

GENAPP 5.1 Cloud



Policy Search GENAPP Extension with Cloud Enablement

Overview

This extension is based on the Policy Search OSGi Extension for CICS® TS 4.2. The content is updated to use Cloud Enablement features provided in CICS TS 5.1. It also demonstrates how to create a single rich CICS Application by using a combination of languages, namely Java™, and COBOL.

Policy Search consists of three core programs:

- LGTESTC2
- IPPROG
- IPDB

LGTESTC2 is a COBOL program that outputs to the 3270 terminal. It takes the user input, passes it on to `com.ibm.cics.genapp51.bundle` by using a COMMAREA and outputs the result.

IPPROG is a CICS program that runs the Java program that is contained in the `com.ibm.cics.genapp51.bundle`. The Java OSGi program within the CICS bundle takes the data from LGTESTC2 and adds it into a CICS container. It then passes the container on to IPDB. Finally, it adds the content that is returned from IPDB into the COMMAREA and passes it back to LGTESTC2.

IPDB is a CICS program that runs the Java program that is contained in `com.ibm.cics.genapp51.db.bundle`. The Java OSGi program handles the database connection and calls. The content that is returned from the database is added in to a container, which is passed back to IPPROG.

Each of the programs is packaged into a CICS Bundle together with any other resources required. The extension additionally provides a sample platform, application, and application binding along with instructions on how to deploy them.

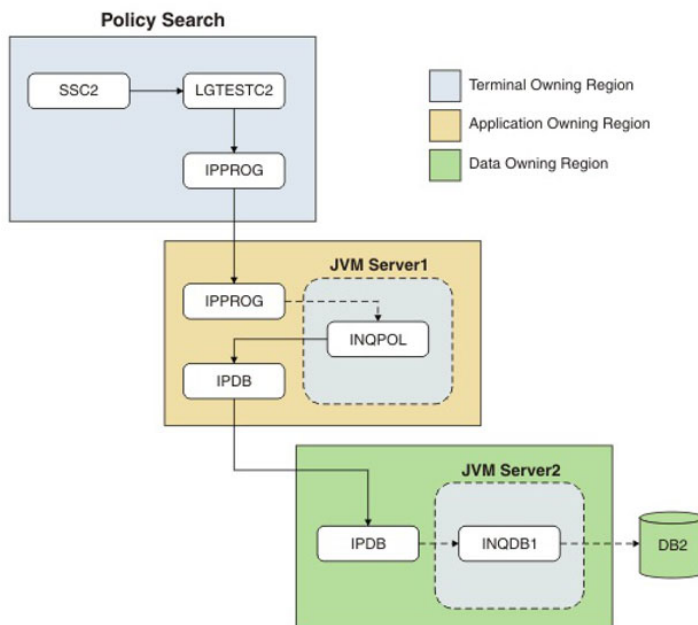


Figure 1. Application overview

Related information:

 General insurance application (GENAPP) for IBM CICS Transaction Server

 Java support in CICS

Cloud enablement

Overview

CICS TS 5.1 introduced the use of platforms, applications, and bindings to increase your service agility, and move towards a service delivery platform for cloud computing.

You can group CICS regions as platforms for rapid application deployment and decouple applications from the underlying topology for increased flexibility. Logically related CICS regions, with similar properties, are grouped into region types. A platform consists of one or more region types. Regions within a platform can be initialized or shut down individually if necessary, for example, to meet fluctuations in capacity requirements.

You can then combine and manage disparate application resources as a single entity, which can be versioned and moved rapidly through the development, test, and production lifecycle. With one installation action, you can deploy and create the resources in every CICS region in which the application runs. You can also manage the lifecycle of those resources together through the application resource.

The application binding associates the CICS bundles in the application with the CICS region types in the platform on which the application is to be deployed. It reduces the need for detailed knowledge of application and system resources by specifying the target platform, and by mapping the application bundles to the topology.

For more information about getting started with cloud enablement, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/index.jsp?topic=%2Fcom.ibm.cics.ts.applicationprogramming.doc%2Ftopics%2Fcloud_getstart_deployment.html, and <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.productoverview.doc/concepts/cloudsupport.html>.

Scalability

With Cloud Enablement, you can scale your environment as necessary by adding or removing regions to the region types in the platform, as illustrated in Figure 2. To optimize performance and workload throughput, you can use existing workload management capability to control where your work requests are run.

