

**Rational** IBM Rational Developer for System z  
Version 7.6.1

## *Host Configuration Quick Start Guide*





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Version 7.6.1

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**Note**

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This edition applies to IBM Rational Developer for System z Version 7.6.1 (program number 5724-T07) and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this book

This document discusses the configuration of the IBM Rational Developer for System z functions. It includes brief instructions on how to configure IBM Rational Developer for System z Version 7.6.1 on your z/OS<sup>®</sup> host system. For complete details on the configuration of this product, refer to *Rational Developer for System z Host Configuration Guide* (SC23-7658).

The following names are used in this manual:

- *IBM Rational Developer for System z* is called *Developer for System z*.
- *Common Access Repository Manager* is abbreviated to *CARMA*.
- *Software Configuration and Library Manager Developer Toolkit* is called *SCLM Developer Toolkit*, abbreviated to *SCLMDT*.
- *z/OS UNIX System Services* is called *z/OS UNIX*.
- *Customer Information Control System Transaction Server* is called *CICSTS*, abbreviated to *CICS*.

For earlier releases, including IBM WebSphere Developer for System z, IBM WebSphere Developer for zSeries, and IBM WebSphere Studio Enterprise Developer, use the configuration information found in the Host Configuration Guide and Program Directories for those releases.

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## Who should read this book

This document is intended for system programmers installing and configuring IBM Rational Developer for System z Version 7.6.1, FMID HHOP760, on their z/OS host system.

It lists and briefly documents the different steps needed to do a basic setup of the products. Refer to *Rational Developer for System z Host Configuration Guide* (SC23-7658) for more details on the listed actions and non-default settings.

To use this book, you need to be familiar with the z/OS UNIX<sup>®</sup> System Services and MVS<sup>™</sup> host systems.



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## Chapter 1. Planning

This section summarizes the host component installation and configuration information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details on these subjects:

- Migration considerations
- Planning considerations
- Preinstallation considerations
- Pre-configuration considerations
- Predeployment considerations
- Client checklist

---

## Requisites

### Requisite products

Developer for System z has a list of prerequisite software that must be installed and operational before the product will work. There is also a list of corequisite software to support specific features of Developer for System z. These requisites must be installed and operational at runtime for the corresponding feature to work as designed.

Refer to *Rational Developer for System z Host Configuration Guide* (SC23-7658) to get a complete list of prerequisites and corequisites for your version of Developer for System z. The key requisites for a basic setup are the following:

- z/OS 1.8 or higher
- ISPF APAR OA29489 (TSO/ISPF Client Gateway)
- Java™ 5.0 or higher

**Note:** The PTF for Developer for System z APAR PM07305 must be applied when using a 64-bit version of Java. The PTF is available via the Developer for System z recommend service page, <http://www-01.ibm.com/support/docview.wss?rs=2294&context=SS2QJ2&uid=swg27006335>.

### Required resources

Basic setup for Developer for System z requires the allocation of the systems resources listed in Table 1.

Table 1. Required resources

Resource	Default value
APF authorized data set	FEK.SFEKAUTH
started task	JMON, RSED, and LOCKD
port for host-confined communication	6715
port for host-confined communication	4036
port for client-host communication	4035
port range for client-host communication	any available port is used
Application security definition	Universal access READ for FEKAPPL

Table 1. Required resources (continued)

Resource	Default value
PassTicket security definitions	no default

Table 2 lists the administrators needed for basic customization tasks.

Table 2. Administrators needed for required tasks

Administrator	Task
System	Typical system programmer actions are required for all customization tasks
Security	<ul style="list-style-type: none"> <li>• Define OMVS segment for Developer for System z users</li> <li>• Define data set profiles</li> <li>• Define started tasks</li> <li>• Define operator command security</li> <li>• Define z/OS UNIX server profiles</li> <li>• Define application security</li> <li>• Define PassTicket support</li> <li>• Define program controlled data sets</li> <li>• Define program controlled z/OS UNIX files</li> </ul>
TCP/IP	Define new TCP/IP ports
WLM	Assign started task goals to the servers and their child processes

---

## Client user ID

The user ID of a Developer for System z user must have the following attributes:

- TSO access (with a normal region size)
- An OMVS segment defined in the security software (for both user ID and default group):
  - A valid z/OS UNIX user ID, UID 0 is not required
  - HOME directory with read, write, and execute access
  - PROGRAM must point to a valid z/OS UNIX shell, such as /bin/sh
  - ASSIZEMAX should be blank (use system defaults)
- Read and execute access to Developer for System z directories and files
- Read access to Developer for System z data sets

---

## Servers

Developer for System z consists of the following permanently active servers, which can be started tasks or user jobs. These servers provide the requested services themselves, or start other servers (as z/OS UNIX threads or user jobs) to provide the service:

- JES Job Monitor (JMON) server provides all JES-related services.
- Lock Daemon (LOCKD) provides tracking services for data set locks.
- Remote Systems Explorer (RSE) server provides core services such as connecting the client to the host and starting other servers for specific services.

Refer to Appendix A, “Security considerations,” on page 27 for more information on TCP/IP port usage and the available mechanisms for secure communication.

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## Configuration method

Beginning with version 7.6.1, Developer for System z provides an alternative method, using an ISPF panel application, to configure the host side of the product. This gives you a choice of the following methods:

- Using the ISPF panel application. This guides you through the required customization steps and selected optional customization steps. For more information, refer to the *Host Configuration Utility* white paper, available at the Developer for System z internet library, <http://www-306.ibm.com/software/awdtools/rdz/library/>.
- Using the *Host Configuration Quick Start Guide*. This guides you through the required customization steps. The scope of this guide is limited to a basic setup.
- Using the *Host Configuration Guide*. This guides you through the required customization steps and all optional customization steps. All configurable options are covered in this guide, including some non-default scenarios

---

## Deployment and upgrade

Developer for System z supports installing the products once, followed by copying a minimal set of necessary data sets and directories to other systems for deployment. Running multiple copies (same or different version) of the product(s) on the same system is also supported.

During an upgrade, make backups of all configuration files BEFORE installing the product, as the install might overlay the files.



---

## Chapter 2. Basic customization

This chapter summarizes the basic customization information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

---

### Customization setup

Developer for System z comes with several sample configuration files and sample JCL. To avoid overwriting your customizations when applying maintenance, you should copy all these members and z/OS UNIX files to a different location and to customize the copy.

Some functions of Developer for System z also require the existence of certain directories in z/OS UNIX, which must be created during the customization of the product. To ease the installation effort, a sample job, FEKSETUP, is provided to create the copies and the required directories.

Customize and submit sample member FEKSETUP in data set FEK.SFEKSAMP to create customizable copies of configuration files and configuration JCL, and to create required z/OS UNIX directories. The required customization steps are described within the member.

This job performs the following tasks:

- Create FEK.#CUST.PARMLIB and populate it with sample configuration files.
- Create FEK.#CUST.PROCLIB and populate it with sample SYS1.PROCLIB members.
- Create FEK.#CUST.JCL and populate it with sample configuration JCL.
- Create FEK.#CUST.CNTL and populate it with sample server startup scripts.
- Create FEK.#CUST.ASM and populate it with sample assembler source code.
- Create FEK.#CUST.COBOLE and populate it with sample COBOL source code.
- Create /etc/rdz/\* and populate it with sample configuration files.
- Create /var/rdz/\* as work directories for various Developer for System z functions.

---

### PARMLIB changes

Note that the listed PARMLIB changes are for a basic setup only. More changes are needed if you select to use certain optional functions.

#### Set z/OS UNIX limits in BPXPRMxx

MAXASSIZE specifies the maximum address space (process) region size. Set MAXASSIZE in SYS1.PARMLIB(BPXPRMxx) to 2G. This is the maximum value allowed.

MAXTHREADS specifies the maximum number of active threads for a single process. Set MAXTHREADS in SYS1.PARMLIB(BPXPRMxx) to 1500 or higher.

MAXTHREADTASKS specifies the maximum number of active MVS tasks for a single process. Set MAXTHREADTASKS in SYS1.PARMLIB(BPXPRMxx) to 1500 or higher.

MAXPROCUSER specifies the maximum number of processes that a single z/OS UNIX user ID can have concurrently active. Set MAXPROCUSER in SYS1.PARMLIB(BPXPRMxx) to 50 or higher.

These values can be checked and set dynamically (until the next IPL) with the following console commands:

- DISPLAY OMVS,0
- SETOMVS MAXASSIZE=2G
- SETOMVS MAXTHREADS=1500
- SETOMVS MAXTHREADTASKS=1500
- SETOMVS MAXPROCUSER=50

## Add started tasks to COMMNDxx

Add start commands for the Developer for System z RSE and JMON servers to SYS1.PARMLIB(COMMANDxx) to start them automatically at next system IPL.

Once the servers are defined and configured, they can be started dynamically with the following console commands:

- S RSED
- S LOCKD
- S JMON

## APF authorizations in PROGxx

In order for JES Job Monitor to access JES spool files, module FEJJMON in the FEK.SFEKAUTH load library and the Language Environment<sup>®</sup> (LE) runtime libraries (CEE.SCEERUN\*) must be APF authorized.

