

Rational Business Developer



Generation Reference for VSE Feature

Version 90.1

Rational Business Developer



Generation Reference for VSE Feature

Version 90.1

Note

Before using this information and the product it supports, read the information in “Notices” on page 41.

First Edition, March 2016

This edition applies to IBM Rational Business Developer Extension for VSE, a chargeable component and licensed feature of IBM Rational Business Developer Version 9, Release 0, Modification 1, Program Number 5724-S50 and to any subsequent releases until otherwise indicated in new editions. Make sure that you are using the correct edition for the level of the product.

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Summary of changes

This section describes the major changes between this document and the Version 8.0.1 product document.

Connections to DB2® on z/VSE®

The section “Connections to DB2 on z/VSE” on page 31 has been updated for Rational® Business Developer 9.0.1 and higher versions.

Appendix. Sample 5: SQL database connections

The figure has been updated to reflect Rational Business Developer 9.0.1 and higher versions. See “Sample 5: SQL database connections” on page 39 for more information.

These changes, and the small changes not mentioned here, are flagged by a “|” in the left margin of the document.

Chapter 1. Overview

The IBM® Rational Development Products with the Enterprise Generation Language (EGL) component are the successor products for VisualAge® Generator.

In 2006 the VisualAge Generator EGL plug-in for VSE was released. This plug-in is supported under RAD/RWD V6.0.0.1.

IBM Rational Business Developer V8.0.1 has been extended to enable the generation of EGL as COBOL source that can be compiled and deployed to z/VSE. This “enabler” feature is the successor product for the EGL/VSE version 6 plugin and is referred to as the “plug-in” within this document.

Because the plug-in is based on the z/OS® Rational Business Developer EGL COBOL Generator, the two features share many similarities, and references to z/OS in EGL manuals often applies to the z/VSE platform. This Reference Manual provides z/VSE-specific information to supplement or replace the information provided about z/OS in EGL manuals.

More information is available from:

- The EGL Café online resource library. The web site is at <http://www-949.ibm.com/software/rational/cafe/community/egl/documentation>
- The EGL Café forum for EGL. The web site is at <http://www-949.ibm.com/software/rational/cafe/community/egl?view=discussions>
- The *EGL Reference Guide* SC31-6837
- The *Rational Software Development Platform VisualAge Generator to EGL Migration Guide* SC31-6830
- The *VisualAge Generator Generation Guide* SH23-0263
- The *VisualAge Generator Server Guide for MVS, VSE, and VM* SH23-0256
- The *TCP/IP for VSE Installation Guide* SC33-6762
- The *z/VSE e-business Connectors User's Guide* SC33-8231
- The web site and news group for VisualAge Generator. The web site is at <http://www.ibm.com/software/awdtools/visgen/>

Unsupported functions within EGL

EGL represents a major change and enhancement from the VisualAge Generator generation language. Due to restrictions on the z/VSE platform, or restrictions within the Server, not all of the functionality within EGL is currently supported by the plug-in.

The new EGL functions that are not supported by the plug-in are:

- Library functions
- Enhanced date and time functionality (VisualAge Generator date and time functions such as EZEDTE and EZETIM are still supported.)
- Formatting of numbers provided by the `strLib.formatNumber` EGL function
- Numeric items greater than 18 digits or numeric items with decimal places greater than 18 digits.
- Primitive ‘character-type’

Unsupported functions within EGL

- Recursive calls

Chapter 2. Prerequisites and installation

Plug-in prerequisites

Rational Business Developer Extension for VSE V8.0.1 is a component/feature of the Rational Business Developer V8.0.1 product.

Refer to this url to obtain Installation instructions for Rational Business Developer V8.0.1 <http://www-949.ibm.com/software/rational/cafecommunity/egl/documentation>.

Server prerequisites

To execute programs generated from Rational Business Developer EGL/VSE, a version of the Server software must be installed on the z/VSE host platform. This version of the Server software is supported:

- Rational COBOL RunTime for z/VSE (Program Number 5648-F66)

The Server software is dependent on other software products that are installed on the z/VSE host system. All these products should be at a currently supported level:

VSE System

A currently supported version of the VSE operating system up to and including z/VSE Version 4.2.

CICS®

A currently supported version of CICS up to and including CICS Transaction Server 1.1.1 (Program Number 5648-054).

TCP/IP

A currently supported version of TCP/IP for VSE/ESA 1.5 (Program Number 5686-A04).

COBOL compiler

A currently supported version of COBOL for VSE/ESA up to and including COBOL for VSE/ESA Version 1.1 (Program Number 5686-068).

Language Environment®

A currently supported version of Language Environment up to and including LE/VSE Version 146 (Program Number 5686-CF8). If LE/VSE version 144 is used, then apply PTF UK02403.

Optional products are:

MQSeries®

A currently supported version of MQSeries for VSE up to and including MQSeries for VSE Version 2.1.2 (Program Number 5686-A06).

DB2

A currently supported version of DB2 Server for VSE and VM up to and including DB2 Server for VSE and VM Version 7.5 (Program Number 5697-F42).

CICS Transaction Gateway

Minimum version 5.1 required to support Web Transactions.

DL/1

DL/1 for VSE 1.1* with PTFs UK14921 or UK14924 installed.

Server prerequisites

z/VSE e-Business Connectors

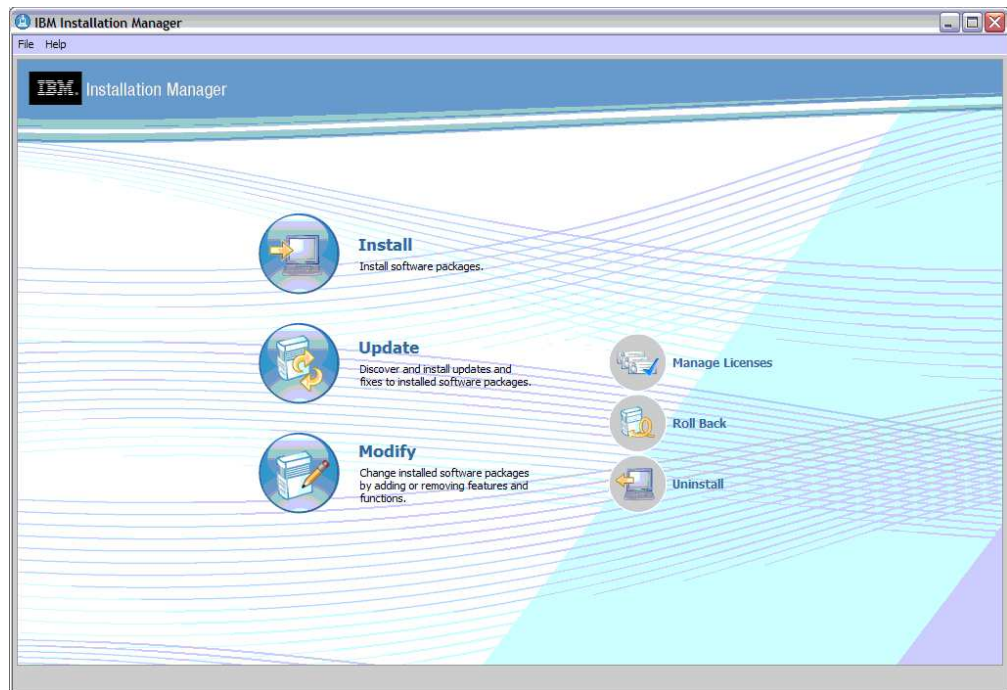
A currently supported version of the z/VSE Connectors (Program Number 5686-CF7 or 5686-CF8) is required to support the VSE Build Server and the EGL Debugger which currently enables remote DB2 calls.

Installation

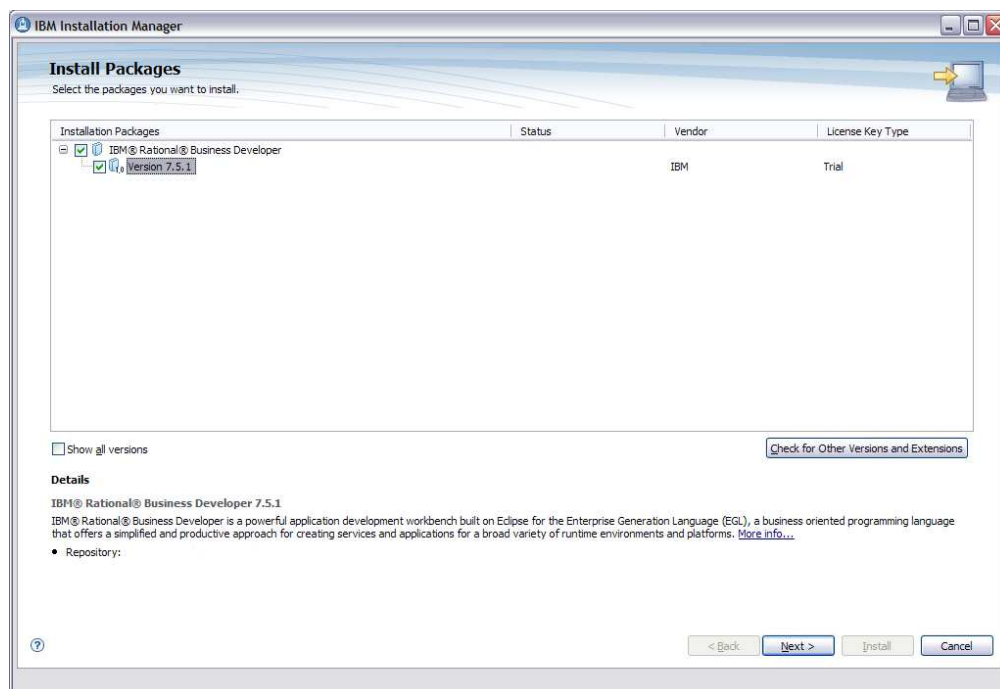
Before you can generate and execute applications for z/VSE from EGL, you must install Rational Business Developer. "Generation for VSE" is a selectable feature on one of the Installation Manager pages. The Rational Business Developer Installation guide is located at

<http://www-949.ibm.com/software/rational/cafe/docs/D0C-2417>

Run the IBM Installation Manager.