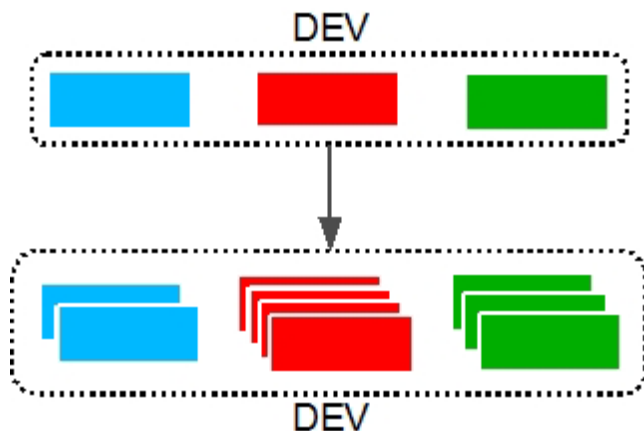


Figure 2. Platform scalability

Service agility

Another advantage of cloud enablement is the ability to quickly promote an application from a development to a test or production environment, without having to modify the application itself. By creating a different platform and application binding for each environment, it is possible to easily install the same application onto different environments, as shown in Figure 3. See “Single region configuration” on page 17 for a sample single region platform and binding.

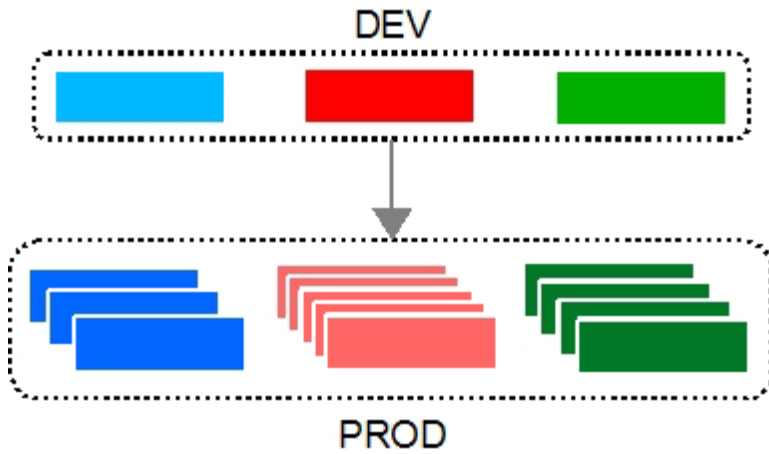


Figure 3. Service agility

Prerequisites

You must use CICS Transaction Server version 5.1 or later. Additionally, you must use CICSplex SM to manage your CICS regions. For more information, see <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.installation.doc/topics/dfha166.html>.

These instructions are based on a three region installation of GENAPP: CICSTOR1 (Terminal Owning Region), CICSAR1 (Application Owning Region) and CICSOR1 (Data Owning Region). The changes that are required to run on a single region instance, are available in “Single region configuration” on page 17.

There are a number of actions that must be completed before Policy Search can be set up:

- You must install the CICS Explorer® SDK plug-in into an Eclipse environment and set up a z/OS® and CICS SM connection.
The CICS Explorer SDK is an Eclipse-based framework for developing extensions to the CICS Explorer. It also provides support for developing Java applications to run in any supported release of CICS. It provides support for JCICS and packaging applications to comply with the OSGi specifications. For more information about installing CICS Explorer SDK, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.java.doc/topics/installing_sdk.html.
- You must establish a connection between CICS Explorer and your CICS systems by providing details about the system connection, its location, and authentication requirements. By default, CICS Explorer attempts to connect by using the SSL protocol. If the SSL connection is not successful, the connection is attempted without SSL. For more information about configuring z/OS and CICS SM connections, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.installation.doc/topics/explorer_configure_connection.html.
- You must set up the target environment for Java development in CICS Explorer to be able to use the JCICS API. Ensure that `com.ibm.cics.server` and `org.eclipse.osgi` are selected in the Content tab of the New Target Definition window. See http://pic.dhe.ibm.com/infocenter/ratdevz/v8r5/topic/com.ibm.cics.server.sdk.help/topics/setup_target_environment.html.
- All JVM profiles must be placed in a directory that is accessible to the CICS region.

Configuring a JVM server

A JVM server is required to run Java applications in CICS.

