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# Adabas for Linux and Cloud

## Adabas REST Administration

Version 7.4.0

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ADABAS & NATURAL

This document applies to Adabas for Linux and Cloud Version 7.4.0 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:

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

# 1 About this Documentation

## Document Conventions

| Convention | Description |
|---|---|
| **Bold** | Identifies elements on a screen. |
| `Monospace font` | Identifies service names and locations in the format *folder.subfolder.service*, APIs, Java classes, methods, properties. |
| *Italic* | Identifies:<br>Variables for which you must supply values specific to your own situation or environment.<br>New terms the first time they occur in the text.<br>References to other documentation sources. |
| `Monospace font` | Identifies:<br>Text you must type in.<br>Messages displayed by the system.<br>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 (...). |

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- Open and update support incidents.
- Add product feature requests.

## Data Protection

Software AG 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

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 GmbH 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 [DEMODB          ]      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: `2018-05-15_01:00:00,2018-05-20_00:00:00` |
| 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 our support for the steps required to enable this data access.

# 3 Installation and First Steps

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 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*.

## 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 |
|---|---|---|
| *http://localhost:8120/adabas/database* | List databases | List all databases known to the REST server |
| *http://localhost:8120/adabas/database/24* | Database Info | Returns the database information for database 24 |
| *http://localhost:8120/adabas/database/24/file* | 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
```

# 4 RESTful Security

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>/AdabasRestAdministratrion/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 prove 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.

Adabas RESTful server does not return a JWT token if the signing key files are not specified in the configuration file, or if the signing key files do not exist. Currently, any RSA public-private key pair can be used for JWT signing. If you are using OpenSSL, the key pair can be generated by executing the following command:

```
openssl genrsa -out apiKey.prv 2048
openssl rsa -in apiKey.prv -pubout -outform PEM -out apiKey.pem
```

You must specify the key pair files in the configuration file:

```
<Server>
    <JsonWebToken issuer="https://softwareag.com" expire="120" encrypt="false">
        <PublicKey>${SAG}/AdabasRestAdministration/keys/apiKey.pem</PublicKey>
        <PrivateKey>${SAG}/AdabasRestAdministration/keys/apiKey.prv</PrivateKey>
    </JsonWebToken>
</Server>
```

## Creating a Keystore File (.JKS)

Follow the steps below to create a self-signed certificate for SSL, 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>/AdabasRestAdministratrion/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

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

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 | *dbid*(adatcp://*host*:*port*) |
| Entire Net-Work | *dbid*(tcpip://*host*:*port*)<br>To access a remote Adabas database via Entire Net-Work, configure the corresponding Adabas Directory Server. |
| local Adabas calls | *dbid*(adatcp://*host*:0) |

## 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 Adabas 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 `Databse` 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 security.conf file configures the JAAS security classes used to set up the authorization. The following modules are predefined in the delivered configuration:

| Module | Description |
|---|---|
| Adabas | Create file-based authorization with the *realm.properties* 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:  MD5:20384856e54267b7488eefea1ac1a8fa, 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 GmbH 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 authentification, use the Waffle Windows Authentication Framework.

# 7 System Service

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 : Adabas REST server v7.1.1.0 (123)
2022-09-20 10:51:32 Install service: 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: 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

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

# Administration Error Codes

## 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** **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.

**PAIF00038** **Invalid Adabas utility provided**

**Action** The Adabas utility specified does not exist. Please use a valid Adabas utility.

**PAIF00039** **Adabas database structure level mismatch with AIF version structure level**

**Action** Please use a DBID that has the same structure level as the Adabas structure level.

**PAIF00040** **Error retrieving the AIF structure level. Adabas registry entry is missing.**

**Action** Please ensure that the Adabas registry is present in the Windows Registry.

**PAIF00041** **Adabas registry entry for the Adabas location is not found**

**Action** Please ensure that the Adabas installation is properly activated.

**PAIF00042** **Adabas Shared Memory Event {0} not running**

**Action** Please start the Adabas SHM Service if it is not already running.

**PAIF00100** **The specified RBAC role does not exist**

**Action** Please specify an existing RBAC role or create the role.

**PAIF00101** **The specified RBAC user does not exist**

**Action** Please specify an existing RBAC user or create the user.

**PAIF00102** **The specified RBAC operation does not exist**

**Action** Please specify a valid RBAC operation.

**PAIF00103** **The specified RBAC object does not exist**

**Action** Please specify a valid RBAC object.

**PAIF00104** **The specified RBAC entity does not exist**

**Action** Please specify a valid RBAC entity.

**PAIF00105** **The specified RBAC permission for user role does not exist**

**Action** Please specify a valid user role permission.

**PAIF00106** **The specified RBAC permission for user role does not exist**

**Action** Please specify a valid permission.

**PAIF00107** **The specified RBAC role already exists**

**Action** Please specify a new role to create.

**PAIF00108** **The specified RBAC user already exists**

**Action** Please specify a new user to create.

**PAIF00109** **The specified RBAC operation already exists**

**Action** Please specify a new operation to create.

**PAIF00110** **The specified RBAC object already exists**

**Action** Please specify a new object to create.

**PAIF00111** **The RBAC user-role relationship already exists**

**Action** Please specify a new permission to grant.

**PAIF00112** **The RBAC permission already exists**

**Action** Please specify a new permission to grant.

**PAIF00113** **Operation is not allowed on a read-only database**

**Action** Please adapt the database permissions.

**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

**EAIF00002** **Database name too long**

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

**EAIF00003** **Database file name too long**

**Action** The given database file name is too long. Provide a correct database file name.

**EAIF00006** **No Adabas environment found**

**Action** No Adabas environment is found. Define Adabas environments using the configuration file.

**EAIF00007** **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.

**EAIF00009** **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.

**EAIF00010** **Adabas field reference missing**

**Action** Invalid parameter REST API reference for the file operation.

**EAIF00011** **Adabas resource reference {0} is not valid**

**Action** The given Adabas resource request is unknown. Check the URL.

**EAIF00012** **Structure level {1} for environment in {0} not supported**

**Action** The given structure level is not supported by Adabas REST API.

**EAIF00013** **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.

**EAIF00014** **Adabas environment path {0} already registered**

**Action** The given Adabas path is already registered.

**EAIF00017** **DELETE http method not valid for resource {0}**

**Action** It is not allowed to delete the given REST API resources.

**EAIF00018** **Invalid DELETE http method request**

**Action** The given REST API resource is not known.

**EAIF00019** **POST http method not valid for resource {0}**

**Action** It is not allowed tp post the given REST API resource.

**EAIF00020** **Invalid POST http method request**

**Action** The given REST API resource is not known.

**EAIF00021** **System file {0} on database id {1} cannot be renamed**

**Action** It is not allowed to rename Adabas system files.

**EAIF00022** **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.

**EAIF00023** **Invalid Adabas parameter provided: {0}**

**Action** Unknown Adabas parameter given.

**EAIF00024** **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.

**EAIF00025** **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.

**EAIF00026** **Adabas options invalid: {0}**

**Action** The given option value is incorrect.

**EAIF00027** **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.

**EAIF00028** **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.