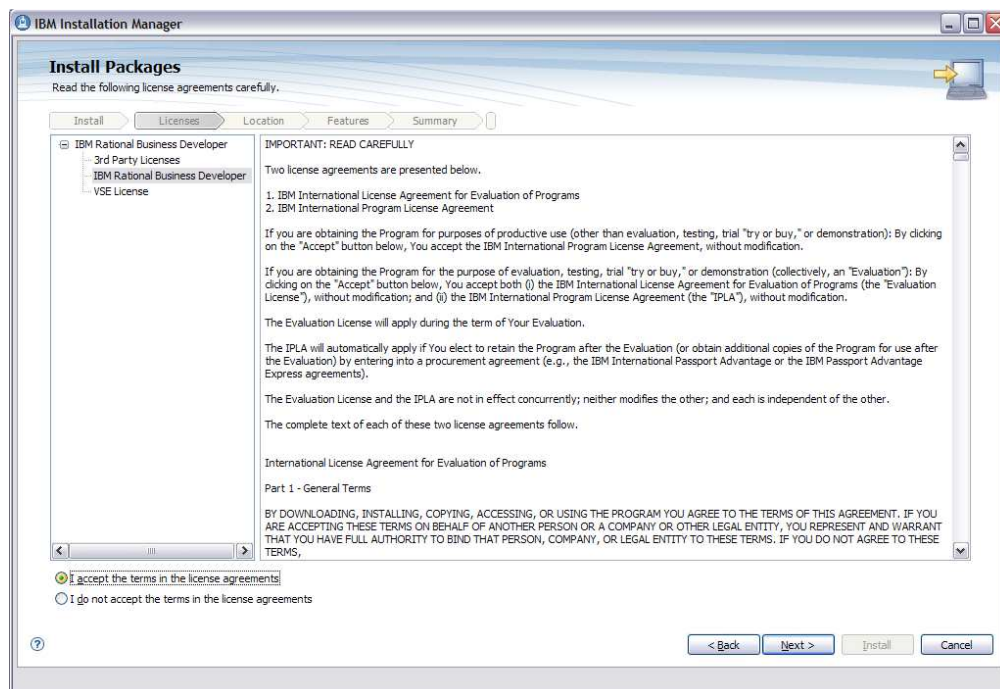


Click **Install**. The Install Packages window is displayed.



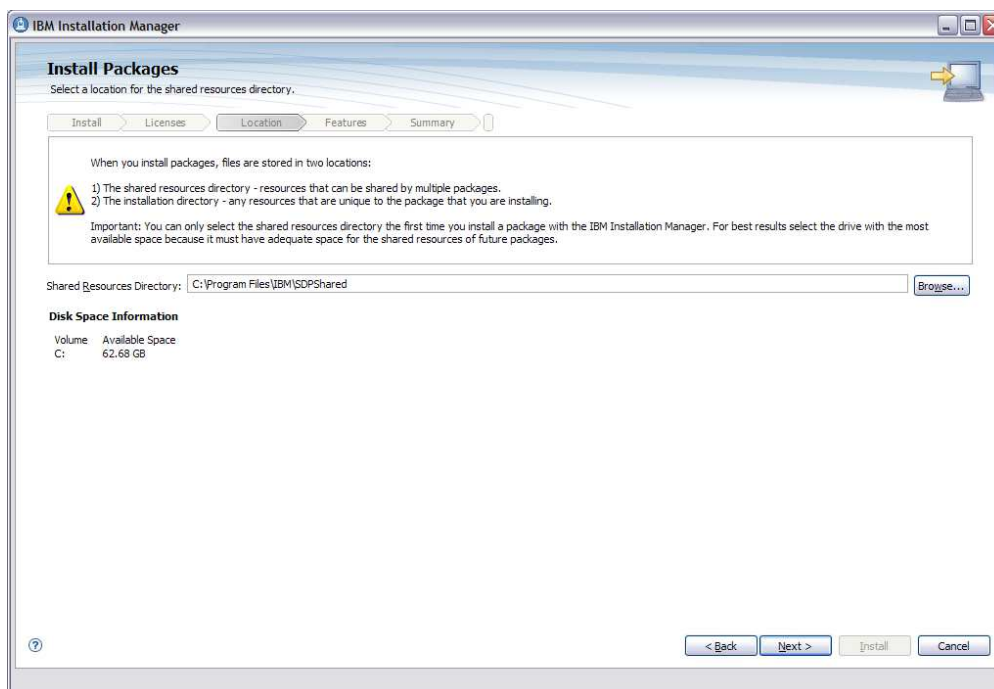
If you want to quickly check for availability of more recent versions, click **Check for Other Versions and Extensions**.

Select the latest version of the IBM Rational Business Developer and click **Next**.



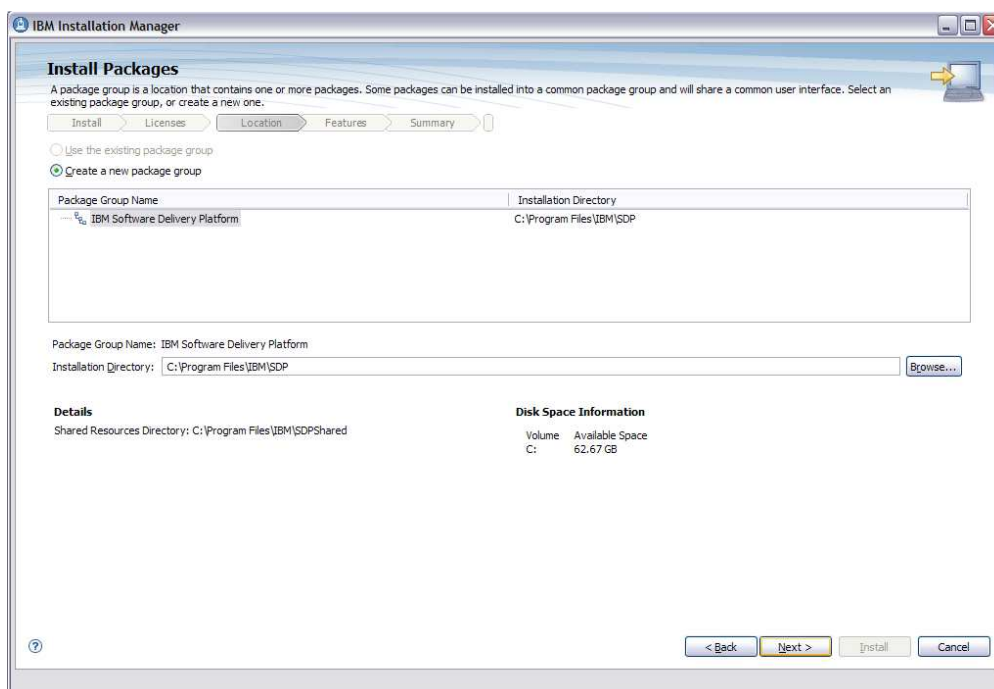
Read the License agreement. and select **I agree to the terms in the license agreements** if you do so. Click **Next**.

Installation



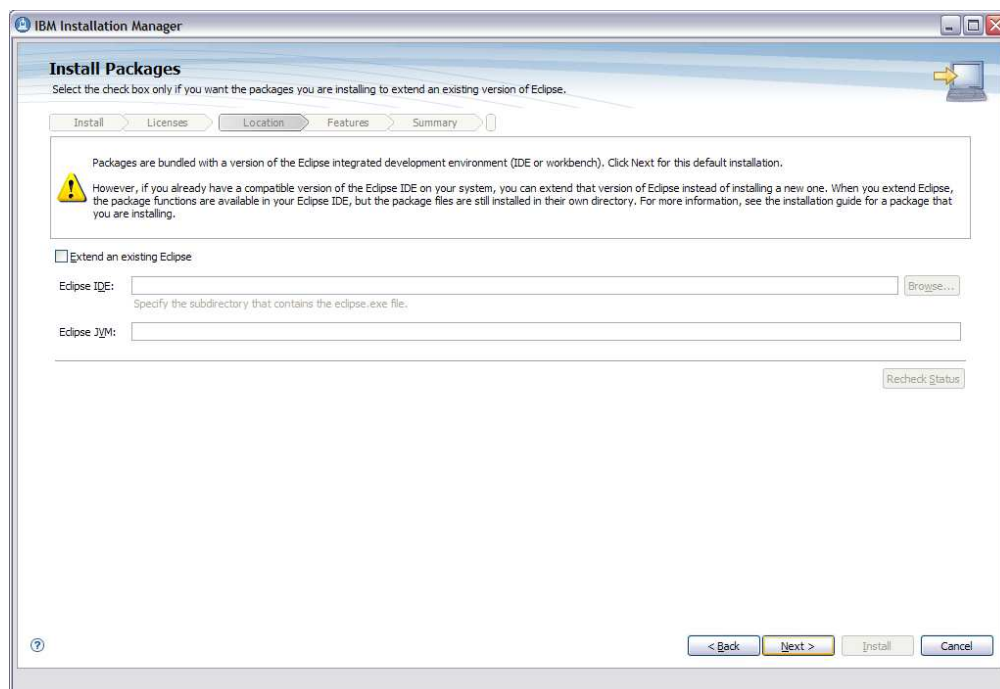
Please note you might not get this page due to existence of Rational Business Developer family products. You may change the share folder if you wish.

