The Vitam Recordkeeping Software, or How to Build Confidence in the Durable Archiving of Digital Documents

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The Vitam Program and the Vitam Recordkeeping Software

A French cross-ministerial project,
A plural Team archivists/IT
Backed and financed by French Ministries of Foreign Affairs, Culture and Defense.

An open source software to manage, preserve and provide long-term access for digital records and archives (back office and front office).
Principle of co-constructing functionalities with the users, in order to increase the community skills.

3 agencies supporting the project use VITAM in order to build their own digital archival system,
5 agencies (Mission Archives) support a SAS offer (VAS),
More than 60 other partners also joined the project to implement VITAM

LEGAL AND NORMATIVE CONTEXT

Records Management norms

ISO 15489

NF Z 30-300...

Digital Archiving norms

ISO 14721 (OAIS)

- Open Archival Information System
- A reference conceptual model designed for long term digital information management, preservation and access
- Defined NASA recommendation

NF Z 42-013 / ISO 14-641-1

- Technical and organizational requirements for registering, storage and access to digital document in order to assure their preservation and integrity

Functional Rules

Heritage Code

ISO 20614 / NF Z 44-022 / Seda

- Data exchange protocol for interoperability and preservation

EAC-CPF, EAD, ISDF

Access Rules and regulations

General data protection Regulation

Directive on the re-use of public sector information (PSI)

Relationships between Public/administration Code

Data Protection and Liberties Regulation (Loi CNIL)

Réglementation Classifié de Défense

Defence Code

IGI 1300

- Protection du secret de la défense nationale

Security Rules and Regulations

eIDAS

- Electronic identification and trust services for electronic transaction

NF Z 42-020

- Description of a digital safe deposit box in an archival information system

Legal Context

Code civil, art. 1366

"Electronic documents have **the same probative value as paper documents**, as provided that the person from whom they were produced can be duly identified and that they are generated and **retained in conditions that guarantee their integrity**."

Règlement « eIDAS » n°910/2014 du 23 juillet 2014, art. 25

"1. An electronic signature shall not be denied legal effect and admissibility as evidence in legal proceedings solely on the grounds that it is in an electronic form or that it does not meet the requirements for qualified electronic signatures.
2. A qualified electronic signature shall have the **equivalent legal effect of a handwritten signature**."

Règlement « eIDAS » n°910/2014 du 23 juillet 2014, art. 34

"A qualified preservation service for qualified electronic signatures may only be provided by a **qualified trust service provider** that uses procedures and technologies capable of **extending the trustworthiness** of the qualified electronic signature **beyond the technological validity period**."

Normative Context

NF Z 42013
"Electronic Recordkeeping"

"**Archived documents, together with the associated metadata and evidence** produced by the EAS, must be stored, as a minimum, on two separate sites which do not present the same environmental or technical risks."

"Evidence consists of documented information:

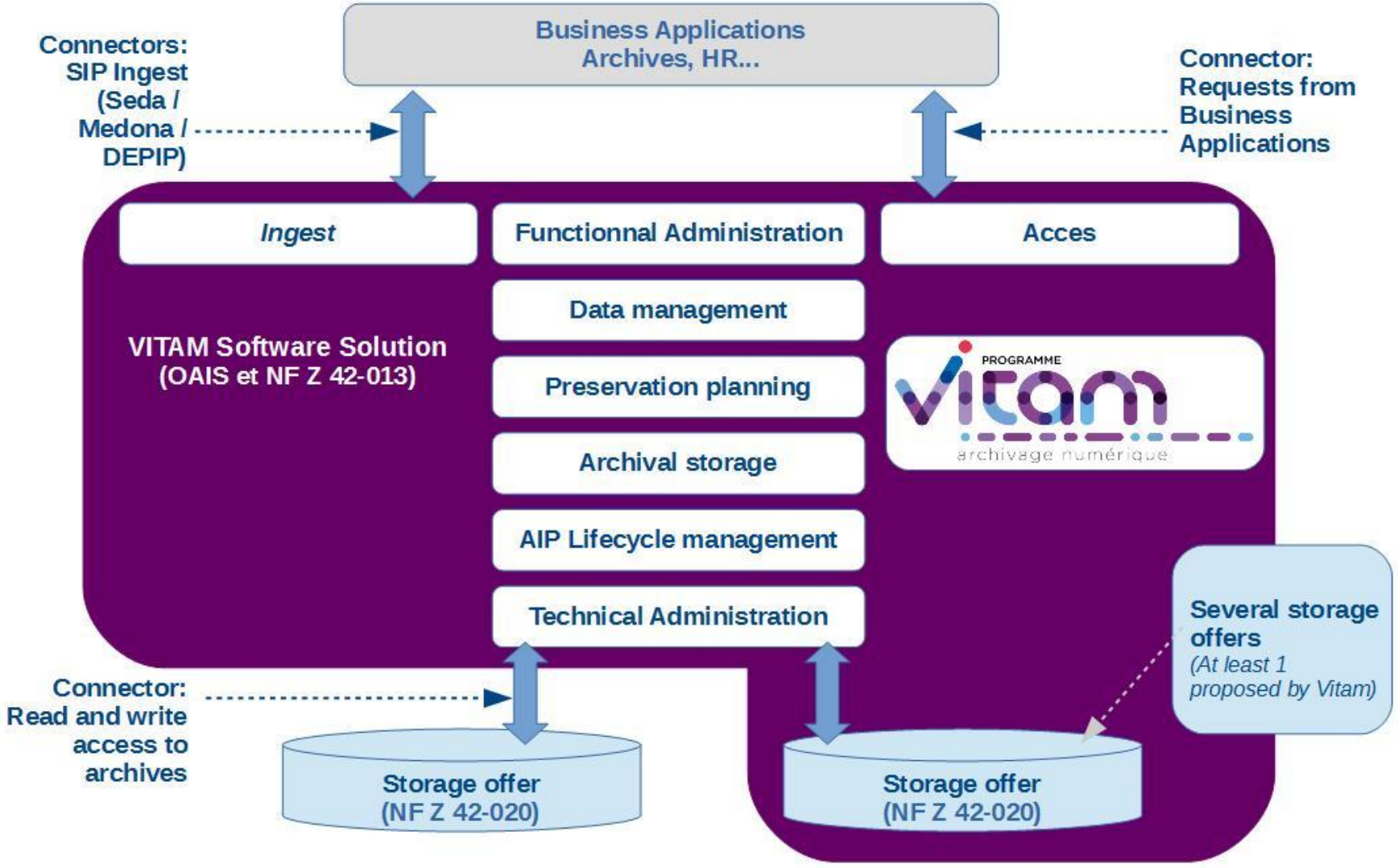
- **Records:** these are the traces generated by the EAS for each event carried out (integrated, for example, in a database or in collections of logs). database or log collections);
- **Logs:** these are documents structured according to a defined, usable format, consolidating a set of records relating to events in the EAS. Logs are managed using procedures that guarantee their integrity and completeness, as well as the absence of any modification to the records they contain records;
- **Attestations:** these are documents attesting to a conformity, to the assumption of responsibility for electronic archives, or to the completion of a specific operation. Attestations include records relating to one or more electronic archives."

"The integrity of the logs and records contained in them must be ensured by a method of **chaining the logs** so that any subsequent modification or deletion of a log or record contained in one of the logs can be detected."

"The [Archival Service] **must implement** and document […] **measures required to detect and deal with the risk of corruption or unauthorized deletion** of all or part of archived documents, associated metadata and evidence."

