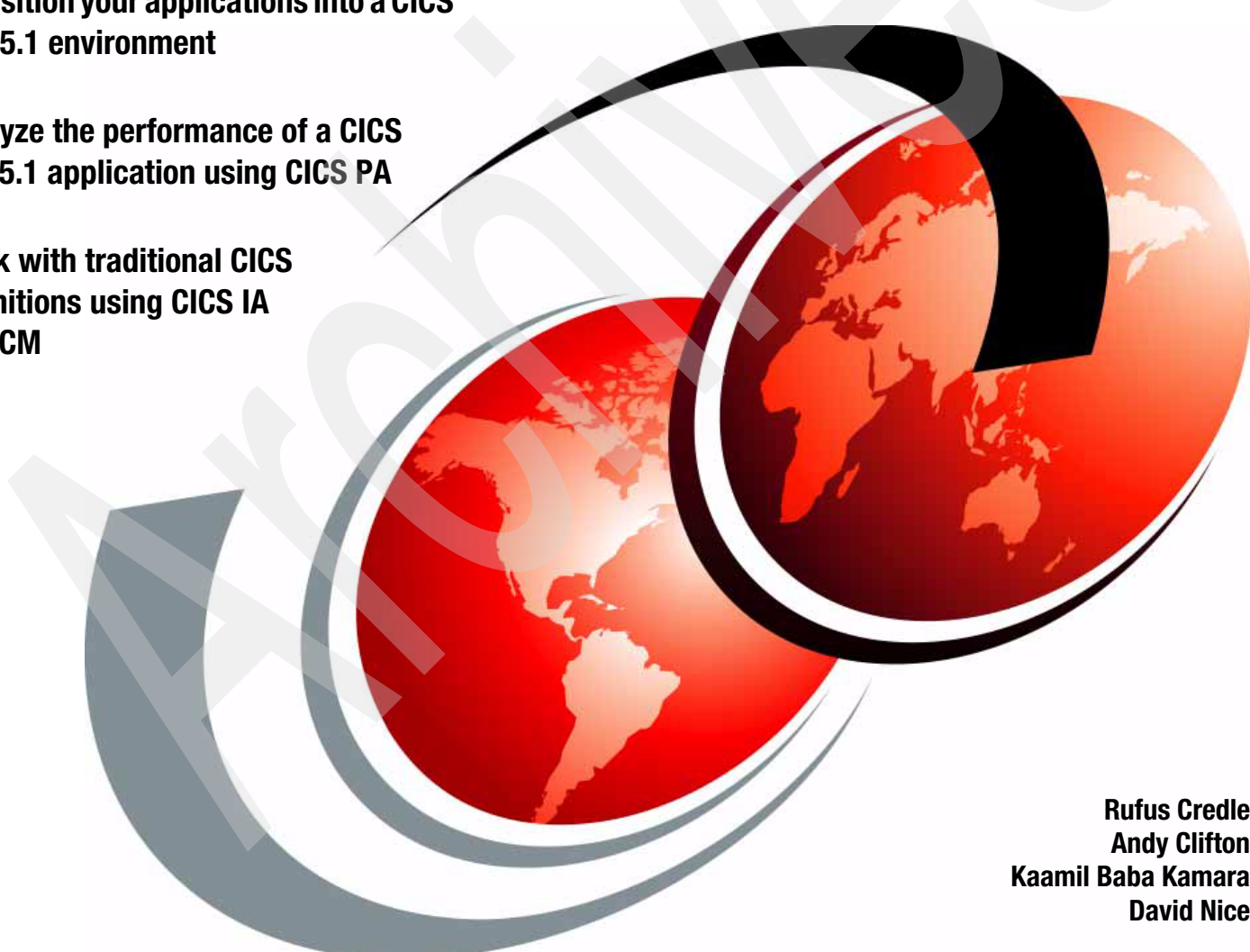


Modernize Your Application Infrastructure with IBM CICS Tools V5.1

Transition your applications into a CICS TS V5.1 environment

Analyze the performance of a CICS TS V5.1 application using CICS PA

Work with traditional CICS definitions using CICS IA and CM



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International Technical Support Organization

**Modernize Your Application Infrastructure with IBM
CICS Tools V5.1**

June 2013

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

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First Edition (June 2013)

This edition applies to CICS Transaction Server V5.1, CICS Interdependency Analyzer for z/OS V5.1, CICS Configuration Manager for z/OS V5.1, and CICS Performance Analyzer for z/OS V5.1

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Preface

This IBM® Redpaper™ publication shows how CICS® V5.1 Tools can help modernize your CICS applications, making them more portable and improving your audit and rollback facilities.

The paper presents you with several scenarios involving a sample general purpose application to demonstrate ways to modernize a traditional CICS application using CICS tools.

It will be of interest to various parties in your organization, including managers, architects, application developers, system administrators, and performance specialists.

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Modernize your application infrastructure with IBM CICS Tools V5.1

IBM CICS Transaction Server (TS) is the IBM general purpose transaction processing software for IBM z/OS, which meets the transaction processing needs of both large and small enterprises. It builds on z/OS and IBM System z® facilities to provide high availability and scalability at a low cost per transaction. It also supports large transaction volumes with a fast and consistent response time.

Many organizations are running applications that are 10 or 20 years old, or even older. These applications still provide the robust levels of service expected from CICS applications, but some might not meet the requirements of today's modern application paradigm. Today, applications allow for easy scalability and provide high availability. They have built-in redundancy, using various communication interfaces ranging from terminals and web browsers to web services and ATOM feeds.

The good news is that these well-proven applications do not need to be scrapped in favor of replacing them with entirely new applications. Instead, by benefitting from newer features of z/OS and CICS TS, these applications are able to participate in the modern application environment.

IBM CICSplex® System Manager (CICSplex SM) provides for flexible management of the CICS infrastructure. You can add or remove additional CICS regions dynamically based on workload changes. With Business Events and System Events, you can emit data from your CICS applications without modifying application code. You can use the emitted event data as input to dashboards that track your business activities. Such tracking allows you to make real-time decisions to improve your business.

So what is the best way for your organization to use these newer CICS features? In today's environment of shrinking budgets and increasing work demands, it is more difficult to change your applications. IBM has tools that make this process simpler and faster, while reducing the risk associated with change.

This paper presents you with several scenarios involving a sample general purpose application to demonstrate ways to modernize a traditional CICS application using CICS tools. It will be of interest to various parties in your organization, including managers, architects, application developers, system administrators, and performance specialists.

Listed are the subtopics of this chapter:

- ▶ 1.1, “Introduction to CICS Transaction Server for z/OS” on page 3
- ▶ 1.2, “Installing the CICS Tools plug-ins into CICS Explorer” on page 4

1.1 Introduction to CICS Transaction Server for z/OS

CICS Transaction Server for z/OS is the premier high-volume transaction processing software available today. CICS uses application programming interfaces (APIs) to communicate directly with resources defined to it, for example, files, databases, and system connections. An entire environment has developed around CICS, dedicated to supporting the lifecycle of both CICS and its applications. The CICS tools are pivotal to this environment, and this paper describes certain methods used by the CICS tools that support it.

This paper builds on the scenarios introduced in the IBM Redpaper *Implementation of Popular Business Solutions with CICS Tools*, REDP-4824, explaining how the CICS Tools support new features introduced in CICS TS V5.1 to enable greater service agility through the use of first-class platforms and applications.

This paper also provides a high-level introduction into several of the facilities available in the CICS family of products that help you modernize your CICS environment to enable greater control over deployment of code from development to production. The scenarios in this paper involve the use of a general insurance application available with IBM GENAPP CB12 SupportPac. The general insurance application GENAPP is a CICS COBOL application that simulates transactions made by an insurance company to create and manage client and policy data.

This paper uses a model of GENAPP running a single region at CICS TS 4.2 level and data stored in IBM DB2® tables. In the first part of the model, the CICS TS systems are upgraded to 5.1 level. In the second part of the example modernization strategy, CICS DA is used to facilitate moving GENAPP from a single -region model into a four-region model using CICSplex SM and CICS IA is used to help inform the structure the CICS Applications. The third part of the paper discusses new capabilities provided in CICS IA, CICS PA, and CICS CM to support service agility.

The paper include the following three chapters, beginning with a walkthrough of the CICS TS V5.1 upgrade, moving on to improve the modernization process.

- ▶ Chapter 2, “Upgrading to CICS TS V5.1” on page 5
This chapter walks you through using CICS Deployment Assistant (DA) to assist upgrading a CICS region to V5.1 level.
- ▶ Chapter 3, “Adopting CPSM capabilities to enable CICS TS V5.1” on page 9
This chapter describes how to use CICS DA to create a new CICSplex containing the CICS V5.1 region upgraded in Chapter 2. You must have a CPSM environment with a CICSplex to use the new platform and application features provided in CICS TS V5.1.
- ▶ Chapter 4, “Working within a CICS Cloud environment” on page 17
This chapter illustrates how the CICS Tools can assist in converting your CICS applications to the first-class application and platform environment.

1.2 Installing the CICS Tools plug-ins into CICS Explorer

As part of the CICS Explorer portfolio, V5.1 introduces a new update site containing plug-ins for the CICS Tools. This update site reduces the time taken to install a new tool plug-in and provides updates automatically. The update site is included by default with the CICS Explorer product. It can be used to install both the CICS Explorer SDK and tools plug-ins if required. To work through the techniques described in this paper, download the CICS Explorer V5.1 product and follow the instructions to install the tools plug-ins into it.

From the CICS Explorer, choose **Help** → **Install New Software**. Using the Work with drop-down box, choose the **IBM CICS Explorer Update Site** option. CICS Explorer contacts the update site to discover the available plug-ins, as shown in Figure 1-1.

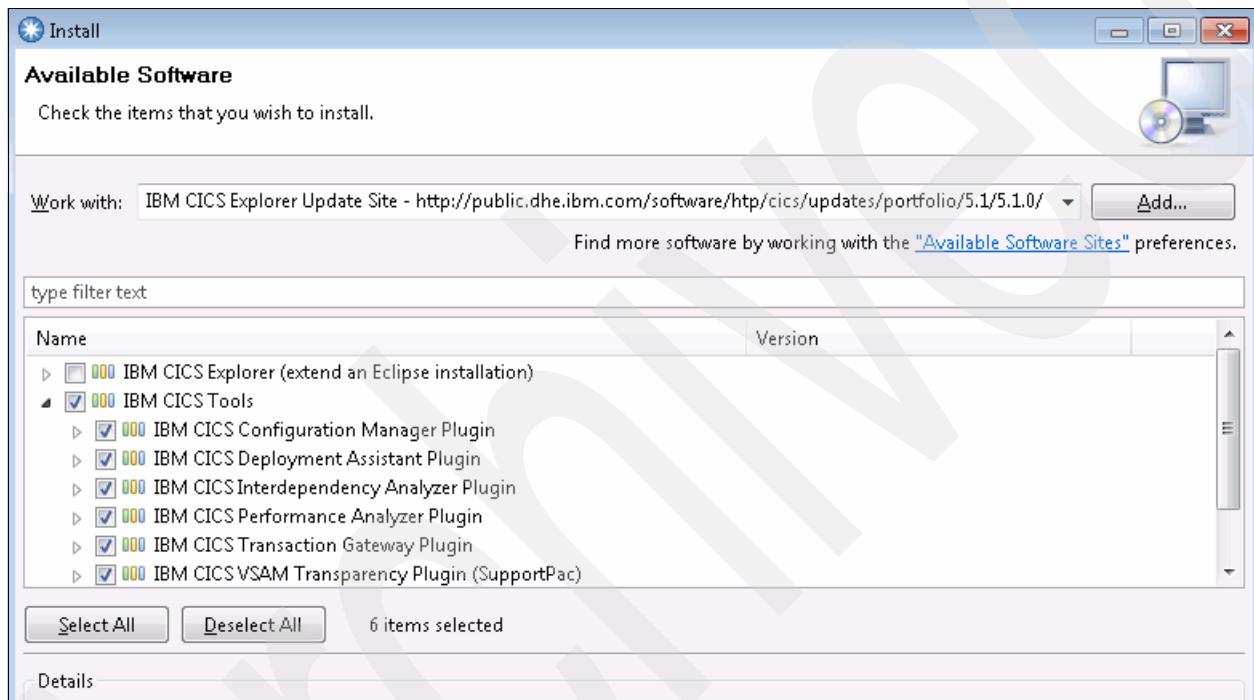


Figure 1-1 Install CICS Tools into CICS Explorer

Select the CICS Tools discussed in this paper; CICS CM, CICS DA, CICS IA, and CICS PA. Click **Next**, and continue through the dialogs to complete the installation.