Click **Next**.

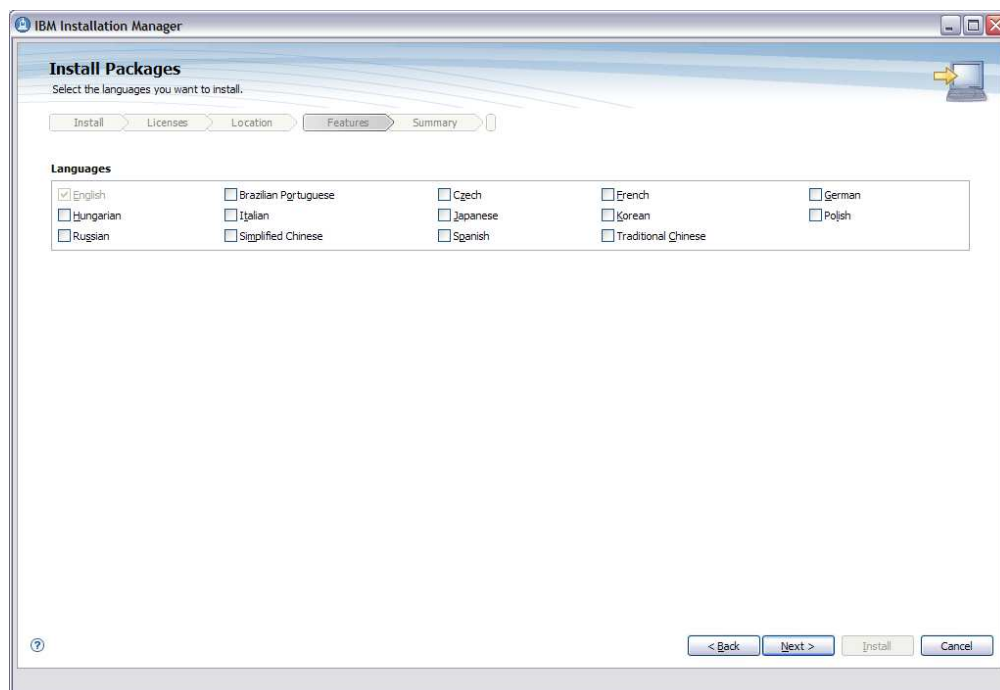


Change the Installation Directory if you wish.

Click **Next**.



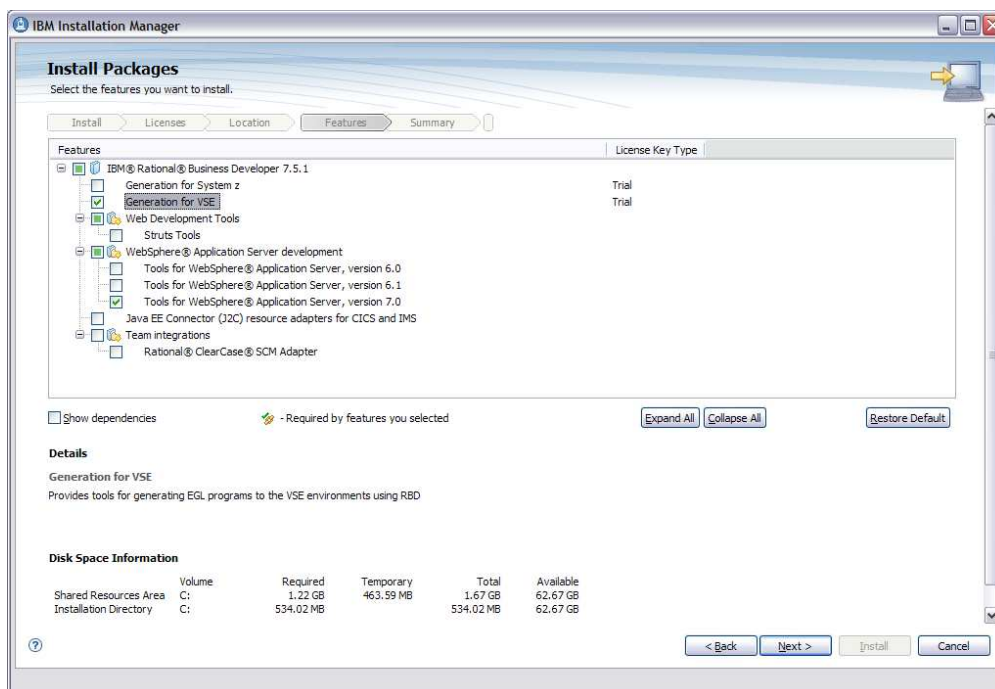
Click **Next**.



Choose a language other than English if you wish.

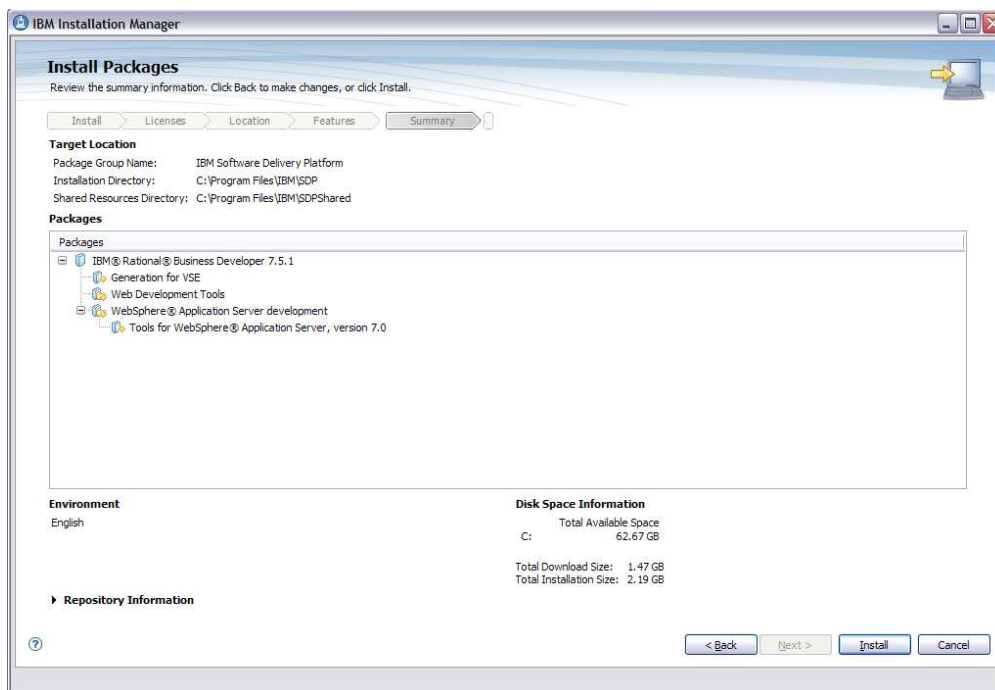
Click **Next**.

Installation

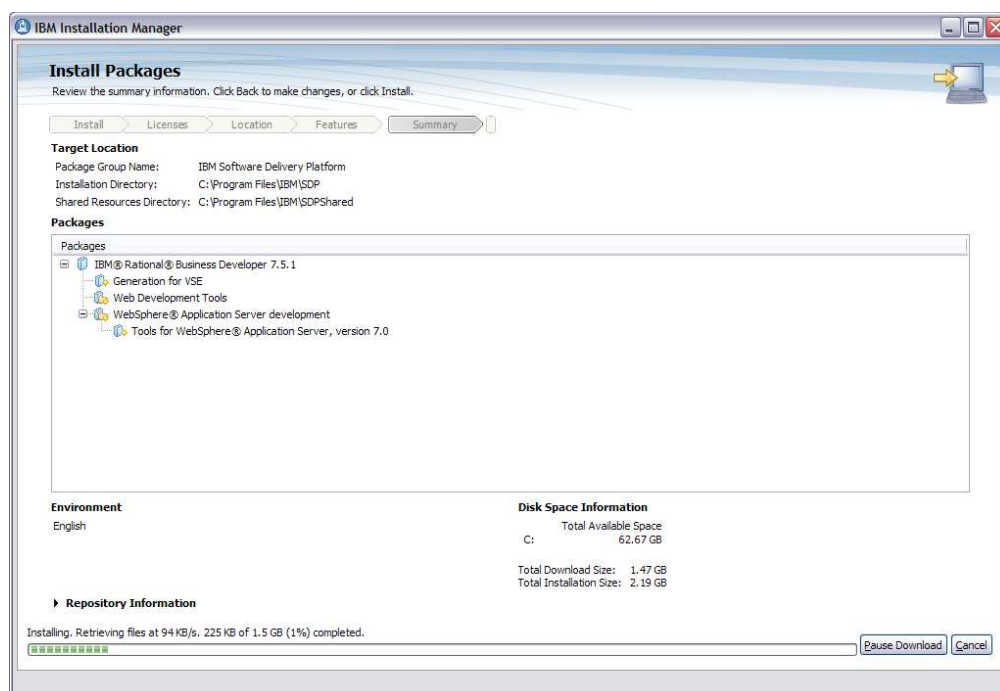


Choose **Generation for VSE**, and any other options that you would like to install.

Click **Next**.



