Generating OpenPGP Keys with SecureZIP and Java on z/OS

PKWARE provides the ability to create and manage OpenPGP public/private key pairs for exchanging files using SecureZIP. This feature uses a Java application that runs under UNIX System Services in z/OS. PKWARE does not directly support Java on z/OS. This page offers information and links to help you configure Java.

Find more information in the documentation included with the key generation package.

Determining Your Current Java Availability

Your z/OS system may already have a Java environment available. In this section, you will discover how to determine your current status. If neither a Java SDK nor the JZOS Batch Launcher are installed in your environment, see "Obtaining Java and Related IBM Materials" later in this document.

Determining Java Availability in Your Existing Environment

To identify if your current system has Java available check the high level qualifier (HLQ) listed for each release. If the HLQ is on your system ensure that the file systems are mounted to the correct java folders. For example,

```
MOUNT    FILESYSTEM('JVA601.ZFS')
         TYPE(ZFS)
         MODE(RDWR)
         MOUNTPOINT('/usr/lpp/java')
```

The table below lists the product, description, FMID, and HLQ of Java release 1.6.

Java Release 1.6.0 and 1.6.1 products

Product Number	Description	Fmid	Dependent FMID	HLQ
5655-R31	IBM 31-Bit SDK for z/OS Java Technology Edition	HJVA601	HJVA601	JVA601
5655-R31	IBM 31-Bit SDK for z/OS Java Technology Edition	HJVA600	HJVA600	JVA600
5655-R32	IBM 64-Bit SDK for z/OS Java Technology Edition	HJVB601	HJVB601	JVB601
5655-R32	IBM 64-Bit SDK for z/OS Java Technology Edition	HJVB600	HJVB600	JVB600

Determining JZOS Availability in Your Existing Environment

JZOS is a set of tools that enhances the ability for z/OS Java applications to run in a traditional batch environment and/or access z/OS system services.

To identify if your current system has JZOS available, check the system dataset "SYS1.SIEALNKE" for a member JVMLDMxx where xx is the version and release of the Java you are using. If the module is there, then JZOS is available.

If these products are not available on your system follow the steps in "Installing the Java Batch Launcher and Toolkit (JZOS)" to install the Java/JZOS environment.

Obtaining Java and Related IBM Materials

The following references may be useful in locating IBM materials relating to Java. Please note that some resources are restricted by IBM to authorized users only.

You may need an IBM userid to access some of these links.

Visit the main IBM Java website (Figure 1) for zOS to get IBM Java products:

Java™ Standard Edition Products on z/OS

Figure 1: Java on z/OS Website

Click the link for the appropriate Java SDK for your environment (we'll use the 31-bit Java 6.0.1 version for examples in this reference document). The product page (Figure 2) contains:

- Information on the content of the Java product

- How to obtain the product

- History of this version of the product, and

- Choosing information on versions and release levels of those versions

Figure 2: Product Page for IBM Java SDK

Download and install Java SDK

Review the four sections of information on the web page, paying close attention to information on restrictions and prerequisites. To install the z/OS Java SDK:

1. Click **Download** to obtain the product.
2. The Sign-In page (Figure 3) appears. Enter your IBM userid and password to advance to the product download page.   If you do not have a userid, click **Get an IBM ID** to apply for one on this page.

Figure 3: Enter your IBM UserID and password to download the Java SDK

3. Review and agree to the license agreement.
4. On the download page, select the version with the required maintenance level (usually the latest).
5. Select either Download Director or http download processing.
6. Download the readme file and review it before installing the product. *This file contains specific information on z/OS requirements that must be completed.*
7. Download pax.Z
8. Transfer the pax.Z file to the mainframe either in a USS folder or a dataset.

Installing the Java Batch Launcher and Toolkit (JZOS)

The JZOS batch launcher function is delivered as part of the z/OS Java product. The function consists of three pieces: a load module that must be put into a z/OS PDSE, a sample start proc that can be tailored and put into an appropriate PROCLIB, and sample JCL that can be tailored and put into an appropriate SAMPLIB.

To install the Java Batch environment:

1. Go to the JZOS Java Launcher and Toolkit overview page
2. Click the reference for JZOS Batch Launcher and Toolkit Installation and Users Guide in the Documentation section.
3. Follow the instructions in Chapter 2, "Installation."

IBM z/OS Unrestricted JCE policy files

Cryptography support in Java is provided by the Java Cryptography Extension (JCE), which has been a part of the Java SDK since Version 1.4. The JCE provides a set of cryptographic

APIs, which are also referred to as *engine classes*, which Java applications can use.   The JCE provider-based architecture allows Java applications to be platform-neutral and still be able to exploit the strengths of each particular platform.

The IBM z/OS JDK comes with a large set of providers, the IBMJCECCA provider is specific to the z/OS platform and will exploit the System z hardware cryptographic devices.

The Java Developer Kit (JDK) and Java Runtime Environment (JRE) ship with limited support for strong cryptography due to import control restrictions for some countries. Residents of eligible countries can obtain the Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy File through the IBM SDK Policy Files website.

This site offers a separate set of policy files for version 1.4.1 of the Java SDK.

1. When you have logged in to the site, select the appropriate policy files for your installation. Unless you have Java SDK 1.4.1, select **Unrestricted JCE Policy Files for SDK for all newer versions**.
2. Review your contact information and update your privacy settings as required.
3. Review the license agreement and check the *I Agree* box.
4. Click *I confirm* at the bottom of the page. The download will begin.

When the download is complete, replace these files with the unlimited JCE files:

`<JAVA_HOME>/lib/security/local_policy.jar`

`<JAVA_HOME>/lib/security/US_export_policy.jar`

The `<JAVA_HOME>` is the absolute path to the installation directory of Java SE.

Additional Resources

Installing the Required Bouncy Castle Provider

The key generation application uses the Bouncy Castle Provider to accomplish certain cryptographic operations. This provider is distributed as a .jar file and installed in the JRE /lib/ext directory.

The appropriate Bouncy Castle Provider file *bcprov-jdk15on-147.jar* supports Java 1.5 and above. This file is included in the installation package, and can also be downloaded from the www.bouncycastle.org/latest_releases.html web page.