

IBM Explorer for z/OS Atlas (Open Toolchain API)
Technical Preview

Installation Guide



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Note

Before using this information, be sure to read the general information under “Notices” on page 15.

Second edition

This edition applies to IBM Explorer for z/OS Atlas Version 0.0.2 and to all subsequent releases and modifications until otherwise indicated in new editions.

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Contents

About this book	v
Who should read this book	v

Chapter 1. Planning the installation . . .	1
System requirements.	1
Pre-installation checklist	1

Chapter 2. Installing Atlas	3
--	----------

Chapter 3. Verifying installation	7
--	----------

Chapter 4. Applying services to Atlas . .	9
--	----------

Chapter 5. Uninstalling Atlas	11
--	-----------

Chapter 6. Troubleshooting installation	13
--	-----------

Notices	15
Copyright license	18

Trademark acknowledgments	18
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About this book

This installation guide provides instructions for installing and upgrading IBM Explorer for z/OS Atlas (Atlas).

The following names are used in this manual:

- *IBM Explorer for z/OS Atlas* is called *Atlas*.
- *IBM Explorer for z/OS* is called *z/OS Explorer*.

This document is maintained between product releases. The new changes, and smaller corrections and additions, are indicated by a "|" change bar in the left margin of the page.

Who should read this book

This book is intended for system programmers who are installing and configuring Atlas on their workstations. To use this book, you must be familiar with:

- z/OS®
- IBM® z/OS Management Facility (z/OSMF)

Chapter 1. Planning the installation

Before you start the installation, review the information about system requirements and other considerations.

System requirements

Before you install Atlas, ensure that your workstation meets the following system requirements:

- Atlas must be installed on z/OS version 2.1 or later.
- IBM z/OS Management Facility (z/OSMF) must be installed and running. z/OSMF is a prerequisite for the Atlas microservice.

Atlas uses the RESTFILES and RESTJOBS services of z/OSMF to access data sets, z/OS UNIX System Services (USS) files, and job spool files. Therefore, these services must be correctly configured and available when Atlas is running.

Additionally, Atlas uses z/OSMF configuration by using symbolic links to the z/OSMF bootstrap.properties, jvm.security.override.properties, and the ltpa.keys files. Specifically, Atlas reuses z/OSMF's SAF, SSL, and LTPA configuration; therefore, these configurations must be valid and complete to operate Atlas successfully.

For more information about z/OSMF installation and customization, see the IBM z/OS Management Facility Configuration Guide (SC27-8419).

- (Optional) To enable real-time access to SYSLOG, SDSF must be installed.
- (Optional) To enable direct access to fault entry reports from abending jobs and transactions, Fault Analyzer Version 13.1 or later must be installed.
- (Optional) To enable FM enhanced search function, File Manager Version 13.1 or later must be installed.

Pre-installation checklist

Before you install Atlas, make the following decisions:

- The HFS directory where you install Atlas, for example, /var/atlas.
- The HFS directory path that contains a 64-bit Java™ 8 JRE.
- The z/OSMF installation directory /lib that contains derby.jar, for example, /usr/lpp/zosmf/lib.
- The z/OSMF configuration user directory path that contains z/OSMF /bootstrap.properties, /jvm.security.override.properties, and /resources/security/ltpa.keys files.
- The Atlas http and https port numbers. By default, they are 7080 and 7443.
- The user ID that runs the Liberty Atlas started task.

Tip: Use the same user ID that runs the z/OSMF IZUSVR1 task, or a user ID with equivalent authorizations.

- (Optional) The SDSF java installation directory, for example, /usr/lpp/sdsf/java.
- (Optional) IBM File Manager high-level qualifier, for example, FMN.V13R1M0.

Chapter 2. Installing Atlas

Procedure

1. Download the Atlas archive from the IBM Mainframe Developer Center. The archive is about 200 MB.
2. Extract the archive on your workstation and transfer the following files to z/OS System:
 - The Atlas PAX archive that contains Liberty Profile binaries and the Atlas application.
 - The Atlas Install script

Note: The Atlas Install script is an ASCII file. If the Install script is transferred by using FTP, the Install script is converted into the appropriate format for the server. If the Install script is transferred by using SCP or SFTP, the Install script is not converted, and it should be converted by taking the action specified in the **Important** note below.

Alternatively, transfer the Atlas archive to your z/OS system, and extract the archive. The Atlas archive contains the following files:

- The Atlas PAX archive that contains Liberty Profile binaries and the Atlas application
- The Atlas Install script
- This Installation Guide
- The Readme file

Extracting the archive on the server does not convert the Install script. The Install script should be converted by taking the action specified in the **Important** note below.