In order for ISPF to create the TSO/ISPF Client Gateway, module ISPZTS0 in SYS1.LINKLIB must be APF authorized.

APF authorizations are defined in SYS1.PARMLIB(PROGxx), if your site followed IBM<sup>®</sup> recommendations.

APF authorizations can be set dynamically (until the next IPL) with the following console commands, where volser is the volume on which the data set resides if it is not SMS managed:

- SETPROG APF,ADD,DSN=FEK.SFEKAUTH,SMS
- SETPROG APF,ADD,DSN=CEE.SCEERUN,VOL=volser
- SETPROG APF,ADD,DSN=CEE.SCEERUN2,VOL=volser
- SETPROG APF,ADD,DSN=SYS1.LINKLIB,VOL=volser

## Requisite LINKLIST and LPA definitions

The RSE server is a z/OS UNIX process that requires access to MVS load libraries. The following (prerequisite) libraries must be made available, either through STEPLIB or LINKLIST/LPALIB:

- System load library
  - SYS1.LINKLIB
- Language Environment's runtime
  - CEE.SCEERUN
  - CEE.SCEERUN2

- C++'s DLL class library
  - CBC.SCLBDLL
- ISPF's TSO/ISPF Client Gateway
  - ISP.SISPLoad
  - ISP.SISPLPA

LINKLIST data sets are defined in SYS1.PARMLIB(PROGxx), if your site followed IBM recommendations. LPA data sets are defined in SYS1.PARMLIB(LPALSTxx).

If you opt to use STEPLIB, you must define the libraries not available through LINKLIST/LPALIB in the STEPLIB directive of rsed.envvars, the RSE configuration file. Be aware, however, that:

- Using STEPLIB in z/OS UNIX has a negative performance impact.
- If one STEPLIB library is APF authorized, then all must be authorized. Libraries lose their APF authorization when they are mixed with non-authorized libraries in STEPLIB.
- Libraries added to the STEPLIB DD in a JCL are not propagated to the z/OS UNIX processes started by the JCL.

---

## PROCLIB changes

The started task and remote build procedures listed below must reside in a system procedure library defined to your JES subsystem. In the instructions below, the IBM default procedure library, SYS1.PROCLIB, is used.

### JES Job Monitor

Customize the sample started task member FEK.#CUST.PROCLIB(JMON), as described within the member, and copy it to SYS1.PROCLIB. As shown in the code sample below, you have to provide the following:

- The high-level qualifier of the load library, default FEK
- The JES Job Monitor configuration file, default FEK.#CUST.PARMLIB(FEJJCNGF)

```

/**
/** JES JOB MONITOR
/**
//JMON    PROC PRM=,          * PRM='-TV' TO START TRACING
//        LEPRM='RPTOPTS(ON)',
//        HLQ=FEK,
//        CFG=FEK.#CUST.PARMLIB(FEJJCNGF)
/**
//JMON    EXEC PGM=FEJJMON,REGION=0M,TIME=NOLIMIT,
//        PARM=('&LEPRM,ENVAR("_CEE_ENVFILE_S=DD:ENVIRON")/&PRM')
//STEPLIB DD DISP=SHR,DSN=&HLQ..SFKAUTH
//ENVIRON DD DISP=SHR,DSN=&CFG
//SYSPRINT DD SYSOUT=*
//SYSOUT  DD SYSOUT=*
//        PEND
/**

```

Figure 1. JMON - JES Job Monitor started task

### RSE daemon

Customize the sample started task member FEK.#CUST.PROCLIB(JMON), as described within the member, and copy it to SYS1.PROCLIB. As shown in the code sample below, you have to provide the following:

- The RSE daemon port, default 4035
- The home directory where Developer for System z is installed, default /usr/lpp/rdz
- The location of the configuration files, default /etc/rdz

```

/**
/** RSE DAEMON
/**
//RSED      PROC IVP='',          * 'IVP' to do an IVP test
//          PORT=4035,
//          HOME='/usr/lpp/rdz',
//          CNFG='/etc/rdz'
/**
//RSE       EXEC PGM=BXPBATS,REGION=0M,TIME=NOLIMIT,
//          PARM='PGM &HOME/bin/rsed.sh &IVP &PORT &CNFG'
//STDOUT    DD SYSOUT=*
//STDERR    DD SYSOUT=*
//          PEND
/**

```

Figure 2. RSED - RSE daemon started task

## Lock daemon

Customize the sample started task member FEK.#CUST.PROCLIB(LOCKD), as described within the member, and copy it to SYS1.PROCLIB. As shown in the code sample below, you have to provide the following:

- The home directory where Developer for System z is installed, default /usr/lpp/rdz.
- The location of the configuration files, default /etc/rdz.
- The initial log detail level, default 1.

```

/**
/** RSE LOCK DAEMON
/**
//LOCKD     PROC HOME='/usr/lpp/rdz',
//          CNFG='/etc/rdz',
//          LOG=1
/**
//LOCKD     EXEC PGM=BXPBATS,REGION=0M,TIME=NOLIMIT,
//          PARM=PGM &HOME./bin/lockd.sh &CNFG &LOG'
//STDOUT    DD SYSOUT=*
//STDERR    DD SYSOUT=*
//          PEND
/**

```

Figure 3. LOCKD - Lock daemon started task

## ELAXF\* remote build procedures

Developer for System z provides sample JCL procedures that can be used for the JCL generation, remote project builds and remote syntax check features of CICS<sup>®</sup> BMS maps, IMS<sup>™</sup> MFS screens and COBOL, PL/I, Assembler and C/C++ programs. These procedures allow installations to apply their own standards, and ensure that developers use the same procedures with the same compiler options and compiler levels.

The sample procedures and their function are listed in Table 3 on page 9.

Table 3. Sample ELAXF\* procedures

Member	Purpose
ELAXFADT	Sample procedure for assembling and debugging High Level assembler programs.
ELAXFASM	Sample procedure for assembling High Level assembler programs.
ELAXFBMS	Sample procedure for creating CICS BMS object and corresponding copy, dsect, or include member.
ELAXFCOC	Sample procedure for doing COBOL Compiles, Integrated CICS translate and integrated DB2® translate.
ELAXFCOP	Sample procedure for doing DB2 preprocess of EXEC SQL statements embedded in COBOL programs.
ELAXFCOT	Sample procedure for doing CICS translation for EXEC CICS statements embedded in COBOL programs.
ELAXFCPC	Sample procedure for doing C compiles.
ELAXFCPP	Sample procedure for doing C++ compiles.
ELAXFCP1	Sample procedure for COBOL compiles with SCM preprocessor statements (-INC and ++INCLUDE).
ELAXFDCL	Sample procedure for running a program in TSO mode.
ELAXFGO	Sample procedure for the GO step.
ELAXFLNK	Sample procedure for linking C/C++, COBOL, PLI and High Level Assembler programs.
ELAXFMFS	Sample procedure for creating IMS MFS screens.
ELAXFPLP	Sample procedure for doing DB2 preprocess of EXEC SQL statements embedded in PLI programs.
ELAXFPLT	Sample procedure for doing CICS translation of EXEC CICS statements embedded in PLI programs.
ELAXFPL1	Sample procedure for doing PL/I compiles, integrated CICS translate and integrated DB2 translate.
ELAXFPP1	Sample procedure for PL/I compiles with SCM preprocessor statements (-INC and ++INCLUDE).
ELAXFTSO	Sample procedure for running/debugging generated DB2 code in TSO mode.
ELAXFUOP	Sample procedure for generating the UOPT step when building programs that run in CICS or IMS subsystems.

Customize the sample build procedure members, FEK.#CUST.PROCLIB(ELAXF\*), as described within the members, and copy them to SYS1.PROCLIB. You have to provide the correct high-level qualifiers for different product libraries, as described in Table 4.

Table 4. ELAXF\* high-level qualifier checklist

Product	Default HLQ	Value
RD/z	FEK	
CICS	CICSTS32.CICS	
DB2	DSN910	
IMS	IMS	
COBOL	IGY.V4R1M0	

Table 4. ELAXF\* high-level qualifier checklist (continued)

Product	Default HLQ	Value
PL/I	IBMZ.V3R8M0	
C/C++	CBC	
LE	CEE	
system LINKLIB	SYS1	
system MACLIB	SYS1	

If the ELAXF\* procedures cannot be copied into a system procedure library, ask the Developer for System z users to add a JCLLIB card (right after the JOB card) to the job properties on the client.

```
//MYJOB JOB <job parameters>
//PROCS JCLLIB ORDER=(FEK.#CUST.PROCLIB)
```

---

## Security definitions

Customize and submit sample member FEKRACF in data set FEK.#CUST.JCL to create the security definitions for Developer for System z. The user submitting this job must have security administrator privileges, such as being RACF SPECIAL. Refer to Appendix A, “Security considerations,” on page 27 for more details.

### Note:

- For those sites that use CA ACF2 TM for z/OS or CA Top Secret® for z/OS, please refer to your product page on the CA support site (<https://support.ca.com>) and check for the related Developer for System z Knowledge Document. This Knowledge Document has details on the security commands necessary to properly configure Developer for System z.
- The sample FEKRACF job holds more than just RACF® commands. The last step of the security definitions consists of making a z/OS UNIX file program controlled. Depending on the policies at your site, this might be a task for the system programmer and not the security administrator.

