

IBM Rational Developer for System z

*RSE Server Installation Guide: Linux on  
System z*





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System z*



**Note**

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

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## Information about this document

This document describes how to install the RSE server option of IBM® Rational® Developer for System z® on a Linux on System z host system.

From here on, the following names are used.

- *IBM Rational Developer for System z* is called *Rational Developer for System z*.
- *IBM Rational Developer for Power Systems Software™* is called *Rational Developer for Power Systems Software*.

For earlier releases, including the following products, see the installation information that is found in the documentation included in those releases.

- IBM Rational Developer for the Enterprise
- Rational Developer for System z

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## Who this document is intended for

This document is intended for system programmers who are installing and configuring Rational Developer for System z on a Linux on System z host system.

This document describes steps that are needed to install the RSE server component of Rational Developer for System z. To use this document, you need to be familiar with the Linux on System z host system.



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## Introduction

The Remote System Explorer Communications Server (RSE server) is installed on any of the following systems:

- Intel Linux
- Linux on System z
- AIX<sup>®</sup> or Linux running on IBM Power Systems<sup>™</sup>

The RSE server allows a workstation that is running Rational Developer for System z to do the following types of tasks on the connected remote host system:

- Copy, edit, create, or delete remote files; search for files on the remote system.
- Download and upload files between workstation and server; transfer files between remote systems.
- Use remote command shells; run commands on the remote system; work with remote processes.
- Run integrated builds of remote source code; develop and debug remote programs.

This document describes how to install, use, and uninstall the RSE server on a Linux on System z host system.





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## Chapter 1. Linux on System z host requisites

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### General information

The products that are listed here are all available at the time of publication of the manual. See the IBM Support Lifecycle website to see whether a selected IBM product is still available at the time that you want to use the related Rational Developer for System z function.

The most current listing of prerequisites and corequisites is available in the *Rational Developer for System z Prerequisites Guide*, SC23-7659. This document supersedes the requirements that are listed in this document and is available in IBM Knowledge Center.

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### Linux on System z

One of the following levels must be installed:

Product Name
Red Hat Linux Enterprise Server 6 (s390x)
Red Hat Linux Enterprise Server 5 (s390x)
SUSE Linux Enterprise Server 11 (s390x)
SUSE Linux Enterprise Server 10 (s390x)

You can find more information at the Linux on IBM System z website.

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### SDK for Linux on System z, Java 2 Technology Edition

To use Remote Systems Explorer (RSE) on Linux on System z, one of the following levels must be installed:

Program Number	Product Name
6207-001	IBM 64-bit Runtime Environment for Linux on System z, Java™ 2 Technology Edition, Version 6
6205-001	IBM 64-bit Runtime Environment for Linux on System z, Java 2 Technology Edition, Version 5

You can find more information at the Linux on IBM System z website.



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## Chapter 2. RSE server installation and configuration

The supported functions of the RSE server on Linux on System z with Rational Developer for System z are shown in the following list:

- RSE access to Linux on System z including SSL and TLS v1.2 connections.
- Command shell use in RSE except **vi** or similar programs.
- Connection by the Host Emulator with full shell access.
- Compiling, linking, and running programs on Linux on System z.

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### RSE server installation, updates, and uninstall

#### Installing

Use IBM Installation Manager to install the RSE server.

**Note:** You can also use Installation Manager to install updates for the RSE server or to roll back a previously installed update. See “Updating” on page 8.

In the following instructions:

- The "server system" is the host system on which you are installing the RSE server.
- The "client system" is the system from which you are viewing and controlling the Installation Manager.

You can run the Installation Manager in either of two ways: with the X Window System or with the silent mode of Installation Manager. These methods are described in the next two subtopics.

#### Installation with the X Window System

1. Copy the installation file from the installation CD to a writable file system directory on the server system.
  - The CD has three directories, AIX, Linux, and zLinux that contain the installation file specific to the target OS. Pick the appropriate file from the directory that matches the OS on the server system.
2. Extract the RSE server installation image:

```
tar -xvf install_file
```

where *install\_file* is the installation file.
3. Connect the client system to the server system. Here are two methods for connecting the systems:
  - Connect a console to the server; or
  - On the client system, start an X Window System server to display the Installation Manager and follow these steps:
    - a. Set the DISPLAY variable on the server system to the host name and port of a third system. For example, if you are running **csch** on the server system, enter the following command on the **csch** command line:

```
setenv DISPLAY client_system:port
```

where *client\_system* is the host name of the client system and *port* is a valid port. For example:

```
setenv DISPLAY myclient:0
```

- b. Start the X Window System server on the third system.
4. On the system that is running the X Window System, enter the following command on the command line:

```
xhost +server_system
```

where *server\_system* is the host name of the server system. For example:

```
xhost +myserver
```

This command tells the X Window System to accept a display stream from the server system.

