

Five Compelling Reasons for Creating a CICS Cloud

Matthew Webster

IBM STSM, CICS meets the cloud

Please Note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

Abstract

Cloud computing is one of the fastest growing technologies and more applications and services are being provided through the cloud to offer cost saving and scalability. CICS TS V5 delivers a pattern based, policy managed, private CICS cloud environment, improving the agility of CICS application deployments whilst reducing the risk of implementation errors. We'll share five compelling reasons for you to create a CICS cloud.

Why do I need to create a CICS cloud?

- Agile methodologies allow developers to increase the rate of change of applications in response to business needs
- IT operations needs to respond by deploying applications into production more frequently while reducing cost and maintaining reliability
- A CICS cloud allows you to deploy new applications, application features or bug fixes while minimizing any impact to existing users or requiring additional infrastructure

Five Compelling Reasons

1. Web Scenario: New Features
2. Traditional 3270 Scenario: Bug Fix
3. MQ Scenario: Phase In
4. Server Consolidation Scenario
5. Application Modernization Scenario

SCENARIOS

Web Scenario: New Features

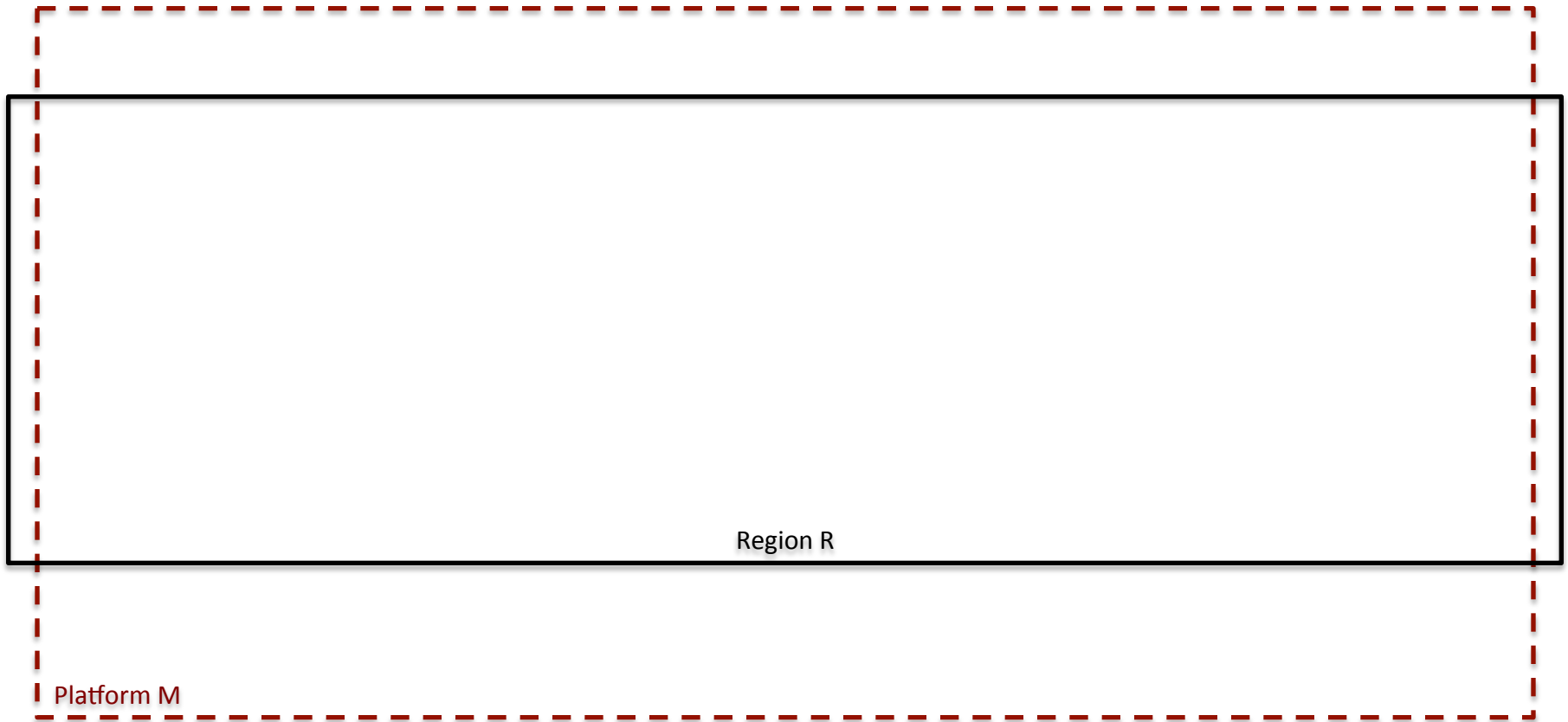
“The mobile guys need a new feature but I’m concerned about the potential performance impact for the existing high volume web site. This is a pilot so I really don’t want to spin up new regions just to support a few users. I’m also still trying to move the back office users off an old version of the application.”

A CICS **Region**: what you already know (and love)