---

## FEJJCNFG, JES Job Monitor configuration file

JES Job Monitor (JMON) provides all JES-related services. The behavior of JES Job Monitor can be controlled with the definitions in FEJJCNFG.

FEJJCNFG is located in FEK.#CUST.PARMLIB, unless you specified a different location when you customized and submitted job FEK.SFEKSAMP (FEKSETUP). See “Customization setup” on page 5 for more details.

Customize the sample JES Job Monitor configuration member FEJJCNFG, as shown in the following code sample:

```

SERV_PORT=6715
TZ=EST5EDT
#_BPXK_SETIBMOPT_TRANSPORT=TCPIP
#APPLID=FEKAPPL
#AUTHMETHOD=SAF
#CODEPAGE=UTF-8
#CONCHAR=$
#CONSOLE_NAME=JMON
#GEN_CONSOLE_NAME=OFF
#HOST_CODEPAGE=IBM-1047
#LIMIT_COMMANDS=NOLIMIT
#LIMIT_VIEW=USERID
#LISTEN_QUEUE_LENGTH=5
#MAX_DATASETS=32
#MAX_THREADS=200
#TIMEOUT=3600
#TIMEOUT_INTERVAL=1200
#SUBMITMETHOD=TSO
#TSO_TEMPLATE=FEK.#CUST.CNTL(FEJTSO)

```

Figure 4. FEJCNFG - JES Job Monitor configuration file

### **SERV\_PORT**

The port number for JES Job Monitor host server. The default port is 6715. Change as desired, however BOTH the server and the Developer for System z clients must be configured with the same port number. If you change the server port number, all clients must also change the JES Job Monitor port for this system in the Remote Systems View.

**TZ** Time zone selector. The default is EST5EDT. The default time zone is UTC +5 hours (Eastern Standard Time (EST) Eastern Daylight Savings Time (EDT)). Change this to represent your time zone.

### **\_BPXK\_SETIBMOPT\_TRANSPORT**

Specifies the name of the TCP/IP stack to be used. The default is TCPIP. Uncomment and change to the requested TCP/IP stack name, as defined in the TCPIPJOBNAME statement in the related TCPIP.DATA.

#### **Note:**

- Coding a SYSTCPD DD statement in the JCL does not set the requested stack affinity.
- When this directive is not active, JES Job Monitor binds to every available stack on the system (BIND INADDRANY).

---

## **rased.envvars, RSE configuration file**

The RSE lock daemon and the RSE server processes (RSE daemon, RSE thread pool, and RSE server) use the definitions in rased.envvars. Optional Developer for System z and third-party services can use this configuration file also to define environment variables for their use.

rased.envvars is located in /etc/rdz/, unless you specified a different location when you customized and submitted job FEK.SFEKSAMP (FEKSETUP). See “Customization setup” on page 5 for more details. You can edit the file with the TSO **OEDIT** command.

See the following sample rased.envvars file, which must be customized to match your system environment.

```

=====
# (1) required definitions
JAVA_HOME=/usr/lpp/java/J5.0
RSE_HOME=/usr/lpp/rdz
_RSE_LOCKD_PORT=4036
_RSE_HOST_CODEPAGE=IBM-1047
TZ=EST5EDT
LANG=C
PATH=/bin:/usr/sbin
_CEE_DMPTARG=/tmp
STEPLIB=NONE
#STEPLIB=$STEPLIB:CEE.SCEERUN:CEE.SCEERUN2:CBC.SCLBDLL
_RSE_SAF_CLASS=/usr/include/java_classes/IRRRacf.jar
_RSE_JAVAOPTS=""
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Xms1m -Xmx256m"
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Ddaemon.log=/var/rdz/logs"
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Duser.log=/var/rdz/logs"
_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_LOG_DIRECTORY="
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dmaximum.clients=60"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dmaximum.threads=1000"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dminimum.threadpool.process=10"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dmaximum.threadpool.process=100"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dipv6=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dkeep.last.log=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Denable.standard.log=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Denable.port.of.entry=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Denable.certificate.mapping=false"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Denable.audit.log=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Daudit.cycle=30"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Daudit.retention.period=0"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Ddeny.nonzero.port=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dsingle.logon=false"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -Dprocess.cleanup.interval=0"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DAPPLID=0MVSAPPL"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDENY_PASSWORD_SAVE=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DHIDE_ZOS_UNIX=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_IDLE_SHUTDOWN_TIMEOUT=3600000"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_TRACING_ON=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DDSTORE_MEMLOGGING_ON=true"
#_RSE_JAVAOPTS="$_RSE_JAVAOPTS -DTSO_SERVER=APPC"
=====
# (2) required definitions for TSO/ISPF Client Gateway
_CMDSERV_BASE_HOME=/usr/lpp/ispf
_CMDSERV_CONF_HOME=/etc/rdz
_CMDSERV_WORK_HOME=/var/rdz
#STEPLIB=$STEPLIB:ISP.SISPLoad:ISP.SISPLPA:SYS1.LINKLIB
_RSE_CMDSERV_OPTS=""
#_RSE_CMDSERV_OPTS="$_RSE_CMDSERV_OPTS&ISPPROF=&SYSUID..ISPPROF"
=====
# (3) required definitions for SCLM Developer Toolkit
_SCLMDT_CONF_HOME=/var/rdz/sc1mdt
#STEPLIB=$STEPLIB:FEK.SFEKAUTH:FEK.SFEKLOAD
#_SCLMDT_TRANTABLE=FEK.#CUST.LSTRANS.FILE
#ANT_HOME=/usr/lpp/Apache/Ant/apache-ant-1.7.1
=====
# (4) optional definitions
#_RSE_PORTRANGE=8108-8118
#_BPXK_SETIBMOPT_TRANSPORT=TCPIP
#_FEKFSCMD_TP_NAME=_FEKFRSRV
#_FEKFSCMD_PARTNER_LU =lu_name
#GSK_CRL_SECURITY_LEVEL=HIGH
#GSK_LDAP_SERVER=ldap_server_url
#GSK_LDAP_PORT=ldap_server_port
#GSK_LDAP_USER=ldap_userid
#GSK_LDAP_PASSWORD=ldap_server_password
=====

```

Figure 5. rsed.envvars - RSE configuration file

```

# (5) do not change unless directed by IBM support center
_CEE_RUNOPTS="ALL31(ON) HEAP(32M,32K,ANYWHERE,KEEP,,) TRAP(ON)"
_BPX_SHAREAS=YES
_BPX_SPAWN_SCRIPT=YES
JAVA_PROPAGATE=NO
RSE_LIB=$RSE_HOME/lib
PATH=.:$JAVA_HOME/bin:$RSE_HOME/bin:$_CMDSERV_BASE_HOME/bin:$PATH
LIBPATH=$JAVA_HOME/bin:$JAVA_HOME/bin/classic:$RSE_LIB:$RSE_LIB/icuc
LIBPATH=./usr/lib:$LIBPATH
CLASSPATH=$RSE_LIB:$RSE_LIB/dstore_core.jar:$RSE_LIB/clientserver.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/dstore_extra_server.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/zosserver.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/dstore_miners.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/universalminers.jar:$RSE_LIB/mvsminers.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/carma.jar:$RSE_LIB/luceneminer.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/mvsluceneminer.jar:$RSE_LIB/cdzminer.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/mvscdzminer.jar:$RSE_LIB/jesminers.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/FAMiner.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/mvsutil.jar:$RSE_LIB/jesutils.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/lucene-core-2.3.2.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/cdtparser.jar
CLASSPATH=$CLASSPATH:$RSE_LIB/wdzBidi.jar:$RSE_LIB/fmiExtensions.jar
CLASSPATH=$CLASSPATH:$RSE_SAF_CLASS
CLASSPATH=.:$CLASSPATH
_RSE_CMDSERV_OPTS="&SESSION=SPAWN$ RSE_CMDSERV_OPTS"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DISPF_OPTS='$RSE_CMDSERV_OPTS'"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DA_PLUGIN_PATH=$RSE_LIB"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Xbootclasspath/p:$RSE_LIB/bidiTools.jar"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dfile.encoding=$RSE_HOST_CODEPAGE"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dconsole.encoding=$RSE_HOST_CODEPAGE"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DDSTORE_SPIRIT_ON=true"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DSPIRIT_EXPIRY_TIME=6"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DSPIRIT_INTERVAL_TIME=6"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dcom.ibm.cacheLocalHost=true"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Duser.home=$HOME"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dclient.username=$RSE_USER_ID"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dlow.heap.usage.ratio=15"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dmaximum.heap.usage.ratio=40"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DDSTORE_KEEPALIVE_ENABLED=true"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DDSTORE_KEEPALIVE_RESPONSE_TIMEOUT=60000"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -DDSTORE_IO_SOCKET_READ_TIMEOUT=180000"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dlock.daemon.port=$RSE_LOCKD_PORT"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -Dlock.daemon.cleanup.interval=1440"
_RSE_JAVAOPTS="$RSE_JAVAOPTS -showversion"
_RSE_SERVER_CLASS=org.eclipse.dstore.core.server.Server
_RSE_DAEMON_CLASS=com.ibm.etools.zos.server.RseDaemon
_RSE_POOL_SERVER_CLASS=com.ibm.etools.zos.server.ThreadPoolProcess
_RSE_LOCKD_CLASS=com.ibm.ftt.rse.mvs.server.miners.MVSLockDaemon
_RSE_SERVER_TIMEOUT=120000
_SCLMDT_BASE_HOME=$RSE_HOME
_SCLMDT_WORK_HOME=$_CMDSERV_WORK_HOME
CGI_DTWORK=$_SCLMDT_WORK_HOME
#=====
# (6) additional environment variables

```

Figure 6. rsed.envvars - RSE configuration file (continued)

### JAVA\_HOME

Java home directory. The default is /usr/lpp/java/J5.0. Change to match your Java installation.

