

Adabas for Linux and Cloud

Adabas REST Administration

Version 7.2.0

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This document applies to Adabas for Linux and Cloud Version 7.2.0 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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Preface

Adabas RESTful administration is a server that provides the REST interface for Adabas monitoring and Adabas administration tasks. Any RESTful client can connect to the server and use standard web techniques to retrieve Adabas information.

The Adabas REST Administration document is organized as follows:

<i>General Information</i>	Describes in short the concepts and components of the Adabas RESTful administration.
<i>Installation and First Steps</i>	Contains information on how to install and configure Adabas RESTful administration.
<i>RESTful Security</i>	Describes the concepts and administration of Adabas RESTful server security topics such as SSL-encrypted connections and access restrictions to Adabas data.
<i>Adding Support for Multiple Adabas Versions</i>	Contains information on how to enable support for multiple Adabas versions in the Adabas RESTful administration.
<i>Adabas REST Server Configuration</i>	Describes how to configure the Adabas REST server before you use it for the first time.
<i>System Service</i>	Describes the system service provided with the Adabas RESTful administration.
<i>Messages</i>	Contains information about the response codes that are returned if errors occur while processing.

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About this Documentation

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Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the symbol.
[]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

Online Information and Support

Product Documentation

You can find the product documentation on our documentation website at <https://documentation.softwareag.com>.

Product Training

You can find helpful product training material on our Learning Portal at <https://learn.software-ag.com>.

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You can collaborate with Software GmbH experts on our Tech Community website at <https://tech-community.softwareag.com>. From here you can, for example:

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- Ask questions and find answers in our discussion forums.
- Get the latest Software GmbH news and announcements.
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- Go to our public GitHub and Docker repositories at <https://github.com/softwareag> and <https://containers.softwareag.com/products> and discover additional Software GmbH resources.

Product Support

Support for Software GmbH products is provided to licensed customers via our Empower Portal at <https://empower.softwareag.com>. Many services on this portal require that you have an account. If you do not yet have one, you can request it at <https://empower.softwareag.com/register>. Once you have an account, you can, for example:

- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

Data Protection

Software GmbH products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

2 General Information

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Adabas RESTful administration consists of three main access parts:

Adabas Administration and Monitor Handler

The Adabas administration and monitor handler supports:

Resource	Description
Adabas Database	An Adabas database can be created or deleted on the server.
Adabas Runtime	Adabas can be started or stopped using the possibilities that Adabas provides. User queue and UCB entries can be managed. Provides Adabas Nucleus log.
Monitor	Display Adabas user queue, command queue and hold queue. Adabas high water marks and buffer pool statistics are available. All possible monitor features can be found in the Swagger definition.
Adabas Files	Provide the creation and deletion of new Adabas files (online) .
Adabas Fields	Inside the Adabas file, Adabas fields can be modified in the frame of the Adabas functionality.

Job Control

Inside the RESTful server it is possible to start scripts for Adabas utilities. The scripts can be triggered asynchronously. After the job is finished, the corresponding log output can be retrieved using a RESTful access.

Detailed information about the RESTful interface is described in the Swagger definition.

File Transfer Handler

The RESTful server provides an interface to upload or download files to or from the server. The server only provides access to restricted, defined directories. The directories have to be configured in the configuration file.

Each configuration entry can be accessed via a given name. All subdirectories under the configured one can be accessed and files can be transferred.

If a job creates output, the created file can be transferred to the HTTP client (browser or RESTful client).

Technical Insight

Adabas RESTful administration includes standard RESTful HTTP access methods. It supports two types of response formats:

- JSON is the standard supported response format you can use.
- XML can be used for read requests.

Adabas RESTful administration also supports SSL-secured HTTPS connections. HTTPS connections are recommended. For further information about configuring secure REST connections and secure data resource accesses, refer to the section [RESTful Security](#).

Adabas RESTful administration supports the following HTTP/S request types:

- GET: Retrieve administration or monitor information
- PUT: Change an administration value or parameter in the Adabas database configuration
- PUSH: Create new objects such as Adabas database files or an Adabas database
- DELETE: Delete a resource inside the Adabas database

The Adabas REST administration server is open to be used by any RESTful client. There are no restrictions by Software AG components. The RESTful definition is provided in the Swagger file located in the product installation. You can use the Swagger/OpenAPI infrastructure to use the Swagger file.

Adabas Batch Administration

On the Software AG GITHUB page, you can download a batch administration client. The client application can access all flavors of Adabas administration tasks that the Adabas RESTful administration server provides.

The GITHUB page can be found at <<https://github.com/SoftwareAG/adabas-admin-restful-client>>.

The following example shows the batch command to list all available databases on the remote server:

```
client -url <host>:<port> list
```

The output of this example out would look something like this:

```

2018/10/10 12:40:54 Adabas Administration RESTful client started

2018/10/10 12:40:54 Server: linhost:8390
2018/10/10 12:40:54 User:   admin

Enter Password:

Dbid   Name                               Active   Version

  001 [TestDatabase   ]      false  Adabas v6.6 (20)
  015 [SAMPLE_DB     ]      false  Adabas v6.6 (20)
  050 [GENERAL_DATABASE]      false  Adabas v6.5 (19)
  075 [GENERAL_DATABASE]      false  Adabas v6.7 (21)
  102 [GENERAL_DATABASE]      false  Adabas v6.6 (20)
  155 [SAMPLE_DB     ]      false  Adabas v6.7 (21)
  195 [DEMOBDB       ]      false  Adabas v6.7 (21)

2018/10/10 12:40:57 Adabas Administration RESTful client took 61.262267ms terminated

```

In batch mode, the ADABAS_ADMIN_URL environment points to the Adabas RESTful administration server, and the ADABAS_ADMIN_PASSWORD environment can contain the user password.