Ensure the CICS DB2® Environment Plan used has support for JDBC calls (see @DB2BIND.jc1 for a sample BIND job). An example of the CICS DOR1 JVM profile is shown in the following figure:

```
#####  
# JVM profile: DFHOSGI #  
# #  
# This sample CICS JVM profile is for a JVM server. #  
# #  
#####  
JAVA_HOME=/java/java70_bit64_sr1fixed/J7.0_64  
WORK_DIR=/cicsts_var/GNAPPLEX/workdir  
LIBPATH_SUFFIX=/usr/lpp/db2v10/jdbc/lib  
OSGI_BUNDLES=/usr/lpp/db2v10/jdbc/classes/db2jcc4.jar,\  
/usr/lpp/db2v10/jdbc/classes/db2jcc_license_cisuz.jar  
OSGI_FRAMEWORK_TIMEOUT=60  
-Xgcpolicy:gencon  
-Ddb2sqljjdbcprogram=dsnjdbc  
JAVA_DUMP_OPTS="ONANYSIGNAL(JAVADUMP,SYSDUMP),ONINTERRUPT(NONE)"
```

Figure 4. CICS DOR1 JVM profile example

Create and install an OSGi enabled JVM Server in CICS region CICS A0R1 and an OSGi and DB2 enabled JVM Server in CICS DOR1:

1. Create a JVM profile for the JVM server. You can copy the supplied profile, DFHOSGI, from the installation directory to the directory that is specified by the JVMPROFILEDIR system initialization parameter. The profile that you copy requires further changes to make it suitable for your environment. If you change the name of the profile, it must be 1 - 8 characters in length. Each CICS region that needs the JVM server must specify the JVMPROFILEDIR system initialization parameter. For more information about how to set up an OSGi enabled JVM server, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.java.doc/JVMserver/config_jvmserver_app.html. For instructions on how to set up a JVM server with DB2 support, see <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.doc/dfhtk/topics/dfhtk4b.html>.

Deploying the COBOL program

You must install both the Java and COBOL components to be able to run Policy Search.

Procedure

1. In ASCII mode, FTP the content of the GENAPP.SOURCE and GENAPP.CNTL folders from the archive provided onto the respective SOURCE and CNTL data sets of your GENAPP installation.
2. Re-run the EXEC job to customize the JCL as described in the main GENAPP documentation. This generates @ASMEMAP and @COBOLE.
3. Submit the job @ASMEMAP to build the BMS map for the 3270 interface (SSEMAP).
4. Submit the job @COBOLE to compile the COBOL program LGTESTC2.

Importing the Java OSGi bundles

You must install both the Java and COBOL components to be able to run Policy Search.

Procedure

In the Java perspective, import the `com.ibm.cics.genapp` and `com.ibm.cics.genapp51.db` OSGi projects from the archive.

Importing the CICS projects

Procedure

1. In the Java perspective, import the following projects from the archive:
 - `com.ibm.cics.genapp51.ui.bundle`
 - `com.ibm.cics.genapp51.logic.bundle`
 - `com.ibm.cics.genapp51.db.bundle`
 - `com.ibm.cics.genapp51.remote.logic.bundle`
 - `com.ibm.cics.genapp51.remote.db.bundle`
 - `com.ibm.cics.genapp51.application`
 - `com.ibm.cics.genapp51.platform`
 - `com.ibm.cics.genapp51.binding`
2. In the SM Administration perspective, create three System Group Definitions (CSYSGRP) for the platform:
 - GENATOR
 - GENAOR
 - GENADOR

If you change the name of the CYSGROUP from the defaults above, you must update the references in `com.ibm.cics.genapp51.platform/META-INF/platform.xml`.

For more information about how to create a CSYSGRP, see <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/index.jsp?topic=%2Fcom.ibm.cics.ts.doc%2Feyua7%2Ftopics%2Feyua7he.html>.

3. Add regions to the CSYSGRP defined in step 2:
 - Add CICSTOR1 to GENATOR
 - Add CICSOR1 to GENAOR
 - Add CICSOR1 to GENADOR

For more information about how to add regions to a CSYSGRP, see <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.doc/eyua7/topics/eyua7hc.html>.

