responsibility for the digital content's preservation is passed on to the repository.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:55:08</td>
<td>authorization check</td>
<td>Producer permissions have been checked to ensure that he has sufficient authorization to store the AIP under the desired node of the classification scheme.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:55:02</td>
<td>format identification</td>
<td>Identified the object's file formats and versions using Siegfried.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:54:56</td>
<td>message digest calculation</td>
<td>Created base PREMIS objects with file original name and file fixity information (SHA-256).</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:54:50</td>
<td>wellformedness check</td>
<td>Checked whether the descriptive metadata is included in the SIP and if this metadata is valid according to the established policy.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:54:33</td>
<td>wellformedness check</td>
<td>Checked that the received SIP is well formed, complete and that no unexpected files were included.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:54:33</td>
<td>unpacking</td>
<td>Extracted objects from package in E-ARK SIP format.</td>
<td>success</td>
</tr>
<tr>
<td>2016-05-19 20:54:16</td>
<td>ingest start</td>
<td>The ingest process has started.</td>
<td>success</td>
</tr>
<tr>
<td>Container</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>roda</code></td>
<td>Repository of Authentic Digital Objects</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>minicraft</code></td>
<td>Dockerfile for Minecraft using Pterodactyl and Wings.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>pterodactyl-panel</code></td>
<td>Build for the Pterodactyl control panel.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>docker-whelale</code></td>
<td>No description.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>rodata</code></td>
<td>Data container for Omd Apps</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>scrapy-sftp</code></td>
<td>Screpy GTFP setup modified for Pterodactyl Deamon usage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>jenkins</code></td>
<td>Continuous integration with disposable containers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>clockerdash</code></td>
<td>Docker dashboard built with ASP.NET Core, Docker.DotNet, SignalR and Vuejs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>introdatasciicocker</code></td>
<td>No description.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Repository of Authentic Digital Objects

- roda
- mincraft
- pterodactyl-panel
- docker-wale
- scrappy-sftp
- introdata2dcocker
- djocker
- orodata
- routeninja
- clockerhub
- nginx-proxy
- parkervcp
- ubuntu-0mq
Documentation and source-code published at
source.roda-community.org
Questions?

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jcr@di.uminho.pt