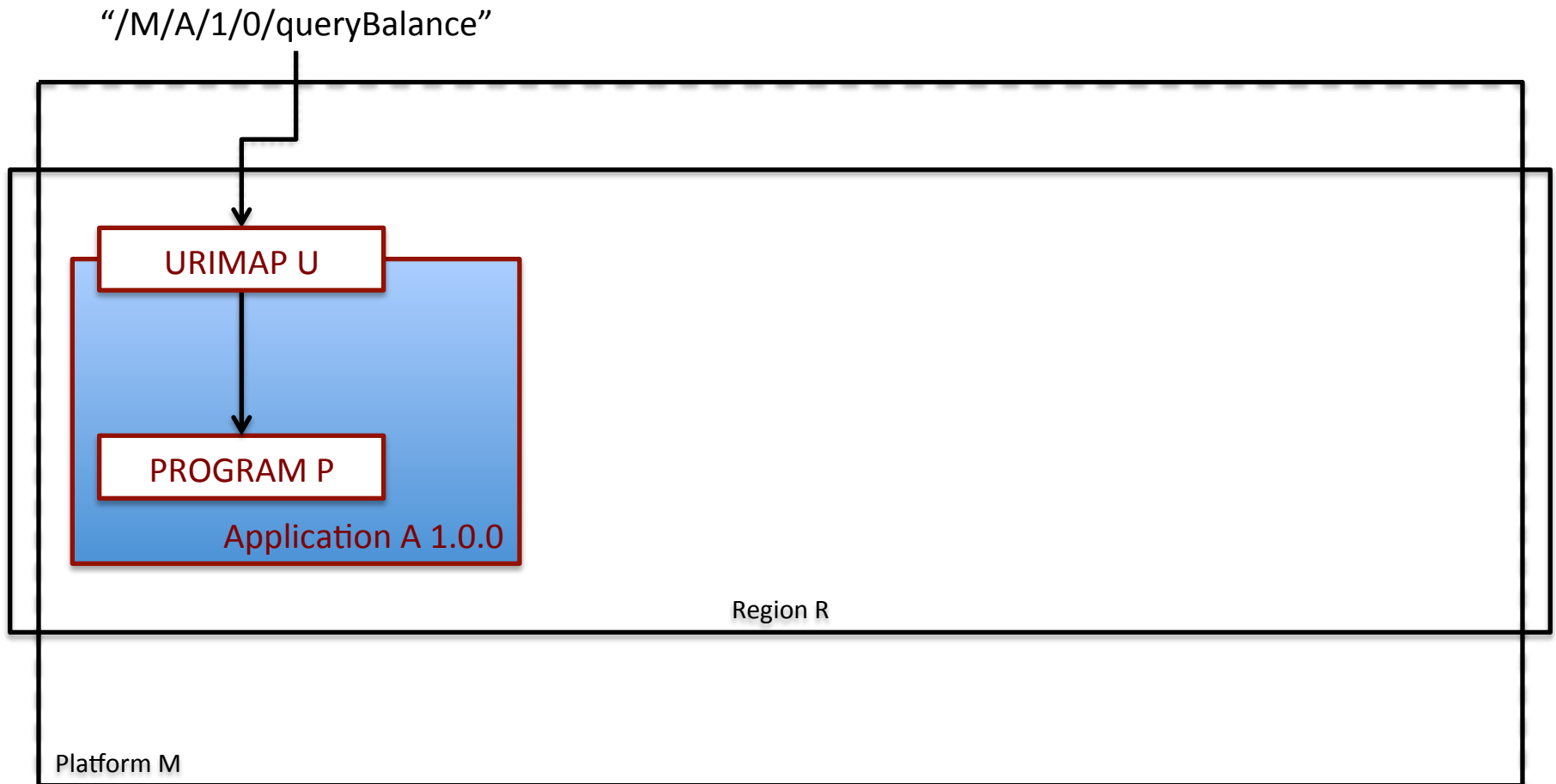


Region R

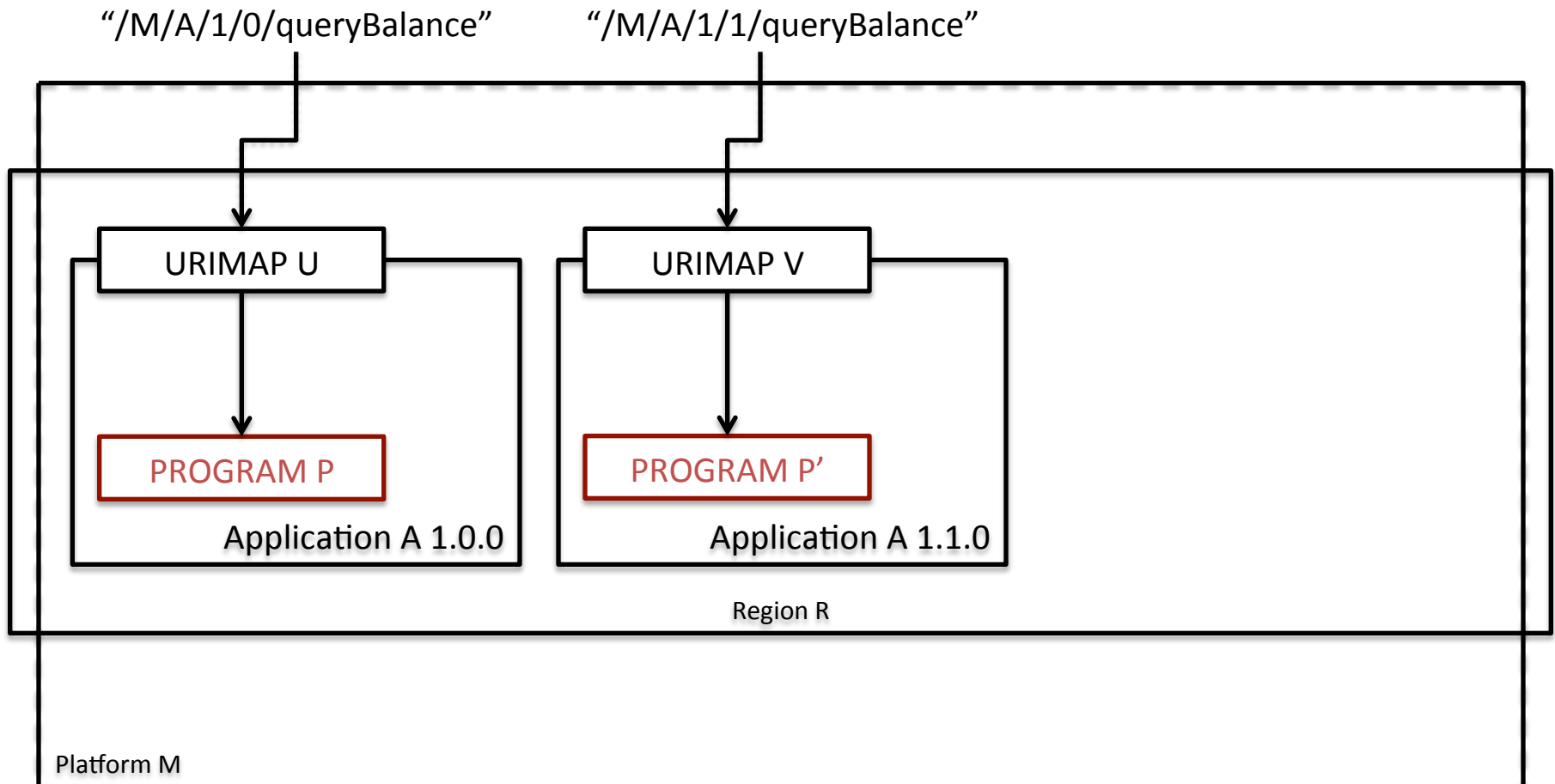
A CICS **Platform**: abstraction of underlying CICS Region topology to simplify deployment



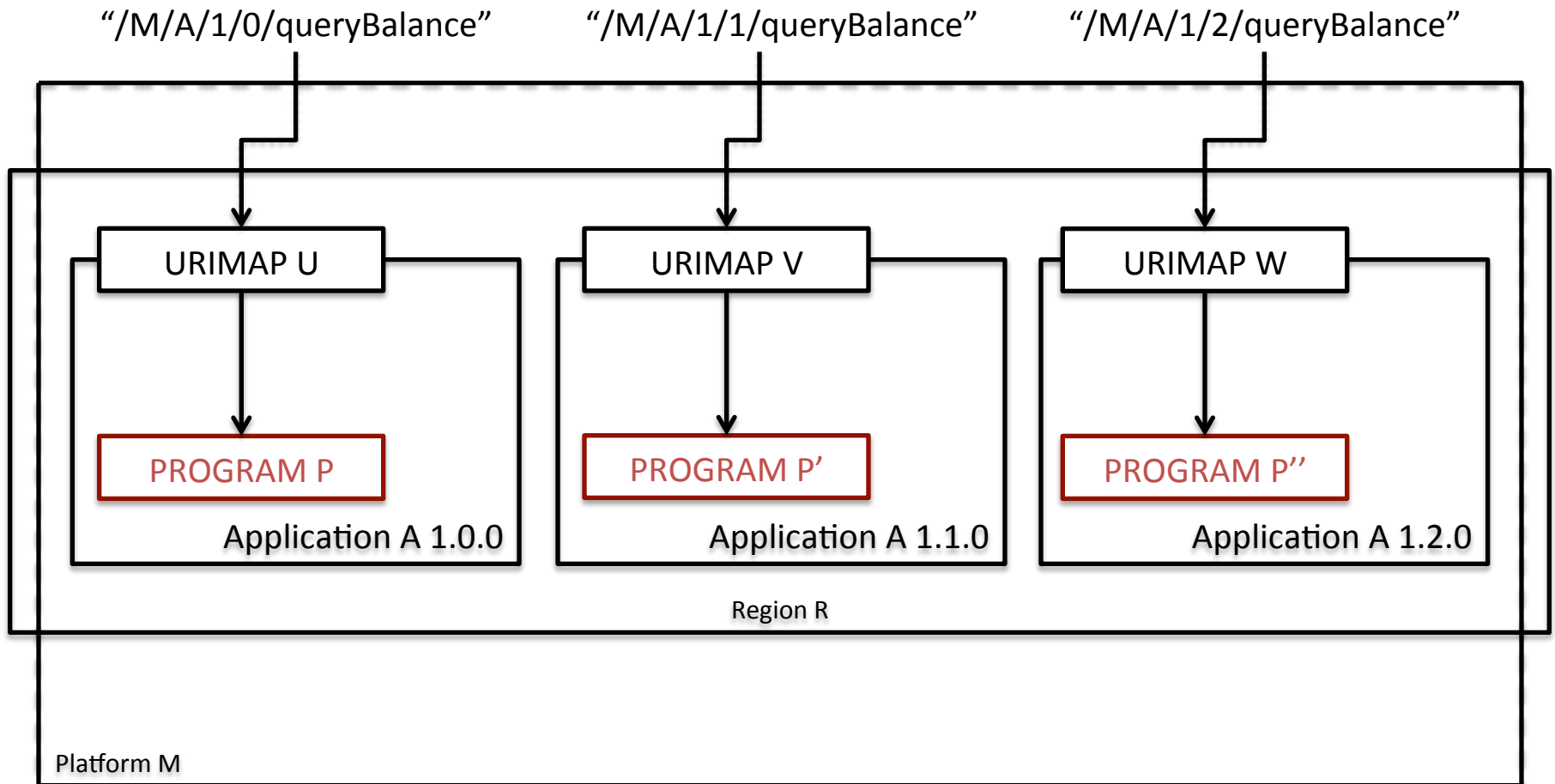
A CICS **Application**: name, version, entry point and now resources



