infotel

Arcsys

Getting Started With Arcsys

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This document is intended for anyone who requires more information on the Arcsys product.

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Identifies information of particular interest

Important

Identifies important information

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Part 1. Understanding the Archiving Market

1. Background

The increase in volume of IT environments, together with a sharp rise in regulations, has highlighted the need to classify and retain certain types of information in companies. There are a number of areas in business that have a great need to implement a strategic archiving project.

1.1. Financial and Technical Areas

These concerns are often the driving forces behind IT production. This category contains HSM (Hierarchical Storage Management) software designed to manage increasing volumes by offering more streamlined storage solutions. This category also contains niche domains as different as: file archiving, database purging, ERP archiving, email archiving and project archiving, for example.

1.2. Documentation

Included in this category is archiving originating from digital document management and publishing. This type of archiving is done down the line from the software where objects are often contained in proprietary structures. Storage solutions available are often marketed by the publisher of the software in question.

1.3. Legacy

This type of archiving is often managed by archivists. Searching for information often requires a number of specialized criteria; defining a record is thus one of the main objectives of this category. The concepts of retention and continuity are very important as this type of archiving is set up for decades, and possibly centuries.

1.4. Fiscal or Regulatory

This category contains information with average retention periods (three to ten years) that require traceability. Volumes are often high and the unitary elements have varying forms. Classification is an important factor, as requests, although rare, are unpredictable and retrieval of such information can be subject to time restrictions.

1.5. Evidentiary Law

This category aims to retain information with a view to supply proof in the event of legal dispute (invoice, mail, contract, for example). Retention can deal with a longer period (up to 30 years), and requires checking the fixity.

2. Solutions

Infotel designed the Arcsys product to cover the variety of objects to archive and with multitude of very diverse objectives. The product addresses a number of aspects:

- Legal archiving: Checks the fixity and traceability of content from its creation to retrieval.
- Long-term archiving, due to an ongoing concern for continuity.
- File archiving, file directory trees, projects, consistent lots, thanks to features based on business applications, object indexing and detailed searches.

Part 2. Objectives and Principles

1. Objectives

The Arcsys software package was designed to maintain company information assets for medium or long-term periods. Paradoxically, even though all companies have specially adapted IT equipment, generally speaking, retention functions over time are not properly taken into account, at least not by IT systems. A number of reasons contribute to this:

1.1. Technological Breakthroughs

IT systems are constantly changing, leaving in their wake a number of previous technological advances, incompatibilities with hardware, applications and software packages. Changing from one operating system to another, from one application to another, makes a certain amount of data inaccessible. Of course, IT operators will "translate" current information so as to make this data compatible with new systems: they keep the most "visible" part in perfect condition. But all old and historical data, and data that is rarely accessed or not accessed at all, is often put aside. For financial reasons or due to the amount of work involved, it remains in this state in the unspoken hope that it will be simply forgotten.

1.2. Company Memory

A significant amount of data in companies still relies on human memory. Phenomena such as the exponential increase in volumes of data processed, the turnover of personnel in companies and mergers/acquisitions reveal that human memory is not infallible and that the company's information assets are in danger. Long-term retention means must be implemented to protect companies from the risk of amnesia.

1.3. Risk Prevention

The last element is the most recent and has seen the emergence of major risks that have not been addressed adequately until now. An increase in regulations, audits, the principle of precaution, risk prevention dealing with fraud, counterfeit, lawsuits, etc. means that companies must plan ahead and justify themselves. They must thus "memorize" masses of old data over increasingly longer periods of time, which are incompatible with the lifespan of IT storage equipment.

2. Basic Principles

The Arcsys software is an archiving infrastructure geared to core businesses used to manage archiving databases in compliance with the **OCSTIS** model, that is:

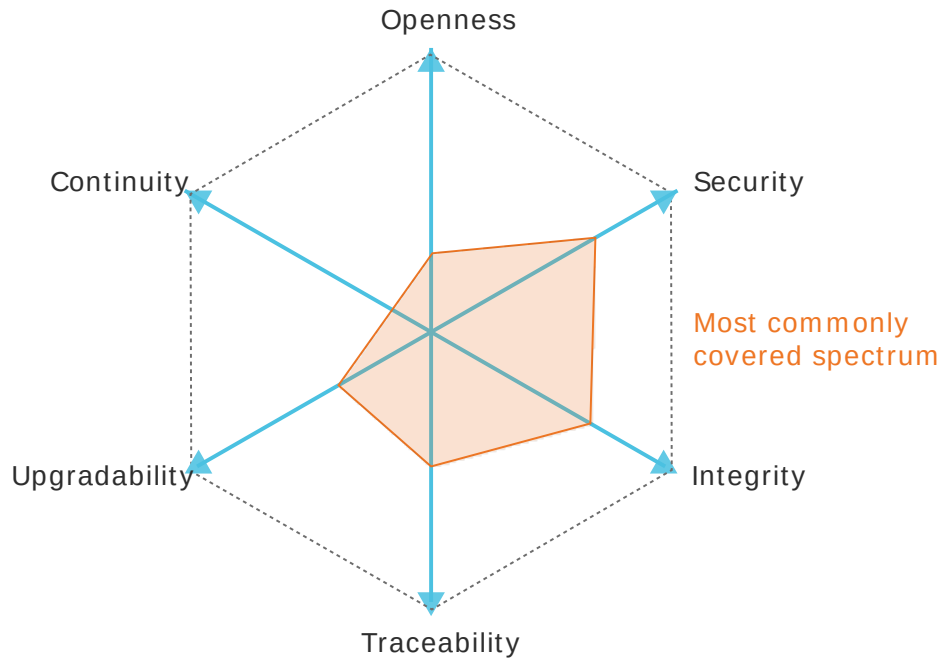

Figure 2.1. OCSTIS Model

2.1. Open

Arcsys accepts all type of items to archive, called objects, without restriction. Basically, Arcsys considers an object to be a series of numerical data (0 and 1) that has a meaning for the issuing application. Arcsys can accept objects sent by different applications concurrently (see Figure 1.1, “Concept of Objects in Arcsys” [12]).

2.2. Continuity

Arcsys was designed to stand up to changes within the limits of current technology. Arcsys is not based on any proprietary elements. It operates on various IT platforms, it does not use a proprietary format at the storage media level, it accepts a variety of storage resources and can switch from one to the other without impacting either the operator or the applications. Arcsys minimizes the use of proprietary APIs in favor of standard, widely used interface services, which are by nature more durable.

2.3. Scalability

Since it is not based on proprietary schemas, Arcsys uses standard technologies with which it can scale according to the IT system of the end client. In this way, Arcsys can operate in "cluster" mode if the client wishes to implement this. Arcsys can even use all the advanced resources the client wishes to put in place in terms of databases. Last but not least, Arcsys can also distribute its processes and therefore leverage the power of a multiprocessor.

2.4. Traceability

Arcsys "follows" each object to archive step by step throughout the life cycle of the record, from the moment of the archiving request to actual physical archiving. Arcsys will also "monitor" each query, retrieval, migration, request, etc. All these traces are kept in tables in the relational database and in the log files.

2.5. Integrity

A record will undergo a mathematical hashing algorithm as soon as it is processed by Arcsys. This hash value will be kept as long as the record itself and will be compared to those subject to new calculations at different stages during the record's life cycle (technological migrations, retrieval, inactivity, for example). Any deliberate or accidental alteration can still be revealed in this way by comparing hashes.

2.6. Security

Arcsys uses authentication and authorization means in the company by implementing external interfaces. In this way, you can restrict the scope and investigation field of end users according to their own permissions or the permissions of the groups to which they belong. Arcsys also possesses mechanisms of accountability, non-repudiation and confidentiality.

3. System Components

Figure 3.1, “System Components” [8] shows the components of the Arcsys system.

It is important to note that Arcsys software implements generic interfaces with peripheral components as indicated in Figure 3.1, “System Components” [8]. This solution gives priority to proprietary APIs for product continuity and to ensure medium-term scalability.

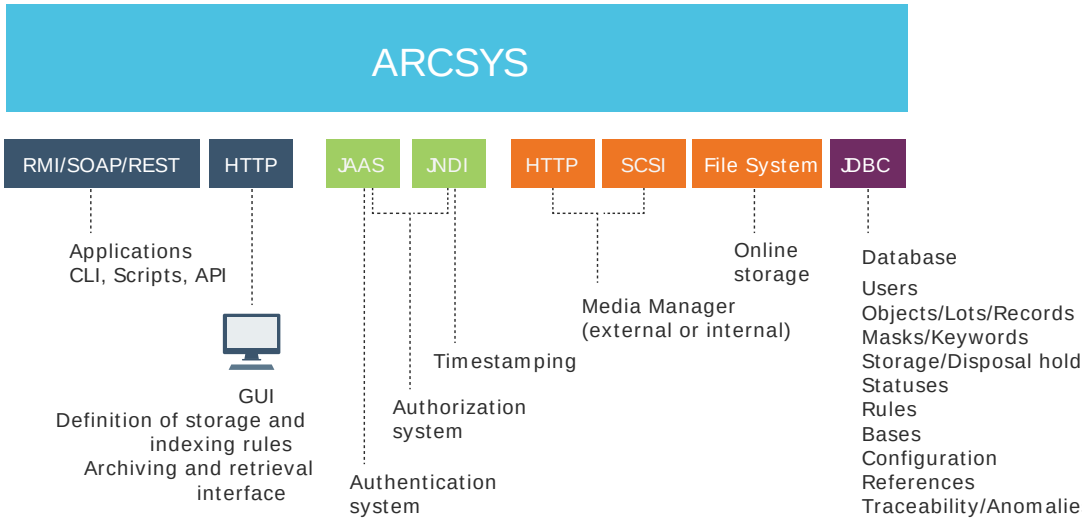

Figure 3.1. System Components

3.1. Central Archiving Engine

Set of synchronous or non-synchronous multi-thread processes:

The engine operates in conjunction with a temporary storage space from which the objects to archive can be transferred, either when sent by another agent or when directly transferred to this space.

3.2. The Arcsys Database

The relational database contains business metadata relating to records and on which query requests from end users are based. In addition, it contains a large amount of additional data relating to indexing rules to be followed, business actions on records (traces), errors encountered, etc. The relational database is the heart of the system.

3.3. The Arcsys Web Agent

This multi-function agent offers both administration options and functions for archiving and retrieval operations initiated manually by a user.

3.4. CLI Command Interface

This is set of commands that can be included directly in the application scripts to call on the archiving system functions to query or retrieve archives.

3.5. API Set

This is a low-level command set, based on RMI or SOAP protocols, with which CLI command lines or special interfaces can be built (thin client, thick client).

4. External Services

There are a number of external services that interface with Arcsys.

- These external authentication and authorization services are accessed via the interfaces available on the Java platform, i.e. JAAS for user authentication and JNDI for looking up authorizations (through directory services).
- The external time server provides an "authentic" external time system so that system timestamping cannot be disputed.
- The communication interface with the media manager gives orders to archive or retrieve to the storage media; it is also used to dynamically query the relational database of the media manager.

Part 3. "OCSTIS" Model Coverage

1. System openness

1.1. Various Objectives to Cover

For the most part, applications for archiving currently still run on dedicated platforms. The need for accounting, EDM, mail, fiscal, IT report, invoicing, check imaging, etc. applications has led to (or may lead to) the chaotic multiplication of contiguous, yet all dedicated archiving applications.

Arcsys is structured in object mode. Whether this object is a document, a relational table, a flow or an invoice, Arcsys deploys a pooled generic environment. This openness naturally results in increased performance at infrastructure and productivity levels, but also guarantees scalability.

1.2. Concept of Objects

Given the different types of challenges presented by archiving, we have designed a platform that can perform archiving operations for images and documents, as well as relational tables and request results. The concept of object has thus been adopted. The Arcsys product is capable of addressing all structures (series of 0 and 1). To each of these objects, metadata are associated, which are totally dependent on business data. Subsequent searches are performed on these metadata. There are no limitations regarding allowed object types, format types used, and the environments from which these objects originate.