### RSE\_HOME

RSE home directory. The default is /usr/lpp/rdz. Change to match your Developer for System z installation.

### **\_RSE\_LOCKD\_PORT**

RSE lock daemon port number. The default is 4036. Can be changed if desired.

### **\_RSE\_HOST\_CODEPAGE**

The host codepage. The default is IBM-1047. Change to match your host codepage.

**TZ** Time zone selector. The default is EST5EDT. The default time zone is UTC +5 hours (Eastern Standard Time (EST) Eastern Daylight Savings Time (EDT)). Change to match your time zone.

### **LANG**

Specifies the name of the default locale. The default is C. C specifies the POSIX locale and (for example) Ja\_JP specifies the Japanese locale. Change to match your locale.

### **STEPLIB**

Access MVS data sets not in LINKLIST/LPALIB. The default is NONE.

You can bypass the need of having (prerequisite) libraries in LINKLIST/LPALIB by uncommenting and customizing one or more of the following STEPLIB directives:

```
STEPLIB=$STEPLIB:CEE.SCEERUN:CEE.SCEERUN2:CBC.SCLBDLL
STEPLIB=$STEPLIB:ISP.SISPLoad:ISP.SISPLPA:SYS1.LINKLIB
STEPLIB=$STEPLIB:FEK.SFEKAUTH:FEK.SFEKLOAD
```

#### **Note:**

- Using STEPLIB in z/OS UNIX has a negative performance impact.
- If one STEPLIB library is APF authorized, then all must be authorized. Libraries lose their APF authorization when they are mixed with non-authorized libraries in STEPLIB.
- Libraries that are designed for LPA placement might require additional program control or APF authorizations if they are accessed through LINKLIST or STEPLIB.
- Coding a STEPLIB DD statement in the server JCL does not set the requested STEPLIB concatenation.

### **RSE\_SAF\_CLASS**

Specifies the Java interface to your security product. The default is /usr/include/java\_classes/IRRRacf.jar. Change to match your security software setup.

**Note:** Since z/OS 1.10, /usr/include/java\_classes/IRRRacf.jar is part of SAF, which ships with base z/OS, so it is available also to non-RACF customers.

### **\_RSE\_JAVAOPTS="\$\_RSE\_JAVAOPTS -Ddaemon.log=/var/rdz/logs"**

Directory holding the RSE daemon and server logging and RSE audit data. The default is /var/rdz/logs. Change to enforce the desired location. If this directive is commented out, the home directory of the user ID assigned to RSE daemon will be used. The home directory is defined in the OMVS security segment of the user ID.

### **\_RSE\_JAVAOPTS="\$\_RSE\_JAVAOPTS -Duser.log=/var/rdz/logs"**

Directory leading to the user-specific logs. The default is /var/rdz/logs. Change to enforce the desired location. If this directive is commented out,

the home directory of the client user ID will be used. The directory path is defined in the OMVS security segment of the user ID.

**Note:** The complete path to the user logs is `userlog/dstorelog/$LOGNAME/`, where `userlog` is the value of the `user.log` directive, `dstorelog` is the value of the `DSTORE_LOG_DIRECTORY` directive and `$LOGNAME` is the client's user ID in uppercase.

#### **\_CMDSERV\_BASE\_HOME**

Home directory for the ISPF code that provides the TSO/ISPF Client Gateway service. The default is `/usr/lpp/ispf`. Change to match your ISPF installation.

#### **\_CMDSERV\_CONF\_HOME**

ISPF base configuration directory. The default is `/etc/rdz`. Change to match the location of `ISPF.conf`, the TSO/ISPF Client Gateway customization file.

#### **\_CMDSERV\_WORK\_HOME**

ISPF base work directory. The default is `/var/rdz`. Change to match the location of the `WORKAREA` directory used by the TSO/ISPF Client Gateway.

#### **\_RSE\_PORTRANGE**

Specifies the port range that the RSE server can open for communication with a client. Any port can be used by default. This is an optional directive.

#### **\_BPXK\_SETIBMOPT\_TRANSPORT**

Specifies the name of the TCP/IP stack to be used. The default is `TCPIP`. Uncomment and change to the requested TCP/IP stack name, as defined in the `TCPIPJOBNAME` statement in the related `TCPIP.DATA`. This is an optional directive.

**Note:**

- Coding a `SYSTCPD DD` statement in the server `JCL` does not set the requested stack affinity.
- When this directive is not active, RSE binds to every available stack on the system (`BIND INADDRANY`).

---

## **ISPF.conf, ISPF's TSO/ISPF Client Gateway configuration file**

ISPF's TSO/ISPF Client Gateway uses the definitions in `ISPF.conf` to create a valid environment to execute batch TSO and ISPF commands. Developer for System z uses this environment to run some MVS based services.

`ISPF.conf` is located in `/etc/rdz/`, unless you specified a different location when you customized and submitted job `FEK.SFEKSAMP(FEKSETUP)`. See "Customization setup" on page 5 for more details. You can edit the file with the TSO `OEDIT` command.

Comment lines start with an asterisk (\*). When concatenating data set names, add them on the same line and separate the names with a comma (,).

Besides providing the correct names for the ISPF data sets, you must also add the TSO Commands service data set name, `FEK.SFEKPROC`, to the `SYSPROC` or `SYSEXEC` statement, as shown in the following code sample.

```
* REQUIRED:  
sysproc=ISP.SISPCLIB,FEK.SFEKPROC  
ispmlib=ISP.SISPMENU  
isptlib=ISP.SISPTENU  
ispplib=ISP.SISPPENU  
ispplib=ISP.SISPLIB  
ispllib=ISP.SISPLOAD  
  
* OPTIONAL:  
*allocjob = FEK.#CUST.CNTL(CRAISPRX)  
*ISPF_timeout = 900
```

*Figure 7. ISPF.conf - ISPF configuration file*

**Note:** You can add your own DD-like statements and data set concatenations to customize the TSO environment, thus mimicking a TSO logon procedure.

---

## Chapter 3. Optional customization

This section summarizes the CARMA, Application Deployment Manager, SCLM Developer Toolkit, and other customization task information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

---

### (Optional) Common Access Repository Manager (CARMA)

You will need the assistance of a security administrator and a TCP/IP administrator to complete this customization task, which requires the following resources or special customization tasks:

- TCP/IP port range for internal communication
- Security rule to allow developers update to CARMA VSAM's
- (Optional) Security rule to allow users to submit CRA\* jobs
- (Optional) LPA update

Common Access Repository Manager (CARMA) is a productivity aid for developers who are creating Repository Access Managers (RAMs). A RAM is an Application Programming Interface (API) for z/OS based Software Configuration Managers (SCMs).

In turn, user-written applications can start a CARMA server which loads the RAMS(s) and provides a standard interface to access the SCM.

The IBM® Rational® Developer for System z Interface for CA Endeavor® Software Configuration Manager gives Developer for System z clients direct access to CA Endeavor® SCM.

---

### (Optional) Application Deployment Manager

You will need assistance of a CICS administrator, a TCP/IP administrator and a security administrator to complete this customization task, which requires the following resources or special customization tasks:

- TCP/IP port for external communication
- Update CICS region JCL
- Update CICS region CSD
- Define group to CICS region
- Security rule to allow administrators update to an Application Deployment Manager VSAM
- CICS TS security setup
- (Optional) Define CICS transaction names
- (Optional) Security rule to allow users update to an Application Deployment Manager VSAM

Developer for System z uses certain functions of Application Deployment Manager as a common deployment approach for various components. Optional customization enables more features of Application Deployment Manager and can add the following services to Developer for System z:

- IBM CICS Explorer provides an Eclipse-based infrastructure to view and manage CICS resources and enables greater integration between CICS tools.
- CICS Resource Definition (CRD) client and server provide the following functions:
  - CICS Resource Definition editor
  - Allow application developers to define CICS resources in a limited, controlled, and secure fashion.
  - Prevent CICS development access to unauthorized or incorrect VSAM data sets by providing the CICS administrator control over the physical data set name attribute in File definitions.
  - Miscellaneous CICS development aids
  - Miscellaneous CICS Web Service development aids

---

## (Optional) SCLM Developer Toolkit

You will need assistance of an SCLM administrator and optionally a security administrator to complete this customization task, which requires the following resources and/or special customization tasks:

- APF and LINKLIST updates
- Define SCLM language translators for JAVA/J2EE support
- Define SCLM types for JAVA/J2EE support
- (Optional) Security rule to allow users update to an SCLM VSAM
- (Optional) Installation of Ant

SCLM Developer Toolkit provides the tools needed to extend the capabilities of SCLM to the client. SCLM (Software Configuration and Library Manager) itself is a host-based source code manager that is shipped as part of ISPF.