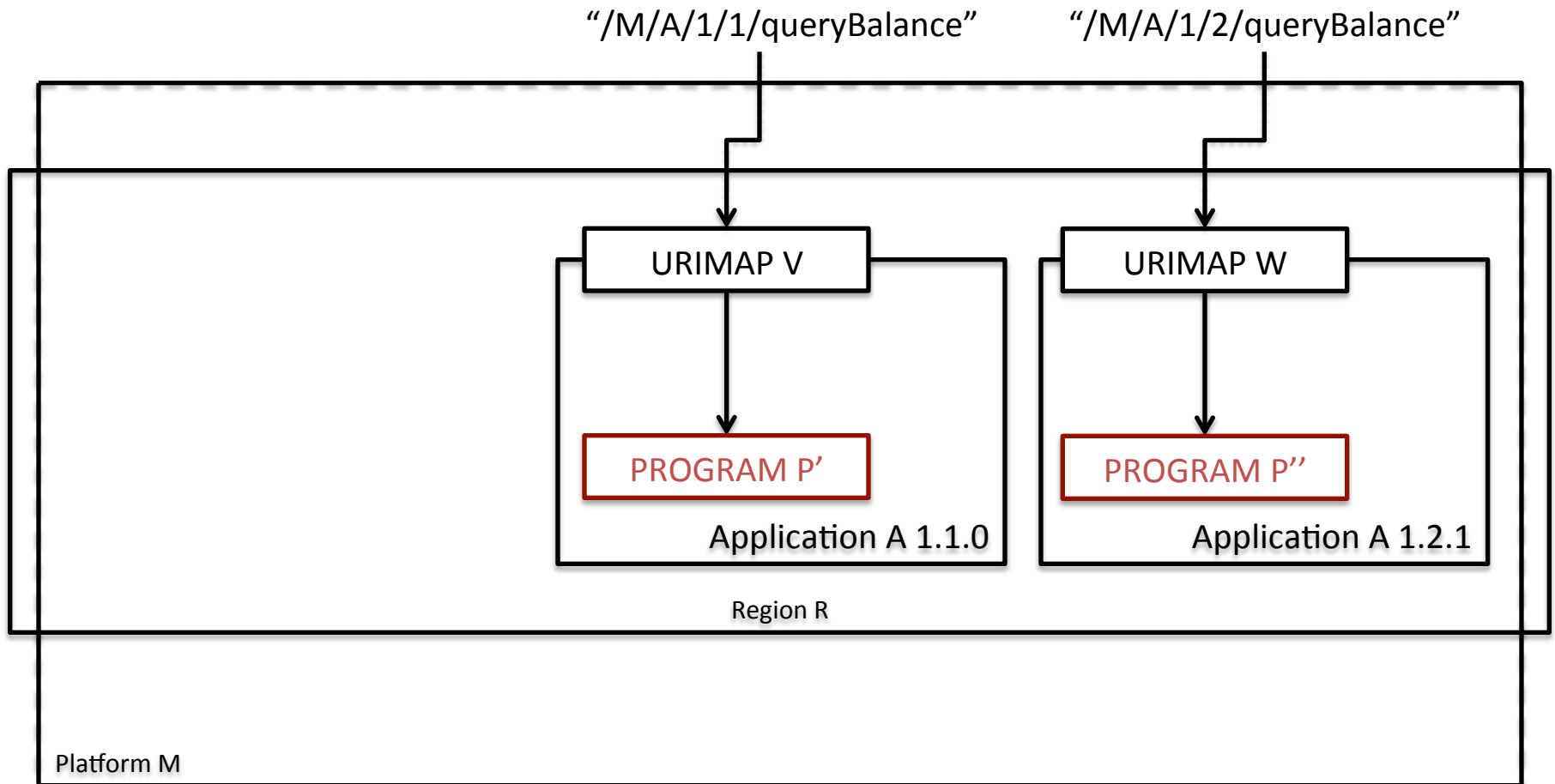
Application versions 1.0.0 & 1.1.0 are hosted on the same Region(s) each define **PROGRAM P**



Can simply add version 1.2.0 without affecting the users of versions 1.0.0 and 1.1.0



Can eventually retire version 1.0.0 when users have moved to a higher version (by looking at Monitoring data)



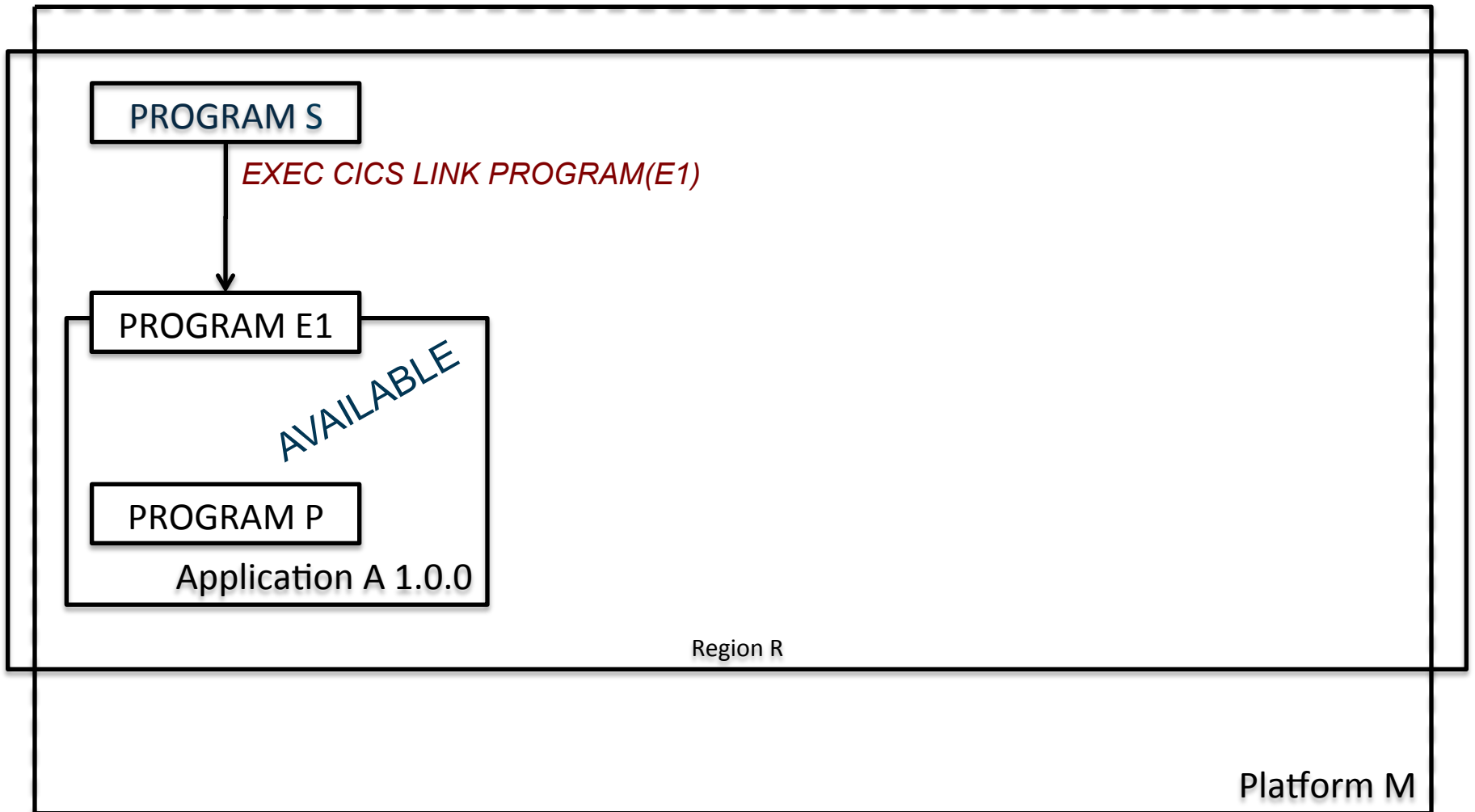
DEMO

http://ibmtvdemo.edgesuite.net/software/http/cics/2014_06_05_2311_Cloud_web_application_concurre.mp4