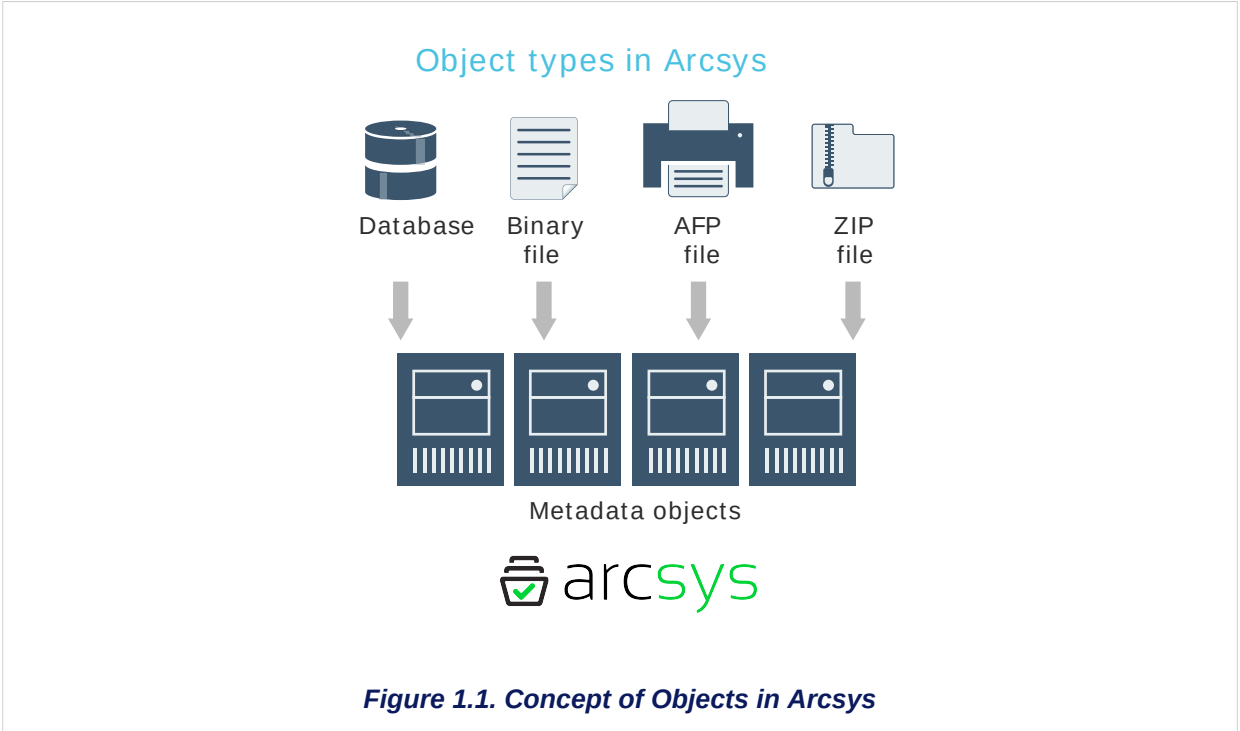

Figure 1.1. Concept of Objects in Arcsys

The Arcsys application can, if the client so desires, partition applications so that management, requests, and storage of each application can be independent of each other. This is the concept of "repository" in Arcsys.

2. System Continuity

2.1. Background

Figure 2.1, “Risk of Dependency” [14] shows that record continuity depends on three successive layers. The lower layer is the most "visible". Inevitably, it must be upgraded every three to five years to keep up with technological changes.

Without looking to cross the top two layers systematically, nonetheless it must be done and at least, they need to be classified properly, so that the list of formats used that could cause problems is known at all times.

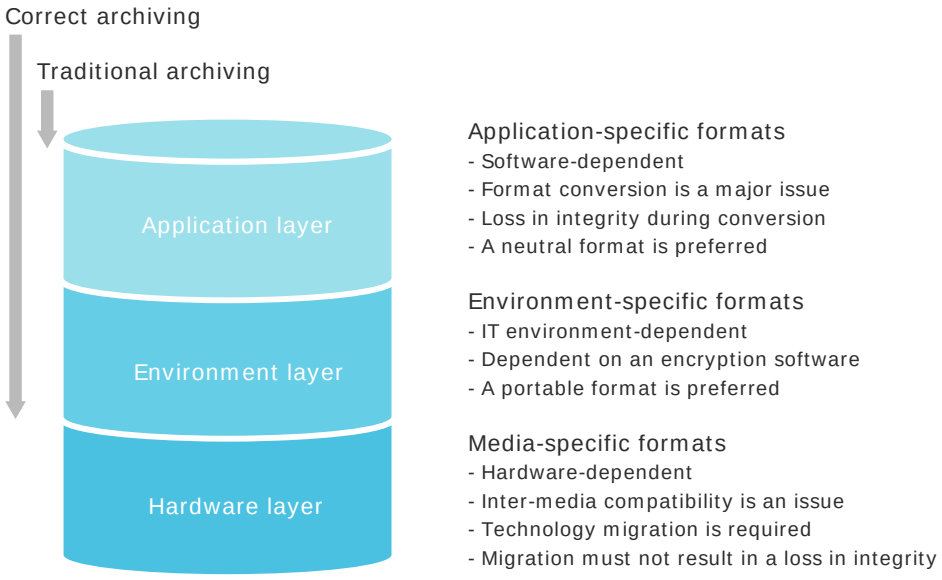

Figure 2.1. Risk of Dependency

Arcsys can cross the environment layer and in certain cases, the application layer. However, the latter is the layer that manages presentation; disregarding this presentation could therefore cause problems, particularly for documents.

2.2. IT Platforms

Arcsys is based on the most standard products available and always offers an alternative to each component:

- Operating systems of the central platform: Windows or Linux
- Relational DBMS: DB2 ®, Oracle Database ®, Microsoft SQL Server ®, MariaDB or PostgreSQL

- Online storage systems: None
- Media manager: Internal (ArcMover), or External: Cloud (any Amazon S3 ® compatible object storage).
- Backup tools: None
- Supervision tools: Arcsys can be monitored using the BMC Patrol ® monitoring tools via use of a third-party KM, for example;
- Authentication: Kerberos (standard on Unix and Windows)
- Authorization tools: LDAPv3 directory

2.3. Adaptability of Storage Media

Arcsys accommodates all types of storage media. Arcsys is independent of all suppliers and all storage technologies.

2.4. Storage Policy

Arcsys can be used to define a "storage policy" for a record. The storage policy is assigned during archiving. It defines the types of storage media (storage policies) that are successfully addressed during the life cycle of the record, the retention periods for each of these media, the number of physical copies of the record, and the logical pool that will be addressed (zones).

When the retention period for a medium has expired, the media manager automatically takes over transfer of the record to the medium according to the hierarchy in compliance with the storage policy. The hashing algorithm (see Integrity Mechanisms) is called before the Arcsys migration routine to check the object hash is always identical to that calculated initially. There is another check after copying on the new medium.

2.5. Technological Obsolescence

In the event the company would like to upgrade the storage policy to be in compliance with new needs: extended retention, reduced retention, different storage support, Arcsys will take charge of these new rules allocated by a administrator via the Arcsys graphic interface, and make the change in storage media if necessary.

2.6. Compliance with Standards

Arcsys was designed to comply with the ISO standard 14721 or OAIS (Open Archival Information System), designed by an international committee in the scientific community. It defines a reference model for installing archiving systems in terms of

continuity, functions and interfaces between the sub-components that are ingest, archiving, management and access modules.

2.7. Continuity of Hashing Algorithms

This chapter describes Integrity Mechanisms, the use of hashes for assuring integrity.

Arcsys can use different calculation algorithms for these hashes over time and ensure backward compatibility with hashes used for a number of years previously. For this, the Arcsys indexing mechanisms **are not based on the hash calculated by the algorithm.**

2.8. Record Portability

Retaining records for long periods of time presents two problems in the long term:

- A change in storage media
- A change in the archiving system itself

Arcsys can perfectly adapt to changes in the storage media, retaining the integrity, and can also inherit the integrity calculated by the previous archiving system and transmit traces during the final migration of integrity, traces, metadata and the manifest to the next archiving system.

3. Scalability in Arcsys

3.1. Redundancy Support

Operation in cluster mode of the relational database is supported natively by the DBMS without impact on Arcsys. In this way, Arcsys supports, for example, Oracle and DB2 clusters.

All other components in the string can be duplicated: Application servers, JEE application, web server, storage infrastructure, etc.

3.2. Scalability in the Number of Processors

Arcsys references the existing engines capable of managing the threads generated by the product's synchronous and asynchronous processes dynamically in an internal table. Arcsys also supports the scalability of 1 to n processors dynamically. Arcsys can distribute the load over all available resources.

3.3. Connecting to the Company Network

Arcsys was designed to be able to easily modify the network ports used in order to cross firewalls without restriction.

Arcsys supports TCP/IP networks in standard mode.

3.4. Scalability of Storage Media

Arcsys is completely independent of any supplier or storage technology.

Arcsys provides portability from one type of storage to another while guaranteeing record fixity, which provides long-term continuity of the solution.

3.5. Storage Infrastructure

Arcsys requires disk space to support the relational database. As its access profile is likely to be highly transactional according to archiving activity and the number of requests, it is recommended you use Fibre Channel disks and double access for availability reasons.

At record storage media level, Arcsys clearly distinguishes between two storage policies:

- Online storage provides quick access to records; this is a disk-type storage with doubled access for availability reasons. Both SATA and Fibre Channel disks are supported. In many cases, SATA disks suffice. Online storage is not mandatory.

- Offline storage addresses storage media managed by an internal or external media manager (tapes, cloud). The differentiating feature compared to online level is the response time, which will deteriorate due to the intrinsic response time of the media manager.

4. Traceability Mechanisms

4.1. End-to-End Logging

Traceability is handled natively in Arcsys, from request transmission at the application level up to effective writing of the record on the storage media.