The SCLM Developer Toolkit has an Eclipse-based plug-in that interfaces to SCLM and provides for access to all SCLM processes for legacy code development as well as support for full Java and J2EE development on the workstation with synchronization to SCLM on the mainframe including building, assembling, and deployment of the J2EE code from the mainframe.

---

## (Optional) DB2 stored procedure

You will need the assistance of a WLM administrator and a DB2 administrator to complete this customization task , which requires the following resources or special customization tasks:

- WLM update
- New PROCLIB member
- DB2 update

Developer for System z provides a sample DB2 stored procedure (PL/I and COBOL Stored Procedure Builder) for building COBOL and PL/I Stored Procedures from within the Developer for System z client.

---

## (Optional) CICS bidirectional language support

You will need the assistance of a CICS administrator to complete this customization task, which requires the following resources or special customization tasks:

- Update CICS region JCL
- Define a program to CICS

The Developer for System z Enterprise Service Tools (EST) component supports different formats of Arabic and Hebrew interface messages, as well as bidirectional data presentation and editing in all editors and views. In terminal applications, both left-to-right and right-to-left screens are supported, as well as numeric fields and fields with opposite-to-screen orientation.

Additional bidirectional features and functionality include the following:

- The EST service requestor dynamically specifies bidirectional attributes of interface messages.
- Bidirectional data processing in service flows is based on bidirectional attributes (text type, text orientation, numeric swapping, and symmetric swapping). These attributes can be specified in different stages of flow creation for both interface and terminal flows.
- EST-generated runtime code includes conversion of data between fields in messages that have different bidirectional attributes.

Additionally, EST-generated code can support bidi transformation in environments other than CICS SFR (for example, batch applications). You can make the EST generators to include calls to the bidirectional conversion routines by specifying the appropriate bidi transformation options in the EST generation wizards and linking the generated programs with the appropriate bidirectional conversion library, FEK.SFEKLOAD.

---

## (Optional) Diagnostic IRZ error messages

This customization task does not require assistance, but does require the following resources or special customization tasks:

- LINKLIST update
- Update CICS region JCL

The Developer for System z client has a code generation component called Enterprise Service Tools (EST). In order for code generated by EST to issue diagnostic error messages, all IRZ\* and IIRZ\* modules in the FEK.SFEKLOAD load library must be made available to the generated code.

---

## (Optional) RSE SSL encryption

You will need assistance of a security administrator to complete this customization task, which requires the following resources or special customization tasks:

- LINKLIST update
- Security rule to add program controlled data sets
- (Optional) Security rule to add certificate for SSL

External (client-host) communication can be encrypted using SSL. This feature is disabled by default and is controlled by the settings in `ssl.properties`.

---

## (Optional) RSE tracing

This customization task does not require assistance, special resources, or special customization tasks.

Developer for System z supports different levels of tracing the internal program flow for problem solving purposes. RSE, and some of the services called by RSE, use the settings in `rsecomm.properties` to know the desired detail level in the output logs.

---

## (Optional) Host based property groups

This customization task does not require assistance, special resources, or special customization tasks.

Developer for System z clients can define property groups which hold default values for various properties (for example, the COBOL compiler options to use when compiling COBOL source code). Developer for System z has some default values built in, but also allows defining custom, system-specific defaults.

---

## (Optional) Host based projects

This customization task does not require assistance, special resources, or special customization tasks.

z/OS Projects can be defined individually through the z/OS Projects perspective on the client or can be defined centrally on the host and propagated to the client on a per user basis. These "host-based projects" look and function exactly like projects defined on the client except that their structure, members, and properties cannot be modified by the client and they are only accessible when connected to the host.

---

## (Optional) File Manager integration

You will need the assistance of a security administrator to complete this customization task, which requires the following resources or special customization tasks:

- Security rule to add program controlled data sets

Developer for System z supports direct access from the client to a limited set of IBM File Manager for z/OS functions. IBM File Manager for z/OS provides comprehensive tools for working with MVS data sets, z/OS UNIX files, DB2, IMS and CICS data. These tools include the familiar browse, edit, copy and print utilities found in ISPF, enhanced to meet the needs of application developers. In the current version of Developer for System z, only browse/edit of MVS data sets (including VSAM KSDS and ESDS) and editing basic MVS data set templates is supported.

Note that the IBM File Manager for z/OS product must be ordered, installed and configured separately. Refer to *Rational Developer for System z Host Planning Guide* (GI11-8296-00) to know which level of File Manger is required for your version of Developer for System z. The installation and customization of this product is not described in this manual.

---

## **(Optional) Uneditable characters**

This customization task does not require assistance, special resources, or special customization tasks.

Some characters do not translate well between host code pages (EBCDIC based) and client code pages (ASCII based). The Developer for System z client editor uses the definitions in `uchars.settings` file to identify these uneditable characters.

---

## **(Optional) Using REXEC (or SSH)**

This customization task does not require assistance, special resources, or special customization tasks.

REXEC (Remote Execution) is a TCP/IP service to let clients execute a command on the host. SSH (Secure Shell) is a similar service, but here all communication is encrypted using SSL (Secure Socket Layer). Developer for System z uses either service for doing remote (host-based) actions in z/OS UNIX subprojects.

---

## **(Optional) APPC transaction for the TSO Commands service**

You will need assistance of an APPC administrator and a WLM administrator to complete this customization task, which requires the following resources or special customization tasks:

- APPC transaction
- WLM update

The TSO Commands service can be implemented as an APPC transaction program, FEKFRSRV. This transaction acts as a host server to execute TSO and ISPF commands that are issued from the workstation. APPC is not required on the workstation because the workstation communicates with FEKFRSRV through TCP/IP. Each workstation can have an active connection to multiple hosts at the same time.

---

## **(Optional) WORKAREA cleanup**

This customization task does not require assistance, special resources, or special customization tasks.

ISPF's TSO/ISPF Client Gateway and the SCLM Developer Toolkit function use the WORKAREA directory to store temporary work files, which are removed before the session is closed. However, temporary output is sometimes left behind, for example, if there is a communication error while processing. For this reason, it is recommended that you clear out the WORKAREA directory from time to time.



---

## Chapter 4. Installation verification

---

### Verify started tasks

This chapter summarizes the installation verification information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

#### JMON, JES, Job Monitor

Start the JMON started task (or user job). The startup information in DD STDOUT should end with the following message:

```
JM200I Server initialization complete.
```

If the job ends with return code 66, then FEK.SFEKAUTH is not APF authorized.

#### LOCKD, Lock daemon

Start the LOCKD started task (or user job). The lock daemon issues the following console message upon successful startup:

```
FEK501I Lock daemon started, port=4036, cleanup interval=1440, log level=1
```

#### RSED, RSE daemon

Start the RSED started task (or user job) with the IVP=IVP parameter. With this parameter, the server will end after doing some installation verification tests. The output of these tests is available in DD STDOUT. In case of certain errors, data will also be available in DD STDERR.

---

### Verify services

The Developer for System z installation provides several Installation Verification Programs (IVP) for the basic and optional services. The IVP scripts are located in the installation directory, default `/usr/lpp/rdz/bin/`.

fekfivpa	(Optional) TSO Commands service connection using APPC
fekfivpd	"RSE daemon connection" on page 24
fekfivpi	ISPF's TSO/ISPF Client Gateway connection
fekfivpj	"JES Job Monitor connection" on page 24
fekfivpl	"Lock daemon connection" on page 25
fekfivpr	(Optional) REXEC connection
fekfivps	(Optional) SCLMDT connection
fekfivpt	TCP/IP address & resolver configuration
fekfivpz	(Optional) REXEC/SSH shell script

**Note:** The optional IVPs are not described in this publication. Refer to *Rational Developer for System z Host Configuration Guide* (SC23-7658) for more details.

The tasks described below expect you to be active in z/OS UNIX. This can be done by issuing the TSO command **OMVS**. Use the **exit** command to return to TSO.

## IVP initialization

All sample commands in this section expect that certain environment variables are set. This way, the IVP scripts are available through the PATH statement and the location of the customized configuration files is known. Use the `pwd` and `cd` commands to verify and change your current directory to the directory with the customized configuration files. The `ivpinit` shell script can then be used to set the RSE environment variables, like in the following sample (\$ is the z/OS UNIX prompt):

```
$ pwd
/u/userid
$ cd /etc/rdz
$ ./ivpinit
RSE configuration files located in /etc/rdz --default
added /usr/lpp/rdz/bin to PATH
```

The first "." (dot) in `./ivpinit` is a z/OS UNIX command to run the shell in the current environment, so that the environment variables set in the shell are effective even after exiting the shell. The second one is referring to the current directory.