Upgrading to CICS TS V5.1

CICS DA V5.1 provides cheat sheets and other capabilities that will walk you through the upgrade process, providing a step-by-step guide and links to help and other resources.

This chapter looks at the steps required to upgrade a single V4.2 region to V5.1 level, using CICS DA V5.1 to assist.

Listed are the subtopics of this chapter:

- ▶ 2.1, “Preparing to upgrade” on page 6
- ▶ 2.2, “Using a cheat sheet” on page 6

2.1 Preparing to upgrade

First, populate the DA model on your local machine. Connect the CICS DA V5.1 client within CICS Explorer to your CICS DA V5.1 server. From the DA Explorer view, right-click your DA server and click **Discover**; see Figure 2-1.

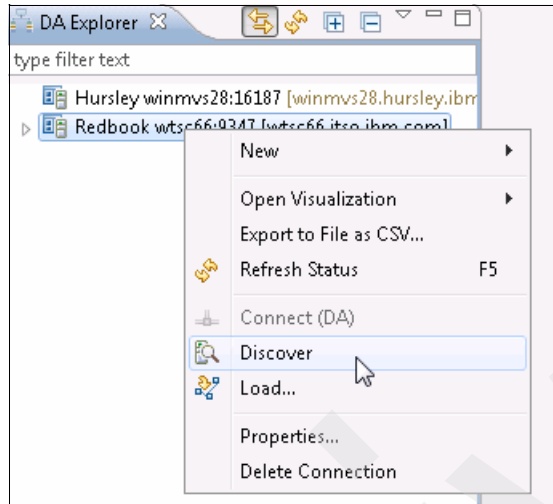


Figure 2-1 Discover menu option on a DA server

The discovery populates a model, on your DA server, of the subsystems available on your IBM MVS™ image. Clients connecting subsequently can load this model without having to perform a full discovery again. Load the model by right-clicking the server and choosing **Load**.

Loading the CICS DA model gives you a simple graphical interface to check on your regions and view their JCL and job output. This is helpful for identifying data set names and similar information during the upgrade process.

2.2 Using a cheat sheet

As mentioned, CICS DA V5.1 provides a cheat sheet to assist with the upgrade from CICS TS V4.2 to CICS TS V5.1. Access the cheat sheets by selecting **Help** → **Cheat Sheets**. Choose the CICS DA upgrade cheat sheet, as shown in Figure 2-2.

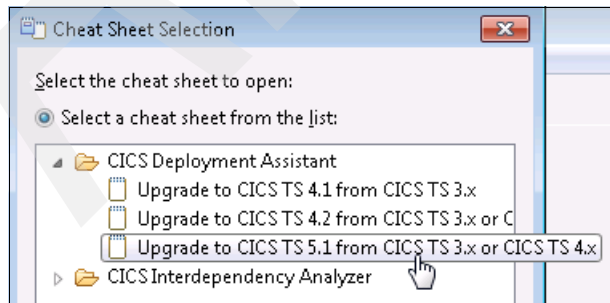


Figure 2-2 CICS TS V5.1 upgrade cheat sheet

The cheat sheet opens in your Explorer environment. Although the instructions mark a CICSplex SM environment as a prerequisite, it is possible to follow the instructions for a single region. Review the starting information and click the play link to begin; see Figure 2-3.

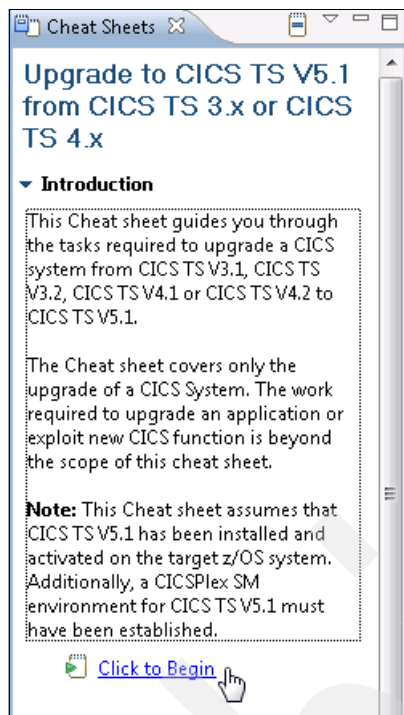


Figure 2-3 Beginning the cheat sheet

Follow through the steps of the cheat sheet, making sure that your CICS region is shut down, cleanly, first. The CICS Information Center upgrade documentation, linked from the cheat sheet, is a useful reference.

In addition to the steps listed in the cheat sheet, the following additional notes apply:

- ▶ The cheat sheet instructs you to review definitions in your region after deleting and redefining your CICS Local and Global catalogs, rather than the more advisable approach of reviewing *before* making any changes.
- ▶ You will need to adjust your startup JCL to reference the new CICS TS V5.1 libraries.
- ▶ During the Review Resource Definitions step, you are advised to use CICS Explorer to review your definitions against the list provided in the CICS Information Center.

For the scenario in this chapter where you are updating a stand-alone region, CICS Explorer cannot be used. Instead, review your resource definitions using CEDDA or the DFHCSDUP batch utility.

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Adopting CPSM capabilities to enable CICS TS V5.1

To benefit from the CICS TS V5.1 first-class platforms and applications, your regions must be part of a CICSplex. CICS DA V5.1 provides wizards to simplify setting up a CMAS and WUI server, and making a CICS region part of a CICSplex.

Listed are the subtopics of this chapter:

- ▶ 3.1, “Creating a CICSplex” on page 10
- ▶ 3.2, “Resolving problems when creating a CICSplex” on page 11
- ▶ 3.3, “Adding a stand-alone region to the new CICSplex” on page 13

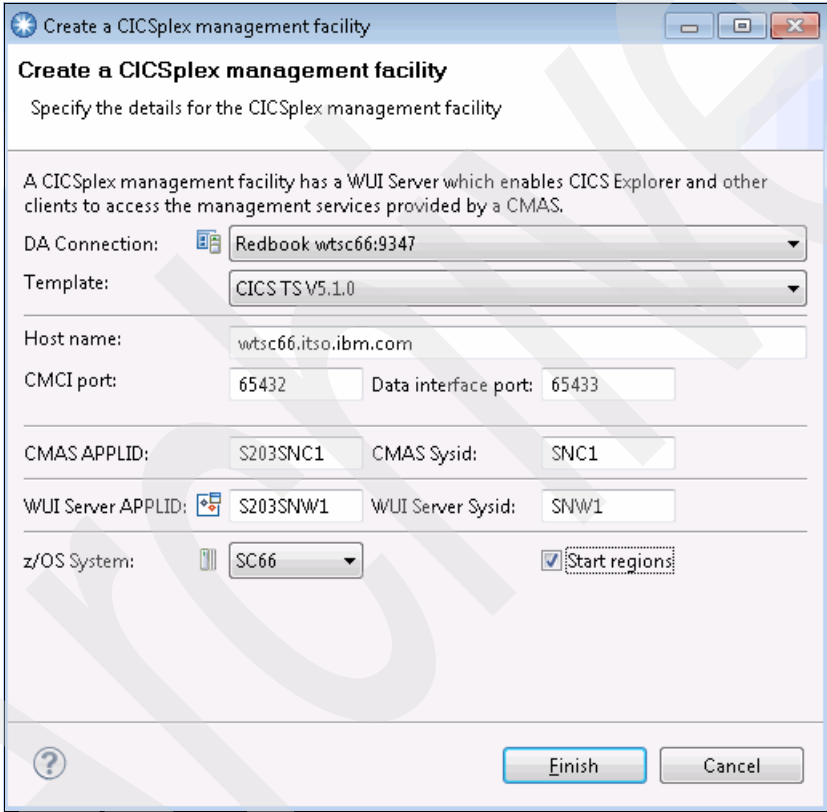
3.1 Creating a CICSplex

CICS DA provides two wizards to assist you in creating a CICSplex. The CICSplex wizard will create a new CICSplex, given an existing CMAS. The CICSplex management facility wizard creates a new CMAS, WUI, and CICSplex.

Chapter 2, “Upgrading to CICS TS V5.1” on page 5 describes how to upgrade a single server to CICS TS V5.1 level.

This chapter builds on that work and describes how to convert the single server into a CICSplex with a WUI and a CMAS. From the DA perspective, choose **File** → **New Wizards** → **CICSplex management facility**.

In the Create a CICSplex management facility wizard, fill in the appropriate values for your system, as shown in Figure 3-1.



The screenshot shows a wizard window titled "Create a CICSplex management facility". The window contains the following fields and values:

- DA Connection: Redbook wtsc66:9347
- Template: CICS TS V5.1.0
- Host name: wtsc66.itso.ibm.com
- CMCI port: 65432
- Data interface port: 65433
- CMAS APPLID: S203SNC1
- CMAS Sysid: SNC1
- WUI Server APPLID: S203SNW1
- WUI Server Sysid: SNW1
- z/OS System: SC66
- Start regions:

At the bottom right, there are "Finish" and "Cancel" buttons.

Figure 3-1 Create CICSplex management facility wizard

Click **Finish** to complete the wizard. The WUI and CMAS servers are created.

Refresh the DA server model by right-clicking the DA connection and choosing **Discover**. After the discovery has completed, click **Load**.

Find the WUI server, right-click and choose **Show in CICS Explorer**; see Figure 3-2 on page 11.