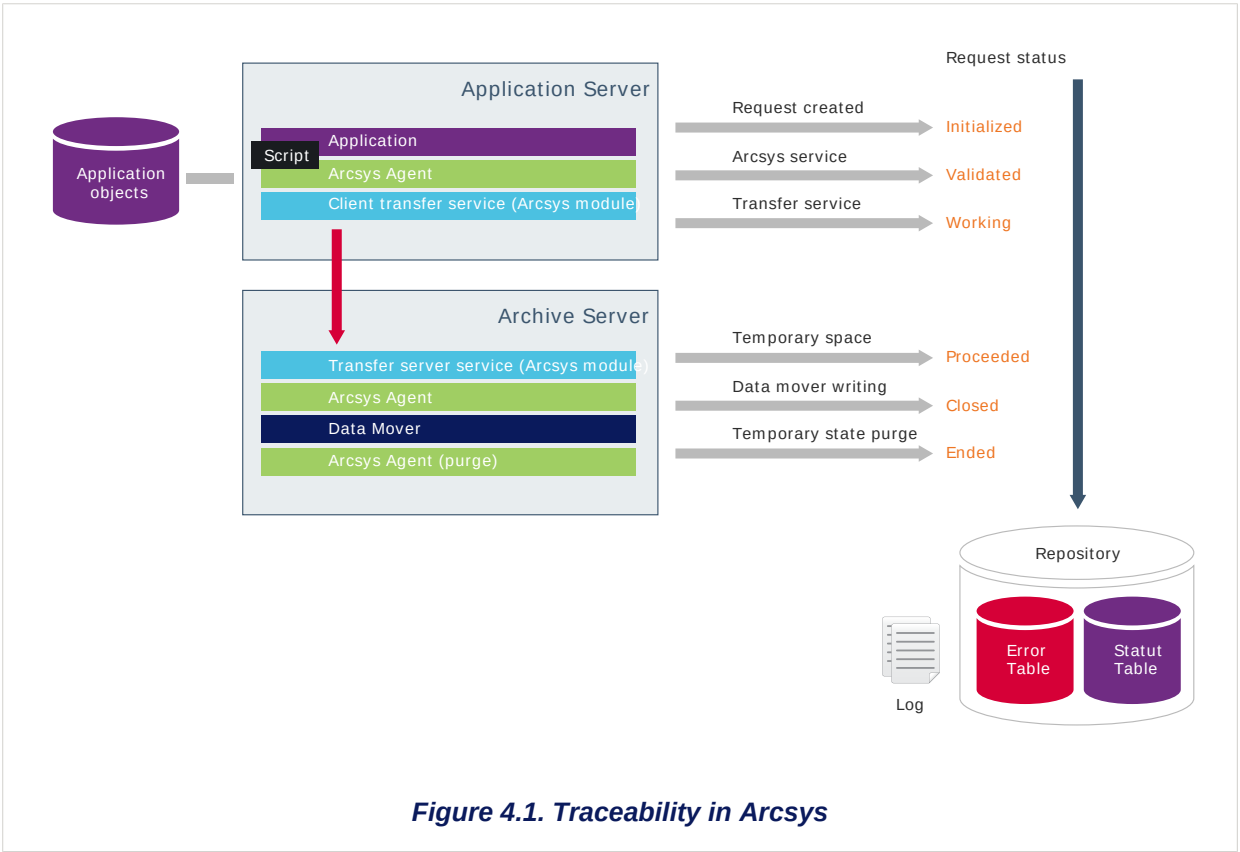

Figure 4.1. Traceability in Arcsys

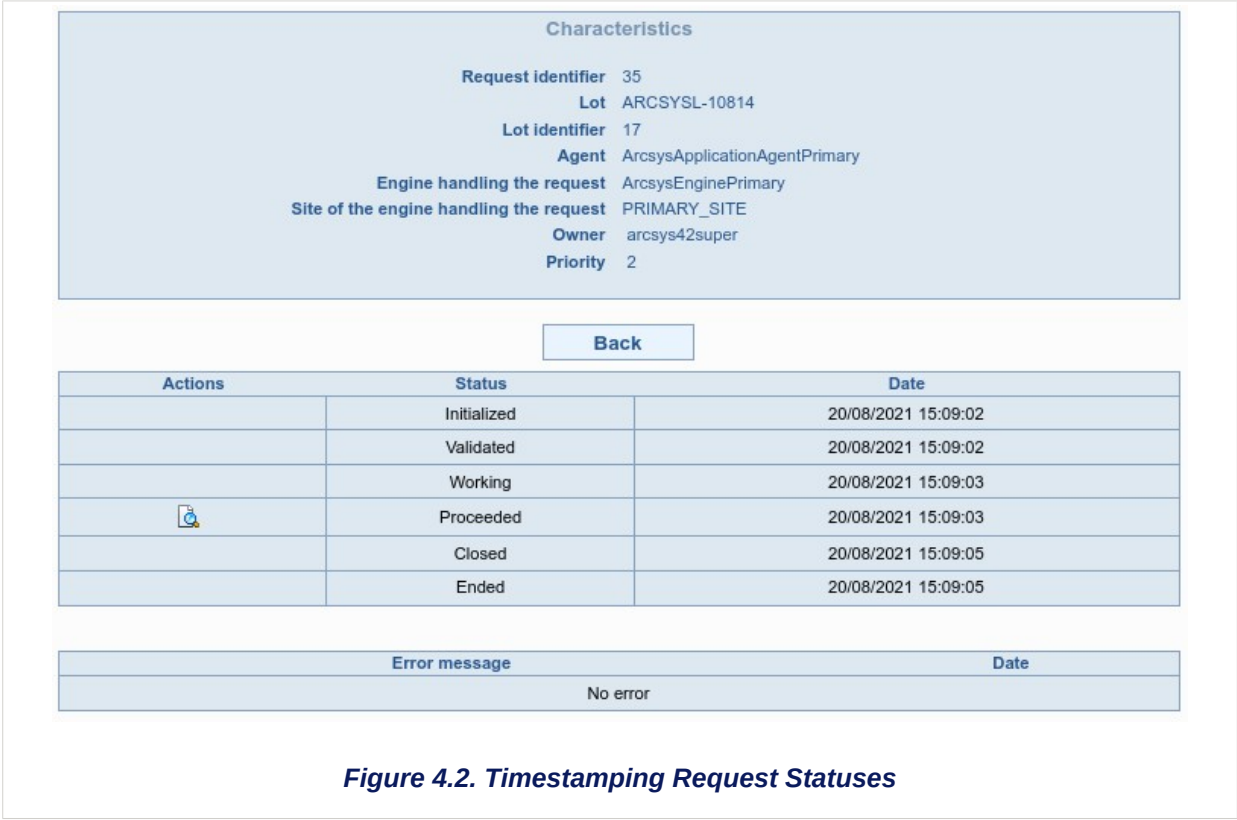

Figure 4.2. Timestamping Request Statuses

4.2. Traceability Levels

Traceability, in addition to integrity and security, is particularly important in the event of evidentiary law.

All events arising in Arcsys, whether they are linked to configuration (definition of retention and indexing rules, for example) or to daily use (archiving, modification of metadata, retrieval, migration, etc.) are traced very closely in different forms:

- In the Arcsys Database;
- In the Arcsys technical log files;
- In the functional trace files activated at collection level.

The log and trace files are themselves archived at time intervals configured in Arcsys. They can be accessed and used by external products such as Patrol.

Arcsys establishes the "Proof Folder" via the optional product ArcEP, which is used to generate a complete proof folder associated with document retrieval.

It is also possible to generate a proof slip on its own using the Arcsys web interface or REST API.

4.3. Non Repudiation and Accountability

Arcsys can capture information at application level and send it directly to the storage platform without the use of intermediaries, making accidental or intentional record substitution, invalidation or addition impossible. Furthermore, the application or user generating the record must sign to interact with Arcsys. The request table provides the message origin, time and user. The traceability system also mentions each of the intermediate steps: record requested, record archived, record received, record sent for storage, record written with a timestamp and user name, etc. (see Figure 4.1, “Traceability in Arcsys” [19] and Figure 6).

In this way, a record received by Arcsys cannot be repudiated as the system does not leave room for system fraud during the creation through to retrieval processes.

5. Integrity Mechanisms

5.1. Unchanged Content

Integrity in Arcsys is based on the call of a mathematical algorithm that calculates a hash for each archived object sent to it. It will last throughout the life cycle of the record. This certificate is dependent only on the data item itself. It is not influenced by the storage media. The integrity calculation is called a number of times during the life cycle of the data item to attest to the integrity of the lot by comparing it with the original certificate. This hash is stored on the storage media so that it remains accessible at all times, even if the Arcsys archiving software is not installed.

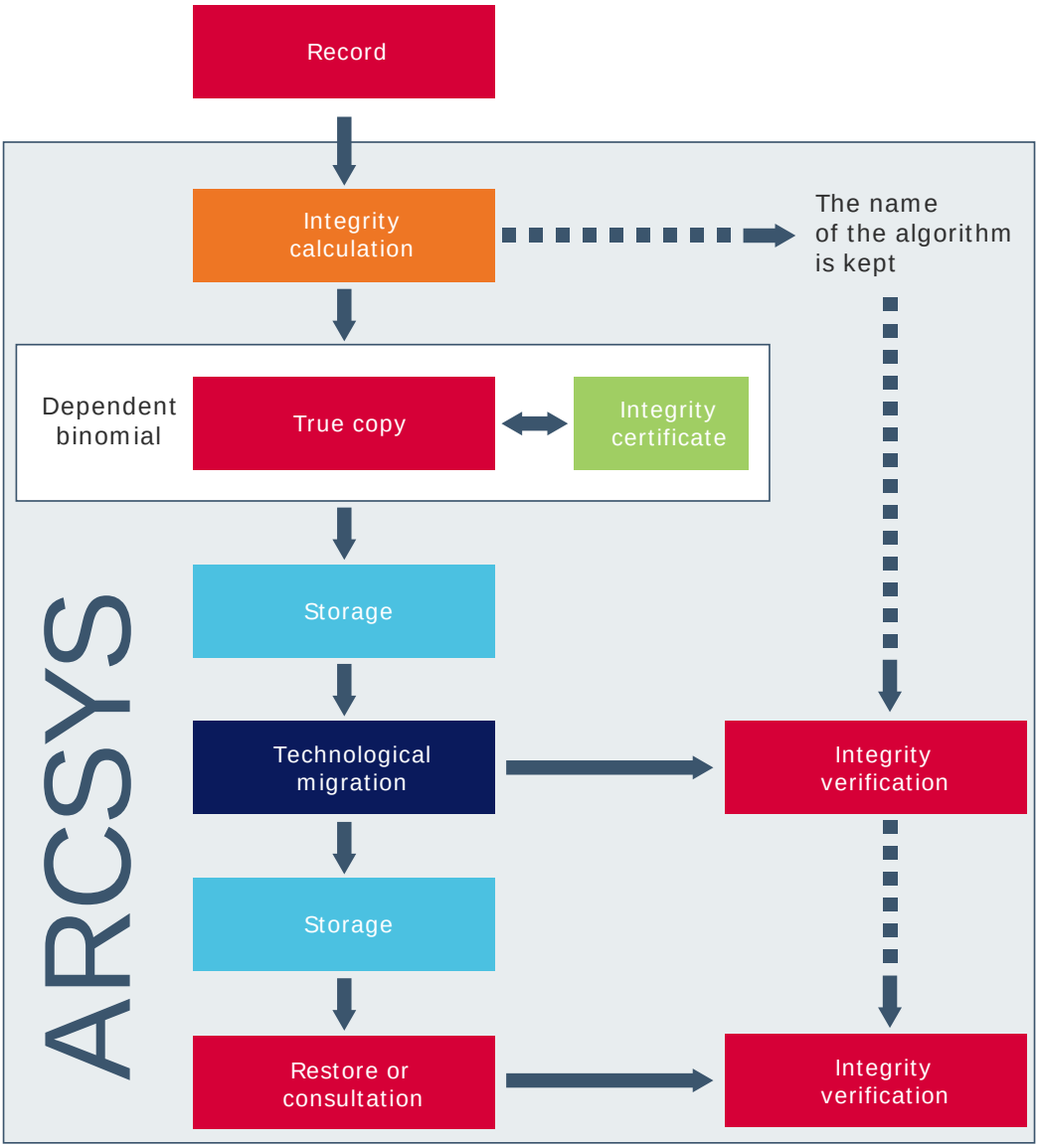

Figure 5.1. Integrity Management

Note

When the retention period exceeds the life expectancy of the physical media, the concept of global integrity becomes particularly important.

5.1.1. Algorithms Used

Arcsys can use a number of algorithms, including algorithms that may seem sufficient at present (128 bits) but that will quickly become obsolete, as well as more advanced algorithms: 256 and 512 bits.

Algorithms are chosen for a given version of Arcsys. Example: One version can be configured with an SHA256 algorithm, and the next version can be configured with SHA512. Backwards compatibility in reading algorithms is, of course, always guaranteed. The name of the algorithm is recorded at the level of the lot description (called manifest, see the definition in the glossary at the end of the document).

To protect records efficiently, algorithms must be upgraded in conjunction with the performance of IT calculation resources. Experts now deem that the SHA-1 protection level no longer offers a sufficiently high security margin and explain that the SHA-512 is becoming increasingly preferred (often faster than the SHA-256).

This hash calculation module is in particular called by:

- migration routines between media, which, during a change in media resulting from the storage policy rules, calculate the file hash read and compare it with the hash stored on the physical medium;
- and more generally, each time the data item is accessed for viewing, retrieval or migration operations.