5. Start the Installation Manager. On the command line:
  - a. Change to the directory where you unpacked the installation file.
  - b. Enter the `install` command to start the Installation Manager:
6. Follow the directions in Installation Manager to complete the installation.

```
install
```

## Installation with silent mode

This method uses the silent mode capability of the Installation Manager. For more information about silent mode, see the product documentation for the IBM Installation Manager.

**Note:** Run the Installation Manager as the root user.

1. Copy the installation file from the installation CD to a writable file system directory on the server system.
  - The CD has three directories, AIX, Linux, and zLinux that contain the installation file specific to the target OS. Pick the appropriate file from the directory that matches the OS on the server system.

2. Extract the RSE server installation image:

```
tar -xvf install_file
```

where *install\_file* is the installation file.

3. On the command line, change to the directory where you unpacked the installation file.
4. The default installation directory for the RSE server is `/opt/IBM/RDz91`. To select another installation directory:
  - a. Open the `install.xml` response file with a text editor.
  - b. Find the `<profile>` element.
  - c. Change the `installLocation` parameter to specify the installation directory that you want to use. For example:

```
<profile
  id="IBM Rational Developer for System z Remote Systems Explorer"
  installLocation="rse_directory">
</profile>
```

where *rse\_directory* is the directory in which you want to install the RSE server.

- d. Close the text editor.

5. If you are installing multiple RSE server instances onto the system, you must specify a unique identifier and a unique installation location for each instance of the server. To specify a unique identifier and installation location:
  - a. Open the `install.xml` response file with a text editor.
  - b. Make the following changes to the `<profile>` element:
    - 1) Change the `id` parameter to specify the installation name that you want to use for this instance of the server.
    - 2) Change the `installLocation` parameter to specify the installation location for this instance of the server. For example:
 

```
<profile
  id="IBM Rational Developer for System z Remote Systems Explorer_1"
  installLocation=" /opt/IBM/RDz91_1">
</profile>
```

where the `_1` suffix is used to make the values unique.
  - c. Also, change the `<offering>` element so that the `profile` parameter has the same value as the `id` parameter of the `<profile>` element. For example:
 

```
<offering profile="IBM Rational Developer for
  System z Remote Systems Explorer_1"
  id="com.ibm.rational.rdz.rseserver.v91"
  version="9.1.0.2014"/>
```
  - d. Close the text editor.
6. To run the Installation Manager, enter the following command on one line. On Linux on System z:
 

```
./install --launcher.ini ./silent-install.ini -acceptLicense
```

## Directories created

Installation Manager creates the following directories:

- `/opt/IBM/RDz91` contains the RSE server program. This directory is the default location.
- `/opt/IBM/InstallationManager` is the directory where Installation Manager is installed.
- `/var/ibm/InstallationManager` contains various files that are used by Installation Manager such as log files, configuration files, and license file.
- `/opt/IBM/SDPShared` contains the shared resources for products that are installed with Installation Manager.

## Uninstalling

Use IBM Installation Manager to uninstall the RSE server:

- With the X Window System:
  1. Set up and start the X Window System as described in the “Installation with the X Window System” on page 5 topic.
  2. Find the directory where the Installation Manager is installed. The default location is `/opt/IBM/InstallationManager`.
  3. Start Installation Manager:
    - a. Change to the directory where you installed Installation Manager.
    - b. Change to the `eclipse` subdirectory.
    - c. Start the executable file `IBMIM`.
  4. In Installation Manager:
    - a. Click **Uninstall**.

- b. Follow the directions to uninstall the RSE server.
- Using silent mode:
  1. On the command line, change to the directory where Installation Manager is installed. The default location is `/opt/IBM/InstallationManager`.
  2. Change to the `eclipse` subdirectory.
  3. Enter the following command on one line:
 

```
./IBMIM --launcher.ini silent-install.ini
          -input rse_directory/uninstall/uninstall.xml
```

where *rse\_directory* is the path of the directory where the RSE server is installed. The default installation directory is `/opt/IBM/RDz91`.

## Updating

Use IBM Installation Manager to update the RSE server.

**Note:** The update process makes backup copies of the current configuration files in the subdirectory `backup` in the installation directory. You might also want to make your own backup copies of any configuration files that you modified. Having a backup ensures that you can easily restore the files after the update is complete.