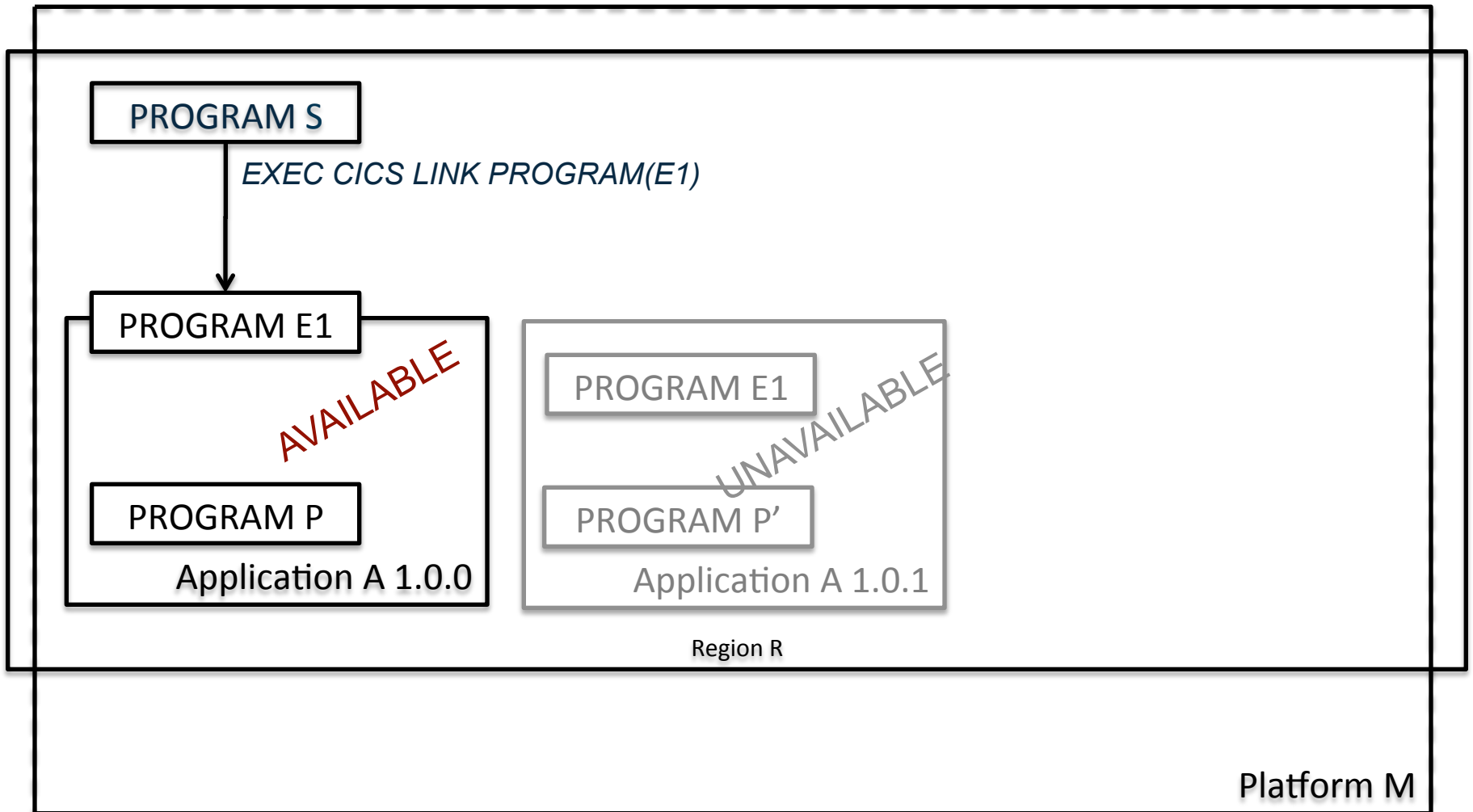
Traditional 3270 Scenario: Bug Fix

“I need to apply a hot fix to an application in production but I want to use the same process that I use for my weekly updates so I get an audit trail and correct monitoring data. I really want to make sure it’s installed correctly before making it live while the existing version is still being used. Also if the update makes things worse I want to rollback the change as quickly as possible”

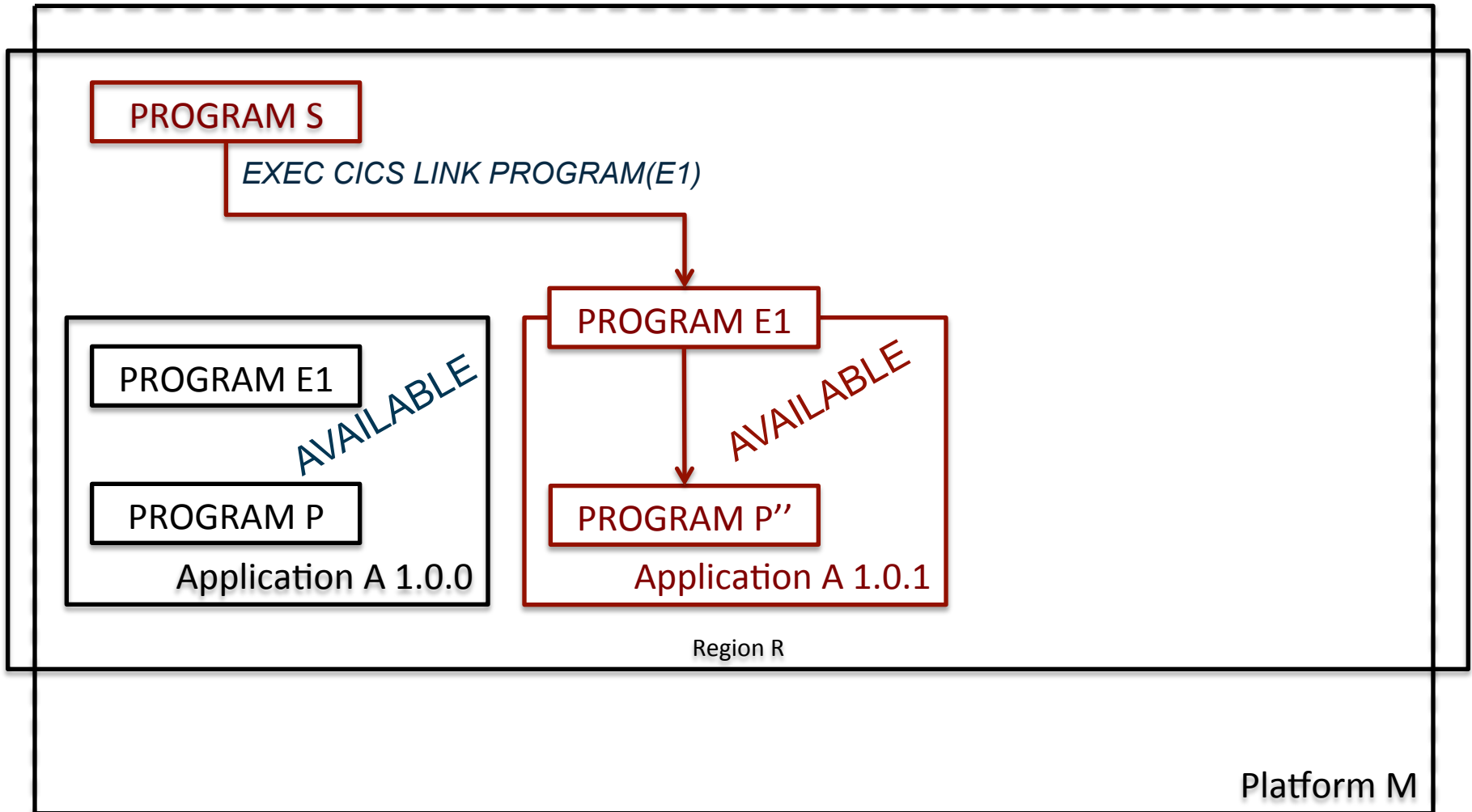
Application version 1.0.0 has a bug



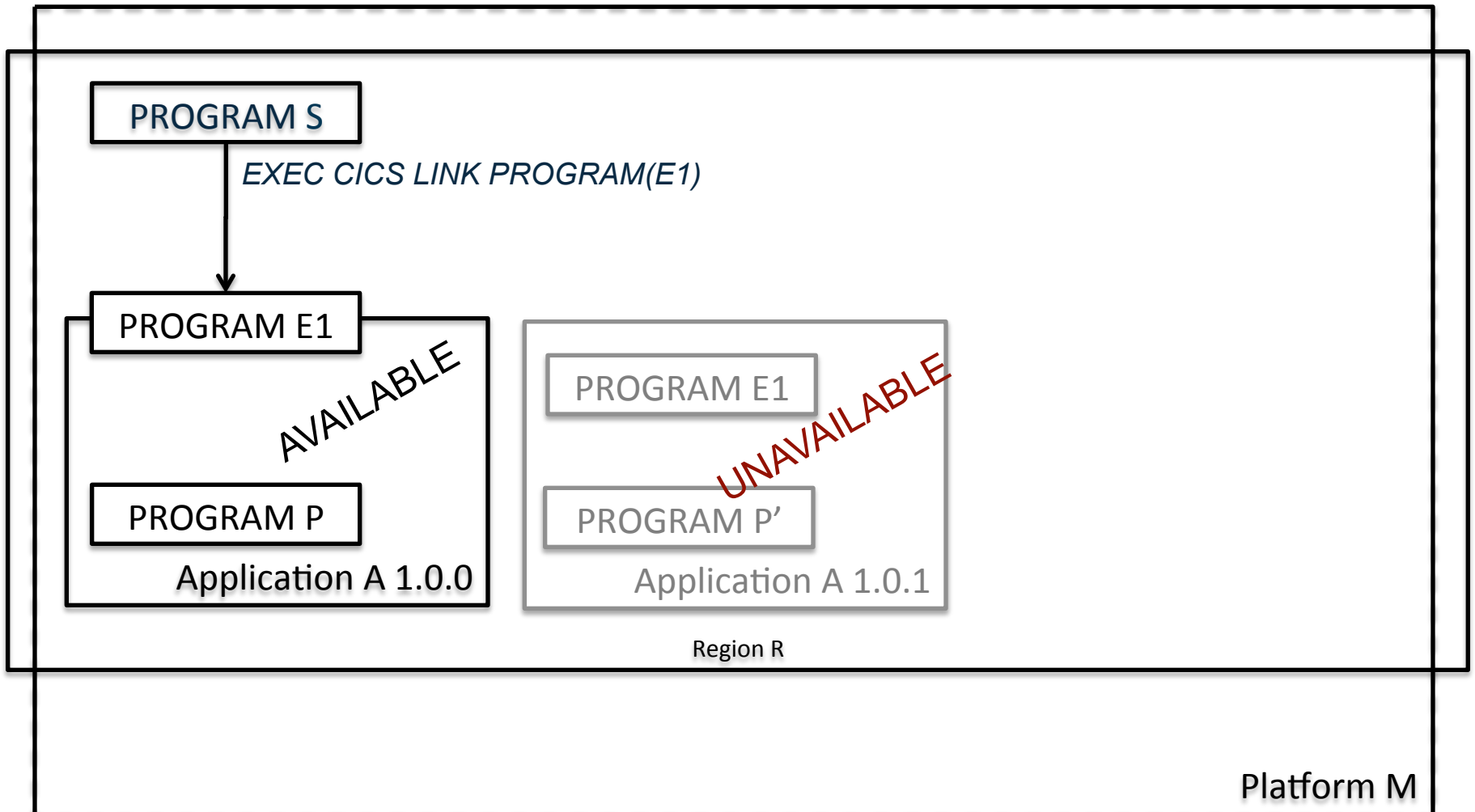
INSTALL and ENABLE version 1.0.1 but requests still go to version 1.0.0