**Note:** If `./ivpinit` is NOT executed before the `fekfivp*` scripts, the path to these scripts must be specified when calling them, like that in the following sample:

```
/usr/lpp/rdz/bin/fekfivpr 512 USERID
```

Also, most `fekfivp*` scripts will ask for the location of the customized `rsed.envvars` if `./ivpinit` is not executed first.

**Note:** Some IVP tests use the TCP/IP REXX socket API, which requires that the TCP/IP load library, default `TCPIP.SEZALOAD`, is in `LINKLIST` or `STEPLIB`. The following commands might be necessary to be able to execute these IVP tests (\$ is the z/OS UNIX prompt):

```
$ EXPORT STEPLIB=$STEPLIB:TCPIP.SEZALOAD
```

For information on diagnosing RSE connection problems, see "*Appendix C, Troubleshooting configuration problems*" in *Rational Developer for System z Host Configuration Guide* (SC23-7658) or the Technotes on the Developer for System z Support Page <http://www-306.ibm.com/software/awdtools/rdz/support/>.

## Port availability

The JES Job Monitor, RSE daemon port, and optionally REXEC or SSH availability can be verified by issuing the `netstat` command. The result should show the ports used by these services.

## RSE daemon connection

Verify the RSE daemon connection by executing the following command. Replace 4035 with the port used by the RSE daemon and USERID by a valid user ID.

```
fekfivpd 4035 USERID
```

## JES Job Monitor connection

Verify the JES Job Monitor connection by executing the following command. Replace 6715 with the JES Job Monitor port number.

```
fekfivpj 6715
```

## **Lock daemon connection**

Verify the lock daemon connection by executing the following command:  
`fekfivpl`

## **ISPF's TSO/ISPF Client Gateway connection**

Verify the connection to ISPF's TSO/ISPF client Gateway by executing the following command:  
`fekfivpi`



---

## Appendix A. Security considerations

This chapter summarizes the security considerations information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

The security mechanisms used by Developer for System z servers and services rely on the file system it resides in being secure. This implies that only trusted system administrators should be able to update the program libraries and configuration files.

---

### Authentication methods

Developer for System z supports multiple ways to authenticate a user ID provided by a client upon connection.

- User ID and password
- User ID and one-time password
- X.509 certificate

---

### Connection security

Different levels of communication security are supported by RSE, which controls all communication between the client and Developer for System z services:

- External (client-host) communication can be limited to specified ports. This feature is disabled by default.
- External (client-host) communication can be encrypted using SSL. This feature is disabled by default.
- Port Of Entry (POE) checking can be used to allow host access only to trusted TCP/IP addresses. This feature is disabled by default.

---

### TCP/IP ports

#### External communication

Define the following ports to your firewall protecting the z/OS host, as they are used for client-host communication:

- RSE daemon for client-host communication setup, default port 4035. Communication on this port can be encrypted using SSL.
- RSE server for client-host communication. By default, any available port is used, but this can be limited to a specified range with the `_RSE_PORTRANGE` definition in `rse.envvars`. Communication on this port can be encrypted using SSL.

#### Notes:

1. Previous clients (version 7.0 and older) communicate directly with the JES Job Monitor server, default port 6715.
2. During a remote debug session for Cobol, PL/I or Assembler, IBM Debug Tool for z/OS is invoked. This product communicates directly with the client. This communication is initiated on the host, and connects to port 8001 on the client.

---

## Using PassTickets

After logon, PassTickets are used to establish thread security within the server. This feature cannot be disabled. PassTickets are system generated passwords with a lifespan of about 10 minutes. The generated PassTickets are based upon the DES encryption algorithm, the user ID, the application ID, a time and date stamp, and a secret key. This secret key is a 64 bit number (16 hex characters) that must be defined to your security software.

**Attention:** The client connection request will fail if PassTickets are not set up correctly.

---

## Audit logging

Developer for System z supports audit logging of actions that are managed by the RSE daemon. The audit logs are stored as text files in the daemon log directory, using the CSV (Comma Separated Value) format.

---

## JES security

Developer for System z allows clients access to the JES spool through the JES Job Monitor server. The server provides basic access limitations, which can be extended with the standard spool file protection features of your security product. Actions (Hold, Release, Cancel, and Purge) against spool files are done through the JMON EMCS console, for which conditional permits must be set up.

---

## CICS TS security

Developer for System z allows, through Application Deployment Manager, CICS administrators to control which CICS resource definitions are editable by the developer, their default values, and the display of a CICS resource definition by means of the CICS Resource Definition (CRD) server.

---

## SCLM security

The SCLM Developer Toolkit service offers optional security functionality for the Build, Promote, and Deploy functions.

---

## Developer for System z configuration files

There are several Developer for System z configuration files whose directives impact the security setup.

---

## Security definitions

Customize and submit sample member FEKRACF in data set FEK.#CUST.JCL, which has sample RACF and z/OS UNIX commands to create the basic security definitions for Developer for System z.

**Note:** For those sites that use CA ACF2™ for z/OS or CA Top Secret® for z/OS, please refer to your product page on the CA support site (<https://support.ca.com>) and check for the related Developer for System z Knowledge Document. This Knowledge Document has details on the security commands necessary to properly configure Developer for System z.

To complete the security setup, the security administrator needs to know the values listed in Table 5. These values were defined during previous steps of the installation and customization of Developer for System z.

Table 5. Security setup variables

Description	<ul style="list-style-type: none"> <li>• Default value</li> <li>• Where to find the answer</li> </ul>	Value
Developer for System z product high level qualifier	<ul style="list-style-type: none"> <li>• FEK</li> <li>• SMP/E installation</li> </ul>	
Developer for System z customization high level qualifier	<ul style="list-style-type: none"> <li>• FEK.#CUST</li> <li>• FEK.SFEKSAMP(FEKSETUP), as described in "Customization setup" on page 5</li> </ul>	
JES Job Monitor started task name	<ul style="list-style-type: none"> <li>• JMON</li> <li>• FEK.#CUST.PROCLIB(JMON), as described in "PROCLIB changes" on page 7</li> </ul>	
RSE daemon started task name	<ul style="list-style-type: none"> <li>• RSED</li> <li>• FEK.#CUST.PROCLIB(RSED), as described in "PROCLIB changes" on page 7</li> </ul>	
Lock daemon started task name	<ul style="list-style-type: none"> <li>• LOCKD</li> <li>• FEK.#CUST.PROCLIB(LOCKD), as described in "PROCLIB changes" on page 7</li> </ul>	

## Define an OMVS segment for Developer for System z users

A RACF OMVS segment (or equivalent) that specifies a valid non-zero uid, home directory, and shell command must be defined for each user of Developer for System z. Their default group also requires an OMVS segment with a group id.

## Define data set profiles

READ access for users and ALTER for system programmers suffices for most Developer for System z data sets.

You should protect FEK.SFEKAUTH against updates since this data set is APF authorized. The same is true for FEK.SFEKLOAD and FEK.SFEKLPA, but here because these data sets are program controlled.

- ADDGROUP (FEK) OWNER(IBMUSER) SUPGROUP(SYS1)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z - HLG STUB')
- ADDSD 'FEK.\*.\*\*' UACC(READ)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- PERMIT 'FEK.\*.\*\*' CLASS(DATASET) ACCESS(ALTER) ID(#sysprog)
- SETROPTS GENERIC(DATASET) REFRESH

## Define the Developer for System z started tasks

The following sample RACF commands create the JMON, RSED, and LOCKD started tasks, with protected user IDs (STCJMON, STCRSE, and STCLOCK, respectively) and group STCGROUP assigned to them. Replace the #group-id and #user-id-\* placeholders with valid OMVS IDs.

- ADDGROUP STCGROUP OMVS(GID(#group-id))  
DATA('GROUP WITH OMVS SEGMENT FOR STARTED TASKS')
- ADDUSER STCJMON DFLTGROUP(STCGROUP) NOPASSWORD NAME('RDZ - JES JOBMONITOR')  
OMVS(UID(#user-id-jmon) HOME(/tmp) PROGRAM(/bin/sh) NOASSIZEMAX  
NOTHEADSMAX)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- ADDUSER STCRSE DFLTGROUP(STCGROUP) NOPASSWORD NAME('RDZ - RSE  
DAEMON')  
OMVS(UID(#user-id-rse) HOME(/tmp) PROGRAM(/bin/sh)  
ASSIZEMAX(2147483647) NOTHEADSMAX)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- ADDUSER STCLOCK DFLTGROUP(STCGROUP) NOPASSWORD NAME('RDZ - LOCK  
DAEMON')  
OMVS(UID(#user-id-lock) HOME(/tmp) PROGRAM(/bin/sh) NOASSIZEMAX  
NOTHEADSMAX)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- RDEFINE STARTED JMON.\* DATA('RDZ - JES JOBMONITOR')
- STDATA(USER(STCJMON) GROUP(STCGROUP) TRUSTED(NO))
- RDEFINE STARTED RSED.\* DATA('RDZ - RSE DAEMON')
- STDATA(USER(STCRSE) GROUP(STCGROUP) TRUSTED(NO))
- RDEFINE STARTED LOCKD.\* DATA('RDZ - LOCK DAEMON')
- STDATA(USER(STCLOCK) GROUP(STCGROUP) TRUSTED(NO))
- SETROPTS RACLIST(STARTED) REFRESH

**Notes:**

1. Ensure that the started tasks user IDs are protected by specifying the NOPASSWORD keyword.
2. Ensure that RSE server has a unique OMVS uid due to the z/OS UNIX related privileges granted to this uid.