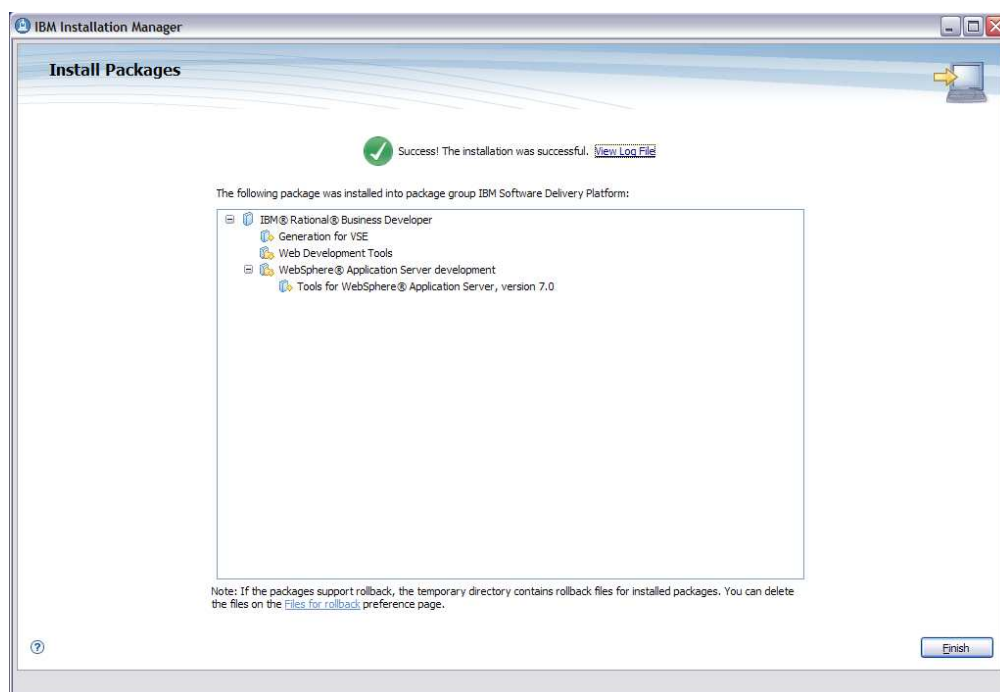
Click **Install**.



The progress bar at the bottom of the window shows how far the installation has progressed.

If you wish, you can pause the download by clicking **Pause Download**, and resume it later.

This window shows the details of the installation, when it is complete.



Installation of the Server and associated PTFs

To execute EGL-generated applications, you must install the Server on the z/VSE host platform, and then customize to site-specific requirements. Refer to the *Rational COBOL Runtime for z/VSE Program Directory*.

Installation of the migration function for VisualAge Generator Developer

If your site is migrating from VisualAge Generator Developer, refer to the *Rational Software Development Platform VisualAge Generator to EGL Migration Guide* to determine what additional software you need for migration purposes. The *Rational Software Development Platform VisualAge Generator to EGL Migration Guide* contains instructions about the installation of the Stage 1 tool that runs on VisualAge Generator Developer. For more information, refer to: <http://www-949.ibm.com/software/rational/cafe/docs/DOC-2393>

Chapter 3. Migration to EGL

Migration from VisualAge Generator Developer to EGL is described fully in the *Rational Software Development Platform VisualAge Generator to EGL Migration Guide*. It is beyond the scope of this Reference Manual to deal with all issues concerning migration. For more information, see <http://www-949.ibm.com/software/rational/caf/docs/DOC-2393>.

The information in this chapter highlights z/VSE-specific migration issues.

In general, migration for VSE is the same as that for z/OS migration. The main points of departure exist where there are z/VSE-specific functions that have no equivalent function or requirement in z/OS.

Generation options and symbolic parameters

Table 1 contains a list of VisualAge Generator parameters that are specific to z/VSE, and the equivalent parameter in EGL. The VisualAge Generator parameter is migrated to the EGL parameter during the migration process and stored in a build descriptor. For a description of the parameters and how they are used, refer to the *VisualAge Generator Generation Guide*.

Table 1. Parameter migration to EGL

VisualAge Generator generation option or symbolic parameter	Usage in VisualAge Generator	Migrated to EGL As	Usage in EGL
/BLKSIZE	Defined in the Resource Association File	blockSize	Defined in the Resource Association File
/LABEL /NOLABEL	Defined in the Resource Association file	standardLabel	Defined in the Resource Association file
/SYSNUM	Defined in the Resource Association File	systemNumber	Defined in the Resource Association File
/JOB CARD	Defined in the Generation Options	JOB CARD	Defined as a symbolic parameter in the generation option file
/JOBNAME	Defined in the Generation Options	JOBNAME	Defined as a symbolic parameter in the generation option file
/VSELIB	Defined in the Generation Options	vseLibrary	Defined in the build descriptor options file
PROCLIB	Defined as a symbolic parameter	PROCLIB	Defined as a symbolic parameter in the symbolic parameter file
PWRCLASS	Defined as a symbolic parameter	PWRCLASS	Defined as a symbolic parameter in the symbolic parameter file

Table 1. Parameter migration to EGL (continued)

VisualAge Generator generation option or symbolic parameter	Usage in VisualAge Generator	Migrated to EGL As	Usage in EGL
SQLDBNAM	Defined as a symbolic parameter	SQLDBNAM	Defined as a symbolic parameter in the symbolic parameter file
SQLPKGNM	Defined as a symbolic parameter	SQLPKGNM	Defined as a symbolic parameter in the symbolic parameter file
SQLPROPT	Defined as a symbolic parameter	SQLPROPT	Defined as a symbolic parameter in the symbolic parameter file
SQLSTMDE	Defined as a symbolic parameter	SQLSTMDE	Defined as a symbolic parameter in the symbolic parameter file
SQLSTOPT	Defined as a symbolic parameter	SQLSTOPT	Defined as a symbolic parameter in the symbolic parameter file
SQLUSRPW	Defined as a symbolic parameter	SQLUSRPW	Defined as a symbolic parameter in the symbolic parameter file
VUSERLIB	Defined as a symbolic parameter	VUSERLIB	Defined as a symbolic parameter in the symbolic parameter file

Note that the /JOBCARD and /JOBNAME generation options have been converted to symbolic parameters in EGL. The JOBCARD and JOBNAME symbolic parameters are used as follows:

JOBNAME

Specifies the value used for the job name in the job statement built for the runtime JCL. This name must be a valid z/VSE job name. This job name is used to replace the EZEJOB parameter in the job template.

JOBCARD

Specifies the name of the file containing the job statement you want to use for generated preparation or runtime JCL. The value for the JOBCARD symbolic parameter should be the name of a file located in the directory specified by the templateDir build descriptor option, or in the default z/VSE Templates directory. The default filename is fda2vjob.tpl.

Templates for preparation and execution of generated applications

Templates are used in the generation process as skeletons for JCL generation. The generated JCL is transferred to the host z/VSE system where it is used to prepare parts for run time, and to run the prepared parts.

The templates for EGL have been copied from the VisualAge Generator templates, and updates have been made. The updates keep the JCL in line with newer versions of the z/VSE operating system and COBOL compiler. Refer to Chapter 7, "Preparation of generated parts," on page 23 for details about these changes.

The templates are provided with the plug-in at installation. They are stored within the plug-in directory structure in a default directory called VSETemplates. It is possible to customize the templates in this default directory, however, our recommendation is to copy them to another directory structure and then customize them. Set the templateDir build descriptor option to point the generation process at the customized templates in the new directory. By customizing the templates in a new directory, any maintenance that is shipped will not overwrite your customized templates.

Table 2 lists the VisualAge Generator template and the EGL equivalent.

Table 2. VisualAge Generator template and EGL equivalent

VisualAge Generator Template	EGL Template	Template Description and Use
efk2vcal.tpl	fda2vcal.tpl	Comment generation in the runtime JCL
efk2veba.tpl	fda2veba.tpl	Generation of DLBL statements in runtime JCL
efk2vebd.tpl	fda2vebd.tpl	Generation of runtime JCL with DB2 access
efk2vebe.tpl	fda2vebe.tpl	Generation of runtime JCL
efk2veza.tpl	fda2veza.tpl	Comment generation in the runtime JCL
efk2vezd.tpl	fda2vezd.tpl	Comment and DLBL generation
efk2vjob.tpl	fda2vjob.tpl	Generation of the job statement for the preparation JCL
efk2vlba.tpl	fda2vlba.tpl	Batch DB2 link edit template used for preparation
efk2vlbc.tpl	fda2vlbc.tpl	Batch link edit template used for preparation
efk2vlca.tpl	fda2vlca.tpl	CICS link edit template used for preparation
efk2vlcc.tpl	fda2vlcc.tpl	CICS and DB2 link edit template used for preparation
efk2vmfm.tpl	fda2vmfm.tpl	Mapgroup link edit template used for preparation
efk2vpba.tpl	fda2vpba.tpl	Batch preparation template
efk2vpbd.tpl	fda2vpbd.tpl	Batch preparation template including DB2 access
efk2vpca.tpl	fda2vpca.tpl	CICS preparation template
efk2vpcb.tpl	fda2vpcb.tpl	CICS preparation template including DB2 access
efk2vpej.tpl	fda2vpej.tpl	End of job template
efk2vsei.tpl	fda2vsei.tpl	Runtime sequential input file allocation template
efk2vseo.tpl	fda2vseo.tpl	Runtime sequential output file allocation template
efk2vtcl.tpl	fda2vtcl.tpl	Preparation template for print services programs
efk2vvsi.tpl	fda2vvsi.tpl	Runtime VSAM input file allocation template
efk2vvso.tpl	fda2vvso.tpl	Runtime VSAM output file allocation template

There is more information about templates and how they are used at generation time in Chapter 11 of the *VisualAge Generator Generation Guide*.