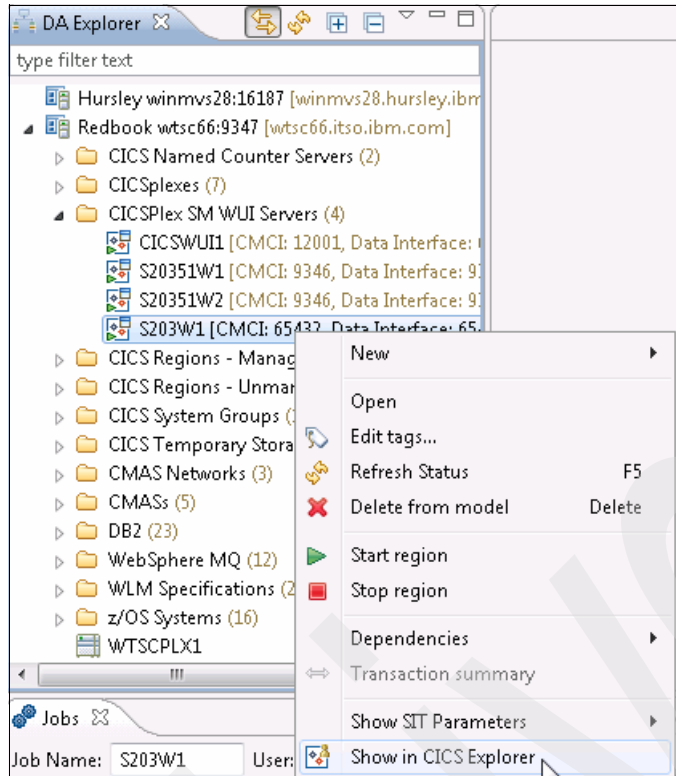


Figure 3-2 WUI server context menu

At this point, you are taken to the SM Administration perspective where you can see the WUI and CMAS have been set up.

3.2 Resolving problems when creating a CICSplex

All z/OS and CICS setups are different. CICS DA V5.1 facilitates the process of fault-finding by providing the ability to check job output and submit JCL from within the Eclipse-based CICS Explorer interface. This section describes a worked example of fixing a configuration problem that occurred on the z/OS machine and prevented the new CICS WUI from starting.

If your WUI is not working correctly, you will be unable to connect after choosing **Show in CICS Explorer** from the context menu on the WUI server.

You might see a message in your Error Log similar to this:

```
com.ibm.cics.core.comm.EnhancedConnectionException: IZE0106E Connect failed
with error "Connection refused: connect ({Auto} S203W1)"
```

Double-click the WUI server to view more details, including a hyperlink to the details of the job running the WUI, as shown in Figure 3-3 on page 12.

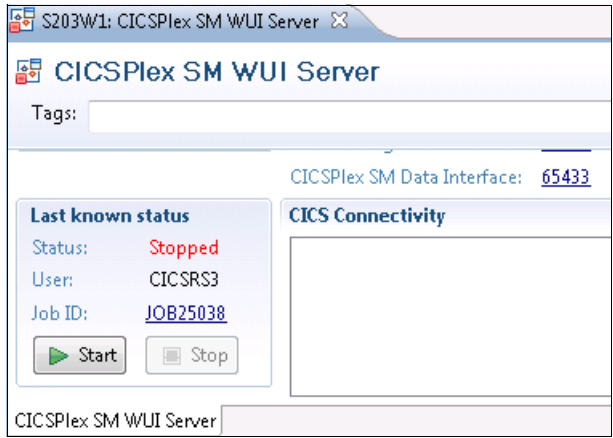


Figure 3-3 WUI details, including hyperlink to job

Clicking the Job ID and looking in the JES message log (see Figure 3-4) reveals an error due to insufficient log data set space.

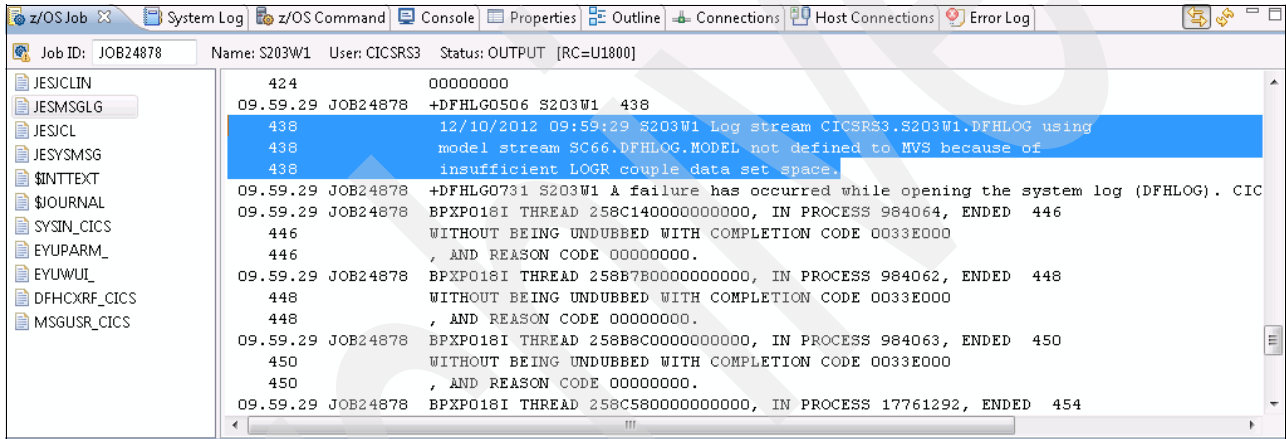


Figure 3-4 JES log shows problem with lack of log space

After resolving the logspace configuration problem in the underlying z/OS system, the region needs an INITIAL start rather than an AUTO start, because no recovery information is available.

Click the Start policy hyperlink, as shown in Figure 3-5 on page 13.

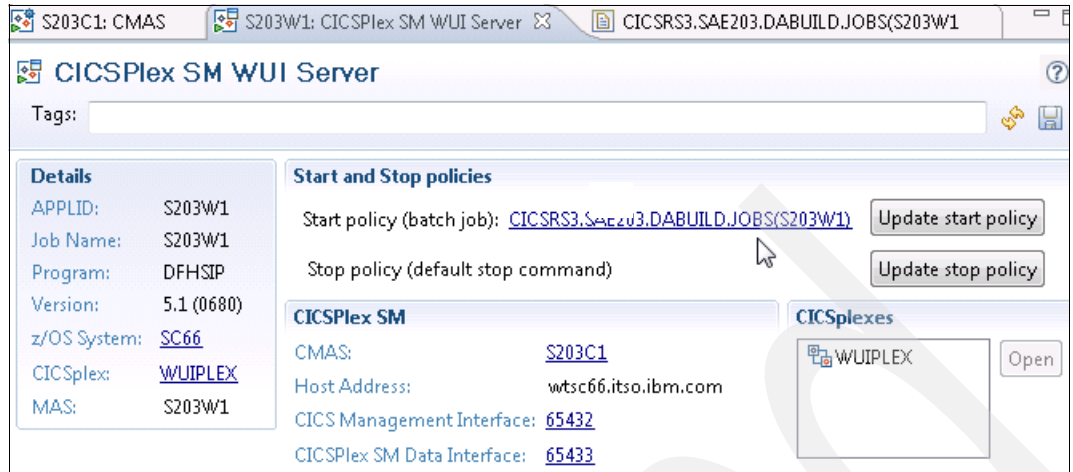


Figure 3-5 WUI start policy

The JCL start policy is opened in a text editor. Make the required edits and, without saving, right-click and select **Submit z/OS job**, as shown in Figure 3-6. This is simply a one-off change to the JCL.

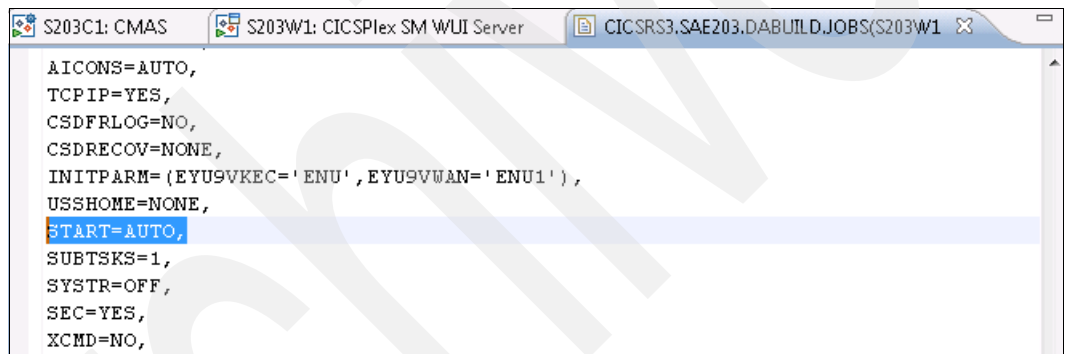


Figure 3-6 Editing start policy JCL

The region will now start successfully; right-click WUI within DA Explorer and choose **Show in CICS Explorer** to make a CMCI connection to the WUI.

3.3 Adding a stand-alone region to the new CICSPlex

At this point the CICSPlex is created but so far contains only a CMAS and a WUI. The next step is to add the stand-alone V5.1 region into the CICSPlex.

Right-click the region within DA Explorer and choose **Add to CICSPlex**, as shown in Figure 3-7 on page 14.

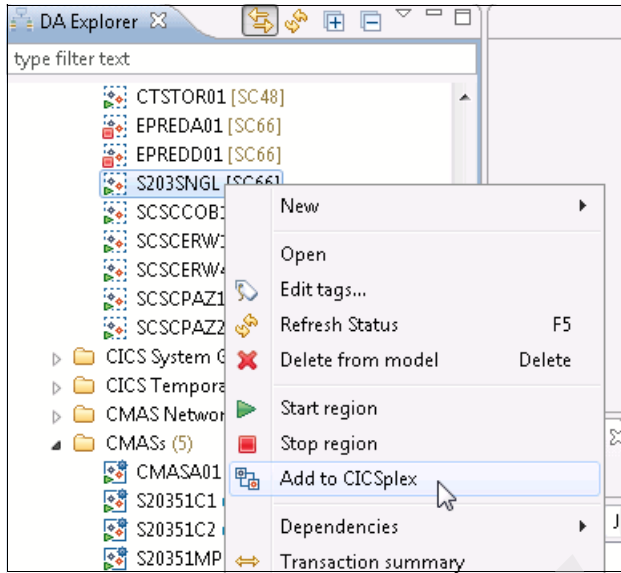


Figure 3-7 Add region to CICSplex

The Add CICS region to CICSplex wizard is shown (see Figure 3-8 on page 15). Choose the recently created CICSplex and CMAS.