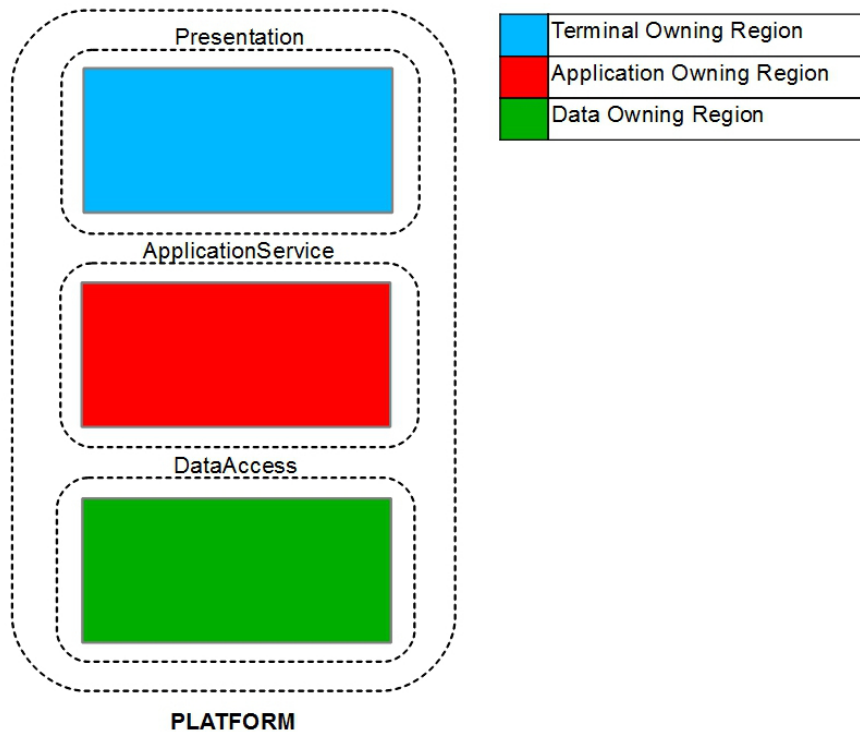


Figure 5. Platform setup

4. Deploy the platform, by exporting the project `com.ibm.cics.genapp51.platform` to zFS, creating and then installing the platform definition.

For more information about how to deploy a platform, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.doc/eyua7/topics/deploying_platform.html.
5. The sample assumes the JVM server is called `OSGIJVM5`. If your JVM server name is different, you must complete the following steps:
 - a. Expand the CICS bundle project `com.ibm.cics.genapp51.logic.bundle`.
 - b. Open the bundle manifest editor by double-clicking the `cics.xml` file in the META-INF folder.
 - c. Select the JVM server and click **Properties**.
 - d. Update the name, and click **OK**.
 - e. In the Defined Resources section, double-click on `IPPROG` program resource.
 - f. Update the **JVM server name** and save.
 - g. In the Defined Resources section, double-click on `genapp OSGi bundle` resource.
 - h. Update the **jvmserver** attribute, and save.
 - i. Expand the CICS bundle project `com.ibm.cics.genapp51.db.bundle`.
 - j. Open the bundle manifest editor by double-clicking the `cics.xml` file in the META-INF folder.
 - k. Select the JVM server and click **Properties**.
 - l. Update the name, and click **OK**.
 - m. In the Defined Resources section, double-click on `IPDB` program resource.
 - n. Update the **JVM server name** and save.
 - o. In the Defined Resources section, double-click on `genapp.db OSGi bundle` resource.
 - p. Update the **jvmserver** attribute and save.
6. The sample assumes that the DB2 connection is called `D1B0`. If your connection is named differently, then complete the following steps:
 - a. Expand the CICS bundle project `com.ibm.cics.genapp51.db.bundle`
 - b. Open the bundle manifest editor by double-clicking the `cics.xml` file in the META-INF folder.

- c. In the Imported Resources section, select the DB2 connection and click **Properties**.
- d. Update the name, and click **OK**.
7. The sample assumes that the database is called GENASA1. If your database is named differently, you must update the SQL statement in the DB2InquirePolicy.java file in the com.ibm.cics.genapp51.db bundle.
8. Deploy the application and all of its associated resources, by exporting the project com.ibm.cics.genapp51.application to zFS, creating and then installing the application definition. The following figure shows the content of the application in this example.