Chapter 4. Enhancements to the VSE Server Runtime to support EGL

The *Rational Software Development Platform VisualAge Generator to EGL Migration Guide* has a detailed description of the language functionality that has been migrated from VisualAge Generator to EGL. This functionality continues to be supported by the Server runtime. In addition, the Server runtime has been enhanced to support dynamic arrays, the `like` operator, and the `matches` operator which are new functions available with EGL. Any enhancements to the Server are delivered as PTFs, which you should install according to the standard installation procedures. Refer to Chapter 2, "Prerequisites and installation," on page 3 for more details about installation of PTFs.

`like` and `matches` operators

With EGL, the `like` and `matches` operators can be used in logical expressions for comparison of strings. These operators are supported by the Server runtime code, providing that the relevant PTFs are installed.

For more information on the use of the `like` and `matches` operators, refer to the *EGL Reference Guide* and the EGL online help.

Chapter 5. EGL features not supported by the Server or Plug-in

Not all features that are available in EGL are supported by COBOL generation; for more information about these unsupported features, refer to the *EGL Reference Guide*. In addition to these unsupported features, the features described below are not supported by the Server or Plug-in. At some stage in the future, support for these features may be included.

Date and time support

Enhanced date and time features that are available in EGL are not supported by the Server runtime. Date and time functions that have been migrated from VisualAge Generator to EGL will continue to be supported.

Table 3 shows the EZE words and the equivalent EGL statement that are supported by VisualAge Generator, and are supported in the new EGL form.

Table 3. EZE words and equivalent EGL statements

EZE word in VisualAge Generator 4.5	EGL definition
EZEDAY	VGVar.currentShortJulianDate
EZEDAYL	VGVar.currentJulianDate
EZEDAYLC	VGVar.currentFormattedJulianDate
EZEDTE	VGVar.currentShortGregorianDate
EZEDTEL	VGVar.currentGregorianDate
EZEDTELC	VGVar.currentFormattedGregorianDate
EZETIM	VGVar.currentFormattedTime

Library functions

A library part contains a set of functions, variables and constants that can be used by programs or other libraries. Library functions are not supported by the Server runtime.

Formatting of numbers

The strLib.formatNumber EGL statement is not supported by the Server runtime.

Numeric items and numeric items with decimal places

EGL allows the definition of numeric items with more than 18 digits, or numeric items with decimal places of more than 18 digits. The COBOL compiler on z/VSE does not support this, therefore the 18-digit limit set by VisualAge Generator Developer applies to the plug-in.

Recursive function calls

COBOL for z/VSE does not support recursive programs.

Chapter 6. Generation of applications

Various parameters and options govern the generation of COBOL applications and the generation of JCL for preparation and execution. These parameters are described in the *EGL Generation Guide* (at <http://www-949.ibm.com/software/rational/caf/docs/DOC-1013>) and the online help.

This chapter describes z/VSE-specific options as a supplement to other documentation.

The build descriptor options, symbolic parameters and other parameters are entered in a “dialog based” editor. The editor may retain white space characters such as spaces. At generation time, white space may be removed for certain parameters. It is recommended that white space characters be used only where they are appropriate.

Build descriptor options

The **build descriptor options** that are z/VSE specific, or have special meaning for z/VSE are listed below. Refer to the *VisualAge Generator Generation Guide* for full descriptions of these parameters.

system

The two valid values for z/VSE generation are VSEBATCH and VSECICS.

destLibrary

Used by the VSE Build Server to specify the library where objects are created during generation. Not used for FTP-based generation (see Chapter 7, “Preparation of generated parts,” on page 23). This option is equivalent to the /VSELIB generation option in VisualAge Generator.

vseLibrary

Only used for generation using FTP. This is equivalent to the /VSELIB generation option in VisualAge Generator and is used to specify the library where objects are created during generation.

z/VSE-specific **symbolic parameters** that can be defined as part of the build descriptor are:

JOBCARD

The file that is to be used as a jobcard template. This file should exist in the template directory specified by the templateDir build parameter, or in the default VSETemplates directory

JOBNAME

The job name used for compiles and link-edits. The first seven characters of this symbolic parameter are used to generate the job name of the preparation JCL.

NODUSRID

The destination for compilation output (user node, userid).

PROCLIB

Used to change the z/VSE PROCLIB (16 bytes)

PWRCLASS

User-defined POWER® class

Build descriptor options

SQLDBNAM

Used to change the default database name

SQLPKGNUM

Used to change the default package name

SQLPROPT

Precompiler options part name

SQLSTMDE

DB2 startup mode

SQLSTOPT

Startup options file

SQLUSRPW

Userid and password for database connection

TRANSLATETABLE

Used to change the FTP Translate Table on the z/VSE host system. Refer to Chapter 7, "Preparation of generated parts," on page 23 for a detailed description.

USEVSEBUILDSERVER

If set to Yes, the VSE Build Server decides whether to use VSE e-business Connectors (default) or FTP for generation. If set to No or not defined, FTP is used. Refer to Chapter 7, "Preparation of generated parts," on page 23 for a detailed description.

VUSERLIB

Additional library used for link-editing

The JOBCARD and JOBNAME symbolic parameters were part of the generation options parameters in VisualAge Generator, and have been migrated to symbolic parameters in EGL. The other symbolic parameters, with the exception of TRANSLATETABLE, are available in both VisualAge Generator and EGL, and their usage is the same across both products. Refer to the *VisualAge Generator Generation Guide* for a full description of these symbolic parameters.

In the chapters that follow, the use of these symbolic parameters is described in more detail. Sample build descriptors are provided in "Samples," on page 35.

There are other build descriptor options that are common to z/OS and z/VSE. In particular, we recommend that you read about the CICS-related options in the *VisualAge Generator Generation Guide*.

Resource Association options

These parameters in the Resource Association Editor should be used for z/VSE generation:

system

The two valid values for z/VSE generation are VSEBATCH and VSECICS.

For z/VSE generation, three properties have been added to the Resource Association Editor:

blockSize

Equivalent to the /BLKSIZE property in VisualAge Generator.

standardLabel

Equivalent to the /LABEL property in VisualAge Generator; this only applies to VSEBATCH. If standardLabel=YES is set, then for PRINTER files, the generator generates a LABEL RECORDS ARE STANDARD clause. For serial files, a LABEL RECORDS statement is not generated. The default is standardLabel=Yes.

If standardLabel=NO is set, for PRINTER files, the generator generates a LABEL RECORDS ARE OMITTED clause. For SERIAL files, LABEL RECORDS ARE OMITTED is also generated.

Printer data is written to a logical file called PRINTER. The PRINTER file in EGL-generated programs is equivalent to the EZEPRINT file generated with the VisualAge Generator Developer. Refer to “Allocating Printer Files” on page 31 for further information.

systemNumber

Equivalent to the /SYSNUM property in VisualAge Generator.

Refer to the *VisualAge Generator Generation Guide* and APAR PQ25672 for more information about the use of these properties.

Outputs from generation

For VSEBATCH, depending on the build descriptor options set, a successful generation may produce the following generated parts:

- COBOL programs with a suffix of .cbl
- Preparation JCL with a suffix of .jcp
- Execution JCL with a suffix of .jcx

For VSECICS, depending on the build descriptor options and the application, a successful generation may produce the following generated parts:

- COBOL programs with a suffix of .cbl
- Map format modules with a suffix of .fmt
- Preparation JCL with a suffix of .jcp
- Execution JCL with a suffix of .jcx
- CICS PCT entries with a suffix of .pct
- CICS PPT entries with a suffix of .ppt

These generated parts are placed in the directory specified by the genDirectory build descriptor option.

Chapter 7. Preparation of generated parts

The preparation process has three steps:

1. Transferring parts to the z/VSE host, including code conversion if needed.
2. Running precompilers, compilers, and linkers.
3. Analyzing results and retrieving output (not available with FTP-based preparation)

This process is controlled by the VSE Build Server. If the prep build descriptor option is set to No, then no preparation occurs.

The VSE Build Server

The VSE Build Server (new in Version 8) encompasses both the existing FTP-based preparation and a new preparation method using the VSE e-business Connectors.

When using VSE Connectors, the VSE Build Server can analyze the results of the translator (optional), precompile (optional), compile, and link-edit steps. If any of those steps fail, an error indicator appears in the EGL Generation Results tab. Outputs from the compile steps are downloaded to the local system, unless the NODUSRID symbolic parameter is specified. A summary of the preparation process is written to the corresponding *Results.xml* file in the generation directory. See below for full details of the preparation process.

When using FTP, the preparation process and output is the same as in previous versions. No analysis of compile steps is performed, and no compile output is retrieved. See below for full details of the preparation process.

If the USEVSEBUILDSERVER symbolic parameter is set to Yes, the VSE Build Server uses the VSE e-business Connectors by default. Otherwise, FTP is always used. Note that if the TRANSLATETABLE symbolic parameter is defined, FTP is always used. See below for full details of these parameters.

Distributed builds

The VSE Build Server supports distributed builds, via the BuildPlanLauncher command. This means that a preparation process can be executed after generation, using the corresponding *BuildPlan.xml* file created during generation. Refer to "Using a build plan after generation" in the *EGL Generation Guide* for details on how to use this command. The VSE Build Server does not currently support distributed builds via FTP—the VSE e-business Connectors are used.