The Adabas batch client supports the following commands/functionality:

Command	Functionality
env	List Adabas environment version
list	List all Adabas databases
start	Start Adabas database
shutdown	Shutdown Adabas database
cancel	Cancel Adabas database
abort	Abort Adabas database
info	Retrieve Adabas database information
userqueue	Display current user queue
cmdqueue	Display current command queue
holdqueue	Display current hold queue
highwater	Display high water mark
commandstats	Display Adabas command statistics
bp	Display Adabas buffer pool statistics
activity	Display Adabas activity
threadtable	Display Adabas thread table
createdatabase	Create new Adabas database
deletedatabase	Delete an Adabas database
renamedatabase	Rename an Adabas database

Command	Functionality
parameter	List database parameter information
parameterinfo	List database parameter information with minimum and maximum ranges
setparameter	Set database parameter
nucleuslog	Display Adabas nucleus log
files	Display Adabas file list
file	Display Adabas file
deletefile	Delete Adabas file
fields	Display Adabas file definition table
information	Display Adabas database information
container	Display Adabas database container
renamefile	Rename database file
createfile	Create database file
checkpoints	Display database checkpoints. Without parameter it shows one day. The following is a parameter example with from and to parameter: <i>2018-05-15_01:00:00,2018-05-20_00:00:00</i>
joblist	Job control list
jobstart	Start a specific job
deletejob	Delete a specific job and the execution log
deletejobexec	Delete the execution log of a job
createjob	Create a new specific job
joblog	Job entry log
listucb	List Adabas UCB entries
deleteucb	Delete an Adabas UCB entry
addfields	Add Adabas fields
status	Adabas database online state
filelocations	List all available file locations
listfiles	List files in file location
downloadfile	Download file from the file location
uploadfile	Upload file to file location

Merge Adabas RESTful Server

The Adabas client for Java contains a module to access Adabas database data content. It is possible to enable the data access in the Adabas RESTful administration server. Please contact Software AG support for the steps required to enable this data access.

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Installation and First Steps

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Installation is done using the Software AG Installer. The Adabas REST administration is part of Adabas but does not have to be installed with Adabas. If another Adabas installation is on the installation host, this can be used, if the Adabas version is greater than or equal to Adabas Version 6.5.

Access to Adabas RESTful resources is protected using authentication, which is managed by the configuration file *realm.properties*, which contains a list of users and passwords.

This chapter is organized as follows:

Password Management

Setting the Initial Admin Password

During installation, you will be prompted by a dialog box to set the initial admin password. This password-setting feature is available from version 7.0.1 onwards.

If for any reason you need to reset the initial password at a later stage, you can do so by deleting the *realm.properties* configuration file in the *configuration* directory, and then recreating the file by running the service script as follows:

```
./service.bat init
```

Managing New Users and Passwords

You can add new user and password entries to *configuration/realm.properties*. The service script provides you with the functionality to add an additional user as follows:

```
./service.bat add_user
```

Adabas Installation Management

The Adabas RESTful server is able to manage different version of Adabas. Up to two minor version are support downwards. In this case, the Adabas Version 6.7 based Adabas RESTful server supports managing Adabas Version 6.6 and Adabas Version 6.5 databases. A prerequisite for this is to provide a corresponding Adabas version installation. The Adabas installation location has to be added to the Adabas RESTful server configuration.

The service script provides you with the functionality to add additional Adabas installations. The current status is displayed by using the following command:

```
./service.bat add_env
```

The output of this example out would look something like this:

```
2019-02-14 10:54:02 - Load default configuration from file ↵
/opt/softwareag/AdabasRestAdministration/configuration/config.xml
Current defined configurations:
-----
ADADATADIR      : /data/SAG/Adabas
-----
Location       : /opt/softwareag
ADAPROGDIR     : /opt/softwareag/Adabas
Version        : V67002
Structure level : 21
-----
```

Use the following command to add a new Software AG installation:

```
./service.bat add_env <Installation location>
```

This will add the Adabas installation to the Adabas RESTful configuration.

Changing the Location of the Adabas Data Directory

By default, the Adabas Data directory (ADADATADIR) is the Adabas installation directory. You can change the default location of the Adabas Data directory with the `change_adadatadir.sh` or `change_adadatadir.bat` command. For details on how to change the Adabas Data directory, see *Installation on Windows > Completing the Installation* or *Installation on Linux > Completing the Installation*.

You can then modify the location of the Adabas Data directory used by the Adabas REST server in the REST server configuration with the following service script:

```
./service.sh data_dir <new Adabas Data directory location>
```

Starting the Server

Inside the installation directory of the Adabas REST administration, a `bin` directory can be found. The `bin` directory contains all of the start scripts required to start the Adabas REST administration. All scripts will provide reference information about valid parameters in case no argument is entered.

For example, to start the REST server on Windows just start:

```
./service.bat run
```

Ensuring that the Server is Working

To check if the server works correctly, you can either use your favorite web browser or use curl. By default, the username is *admin* and the password is *manage*.

Use the following command to check whether the server is running:

```
http://<host>:<port>/adabas/database
```

where *<host>* and *<port>* correspond to your environment. The following are some example REST calls:

URL	Function	Result
<i>http://localhost:8120/adabas/database</i>	List databases	List all databases known to the REST server
<i>http://localhost:8120/adabas/database/24</i>	Database Info	Returns the database information for database 24
<i>http://localhost:8120/adabas/database/24/file</i>	List database files	List all files defined in the database 24

Using curl, the following command would correspond to the first example:

```
curl -vv --user admin:manage http://localhost:8120/adabas/database
```

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RESTful Security

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This section provides information about Adabas RESTful server security topics such as SSL-encrypted connections and access restrictions to Adabas data.

Secure connection with SSL

The Adabas RESTful server can handle simultaneous HTTP and HTTPS connections to Adabas Manager or any other RESTful client. To prevent the RESTful server from providing an unsecured HTTP protocol link, the port number must be set to -1.

If the secure HTTPS protocol port is to be used, a keystore file (.JKS) containing the server certificate and key must be added to the RESTful server configuration. An example certificate to be used for testing purposes is delivered as part of the RESTful server release. This certificate can be found in *<SAG installation>/AdabasRestAdministration/keys*.



Important: After testing, the example certificate must be exchanged with the corporate certificates of the customer environment!

If a self-signed certificate is needed, it can be generated by a script that is delivered with the Adabas RESTful server release (available with version 7.0.1 and above). For detailed instructions on how to generate the self-signed certificate, keys and keystore file, refer to the section [Creating a Keystore file \(.JKS\)](#).

Adabas User Authentication

The Adabas RESTful server supports the following type of user authentication:

- User and password file called Realm.

The password is stored in an MD5 and SHA-hash in a text file.

Realm Text File Usage

Realm-based password authentication is handled by the configuration file *AdabasRestAdministration/configuration/realm.properties*. The file contains usernames and passwords. The password is stored as SHA or MD5 hashsum.

The *service.sh* script can add users to the file. The output of the command will appear on screen as shown below:

```

AdabasRestAdministration/bin> ./service.sh
add_userAdding user to password file ...
2022-09-20 08:40:20 Adabas REST client version v7.1.1.0
2022-09-20 08:40:20 Trace 'info' log send to ↵
/opt/softwareag/AdabasRestAdministration/logs/client.log
Enter username: sag2
Enter password: manage
User sag2 added to realm file
2022-09-20 08:40:42 client ended

```

If no *realm.properties* file is available, a new file can be generated by using the `service.sh init` command.