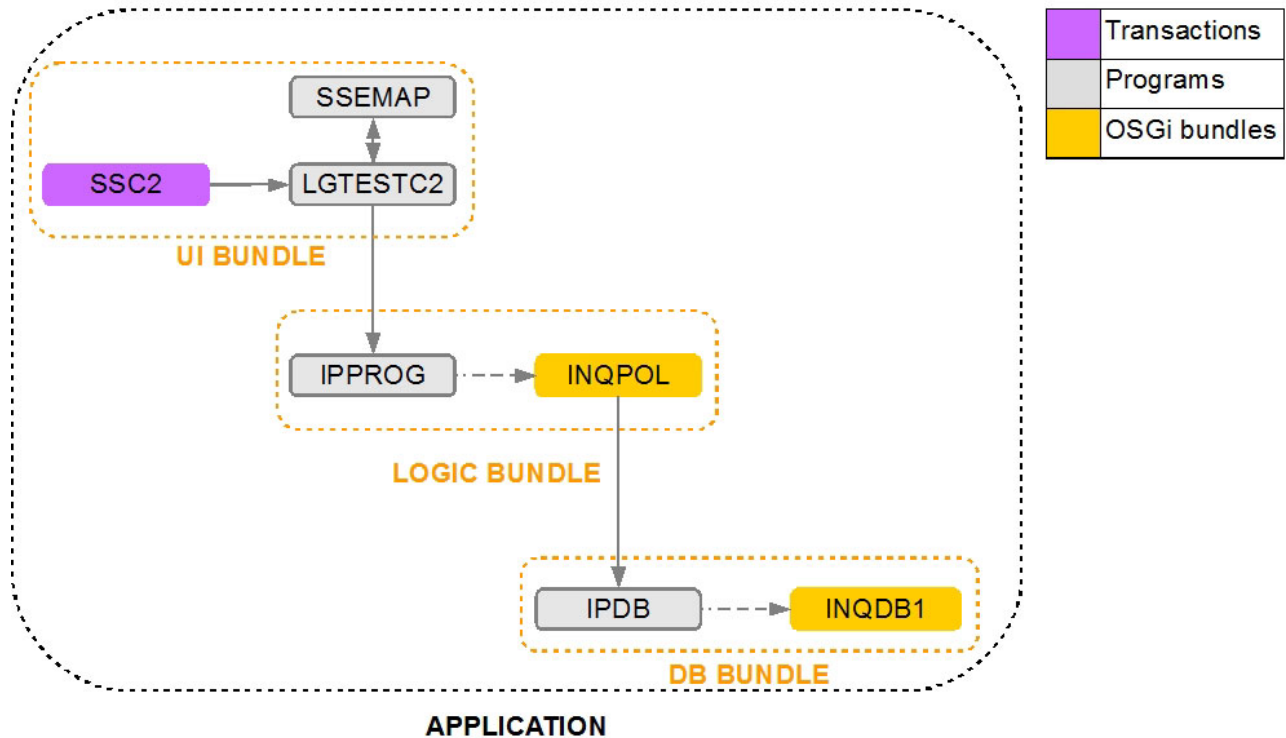


Figure 6. Application bundles overview

The application binding that is shown in the following figure, is automatically deployed together with the application. The binding defines two more bundles that contain remote programs that are only required in a multi-region instance of GENAPP.