To use distributed build, you must specify your userid and password for the host in the CCU Security Manager (via CCUconfig). For details on how to use CCUconfig, refer to step 3 under "Starting the CCU Security Manager" in the *EGL Generation Guide*. The EGLPREP command is not currently supported by the VSE Build Server.

Setting up the VSE Build Server

The VSE Build Server supports VSE Connector Client updated August 2009 or later. To use this client, you must first copy the two jar files VSEConnector.jar and cci.jar, that are part of the VSE Connector Client installation, to the *vsecon* folder in

Setting up the VSE Build Server

the distributed build plugin location. This is located in the SDPShared directory, under `com.ibm.etools.egl.distributedbuild_xxxx`, where SDPShared is the directory for shared plug-ins you specified when you installed Rational Business Developer and `xxxx` is the latest version of the distributedbuild plugin. This only needs to be done once each time Rational Business Developer is installed. You need to restart Rational Business Developer for the new plugins to be used. When you upgrade the VSE Connector Client, you must copy the updated versions of these two plugins to that directory and restart Rational Business Developer.

The VSE Connector Server (which is included in the z/VSE installation) should be configured and active on the host z/VSE system. For more information, refer to "Configuring the VSE Connector Server" in the *z/VSE e-business Connectors User's Guide*. In general, the server should be configured as follows:

- Allow connection from the generating workstation
- Allow login from the desired userid
- Allow access to all libraries that are used during preparation, including the destination library
- Codepage translations set to the desired translation
- The date-format for the VSE Connector Server matches the format on the z/VSE host

The VSE Build Server does not currently support SSL. The VSE Connector Server should be configured to not use SSL.

The FTP server should be configured and active on the host z/VSE system. The FTP server should be configured to allow:

- Submission of jobs to the internal reader
- Write access to all libraries that are used for generation output

Note that SNA file transfer that is supported in VisualAge Generator is not supported by the plug-in.

Transferring parts to the z/VSE host system

If the prep option is not set, then no file transfer occurs.

File transfer options

These build descriptor options control the file transfer:

debugTrace

This option is used by the developers. It generates a lot of data, and has a performance hit. For these reasons, make sure that the option is set to "No".

commentLevel

The build option which controls the level of comments for the preparation process. Set it to "1" to get detailed comments.

If you experience problems during the preparation phase, then IBM Support may ask you to set the `commentLevel` to 1 and provide a copy of the resultant comment file.

destHost

The TCP/IP host address or hostname of the z/VSE host server.

destPort

The port on which the FTP server or VSE Connector Server is listening for

requests. The default port for VSE Connector Server is defined in the server's configuration file (usually 2893). The default port for FTP is 21.

destPassword

The password associated with the destUserID used to connect to the host server.

destUserId

The userid that is used to connect to the host server.

serverCodeSet

Character code conversion control for maps. For more information, see "Character code conversion" on page 26.

destLibrary

Used by the VSE Build Server by default. The z/VSE library and sublibrary on the host server that is used to store the output of the preparation process

VSELibrary

Used by the VSE Build Server for FTP generation only. The z/VSE library and sublibrary on the host server that is used to store the output of the FTP process and the preparation process.

In addition, the following symbolic parameter is used for character code conversion:

TRANSLATETABLE

Changes the FTP Translation Table on the z/VSE host system.

The following symbolic parameter controls the preparations method:

USEVSEBUILDSERVER

If set to Yes, the VSE Build Server decides whether to use VSE e-business Connectors (default) or FTP for generation. If set to No or not defined, FTP is used.

Outputs of the file transfer

For VSEBATCH, a successful preparation process transfers parts to the library and sublibrary specified in the VSELibrary option or destLibrary option respectively. These parts have a z/VSE "type" as listed:

- COBOL programs: type of "C"
- Preparation JCL: type of "Z"
- Execution JCL: type of "X"

For VSECICS, a successful preparation process transfers parts to the library and sublibrary specified in the VSELibrary or destLibrary option respectively:

- COBOL programs: type of "C"
- Map format modules: type of "OBJ"
- Preparation JCL: type of "Z"
- Execution JCL: type of "X"
- CICS PCT entries: type of "PCT"
- CICS PPT entries: type of "PPT"

The preparation JCL is also transferred to the VSE/POWER reader queue on the host system.

Transferring parts to the z/VSE host system

A log of the transfer process is created in the genDirectory. For details about the control of the log, refer to the debugTrace build descriptor option described above. For FTP preparation, three types of log message are produced:

- Information messages with a suffix of “i”.
- Error messages with a suffix of “e”.
- Trace messages with a suffix of “t”.

If the VSE Build Server is used, the log is written to the cbl_Results.xml file in the genDirectory.

Character code conversion

Character code conversion is performed at two different times:

1. At generation time, for text fields defined in a form group part.
2. At preparation time, for text fields in generated COBOL source.

Character code conversion at generation

The serverCodeSet build descriptor option is used for converting the text in maps from the code page on the development platform, to a code page on the host z/VSE system. The value specified by the serverCodeSet build descriptor option should be the name of a valid code page translation table as defined on the workstation. Once the map format module is generated, it is transferred to the z/VSE host using a binary transfer.

Character code conversion at preparation

This is done in one of two ways, depending on whether the TRANSLATETABLE symbolic parameter is set.

If the TRANSLATETABLE parameter is not set, the VSE Build Server uses the default code page translation defined in the FTP server or VSE Connector Server. If the USEVSEBUILDSERVER symbolic parameter is set to Yes, the VSE Build Server uses the code page translation defined in the VSE Connector Server. Otherwise, the Build Server uses the default code page translation table defined in the FTP server.

If the TRANSLATETABLE parameter is set, the VSE Build Server always uses the existing FTP process for transferring and submitting parts. When transferring text parts, the value set for that parameter is sent to the FTP server as part of a SITE TRANSLATE command. This value should be the name of a valid code page translation table as defined to the FTP server on the host.

The VSE Build Server uses the codepage settings in the VSE Connector Server configuration file. For more information on how to set this, refer to "Configuring The VSE Connector Server" in the *z/VSE e-business Connectors User's Guide*.

For information on code page translation, and the FTP server, refer to Chapter 11, "ASCII to EBCDIC translation" in the *TCP/IP for VSE Installation Guide*.

FTP commands issued during preparation

For FTP preparation, these FTP commands are issued during the preparation process, and should be enabled on the FTP server:

```
CWD
PASV
PORT
PWD
QUIT
SITE clrf off/on
```

```
SITE crlf on
SITE lrecl 80
SITE reclf on
SITE TRANSLATE
STOR
TYPE I
USER
```

In addition, JCL is transferred to the VSE/POWER reader queue using FTP. Transfer to the VSE/POWER reader queue should also be enabled on the FTP server.

Running precompilers, compilers and linkers

The templates used by VisualAge Generator for JCL generation have been used as a basis for the plug-in. For EGL, the templates have been renamed and placed in the VSETemplates directory. Minor changes to the templates bring the JCL up to date with new versions of the compiler and operating system.

“Templates for preparation and execution of generated applications” on page 12 contains a table with the name of the VisualAge Generator template and the name of the equivalent template in the plug-in.

Changes to the templates

For the plug-in, the following changes have been made to the templates:

- In template fda2vjob, a “J” has been added to the jobname to differentiate it from other jobs that are part of the preparation stream.
- Construction of the jobname for all jobs has been changed. To create the jobname, up to seven characters of the JOBNAM symbolic parameter are used with a character appended according to the stage of preparation. If no JOBNAM symbolic parameter is specified, then the first seven characters of the program name are used.
- EZETPROC is set to eight characters in length where:

position 1-4

First four characters of the destUserID build descriptor option

If destUserID is not set, then the first four characters of the program name are used.

If less than four characters are available, then “Z” is used as the padding character

position 5-8

MMSS (min,min,sec,sec) obtained from the system-generated time.

For example, if destUserID is set to USERID and the program is generated at 8:45:29, SYMPARM EZETPROC is set to USER4529.

- The RES COBOL compiler option has been removed from these templates:
fda2vpba.tpl
fda2vpbd.tpl
fda2vpca.tpl
fda2vpcb.tpl
fda2vtcl.tpl
- In fda2vpca.tpl and fda2vpcb.tpl, for the CICS translator step, the SP parameter has been added as an option to XOPTs.

Outputs from the execution of the preparation JCL

For all VSE preparations except FTP, a summary of the preparation results is written to `membername_cbl_Results.xml` in the generation output directory. This includes the return code of each step of the JCL execution. Outputs from the preparation JCL are retrieved from the host system and stored in the generation directory (except if the `NODUSRID` symbolic parameter is specified). These outputs are deleted from the host if the transfer was successful.

For FTP-based preparation, there has been no significant change to the preparation JCL, the outputs from the execution of the preparation JCL are similar to that of VisualAge Generator. Refer to the *VisualAge Generator Server Guide for MVS, VSE, and VM* for more information.

Chapter 8. Execution of generated applications

As there has been no significant change to the generation of the execution JCL, or COBOL programs, the process for running generated applications has not changed. Refer to the *VisualAge Generator Server Guide for MVS, VSE, and VM* for more information.

Additional runtime messages

New runtime messages have been added. Refer to IBM Rational COBOL Runtime Guide for zSeries for the complete list of messages: http://publib.boulder.ibm.com/infocenter/rbdhelp/v7r1m0/topic/com.ibm.etools.egl.zos.server.doc/pdf/rcr/rational_cobol_runtime_guide_en.pdf.