**EAIF00029** **Input text/plain cannot converted to type**

**Action** Internal error for type conversion. Check output and contact your nearest support centre for further information.

**EAIF00030** **Isn or search need to be given**

**Action** No Isn or search input provided. Please provide the isn or search input parameter

**EAIF00031** **No records received from query**

**Action** Check for valid Data 'Store' or 'Records' provided.

**EAIF00032** **No records found**

**Action** No records found in the read request.

**EAIF00036** **Passed dbid not found**

**Action** The Database ID provided is not found

**EAIF00037** **Invalid database id reference:**

**Action** The Database ID reference provided is invalid

**EAIF00038** **Reference '{0}' not allowed**

**Action** Reference is not allowed. Provide correct DatabaseAccess configuration in config.xml

**EAIF00039** **database id out of range**

**Action** The given database id is not in the valid range

**EAIF00040** **unsupported protocol:**

**Action** The provided protocol is not supported

**EAIF00041** **parse protocol error of**

**Action** Error to parse the protocol. Provide correct protocol configuration in config.xml

**EAIF00042** **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.

**EAIF00043** **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.

**EAIF00044** **Error to initialize JSON Web token**

**Action** Provide correct configuration to initialize the Web token. Contact your nearest support centre for further information.

**EAIF00045** **Job definition invalid (name empty)**

**Action** Provide a valid name for the Job definition

**EAIF00046** **Job name is already available**

**Action** Job name provided is already available. Provide a new Job name.

**EAIF00047** **Job not found**

**Action** Unable to locate Job provided. Provide a Job name that already exists

**EAIF00048** **Delete execution ID fail, ID not found**

**Action** Failed to delete job execution from provided ID. Provide a valid ID to delete.

**EAIF00049** **Error job not found**

**Action** Job name does not exist. Provide a valid job name.

**EAIF00050** **Job storage not defined**

**Action** Job storage has not been defined. Provide valid Job storage configurations in config.xml

**EAIF00051** **No valid database target defined**

**Action** No valid database target provided. Provide a valid database target configuration in config.xml

**EAIF00052** **Job execution entry not found**

**Action** No Job execution entry was found

**EAIF00053** **Connection not active**

**Action** Internal error, no active connection. Contact your nearest support centre for further information.

**EAIF00054** **Job storage not defined**

**Action** Internal error, failed to configure a valid Job storage. Contact your nearest support centre for further information.

**EAIF00055** **Container for creation are not given**

**Action** Failed to create database without container list. Provide valid `ContainerList`

**EAIF00056** **Container for creation are missing**

**Action** Failed to create database due to incomplete container list. `ContainerList` requires four containers to be provided.

**EAIF00057** **Error generating call to**

**Action** Unknown error generating call to. Check output and contact your nearest support centre for further information.

**EAIF00058** **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.

**EAIF00060** **Reference not found:**

**Action** Reference for location is not found. Provide correct `Directories` configuration in config.xml

**EAIF00070** **No Adabas cluster support has been configured**

**Action** No Adabas cluster configuration found. Provide correct configuration for `Cluster Node` in config.xml

**EAIF00080** **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

**EAIF00081** **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.

**EAIF10000** **RBAC invalid usage of Assignment**

**Action** Incorrect usage of Assignment, please check the request body for valid parameters.

**EAIF10279** **[{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

**EAIF10280** **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 to 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 exceed maximum possible value |
| **AIF00035** | **FCB read** |
| **Action** | Interal error, please send Exception and trace log to support for detailed information. |
| **AIF00036** | **Adabas container creation** |
| **Action** | Given Adabas container does already exists |
| **AIF00037** | **Adabas database creation** |
| **Action** | Given Adabas database id does already exists |
| **AIF00038** | **Access to Adabas GCB** |
| **Action** | Access to the GCB is failed. |
| **AIF00039** | **Retrieving free space table** |
| **Action** | Interal 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 removale 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 utitility 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 intergrity 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

**AIF10264** **Cluster primary node switch failed**

**Action** Please check status of cluster nodes or try restarting them. If issue persists, please contact your nearest support center

**AIF10265** **Connection error due to inactive database or incorrect address or portnumber**

**Action** Please check the remote DB status

**AIF10266** **Connection error due to invalid argument**

**Action** Please check the connection argument

**AIF10267** **TCP connection error**

**Action** Reconnect through connection string. If the problem persists, please contact support.

**AIF10268** **Error in enabling ADATCP**

**Action** Internal ADATCP error, please contact support

**AIF10269** **Error in disabling ADATCP**

**Action** Internal ADATCP error, please contact support

**AIF10270** **ADATCP not initialized**

**Action** Please check TCP configuration

**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** Error when creating or adding an inotify watcher. Check the error message {2}.

For Linux platform, check system limits for `fs.inotify.max_user_watches` and `fs.inotify.max_user_instances`. If there are insufficient resources, any modifications to the configuration file {1} are not reflected until the server is restarted.

**SYS00029** **Error opening PID file**

**Action** Check if PID file exists in the default location. Contact your nearest support centre for further information.

# 9 Adabas RESTful APIs

The following lists of endpoints are available in Adabas RESTful administration. Parameters marked with an asterisk (*) are mandatory.

## Adabas Administration Information

| Endpoint | Method | Description |
|---|---|---|
| /adabas/config/ | GET | Get Adabas configuration<br>Parameters:<br>No parameters |
| | PUT | Store configuration<br>Parameters:<br>data*: Configuration content |
| | POST | Store configuration<br>Parameters:<br>No parameters |
| /adabas/config/classic | GET | Define the Adabas direct access<br>Parameters:<br>No parameters |