Adabas User Authorization

The Adabas RESTful server provides Adabas users direct access to Adabas database administration tasks, records and data resources like Adabas Maps and Database IDs.

This user access to Adabas data resources can be controlled and limited using security definitions and Role-based Access Control (RBAC). RBAC definitions are configured on Adabas.

However, if RBAC definitions cannot be used for any reason, an alternative advanced security feature is provided on the RESTful server. This security feature allows you to configure and control access authorizations to Adabas data resources through the use of several configuration files in the `<SAG>/AdabasRestAdministration/configuration` directory. The main configuration file is *config.xml*.

The following user authorizations can be assigned using the configuration files:

- Enable access for an Adabas Database ID
- User-based access control
 - Provide Administration Permission
 - Provide Data Resources Permission

Enable Access for an Adabas Database ID

In the Adabas RESTful configuration (*config.xml*), direct access to Adabas databases using Database IDs is restricted with the `DatabaseAccess` tag. The `DatabaseAccess` attribute *global* defines whether all databases are accessible by default. If the attribute *global* is set to *false*, then any Adabas database ID used for direct access needs to be listed in the `Database` tag. In the example below, direct access is enabled only for the database with ID 123:

```
<DatabaseAccess global="false">
  <Database dbid="123" />
</DatabaseAccess>
```

User-based Access Control

Any user can be added to the Administrator role. In addition, the user can be restricted to access only specific Adabas Maps or Database IDs.

Within the `LoginService` tag of *config.xml* there are two tags that are used to differentiate Administrators from plain Users:

```
<LoginService module="" webTokenExpires="24">
  <Administrators ↵
file="$ {CURDIR}/configuration/administrator.xml"></Administrators>
  <Users file="$ {CURDIR}/configuration/users.xml"></Users>
</LoginService>
```

The *administrator.xml* file that is specified in the `Administrator` tag must list all users with Administrator rights. Similarly, the *users.xml* file specified in the `Users` tag must list all users that should not have administrator rights. The *users.xml* also allows you to set permissions to specific data resources.

Provide Administration Permission

The *service.sh* (for Linux platform) or *service.bat* (for Windows platform) script should be used to add Administration permissions. The script is located in *<install-dir>/AdabasRestAdministration/bin*

```
service.bat add_admin admin_name
```

where `admin_name` represents the user to be added as an administrator role.

The list of Administrators with permissions are located in the file *<install-dir>/AdabasRestAdministration/configuration/administration.xml*.

The file is auto-generated, containing usernames and generated checksum. It should not be edited manually.

In the example below, the users `admin` and `sag` have Administration permissions:


```
<Users>
  <User name="admin" checksum=<generated-checksum> />
  <User name="sag" checksum=<generated-checksum> />
</Users>
```

The rights to work with Adabas as Administrator covers all accesses and modifications that relate to administration and monitoring of the database.

Provide Data Resources Permission

To restrict user access to specific Adabas data resources, you can define permissions with the `Users` tag in the file `<SAG>/AdabasRestAdministration/configuration/users.xml`. The tag allows users' read and write permissions to be set for following Adabas record-based resources:

- Adabas Map
- Database ID

An example is shown below:

```
<Users>
  <Default read="*" write="" />
  <User name="sag" read="*,#*" write="*" />
  <User name="sag2" read="Employees,Vehicles" write="Employees" />
</Users>
```

In this example:

- All users not listed under `Users` can read all Adabas Maps (*) and have no write access ("") to any Adabas Maps.
- The user `sag` has read permission to all Adabas Maps (*) and all database IDs (#*). Note that all database ID definitions need to have the prefix #. The user `sag` also has write permissions to all Adabas Maps (*).
- The user `sag2` only has read permission to the Adabas Maps named `Employees` and `Vehicles`. `sag2` only has write permission to the Adabas Map `Employees`.

If RBAC or LDAP-based authentication is used, you can disable all user restrictions by setting the `Default` tag to provide full access for all users.

Provide Database Modification Permission

To restrict access for any modification made on the database, set the `NoModification` configuration parameter in *config.xml*. This parameter enables or restricts access to create and delete any database.

The following example enables the permission to create and delete any database:

```
<Module>
  <Admin NoModification="false"></Admin>
</Module>
```

JSON Web Token

Adabas RESTful server supports the use of signed JSON Web Tokens (JWT). After logging in using the `/login` web page, a JWT token is returned. The JWT token is valid for a limited time range and may be provided alternatively as a credential.

The token issuer and time limit can be configured in the configuration file `<SAG>/AdabasRestAdministration/configuration/config.xml`. In the example below, the token is configured to expire after 120 minutes:

```
<Server>
  <JsonWebToken issuer="https://softwareag.com" expire="120" />
</Server>
```

The JSON Web Token can be sent in an HTTP call as `Authorization: Bearer <jwt token>` to the Adabas RESTful server.

Creating a Keystore File (.JKS)

Follow the steps below to create a self-signed certificate for SSL and JWT, or to create keys, or to generate a keystore file for the certificate and keys. These scripts are only available from version 7.0.1 and above:

1. Navigate to the directory `<SAG installation>/AdabasRestAdministration/keys/scripts`. This directory contains the sample config file (*csr_config.cnf*) and the script (*generate_jks.sh*) used to generate the self-signed certificate, keys and keystore file.
2. The config file *csr_config.cnf* is shown below. Adapt this file for the domain and infrastructure in your destination environment. For example, *example.com* must be replaced with your actual DNS names.

```
[ req ]
default_bits = 2048
default_keyfile = test_privatekey.pem
distinguished_name = req_distinguished_name
encrypt_key = no
prompt = no
string_mask = nombstr
req_extensions = v3_req

[ v3_req ]
basicConstraints = CA:FALSE
keyUsage = digitalSignature, keyEncipherment, dataEncipherment
extendedKeyUsage = serverAuth, clientAuth
subjectAltName = DNS:test.example.com, DNS:*.test.example.com

[ req_distinguished_name ]
countryName = DE
stateOrProvinceName = Hessen
localityName = Locale Test
0.organizationName = Test Certificate
organizationalUnitName = Evaluation
commonName = test.example.com
```

3. Create the *keyfile.jks* keystore file by running the command:

```
> generate_jks.sh
```

The contents of the script *generate_jks.sh* are shown below and they can be adapted to suit your needs:

```
# Generate self signed certificate and keys dependent on the csr_config.conf ↵
input file
openssl req -new -x509 -nodes -days 365 -sha256 -newkey rsa:4096 -keyout key.pem ↵
-out certificate.pem -config csr_config.cnf
openssl x509 -text -noout -in certificate.pem
openssl pkcs12 -password pass:test123 -inkey key.pem -in certificate.pem -export ↵
-out certificate.p12
openssl pkcs12 -password pass:test123 -in certificate.p12 -noout -info

# Generate keystore file based on the p12 certificate
keytool -importkeystore -keypass test123 -srcstorepass test123 -srckeystore ↵
certificate.p12 -srcstoretype jks -destkeystore keystore.jks -deststoretype pkcs12 ↵
-deststorepass test123
```

4. Copy the generated keystore file *keyfile.jks* to the location defined in the configuration. The default location is the *keys* directory of the installation.