Chapter 9. Recommendations

Connections to DB2 on z/VSE

With EGL, it is possible to connect to DB2 to debug programs, retrieve SQL record definitions, and validate SQL SELECT statements in your EGL program. You can also view the contents of your DB2 VSE database in the Data Source Explorer tab. To connect to a DB2 system running on a z/VSE host, we recommend using the driver supplied with Rational Business Developer (db2java.zip). This driver is located inside the jar file `com.ibm.etools.egl.db2.zvse_version.jar` in the shared plugins directory; for example, `C:\Program Files (x86)\IBM\IBMIMShared\plugins` (Windows) or `/opt/IBM/IBMIMShared/plugins` (Linux).

To obtain the driver, rename `com.ibm.etools.egl.db2.zvse_version.jar` to `com.ibm.etools.egl.db2.zvse_version.zip` and extract `db2java.zip`. Be sure to rename `com.ibm.etools.egl.db2.zvse_version.zip` back to `com.ibm.etools.egl.db2.zvse_version.jar` before running Rational Business Developer.

It is beyond the scope of this document to provide detailed descriptions of the configuration required to support JDBC calls to DB2 VSE. However, in broad terms, the following software needs to be configured:

- **DB2 Connect™** should be installed on the developer platform. We recommend use of the JDBC driver supplied with Rational Business Developer (see above). Within DB2 Connect a database definition should be made for the databases that reside on the z/VSE host.
- In **RDB** the *Preferences > EGL > SQL Database Connections* should be configured to use a type 2 JDBC driver. See “Sample 5: SQL database connections” on page 39 for an example configuration.
- **DB2 VSE Server** should be configured to allow TCP/IP and JDBC communication. Refer to the DB2 manuals for further information.

Allocating Printer Files

For printer files, the plug-in generates a default filename of `PRINTER`. This is in contrast to VisualAge Generator Developer which generates a filename of `EZEPRINT`. To control the characteristics of the printer file, we recommend that a resource association element be created for filename `PRINTER`.

For CICS applications, you can associate the `PRINTER` file with either a transient data queue (type `TRANSIENT`) or a `VSE/POWER` file (type `SPOOL`) using a `PRINTER` resource association. We recommend that:

- Either a default transient data queue named `PRIN` be defined to the CICS system, or
- A resource association entry for `PRINTER` be defined with a systemname of `EZEP` (as a transient data queue called `EZEP` is defined when the Server is installed)

Resource Association files migrated from VisualAge Generator Developer to EGL should have any `EZEPRINT` resource association definitions migrated to `PRINTER` resource association definitions.

Chapter 10. Using the CICS Utilities Menu

To access the CICS utilities:

1. Log on to CICS.
2. Type ELAM on a clear screen.
3. Press Enter. When the ELAM transaction is started, a copyright panel is displayed.
4. Press Enter. The CICS Utilities Menu is displayed.

```
ELAM                                Rational COBOL RT for z/VSE
                                     CICS Utilities Menu

Select one of the following utilities; then press Enter.

Action....

1. New Copy
2. Diagnostic Message Printing
3. Diagnostic Control Options

ENTER  F1=HELP  F3=EXIT
```

Three functions are available from the CICS Utilities Menu panel.

New Copy

This function causes a new copy of a program, form group, or data table to be used by subsequent transactions. Use the new copy function when programs, form groups, and data tables are modified and generated again.

For programs and form groups, you can use either the Rational COBOL Runtime new copy utility or the CICS NEWCOPY command to cause the new copy of the program to be used the next time a load request is issued for the program.

The Rational COBOL Runtime new copy utility does a new copy for both the online print services program and the form group format module when you specify a part type of form group. If you use the CICS NEWCOPY command for a form group, you must issue the NEWCOPY for both the online print services program and the form group format module.

For a data table, you must use the Rational COBOL Runtime new copy utility to cause a fresh copy of the data table to be used the next time a load request is issued for the data table. Do not use the CICS NEWCOPY command for data tables.

Diagnostic Message Printing

This function routes the diagnostic messages in an error destination transient data queue to a spool file for printing or subsequent processing.

Diagnostic Control Options

This function lets you view or change the diagnostic control options set for the installation or for individual transactions. The options include dump control, error message routing to a transient data queue or the CICS journal, and transaction disabling when serious problems occur.

Appendix. Samples

These samples are provided as a reference only, and should be customized according to site requirements.

Sample 1: Basic build descriptor options

Figure 1 shows the basic build descriptor options.

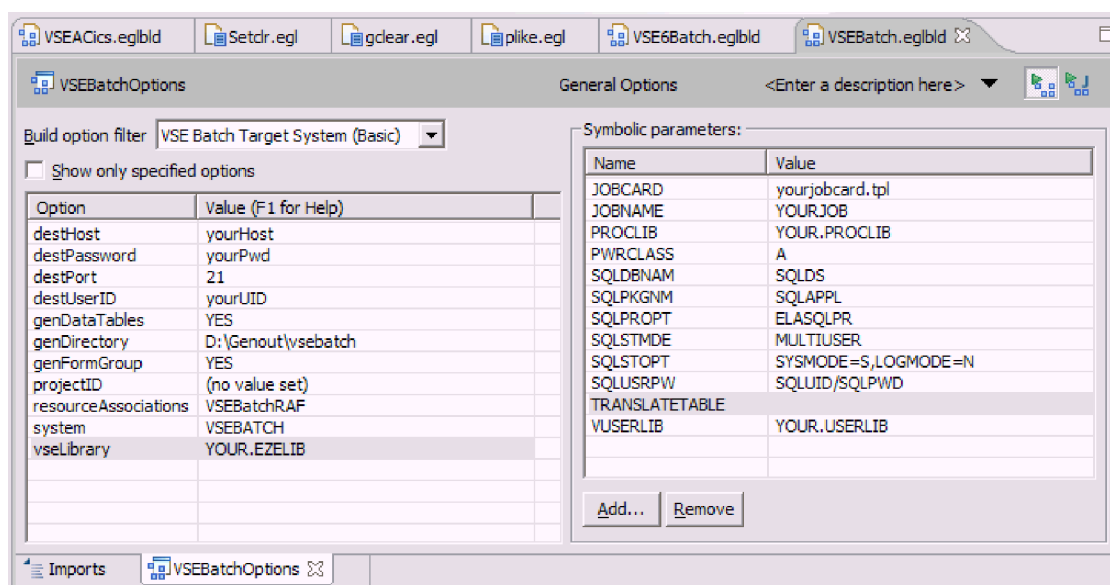


Figure 1. The basic build descriptor options

Sample 2: The associated Resource Association File

Figure 2 on page 36 shows the Resource Association File associated with the build descriptor options in Sample 1.