Important: To convert the Install script from ASCII into the standard EBCDIC code page, use **ICONV**. For example,

```
iconv -f ISO8859-1 -t IBM-1047 atlas-wlp-package-0.0.1.sh > atlas-wlp-package-EBCDIC.sh
```

Note: Transfer the PAX archive and the Install script in binary mode to the Atlas installation directory that is chosen during planning, for example, /var/atlas, or wherever you choose to install Atlas.

3. Run the Atlas install script.

The install script must be transferred to the same Atlas installation directory of the Atlas PAX archive. Run the install script in the installation directory with a user ID that has the authority to:

- Unpack the Atlas PAX archive and install Atlas into the installation directory, for example, /var/atlas. About 205 MB is needed to unpack the archive and more space is needed for Liberty operation and logging.
- Set the file group ownership to IZUADMIN.
- Create symbolic links to the files that z/OSMF owns.

Therefore, use super user authority to run the Atlas install script.

4. Change the ownership of Atlas installation directory and files.

The user who runs the Atlas Liberty server needs the access to the Atlas installation directory and files. You can use the same user ID that runs the z/OSMF IZUSVR1 started task to run the Atlas Liberty server. By default, it is the user IZUSVR.

To change the ownership of the Atlas installation directory and files, enter the following z/OS UNIX System Services command from the Atlas installation directory:

```
chown -R IZUSVR *
```

You might need super user authority to run this command. Use an alternative user ID if you chose not to use the default z/OSMF IZUSVR1 started task user.

5. Create a member FEKATLS in your system PROCLIB data set.

The install script creates a file that is called FEKATLS.jcl is created in your Atlas installation directory. Copy this file to a system PROCLIB data set by using the following z/OS UNIX System Services command:

```
cp FEKATLS.jcl "'h1q.PROCLIB(FEKATLS)'"
```

The FEKATLS procedure starts a Liberty profile server running the Atlas microservice application.

6. Configure the FEKATLS started procedure.

To run the FEKATLS procedure as the user IZUSVR, define the procedure to the STARTED class by using RACF® or equivalent, for example:

- RDEF STARTED (FEKATLS.*) STDATA(USER(IZUSVR) GROUP(IZUADMIN))
- SETR RACLIST(STARTED) REFRESH

Here is an example of the FEKATLS procedure JCL:

```
//*****
//* Licensed Materials - Property of IBM                      *
//*                                                         *
//* 5655-EX1                                                  *
//*                                                         *
//* Copyright IBM Corp. 2017. All rights reserved.          *
//*                                                         *
//* US Government Users Restricted Rights - Use,            *
//* duplication or disclosure restricted by GSA ADP          *
//* Schedule Contract with IBM Corp.                        *
//*                                                         *
//*****
//*                                                         *
//* ATLAS WLP PROCEDURE                                     *
//*                                                         *
//* This is a procedure to start the Atlas web server platform, *
//* running on the WebSphere Liberty Profile. This procedure *
//* requires a WebSphere Liberty Angel procedure is running, such as *
//* z/OSMF procedure "IZUANG*".                               *
//*                                                         *
//* NOTE: THIS JCL IS MODIFIED BY THE ATLAS INSTALLATION PROCESS TO *
//* SET THE ATLAS INSTALLATION PATH. IF THE INSTALLATION PATH *
//* CHANGES, MODIFY THE SRVRPATH VALUE ACCORDINGLY.         *
//*                                                         *
//*****
//ATLAS PROC
//*-----
//* SRVRPATH - The path to the HFS directory where the Atlas server *
//* was installed.                                              *
//*-----
//EXPORT EXPORT SYMLIST=*
// SET SRVRPATH='${atlaspath}'
//*-----
//* Start the Atlas WebSphere Liberty Profile server
//*-----
//STEP1 EXEC PGM=BPXBATSL,REGION=0M,TIME=NOLIMIT,
```

```
// PARM='PGM &SRVRPATH/wlp/lib/native/zos/s390x/bbgzsrv Atlas'
//WLPUDIR DD PATH='&SRVRPATH/wlp/usr'
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//*-----
//* Optional logging parameters that can be configured if required
//*-----
//*STDOUT DD PATH='&SRVRPATH/std.out',
//*        PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//*        PATHMODE=SIRWXU
//*STDERR DD PATH='&SRVRPATH/std.err',
//*        PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//*        PATHMODE=SIRWXU
```

7. Add Atlas users to the z/OSMF users group (IZUUSER).

Atlas uses z/OSMF to access data sets, z/OS UNIX System Services files, and job spool files. To use these z/OSMF services, Atlas users must be authorized to z/OSMF resources. For more information, see the IBM z/OS Management Facility Configuration Guide, Appendix A.