In the event of a consistency error between the hash and the record of origin, Arcsys records the error and tries to access another copy of the record (if the storage policy is such that more than one copy exists).

5.2. Checking Integrity Automatically

The hashing calculation routine is also called by internal Arcsys routines for checking physical storage media that periodically reread records stored on physical media and calculate record hash to compare it with the original.

This checking process is triggered periodically. To do this, the Arcsys Engine must be started. This function guarantees that ageing of magnetic media takes place in good conditions.

5.3. Non-Rewritability of Records

There are a number of solution to this problem.

5.3.1. The deletion operation is not allowed

Once the record has been created, users can only access it using Arcsys keywords, based on a DBMS.

The records are not directly accessible via a file system, so direct access to delete functions is not allowed.

Arcsys is an archiving system and, as such, does not deliver a standard function for deleting a record. In Arcsys, the records can expire, but they must expire according to the storage policy and after expiry of the scheduled retention. There is no other solution.

Important

In the chapter "Use", and in particular, in a number of screen shots, you can see that the concept of deletion appears. Only an imperatively empty structure can be deleted.

Example: A user creates a collection (or a repository, a profile) using the interface and sees a definition error even before record creation. This structure can be deleted if the user has deletion permissions. When a record has been created, users no longer have this permission and the previous points apply.

5.3.2. Retrieval does not Destroy the Record

Record retrieval generates a compliant copy of the record, but it does not destroy the record itself on its physical medium.

5.3.3. Re-archiving does not Destroy the Original Record

With the record retrieved, the re-archiving of this record is technically possible. Nothing can prevent this. From the Arcsys point of view, a re-archived record technically becomes another record because there is at least one difference: the archive date. In this case, there will be two physical records, which from a traceability point of view are completely different. This is possible since the hash value is not used directly as an index.

6. Digital Signature

Digital signature mechanisms add an additional level to the integrity aspect. With Arcsys you can attach a digital signature to the document hash. The digital signature is then saved in the relational database, in the XML manifest of the lot and if appropriate in a common signature file.

This function is a commercial option of the Arcsys product (ArcSIGN Option).

7. System Security

7.1. Description

The Arcsys Engine is accessed in a user session context, i.e. using authentication services and authorization management. Since each company network has these services, Arcsys Engine security is based on these external services.

These external authentication and authorization services are accessed via the interface available on the Java platform, i.e. JAAS for user authentication and JNDI for looking up authorizations (through directory services).

7.2. Authentication

When the user is identified, a connection to the security management server (Active Directory, Kerberos, PAM, etc.) declared in the configuration files of the product takes place. This operation retrieves "a ticket" that authenticates the end user in a unique way and checks the permissions granted to this user.

7.3. Authorizations

The Arcsys interface accesses a mainstream directory service such as Microsoft's Active Directory, which is an LDAP type service, but without limiting the system to this component.

Authorizations from the point of view of functions are handled by the LDAP; authorizations at the level of collections, repositories and lots are handled in the Arcsys Database.

7.4. Access and Operating Security

Expiry dates are managed at record level in compliance with the time period requested in the storage policy or better, in the retention schedule. A storage policy is a rule (there can be an infinity) that establishes the series of storage media on which a record is to be placed throughout its life cycle. A retention period is associated with each of these media.

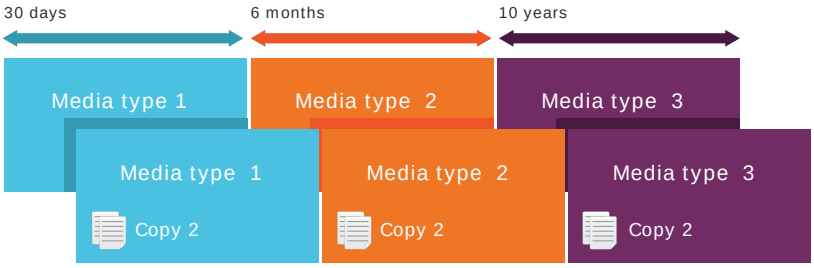

Figure 7.1. Example of a Storage Policy

A *retention schedule* defines the retention start and end dates of records that are attached to it, either directly or through their class. The use of the retention schedule, possible as of version 5.0 of Arcsys, is not mandatory but highly recommended, as it separates the storage concept clearly from the retention concept.

With the example of the Figure 7.1, “Example of a Storage Policy” [28], a storage policy in which a succession of three types of media has been defined, designated by logical pools.

In addition, a duplicate copy is requested for each medium.

The expiry date is the sum of the retention periods of n media making up the life cycle, i.e. 10 years and seven months in our example.

Arcsys can generate and manage multiple record copies.

7.4.1. Operational Security

Arcsys can be deployed with a view to a BRP (Business Recovery Plan): each module is duplicated on a number of sites that thus ensure continuity in the event of a technical incident.

7.5. Confidentiality

The confidentiality of information during transfer to the network and during intermediate storage on buffer disk zones during the archiving phase is managed either directly by the NFS protocol that takes over the encryption function natively by calling an encryption routine on IP protocol. In the absence of a specific module in the company, Arcsys uses its own encryption module. Confidentiality is configured at the level of each client agent, i.e. certain applications could have their records encrypted during transfer to the network, whereas others would not.

7.6. Timestamp Authenticity

To timestamp the activity of the archiving server, Arcsys captures the time system at the level of the server that supports the relational database.

The evidential value of the record will depend on the authenticity of this system time and its traceability. For this, simply connect to a time server that captures the system time on an official source outside the company.

Note

The purpose of this chapter is simply to emphasize to the client company the importance of this point in demonstrating good faith at all times.

This is a prerequisite outside the scope of the Arcsys system that is incumbent on the end client.

7.7. External Timestamping

Arcsys provides an option used to perform external timestamping compliant with the RFC3161 standard. Use of this function is recommended in conjunction with the digital signature option. In this way, timestamping is performed on the digital signature.

The complete timestamp response is stored in the Arcsys Database.

7.8. Partitioning Applications

Two complementary utilities manage application partitioning:

- The principle of "repositories" that logically partitions records;
- The use of specialized agents per application assigns permissions to users responsible for operating these agents.

Part 4. Technological Features of the Software

1. Functional Architecture

1.1. Introduction

The diagram below provides an overview of the Arcsys architecture.

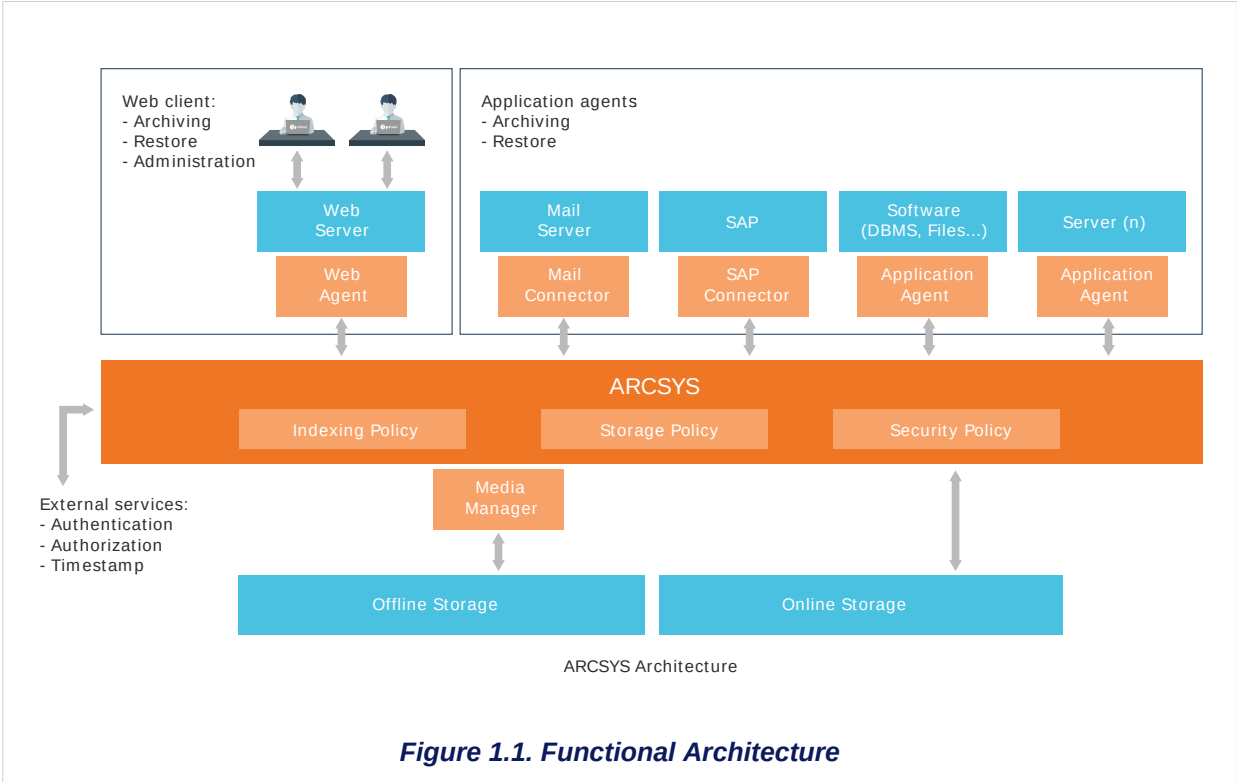

Figure 1.1. Functional Architecture

It is composed of an Arcsys Engine running synchronous or asynchronous multi-thread processes and client agents.

1.1.1. Arcsys Application Agent

The Arcsys Application Agent lets you archive:

- Data present on an end-user workstation (e.g. PDF document, etc.) ;
- Data present on an application server, issued from a processing string or extracted by a connector (example: rows extracted from a database, AFP files, documents from an EDM, etc.).

1.1.2. Arcsys Engine

The engine operates in conjunction with a temporary storage space from which the objects to archive can be transferred, either when sent by another agent or when directly transferred to this space.

1.1.3. Connectors

These are used to extract data from a third-party software package or to bring additional functions to Arcsys.

To date, there are numerous connectors or options:

- ArcERP for ERP archiving (example: ArcERP for SAP)
- ArcGED for interfacing with EDM software packages (Electronic Document Management). Examples: Nuxeo, FileNet
- ArcMAIL for archiving Exchange or Domino emails
- ArcIP for record ingestion
- ArcEP for batch record retrieval
- ArcSIGN Option for internal and external signature and timestamping management
- ArcAFP Option for archiving and viewing AFP files
- ArcPAK Option for managing native ZIP files
- etc.

Please contact Infotel for additional information on these products.

1.2. Archiving Agent

The user component is equipped with a web-type graphical interface. It contains functions that are available or not available according to the permissions granted to a group of users to which the connected user belongs.

Generally speaking, there are three main function groups on the agent:

- Administration functions: Manages Arcsys components;
- Operation: Defines archiving policies;
- Business functions: Defines indexing criteria and proceed with archiving.

The web interface is retrieved with the properties files in the following two languages: French and English. These files are easily modifiable.

When users identify themselves, a connection to the LDAP server configured takes place thus allowing recovery of all user permissions.

The duration of user sessions can be configured. When the session expires, the user is directed to the identification page.

The figure below gives a general idea of the appearance and usability of the interfaces.

1.2.1. Graphical Interface

This interface is designed for use with a number of browsers such as Microsoft Internet Explorer (Windows), Mozilla Firefox, or Google Chrome.

On the left, the Menu section is used to find the current function in the Arcsys directory trees and directly access the function in question.