| | POST | Add an entry for the Adabas direct access<br>Parameters:<br>url: Database URL<br>global: Global classic database access parameter |
| | DELETE | Delete an entry in the configuration<br>Parameters:<br>url*: Database URL |
| /adabas/config/cluster | GET | Get the cluster node entries<br>Parameters: |
| /adabas/config/jobs | GET | Read Adabas job configuration section<br>Parameters:<br>No parameters |

| Endpoint | Method | Description |
|---|---|---|
| | PUT | Set the ADADATADIR<br>Parameters:<br>jobConfig: Job configuration |
| /adabas/config/mapping | GET | Define the current Adabas Map repositories<br>Parameters:<br>No parameters |
| | POST | Add configuration in Adabas Map repositories<br>url*: Database URL<br>file*: Database file number |
| | DELETE | Delete entry in configuration<br>url*: Database URL<br>file*: Database file number |
| /adabas/config/module | GET | Define the current Adabas module section<br>Parameters:<br>No parameters |
| | PUT | Set the ADADATADIR<br>Parameters:<br>adadatadir*: Adabas Database DATADIR location |
| /adabas/config/module/directories | GET | Read upload/download directories<br>Parameters:<br>No parameters |
| | POST | Add directory location<br>Parameters:<br>location*: Directory path to add<br>name*: Name of upload/download location |
| | DELETE | Delete the directory location<br>Parameters:<br>name*: Name of the directory location to delete |

| Endpoint | Method | Description |
|---|---|---|
| /adabas/config/module/installation | GET | Retrieve the current Adabas installation configuration<br>Parameters:<br>No parameters |
| | POST | Add a new Adabas installation location<br>Parameters:<br>installation*: Installation directory path to add |
| | DELETE | Remove an existing Adabas installation location<br>Parameters:<br>installation*: Installation directory path to remove |
| /adabas/config/server | GET | Retrieve the current Adabas server configuration<br>Parameters:<br>No parameters |
| /adabas/license | POST | Upload license<br>Parameters:<br>sag*: Upload SAG environment destination<br>name*: Upload name of license file<br>uploadLicense*: Upload license content of field |
| /adabas/rest/env | GET | Retrieve the list of environments<br>Parameters:<br>No parameters |
| /adabas/rest/log | GET | Retrieve Rest server log<br>Parameters:<br>No parameters |
| /adabas/version | GET | Retrieve the current Adabas version<br>Parameters:<br>No parameters |
| /env | GET | Retrieve the list of environments<br>Parameters:<br>No parameters |

| Endpoint | Method | Description |
|---|---|---|
| /login | GET | Login receiving JSON Web Token (JWT)<br>Parameters:<br>No parameters |
| | POST | Login receiving JSON Web Token (JWT)<br>Parameters:<br>No parameters |
| | PUT | Login receiving JSON Web Token (JWT)<br>Parameters:<br>No parameters |
| /logout | GET | Remove the current session<br>Parameters:<br>No parameters |
| /rest/logoff | GET | Remove the current session<br>Parameters:<br>No parameters |
| /shutdown/{hash} | PUT | Initiate server shutdown<br>Parameters:<br>hash*: Shutdown validation hash |
| /version | GET | Retrieve the current version<br>Parameters:<br>No parameters |

## Adabas Database Can be Operated in Online Mode Only

| Endpoint | Method | Description |
|---|---|---|
| /adabas/cluster | GET | Retrieve the current Adabas cluster status<br>Parameters:<br>No parameters |

| Endpoint | Method | Description |
|---|---|---|
| /adabas/database/{dbid}/actstats | GET | Retrieve Adabas activity statistics<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/bfstats | GET | Retrieve Adabas buffer flush statistics<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/bpstats | GET | Retrieve Adabas buffer pool statistics<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/checkpoints | GET | Retrieve the list of Adabas checkpoints for the specified database<br>Parameters:<br>dbid*: Database ID<br>start_time: Timestamp of first checkpoint entry<br>end_time: Timestamp of last checkpoint entry |
| | DELETE | Delete Adabas checkpoints for the specified database<br>Parameters:<br>dbid*: Database ID<br>start_time: Timestamp of first checkpoint entry<br>end_time: Timestamp of last checkpoint entry |
| /adabas/database/{dbid}/cluster | GET | Retrieve the current Adabas cluster status for the specified database<br>Parameters: |

| Endpoint | Method | Description |
|---|---|---|
| | | dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| | PUT | Trigger a primary node switch<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>primary_node*: Cluster primary node name |
| /adabas/database/{dbid}/commandqueue | GET | Retrieve a list of user queue entries for the specified database<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>rfc3339: Return timestamps in RFC3339 format (true /false) |
| /adabas/database/{dbid}/commandstats | GET | Retrieve Adabas command statistics for the specified database<br>Parameters:<br>dbid*: Database ID |
| | DELETE | Reset Adabas command statistics for specified database<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/file | POST | Create a new Adabas file in the specified database<br>Parameters<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>fdufdt: Please refer to the example value in the Swagger API |

| Endpoint | Method | Description |
|---|---|---|
| /adabas/database/{dbid}/file/{file_operation} | POST | Create a new Adabas file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file_operation*: File number (the file number in the body is ignored)<br>name: Used for the rename operation<br>number: Used for the renumber operation<br>fdufdt: Please refer to the example value in the Swagger API |
| | PUT | Adapt a Adabas file parameter<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file_operation*: File number and operation, separated by a ':'. Supported operations: renumber, refresh<br>number: New file number (for renumber operation)<br>name: New file name (for rename operation)<br>pgmrefresh: Set PGM refresh (true/false)<br>spacereusage: Enable/disable space reuse (true/false)<br>isnreusage: Enable/disable ISN reuse (true/false)<br>spannedrecords: Enable/disable spanned records, need to be given exclusive (true/false) |
| /adabas/database/{dbid}/holdqueue | GET | Retrieve a list of hold queue entries<br>Parameters: |

| Endpoint | Method | Description |
|---|---|---|
| | | dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| /adabas/database/{dbid}/hwm | GET | Retrieve Adabas High water mark<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| | DELETE | Reset Adabas high water statistics<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/monitor | GET | Retrieve Adabas monitor statistics<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/permission | GET | List RBAC assignments permission<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>list: List for all types. (Available values: assignments, userrole)<br>user: List by User<br>role: List by Role |