- With the X Window System:
  1. Set up and start the X Window System as described in the subtopic “Installation with the X Window System” on page 5.
  2. Copy the tar file that contains the update information into a writable file system directory on the target system.
  3. Extract the update information from the update tar file. For example:
 

```
tar -xvf install_file
```

where *install\_file* is the tar file that contains the update information.
  4. Find the directory where the Installation Manager is installed. The default location is `/opt/IBM/InstallationManager`.
  5. Change to the `eclipse` subdirectory.
  6. Start the executable file `IBMIM`.

**Note:** You must run the Installation Manager as the root user.

7. In Installation Manager:
  - a. Add that path of the repository where the update files are located:
    - 1) Click **File > Preferences** to open the Preferences window.
    - 2) In the left pane click **Repositories**.
    - 3) Click **Add Repository**.
    - 4) In the directory where the tar file was expanded, change to subdirectory `RSE` and then select the file `repository.config`.
    - 5) Click **OK**.
    - 6) Click **OK** again to close the Preferences window.
  - b. Click **Update**.
  - c. Follow the directions to update the RSE server.

- Using silent mode:

The process for updating an installed version of the RSE server is similar to the process for installing the server. Follow these steps:

1. Copy the tar file that contains the update information into a writable file system directory on the target system.

2. Extract the update information from the update tar file. For example:

```
tar -xvf install_file
```

where *install\_file* is the tar file that contains the update information.

3. In the `install.xml` response file, set the correct values for the unique identifier and the unique installation location of this instance of the server:

- a. To ensure that know the correct values, follow these steps.

- 1) Start the Installation Manager. It must be the same Installation Manager that was used to install this instance of the RSE server.

- 2) Click **File > View Installed Packages**.

- 3) In the list of **Installed Packages**, select the instance of the RSE server that you want to update.

- 4) Look in the **Details** section to find the identifier and the installation location of this instance of the server:

- The identifier is the title of the package group, printed immediately after the heading **Details**.
- The installation location is printed in the bulleted list that follows the words Installation Directory.

- 5) Close the Installation Manager.

- b. Go to the directory where you unpacked the tar file.

- c. Open the `install.xml` response file with a text editor.

- d. In the `<profile>` element set the correct values for the `id` and `installLocation` parameters. The following example shows the default values:

```
<profile
  installLocation="/opt/IBM/RDz91RH"
  id="IBM Rational Developer for System z Remote Systems Explorer">
</profile>
```

- e. In the `<offering>` element set the correct value for the `profile` parameter. The value must be the same as the value that you set for the `id` parameter of the `<profile>` element. For example:

```
<offering profile="IBM Rational Developer for
  System z Remote Systems Explorer"
  id="com.ibm.rational.rdz.rseserver.v91"
  version="9.1.0.rseserver910-I20140411_1625"/>
```

- f. Close the text editor.

4. To run the Installation Manager, enter the following command on one line. On Linux on System z:

```
./install --launcher.ini ./silent-install.ini
```

**Note:** You must run the Installation Manager as the root user.

---

## RSE directory configuration

**Important:** After the RSE server is installed on a host system, only the root user can log in to the host system.

To allow other users to log in to the system, the system administrator must grant read and execute permissions. The permissions must be on the directory where the RSE server is installed and on all the files and subdirectories within that directory.

To grant permissions to the owning user (root) and to all users in the root group, enter the following command at the command line:

```
chmod -R ug+xr rse_directory
```

where *rse\_directory* is the path of the directory where the RSE server is installed. The default path is /opt/IBM/RDz91.

**Note:** This example assumes that the RSE server is the only product that is installed in the directory.

To grant permissions to every user on the system, enter the following command at the command line:

```
chmod -R ugo+xr rse_directory
```

where *rse\_directory* is the path of the directory where the RSE server is installed. The default path is /opt/IBM/RDz91.

**Note:** This example assumes that the RSE server is the only product that is installed in the directory.

---

## Starting the RSE server

To start the RSE server:

1. Open the ksh shell.
2. Change to the directory that contains the executable programs and scripts for the RSE server. If the RSE server is installed in the default directory /opt/IBM/RDz91, then the executable programs and scripts are in /opt/IBM/RDz91/bin.
3. Enter the following command.
  - For Red Hat Linux on System z:  
rsedaemon.RedHat.sh [*port*]

where *port* is the number of the port on which you want the RSE server to listen.

**Note:** The default port is 4035.

- For SuSe Linux on System z:  
rsedaemon.Suse.sh [*port*]

where *port* is the number of the port on which you want the RSE server to listen.