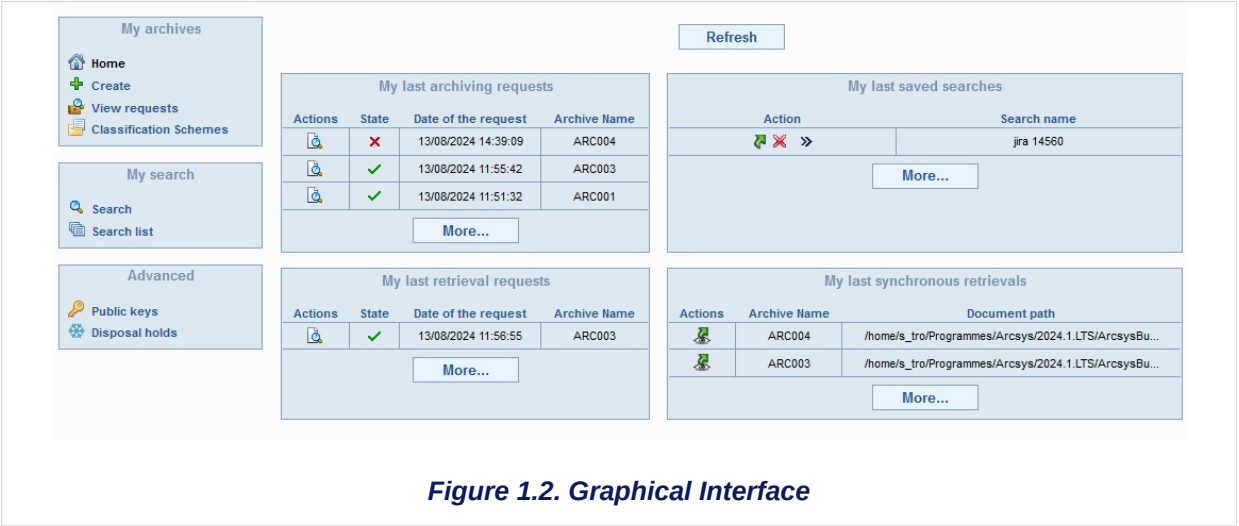

Figure 1.2. Graphical Interface

2. Physical Location of Components

2.1. Introduction

The archiving platform of the Arcsys product is composed of several modules that can be duplicated to absorb any scaling in infrastructure. These modules are located on one or more physical machines according to the capacity loads required for the archiving and retrieval operations.

Moreover, the general architecture of the Arcsys Engine uses a certain number of interfaces. With the exception of the communication interface, these interfaces help to integrate the Arcsys Engine in multiple software environments that can be found in an open system.

The figure below illustrates both the components and the flows between these various modules.

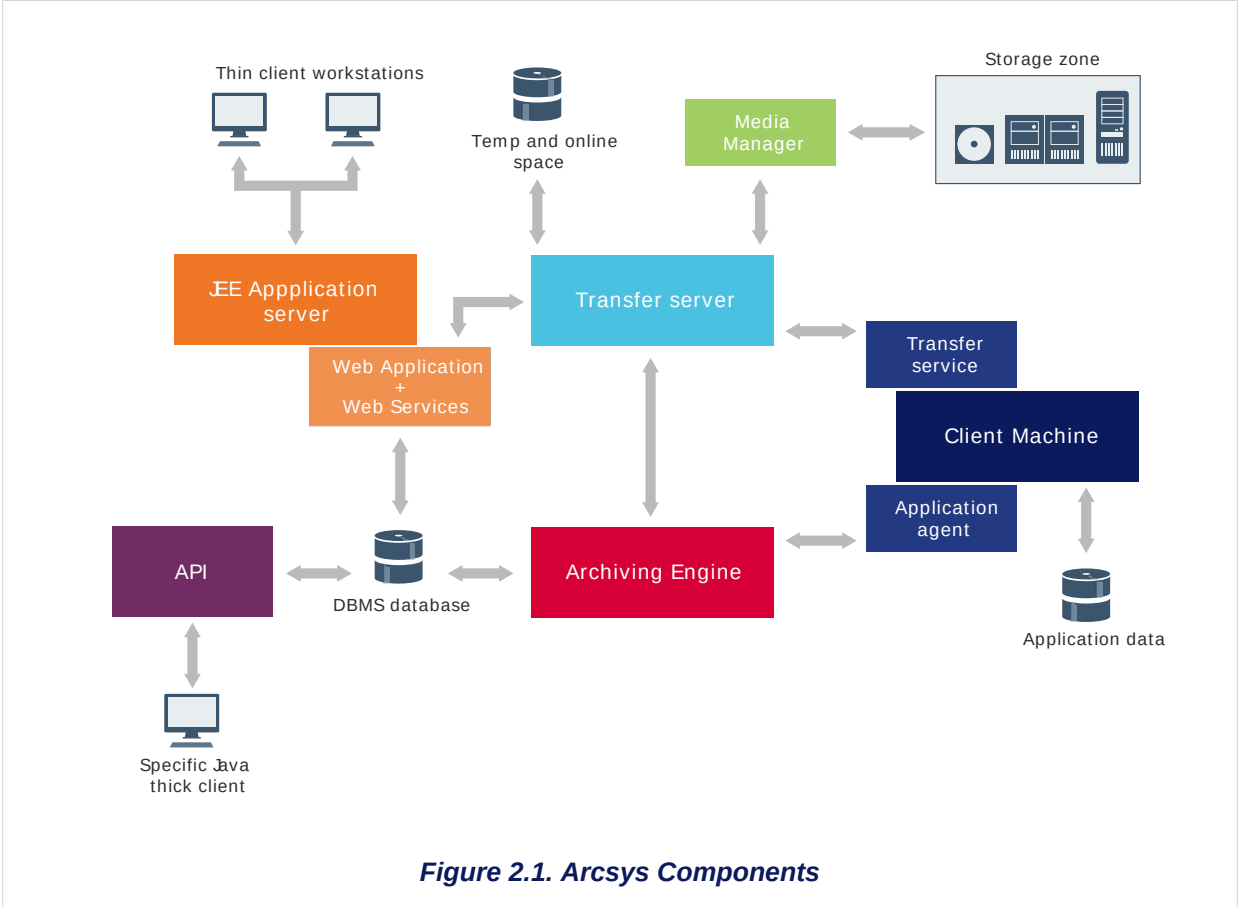

Figure 2.1. Arcsys Components

2.2. Archiving Engines

Each Arcsys Engine is a Java process that uses a number of threads.

2.3. Characteristics

This component is used to:

- Carry out archiving and retrieval requests;
- Prioritize these requests;
- Manage the "Arcsys Transfer Server";
- Control the agents specific to each client application for archiving.

This component:

- Is written in Java;
- Uses the RMI protocol to communicate with the agents;
- Uses the IP sockets to communicate with the Arcsys Transfer Server;
- Accesses the relational database via the JDBC interface;
- Checks the identifications and authorizations with JAAS and JNDI.

2.4. Transfer Servers

Each Arcsys Transfer Server is composed of two processes that are self-monitoring.

2.4.1. Characteristics

This component is used to:

- Control the media manager to archive and retrieve objects;
- Carry out archiving engine requests;
- Make use of "ONLINE" requests of the application server;
- Retain objects in local with an "ONLINE" retention date;
- Transfer to and from the transfer services located on each archiving client machine;
- Manage NFS mounting on the archiving client machines.

2.5. Transfer Services

Each Arcsys Transfer Service is presented as two processes managed by the transfer servers.

2.5.1. Characteristics

This component is used to:

- Transfer from the client machines to the "Arcsys Transfer Server" and vice-versa;

2.6. Application Agents

Each Arcsys Application Agent is a Java process controlled remotely by an archiving engine.

2.6.1. Characteristics

This component is used to:

- Extract client application objects;
- Build the files of each record;
- Extract the objects of a record to retrieve them;
- Inject retrieved objects in the client applications;
- Ensure encryption of transfers;
- Ensure data integrity.

2.7. The Arcsys Web Agent

This is a JEE application.

2.7.1. Characteristics

This application is used to:

- Present all necessary functions for the product in a "thin" web interface (HTTP or HTTPS protocol);
- Control the Arcsys Transfer Server during synchronous retrieval requests of the archived documents.

2.8. The Arcsys Database

The relational database is hosted by a relational database manager.

2.8.1. Characteristics

This component is unique on the archiving platform, and:

- Stores all definitions either by business type (indexing mask) or operating type (storage policies for archived objects);
- Retains all archived object references;
- Facilitates a given object search according to indexing criteria;
- Traces all operations irrespective of their type of archiving, retrieval, technical work, updates of other components, etc. ;
- Integrated in a standard database manager, it supports the main products on the market (Oracle, DB2, MariaDB, SQL Server);
- Uses only functions common to all these managers according to the JDBC protocol.

2.8.2. Modelling

This relational database is simple enough to be easily implemented on the main relational database management systems.

2.9. Communication Interface

The Arcsys Engine uses a communication interface based on the Java™ RMI (Remote Method Invocation). This method deploys a part of resource use to the machine hosting the archiving server and not to the machine hosting the client application.

2.10. Security Management

The Arcsys Engine is accessed in a user session context, i.e. using authentication services and authorization management. Since each company network has these services, Arcsys Engine security is based on these external services.

These external authentication and authorization services are accessed via the interfaces available on the Java platform, i.e. JAAS for user authentication and JNDI for looking up authorizations (through directory services).

2.10.1. Authentication

This component implements a Java version of the PAM (Pluggable Authentication Module) model that delivers an authentication service independent of the authentication technologies used.

2.10.2. Authorizations

The external authorization service is accessed via the JNDI interface (Java Naming and Directory Interface). This interface is a Java standard that provides Java applications with a unified interface for directory services. This interface accesses a mainstream directory service such as Microsoft's Active Directory, which is an LDAP type service, but without limiting the system to this component.

2.10.3. Interfaces with the Relational Database

The Arcsys Engine requires use of a relational database. Access to this database takes place via an interface for access to data using the JDBC protocol (Java Database Connectivity) and the connections to this database are distributed via a connection pool.

This connection pool aims to eliminate the impact of initial creation of access to the repository, which is costly on performance. The connection pool allows a certain number of pre-established connections to remain permanently available.

The JDBC API allows access to effectively all data sources, database models and flat files. Using this API provides the Arcsys Engine with considerable independence in terms of the DBMS chosen to support the relational database.

2.11. Arcsys APIs

The APIs can be used in addition to the standard commands or functions available with the product.

They are based on the SOAP, RMI and REST protocols. These APIs are used to manage each type of Arcsys entity (repository, collection,lot, storage policy, indexing mask). They access the Arcsys Database.

The APIs are used to access the same options as in the Arcsys web interface, and are used in particular by all Arcsys connectors to inject or retrieve records.

3. Arcsys Media Manager (ArcMover)

3.1. Overview

In addition to interfaces with Cloud products, Arcsys includes its own media manager called ArcMover. This is a commercial option for the product. This component includes functions that are located on a number of levels:

- at relational database level;
- at the level of the Arcsys Engine;
- at the level of the Arcsys Transfer Server;
- at the level of the Arcsys Web Agent;
- via the creation of a new TCP/IP protocol.