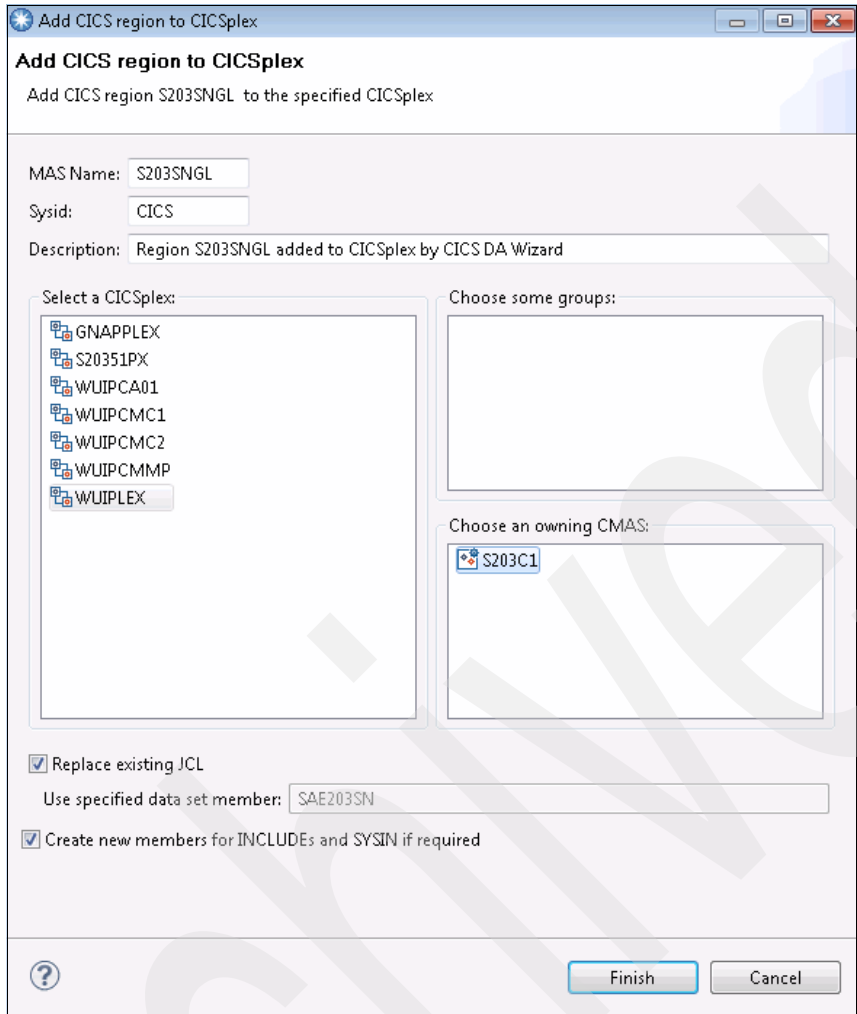


Figure 3-8 Add CICS region to CICSplex wizard

Press **Finish** to exit the wizard and restart the region. Right-click the WUI from within the DA Explorer view and choose **Show in CICS Explorer**. At this point, the new CICSplex is complete; see Figure 3-9.

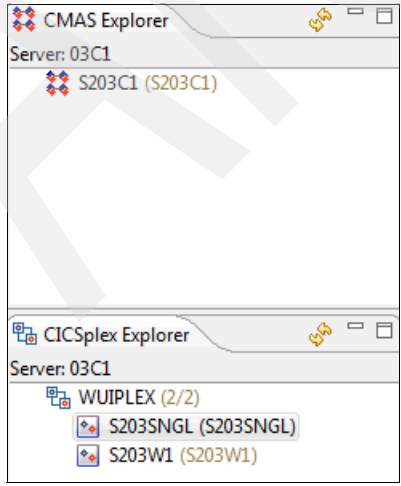


Figure 3-9 Completed CICSplex

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Working within a CICS Cloud environment

This chapter discusses how you work within a CICS Cloud environment by transitioning your applications into a CICS, analyzing your performance, and the use of definitions using CICS CM.

Listed are the subtopics of this chapter:

- ▶ 4.1, “Transitioning your applications into a CICS TS V5.1 environment” on page 18
- ▶ 4.2, “Analyzing the performance of a CICS TS V5.1 application using CICS PA” on page 26
- ▶ 4.3, “Working with traditional CICS definitions using CICS CM” on page 31

4.1 Transitioning your applications into a CICS TS V5.1 environment

CICS TS V5.1 introduces the concept of an application as a first-class entity within CICS. Repackaging your current resources as applications makes management and deployment simpler because you work with one entity rather than with numerous related definitions.

This section explains how to use the IBM CICS Interdependency Analyzer (IA) to discover the definitions that make up your application by analyzing the dependencies between your definitions. For detailed information about the process of creating platforms and applications, given a set of existing definitions, refer to the CICS TS 5.1 Information Center website:

http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.applicationprogramming.doc/topics/cloud_deploy_intro.html

Finally, you will use CICS CM to create Platform and Application definitions with audit trail and version management capabilities.

4.1.1 Discover the resources that make up your application using CICS IA v5.1

This section studies the model GENAPP application to acquire an enhanced perspective of the application topology. It focuses on discovering which resources make up the application, including programs, transactions, files, tables, or temporary storage queues (TSQs), and how these resources interact with each other. Having a clear understanding of the application is vital as you look to modernize your CICS environment. Many CICS applications operating today are years old and chances are the documentation is out of date, if it exists at all.

IBM CICS Interdependency Analyzer (IA) is a runtime tool that captures information from running CICS applications. It helps analyze resource interdependencies and affinities and assess the impact of application changes quickly and efficiently. As CICS IA gathers information from the CICS environment, the information is stored in a relational database. The CICS IA plug-in to the IBM CICS Explorer provides a rich query interface for analyzing the collected data. CICS IA also provides batch-reporting facilities for analyzing the data.

4.1.2 Analyzing resource dependencies

CICS IA assists in understanding, in a controlled manner, the interrelationships between the shared common resources of applications and services. For example, to change the content or structure of a file, you must know which programs use this file because they need to be changed. CICS IA can identify the programs and the transactions that drive the programs.

CICS IA records the interdependencies between resources, such as files, programs, IBM WebSphere message queues, DB2 tables, and transactions. CICS IA records the connections by monitoring programming commands as they run in the CICS environment. CICS IA stores the collected data in a relational database; the preferred way to use the powerful query interface of CICS IA is using a plug-in to the CICS Explorer. You can use the IA plug-in to perform data analysis activities and run reports on the collected data without writing your own SQL. Using the CICS IA Explorer plug-in, you can find all of the resources involved with transaction SSC1.

To see this list of resources, under the Transactions tab in the IA perspective in the CICS Explorer, right-click the SSC1 transaction. Then, select the **Uses Resources** option from the context menu, as shown in Figure 4-1 on page 19.

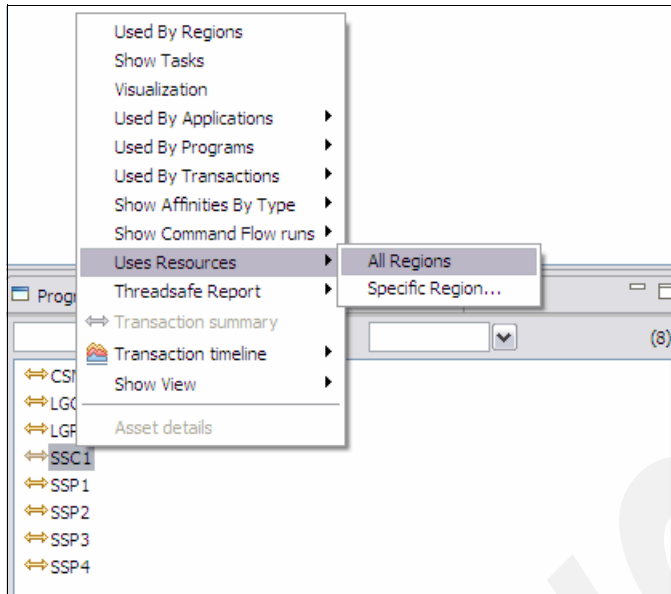


Figure 4-1 Uses resource on transaction SSC1

CICS Explorer displays the results under the Uses tab in the Resources used window, as shown in Figure 4-2 on page 20.

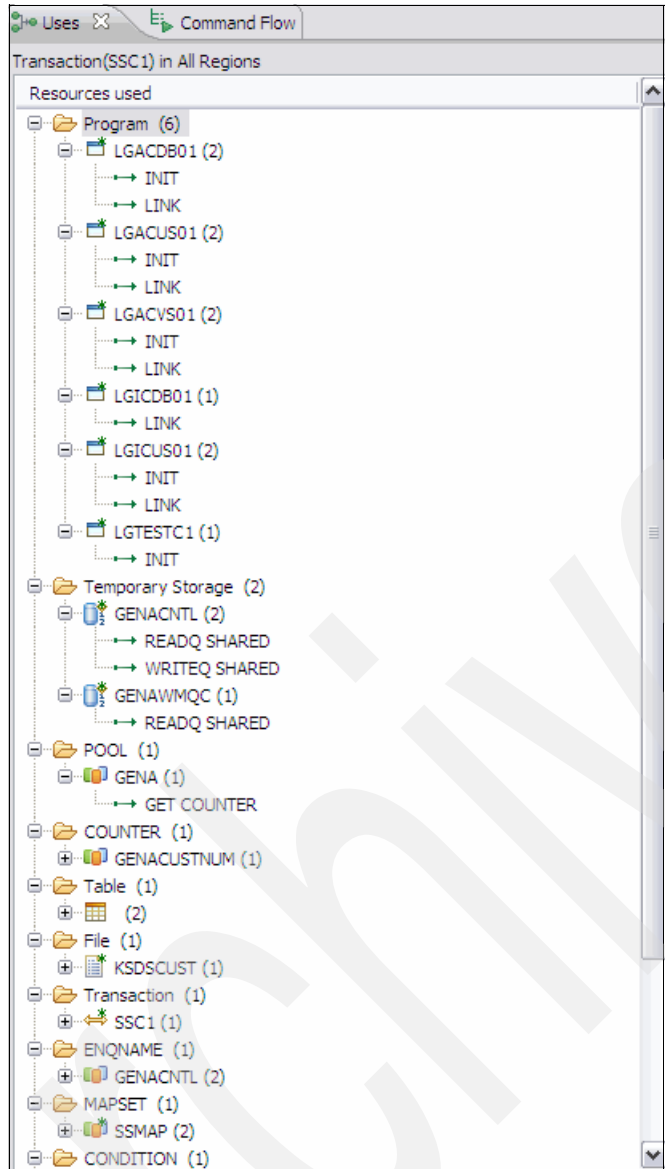


Figure 4-2 Resources used by transaction SSC1

From this display, you can see all the programs, temporary storage queues, maps, files, and other resources involved with transaction SSC1. The application initializer is also visible underneath the program definition shown by "INIT". By clicking any of these resources, CICS IA identifies additional information about that resource. For example, in Figure 4-2, temporary storage queue GENAWMQC is selected, and to the right, CICS IA shows that program LGICUS01 uses this temporary storage queue.

4.1.3 Using IA to discover the set of definitions that make up the application

From the IA perspective, open the Programs view. The Programs view shows an alphabetic list of all programs known to CICS IA.

The following programs are listed:

- Programs that are the sources of interactions

- ▶ Programs that make calls into CICS
- ▶ Programs that are the results of interactions
- ▶ Programs that are CICS resources of type PROGRAM

Figure 4-3 shows the programs listed in a Programs view.

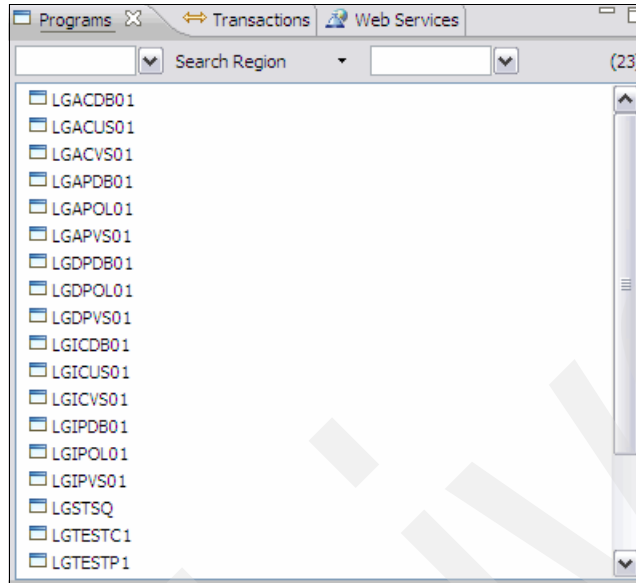


Figure 4-3 The Programs view

You can filter the programs in the list using the first text field in the Programs view. You can use an asterisk (*) as a wildcard, as shown in the following figure. The value *L* finds all programs with a L in the name, LGT* finds all programs starting with LGT, and L*1 finds programs beginning with L and ending with 1; see Figure 4-4.