## Define JES command security

JES Job Monitor issues all JES operator commands requested by a user through an extended MCS (EMCS) console, whose name is controlled with the `CONSOLE_NAME` directive, as documented in “FEJJCNFG, JES Job Monitor configuration file” on page 10.

The following sample RACF commands give Developer for System z users conditional access to a limited set of JES commands (Hold, Release, Cancel, and Purge). Users only have execution permission if they issue the commands through JES Job monitor. Replace the `#console` placeholder with the actual console name.

- RDEFINE OPERCMDS MVS.MCSOPER.#console UACC(READ)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- RDEFINE OPERCMDS JES%.\*\* UACC(NONE)
- PERMIT JES%.\*\* CLASS(OPERCMDS) ACCESS(UPDATE) WHEN(CONSOLE(JMON)) ID(\*)
- SETROPTS RACLIST(OPERCMDS) REFRESH

**Notes:**

1. Usage of the console is permitted if no `MVS.MCSOPER.#console` profile is defined
2. The `CONSOLE` class must be active for `WHEN(CONSOLE(JMON))` to work, but there is no actual profile check in the `CONSOLE` class for EMCS consoles.
3. Do not replace `JMON` with the actual console name in the `WHEN(CONSOLE(JMON))` clause. The `JMON` keyword represents the point-of-entry application, not the console name.

**CAUTION:**

Defining JES commands with universal access **NONE** in your security software might impact other applications and operations. Test this before activating it on a production system.

## Define RSE as a secure z/OS UNIX server

RSE requires UPDATE access to the BPX.SERVER profile to create/delete the security environment for the client's thread. If this profile is not defined, UID(0) is required for RSE.

- RDEFINE FACILITY BPX.SERVER UACC(NONE)
- PERMIT BPX.SERVER CLASS(FACILITY) ACCESS(UPDATE) ID(STCRSE)
- SETROPTS RACLIST(FACILITY) REFRESH

## Define MVS program controlled libraries for RSE

Servers with authority to BPX.SERVER must run in a clean, program-controlled environment. This implies that all programs called by the RSE server must also be program controlled. For MVS load libraries, program control is managed by your security software.

- RALTER PROGRAM \*\* UACC(READ) ADDMEM('SYS1.LINKLIB'//NOPADCHK)
- RALTER PROGRAM \*\* UACC(READ) ADDMEM('CEE.SCEERUN'//NOPADCHK)
- RALTER PROGRAM \*\* UACC(READ) ADDMEM('CEE.SCEERUN2'//NOPADCHK)
- RALTER PROGRAM \*\* UACC(READ) ADDMEM('ISP.SISPLD'//NOPADCHK)
- SETROPTS WHEN(PROGRAM) REFRESH

**Note:** Do not use the \*\* profile if you already have a \* profile in the PROGRAM class. It obscures and complicates the search path used by your security software. In this case, you must merge the existing \* and the new \*\* definitions. IBM recommends using the \*\* profile, as documented in *Security Server RACF Security Administrator's Guide (SA22-7683)*.

## Define application protection for RSE

During client logon, RSE daemon verifies that a user is allowed to use the application.

- RDEFINE APPL FEKAPPL UACC(READ)  
DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- SETROPTS RACLIST(APPL) REFRESH

**Note:** The client connection request will fail if the profile is not defined, or when the user lacks READ access to the profile.

## Define PassTicket support for RSE

The client's password (or other means of identification, such as an X.509 certificate) is only used to verify his identity upon connection. Afterwards, PassTickets are used to maintain thread security. PassTickets are system generated passwords with a lifespan of about 10 minutes. The generated PassTickets are based upon a secret key. This key is a 64 bit number (16 hex characters). Replace in the sample RACF commands below the key16 placeholder with a user-supplied 16 character hex string (characters 0-9 and A-F).

- RDEFINE PTKTDATA FEKAPPL UACC(NONE) SSIGNON(KEYMASKED(key16))  
APPLDATA('NO REPLAY PROTECTION – DO NOT CHANGE') DATA('RATIONAL DEVELOPER FOR SYSTEM Z')

- RDEFINE PTKTDATA IRRPTAUTH.FEKAPPL.\* UACC(NONE) DATA('RATIONAL DEVELOPER FOR SYSTEM Z')
- PERMIT IRRPTAUTH.FEKAPPL.\* CLASS(PTKTDATA) ACCESS(UPDATE) ID(STCRSE)
- SETROPTS RACLIST(PTKTDATA) REFRESH

**Note:** If the PTKTDATA class is already defined, verify that it is defined as a generic class before creating the profiles listed above. The support for generic characters in the PTKTDATA class is new since z/OS release 1.7, with the introduction of a Java interface to PassTickets.

**Attention:** The client connection request will fail if PassTickets are not set up correctly.

## Define z/OS UNIX program controlled files for RSE

Servers with authority to BPX.SERVER must run in a clean, program-controlled environment. This implies that all programs called by RSE server must also be program controlled. For z/OS UNIX files, program control is managed by the **extattr** command. To execute this command, you need READ access to BPX.FILEATTR.PROGCTL in the FACILITY class, or be UID(0).

- `extattr +p /usr/lib/libIRRRacf.so`

**Note:**

- Since z/OS 1.9, /usr/lib/libIRRRacf.so is installed program controlled during SMP/E RACF install.
- Since z/OS 1.10, /usr/lib/libIRRRacf.so is part of SAF, which ships with base z/OS, so it is available also to non-RACF customers.
- The setup might be different if you use a security product other than RACF. Consult the documentation of your security product for more information.
- The SMP/E install of Developer for System z sets the program control bit for internal RSE server programs.

## Verify security settings

Use the following sample commands to display the results of your security-related customizations.

- Security settings and classes
  - SETROPTS LIST
- OMVS segment for users
  - LISTUSER #userid NORACF OMVS
  - LISTGRP #group-name NORACF OMVS
- Data set profiles
  - LISTGRP FEK ALL
  - LISTDSD PREFIX(FEK) ALL
- Started tasks
  - LISTGRP STCGROUP OMVS
  - LISTUSER STCJMON OMVS
  - LISTUSER STCRSE OMVS
  - LISTUSER STCLOCK OMVS
  - RLIST STARTED JMON.\* ALL STDATA

- RLIST STARTED RSED.\* ALL STDATA
- RLIST STARTED LOCKD.\* ALL STDATA
- JES command security
  - RLIST CONSOLE JMON ALL
  - RLIST OPERCMDS MVS.MCSOPER.JMON ALL
  - RLIST OPERCMDS JES%.\*\* ALL
- RSE as a secure z/OS UNIX server
  - RLIST FACILITY BPX.SERVER ALL
- MVS program controlled libraries for RSE
  - RLIST PROGRAM \*\* ALL
- Application protection for RSE
  - RLIST APPL FEKAPPL ALL
- PassTicket support for RSE
  - RLIST PTKTDATA FEKAPPL ALL SSIGNON
  - RLIST PTKTDATA IRRPTAUTH.FEKAPPL.\* ALL
- z/OS UNIX program controlled files for RSE
  - ls -E /usr/lib/libIRRRacf.so



---

## Appendix B. Migration considerations

This appendix summarizes the migration information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

---

### Version 7.6.1 migration notes

The following migration notes are version 7.6.1 specific. They are valid for migrating from version 7.6, or are additions to the existing version 7.6 migration notes.