| | POST | Grant RBAC permission<br>Parameters: |

| Endpoint | Method | Description |
|---|---|---|
| | | dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>definition: Please follow the example value in the Swagger API |
| | DELETE | Revoke RBAC permission<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>definition: Please follow the example value in the Swagger API |
| /adabas/database/{dbid}/permission/{resource} | GET | List RBAC resources<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>resource*: RBAC type (Available values: Role, role, ROLE, Object, object, OBJECT, User, user, USER, Operation, operation, OPERATION) |
| /adabas/database/{dbid}/permission/{resource}/{name} | POST | Create RBAC resource<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>resource*: RBAC type (Available values: Role, role, ROLE, Object, object, OBJECT, User, user, USER, Operation, operation, OPERATION)<br>name*: resource name |
| | DELETE | Drop RBAC resource<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |

| Endpoint | Method | Description |
|---|---|---|
| | | resource*: RBAC type (Available values: Role, role, ROLE, Object, object, OBJECT, User, user, USER, Operation, operation, OPERATION)<br>name*: resource name |
| /adabas/database/{dbid}/plog | GET | Retrieve the current PLOG statistics of Adabas PLOG<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/tcp | GET | Retrieve the current status of ADATCP/IP communication<br>Parameters:<br>dbid*: Database ID |
| | POST | Enable or disable TCP for the given dbid<br>Parameters:<br>dbid*: Database ID<br>enabled: Enable or disable TCP for the given dbid (true/false) |
| /adabas/database/{dbid}/tcpinfo | GET | Retrieve the current ADATCP connection of Adabas<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| | DELETE | Disconnect ADATCP connection in the database with the given dbid<br>Parameters:<br>dbid*: Database ID<br>start_id: First entry of ADATCP connection ID<br>end_id: Last entry of ADATCP connection ID |

| Endpoint | Method | Description |
|---|---|---|
| /adabas/database/{dbid}/threadtable | GET | Retrieve Adabas Thread Table<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/userqueue | GET | Retrieve a list of user queue entries<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| /adabas/database/{dbid}/userqueue/{queueid} | GET | Provide User queue details of a specific user queue element<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>queueid*: User Queue ID<br>rfc3339: Return timestamps in RFC3339 format (true/false) |
|  | DELETE | Stop the User Queue element<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>queueid*: User Queue ID<br>toqueueid: If range of users this is the user id end User Queue entry |

## Adabas Database Can be Operated in Offline Mode Only

| Endpoint | Method | Description |
|---|---|---|
| /adabas/database | POST | Create a new Adabas database, the input needs to be JSON. A structure level parameter indicates Adabas version to be used.<br>Parameters:<br>database: Please refer to the example value in Swagger API |
| /adabas/database/{dbid_operation} | DELETE | Delete the Adabas database<br>Parameters:<br>dbid_operation*: Database ID |
| /adabas/database/{dbid}/container/{container_type} | DELETE | Delete a Adabas container<br>Parameters:<br>dbid*: Database ID<br>container_type*: Container type, may be ASSO or DATA |

## Adabas Database Can be Operated in Online and Offline Mode

| Endpoint | Method | Description |
|---|---|---|
| /adabas/database | GET | Retrieve a list of databases known by Adabas Interface.<br>Parameters:<br>No parameters |
| /adabas/database/{dbid_operation} | GET | Retrieve the current status of database with the given dbid<br>Parameters:<br>dbid_operation*: Database ID optional with operation append with : like 123:shutdown. Possible operations are: cancel, shutdown, abort, start |

| Endpoint | Method | Description |
|---|---|---|
| | POST | Initiate operations on the given dbid<br>Parameters:<br>dbid_operation*: Database ID optional with operation append with : like 123:shutdown. Possible operations are: cancel, shutdown, abort, start, feofclog, feofplog, feofelog<br>etsync: Only used together with PLOG FEOF (true/false) |
| | PUT | Change resource of the given database<br>Parameters:<br>dbid_operation*: Database ID (123) or Database ID optional with operation append with : like 123:shutdown. Possible operations are: cancel, shutdown, abort, start, feofclog, feofplog, feofelog<br>name: Database name<br>eventing: Enable or disable eventing(true/false)<br>writelimit: Set Write Limit<br>lock: Lock database (true/false)<br>externalbackup: External database backup (true=prepare false=continue) |
| /adabas/database/{dbid}/GCB | GET | Retrieve the current GCB of the database with the given dbid<br>Parameters:<br>dbid*: Database ID<br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| /adabas/database/{dbid}/container | GET | Retrieve Adabas containers<br>Parameters:<br>dbid*: Database ID |
| | POST | Add a container to Adabas<br>Parameters: |

| Endpoint | Method | Description |
|---|---|---|
| | | dbid*: Database ID<br>database: Please refer to the example value in Swagger API |
| /adabas/database/{dbid}/container/{container_type} | POST | Add a container type to Adabas<br>Parameters:<br>dbid*: Database ID<br>container_type*: Container type, may be ASSO or DATA<br>database: Please refer to the example value in Swagger API |
| /adabas/database/{dbid}/fields/{file} | GET | Retrieve Adabas FDT information for a file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number and operation separated by ':'. Possible operations are: refresh, renumber<br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| | POST | Modify Adabas FDT information for a file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>addfields*: Add fields to the FDT |
| | PUT | Change a list of fields in an Adabas file, first drop or add fields<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number |

| Endpoint | Method | Description |
|---|---|---|
| | | drop: List of fields to be deleted<br>add: Add fields to the FDT<br>change: Change fields to the FDT |
| | DELETE | Drop a list of fields in an Adabas file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>fields*: List of fields to be deleted |
| /adabas/database/{dbid}/file | GET | Retrieve a list of files defined in the database<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port> |
| /adabas/database/{dbid}/file/{file_operation} | GET | Retrieve Adabas FCB information for a file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file_operation*: File number and operation, separated by ':'. Possible operations are: refresh, renumber, rename, addlob<br>name: Used for operation rename<br>number: Used for operation renumber/ addlob<br>uiblocksize: Used for operation addlob (in kilobyte unit). Input format (separated by ':' if there are 2 entries): number or number:number. Note: if you specify two block sizes, one value should be < 16K, and one value should be >= 16K. You should also specify two values for UISIZE; the first value for UIBLOCKSIZE corresponds to the first value of UISIZE, and the second value for |