5

Adding Support for Multiple Adabas Versions

- Enable different Adabas version of databases shown in Adabas Manager 24

This version of Adabas RESTful server supports administration of multiple Adabas versions. Currently, Adabas Version 7.2 with internal structure level 24 and Adabas Version 7.1 with internal structure level 23 are supported. To support additional Adabas versions the relevant Adabas version installations need to be registered in the configuration of the RESTful server.

In order to register the Adabas version installation in *config.xml*, the *service.sh* script (or *service.bat* respectively) has an additional feature. With the following command, you may add the current Adabas installation, if you are in an Adabas command prompt shell:

```
service.bat add_env
```

To register an Adabas version installation outside of the current environment, you can add the corresponding directory:

```
service.bat add_env <Adabas version installation directory>
```

Enable different Adabas version of databases shown in Adabas Manager

Option 1:

1. Install the Adabas RESTful server together with each different Adabas version installations with different port number.
2. Setup the Adabas Manager with 2 different port number in "Host Config".

Option 2:

1. Only need to install 1 Adabas RESTful server to handle different Adabas version
2. Setup each of the Adabas installed ADADATADIR to a common directory

```
./change_adadatadir.sh <New ADADATADIR>
```

3. Setup the Adabas RESTful server configuration

```
./service.sh data_dir <New ADADATADIR>
```

4. Restart the Adabas RESTful server

6

Adabas REST Server Configuration

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The Adabas REST Interface is a sub-component of the Adabas installation. It is used to access data from any programming language that supports HTTP requests and to request and monitor Adabas administration tasks.

You must install The Adabas REST Interface separately from the Adabas product installation.

This chapter is organized as follows:

Prerequisites

The Adabas REST server is initially installed as a service task. To manually uninstall or install the service task, use either the *system_service.sh* or *system_service.bat* script.

To configure the server, you must first access an Adabas database using one of the following methods.

To connect to an Adabas database with	Use
Adabas TCP/IP	<code>dbid(adatcp://host:port)</code>
Entire Net-Work	<code>dbid(tcpip://host:port)</code> To access a remote Adabas database via Entire Net-Work, configure the corresponding Software AG Directory Server.
local Adabas calls	<code>dbid(adatcp://host:0)</code>

Configuration

The server is configured during the Adabas RESTful administration installation process. The configuration parameters are defined in *config.xml*. This file is located in the configuration subdirectory of the Adabas RESTful administration installation. The configuration file looks as follows:

```
<RestServer>
  <Server>
    <Content directory="examples" />
    <Service port="8190" type="http" />
    <Service port="8191" type="https">
      <KeyStore file="keys/keystore.jks" />
      <KeyPassword password="test123" />
    </Service>
    <LoginService module="" webTokenExpires="24">
      <Administrators ↵
file="${SAG}/configuration/administrator.xml"></Administrators>
      <Users file="${SAG}/configuration/users.xml"></Users>
      <AuthenticationServer module="" type="file">
```



```

        <Realm file="${SAG}/configuration/realm.properties"></Realm>
    </AuthenticationServer>
</LoginService>
    <Shutdown passCode="shut123" />
</Server>
<Directory url="file:xtsurl.cfg" />
<Mapping>
    <Database dbid="24" file="4" />
    <Database dbid="23" file="250" />
    <Database dbid="100(adatcp://databasehost:61100)" file="250" />
</Mapping>
<DatabaseAccess global="false">
    <Database dbid="100" />
</DatabaseAccess>
</RestServer>

```

<Server> contains the basic attributes for running the REST server:

- <Content> defines the directory of the static HTML files used to provide the REST service. The example subdirectory provides an example application to help you learn more about accessing Adabas using the REST interface.
- <Service> sets the TCP/IP listening port for HTTP and HTTPS requests. The access URL for the example application looks as follows: `https://localhost:/port`.

For HTTPS access, define the <KeyStore> and <KeyPassword> attributes to set the necessary SSL certificates.



Note: The provided *keystore.jks* file is only an example keystore with self-signed certificates. You must not use them in a production environment.

- <LoginService> defines the authentication method used by the REST server.

The possible values for type are: `file`, `pam` (using system login for UNIX), and `system` (using system login for Windows).

- <Shutdown> defines the password for the shutdown command of the REST server. This password is an additional validation measure against unauthorized shutdown of the server. You can shut down the server manually with the `service.sh stop` script.

<Directory> sets the reference to the Software AG Directory Server. All directory information required to accomplish communication between clients and servers is obtained from the Directory Server. A file reference such as `file:directory/xtsurl.cfg` points to a file which contains the access URLs of remote databases. A URL reference such as `tcpip://host:4952` points to the Directory Server URL.

<Mapping> connects the unique Adabas map definitions to the REST service. The Adabas Client for Java uses map definitions to map database names and long name fields to short names. Use Natural DDMs to define the long names. To create long field names, use the Adabas Data Designer.

The Adabas data maps are stored in an Adabas file. Each database can contain multiple mapping files, but at least one mapping file must define the long name references.

`<DatabaseAccess>` determines whether direct database references are allowed. Direct database references use the Adabas database ID to request Adabas data. The two valid attributes for `<Database>` are: `dbid` (to set the database ID) and `url` (to set an access path to a remote database). If the `global` attribute is set to `true`, all known local databases can be accessed directly. If `global` is set to `false`, you will not be able to access the database directly using `http://rest_server:port/rest/db/dbid`. You must explicitly enable access by setting the database ID using the `Database` configuration.

Runtime

The Adabas RESTful server is part of the system service startup process.

The *wrapper.log* file in the log directory stores the output of the server log. The *server.log* file stores trace and debug information.

You can also start the server manually with the `service.sh run` script on UNIX/Linux and `service.bat run` on Windows platforms. The manual start opens a console window where the REST server generates the output.

The REST server example page can be accessed via `http://localhost:port` or `https://localhost:port`. The default user name is "admin" with the password "manage". Change the password or remove the default user password of the admin from the *realm.properties* file. You can add new users with the *service.sh* or *service.bat* script.