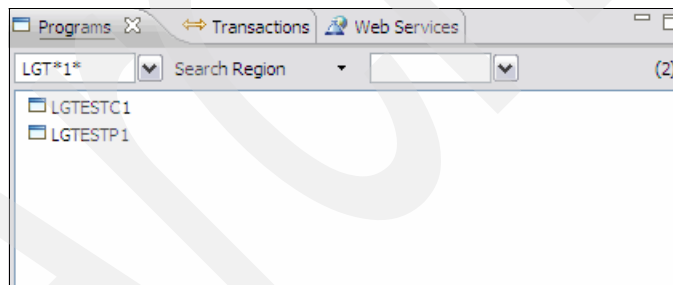


Figure 4-4 Filtering the Programs view

To modify program definitions, you can use the CICS Program Definition Editor in the SM perspective; it is not necessary to switch to the SM perspective first. From the IA Programs view, right-click the program name and click **Open CICS SM Editor** from the menu, as shown in Figure 4-5 on page 22.

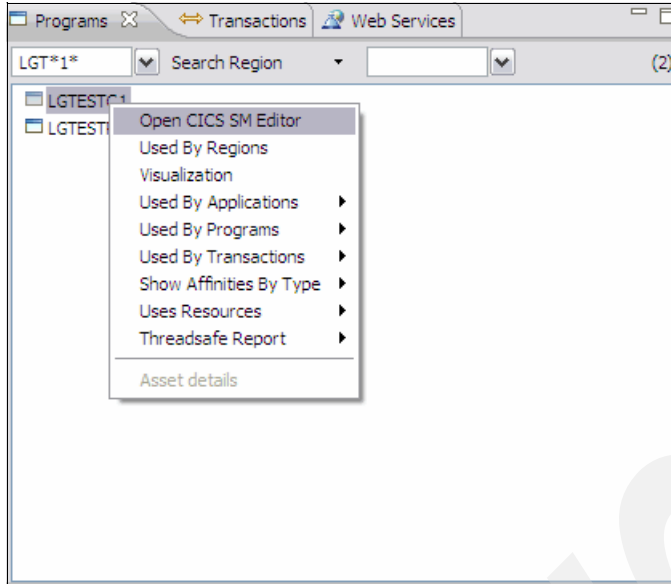


Figure 4-5 Context menu on a program

To open the editor successfully, the CICS Management Interface connection must be active. If there is no connection, the error message is displayed as shown in Figure 4-6.

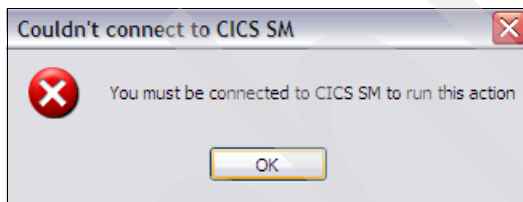


Figure 4-6 You must be connected to CICS SM to view a program editor

If the selected program was captured by CICS IA in more than one region, you are asked to select the region you want to open an editor for; see Figure 4-7.

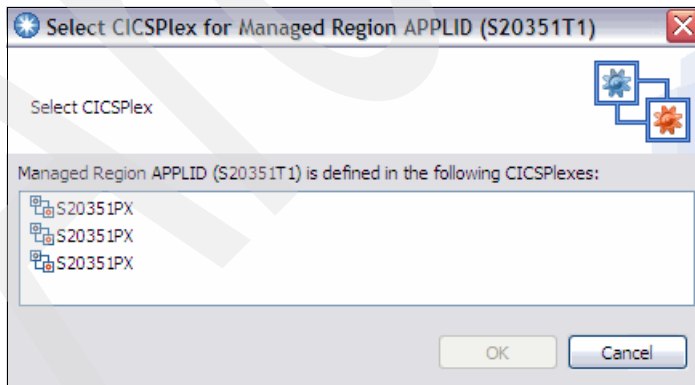


Figure 4-7 Choose which region to open an editor for

The editor displays all the attributes and their values for a selected resource. You can edit attributes and save your changes. In the EntryPoint Signature section, define an Operation name; see Figure 4-8 on page 23.

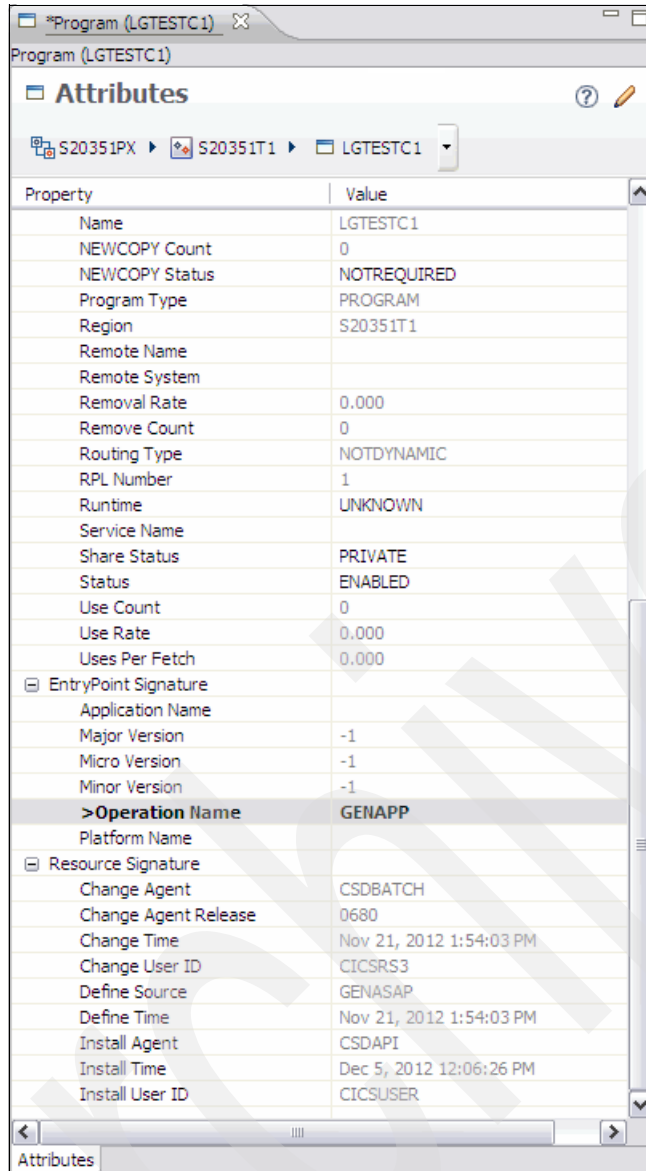


Figure 4-8 Enter an operation name

Run the transaction or program. The collected data is loaded into the IA database and can be viewed from the Applications view. A reserved application name, TEST OPERATIONS, is used for the trial collections. The Applications view shows a list of all applications known to CICS IA. Expand TEST_OPERATIONS and select your defined operation name.

Right-click your operation name and select **Show All Resources** (as shown in Figure 4-9 on page 24). This will show the collected data and display the data for a deployed application. Select by right-clicking the defined operation.

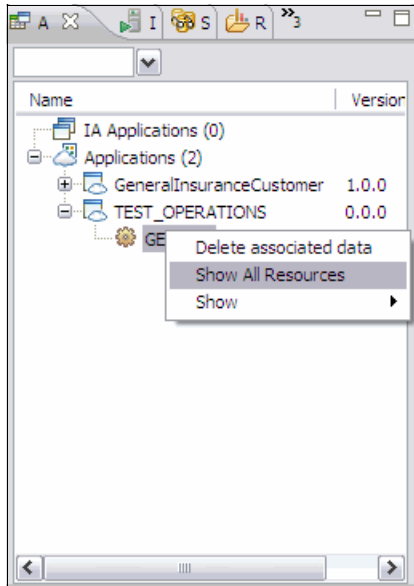


Figure 4-9 Context view on the collected operation data

The resources are shown in the Show Resources view. The Show Resources view displays resources from a number of sources, including searches run from the toolbar, from the Queries view, and from the Regions view. Highlight **Show** and select CICS resources. In the Show Resources view select the program, as shown in Figure 4-10.

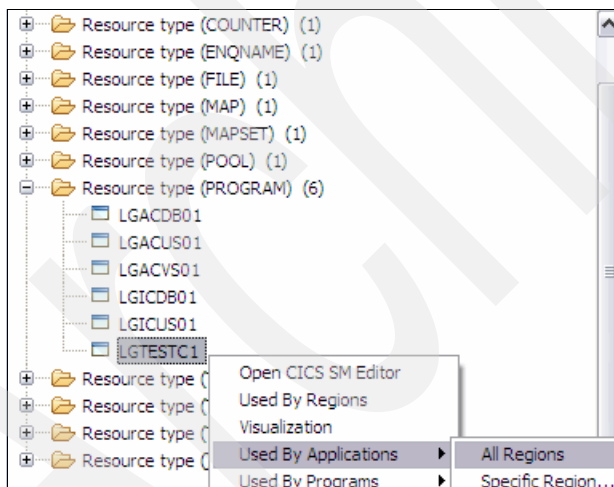


Figure 4-10 Check which applications use this program resource

Right-click and choose **Used by Applications** and **All Regions**. This is a new menu option that can be used on any resource. The application used will be shown in the Show Resources view; see Figure 4-11 on page 25.

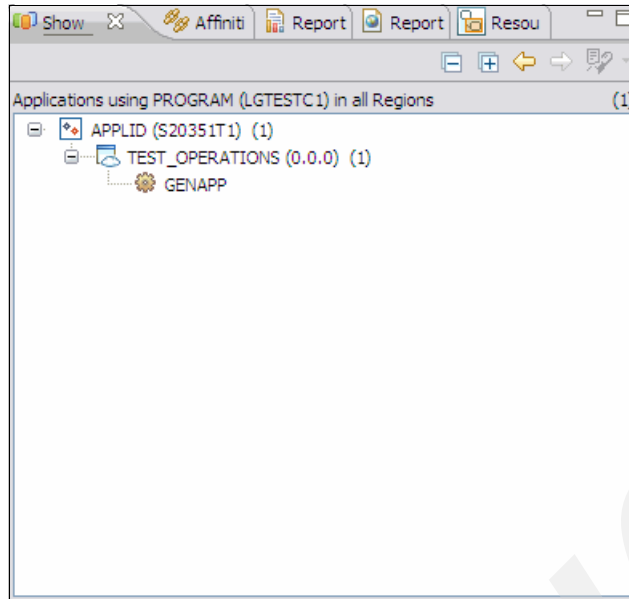


Figure 4-11 Show resources view

4.1.4 Defining the application

The CICS TS 5.1 Information Center website provides details about how to take the list of definitions and convert to bundles:

http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.applicationprogramming.doc/topics/cloud_deploy_intro.html

4.1.5 Deploying the application using CICS CM V5.1

CICS CM provides audit trail and version control capabilities for definitions. The CM perspective sits on top of the CICS SM perspective. For operations carried out through CM, the CM perspective will provide the definition history and the option to restore to a previous version.

To benefit from these capabilities, use CICS CM to create the platform and application definitions in your system's BAS repository.

From the CICS CM perspective, choose your BAS repository from within the Configurations view. From the **Definitions** menu, open the **Platform Definitions** view. Right-click in the view and choose **New**. Create the platform definition, referencing the platform directory on zFS where you exported the platform.