| Endpoint | Method | Description |
|---|---|---|
| | | UIBLOCKSIZE corresponds to the second value of UISIZE<br>niblocksize: Used for operation addlob (in kilobyte unit). Input format (separated by ':' if there are 2 entries): number or number:number. Note: if you specify two block sizes, one value should be < 16K, and one value should be >= 16K. You should also specify two values for NISIZE; the first value for NIBLOCKSIZE corresponds to the first value of NISIZE, and the second value for NIBLOCKSIZE corresponds to the second value of NISIZE<br>nisize: Used for operation addlob (in blocks or megabytes unit). Input format (separated by ':' if there are 2 entries): number[B:M] or number[B:M]: number[B:M]:. Note: If you specify two NIBLOCKSIZE, you should also specify two values for NISIZE<br>uisize: Used for operation addlob (in blocks or megabytes unit). Input format (separated by ':' if there are 2 entries): number[B:M] or number[B:M]: number[B:M]:. Note: If you specify two UIBLOCKSIZE, you should also specify two values for UISIZE<br>acblocksize: Used for operation addlob (in kilobyte unit)<br>rfc3339: Return timestamps in RFC3339 format (true/false) |
| | DELETE | Delete the file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file_operation*: File number, no operation possible |
| /adabas/database/{dbid}/gcb | GET | Retrieve the current GCB of the database with the given dbid<br>Parameters: |

| Endpoint | Method | Description |
|---|---|---|
| | | dbid*: Database ID rfc3339: Return timestamps in RFC3339 format (true/false) |
| /adabas/database/{dbid}/nuclog | GET | Retrieve Adabas nucleus log<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>list: List all available (true/false)<br>name: Get specific adanuc log, default is adanuc.log |
| /adabas/database/{dbid}/parameter | GET | Retrieve Adabas parameters<br>Parameters:<br>dbid*: Database ID<br>type*: Type of parameter static or dynamic. (Available type: dynamic, DYNAMIC, static, STATIC) |
| | POST | Change Adabas parameter, Adabas parameter can even be given as request parameter<br>Parameters:<br>dbid*: Database ID<br>type*: Type of parameter static or dynamic. (Available type: dynamic, DYNAMIC, static, STATIC)<br>parameter: Please refer to the example value in the Swagger API |
| | PUT | Change Adabas parameter, Adabas parameter can even be given as request parameter<br>Parameters:<br>dbid*: Database ID<br>type*: Type of parameter static or dynamic. (Available type: dynamic, DYNAMIC, static, STATIC) |

| Endpoint | Method | Description |
|---|---|---|
| | | AR: Action if a restart detects that the last system crash was during a buffer flush<br>BI: Write before image to PLOG (true/false)<br>CLOGLAYOUT: Select layout of CLOG<br>PLOG: Protection logging (true/false)<br>LPXA: Size of XA area<br>BFIO: Limit of parallel buffer flush IOs<br>CLOGBMAX: Length of Adabas buffers logged<br>LOGGING: Command logging<br>NCL: Number of local client threads<br>NISNHQ: Maximum number of ISNs in hold per user<br>NT: Number of threads<br>NU: Number of user queue elements<br>OPTIONS: Various options<br>TNAA: Non-activity time limit (ACC only users)<br>TNAE: Non-activity time limit (ET Logic users)<br>TNAX: Non-activity time limit (EXU, EXF users)<br>TT: Transaction time limit<br>USEREXITS: User exit(s) to be used<br>RPL_RECORDS: Read parallel limits records<br>RPL_BLOCKS: Read parallel limits blocks<br>RPL_TOTAL: Read parallel limits total<br>LAB: Length of attached buffers area<br>LABX: Length of attached buffers extended area |

| Endpoint | Method | Description |
|---|---|---|
| | | LBP: Adabas buffer pool size<br>LWP: Length of Adabas Work Pool<br>WRITE_LIMIT: Buffer pool modification limit<br>APU_UNITS: Number of APUs<br>APU_WORKERS: Number of worker threads per APU<br>APU_RECVS: Number of receiver threads per APU<br>ADATCP: ADATCP (true/false)<br>ADATCPPORT: TCP/IP receiver port number<br>ADATCPATB: Attached buffer size for ADATCP receivers<br>ADATCPRECEIVER: Number of ADATCP receiver threads<br>ADATCPCONNECTIONS: Maximum number of parallel ADATCP connections per receiver thread<br>SSLPORT: The TCP/IP port for encrypted communication<br>SSLPORTNUMBER: The TCP/IP port for encrypted communication<br>SSLCERTFILE: Certificate file for encrypted communication<br>SSLKEYFILE: Private key file for encrypted communication<br>SSLVERIFY: Verification level of client certificates<br>SSLCAFILE: CA certificate file or certificate chain file<br>SSLCADIRECTORY: Directory name where certificates of the Certificate Authority are stored |

| Endpoint | Method | Description |
|---|---|---|
| | | SSLPASSWORD: Passphrase of file name which contains the passphrase<br>CLUSTER_BOOTSTRAP: Cluster bootstrap (true/false)<br>CLUSTER_PORT: TCP/IP port for cluster communication<br>CLUSTER_URL: Cluster nodes address<br>CLUSTER_DONOR_NAMES: Node name which should transfer data (IST or SST) to a joining node<br>CLUSTER_IST_PORT: TCP/IP port for Incremental State Transfer<br>CLUSTER_LOG_LEVEL: Maximum log level of cluster messages: FATAL\|ERROR\|WARN\|INFO\|DEBUG<br>CLUSTER_PUBLIC_HOST: Cluster public host<br>CLUSTER_PUBLIC_PORT: Cluster public port<br>CLUSTER_OPTIONS: Allow additional provider library parameter settings<br>CLUSTER_SST_PORT: TCP/IP for State Snapshot Transfer<br>CLUSTER_NODE_NAME: Cluster node name<br>type*: Type of parameter static or dynamic. (Available values: dynamic, DYNAMIC, static, STATIC) |
| /adabas/database/{dbid}/parameterinfo | GET | Retrieve Adabas parameter metadata information<br>Parameters:<br>dbid*: Database ID |
| /adabas/database/{dbid}/ucb | GET | Retrieve Adabas UCB entries<br>Parameters:<br>dbid*: Database ID |

| Endpoint | Method | Description |
|---|---|---|
| | | rfc3339: Return time format in RFC3339(true/false) |
| /adabas/database/{dbid}/ucb/{ucbid} | DELETE | Delete an Adabas UCB entry<br>Parameters:<br>dbid*: Database ID<br>ucbid*: UCB entry id |
| /adabas/env | GET | Retrieve a list of Adabas version installations used<br>Parameters:<br>No parameters |
| /adabas/{clusterid}/getclusterinfo | GET | Verify Cluster Connection String which mapped in dbmapping.txt or using connection string parameter.<br>Parameters:<br>clusterid*: Cluster ID or ADATCP short reference like adatcp:<host>:<port> |

## The Scheduler Manages Jobs Running in the RESTful Server

| Endpoint | Method | Description |
|---|---|---|
| /scheduler/execution | GET | Retrieve a specific job result<br>Parameters:<br>from: Start time from<br>to: End time to<br>start_time: Timestamp of first job execution entry<br>end_time: Timestamp of last job execution entry |