Authentication

The Adabas RESTful server supports file-based authentication.

The following modules are predefined in the delivered configuration:

Module	Description
Adabas	Create file-based authorization with the <i>realm.properties</i> file.
LocalUnix	Use the Software AG local access security library (SSX) to enable system authentication.
LocalWindows	Use the local system authentication.

- [Adabas](#)
- [UNIX Platforms](#)

- Windows Platforms

Adabas

With the Adabas module, you can create file-based authorization with the *realm.properties* file. The REST server supports a realm with minimal authentication.

In order to set up authentication with MD5 or SHASUM hash encoding, modify the *realm.properties* file from the configuration subdirectory. This file contains the username and password information. By default, the user is "admin" with password "manage".

The format of the password file is as follows: *user name:user password, roles of the user*. The user password can be prefixed with the hashsum MD5: or SHA: algorithm name, which represent the md5sum or shasum hash of the password.

For example:

```
Administrator: MD5:70682896e24287b0476eff2a14c148f0, sagadmin, jobadmin
sag: MD5:20384856e54267b7488eefe1a1a8fa, saguser
user: MD5:d47f18dc7780fe47c24759714e2cd58f, saguser
```

The user roles are defined in the configuration file. For example, you can define the role for job control as follows:

```
<Job role="jobadmin" use_role="false" />
```

This configuration can also apply to file upload and download rights for <Directory> and for controlling administration tasks with <Admin>.

To add a new user to *realm.properties*, start the server.<sh or bat> add_user command, and enter the new user and password.

UNIX Platforms

The Software AG SSX modules use the Pluggable Authentication Module (PAM) to authenticate the username and password on UNIX.

For detailed information on how to use PAM, see *Software AG Security eXtensions Administrator's Guide > Using the Pluggable Authentication Module (PAM) on UNIX*.

To configure PAM with Adabas REST service, add the PAM configuration file in config.xml for 'module':

```
<AuthenticationServer module="file" type="pam"></AuthenticationServer>
```

Where “file” represents the PAM configuration file to use.

For example:

```
<AuthenticationServer module="login" type="pam"></AuthenticationServer>
```

If AuthenticationServer module is an empty string, the default built-in login configuration file will be used.

Windows Platforms

For local Windows authentication, use the Waffle Windows Authentication Framework.

7

System Service

■ Linux System Service	32
■ Windows System Service	32

The Adabas RESTful administration provides a system service for starting the daemon during startup. The service is started with a specific user, and all database containers, configuration files and log files are created with this user.

The system service scripts provide the possibility to start, stop, remove and install the system service. The script is called *system_service.sh* (on Linux) and *system_service.bat* (on Windows).

Please be aware that the user who starts the Adabas RESTful server will be the user that works on the offline methods on the database container. Online activities are performed using the login id that is used to connect to the Adabas RESTful server. This user id is displayed in the user queue of the database.

Linux System Service

On Linux platforms, the Adabas RESTful service is added to the Linux system startup during installation. The service is started with the installation user.

Windows System Service

On Windows platforms, the user who starts the Adabas RESTful administration must have administration rights. Run the command prompt as administrator and run the *system_service.sh* or *bat* command.

```
C:\SoftwareAG\AdabasRestAdministration\bin>system_service.bat install
"START_DIRECTORY: C:\SoftwareAG\AdabasRestAdministration\bin\"
"SAG           : C:\SoftwareAG\AdabasRestAdministration\bin\..\.."
2022-09-20 10:51:31 Adabas Operator RESTful service version v7.1.1.0
2022-09-20 10:51:31 Build date=20-09-2022_08:14:35
2022-09-20 10:51:31 Logging to file ↵
winfile:///C:\SoftwareAG\AdabasRestAdministration\bin\..\..\AdabasRestAdministration\logs\service.log
2022-09-20 10:51:32 Service name : Software AG Adabas REST server v7.1.1.0 (123)
2022-09-20 10:51:32 Install service: Software AG Adabas REST server v7.1.1.0 (123)
2022-09-20 10:51:32 Service path  : C:\SoftwareAG
2022-09-20 10:51:32 Service user   :
2022-09-20 10:51:32 Service group : None
2022-09-20 10:51:32 Service connected
2022-09-20 10:51:32 Install service successfully: Software AG Adabas REST server ↵
v7.1.1.0 (123)
2022-09-20 10:51:32 Service command finished
```

In order to use the Adabas RESTful administration, the Adabas client global environment configuration needs to be set.

8

Messages

■ Administration Error Codes	34
■ System Component Error Messages	56

The following response codes are returned if errors occur while processing.

Administration Error Codes

- [General Error Messages](#)
- [Error Messages from the REST Server](#)
- [Error Messages from Adabas](#)

General Error Messages

PAIF00001	Adabas interface
Action	Check log and platform, contact support
PAIF00008	Adabas interface check
Action	Adabas interface is not supported, upgrade version
PAIF00009	Buffer check
Action	Provide correct buffer
PAIF00010	Adabas product installation environment
Action	Requested Adabas installation path is not correct, provide correct one.
PAIF00012	Software AG installation environment evaluation
Action	Incorrect path name given
PAIF00020	Unknown exception thrown inside application
Action	Contact support for further evaluation
PAIF00021	Adabas RESTful API
Action	Unsupport RESTful API request, check request

PAIF00023	Parsing of FDT field
Action	Unknown error during parsing of FDT field occurs. Check output and contact support
PAIF00024	Send request for all files
Action	No Adabas environment is found. Define Adabas environment using the configuration file.
PAIF00025	Missing SAG environment directory
Action	No Adabas environment is found. Define Adabas environment (ADAPROGDIR) directory.
PAIF00026	Invalid directory for SAG environment
Action	No Adabas environment is found. Define valid Adabas environment (ADAPROGDIR) directory
PAIF00027	Adabas ADADATADIR environment path is not defined
Action	No ADADATADIR environment is found. Define Adabas environments using the configuration file.
PAIF00028	Unknown FEOF type given
Action	Use valid keyword for FEOF type
PAIF00029	Unknown reset type given
Action	Use valid keyword for Reset type
PAIF00030	Interface error, failed to create Adabas admin instance
Action	Provide a valid atabase target
PAIF00031	Existing SAG environment already registered
Action	The SAG environment is already registered

PAIF00032	Invalid buffer for database creation
Action	Unknown error during creation of database. Check output and contact support
PAIF00033	Encrypted database creation with AIF structure level
Action	The given structure level is not supported for encryption database usage.
PAIF00034	AIF request error
Action	Unknown error during sending AIF request. Check output and contact support
PAIF00035	RBAC operation is invalid
Action	Unknown RBAC operation is used, only valid operation are allowed.
PAIF00036	Failed to read ADABAS.INI file from path in configuration.
Action	Check for valid ADABAS.INI file and provide valid `AdabasData` location path in the configuration file
PAIF00037	Failed to read DB{0}.INI file from path in configuration.
Action	Check for valid DB{0}.INI file and provide valid `AdabasData` location path in the configuration file
PAIF10248	Internal error to parse invalid parameter info
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10254	Invalid Parameter in parameter info
Action	Provide only valid parameter info.
PAIF10256	Failed to locate aifcommand in ADAPROGDIR
Action	Check for valid aifcommand in ADAPROGDIR location. Contact your nearest support centre for further information.