Make sure the History view is visible and select the newly created platform definition in the Platform Definitions view. The history for the platform definition will look similar to Figure 4-12 on page 26.

Revision Time	Resource Nam...	Resource Ty...	G	User Name	Configurat...	Command	C
2012/12/14 04:42:23	GNAPDE2	PLATDEF		CICSUSER	S203BAS	CREATE	
	changeAgentRel	0680					
	changeAgent	DREPAPI					
	createTime	2012/12/14 04:4...					
	TYPE	PLATDEF					
	name	GNAPDE2					
	description	General insuran...					
	changeTime	2012/12/14 04:4					

Figure 4-12 Platform definition history

CICS CM also shows history for repositories, for operations carried out using CICS CM. Right-click the newly created platform definition and delete it.

Right-click your BAS repository within the Configurations view and choose **Show history**. A history of all changes made to BAS using CICS CM is displayed, as shown in Figure 4-13.

Revision Time	Resource Nam...	Resource Ty...	G	User Name	Configurat...	Command	C
2012/12/14 04:44:12	GNAPDE2	PLATDEF		CICSUSER	S203BAS	DELETE	
2012/12/14 04:42:23	GNAPDE2	PLATDEF		CICSUSER	S203BAS	CREATE	
	changeAgentRel	0680					
	changeAgent	DREPAPI					
	createTime	2012/12/14 04:4...					
	TYPE	PLATDEF					
	name	GNAPDE2					
	description	General insuran					

Figure 4-13 History of BAS repository

Right-click the history entry representing the CREATE of the PLATDEF resource and select **Restore**. When you refresh the Platform Definitions view, you will see that the definition has been recreated.

Complete the installation of the platform and application using the instructions provided at the CICS TS 5.1 Information Center website:

http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.applicationprogramming.doc/topics/cloud_deploy_intro.html

4.2 Analyzing the performance of a CICS TS V5.1 application using CICS PA

IBM CICS Performance Analyzer (CICS PA) for z/OS is an offline performance analysis tool. It combines ease of use, flexibility, and the level of detail required to meet the performance challenges of businesses today. CICS PA is designed to accurately detail how your enterprise uses CICS resources. It provides detailed reports and views of all aspects of CICS system and application performance, while helping you collect and manage historical performance data.

CICS systems programmers and performance specialists can tailor these reports to quickly access the critical data they need. Along with application developers, they can benefit from the intuitive selection, tabular, and graphical views when using the CICS PA plug-in for the CICS Explorer. CICS PA helps you gain the insight you need to manage CICS systems effectively and enhance their function and efficiency.

CICS PA analysis programs use performance and accounting data written to IBM z/OS System Management Facilities (SMF) data sets to generate reports. CICS PA delivers over 230 standard report forms providing analysis ranging from various transaction performance reports, to reporting for trend analysis and capacity planning. Using the reporting interface of CICS PA, you can easily customize and generate performance reports and extracts without the use of any specialized programming languages or having in-depth knowledge of the SMF data layout.

4.2.1 Analyzing the performance of CICS TS V5.1 platforms and applications using CICS PA

For CICS TS V5.1, PA introduces an additional report and context-based options to enable performance analysis at platform, application, and operation levels.

Collecting performance data for CICS TS V5.1 platforms and applications

CICS TS V5.1 introduces six new performance metrics to help with performance analysis of your platforms and applications, namely ACPLATNM, ACAPPLNM, ACMAJVER, ACMINVER, ACMICVER, and ACOPERNM.

In addition, CICS PA V5.1 provides a new derived field, ACAPPLVR, to help with the analysis of application versions.

When the transactions, programs, and operations for your platforms and applications are executed, the CICS Performance Monitoring record is written to SMF. This monitoring record includes these new metrics.

CICS PA V5.1 provides a new Historical Data Base (HDB) template APPLNM51 (Explorer HDB for Appl Context) to enable loading this data to a Summary HDB, and then exporting to DB2. After the data is exported to DB2, it can then be analyzed using the CICS PA plug-in to the CICS Explorer.

When you define your new HDB using ISPF, use the HDB format template *Explorer HDB for Appl Context*.

Run your workload and collect performance data as usual.

Accessing performance data for CICS TS V5.1 platforms and applications

As mentioned, for CICS TS V5.1 applications you can analyze performance data at platform, application, version, and operation levels. An *operation* is a program that represents an entry point to your application. You can view performance data from the CICS PA perspective in CICS Explorer by choosing the Application context summary, or from the Cloud Explorer in the CICS Cloud perspective.

This section walks through the analysis of a problem with an application's slow response time. Make sure you have a CMCI or CICSplex SM Data interface connection active, and a CICS PA connection.

Switch to the PA perspective. From the Records view, use the toolbar button to access the table selector dialog and choose the *Application Context Performance Summary*; see Figure 4-14.

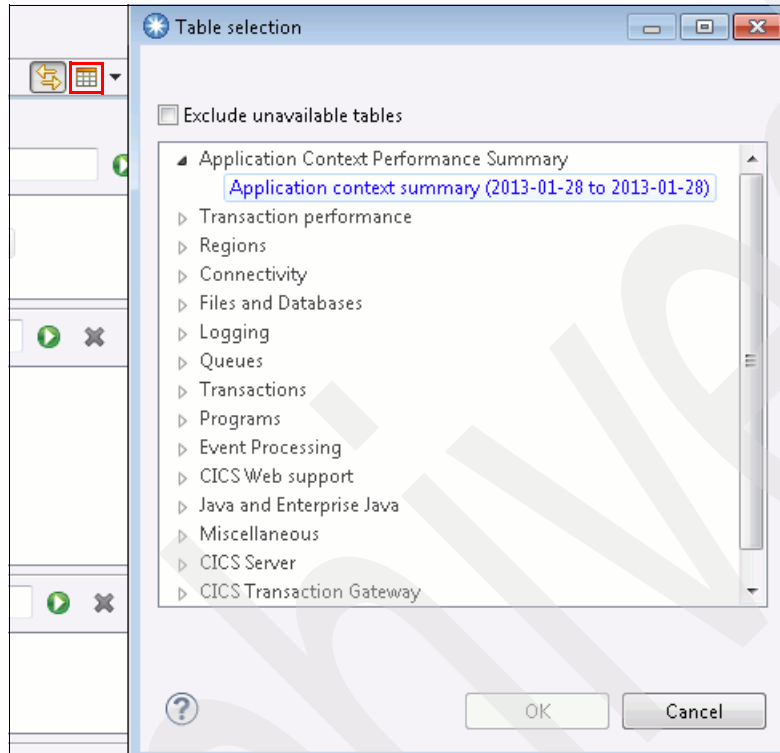


Figure 4-14 Using the table selection dialog to choose the Application context summary

Click the platform name in the Records view.

Customize your columns to facilitate analyzing a problem with slow response time. From the Application context summary view menu, choose **Customize Columns**; see Figure 4-15.

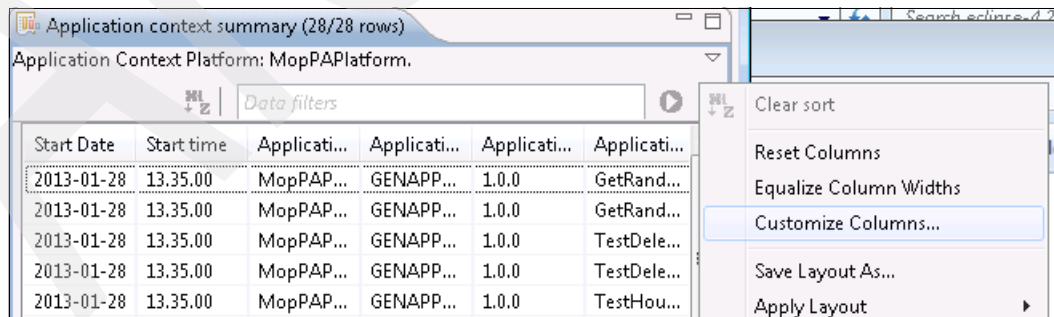


Figure 4-15 Application context summary view menu

Remove all columns other than Start Date, Start time, Application Operation name, Response time average, User CPU time average, and Total eligible offload time average. Select **Close** to shut the Customize Columns window.

Next, save the layout for future reference; from the view menu, choose **Save Layout As**. Give the layout a name and click **OK**. From the view menu, you can export and import layouts to share them with other people.

Drill down using the Records view through the Platform, Application name, Application version. At each level, the Application context summary view is updated to aggregate the performance records within the selected scope.

Compare the performance of two operations. Multi-select the operations in the Records view by holding the Ctrl key on the keyboard while selecting. The Application context summary view updates to show the performance data of both selected operations. Click the column heading **Response time average** twice to sort in descending order. Figure 4-16 shows a sort on average response time, with some columns removed for clarity.

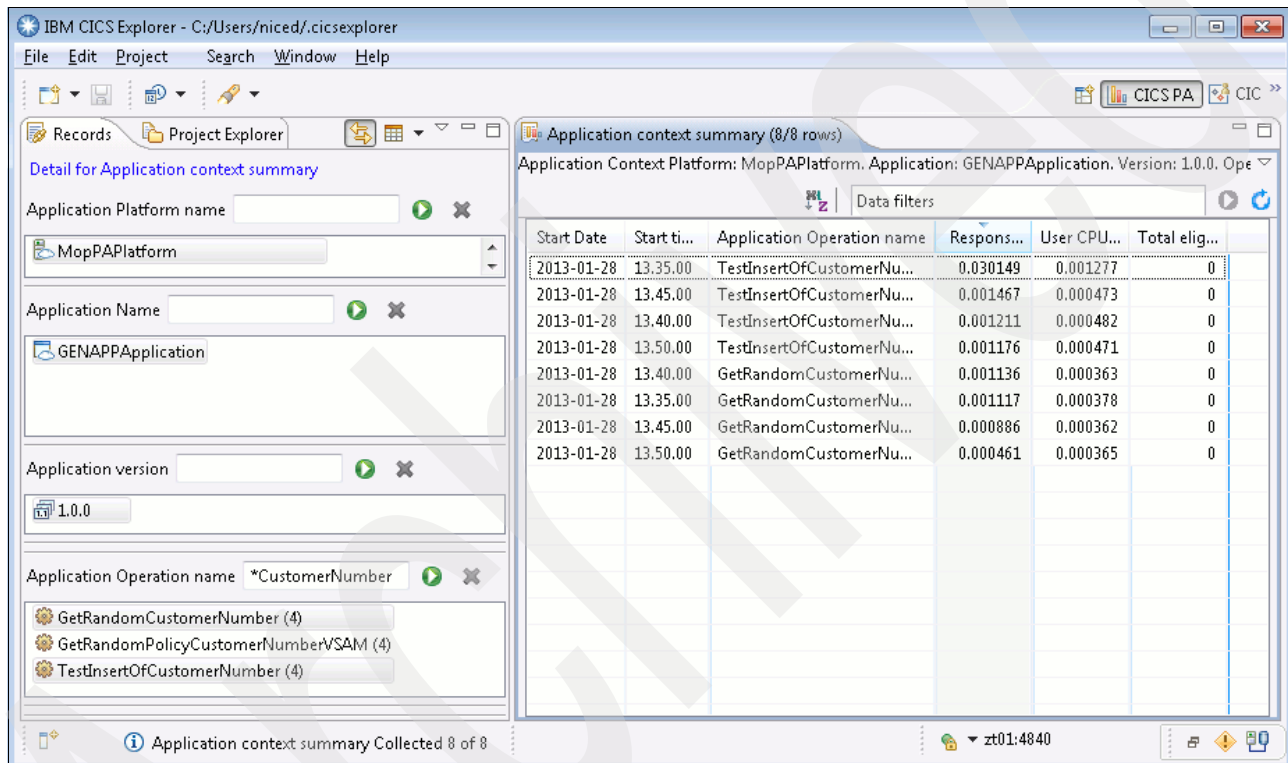


Figure 4-16 Comparing the performance of two operations over time

Apply a filter to show only the items with the highest User CPU time. CICS PA V5.1 provides content assist for filtering. In the filter box, type Use and press Ctrl+space. Choose **User CPU time average** from the list of suggestions. Type > 0.0004 and press the Enter key. The view updates to show only the rows with the highest User CPU time average; see Figure 4-17.