| /scheduler/job | GET | Retrieve a list of jobs known by Adabas Interface<br>Parameters:<br>start_time: Timestamp of first job entry<br>end_time: Timestamp of last job entry |

| Endpoint | Method | Description |
|---|---|---|
| | POST | Create a new Job database<br>Parameters:<br>job: Please refer to the example value in the Swagger API |
| /scheduler/job/{jobName} | GET | Retrieve a job definition<br>Parameters: j<br>obName*: Job Name to be requested |
| | PUT | Schedule an already defined Job<br>Parameters:<br>jobName*: Job Name to be requested |
| | POST | Update an already defined Job<br>Parameters:<br>jobName*: Job Name to be requested |
| | DELETE | Delete a job definition<br>Parameters:<br>jobName*: Job Name to be requested |
| /scheduler/job/{jobName}/full | GET | Retrieve a full job definition<br>Parameters:<br>jobName*: Job Name to be requested |
| /scheduler/job/{jobName}/result | GET | Retrieve all job results<br>Parameters:<br>jobName*: Job Name to be requested<br>rfc3339: Return timestamps in RFC3339 format (true /false)<br>start_time: Timestamp of first execution entry<br>end_time: Timestamp of last execution entry |
| /scheduler/job/{jobName}/result/{jobId} | DELETE | Delete a specific job result<br>Parameters:<br>jobName*: Job Name to be requested<br>jobId*: Job id of execution result to be requested |

| Endpoint | Method | Description |
|---|---|---|
| | GET | Retrieve a specific job result<br>Parameters:<br>jobName*: Job Name to be requested<br>jobId*: Job id of execution result to be requested |
| /scheduler/jobs | GET | Retrieve a list of active job names known by Adabas Interface<br>Parameters:<br>No parameters |
| /scheduler/results | GET | Retrieve a specific job result<br>Parameters:<br>from: Start time from<br>to: End time to |

## User Permission to Access the Adabas Data

| Endpoint | Method | Description |
|---|---|---|
| /adabas/rest/access/{role} | GET | Retrieve the list of users who are allowed to access data<br>Parameters:<br>role*: Access to role information for users or administrators. (Available values: User, user, USER, Administrator, administrator, ADMINISTRATOR) |
| | POST | Insert user into the list of users who are allowed to access data<br>Parameters:<br>role*: Access to role information for users or administrators. (Available values: User, user, USER, Administrator, administrator, ADMINISTRATOR)<br>user*: New user to be added |
| | DELETE | Delete user into the list of users who are allowed to access data<br>Parameters:<br>role*: Access to role information for users or administrators. (Available values: User, user, USER, Administrator, administrator, ADMINISTRATOR) |

| Endpoint | Method | Description |
|---|---|---|
| | | user*: User to deleted |

## Classic Direct Access to Adabas Data

| Endpoint | Method | Description |
|---|---|---|
| /binary/db/{dbid}/{file}/{isn}/{field} | GET | Retrieve a lob of a specific ISN of a field<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: Database file<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>reference: Remote node reference<br>mimetype: Specific the data MIME type<br>search: search criterium |
| | PUT | Set a lob at a specific ISN of a field in a Map<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: Database file<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>reference: Remote node reference<br>uploadLob*: Upload raw binary content of field |
| /image/db/{dbid}/{file}/{isn}/{field} | GET | Retrieve a field of a specific ISN of a Map definition<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: Database file |

| Endpoint | Method | Description |
|---|---|---|
| | | isn*: Specific ISN number<br>field*: Specific the field to be<br>reference: Remote node reference<br>search: search criterium |
| /rest/db | GET | Retrieve a list of known databases.<br>Parameters:<br>No parameter |
| /rest/db/{dbid} | GET | Retrieve a list of files contained in the given database<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>reference: Remote node reference |
| /rest/db/{dbid}/{file} | GET | Get database records of a given database and file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>fields: A comma separated list of fields which should be in result (Default value: *)<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium<br>search: Search criterium<br>reference: Remote node reference<br>compact: Return result in compact structure(true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false) |

| Endpoint | Method | Description |
|---|---|---|
| | | xmlnotation: Use XML notation namespace (true/false) |
| | POST | Insert database record<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>reference: Remote node reference<br>data*: Data content. Please refer to the example value in the Swagger API |
| | PUT | Update record data<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>reference: Remote node reference<br>data*: Data content. Please refer to the example value in the Swagger API |
| /rest/db/{dbid}/{file}/{isn} | GET | Retrieve database record(s) of a given ISN<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN number or “*” for all records<br>reference: Remote node reference<br>fields: A comma separated list of fields which should be in result (Default value: *)<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium |

| Endpoint | Method | Description |
|---|---|---|
| | | search: Search criterium<br>compact: Return result in compact structure (true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>xmlnotation: Use XML notation namespace (true/false) |
| | POST | Insert database record at given ISN.<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN number to be inserted<br>reference: Remote node reference<br>data*: Data content. Please refer to the example value in the Swagger API |
| | PUT | Update database record of a given ISN.<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN number to be updated<br>reference: Remote node reference<br>data*: Data content. Please refer to the example value in the Swagger API |
| | DELETE | Delete a specific ISN<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN of the record to be deleted |

| Endpoint | Method | Description |
|---|---|---|
| | | reference: Remote node reference |
| /rest/db/{dbid}/{file}/{isn}/{field} | GET | Retrieve a specific database record field data.<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN number or "*" for all records<br>field*: Field to be read<br>reference: Remote node reference<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium<br>search: Search criterium<br>compact: Return result in compact structure (true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>xmlnotation: Use XML notation namespace (true/false) |
| | PUT | Update database record field<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number<br>isn*: ISN number to be updated<br>field*: Field to be updated<br>reference: Remote node reference<br>data*: Data content. Please refer to the example value in the Swagger API |