**Note:** The default port is 4035.

Examples:

- To start the RSE server and have it listen on the default port, enter the following command:
  - For Red Hat Linux on System z:  
rsedaemon.RedHat.sh
  - For SuSe Linux on System z:  
rsedaemon.Suse.sh
- To start the RSE server and have it listen on port 3080, enter:



- For Red Hat Linux on System z:  
rsedaemon.RedHat.sh 3080
- For SuSe Linux on System z:  
rsedaemon.Suse.sh 3080

## Example: RSE server start

The following example shows what the command-line interface looks like when the RSE server is started successfully. The first line of text is the command to start the server and the subsequent lines are output from that command:

```
rsedaemon.RedHat.sh
...
java version "1.6.0"
Java(TM) SE Runtime Environment (build pxz6460sr5-20090529_04(SR5))
IBM J9 VM (build 2.4, J2RE 1.6.0 IBM J9 2.4 Linux s390x-64
    jvmxz6460sr5-20090519_35743 (JIT enabled, AOT enabled)
J9VM - 20090519_035743_BHdSMr
JIT - r9_20090518_2017
GC - 20090417_AA
JCL - 20090529_01

FEK001I RseDaemon being initialized
FEK010I (rsed.envvars location = /opt/IBM/RDz91/bin)
FEK011I (log directory = ../../log/)
java version "1.6.0"
Java(TM) SE Runtime Environment (build pxz6460sr5-20090529_04(SR5))
IBM J9 VM (build 2.4, J2RE 1.6.0 IBM J9 2.4 Linux s390x-64
    jvmxz6460sr5-20090519_35743 (JIT enabled, AOT enabled)
J9VM - 20090519_035743_BHdSMr
JIT - r9_20090518_2017
GC - 20090417_AA
JCL - 20090529_01

FEK002I RseDaemon started. (port=4035)
Server Started Successfully
```

---

## Configuring the RSE server to use SSL or TLS v1.2

You can configure the RSE server to provide server authentication with SSL or TLS v1.2 encryption to provide secure connections between server and clients.

---

## Setting up a keystore file

To use SSL or TLS v1.2, you must set up a Java keystore file on the server for server authentication.

### Procedure

1. Use the `keytool` program that is provided with the Java SDK to generate a keystore file that contains a key pair (public key and associated private key). For example:

```
keytool -genkey -alias alias_name -validity 3650 -keystore keystore_name
-storepass keystore_password -keypass key_password
```

- *alias\_name* is the name of the keystore.
- *keystore\_password* is the password for the keystore.
- *key\_password* is the password for the key.

2. In the `ssl.properties` file, enter the path of the Java keystore file and the keystore password.

```
daemon_keystore_file=jks_file
daemon_keystore_password=jks_password
```

- *jks\_file* is the path of the Java keystore file that you created, and
- *jks\_password* is the password for the Java keystore file.

---

## Configuring the server and client for SSL

### Procedure

1. On the server, complete the following steps.
  - a. In the `ssl.properties` file, set the following two properties.

```
enable_ssl=true
disable_server_ssl=false
```
  - b. In the `rsed.envvars` file, set the following option.

```
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_SSL_ALGORITHM=SSL"
```
  - c. Start the RSE server.
2. On each client workstation, complete the following steps.
  - a. Close the development workbench.
  - b. Add the JVM option `-DDSTORE_SSL_ALGORITHM=SSL` to the `eclipse.ini` file. For example:

```
-vm
C:\ProductBuilds\PkgGroups\RDZ911\jdk\jre\bin\javaw.exe
-startup
plugins/org.eclipse.equinox.launcher_1.3.0.v20120522-1813.jar
--launcher.library
plugins/org.eclipse.equinox.launcher.win32.win32.x86_64_1.1.200.v20120913-144807
-install
C:/ProductBuilds/PkgGroups/RDZ911
-vmargs
-Xquickstart
-Xms40m
-Xmx1024m
-Xmnx64m
-Xgcpolicy:gencon
-Xscmx96m
-Xshareclasses:name=IBMSDP_%u
-Xnolinenumbers
-Xcompressedrefs
-DDSTORE_SSL_ALGORITHM=SSL
```

- c. Open the development workbench.

### Results

The RSE server is started with SSL active. The client can connect to the RSE server.