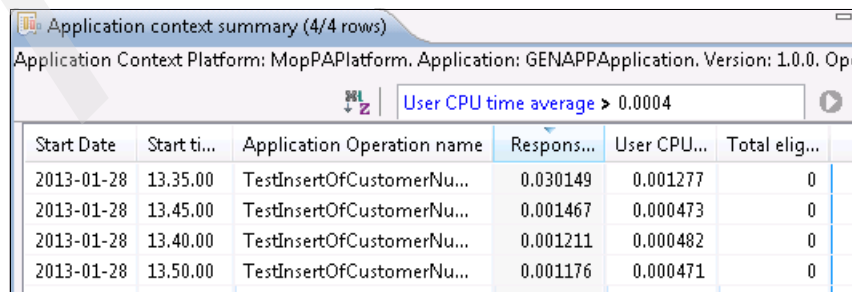


Figure 4-17 Filtering the results

In this case, the addCustomer operation looks to have a consistently slower response time than inquireCustomer. It can be useful to see more detailed information, so right-click the top table row and choose **Performance breakdown**.

The performance breakdown in Figure 4-18 shows that the majority of suspend time is caused by file waiting. This might be a useful area to view and reduce the time spent in the suspended state.

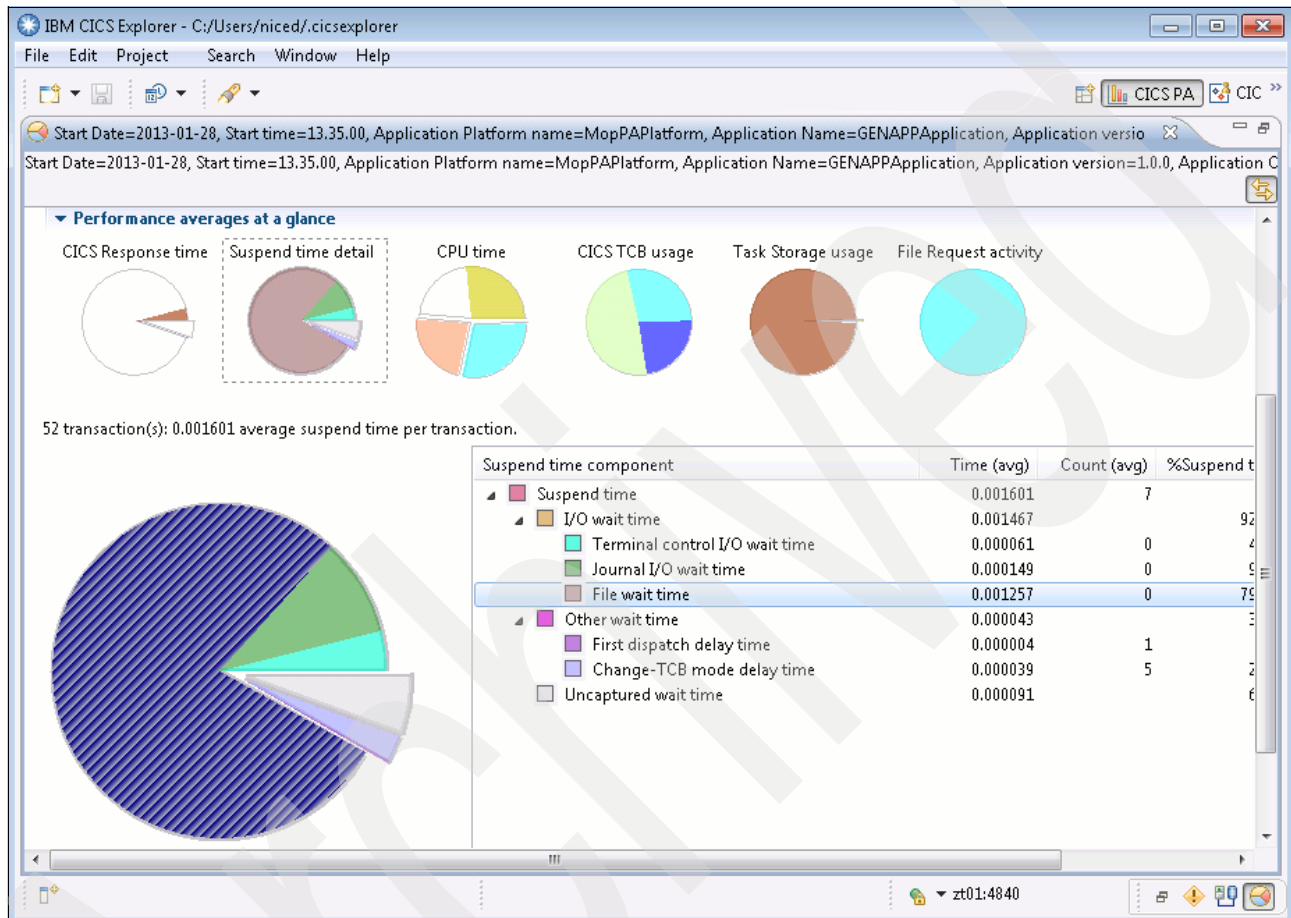


Figure 4-18 Performance breakdown for an operation showing a large proportion of file wait time

4.2.2 Accessing performance data from the Cloud Explorer

Switch to the CICS Cloud perspective. From within the Cloud Explorer, drill down to the level of an operation. Right-click the operation and choose **Application context summary**; see Figure 4-19 on page 31.

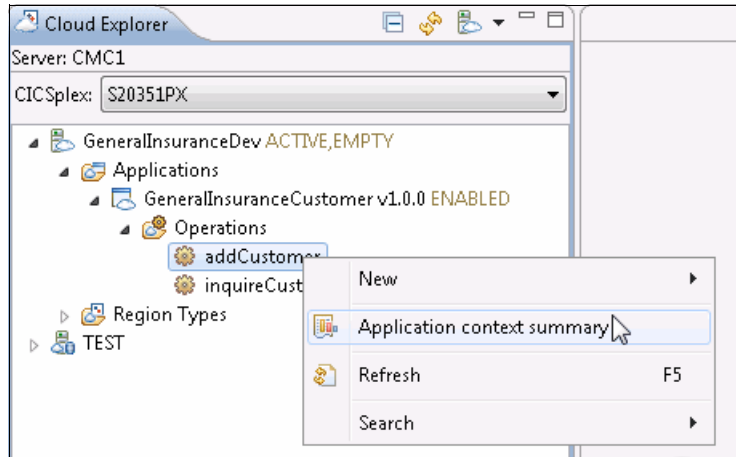


Figure 4-19 Context menu to access performance report from an operation

The Cloud Explorer context menu gives a quick context menu shortcut to relevant performance information. Using the PA perspective directly you can view and compare the performance of multiple operations simultaneously.

4.3 Working with traditional CICS definitions using CICS CM

For definitions that are not part of a first-class application, the CICS CM change package facility provides a way to group, approve, and migrate changes between CSDs as one unit.

In this section, you will see how to migrate definition updates and commands, using the example of a hosted connections preferences file.

Using the Host Connections view in CICS Explorer V1.1.1 onwards, you can export and import connections preferences files. CICS can host an exported preferences file from zFS and provide the file contents as a response to HTTP connections, by combining a URIMAP and TCP/IPSERVICE. These definitions must be part of a resource group, for CICS CM to be able to work with them.

4.3.1 Adding definitions to a change package

Within the Change Packages view in the CM perspective in the CICS Explorer, right-click and choose **New** or click the plus sign (+) icon in the toolbar.

Enter a name and a description for the new change package and click **OK**. The Change Packages view refreshes to show the new change package.

Start by adding the TCP/IP service definition to the change package. Switch to the TCP/IP Service Definitions view and choose the appropriate CSD from the Configurations view. The TCP/IP Service Definitions view updates to show TCP/IP service definitions stored within the CSD. Show the Resource Group Definitions view and scope by the appropriate resource group. Right-click the TCP/IP service definition and choose **Add to Change Package**, as shown in Figure 4-20 on page 32. Choose the change package you created earlier.

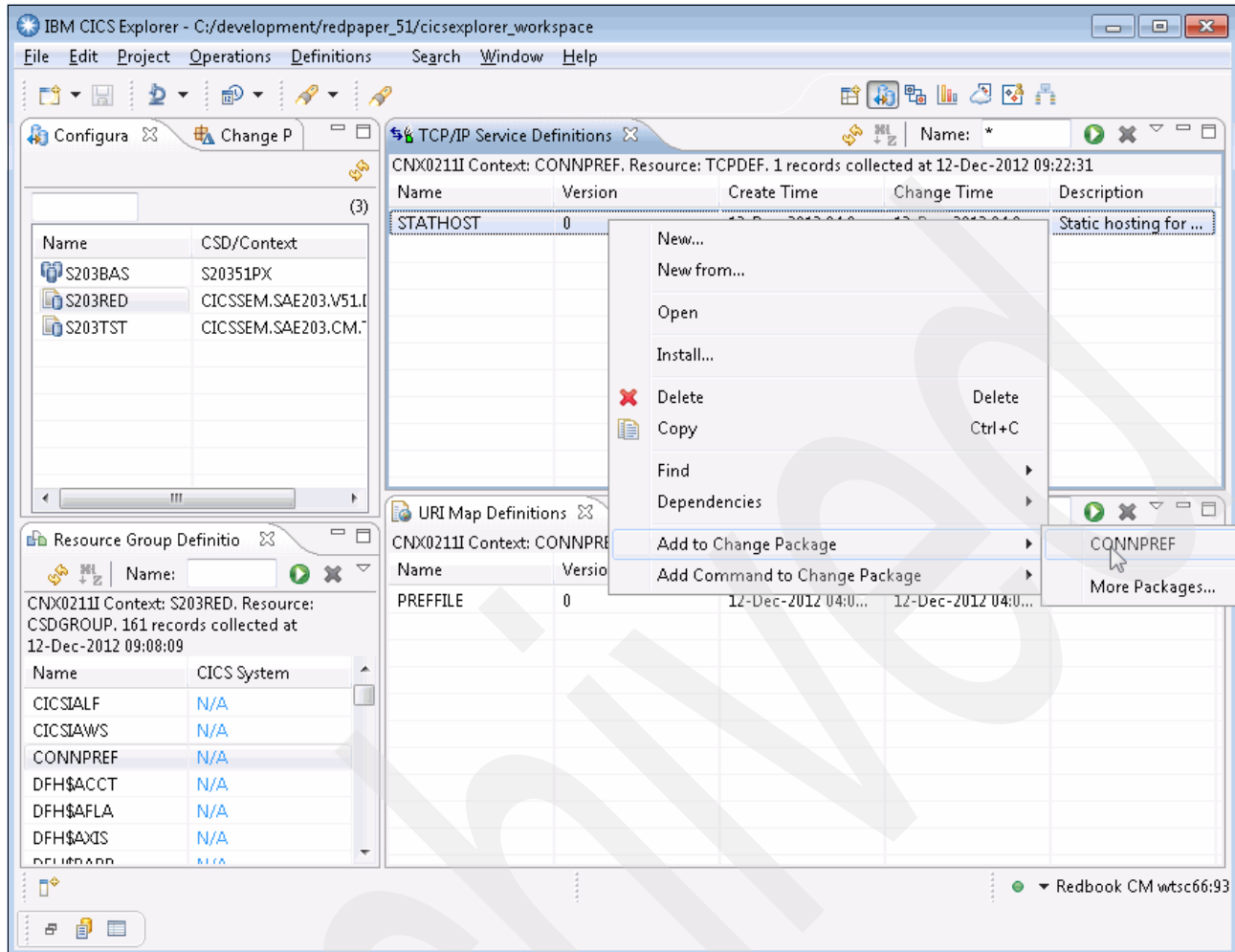


Figure 4-20 Adding a definition to a change package

The TCP/IP service definition is now part of the change package. Also add the URIMAP definition.