Make application version 1.0.1 **AVAILABLE** so it receives new requests



If there is a problem make version 1.0.1
UNAVAILABLE to rollback to version 1.0.0



DEMO

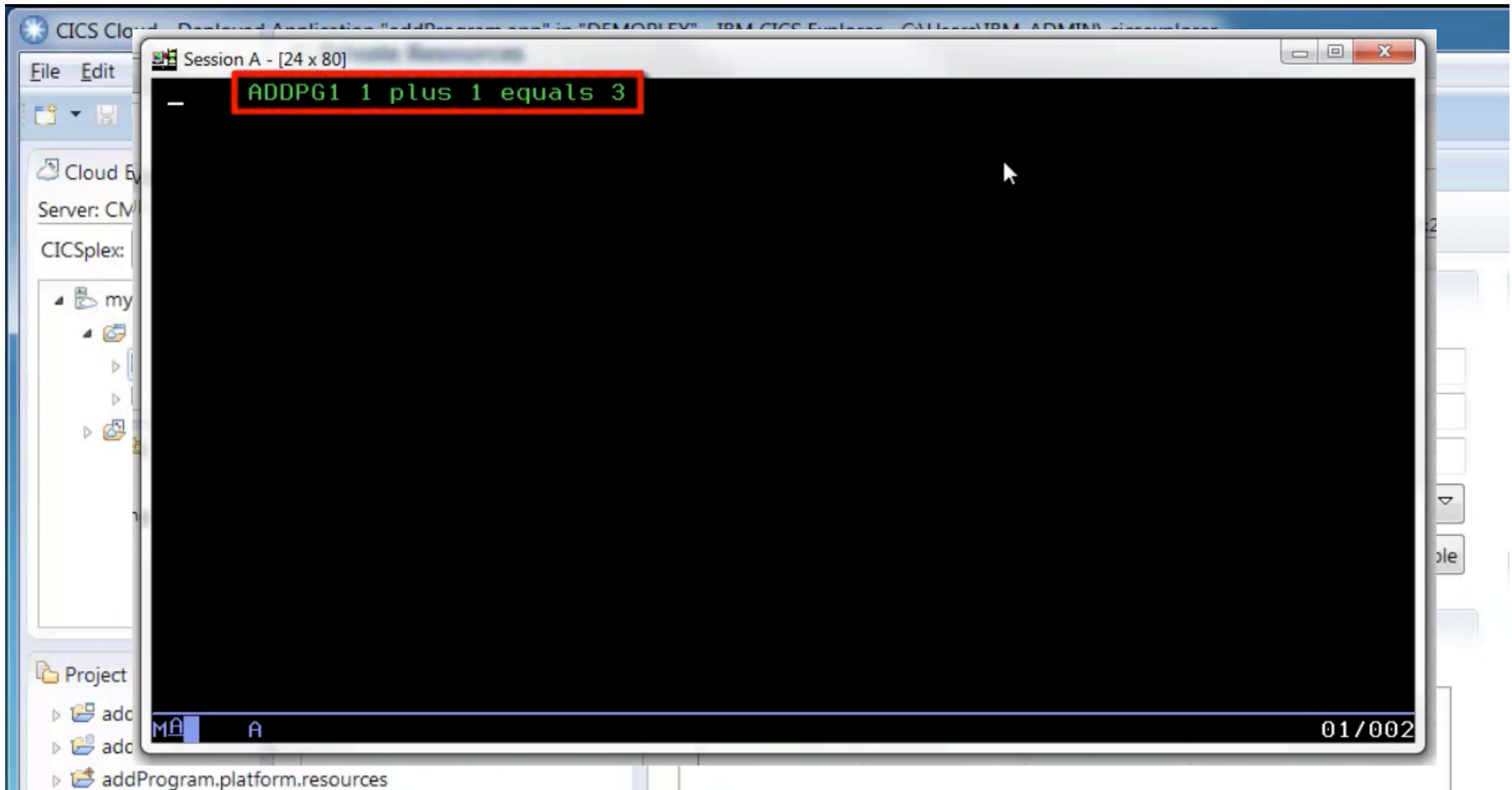
http://ibmtvdemo.edgesuite.net/software/http/cics/2014_06_05_2546_Cloud_application_update_video.mp4

Application addProgram.app version 1.0.0 is enabled and available

The screenshot displays the IBM CICS Explorer interface. The title bar indicates the context: "CICS Cloud - Deployed Application 'addProgram.app' in 'DEMOPLEX' - IBM CICS Explorer - C:\Users\IBM_ADMIN\cicsexplorer". The main window is divided into several panes:

- Cloud Explorer:** Shows the server "CMAS" and the CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", the "Applications" folder is expanded, showing "addProgram.app (1.0.0) ENABLED,AVAILABLE" selected, and "addProgram.app (1.0.1) DISABLED,UNAVAILABLE".
- Project Explorer:** Lists the project files: "addProgram.app", "addProgram.app_my.demo.platform_binding", and "addProgram.platform.resources".
- Application (addProgram.app (1.0.0)) Overview:** Provides details for the selected application:
 - General Information:** This section describes general information about this application.
 - Name: addProgram.app
 - Version: 1.0.0
 - Description: Financial application to add numbers together
 - Status: ENABLED (with "Enable" and "Disable" buttons)
 - Availability: AVAILABLE (with "Make Available" and "Make Unavailable" buttons)
 - CICS Bundles:** The CICS bundles installed as part of this application are shown here.
 - addprogram.resources (1.0.0) ENABLED,AVAILABLE

However, it has a bug ...