PAIF10257	Failed to parse binary init of environment
Action	Unknown error has occurred. Contact your nearest support centre for further information.
PAIF10258	No database file entry found
Action	No Adabas file control block found
PAIF10259	Request return error:
Action	Unknown request return error. Check output and contact support
PAIF10260	Error encountered to delete database file
Action	Check error description.
PAIF10261	Error to renumber file from to {1}
Action	Check if file number {1} exists.
PAIF10262	Error to refresh file
Action	Check if file number exists.
PAIF10263	Request for database file returned error
Action	Unknown error in request response. Check output and contact your nearest support centre for further information.
PAIF10264	Incorrect container type used
Action	Provide a valid container type (ASSO / DATA) in the request
PAIF10265	Database name too long
Action	The given database name is too long. Provide a shorted database name, less than 16 characters

PAIF10267	Nucleus log file is not created
Action	Check for valid nucleus log file and contact your nearest support centre for further information.
PAIF10268	Operation is not known
Action	Invalid database operation used. Provide only valid database operation
PAIF10269	Failed to get next free database ID
Action	Unknown error in request response. Contact your nearest support centre for further information.
PAIF10270	Internal error, Adabas admin handler missing
Action	Missing Adabas admin handler. Check output and contact your nearest support centre for further information.
PAIF10271	Error evaluating Adabas option:
Action	Provide a valid option keyword, please see Adabas documentation for valid option keywords.
PAIF10272	Value does not fit into parameter.
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10273	Parameter not valid:
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10274	Parameter extent not valid:
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10275	Error evaluating parameter:
Action	An internal error has occurred. Contact your nearest support centre for further information.

PAIF10276	Error parsing parameter buffer
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10277	Error sending parameter request
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF10278	Invalid Adabas parameter provided:
Action	Check for invalid Adabas parameter used. Please use only valid parameter keywords
PAIF11000	Cannot convert type to uint64:
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF11001	PAIF11001=Cannot convert type to uint32:
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF11002	PAIF11002=Cannot convert type to byte:
Action	An internal error has occurred. Contact your nearest support centre for further information.
PAIF90001	Unknown error:
Action	Check response output and contact your nearest support centre for further information.

Error Messages from the REST Server

EAI00002	Database name too long
Action	The given database name is too long. Provide a correct database name.

EAlF00003	Database file name too long
Action	The given database file name is too long. Provide a correct database file name.
EAlF00006	No Adabas environment found
Action	No Adabas environment is found. Define Adabas environments using the configuration file.
EAlF00007	Invalid Adabas database operation given: {0} ({1})
Action	An unknown error during database operations occurred. Check the output, and contact your nearest support centre for further information.
EAlF00009	Adabas database id {0} is not in range of [{1}:{2}]
Action	The given database id is not in the valid range of databases between 1 and 255.
EAlF00010	Adabas field reference missing
Action	Invalid parameter REST API reference for the file operation.
EAlF00011	Adabas resource reference {0} is not valid
Action	The given Adabas resource request is unknown. Check the URL.
EAlF00012	Structure level {1} for environment in {0} not supported
Action	The given structure level is not supported by Adabas REST API.
EAlF00013	Adabas environment path error for {0}
Action	The path of the Adabas environment does not exist. Check the suite path or the Adabas program directory.
EAlF00014	Adabas environment path {0} already registered
Action	The given Adabas path is already registered.

EAlF00017	DELETE http method not valid for resource {0}
Action	It is not allowed to delete the given REST API resources.
EAlF00018	Invalid DELETE http method request
Action	The given REST API resource is not known.
EAlF00019	POST http method not valid for resource {0}
Action	It is not allowed to post the given REST API resource.
EAlF00020	Invalid POST http method request
Action	The given REST API resource is not known.
EAlF00021	System file {0} on database id {1} cannot be renamed
Action	It is not allowed to rename Adabas system files.
EAlF00022	Adabas offline tool evaluation for Adabas installation at {0} failed
Action	Problems occurred during the initialization of the offline Adabas interface. Contact your nearest support centre for further information.
EAlF00023	Invalid Adabas parameter provided: {0}
Action	Unknown Adabas parameter given.
EAlF00024	Adabas parameter request need type of modification (dynamic or static)
Action	The Adabas parameter setting REST API needs type information. Provide the type parameter for the REST API.
EAlF00025	Adabas parameter only dynamic or static type of modification allowed
Action	The incorrect type value is given for the Adabas REST API setting Adabas parameter.
EAlF00026	Adabas options invalid: {0}
Action	The given option value is incorrect.

EAlF00027	Either UTILITIES_ONLY or LOCAL_UTILITIES can be set in dynamic mode, not both together
Action	The given option UTILITIES_ONLY or LOCAL_UTILITIES are mutually exclusive.
EAlF00028	Input update/insert tag 'Store' or 'Records' missing
Action	Internal error to update/insert tag. Check output and contact your nearest support centre for further information.
EAlF00029	Input text/plain cannot converted to type
Action	Internal error for type conversion. Check output and contact your nearest support centre for further information.
EAlF00030	Isn or search need to be given
Action	No Isn or search input provided. Please provide the isn or search input parameter
EAlF00031	No records received from query
Action	Check for valid Data 'Store' or 'Records' provided.
EAlF00032	No records found
Action	No records found in the read request.
EAlF00036	Passed dbid not found
Action	The Database ID provided is not found
EAlF00037	Invalid database id reference:
Action	The Database ID reference provided is invalid
EAlF00038	Reference '{0}' not allowed
Action	Reference is not allowed. Provide correct DatabaseAccess configuration in config.xml