To add Atlas users to the z/OSMF IZUUSER group, use RACF or equivalent. For example,

```
CONNECT userid GROUP(IZUUSER) AUTH(USE)
```

8. Start the Atlas server.

To start Atlas manually, enter the **START** operator command:

```
S FEKATLS
```

To start Atlas automatically at IPL, add the **START** command to your active COMMNDxx parmlib member.

9. Optional: Change your language in Atlas by adding the following line to the jvm.options file, for example,

```
-Duser.language=de
```

where de can be replaced with other language codes.

Chapter 3. Verifying installation

After Atlas is installed and the FEKATLS procedure is started, you can verify the installation from an internet browser by using the following URL:

`https://your.server:atlasport/Atlas/api/system/version`

where *your.server* matches the host name or IP address of your z/OS system where Atlas is installed, and *atlasport* matches the port number that is chosen during installation. You can verify the port number in the `server.xml` file that is located in the Atlas installation directory, which is `/var/atlas/wlp/usr/servers/Atlas/server.xml` by default. Look for the `httpsPort` assignment in the `server.xml` file, for example: `httpPort="7443"`.

Important: This URL is case-sensitive.

This URL sends an HTTP GET request to your Liberty Profile Atlas server. If Atlas is installed correctly, a JSON payload that indicates the current Atlas application version is returned. For example:

```
{ "version": "V0.0.1" }
```

Note: For the first interaction with the Atlas server, you are prompted to enter an MVS™ user ID and password. The MVS user ID and password are passed over the secure HTTPS connection to establish authentication.

Verifying the availability of Atlas REST APIs

To verify the availability of all Atlas REST APIs, use the Liberty Profile's REST API discovery feature from an internet browser with the following URL:

`https://your.server:atlasport/ibm/api/explorer`

Note: This URL is case-sensitive.

With the discovery feature, you can also try each discovered API. The users who verify the availability must have access to their data sets and job information by using relevant Atlas APIs. This ensures that your z/OSMF configuration is valid, complete, and compatible with the Atlas application. For example, try the following APIs:

```
Atlas : JES Jobs APIs
      GET /Atlas/api/jobs
      This API returns job information for the calling user.
Atlas : Dataset APIs
      GET /Atlas/api/datasets/userid.**
      This API returns a list of the userid.** MVS datasets.
```

Chapter 4. Applying services to Atlas

You can monitor IBM Mainframe Developer Center for service availability of Atlas.

When maintenance is available, you can apply the service to Atlas with one of the following options:

- Replace the EAR file only. To do so, take the following steps:
 1. Download the EAR file from the download site as a .zip file.
 2. Extract the EAR package on your personal machine or by using zip utilities on the mainframe.
 3. Stop the existing instance of the Atlas server.
 4. Backup and delete the existing EAR file located at "{server root folder}/wlp/usr/servers/Atlas/apps".
 5. Transfer the new EAR file to the server at the same location "{server root folder}/wlp/usr/servers/Atlas/apps".
 6. Restart the Atlas server.
- Apply the whole service package. To do so, take the following steps:
 1. Transfer the maintenance archive to your z/OS system in binary mode.
 2. Unpack the archive in your Atlas installation directory in z/OS UNIX System Services. Or, run the install script that is provided in the archive if any.
 3. Stop and restart your Atlas Liberty server.

Note: By default, Atlas server configuration switches off application monitoring in the Liberty server.xml file. For “hot deploy”, you can remove this setting in the server.xml file to avoid the need to stop and restart your Atlas server. For more information, see WebSphere® Liberty Profile documentation.

After restarting the Atlas server, you can check the version of Atlas installed from the swagger interface, which is Atlas/api/system/version under System APIs.

Chapter 5. Uninstalling Atlas

About this task

To uninstall Atlas, take the following steps:

Procedure

1. Stop your Atlas Liberty server by running the following operator command:
`P FEKATLS`
2. Delete the FEKATLS member from your system PROCLIB data set.
3. Remove RACF (or equivalent) definitions with the following command:
`RDELETE STARTED (FEKATLS.*)`
`SETR RACLIST(STARTED) REFRESH`
`REMOVE (userid) GROUP(IZUUSER)`
4. Delete the z/OS UNIX System Services Atlas directory and files from the Atlas installation directory by using the following command:
`rm -R /var/atlas`

Notes:

- You might need super user authority to run this command.
- You must identify the Atlas installation directory correctly. Running a recursive remove command with the wrong directory name might delete critical files.

Chapter 6. Troubleshooting installation

If Atlas REST APIs do not work, check the following items:

- Check whether your Atlas Liberty server is running.