3.2. ArcMover Functions

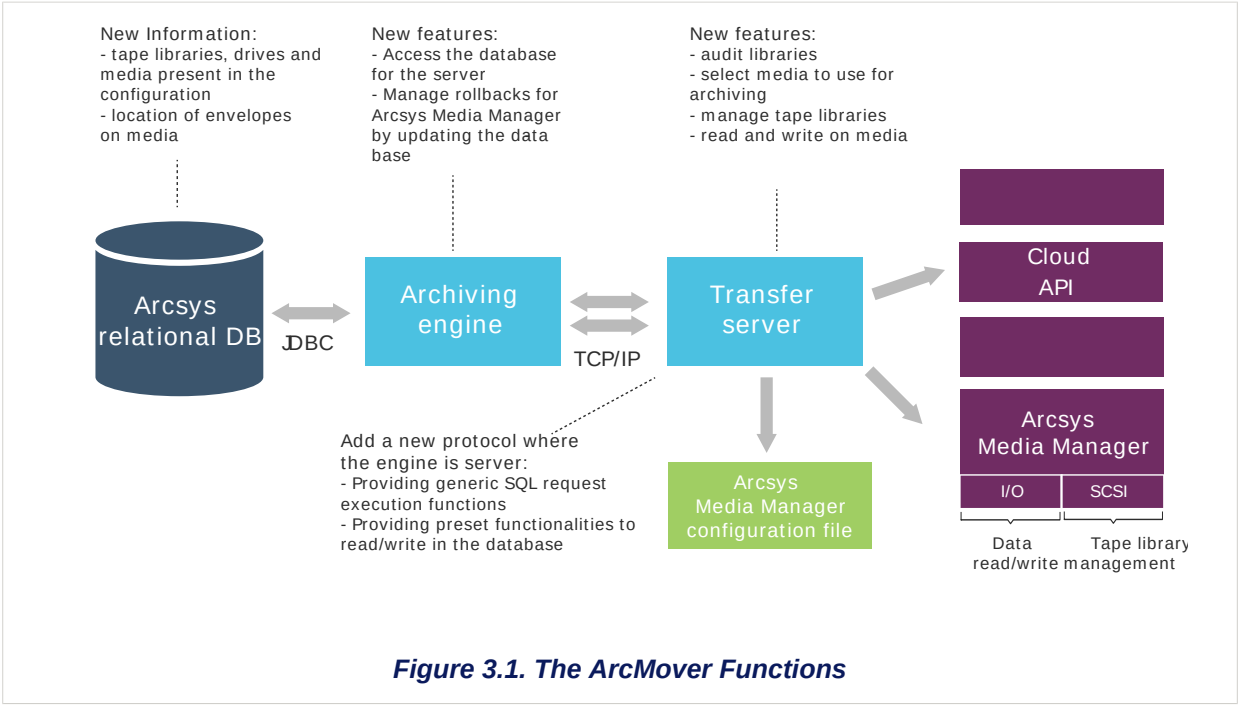

Figure 3.1. The ArcMover Functions

3.3. Relational Database

Information in the relational database includes in particular:

- Managing storage peripherals: the tape libraries, the different drives dedicated to Arcsys, etc.

- Managing media available for tape libraries, with the media's id, barcode, capacity, remaining space, status, state, the drives that can be accessed, etc.
- Location of envelopes on the media, with the associated media and its placement (in offset or file mark form) for each envelope archived.
- Description of all jobs and actions performed for each job.
- List of errors per hardware component, such as the number of read/write errors on a given tape and the movement of an arm, etc.

3.4. SCSI

SCSI controls the tape library to which the controller is connected.

4. Asynchronous Tasks

4.1. Introduction

The main asynchronous tasks running within the system are as follows:

- Archiving process
- Retrieval process
- System audit process

4.2. Archiving Process

Even though creating an archiving request is a synchronous task, the operation consisting of fulfilling this request is purely asynchronous.

4.2.1. Characteristics

Archiving tasks are performed in a time window. This window is managed externally, via a command telling Arcsys that it must start or stop all archiving. Nonetheless, this window does not affect requests sent online nor the creation and acceptance of archiving.

Data is analyzed and reorganized to create archiving objects. Objects for archiving are sent to the media manager via an access interface. Archiving identifiers received from the media manager as well as the metadata are finally stored at the Arcsys Database level.

Archiving request statuses are updated in the Arcsys Database. Managing the statuses for each request creates synchronization points for the archiving. These statuses are used for Recovery/Restart procedures. In case of a programmed or unexpected system shutdown, the processes resume at the levels indicated by their status.

4.2.2. Data Organization

An archiving lot corresponds to each archiving request. This functional concept of a lot represents a set of objects that will be archived in the same archiving process and with the same indexing criteria.

A file called a "manifest" contains all indexing criteria allocated to the lot, as well as the description of all objects present in the lot, will be generated and retrieved by the Arcsys Transfer Server. This information contained in this (XML) file comprises the metadata associated with the lot.

On the storage media, the "Manifest" always precedes the TAR file containing the objects.

```
<?xml version="1.0" encoding="UTF-8"?>
<MANIFEST CREATION_DATE="2009/04/07 12:03:39" VERSION_XSD="V4">
  <LOT ID="35">
    <CODE>TC05-06_0</CODE> <LIBELLE>TC05-06_20090407120334</LIBELLE>
    <START_CONSERVATION>2009/04/07 12:03:38</START_CONSERVATION>
    <OBJECT_AMOUNT>11</OBJECT_AMOUNT> <SIZE>13</SIZE>
    <COLLECTION ID="6">
      <CODE>Theses</CODE> <LIBELLE>Theses</LIBELLE> <RETENTION>1</RETENTION>
    </COLLECTION>
    <BASE ID="3">
      <CODE>ABES</CODE>  <LIBELLE>Agence Bibliographique de l'Enseignement Supérieur</LIBELLE>
    </BASE>
    <META_DATA_LIST>
      <META_DATA ID="2041">
        <KEY ID="49"> <KEY_CODE>title</KEY_CODE> <KEY_TYPE>STRING</KEY_TYPE> </KEY>
        <VALUE>Test_Case_05_06</VALUE>
      </META_DATA>
      <META_DATA ID="2042">
        <KEY ID="50"> <KEY_CODE>creator</KEY_CODE> <KEY_TYPE>STRING</KEY_TYPE> </KEY>
         <VALUE>or</VALUE>
      </META_DATA>
    </META_DATA_LIST>
   </LOT>
  <TAR_LIST>
    <TAR_FILE TAR_NUMBER="2">
      <HASH_FUNCTION>SHA1</HASH_FUNCTION> <HASH_VALUE>09117e48d5d83e4799b31eb0be9ce0d28e054b2a</HASH_VALUE>
      <NAME>lot_35_seq_2</NAME> <SIZE>70</SIZE>
    </TAR_FILE>
  </TAR_LIST>
  <OBJECT_LIST>
    <OBJECT ID="125">
      <TYPE>FILE</TYPE><FILE_EXTENSION>TXT</FILE_EXTENSION><IS_NATIF>true</IS_NATIF> <SIZE>1</SIZE>
      <TAR_NUMBER>2</TAR_NUMBER>
      <HASH_FUNCTION>MD5</HASH_FUNCTION><HASH_VALUE>bb5903310de340d79de6cf9cc8bc1599</HASH_VALUE>
      <LOGICAL>/home/arcsys/4.3/Test/SERVICE1/VERS/Theses/TC05-06/DEPOT/TEST000003.txt</LOGICAL>
      <PHYSICAL>file0</PHYSICAL> <OBJECT_DESCRIPTOR>file0.arcsys</OBJECT_DESCRIPTOR>
      <IS_HIDDEN>false</IS_HIDDEN>
      <LAST_MODIFIED>2009/04/07 11:58:54</LAST_MODIFIED> <HAS_READ_ACCESS>true</HAS_READ_ACCESS>
      <HAS_WRITE_ACCESS>true</HAS_WRITE_ACCESS><UID>987</UID><GID>987</GID><RIGHTS_ACCESS>436</RIGHTS_ACCESS>
      <LAST_ACCESS>2009/04/07 12:03:34</LAST_ACCESS><LAST_CHANGING_STATUS>2009/04/07 11:58:54</LAST_CHANGING_STATUS>
      <FILE_TYPE>R</FILE_TYPE>
      <META_DATA_LIST>
        <META_DATA ID="2069">
          <KEY ID="80"><KEY_CODE>nomFichier</KEY_CODE><KEY_TYPE>STRING</KEY_TYPE></KEY>
           <VALUE>TEST000003.txt</VALUE>
        </META_DATA>
      </META_DATA_LIST>
    </OBJECT>
  </OBJECT_LIST>
</MANIFEST>
```

Figure 4.1. Organization of the Manifest File

4.2.3. Metadata

The metadata associated with the lot can be of two types:

- Structural metadata:
  - Object name
  - Type: The type of the archived object indicates the type of action that can be performed on the object (editor tool, structure analysis, converter, etc.) ;
  - Size;
  - Description (optional text describing the object)
  - Associated structure: A file describing the structure of the object can be associated with it, if appropriate.
- Indexing metadata:

This data is used to classify a lot (all its elements) with respect to a set of indexing criteria. The indexing criteria are thus comprised of a list of "Keyword/Value" pairs.

4.2.4. Request Statuses

There are nine different statuses that indicate the progress of the archive request. Apart from their informative value, they are necessary synchronization points in system recovery/restart.

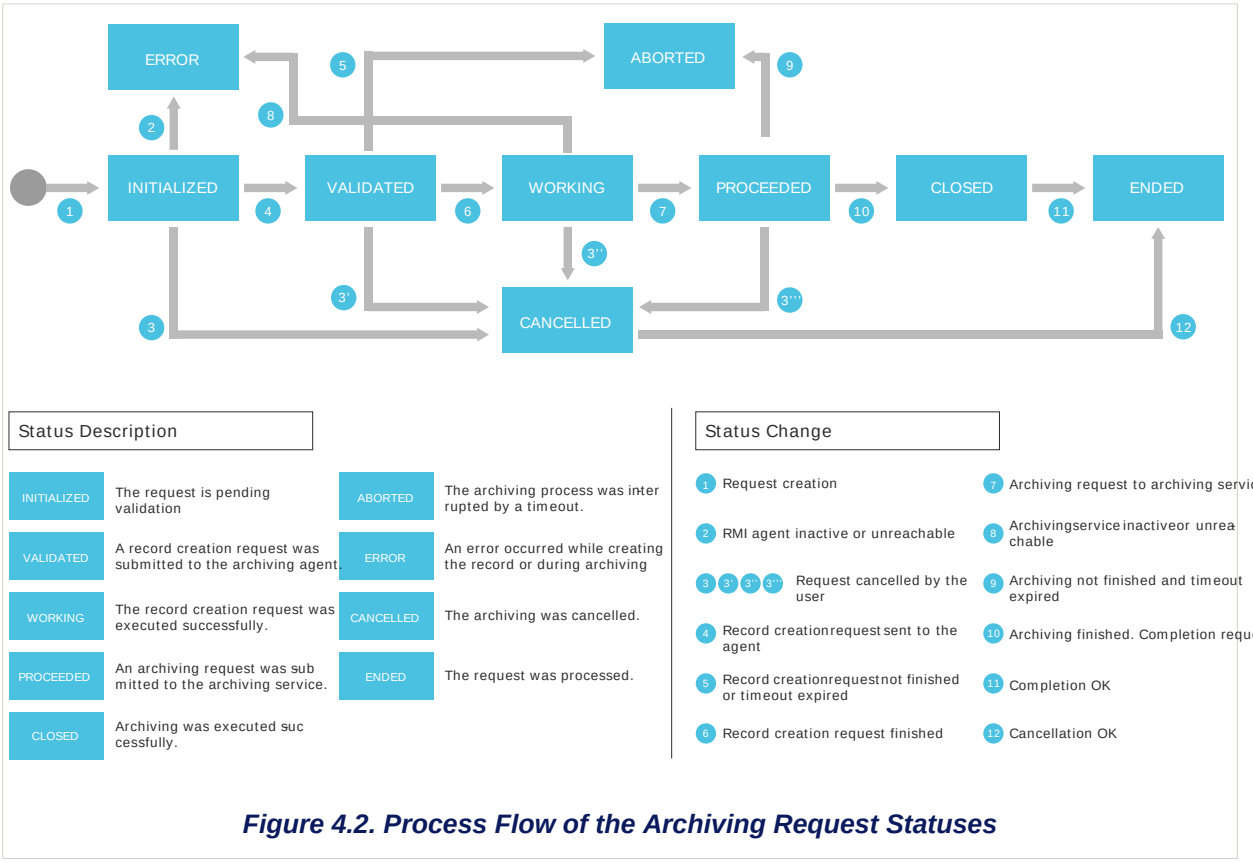

Figure 4.2. Process Flow of the Archiving Request Statuses

4.3. Retrieval Process

A retrieval process also exists.