| Endpoint | Method | Description |
|---|---|---|
| /rest/fields/{dbid}/{file} | GET | Retrieve all fields of an Adabas file<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: File number |
| /video/db/{dbid}/{file}/{isn}/{field} | GET | Retrieve a video stream of a specific ISN of a Map definition<br>Parameters:<br>dbid*: Database ID or ADATCP or ADATCPS short reference like adatcp:<host>:<port><br>file*: Database file<br>isn*: Specific ISN number<br>field*: Specific the field to be streamed<br>reference: Remote node reference<br>mimetypeField*: Specific the field containing the mimetype<br>search: search criterium |

## Adabas Database Access Using Adabas Maps

| Endpoint | Method | Description |
|---|---|---|
| /binary/map/{name}/{isn}/{field} | GET | Retrieve a lob of a specific ISN of a field in a Map<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>mimetype: Specific the data MIME type<br>search: search criterium |
| | PUT | Set a lob at a specific ISN of a field in a Map<br>Parameters:<br>name*: Map name |

| Endpoint | Method | Description |
|---|---|---|
| | | isn*: Specific ISN number<br>field*: Specific the field to be<br>uploadLob*: Upload raw binary content of field |
| /image/map/{name}/{isn}/{field} | GET | Retrieve a field of a specific ISN of a Map definition<br>Parameters:<br>name*: Map name<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>search: search criterium |
| | PUT | Upload a LOB date to the given database field<br>Parameters:<br>name*: Map name<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>uploadImage*: Upload image |
| /rest/map | GET | Retrieve a list of available maps<br>Parameters:<br>No parameters |
| | POST | Store send records into Map definition<br>Parameters:<br>data: The file to upload |
| /rest/map/{name} | GET | Retrieve all records of a Map definition<br>Parameters:<br>name*: Map definition name<br>fields: A comma separated list of fields which should be in the result (Default value: *)<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20) |

| Endpoint | Method | Description |
|---|---|---|
| | | sorted_by: Sort criterium<br>search: Search criterium<br>compact: Return result in compact structure (true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>xmlnotation: Use XML notation namespace (true/false) |
| | POST | Store send records into Map definition<br>Parameters:<br>name*: Map definition name<br>data*: Data content. Please refer to the example value in the Swagger API |
| | PUT | Update send records into a Map definition<br>Parameters:<br>name*: Map definition name<br>data*: Data content. Please refer to the example value in the Swagger API |
| /rest/map/{name}/{isn} | GET | Retrieve all records of specific ISN in a Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number or "*" for all ISN<br>fields: A comma separated list of fields which should be in result (Default value: *)<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium<br>search: Search criterium<br>compact: Return result in compact structure (true/false) |

| Endpoint | Method | Description |
|---|---|---|
| | | flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>xmlnotation: Use XML notation namespace (true/false) |
| | POST | Insert a new records of a Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number or “*” for all ISN<br>data*: Data content. Please refer to the example value in the Swagger API |
| | PUT | Update a record of a Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number or “*” for all ISN<br>fields: A comma separated list of fields which should be in result (Default value: *)<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium<br>search: Search criterium<br>compact: Return result in compact structure (true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>exchange: Exchange current input data with record (true/false)<br>xmlnotation: Use XML notation namespace (true/false)<br>data*: Data content. Please refer to the example value in the Swagger API |

| Endpoint | Method | Description |
|---|---|---|
| | DELETE | Delete a record of Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number or “*” for all ISN |
| /rest/map/{name}/{isn}/{field} | GET | Retrieve a field of a specific ISN of a Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number or “*” for all ISN<br>field*: Specific a comma separated list of fields to be part of the result record<br>start: Start offset where the read will start from (Default value: 0)<br>limit: Maximal number of records retrieved (Default value: 20)<br>sorted_by: Sort criterium<br>search: Search criterium<br>compact: Return result in compact structure (true/false)<br>flatten: Remove database group tree entries in result records (true/false)<br>descriptor: Read a descriptor read with the given field entry (true/false)<br>xmlnotation: Use XML notation namespace (true/false) |
| /rest/metadata/map/{name} | GET | Retrieve metadata of a Map definition<br>Parameters:<br>name*: Map definition name |
| /video/map/{name}/{isn}/{field} | GET | Retrieve a video stream of a specific ISN of a Map definition<br>Parameters:<br>name*: Map definition name<br>isn*: Specific ISN number<br>field*: Specific the field to be<br>mimetype: Specific the data MIME type |

| Endpoint | Method | Description |
|---|---|---|
| | | mimetypeField*: Specific the field containing the mimetype<br>search: search criterium |

## Browse to the File Locations

| Endpoint | Method | Description |
|---|---|---|
| /file/access/{location} | GET | Download a file out of file location<br>Parameters:<br>location*: Identifier of the file location<br>file*: Identifier of the file location |
| | POST | Upload a new file to the given location<br>Parameters:<br>location*: Identifier of the file location<br>file*: Identifier of the file location<br>fileUpload*: Upload file |
| | PUT | Create a new directory<br>Parameters:<br>Ffile*: Identifier of the file location<br>location*: Identifier of the file location |
| | DELETE | Delete the file on the given location<br>Parameters:<br>location*: Identifier of the file location<br>file*: Identifier of the file location |
| /file/browse | GET | Retrieve a list of browsable locations<br>Parameters:<br>No parameters |
| /file/browse/{location} | GET | Retrieve a list of files in the defined location.<br>Parameters:<br>location*: Identifier of the file location |

| Endpoint | Method | Description |
|---|---|---|
| | | file: Identifier of the file location |

## Redirect to Remote Cluster Node

| Endpoint | Method | Description |
|---|---|---|
| /redirect/{name} | GET | Redirect to remote cluster entry<br>Parameters:<br>name*: Name of the node<br>x*: Destination path |
| | POST | Store configuration<br>Parameters:<br>name*: Name of the node<br>x*: Destination path |
| | PUT | Store configuration<br>Parameters:<br>name*: Name of the node<br>x*: Destination path |