You can check this in the Display Active (DA) panel of SDSF under ISPF. The FEKATLS task should be running. If the FEKATLS task is not running, start the Atlas server by using the following **START** operator command:

```
S FEKATLS
```

You can also use the operator command `D A, ATLAS` to verify whether the task is active, which alleviates the need for SDSF. If the started task is not running, ensure that your FEKATLS procedure resides in a valid PROCLIB data set, and check the task's job output for errors.

- Check whether the Atlas server is started without errors.

In the Display Active (DA) panel of SDSF under ISPF, select the FEKATLS job to view the started task output. If the Atlas server is started without errors, you can see the following messages:

```
CWWKE0001I: The server Atlas has been launched.
```

```
CWWKF0011I: The server Atlas is ready to run a smarter planet.
```

If you see error messages that are prefixed with "ERROR" or stack traces in the FEKATLS job output, respond to them.

- Check whether the URL that you use to call Atlas REST APIs is correct. For example: `https://your.server:atlasport/Atlas/api/system/version`. The URL is case-sensitive.
- Ensure that you enter a valid z/OS user ID and password when initially connecting to the Atlas Liberty server.
- If testing the Atlas REST API for jobs information fails, check the z/OSMF IZUSVR1 task output for errors. If no errors occur, you can see the following messages in the IZUSVR1 job output:

```
CWWKE0001I : The server zosmfServer has been launched.
```

```
CWWKF0011I: The server zosmfServer is ready to run a smarter planet.
```

If you see error messages, respond to them.

For RESTJOBS, you can see the following message if no errors occur:

```
CWWKZ0001I: Application IzuManagementFacilityRestJobs started in n.nnn seconds.
```

You can also call z/OSMF RESTJOBS APIs directly from your internet browser with a URL, for example,

```
https://your.server:securezosmfport/zosmf/restjobs/jobs
```

where the *securezosmfport* is 443 by default. You can verify the port number by checking the *izu.https.port* variable assignment in the z/OSMF bootstrap.properties file.

If calling the z/OSMF RESTJOBS API directly fails, fix z/OSMF before Atlas can use these APIs successfully.

- If testing the Atlas REST API for dataset information fails, check the z/OSMF IZUSVR1 task output for errors and confirm that the z/OSMF RESTFILES services are started successfully. If no errors occur, you can see the following message in the IZUSVR1 job output:

```
CWWKZ0001I: Application IzuManagementFacilityRestFiles started in n.nnn seconds.
```

You can also call z/OSMF RESTFILES APIs directly from your internet browser with a URL, for example,

`https://your.server:securezosmfport/zosmf/restfiles/ds?dslevel=userid.**`

where the *securezosmfport* is 443 by default. You can verify the port number by checking the *izu.https.port* variable assignment in the z/OSMF bootstrap.properties file.

If calling the z/OSMF RESTFILES API directly fails, fix z/OSMF before Atlas can use these APIs successfully.

Tip: The z/OSMF installation step of creating a valid IZUFPROC procedure in your system PROCLIB might be missed. For more information, see the z/OSMF Configuration Guide.

The IZUFPROC member resides in your system PROCLIB, which is similar to the following sample:

```
//IZUFPROC PROC ROOT='/usr/lpp/zosmf' /* zOSMF INSTALL ROOT */
//IZUFPROC EXEC PGM=IKJEFT01,DYNAMNBR=200
//SYSEXEC DD DISP=SHR,DSN=ISP.SISPEXEC
//          DD DISP=SHR,DSN=SYS1.SBPXEXEC
//SYSPROC DD DISP=SHR,DSN=ISP.SISPCLIB
//          DD DISP=SHR,DSN=SYS1.SBPXEXEC
//ISPLLIB DD DISP=SHR,DSN=SYS1.SIEALNKE
//ISPPLIB DD DISP=SHR,DSN=ISP.SISPPENU
//ISPTLIB DD RECFM=FB,LRECL=80,SPACE=(TRK,(1,0,1))
//          DD DISP=SHR,DSN=ISP.SISPTENU
//ISPSLIB DD DISP=SHR,DSN=ISP.SISPSENU
//ISPMLIB DD DISP=SHR,DSN=ISP.SISPMENU
//ISPPROF DD DISP=NEW,UNIT=SYSDA,SPACE=(TRK,(15,15,5)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120)
//IZUSRVM DD PATH='&ROOT./defaults/izurf.tsoservlet.mapping.json'
//SYSOUT DD SYSOUT=H
//CEEDUMP DD SYSOUT=H
//SYSUDUMP DD SYSOUT=H
//
```

Note: You might need to change paths and data sets names to match your installation.

A known issue and workaround for RESTFILES API can be found at TSO SERVLET EXCEPTION ATTEMPTING TO USE RESTFILE INTERFACE.

- Check your system console log for related error messages and respond to them.

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