FROM THEORY TO PRACTICE

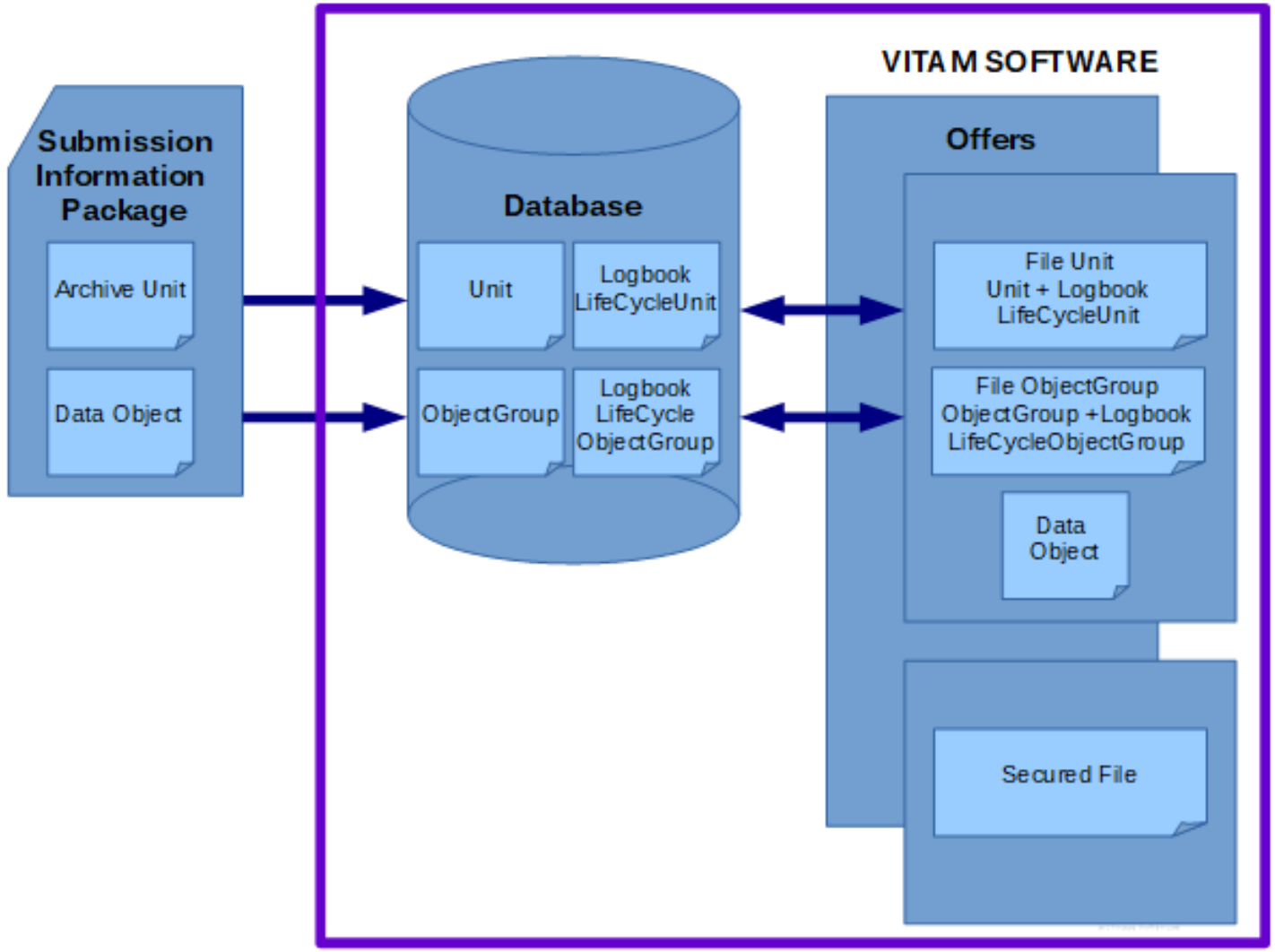
The Vitam Software



Capture and Storage

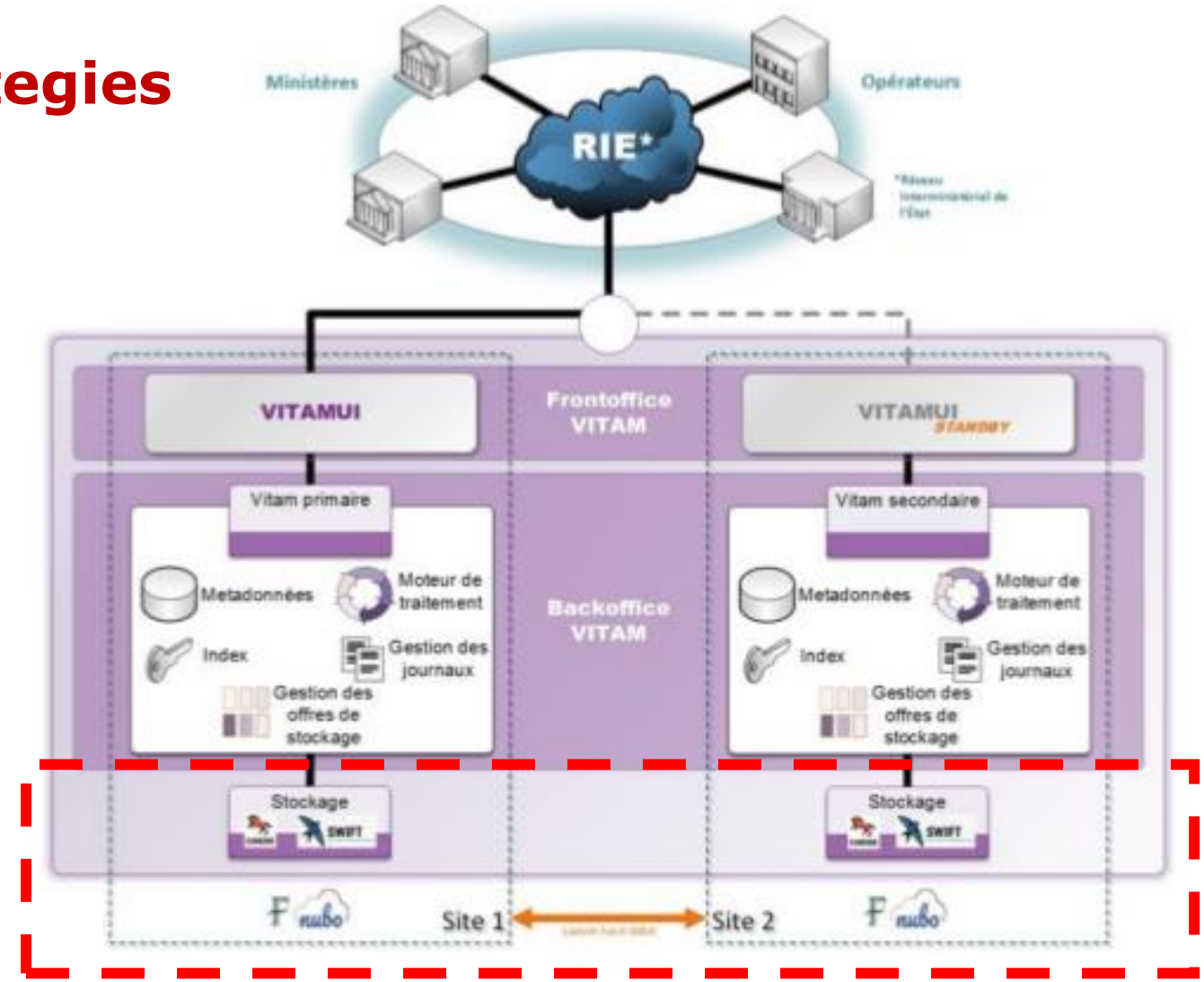
As soon as archives (including descriptive management and technical metadata, and digital objects) are captured into the Vitam software, they are recorded, in addition to their logs, in a various way:

- as database records,
- as files on storage offers,
- as part of the secured files



Storage and Storage strategies

- The Vitam software is deployed by default with a single storage strategy and at least two storage offers to support all BCP/ERP functions. This is the recommended deployment mode.
- It is also possible to deploy the Vitam software solution with several storage strategies under certain conditions.
- These storage strategies can include hot or cold offers



Functional audits

The software solution provides check of data integrity and overall consistency:

What audit?	What is audited?	Where is it audited?	
Audit file existing	Objects	Database AND Offers	no inconsistency in the storage policy and all objects have copies
Audit file integrity			objects have not been corrupted (database fingerprint / storage offer check)
Check consistency	Objects AND Archive Units AND their LogbookLifecycle	Database AND Offers AND Secured files	verify consistency of all elements on database and storage offers on a given set of items
Corrective audit			Correct inconsistencies
Statement of probative value	Objects AND their LogbookLifecycle	Database AND Offers AND Secured files	Produce au report on the basis of a consistency audit on objects

Technical audits

The software solution provides technical checks:

What audit?	What is audited?	
Audit secured logs	Secured logs	checks that secured files have been secured between two dates and that they have not been corrupted
Audit masterdata existing	Archival Profile Archive Unit profile	no inconsistency in the storage and in the database

Traceability and Logging

The Logbooks guarantee traceability, durability, interoperability of the archives kept.
Fully human readable.
Events are compliant with PREMIS

Logbook Operation	Records events related to the archiving application, the security, the system
Logbook Lifecycle	Records for an archive unit, at a finer level object group or object, any event to issue proof of ingest, conversion of file formats, modification of access, rights or management rules.
Logbook Storage	Saves writing of all data and metadata on storage offers
Access Log	Record accesses to objects from the storage offers

All the Logbooks are:

- stored on the storage offers like any other object (archive or metadata)
- securized with a system of hash and Merkle Tree inspired by Blockchain.

A TRUST BASED ON THE CO-CONSTRUCTION

The Vitam Community

More than 60 users
From public and private sectors

Move forward with all and support all

Users' Club meetings:
news about the Vitam Program, updates on the software solution,
demonstration, news about the various users' projects, exchanges on cross-cutting issues

General meetings: regular meetings on functional, archival and/or technical and software issues

One-to-One meetings: as soon as necessary to discuss specific points

Functional or technical workstreams: preparation of ingests (2015-2016), access (2015-2016), preservation (2017-2019), management of classified archives (2017-2019), evidence management (2017-2018), persistent identifier (2021-...), electronic signature (2022-...)...

Access to tools :
- exchanges and questions through collaborative platform *Osmose*
- support through ticketing tool *Tuleap*
- discovery and testing, through the provision of a dedicated environment to each partner

Purchase of tickets to get support services, small improvements or prioritization of bug fixes

A specific way to construct the Vitam software

Organization of functional or technical workstreams

- A way of identifying services required for the management of a specific type of archive or a particular service
- A way of increasing the community skills together on a given subject
- Based on a series of workshops, work sessions, feedback and literature reviews

preparation of ingests (2015-2016)	access (2015-2016)
management of classified archives (2017-2019)	evidence management (2017-2018)
preservation (2017-2019)	Disposal holding service (2020)
Persistent identifier (2021-2022)	Signed documents management (2022-2023)

A public and cooperative certification

- Risk analysis in 2016, enriched in an Agile way for V1 and V2
- Code analysis in the continuous integration platform (CheckMarx)
- Security audit per release and in-depth audit for major releases

Reference certification process

- Reference certification strategy supported by the French Ministry of Culture
- Measures to take security into account during design (Vitam) and implementation (implementer)
- Vitam project accessible in service = reference implementation
- Certification commission with information systems security managers from implementing ministries (once a year from 2018 to 2020, twice a year since 2021)

THANK YOU

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إثراء مجتمعات المعرفة

ENRICHING KNOWLEDGE SOCIETIES