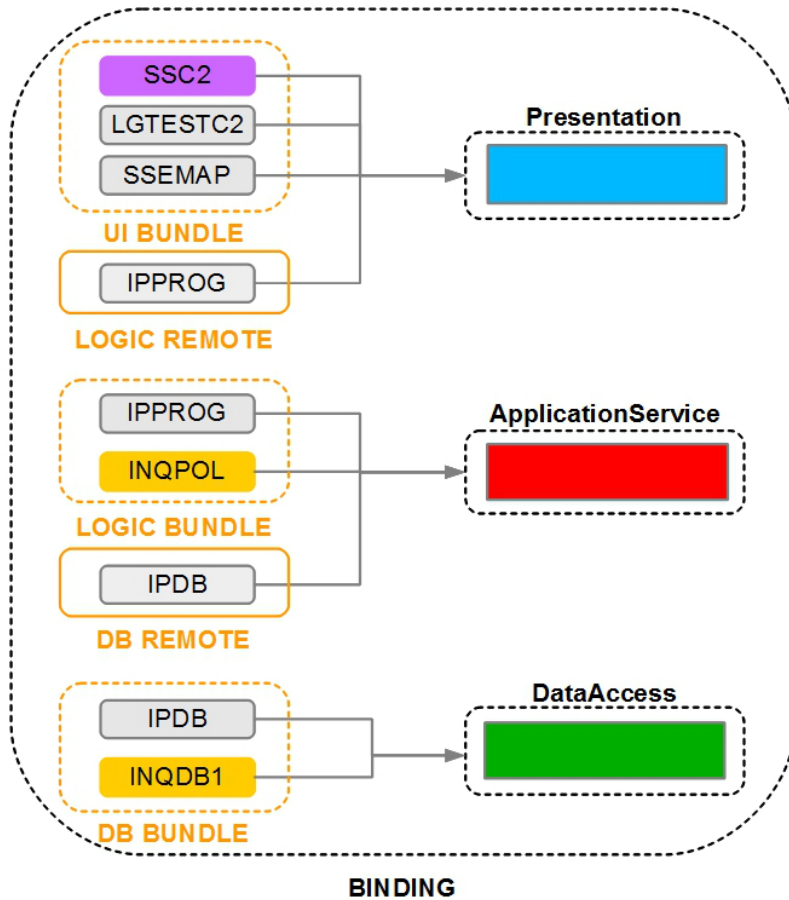


Figure 7. Binding overview

For more information about how to deploy an application, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.scenarios.doc/app_platform/topics/deploy.html.

9. In the CICS Cloud perspective, in the application-centric view, right click the application and click **Enable**. On refresh, the application is in an enabled state.
10. To run the application, run transaction SSC2 in the Terminal.

Single region configuration

If you are running in a single region environment, make the following changes:

1. Install a single OSGi and DB2 enabled JVM Server onto the region
2. Create a CYSGROUP called GENASA0R and add your single region to it.
If you change the name of the CYSGROUP, you must update the reference in `com.ibm.cics.genapp51.single.platform/META-INF/platform.xml`.
3. Use the single region versions of the platform and binding projects when deploying:
 - `com.ibm.cics.genapp51.single.platform`
 - `com.ibm.cics.genapp51.single.binding`

The following figure shows the platform layout:

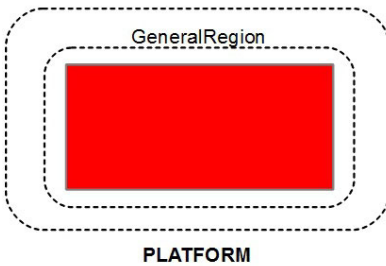


Figure 8. Single region platform

In a single-region GENAPP, the bundle that contains the remote programs is not required, and hence not included in the binding:

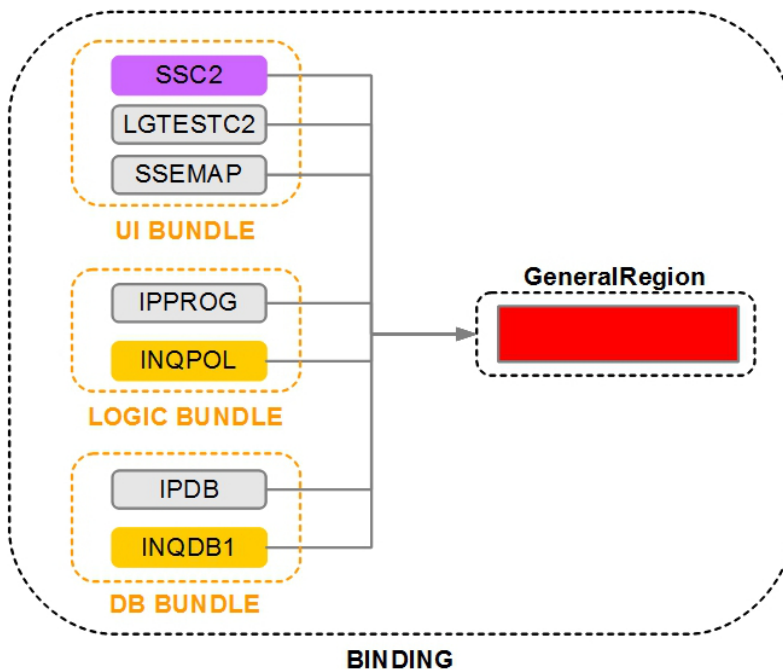


Figure 9. Single region binding

Creating your own platform, application, and binding

For more information about how to create your own platform, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.doc/eyua7/topics/settingup_platform.html.

To create your own application, see <http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.productoverview.doc/concepts/cloudapplications.html>.

To create your own binding, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.applicationprogramming.doc/topics/binding_application.html.

Or for an end-to-end development guide, see http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/index.jsp?topic=%2Fcom.ibm.cics.ts.applicationprogramming.doc%2Ftopics%2Fcloud_getstart_deployment.html.

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