---

## Configuring the server and client for TLS v1.2

### Procedure

1. In the `rsed.envvars` file, set the following option.

```
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_SSL_ALGORITHM=TLSv1.2"
```
2. On the server, modify the `runserver.sh` script.
  - a. Find the section of the script where the Java JVM is called.
  - b. Add the JVM option `-DDSTORE_SSL_ALGORITHM=TLSv1.2` to each call to the JVM. The result should look similar to the following lines:

```

if [ $# -gt 4 ]; then
    $javaExe -Xgcpolicy:gencon -Xms64m -Xmx128m -Xss2m -cp $classpath
        -DA_PLUGIN_PATH=$pathIN
        -DDSTORE_SSL_ALGORITHM=TLSv1.2
        -DDSTORE_SPIRIT_ON=$SPIRIT_ON
        -DDSTORE_MEMLOGGING_ON=$MEMLOGGING_ON
        -DDSTORE_TRACING_ON=$TRACE_ON
        org.eclipse.dstore.core.server.Server
        $portIN
        $timeoutIN
        $ticketIN
elif [ $# -gt 3 ]; then
    $javaExe -Xgcpolicy:gencon -Xms64m -Xmx128m -Xss2m -cp $classpath
        -DA_PLUGIN_PATH=$pathIN
        -DDSTORE_SSL_ALGORITHM=TLSv1.2
        -DDSTORE_SPIRIT_ON=$SPIRIT_ON
        -DDSTORE_MEMLOGGING_ON=$MEMLOGGING_ON
        -DDSTORE_TRACING_ON=$TRACE_ON
        org.eclipse.dstore.core.server.Server
        $portIN
        $timeoutIN
        $ticketIN
fi

```

3. On the server, modify the daemon.pl script.
  - a. Find the section of the script where the Java JVM is called.
  - b. Add the JVM option -DDSTORE\_SSL\_ALGORITHM=TLSv1.2 to each call to the Java JVM. The result should look similar to the following lines:

```

if [ $# -gt 4 ]; then
    $javaExe -Xgcpolicy:gencon -Xms64m -Xmx128m -Xss2m -cp $classpath
        -DA_PLUGIN_PATH=$pathIN
        -DDSTORE_SSL_ALGORITHM=TLSv1.2
        -DDSTORE_SPIRIT_ON=$SPIRIT_ON
        -DDSTORE_MEMLOGGING_ON=$MEMLOGGING_ON
        -DDSTORE_TRACING_ON=$TRACE_ON
        org.eclipse.dstore.core.server.Server
        $portIN
        $timeoutIN
        $ticketIN

elif [ $# -gt 3 ]; then
    $javaExe -Xgcpolicy:gencon -Xms64m -Xmx128m -Xss2m -cp $classpath
        -DA_PLUGIN_PATH=$pathIN
        -DDSTORE_SSL_ALGORITHM=TLSv1.2
        -DDSTORE_SPIRIT_ON=$SPIRIT_ON
        -DDSTORE_MEMLOGGING_ON=$MEMLOGGING_ON
        -DDSTORE_TRACING_ON=$TRACE_ON
        org.eclipse.dstore.core.server.Server
        $portIN
        $timeoutIN
fi

```

4. Start the server.
5. On each client workstation, complete the following steps.
  - a. Close the development workbench.
  - b. Add the JVM option -DDSTORE\_SSL\_ALGORITHM=TLSv1.2 to the eclipse.ini file. For an example, see the previous section on configuring SSL.
  - c. Open the development workbench.

## Results

The RSE server is started with TLS v1.2 active. The client can connect to the RSE server.

---

## Example: RSE server start with SSL

The following example shows what the command-line interface looks like when the RSE server with SSL is started successfully. The first line is the command to start the server and the subsequent lines are output from that command:

```
rsedaemon.RedHat.sh 4077
```

SSL Settings

```
[daemon keystore:      /opt/IBM/RDz91SSL/rdzrse.jks]
[daemon keystore pw:   MyKeystorePassword]
[server keystore:      /opt/IBM/RDz91SSL/rdzrse.jks]
[server keystore pw:   MyKeystorePassword]
Daemon running on:     RDzServer.rtp.raleigh.ibm.com, port: 4077
```

---

## Secure and nonsecure sessions

If you want to concurrently run both secure sessions and nonsecure sessions, you must install a second instance of the RSE server. You cannot use a single instance of the server to run secure sessions and nonsecure sessions concurrently.

The following instructions assume that the RSE server is installed in the default directory and is configured to run nonsecure sessions on the default port 4035. To install a second instance of the server and configure it to use SSL or TLS v1.2, complete the following steps.

1. Install a second instance of the RSE server into a new installation directory, for example /opt/IBM/RDz91SSL.
2. Configure SSL or TLS v1.2 for the second server as described in the preceding sections.
3. Start the server, specifying a different port than the port that the first RSE server is using. For example:

```
rsedaemon.RedHat.sh 4077
```

---

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