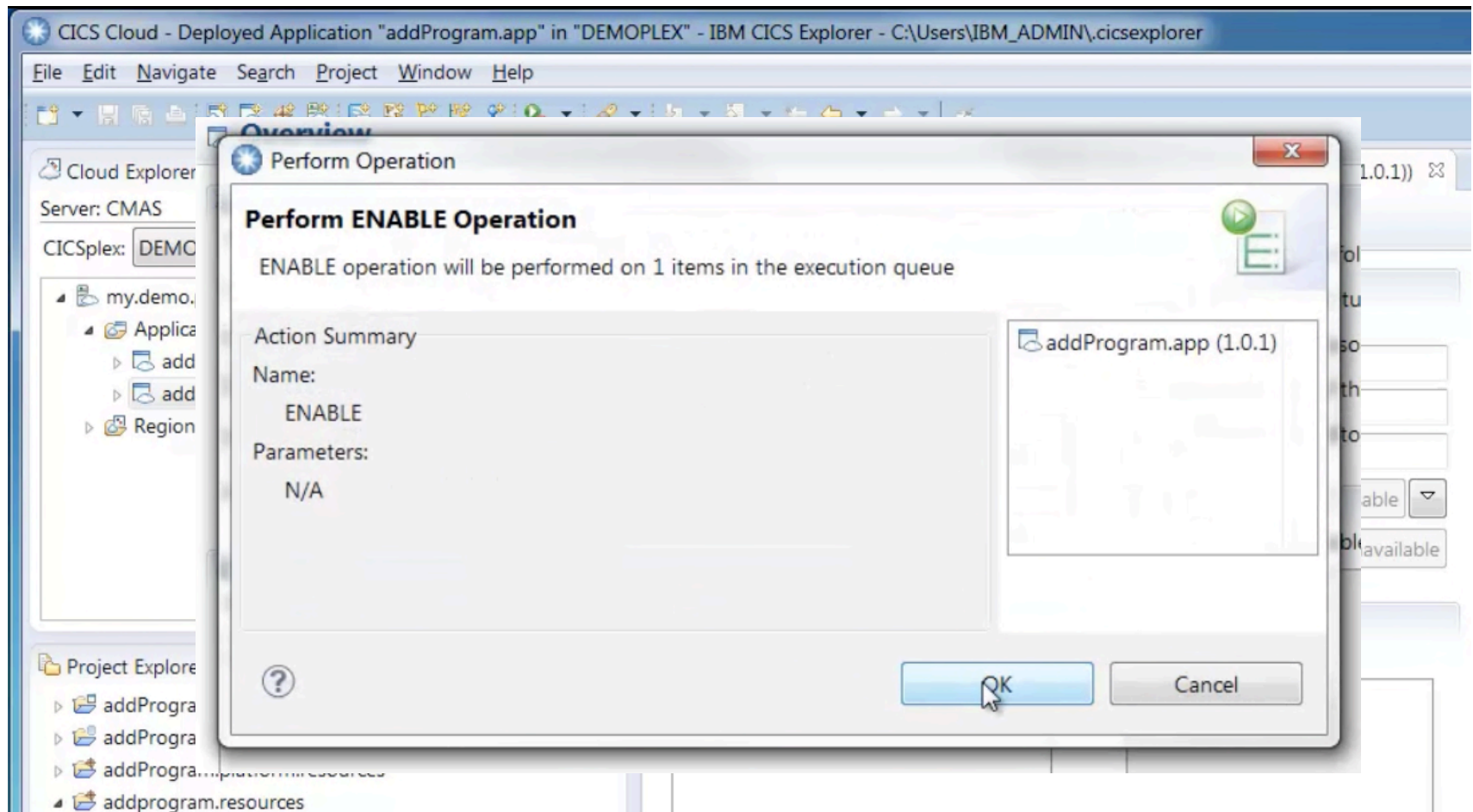


To fix the bug we first enable version 1.0.1 of addProgram.app

The screenshot displays the IBM CICS Explorer interface for a deployed application named "addProgram.app" in the "DEMOPLEX" environment. The interface is divided into several panes:

- Cloud Explorer:** Shows the server "CMAS" and CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", the "Applications" folder contains "addProgram.app (1.0.0) ENABLED,AVAILABLE" and "addProgram.app (1.0.1) DISABLED,UNAVAILABLE". The latter is highlighted with a red box.
- Project Explorer:** Lists the project structure, including "addProgram.app", "addProgram.app_my.demo.platform_binding", "addProgram.platform.resources", and "addprogram.resources".
- Application (addProgram.app (1.0.1)) Overview:** Provides general information:
 - Name: addProgram.app
 - Version: 1.0.1
 - Description: Financial application to add numbers together
 - Status: DISABLED
 - Availability: UNAVAILABLEButtons for "Enable", "Disable", "Make Available", and "Make Unavailable" are visible. The "Enable" button is highlighted with a mouse cursor.
- CICS Bundles:** Shows "addprogram.resources (1.0.1) DISABLED,UNAVAILABLE".

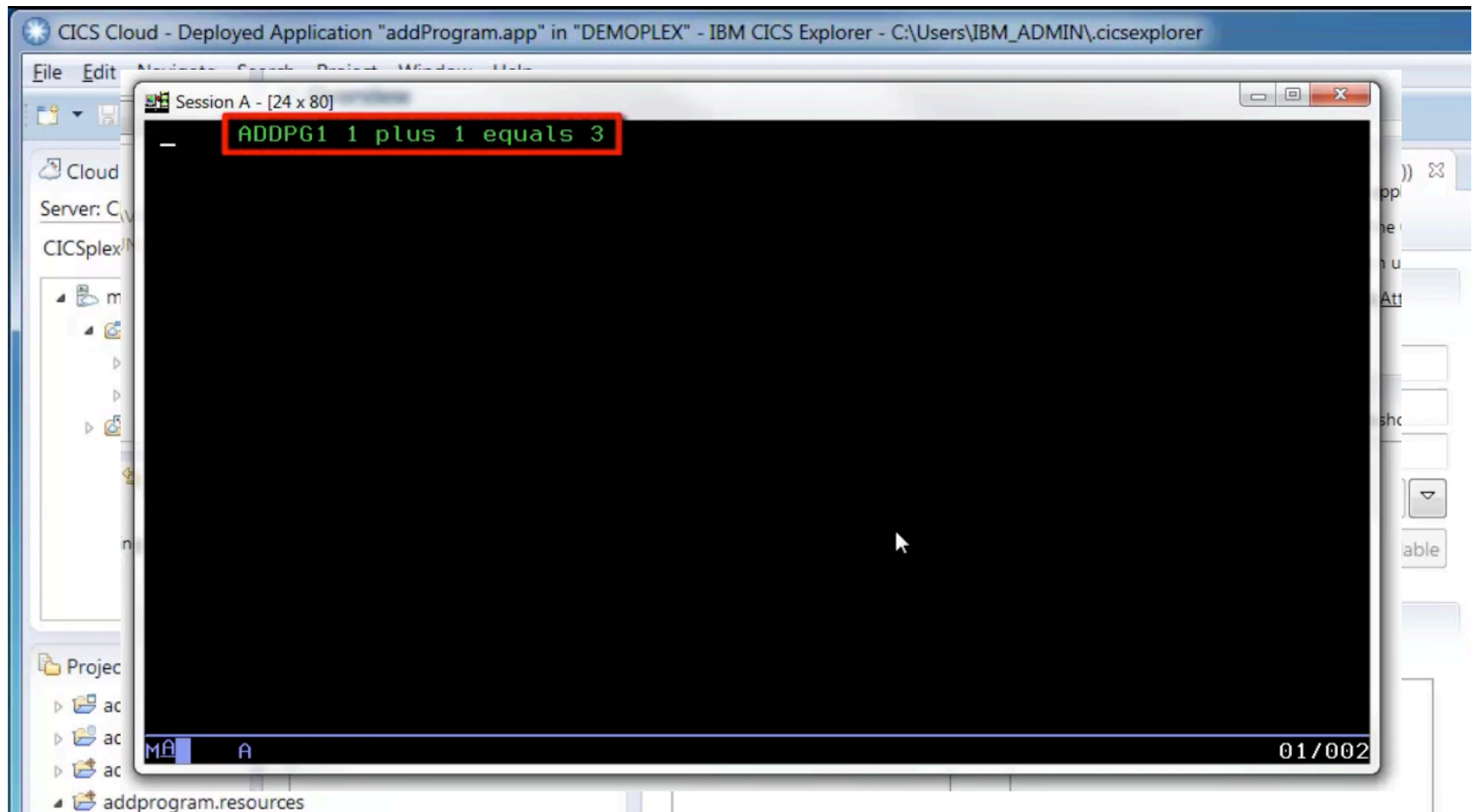
To fix the bug we first enable version 1.0.1 of addProgram.app ...



... ensuring it was deployed correctly
and its dependencies are satisfied

The screenshot displays the IBM CICS Explorer interface. The title bar reads "CICS Cloud - Deployed Application 'addProgram.app' in 'DEMOPLEX' - IBM CICS Explorer - C:\Users\IBM_ADMIN\cicsexplorer". The interface includes a menu bar (File, Edit, Navigate, Search, Project, Window, Help) and a toolbar. On the left, the "Cloud Explorer" pane shows the server "CMAS" and CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", the "Applications" folder contains "addProgram.app (1.0.0) ENABLED,AVAILABLE" and "addProgram.app (1.0.1) ENABLED,UNAVAILABLE" (highlighted with a red box). The "Region Types" folder is also visible. The "Project Explorer" at the bottom left shows the project structure: "addProgram.app", "addProgram.app_my.demo.platform_binding", "addProgram.platform.resources", and "addprogram.resources". The main right pane shows the "Overview" for the selected application "addProgram.app (1.0.1)". The "General Information" section includes: Name: addProgram.app, Version: 1.0.1, Description: Financial application to add numbers together, Status: ENABLED (with Enable/Disable buttons), and Availability: UNAVAILABLE (with Make Available/Make Unavailable buttons). The "CICS Bundles" section lists "addprogram.resources (1.0.1) ENABLED,UNAVAILABLE".