EAIIF00039	database id out of range
Action	The given database id is not in the valid range
EAIIF00040	unsupported protocol:
Action	The provided protocol is not supported
EAIIF00041	parse protocol error of
Action	Error to parse the protocol. Provide correct protocol configuration in config.xml
EAIIF00042	Error loading configuration
Action	Error to load configuration file. Provide a valid config.xml file in the default directory `configuration` in the Adabas Rest Administration installation directory.
EAIIF00043	Authentication configuration type is no longer supported
Action	Provide a supported authentication login service type in the configuration. Contact your nearest support centre for further information.
EAIIF00044	Error to initialize JSON Web token
Action	Provide correct configuration to initialize the Web token. Contact your nearest support centre for further information.
EAIIF00045	Job definition invalid (name empty)
Action	Provide a valid name for the Job definition
EAIIF00046	Job name is already available
Action	Job name provided is already available. Provide a new Job name.
EAIIF00047	Job not found
Action	Unable to locate Job provided. Provide a Job name that already exists

EAIIF00048	Delete execution ID fail, ID not found
Action	Failed to delete job execution from provided ID. Provide a valid ID to delete.
EAIIF00049	Error job not found
Action	Job name does not exist. Provide a valid job name.
EAIIF00050	Job storage not defined
Action	Job storage has not been defined. Provide valid Job storage configurations in config.xml
EAIIF00051	No valid database target defined
Action	No valid database target provided. Provide a valid database target configuration in config.xml
EAIIF00052	Job execution entry not found
Action	No Job execution entry was found
EAIIF00053	Connection not active
Action	Internal error, no active connection. Contact your nearest support centre for further information.
EAIIF00054	Job storage not defined
Action	Internal error, failed to configure a valid Job storage. Contact your nearest support centre for further information.
EAIIF00055	Container for creation are not given
Action	Failed to create database without container list. Provide valid `ContainerList`
EAIIF00056	Container for creation are missing
Action	Failed to create database due to incomplete container list. `ContainerList` requires four containers to be provided.

EAlF00057	Error generating call to
Action	Unknown error generating call to. Check output and contact your nearest support centre for further information.
EAlF00058	Adabas renumber parameter not given or negative
Action	File renumber parameter is not given or negative value. Provide a valid value that is bigger than 0.
EAlF00060	Reference not found:
Action	Reference for location is not found. Provide correct `Directories` configuration in config.xml
EAlF00070	No Adabas cluster support has been configured
Action	No Adabas cluster configuration found. Provide correct configuration for `Cluster Node` in config.xml
EAlF00080	Encryption algorithm for creation is missing
Action	Failed to create Database due to missing Encryption algorithm. Provide the correct keyword for the Database Encryption algorithm
EAlF00081	Adabas nucleus log file not found:
Action	Unknown error, nucleus log file is not found. Check for valid file and contact your nearest support centre for further information.
EAlF10279	[[0]] One value should be less than 16, another value should be greater or equal to 16
Action	Invalid value provided for. Please specify the appropriate Blocksize
EAlF10280	Invalid unit value
Action	Invalid unit value provided. Please use the accepted values of : [M or B]

Error Messages from Adabas

AIF00000	Normal usage
Action	None
AIF00001	Adabas interace
Action	Interal error, please send Exception and trace log to support for detailed information.
AIF00002	Adabas interface container generation operations
Action	Disk space is left, add additional space
AIF00003	Adabas database online check
Action	Adabas database is not available
AIF00004	Adabas database evaluation
Action	Could not open ADABAS.INI. Please check ADADATADIR configuration
AIF00007	Adabas create demo database tool
Action	Invalid utility option for crdemodb
AIF00009	Adabas environment check
Action	Adabas environment is not set correctly
AIF00010	Adabas operations
Action	Used Adabas interface version does not match to Adabas database structure level
AIF00011	Adabas operations
Action	Database is in a state that an AUTORESTART need to be done or is done at the moment

AIF00013	Adabas operations on LOB file
Action	Adabas operations are not allowed on LOB file. Use regular file
AIF00014	Adabas file definition table generation
Action	The number of Adabas fields for new FDT is too high
AIF00015	Adabas file ISN reusage on system files
Action	Reusage operations are not allowed on system files. Use regular file
AIF00016	Adabas ciphering on system files
Action	Adabas ciphering is not allowed on system files. Use regular file
AIF00017	ADAM usage
Action	ADAM files cannot be refreshed. Use regular file
AIF00018	Adabas parameter value setting
Action	Given parameter value exceeds maximum possible value
AIF00035	FCB read
Action	Internal error, please send Exception and trace log to support for detailed information.
AIF00036	Adabas container creation
Action	Given Adabas container does already exist
AIF00037	Adabas database creation
Action	Given Adabas database id does already exist
AIF00038	Access to Adabas GCB
Action	Access to the GCB is failed.

AIF00039	Retrieving free space table
Action	Internal error, please send Exception and trace log to support for detailed information.
AIF00041	Access to Adabas CSA
Action	Access to the CSA is failed.
AIF00042	Set Adabas security mode
Action	Error setting the security mode of the Adabas database
AIF00148	Adabas operations for online databases
Action	Adabas database is not active. Start the database
AIF00149	Database container remove request
Action	Adabas database container removal is only possible on offline databases
AIF00151	Adabas file changes
Action	Adabas file is locked for Adabas utility operations only. Unlock file
AIF00152	Adabas interface
Action	A parameter given is invalid
AIF00153	Adabas interface
Action	The given database ID is not valid in the used context.
AIF00154	Adabas interface
Action	The given database file is not valid in the used context.
AIF00156	Adding a LOB file for a Adabas file
Action	A base file, used for adding lob file, is missing

AIF00157	Adding a LOB file for a Adabas file
Action	Given base file number and lob file number are equal. Use different file numbers
AIF00158	Any Adabas operation
Action	the Adabas database is read-only. Change read-only state
AIF00159	Read on ASSO container
Action	Failed to read records from ASSO container
AIF00160	Loading a Adabas file
Action	Not enough container space to load the Adabas file
AIF00161	Creation of database
Action	No permission to create Adabas containers
AIF00162	Adabas file load
Action	File is either already available or not able to create
AIF00163	Adabas lob file creation
Action	File is either already available or not able to create
AIF00164	Adabas file load
Action	Cannot create a UCB entry. Number of entries is exceed.
AIF00166	Adabas lob file creation
Action	Base Adabas file not available
AIF00167	Set Adabas file option
Action	Not able to read Adabas file control block