4.3.1. Characteristics

It runs in an independent thread.

Retrieval tasks are performed in a time window. This window is managed externally via a command telling Arcsys that it must start or stop all archiving tasks.

The list of retrieval tasks is retrieved from the Arcsys Database.

Request statuses are updated in the relational database.

Status management is used to create synchronization points used in the event of a Recovery/Restart.

4.3.2. Data Organization

All objects retrieved are transferred to the retrieval buffer sub-directory associated with the request. A file describing the retrieved objects will be generated by the engine and recorded in the same directory.

4.3.3. Request Statuses

There are nine different statuses that indicate the progress of the retrieval request. Apart from their informative value, they are necessary synchronization points in system recovery/restart.

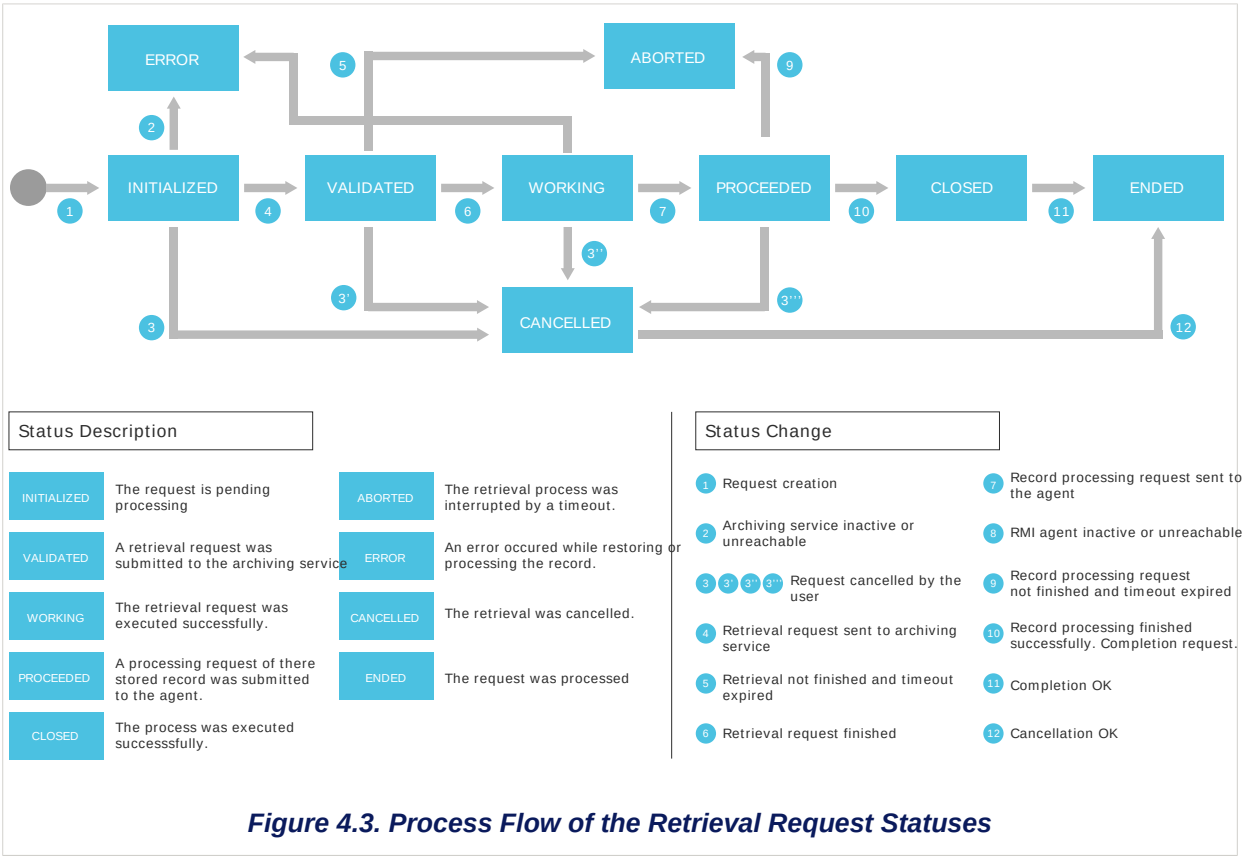

Figure 4.3. Process Flow of the Retrieval Request Statuses

4.3.4. Retrieval Modes

The retrieval process can be performed according to one of the following two modes:

- "Retrieve to client" mode

In the "Retrieve to client" mode, the retrieval process will be executed until final availability of the data to retrieve on a specific remote space specified by the client. On starting the request, the client will have provided all the parameters required for connection and data transfer.

- "Retrieve to online" mode

In "Retrieve to online" mode, the retrieval process will run until the Arcsys Engine is directly available on the Arcsys Web Agent or via an API call by the Arcsys RMI, TCP/IP and SOAP API.

4.4. System Check

The characteristics of the system check process are as follows:

- The system check is a permanent task that runs in an independent thread.
- It checks smooth operations of all components of the system and restarts faulty modules if necessary.
- It checks the use of work spaces.
- It closes sessions after detecting a certain period of inactivity.
- It purges "Close" or "Error" status requests according to retention periods defined for each of these cases.

5. Synchronous Tasks

5.1. Introduction

The main synchronous tasks running within the system are those generated by the engine or API accesses via their RMI interface. They can come in three types:

- Actions used for engine administration
- Actions used to submit archive and retrieval requests
- "Online" access to the record

These synchronous tasks take place during user sessions. Hence, the execution of these tasks depends on the permissions associated with these sessions.

5.2. Engine Control

These are orders sent to the engine to stop, start, and query its current status.

The stop can be immediate or "graceful". A "graceful" stop awaits for the pending requests to be terminated before stopping the engine.

5.3. Request Management

Archive and retrieval requests take place via the Arcsys API. This management consists of a set of synchronous commands as seen below:

5.4. Creating a Request

This command initiates an archiving or retrieval process. Depending on the type of request created and the data transfer mode chosen, information concerning the location of the data (transfer protocol, service URL, access identifier etc.).

5.5. Cancelling a Request

All retrieval requests can be cancelled by the request initiator.

5.6. Status of a Request

All authorized users can query the status of a request (in archiving or retrieval).

5.7. "Online" Access to the Record

The advantage of this online record is immediate access to the elements it contains, which allows it to authorize synchronous access.

Part 5. Advantages

1. Introduction

Information is often managed in a company on different IT platforms, which is why Arcsys was built on a central architecture that can manage all the company's archiving, irrespective of environment type.

The Arcsys software is an archiving system that completely takes over issues of solution continuity and integrity:

- Arcsys captures information at source in real time, without penalizing IT production. In the same way, integrity checks are performed throughout the record retention phase, irrespective of the type of medium on which it is stored. Arcsys is probably the safest way to meet legal obligations for data retention.
- To guarantee system continuity, all records produced can be reread without the archiving software. In the same way, all internal structures are published so that system holders are completely independent and have free access to their records.

Above and beyond legal requirements, Arcsys is a software package used to archive all type of files and content for databases on the most common platforms, index record lots flexibly to enable searches based on company core business criteria.

The extreme scalability and independence from all types of hardware and software protects your investment and enables it to adapt to any increase in volume.

2. Advantages for Business Activity

Arcsys can meet legal obligations regarding data retention, but not just that. Integrity is a parameter set at the level of each object archived, meaning that Arcsys can be used both for legal obligations and for standard objects.

Depending on the company's business activity, data belonging to certain core businesses may be subject to archiving and require traceability.

Financial department managers may also be required to justify their business activity to fiscal authorities or even be required to comply with foreign regulations.

Secure storage and, in particular, the Arcsys classification methodology means you can find information quickly and the meet the claimant's demands.

3. Advantages for the User

Arcsys can be configured to completely automate periodic archiving operations. Nonetheless, users can still perform manual archiving operations via the GUI.

The archiving operation either makes a copy or moves objects. For the latter, they are deleted from their original position.

Metadata can be either acquired directly from the content of the object to archive (structure metadata) or defined via a definition structure (indexing metadata) to comply with regulations.

4. Advantages for the IT Department

Arcsys is a central archiving platform that hosts and consolidates all the company's archiving applications. Storage media can also be consolidated.

Arcsys manages the automatic transparent technological migration between storage media.

Arcsys rereads storage media periodically to prevent faults on the physical media.

The use of various storage media guarantees continuity of the archiving system.

The records generated are independent of all software components, so they can be viewed without having to stop the software that generated them.

With efficient administration tools, the archiving process is customized to meet all specific client needs.

The system is granular and scalable, which makes investments sustainable and reliable. This is particularly important to meet regulatory requirements and needs for long retention periods.

5. Compliance with Standards and Legislation

Arcsys takes into account standards issued from two different areas:

- Standards for secure preservation of digital data: NF Z42-013, ISO 14721 (OAIS)
- Standards for the management of electronic records: MoReq2, MoReq 2010

With respect to archiving, the NF Z 42-013 standard is the better known. This standard manages the fixity of a container: the storage media.

French legislation (Article 1316 of the Civil Code), however, requires the fixity of the content, from object creation to its presentation as evidence.

The difference between this standard and the law is therefore important, as before it is copied onto an electronic medium, in many cases the data has already existed on a simple magnetic medium. The search for integrity therefore covers the period preceding the copy (as close as possible to the original). In the same way, if the retention period exceeds the life expectancy of the medium, integrity must also cover the technological migration periods of the medium and cover the succession of storage media.

Without questioning the spirit of the standard, it can be seen that strict integrity requires much more than simple compliance with the standard.

Arcsys offers a superior guarantee of fixity. The integrity certificate, calculated during the archiving procedure, will remain effective throughout the life cycle of the data, irrespective of the storage medium.

Glossary

Access Zone

An access zone is an independent entity within Arcsys that defines a controlled network area from which resources can be accessed. These entities can then be attached to permissions (at the repository, collection, lot, or class level) to restrict or grant access based on the client's IP address when authenticating to the Arcsys REST API, the Arcsys Web Agent or ArcWeb Module.

API *(Application Programming Interface)*

The APIs provided by Arcsys enable the product holder to fully customize a new application or user interface according to the specific ergonomic needs of their use case. Arcsys exposes several types of APIs:

- REST APIs are the recommended interface. They offer broad coverage of Arcsys's functionalities, including administration, operations, archiving, search, and archive retrieval.
- Legacy APIs based on RMI and SOAP protocols are still available for compatibility purposes but are deprecated and should no longer be used in new developments.

Application Agent

There are two different types of agents at archiving level: application interface agents and user interface agents. An **application agent** can archive all the objects specific to an application (files, RDBMS table records, etc.), whereas a **web agent** performs both administration functions and manual archiving functions initiated by the user.

Archiving By Reference

Archiving by reference is a method in which data remains in its original storage location when added to an archive system, and the system generates references and metadata entries for the files. Eventually, the files are transferred to the archive system's defined storage using the copy and migration mechanism.

Archive Restitution

Archive restitution is the return and transfer of archived documents to their originator, or to a duly appointed person or organization. An Archive Restitution is in Arcsys an Archive Retrieval operation that ends with a Destruction. An Archive restitution operation can only be created through the appropriate operation in the REST API, or by using ArcEP module.
See Also **Archive Retrieval**, **Destruction**.

Archive Retrieval

Archive retrieval is an operation that makes a copy of a record available to a record requester. This term takes precedence over the term *restore*, which has another meaning at archiving level (restore in the sense of handing back the documents to the organization that created them or to its representatives, then destroying them). Archive retrieval can be

complete (misleadingly called a "complete retrieval") or partial (*Partial Archive Retrieval*, misleadingly called a "partial retrieval").
See Also **Archive Restitution**.