4.3.2 Adding commands to a change package

To make sure the definitions get installed when the region is started, the resource group that they are in must be part of the correct group list. Change packages can contain commands to manage resource groups

Add a command to the change package to add the resource group to the correct group list during the migration.

From the Change Packages view, right-click your new change package and Add Command to Change Package. Under Source Definitions, choose your development Configuration and resource group that you want to become part of the group list in the test CSD, then click the **Add** button. Next, under Command, choose **Add** and pick the test CSD and target group list; see Figure 4-21 on page 33.

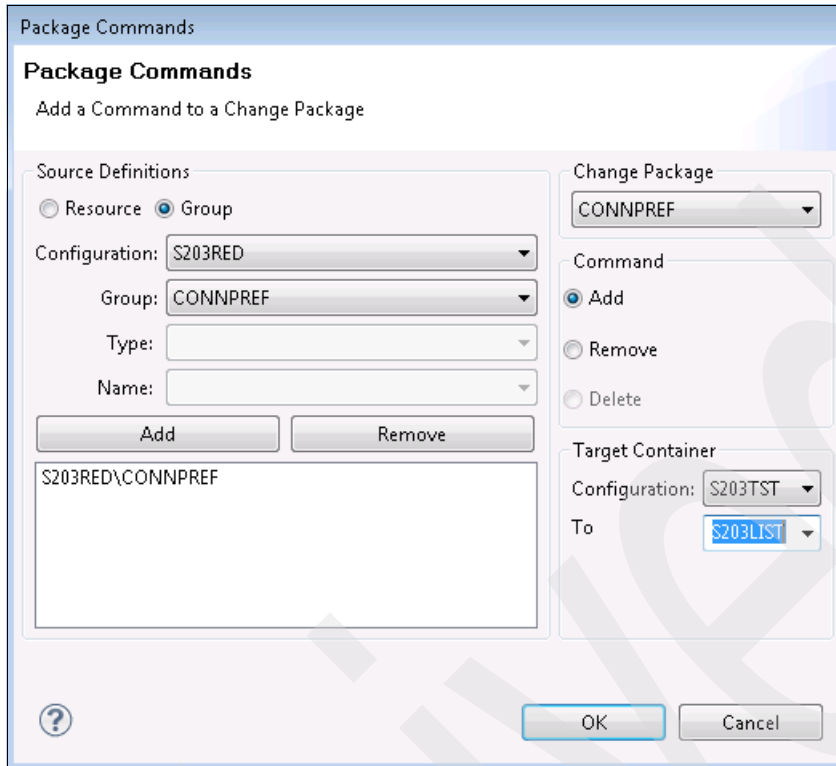


Figure 4-21 Add command dialog

4.3.3 Migrating definitions in a change package

A change package must be marked as ready before it can be migrated.

Open your change package by double-clicking it. Because your change package is not ready, you will see an error message with a reason code.

Right-click your change package, choose **Ready** and then select your migration scheme; see Figure 4-22.

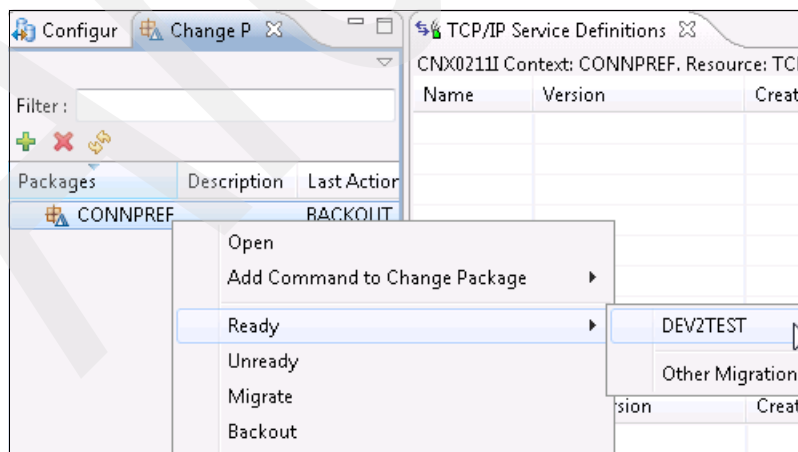


Figure 4-22 Change package context menu

You can choose to make the change package ready before the change package wizard is completed, or to generate JCL in a data set that can be run ready the change later. Leave Process action immediately selected and click **Next**, then **Finish** the wizard.

Migrate the change package by right-clicking it and choosing **Migrate**. In the same way as we made the change package ready, choose to process the action immediately.

You might receive a warning that a DFHEDAP exception occurred. This warning is produced as part of the new group list creation.

4.3.4 Viewing change package history and backing out changes

Open your change package by double-clicking it and switch to the History tab at the bottom of the editor. Tick the check box representing the migration scheme you used to migrate the change package; see Figure 4-23.

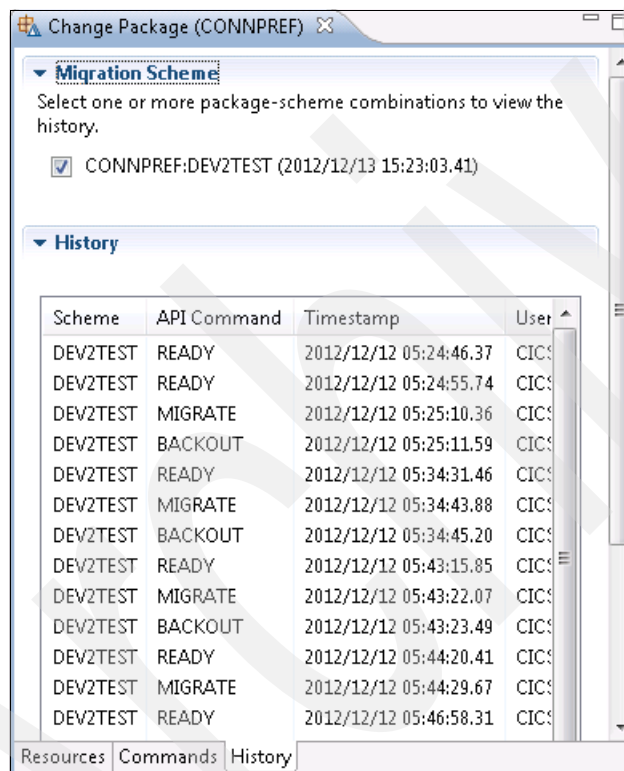


Figure 4-23 Change package editor showing history

The migration tab shows a list of actions taken on the change package, along with details about who carried out each action and its result. You can view specific history about each action by clicking it; the history view will show information about the selected action.

After you have identified a change package migration you want to back out, right-click the change package in the Change Packages view and choose **Backout**. Select the action from the list; see Figure 4-24 on page 35.

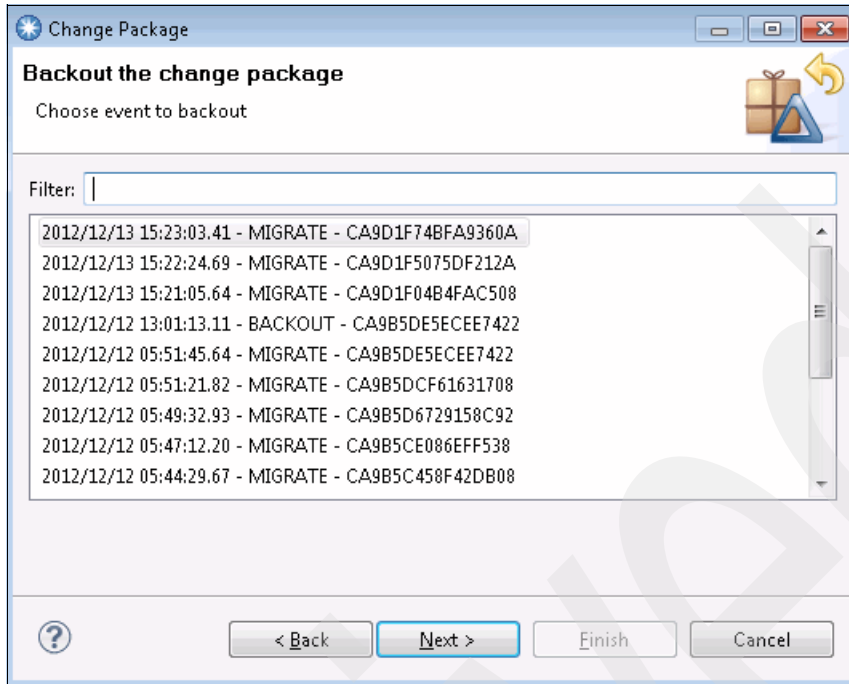


Figure 4-24 History in change package backout dialog

Click **Next** and then complete the wizard to back out the migration.

Archived

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this paper.

IBM Redbooks

The following IBM Redbooks publications provide additional information about the topic in this document. Note that some publications referenced in this list might be available in softcopy only.

- ▶ *Implementation of Popular Business Solutions with CICS Tools*, REDP-4824

You can search for, view, download or order these documents and other Redbooks, Redpapers, Web Docs, draft and additional materials, at the following website:

ibm.com/redbooks

Online resources

These websites are also relevant as further information sources:

- ▶ CICS TS 5.1 Information Center site

http://pic.dhe.ibm.com/infocenter/cicsts/v5r1/topic/com.ibm.cics.ts.applicationprogramming.doc/topics/cloud_deploy_intro.html

Help from IBM

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Modernize Your Application Infrastructure with IBM CICS Tools V5.1



Transition your applications into a CICS TS V5.1 environment

This IBM Redpaper publication shows how CICS® V5.1 Tools can help modernize your CICS applications, making them more portable and improving your audit and rollback facilities.

Analyze the performance of a CICS TS V5.1 application using CICS PA

The paper presents you with several scenarios involving a sample general purpose application to demonstrate ways to modernize a traditional CICS application using CICS tools.

Work with traditional CICS definitions using CICS IA and CM

It will be of interest to various parties in your organization, including managers, architects, application developers, system administrators, and performance specialists.

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