AIF00168	Adabas file load
Action	No space available in the Adabas ASSO containers
AIF00169	Adabas file load
Action	No space available in the Adabas DATA containers
AIF00171	Adabas file load
Action	No space available in the Adabas normal index
AIF00172	Adabas file load
Action	No space available in the Adabas upper index
AIF00173	Reset the USB range
Action	Failed to read the UCB entries
AIF00174	Change Adabas container
Action	Failed to read ASSO blocks
AIF00179	Rename database
Action	Failed to write the ASSO block
AIF00180	Retrieve Adabas container information
Action	Failed to open the DATA file
AIF00181	Adabas container operations/changes
Action	Failed to lock the database container before change
AIF00183	Adabas shutdown, cancel or abort request
Action	The database is in progress to shutdown or cancel

AIF00184	Delete Adabas database
Action	Access to delete Adabas resources is denied
AIF00187	Creation of Adabas file, lob file or replication file
Action	The ASSO storage space is not available for the file operation.
AIF00190	Loading of Adabas regular file or lob file
Action	DATA space storage is exhausted
AIF00195	ADAM usage
Action	There are too many ADAM blocks used
AIF00196	Record count calculation
Action	Internal error, contact support
AIF00197	Adabas operations
Action	A stop or terminate is detected during operation run
AIF00201	Adabas demo database creation
Action	Unknown error, contact support
AIF00202	Adabas database creation
Action	Invalid block size given, use correct block size
AIF00203	Adabas Database deletion
Action	Could not delete Adabas container. Check file permissions
AIF00204	Retrieve Adabsa container information
Action	Not able to access WORK file

AIF00205	Checkpoint file record modifications
Action	Failed to write checkpoint entry
AIF00206	Adabas container deletion
Action	The Adabas container to be deleted is still used by Adabas data
AIF00207	Adabas container creation
Action	On the file system or RAW device is not enough space to create the container
AIF00208	Adabas container creation
Action	The given RAW device is not correct.
AIF00209	Adaba database creation
Action	Given path for ADADATADIR or container ASSOx or DATAx is not correct
AIF00300	During Adabas utility initialization
Action	The ADAPROGDIR configuration/environment variable is not correct
AIF00301	Adabas error handling initialization
Action	Internal error, please contact support
AIF00302	Adabas interface operations
Action	Either ADABAS.INI or `DB<dbid>.INI` cannot be found
AIF00303	Adabas interface operations
Action	The ADADATADIR configuration/environment variable is not correct
AIF00304	Adabas version query (deprecated)
Action	In the installation the ADAVERS is not set correctly or the configuration is wrong

AIF00306	Adabas configuration read
Action	Configuration in INI files are missing or incorrect
AIF00307	Adabas nucleus parameter set new value
Action	Failed to set value in INI file
AIF00308	Adabas configuration file store
Action	Failed to write INI file
AIF00309	Database id configuration search
Action	Adabas Database id is not registered in ADABAS.INI. Register Database id
AIF00310	Read structure level out of ADABAS.INI
Action	Item for structure level is missing
AIF00400	Read of checkpoint entries
Action	Internal error, contact support.
AIF00502	Adabas file operations
Action	Cannot find the given Adabas file
AIF00503	Adabas file operations
Action	Call tried on Adabas system files which is not allowed
AIF00504	Adabas file operations
Action	Operation request is tried on Adabas lob files which is not allowed
AIF00507	Set Adabas file option BT
Action	Adabas file option BT is not allowed to be set if Adabas is online

AIF00511	Set Adabas file record spanning
Action	The Adabas file does not have a lob file defined. Define lob file
AIF00512	Disable Adabas file record spanning
Action	Disabling of Adabas file record spanning is only allowed, if Adabas file is empty.
AIF00600	Set an Adabas string based parameter
Action	The length of the string exceeds the maximum limit.
AIF00651	Adabas interface request to start Adabas nucleus
Action	The start of the Adabas nucleus failed. Check Nucleus log
AIF00800	Adabas interface
Action	Failed to allocate memory
AIF00801	Adabas interface
Action	Failed to reallocate memory
AIF00850	Adabas nucleus creation with encrypted container
Action	The AEL license file was not found
AIF00863	Setting Adabas parameter
Action	Could not update INI files. Check permission
AIF00900	Create demo database
Action	Example ordexp file is not available
AIF00901	Create demo database
Action	Adabas utility to import demo data returns error

AIF01000	Adabas set file operation
Action	A referential integrity error cause error
AIF01002	Adabas file creation
Action	Referential integrity is not allowed for system files
AIF01016	Adabas file creation with reference integrity
Action	Adabas reference integrity file not available
AIF01100	Setting of Adabas parameter userexit parameter
Action	User exit 1 and 11 are mutually exclusive
AIF02000	Create an environment script file
Action	Error creating the assign file
AIF02001	Delete an environment script file
Action	Error deleting the file
AIF02002	Delete an environment script file
Action	File status is unknown
AIF02003	Working with environment script files
Action	Internal error, contact support
AIF02004	Working with environment script files
Action	The corresponding assign files do not exist
AIF03000	Adabas encryption unit
Action	Failed to initialize cryptography subsystem, check output

AIF03001	Adabas encryption unit
Action	Given encryption key does not match to the container encryption
AIF09999	Adabas nucleus and parameter operations
Action	Internal error, contact support
`AIF10<rso>`	Adabas call based operations
Action	Please check Adabas response code documentation. Contact support
AIF20001	Delete of Adabas container
Action	Referenced Adabas container identifier is wrong
AIF20002	Delete of Adabas container
Action	Referenced Adabas container type is wrong
AIF20003	Adabas file operations
Action	Adabas file operations missing required parameter

System Component Error Messages

SYS00002	Failed to initialize User
Action	Failed to initialize unknown User. Create the specified User
SYS00003	Authentication method is not yet implemented
Action	The authentication method is not yet implemented. Use only the supported authentication method
SYS00004	Specified user is already available in the list
Action	Provide a different user that is not already in the list

SYS00005	Specified user is not found in the list
Action	Provide a valid user that is currently in the list
SYS00006	Assigned PID file path is a directory, expecting a file
Action	Check the default location for the PID file
SYS00007	Fail to create PID file with same file path and name
Action	Check the output of PID file path. Contact your nearest support centre for further information.
SYS00008	Failed to create the PID file
Action	Check the error message {1} for cause error. Contact your nearest support centre for further information.
SYS00009	Error to {0} {1} watcher: {2}
Action	<p>Error when creating or adding an inotify watcher. Check the error message {2}.</p> <p>For Linux platform, check system limits for <code>fs.inotify.max_user_watches</code> and <code>fs.inotify.max_user_instances</code>. If there are insufficient resources, any modifications to the configuration file {1} are not reflected until the server is restarted.</p>
SYS00029	Error opening PID file
Action	Check if PID file exists in the default location. Contact your nearest support centre for further information.