Sample 3: The resultant XML file

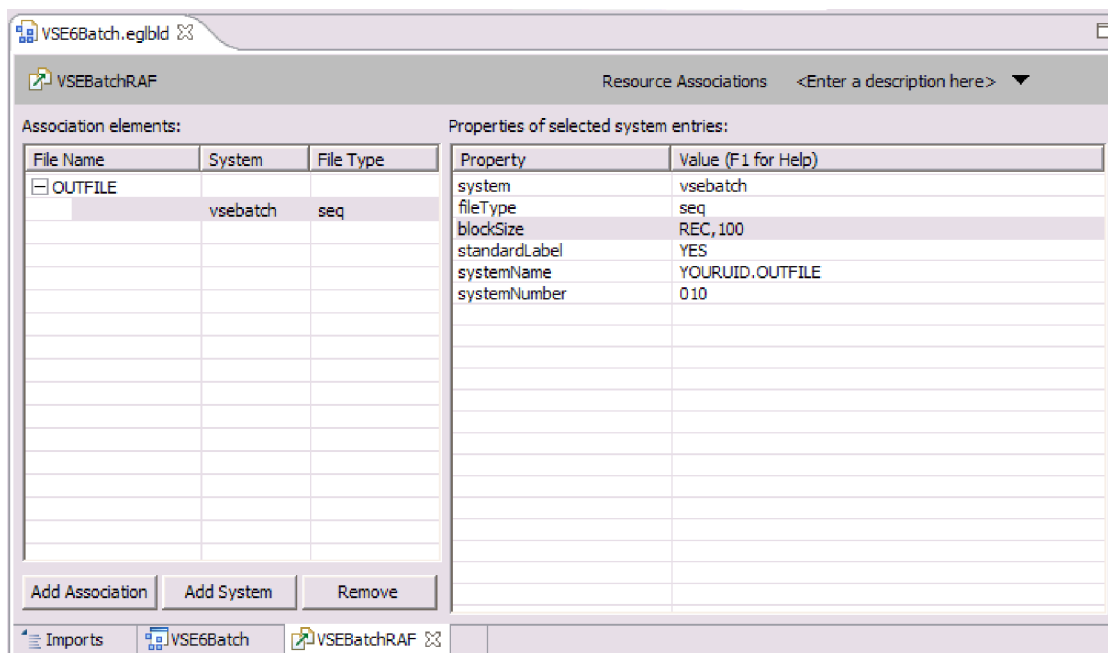


Figure 2. The Resource Association File

Sample 3: The resultant XML file

Figure 3 on page 37 shows the XML file that holds the build descriptor options of Sample 1 and resource association file of Sample 2.

```

<?xml version="1.0" encoding="UTF-8"?>

<!DOCTYPE EGL PUBLIC "-//IBM Corporation, Inc.//DTD EGL Build Parts 6.0//EN" "">

<EGL>
  <BuildDescriptor name="VSEBatchOptions" destHost="yourHost" destPassword="yourPwd" destPort="21"
destUserID="yourUID" genDataTables="YES" genDirectory="D:\Genout\vsebatch" genFormGroup="YES"
system="VSEBATCH" vseLibrary="YOUR.EZELIB" resourceAssociations="VSEBatchRAF">
    <symbolicParameter name="JOBCARD">
      <symbolicValue><![CDATA[yourjobcard.tpl</symbolicValue></symbolicParameter>
    <symbolicParameter name="JOBNAME">
      <symbolicValue><![CDATA[YOURJOB</symbolicValue></symbolicParameter>
    <symbolicParameter name="PROCLIB">
      <symbolicValue><![CDATA[YOUR.PROCLIB</symbolicValue></symbolicParameter>
    <symbolicParameter name="PWRCCLASS">
      <symbolicValue><![CDATA[A</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLDBNAM">
      <symbolicValue><![CDATA[SQLDS</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLPKGNM">
      <symbolicValue><![CDATA[SQLAPPL</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLPROPT">
      <symbolicValue><![CDATA[ELASQLPR</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLSTMDE">
      <symbolicValue><![CDATA[MULTIUSER</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLSTOPT">
      <symbolicValue><![CDATA[SYSMODE=S, LOGMODE=N</symbolicValue></symbolicParameter>
    <symbolicParameter name="SQLUSRPW">
      <symbolicValue><![CDATA[SQLUID/SQLPWD</symbolicValue></symbolicParameter>
    <symbolicParameter name="TRANSLATETABLE">
      <symbolicValue><![CDATA[</symbolicValue></symbolicParameter>
    <symbolicParameter name="VUSERLIB">
      <symbolicValue><![CDATA[YOUR.USERLIB</symbolicValue></symbolicParameter>
  </BuildDescriptor>
  <ResourceAssociations name="VSEBatchRAF">
    <association fileName="OUTFILE">
      <vsebatch>
        <seq systemNumber="010" systemName="YOURUID.OUTFILE" standardLabel="YES" blockSize="REC,100"/>
      </vsebatch>
    </association>
  </ResourceAssociations>
</EGL>

```

Figure 3. Sample XML file

Sample 4: An FTP trace

Figure 4 on page 38 shows an FTP trace produced when the debugTrace build descriptor option (see page 24) is specified.

Sample 4: An FTP trace

```
20050322 05:04:10 ELA.FTP.0000.i (c) Copyright, IBM Corp. 2005
20050322 05:04:10 ELA.FTP.2001.t Attempt connection to yourHost on port 21
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 220-TCP/IP for VSE FTP Daemon Version 01.05 C 10/12/03 22.50

20050322 05:04:10 ELA.FTP.2010.t FTP server response:      Copyright (c) 1995,2003 Connectivity Systems Incorporated

20050322 05:04:10 ELA.FTP.2010.t FTP server response: 220 FTPD ready for new user.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 220 .
20050322 05:04:10 ELA.FTP.0001.i Connection to yourHost opened on port 21
20050322 05:04:10 ELA.FTP.2003.t Attempt login with userid youruid .
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'USER youruid' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 331 User name okay, need password.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 331 .
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'PASS *****' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 230 User logged in, proceed.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 230 .
20050322 05:04:10 ELA.FTP.0003.i Login to Host for user youruid successful.
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'SITE lrecl 80' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 200 Command okay.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 200 .
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'SITE crlf on' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 200 Command okay.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 200 .
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'SITE reclf on' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 200 Command okay.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 200 .
20050322 05:04:10 ELA.FTP.2004.t Attempt 'cd' to YOUR.EZELIB
20050322 05:04:10 ELA.FTP.0004.i Change Directory command to library YOUR.EZELIB successful.
20050322 05:04:10 ELA.FTP.2005.t Attempt 'put' command for file TESTDLBL.cbl
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'PORT nnn,nnn,nnn,nnn,n,nn' .
20050322 05:04:10 ELA.FTP.2010.t FTP server response: 200 Command okay.

20050322 05:04:10 ELA.FTP.2007.t FTP Reply code of 200 .
20050322 05:04:10 ELA.FTP.2006.t Issue FTP command 'STOR TESTDLBL.c' .
20050322 05:04:11 ELA.FTP.2010.t FTP server response: 150-About to open data connection

20050322 05:04:11 ELA.FTP.2010.t FTP server response:      File: YOUR.EZELIB.TESTDLBL.C

20050322 05:04:11 ELA.FTP.2010.t FTP server response:      Type: ASCII  Recfm: FB Lrecl:      80 Blksize:      80

20050322 05:04:11 ELA.FTP.2010.t FTP server response:      CC=ON  UNIX=OFF RECLF=ON  TRCC=OFF CRLF=ON

20050322 05:04:11 ELA.FTP.2010.t FTP server response:      Translate with US_ENG_03

20050322 05:04:11 ELA.FTP.2010.t FTP server response:      MODE=Stream      STRU=File

20050322 05:04:12 ELA.FTP.2010.t FTP server response: 150 File status okay; about to open data connection

20050322 05:04:12 ELA.FTP.2007.t FTP Reply code of 150 .
20050322 05:04:13 ELA.FTP.2010.t FTP server response: 226-Bytes received: 102,949

20050322 05:04:14 ELA.FTP.2010.t FTP server response:      Records received:      1,356

20050322 05:04:14 ELA.FTP.2010.t FTP server response:      Transfer Seconds:      1.68 (      100K/Sec)

20050322 05:04:14 ELA.FTP.2010.t FTP server response:      File I/O Seconds:      .09 (      0K/Sec)

20050322 05:04:14 ELA.FTP.2010.t FTP server response: 226 Closing data connection.

20050322 05:04:14 ELA.FTP.2007.t FTP Reply code of 226 .
20050322 05:04:14 ELA.FTP.0005.i Put command for file TESTDLBL.cbl successful.
20050322 05:04:14 ELA.FTP.2002.t Attempt to close connection to Host.
20050322 05:04:14 ELA.FTP.2006.t Issue FTP command 'QUIT' .
20050322 05:04:14 ELA.FTP.2010.t FTP server response: 221 FTPD closing control connection.
20050322 05:04:14 ELA.FTP.2007.t FTP Reply code of 221 .
20050322 05:04:14 ELA.FTP.0002.i Connection to Host closed.
```

Figure 4. Sample FTP trace

Sample 5: SQL database connections

Figure 5 shows an example of parameters used to connect to a DB2 database on a z/VSE host.

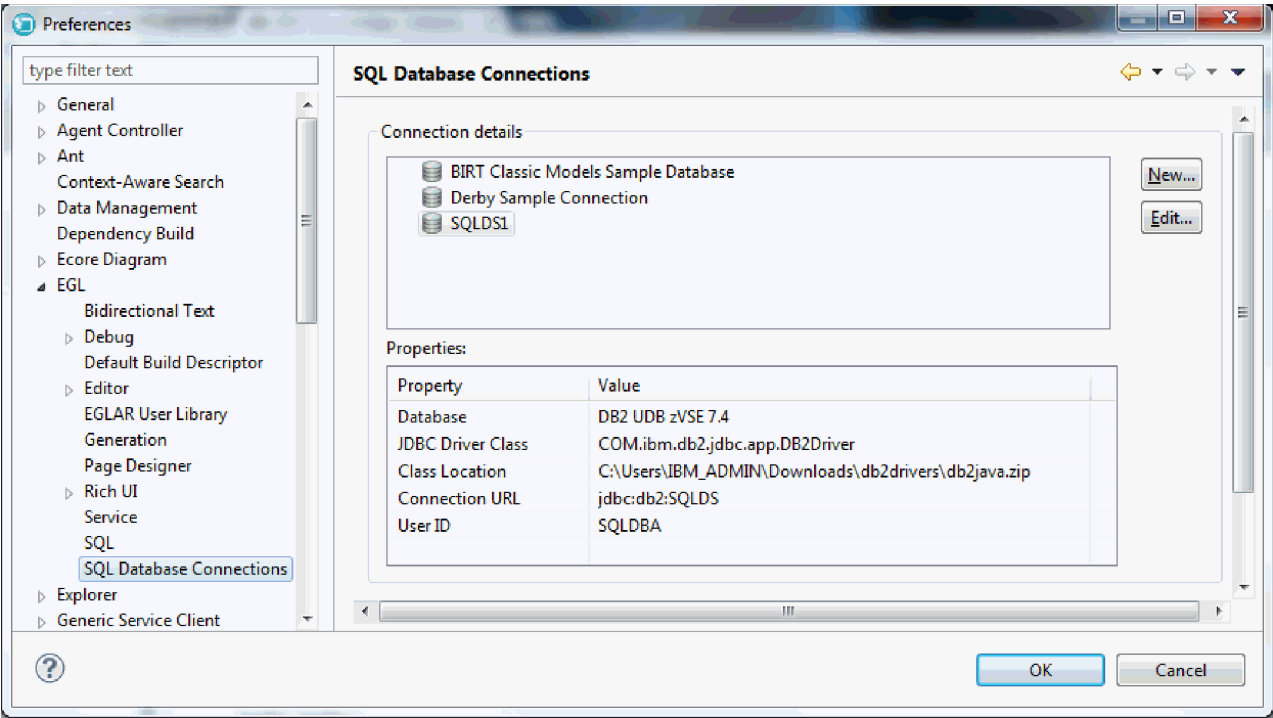


Figure 5. Parameters used to connect to a DB2 database on a z/VSE host

Sample 5: SQL database connections

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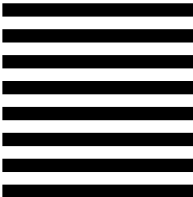
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