Arcsys
ERM published by Infotel. Arcsys refers to both the Arcsys Core product and all of its connectors and options.

Arcsys Connector
An Arcsys connector is an operational module generally requiring an additional license used to interface with an external software package (ECM, ERP, Mail) for archiving and/or archive retrieval to and from Arcsys.

Arcsys Core
The Arcsys Core represents all "essential" Arcsys modules, which are: Arcsys Database, the Arcsys RMI, TCP/IP and SOAP API, the Arcsys REST API, the Arcsys Transfer Server, the Arcsys Transfer Service, the Arcsys Engine, the Arcsys Web Agent, the Arcsys Application Agent, the Arcsys Auto-Archive Agent, the ArcFF format control module, the CopyRequestManager, the Arcsys standard Clients, the ArcsysFsComparator File systems comparator, the ArcProofFolder Proof Folder module and the ArcsysBatchs batch module.
See Also **Arcsys**.

Arcsys Engine
Central archiving platform on which synchronous and asynchronous archiving, indexing and retrieval processes operate. The engine can spread threads over multiple processors. This guarantees dialogue and traceability between the agents that are associated to it.

Arcsys Option
Arcsys options are added to the Arcsys Core for additional functionalities. They do not necessarily require an additional architectural module. They may be subject to a separate license. The main options are:

- ArcAFP Option (AFP format management)
- ArcMover Tape Option (media manager managing file systems and tape libraries)
- ArcIP (record ingestion)
- ArcEP (record extractor)
- ArcPAK Option (record compression on ArcMover and native ingestion of compressed files)
- ArcRFT Option (full text search)
- ArcSIGN Option (internal digital signature generation) and ArcVERIF (external digital signature verification)

- ArcCrypt Option (encryption of data at rest)
- ArcCFN (digital vault)
- ArcREF Option (record ingestion by reference)
- ArcMOVS3 Option (media manager allowing to archive and retrieve data on any Cloud media compatible with the Amazon S3 REST API)

Attestation policy

An attestation policy allows to define which type of attestation can be generated as well as a set of parameters concerning their generation.

Classification Scheme

A classification scheme in archiving and digital preservation refers to an organized framework for categorizing records and archival materials based on a hierarchical structure. It facilitates systematic retrieval, management, and preservation of information. In the context of Arcsys, the classification scheme is defined as the structural entity that contains a hierarchy of classes. These classes are used for organizing archives and records and for implementing specific archival policies such as retention schedules and format management. Within Arcsys, a classification scheme is linked to a specific repository, providing an organizational backbone for multiple collections. It also serves as a navigational tool for end users, enabling them to explore archives through the hierarchical structure of classes, alongside navigation by repository and collection.

Collection

Set of rules that a record must comply with. The collection is defined via the Web agent or Arcsys API, and comprises information contained in the relational database tables. A collection always refers to two rules: one concerning the **storage policy** and one relating to the **indexing mask**. A collection is assigned to the record on the initial record request.
See Also **Storage policy**, **Indexing mask**.

Deletion

MOREQ2010 provides the following definition for this concept: the act of deleting data from the relational database so that no trace remains. Generally speaking, an entity can only be deleted if is not used in a stored record. Otherwise, it can only be destroyed and not deleted, thus leaving a residual entity.
See Also **Destruction**.

Destruction

Irreversible action that deletes the documents by applying disposal criteria. It can be associated with the retention of residual information in the relational database.

Disposal

Outcome of archived documents when the retention period ends, i.e. generally, destruction or transfer.
See Also **Destruction**, **Transfer**.

Disposal due date (or retention end date)
Scheduled end of retention date.

Disposal Hold
Arcsys can be used to place a "disposal hold" on one or more lots archived in the application. This prevents certain sensitive operations, such as transitioning the lots to end-of-life status or migrating them to a different storage medium. All other operations remain authorized. The disposal hold guarantees that no irreversible change affecting the archival integrity or status of the lot can occur while the hold is active.

Electronic Attestation
Document produced to attest that an action or an electronic transaction has occurred.

Envelope
Arcsys groups documents stored in the system in envelopes, either created by Arcsys during the archiving process (in this case, files in TAR format), or created prior to Arcsys processing by the user or third-party processes (*native envelopes* in AFP or ZIP format, for example). The representation of an envelope in the Arcsys Database is called a **logical envelope**. Its technical implementation is also called *MoverReference*. Last but not least, the representation of information of where the envelope is physically stored in the optional ArcMover module is called *MoverMedia*.

Event
In Arcsys, a retention schedule can associate the start of record retention with an event with a known or unknown date. This event, created in an Arcsys repository, can thus be attached to a number of different retention schedules.
See Also **Retention schedule**.

Feature preview
A Preview status on a feature enables early access to non-production features, allowing users to explore and provide feedback for improvement.

Features in Preview status should not be used in production environment, as they are not fully implemented yet.

Fixity
The quality of a document that has not been subject to intentional or accidental destruction, alteration or modification.

Format policy
A format policy is used to define a set of rules concerning format checks for a given file type. These rules are used to specify the action that will be performed, the expected results of these actions, as well as the error cases, triggering archiving failure.

Hash value
Also called an "integrity certificate" in cryptography, the hash value is the digest of a message which guarantees a practically unique result that is impossible to reverse calculate. The most commonly used algorithms are MD5 (128 bits), SHA-1 (160 bits), SHA256 (256

bits) and SHA512 (512 bits). Arcsys includes a module that is capable of dynamically calling several algorithms. The choice of an algorithm type is valid for all archived objects within the same Arcsys product version; compatibility with algorithms from the previous version is guaranteed. The associated term *hash function* is also used.

Indexing mask

As is the case with the storage policy, an indexing mask is a rule that is referenced by a collection. An indexing mask can be referenced by several collections. An indexing mask refers to the use of a set of Keyword = Value pairs. The keyword component is set to make sense in a specific business application (e.g. Accounting Day, Department, Account No., Account Holder, etc.). The value component can be either unrestricted, or restricted to a set of acceptable values (e.g. A, B or C), or in date format, or restricted by an input mask. Some pairs are defined as mandatory whereas others may be optional.

An application which uses an indexing mask through a collection must supply all Keyword=Value pairs as they are defined using this mask. Any indexing-related errors lead to the record being rejected for conformity. This record is then added to the list of records with errors.

The indexing mask is defined by an administrator via the Arcsys interface or APIs. It is comprised of a set of metadata element definitions.

Journal

A journal is an XML file which contains a list of PREMIS events.

Lot

Arcsys can consolidate several different objects that form a functional set in a client application in the same physical record. It is comprised of different types of objects: files, databases, or any other type of object managed by Arcsys. It is possible to retrieve the entire lot or one of the objects contained in the lot. The MOREQ2010 record is translated in Arcsys implementation by a lot; the lot, as opposed to a MOREQ2010 record, can represent documents that are not yet archived.

Lot enrichment

The process of adding new objects to an existing archive.

Manifest

The manifest is an XML file that defines precisely the content of a record. The manifest contains: metadata associated with the record, structure metadata, a description of the physical files of the record(s) that follow, the object-by-object content of the record, object formats, object names, their size, hash value, the algorithm used to calculate the hash value, etc. The manifest is a type of complete ID card for the record.

The manifest is always written on the storage media and precedes the record that it describes. This process is used to automatically describe storage media (irrespective of the medium). With this system, users can understand media content and metadata without installing the software that generated the records.

Metadata element definition (or keyword)
Component of an indexing mask. We use the term "metadata element definition" rather than the term "keyword" as it is closer to MOREQ2010. The metadata element definition in particular defines the type of metadata (date, string, digital, controlled) and its input mask, for example.
See Also **Indexing mask**.

Object
The object is a basic archived unit that can be retrieved via Arcsys. Lots contain one or more objects. An object can be: a file, a directory, a table, a relational table, etc. The MOREQ2010 component is implemented by this object concept; the object, as opposed to a MOREQ2010 component, can represent a document that has not yet been archived.

Online
Storage level, which must be disk type, that makes records permanently available within an extremely reduced time period.

Permissions
Permissions refer to the user profiles or groups authorized to access documents or sets of documents archived in the system.

Program exit
Place in the standard workflow for picking up and executing specific code.
See Also **Workflow**.

Proof folder
A proof folder consists of a record, a proof slip, and, where appropriate, additional items (common signature or timestamp response, for example) that are used, by demonstrating the fixity and the authenticity of a document, for admission as proof. A proof slip can be generated using Arcsys Web Agent, ArcWeb Module, or Arcsys REST API. A proof folder can only be generated using ArcEP.

Record
A record is an evidential document that is deemed sufficiently important by the creator to be managed by an ERM that will manage its life cycle (retention, disposal, etc.). A record represents an archived lot. A record is archived via a *record request*. Archiving a document *creates a record*.

Relational database (or referential)
Essential component of the system, it contains all the data (excluding archived data) used by Arcsys for its operation. It includes logical entities called "repositories" (see definition).

Repository
Logical entity in the Arcsys relational database. The company can define as many repositories as it wants, either to define a test set, to isolate an application, or for any other reason. These repositories are entirely independent of each other. They all have their own pattern and all have the same structure.

Restore(or retrieval)
This term is used misleadingly in Arcsys to refer to the concept of archive retrieval. It is not accepted in archiving terminology as to mean transfer and then destruction.
See Also **Archive Retrieval**.

Retention and disposal schedule
This comprises all the rules defining the record retention period for a company or an organization, according to risks of unavailability and information system access requirements. It specifies the disposal after these time periods.
See Also **Retention schedule**.

Retention period
A duration expressed in days, months or years of object retention. The retention period is a concept used notably in MOREQ2010.

Retention schedule
A retention schedule defines the start and the end of the retention of records that are attached to it, either directly or through their class.

Retention start date
Date from which a retention period must be taken into account. The retention start date is a concept used notably in MOREQ2010.

Security
An ERMS requirement that involves including documents whose use (confidentiality, risk of exposure) and/or fixity (non modification of content, non-alteration of media) should be closely monitored.

Storage policy
A storage policy is a rule that is referenced by a collection. The policy dictates the storage media which are successively implemented to hold a record, as well as the retention period for each media. The storage policy is defined through the graphical interface. Applications or business users use it indirectly through the reference to a collection. A storage policy can be changed over time to reflect new retention periods or new storage media. The policy covers storage units by logical pool.

Storage pool
Logical storage pool, characterized in particular by its time period (e.g. 10 years). The storage policy assigns a "zone" to a "policy".

Storage zone
The storage zone is a logical entity representing a physical storage space (e.g. set of file systems, tape libraries, cloud storage).

Synchronous retrieval
Archive retrieval that takes place in the form of a direct retrieval of a document (for direct viewing or downloading) in a Web browser.

See Also **Archive Retrieval**.

Time stamping

Time stamping is a technique used to associate a document with a certain date in reference to a given and recognized time system. The date set in this way is an essential element for document authentication. Time stamping can be performed internally or by a third-party time stamp.

Tracking

Result of continuously creating, capturing and maintaining information about the movement and use of the system and objects (ISO 15489-1:2001, 3.19).

Transfer

In an archival sense, this operation sends an archived object to another IT system. Once the transfer is performed, the object can be removed from the ERMS as needed. In OAIS terminology, a transfer represents more specifically the physical transmission of a record or a set of records by a service supplying an archive service. Not to be confused with the transfer of data in the purely technical sense, as with the Arcsys Transfer Server module.

Transit Zone

Entity logically connecting an application agent and a directory, along with additional configuration.

Workflow

A set of operations carried out from the beginning to the end of a process. In Arcsys, this refers to all actions carried out on archives and objects, either directly or indirectly, in the case of archives, from their pre-archiving or preparation to their removal from the system (after they have reached end-of-life). There are other workflows in Arcsys besides the archiving workflow, which are more administration-oriented. Customized workflow involves the use of at least one drop-off point to carry out customer processing.

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