- Application Deployment Manager - Existing ADN\* modules in the CICS RPL concatenation must be updated.
- Application Deployment Manager - The following sample members have been updated to add URIMAP support in the Administrative utility:
  - ADNJSPAU
  - ADNVCRD
- Application Deployment Manager - An existing CRD repository VSAM must be replaced to enable URIMAP support.
- CARMA - Added support for a variable-length layout for the CARMA custom information VSAM data set, CRASTRS
- CARMA - New sample members have been added:
  - CRA#VS2 - migrate CRASTRS to variable-length format
- JES Job Monitor - Usage of `_CEE_ENVFILE_S` in the started task JCL.
- JES Job Monitor - The following FEJCNFG directives became optional:
  - HOST\_CODEPAGE
- RSE - Usage of 64-bit Java is now supported.
- RSE - New operator commands have been added (since version 7.6.1.0):
  - MODIFY DISPLAY PROCESS,DETAIL
- RSE - The following non-customizable directives have changed or are new in `rсед.envvars` (since version 7.6.0.0):
  - (`_RSE_JAVAOPTS`) -DDSTORE\_KEEPALIVE\_RESPONSE\_TIMEOUT
  - (`_RSE_JAVAOPTS`) -DDSTORE\_IO\_SOCKET\_READ\_TIMEOUT
  - (`_RSE_JAVAOPTS`) -DRSECOMM\_LOGFILE\_MAX
- RSE - New optional directives have been added to `rсед.envvars` (since version 7.6.0.0 and 7.6.0.1):
  - (`_RSE_JAVAOPTS`) -Denable.automount
  - (`_RSE_JAVAOPTS`) -Ddeny.nozero.port
  - (`_RSE_JAVAOPTS`) -Dsingle.logon
  - (`_RSE_JAVAOPTS`) -Dprocess.cleanup.interval
- RSE - The following console messages have changed or are new (since version 7.6.0.1 and 7.6.1.0):
  - FEK001I
  - FEK210I

---

## Migrate from version 7.5 to 7.6

- The default SMP/E install location for MVS and z/OS UNIX components did not change and thus remain FEK.\* and /usr/lpp/rdz/\*.
- Application Deployment Manager - Existing ADN\* modules in the CICS RPL concatenation must be updated.
- Application Deployment Manager - New load modules, which must be part of the CICS RPL concatenation, have been added to support the CICS RESTful interface.
  - ADNANAL
  - ADNCRD41
  - ADNREST
- Application Deployment Manager - New sample members have been added to support the CICS RESTful interface.
  - ADNCSDRS
  - ADNCSDTX
  - ADNTXNC
- Application Deployment Manager - Existing sample members are renamed.
  - ADNARCSD -> ADNCSDAR
  - ADNCMSGH -> ADNMSGHC
  - ADNMFEST -> ADNVMFST
  - ADNPCCSD -> ADNCSDWS
  - ADNSMSGH -> ADNMSGHS
  - ADNVSAM -> ADNVCRD
- A new, production type, RAM is provided to access CA Endeavor<sup>®</sup>.
  - CRARENDV
- CARMA - New sample members have been provided to support the CA Endeavor<sup>®</sup> RAM.
  - CRA#VCAD
  - CRA#VCAS
- CARMA - New sample members have been provided to support merging RAM definitions.
  - CRA#UADD
  - CRA#UQRY
- File Manager Integration - The batch interface to access File Manager is no longer supported.
- File Manager Integration - The FMIEXT.properties configuration file has changed completely and must be replaced.
- JES Job Monitor - LE options are embedded in the FEJJMON load module (since version 7.5.0.1), which might require changes to your started task definition. See the FEK.SFEKSAMP(FEJJJCL) sample JCL for more details.
- JES Job Monitor - New optional directives have been added to FEJCNFG (in version 7.5.0.1 and 7.5.1.0).
  - APPLID
  - CONSOLE\_NAME
  - GEN\_CONSOLE\_NAME
- JES Job Monitor - A new command, Show JCL, is supported (since version 7.5.1.0) which might require updates to your security software.

- Lock daemon – The lock daemon (LOCKD) is a new started task (since version 7.5.0.1). This started task can be queried to identify which Developer for z client is holding a data set lock. (System commands stop at address space level, which is the RSE thread pool.)
- SCLMDT - the default location for the SCLMDT project configuration files has changed.
  - /var/rdz/sclmdt
- RSE - New operator commands have been added.
  - MODIFY RSESTANDARDLOG
- RSE - New required directives have been added to rsed.envvars (in version 7.5.0.1 and 7.6.0.0).
  - \_RSE\_LOCKD\_PORT
  - (\_RSE\_JAVAOPTS) -Dlock.daemon.port
  - (\_RSE\_JAVAOPTS) -Dlock.daemon.cleanup.interval
  - \_RSE\_LOCKD\_CLASS
  - \_RSE\_HOST\_CODEPAGE
  - (\_RSE\_JAVAOPTS) -Dfile.encoding
  - (\_RSE\_JAVAOPTS) -Dconsole.encoding
- RSE - New optional directives have been added to rsed.envvars (since version 7.5.0.1, 7.5.1.0 and 7.6.0.0).
  - (\_RSE\_JAVAOPTS) -Duser.log
  - (\_RSE\_JAVAOPTS) -Dkeep.last.log
  - (\_RSE\_JAVAOPTS) -Denable.standard.log
  - (\_RSE\_JAVAOPTS) -DDSTORE\_LOG\_DIRECTORY
  - (\_RSE\_JAVAOPTS) -DHIDE\_ZOS\_UNIX
  - (\_RSE\_JAVAOPTS) -Denable.certificate.mapping
  - GSK\_CRL\_SECURITY\_LEVEL
  - GSK\_LDAP\_SERVER
  - GSK\_LDAP\_PORT
  - GSK\_LDAP\_USER
  - GSK\_LDAP\_PASSWORD
- RSE - Some optional directives have changed in rsed.envvars.
  - (\_RSE\_JAVAOPTS) -Ddaemon.log
  - (\_RSE\_JAVAOPTS) -Xms
  - (\_RSE\_JAVAOPTS) -Xmx
- RSE - New optional directives have been added to ssl.properties (since version 7.5.1.0 and 7.6.0.0).
  - server\_keystore\_label
  - server\_keystore\_type
- RSE - RSE daemon supports X.509 client certificate authentication (since version 7.5.1.0), which requires updates to your current certificate and security setup when used.
- RSE - Security has been tightened, failing connection requests upon PassTicket and FEKAPPL errors.
- RSE - The default location for all log files (daemon and user logs) has changed.
  - /var/rdz/logs
  - /var/rdz/logs/\$LOGNAME

- RSE - A new sample JCL has been provided to gather Developer for System z<sup>®</sup> logs and configuration information.
  - FEKLOGS

---

## Appendix C. Other information

This appendix summarizes the remaining information in *Rational Developer for System z Host Configuration Guide* (SC23-7658). Refer to that publication for more details.

---

### Operator commands

This chapter provides an overview of the available operator (or console) commands for Developer for System z.

---

### Troubleshooting configuration problems

This chapter is provided to assist you with some common problems that you may encounter during your configuration of Developer for System z, and has the following sections:

- Log and setup analysis using FEKLOGS
- Log files
- Dump files
- Tracing
- z/OS UNIX permission bits
- Reserved TCP/IP ports
- Address Space size
- APPC transaction and TSO Commands service
- Miscellaneous information

---

### Understanding Developer for System z

The Developer for System z host consists of several components that interact to give the client access to the host services and data. Understanding the design of these components can help you make the correct configuration decisions.

---

### WLM considerations

Unlike traditional z/OS applications, Developer for System z is not a monolithic application that can be identified easily to Workload Manager (WLM). Developer for System z consists of several components that interact to give the client access to the host services and data. Some of these services are active in different address spaces, resulting in different WLM classifications.

---

### Tuning considerations

RSE (Remote Systems Explorer) is the core of Developer for System z. To manage the connections and workloads from the clients, RSE is composed of a daemon address space, which controls thread pooling address spaces. The daemon acts as a focal point for connection and management purposes, while the thread pools process the client workloads.

This makes RSE a prime target for tuning the Developer for System z setup. However, maintaining hundreds of users, each using 16 or more threads, a certain

amount of storage, and possibly one or more address spaces requires proper configuration of both Developer for System z and z/OS.

The following topics are covered in this chapter:

- Resource usage
- Storage usage
- z/OS UNIX file system space usage
- Key resource definitions
- Various resource definitions
- Monitoring
- Sample setup

---

## Performance considerations

z/OS is a highly customizable operating system, and (sometimes small) system changes can have a huge impact on the overall performance. This chapter highlights some of the changes that can be made to improve the performance of Developer for System z.

---

## CICSTS considerations

This chapter contains information useful for a CICS Transaction Server administrator.

---

## Customizing the TSO environment

This chapter assists you with mimicking a TSO logon procedure by adding DD statements and data sets to the TSO environment in Developer for System z.

---

## Running multiple instances

There are times that you want multiple instances of Developer for System z active on the same system, for example, when testing an upgrade. However, some resources such as TCP/IP ports cannot be shared, so the defaults are not always applicable. Use the information in this chapter to plan the coexistence of the different instances of Developer for System z, after which you can use this configuration guide to customize them.

---

## Setting up SSL and X.509 authentication

This appendix is provided to assist you with some common problems that you may encounter when setting up Secure Socket Layer (SSL), or during checking or modifying an existing setup. This appendix also provides a sample setup to support users authenticating themselves with an X.509 certificate.

---

## Setting up TCP/IP

This appendix is provided to assist you with some common problems that you may encounter when setting up TCP/IP, or during checking or modifying an existing setup.

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## Setting up INETD

This appendix is provided to assist you with some common problems that you may encounter when setting up INETD, or during checking or modifying an existing setup. INETD is used by Developer for System z for REXEC/SSH functionality.

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## Setting up APPC

This appendix is provided to assist you with some common problems that you may encounter when setting up APPC (Advanced Program-to-Program Communication), or during checking or modifying an existing setup.

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## Requisites

This appendix lists the host prerequisites and corequisites for this version of Developer for System z.



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## Documentation notices for IBM Rational® Developer for System z

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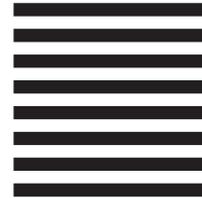
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