But users still access addProgram.app version 1.0.0

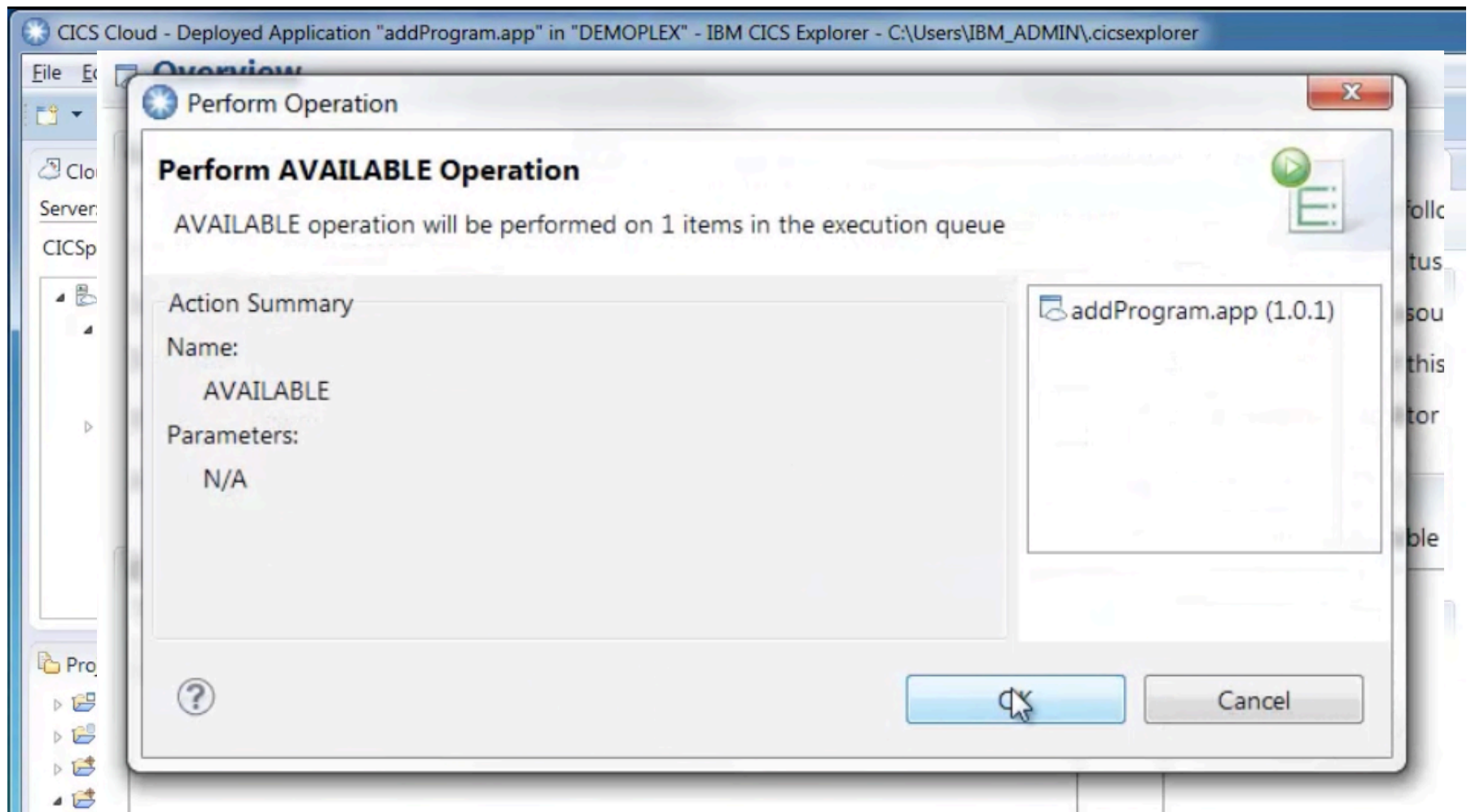


We now make addProgram.app version 1.0.1 available

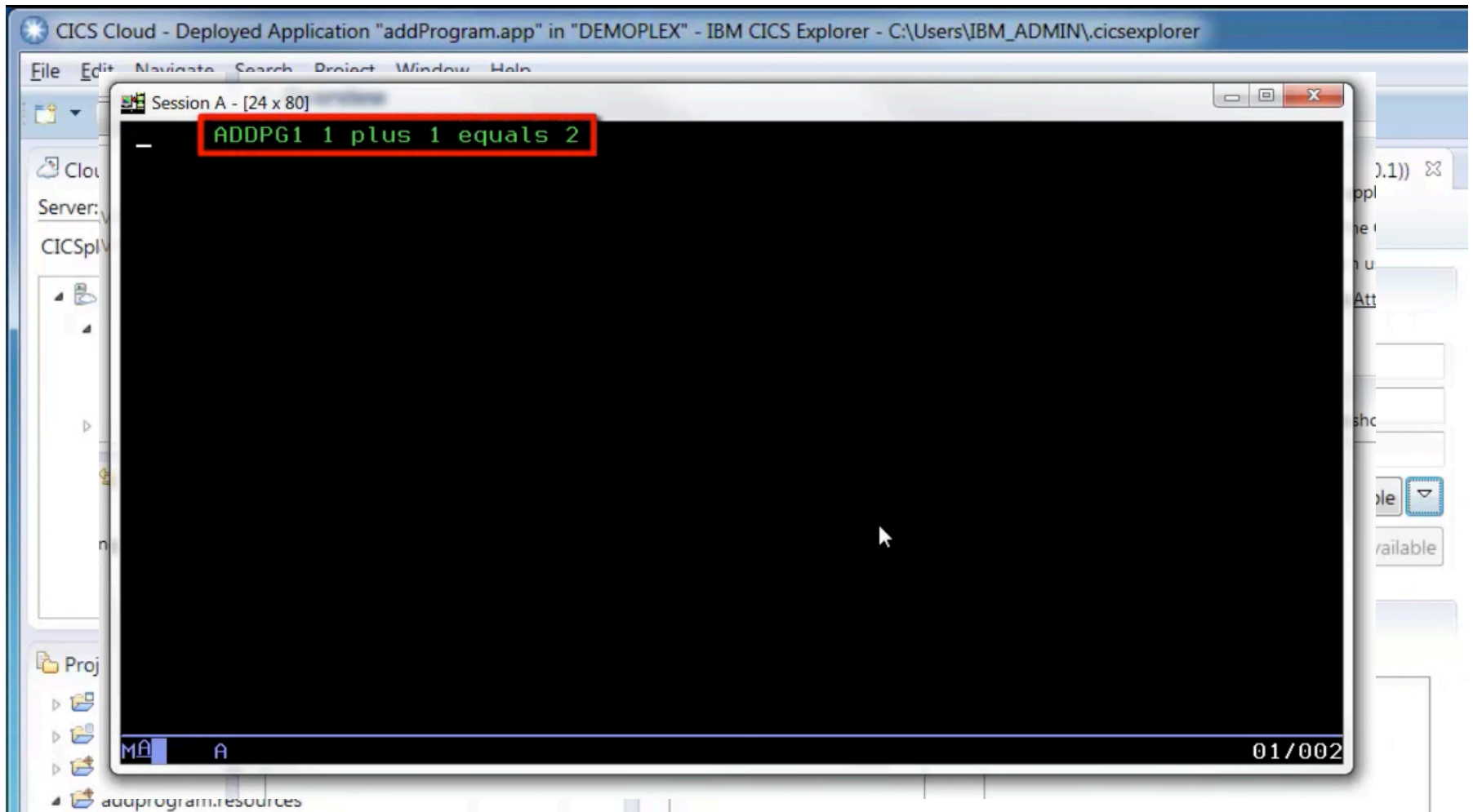
The screenshot displays the IBM CICS Explorer interface for a deployed application named "addProgram.app" in the "DEMOPLEX" environment. The interface is divided into several panes:

- Cloud Explorer:** Shows the server "CMAS" and the CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", there are two application entries: "addProgram.app (1.0.0) ENABLED,AVAILABLE" and "addProgram.app (1.0.1) ENABLED,UNAVAILABLE".
- Project Explorer:** Lists the project structure, including "addProgram.app", "addProgram.app_my.demo.platform_binding", "addProgram.platform.resources", and "addprogram.resources".
- Application Overview:** Provides details for the selected application "addProgram.app (1.0.1)".
 - General Information:** Name: addProgram.app, Version: 1.0.1, Description: Financial application to add numbers together, Status: ENABLED, Availability: UNAVAILABLE.
 - Buttons:** "Enable", "Disable", "Make Available" (highlighted with a red box), and "Make Unavailable".
- CICS Bundles:** Shows "addprogram.resources (1.0.1) ENABLED,UNAVAILABLE".

We now make addProgram.app version 1.0.1 available



and users now get access to addProgram.app
version 1.0.1 with the bug fix



Both version 1.0.0 and 1.0.1 are available but CICS always chooses the highest version

The screenshot displays the IBM CICS Explorer interface. The title bar reads "CICS Cloud - Deployed Application 'addProgram.app' in 'DEMOPLEX' - IBM CICS Explorer - C:\Users\IBM_ADMIN\cicsexplorer". The main window is divided into several panes:

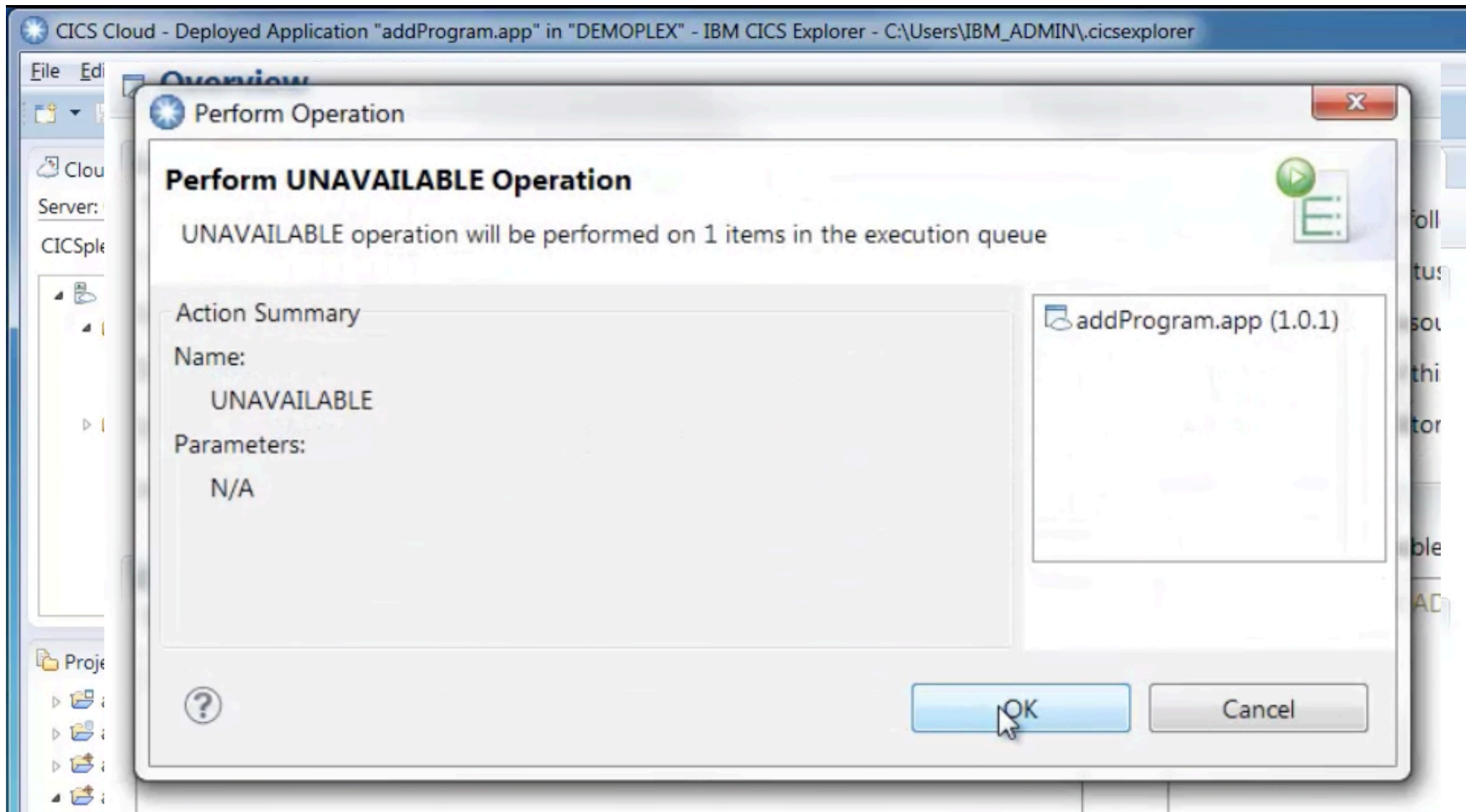
- Cloud Explorer:** Shows the server "CMAS" and CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", the "Applications" folder contains two entries: "addProgram.app (1.0.0) ENABLED,AVAILABLE" and "addProgram.app (1.0.1) ENABLED,AVAILABLE". Both are highlighted with a red box.
- Project Explorer:** Lists project files including "addProgram.app", "addProgram.app_my.demo.platform_binding", "addProgram.platform.resources", and "addprogram.resources".
- Application (addProgram.app (1.0.1)) Overview:** Displays general information for the selected application:
 - General Information:** This section describes general information about this application.
 - Name: addProgram.app
 - Version: 1.0.1
 - Description: Financial application to add numbers together
 - Status: ENABLED (with "Enable", "Disable", and a dropdown menu)
 - Availability: AVAILABLE (with "Make Available" and "Make Unavailable" buttons)
 - CICS Bundles:** The CICS bundles installed as part of this application are shown here.
 - addprogram.resources (1.0.1) ENABLED,AVAILABLE

However, if there is a problem with version 1.0.1 ...

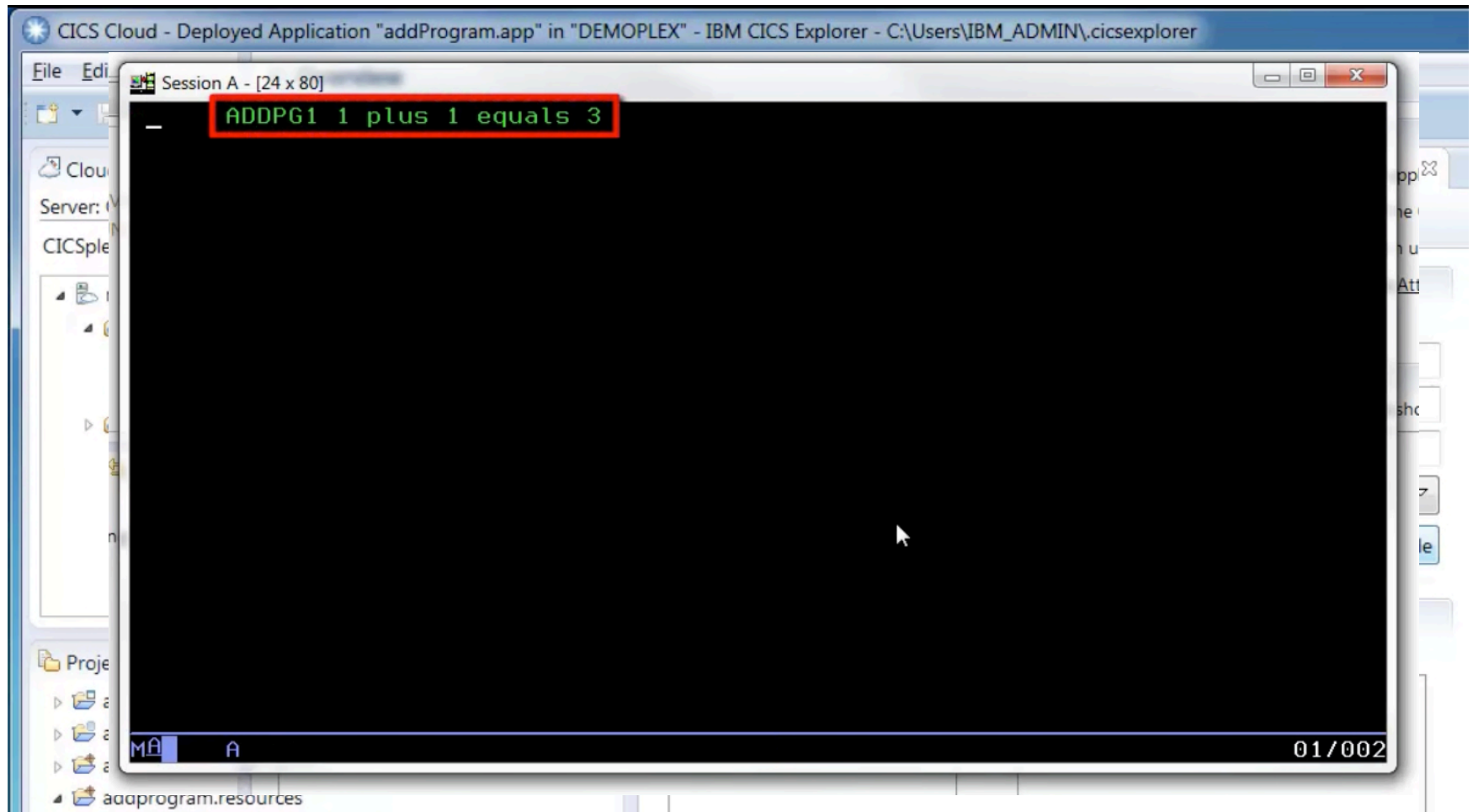
The screenshot displays the IBM CICS Explorer interface. The title bar reads "CICS Cloud - Deployed Application 'addProgram.app' in 'DEMOPLEX' - IBM CICS Explorer - C:\Users\IBM_ADMIN\cicsexplorer". The main window is divided into several panes:

- Cloud Explorer:** Shows the server "CMAS" and CICSplex "DEMOPLEX". Under "my.demo.platform ACTIVE,ENABLED", there are two application entries: "addProgram.app (1.0.0) ENABLED,AVAILABLE" and "addProgram.app (1.0.1) ENABLED,AVAILABLE".
- Project Explorer:** Lists project files including "addProgram.app", "addProgram.app_my.demo.platform_binding", "addProgram.platform.resources", and "addprogram.resources".
- Application (addProgram.app (1.0.1)) Overview:** This pane is active and shows the following details:
 - General Information:** Name: addProgram.app, Version: 1.0.1, Description: Financial application to add numbers together, Status: ENABLED, Availability: AVAILABLE. There are buttons for "Enable", "Disable", "Make Available", and "Make Unavailable". The "Make Unavailable" button is highlighted with a red box and a mouse cursor.
 - CICS Bundles:** Shows "addprogram.resources (1.0.1) ENABLED,AVAILABLE".

... you can simple make it unavailable
to back-out the fix



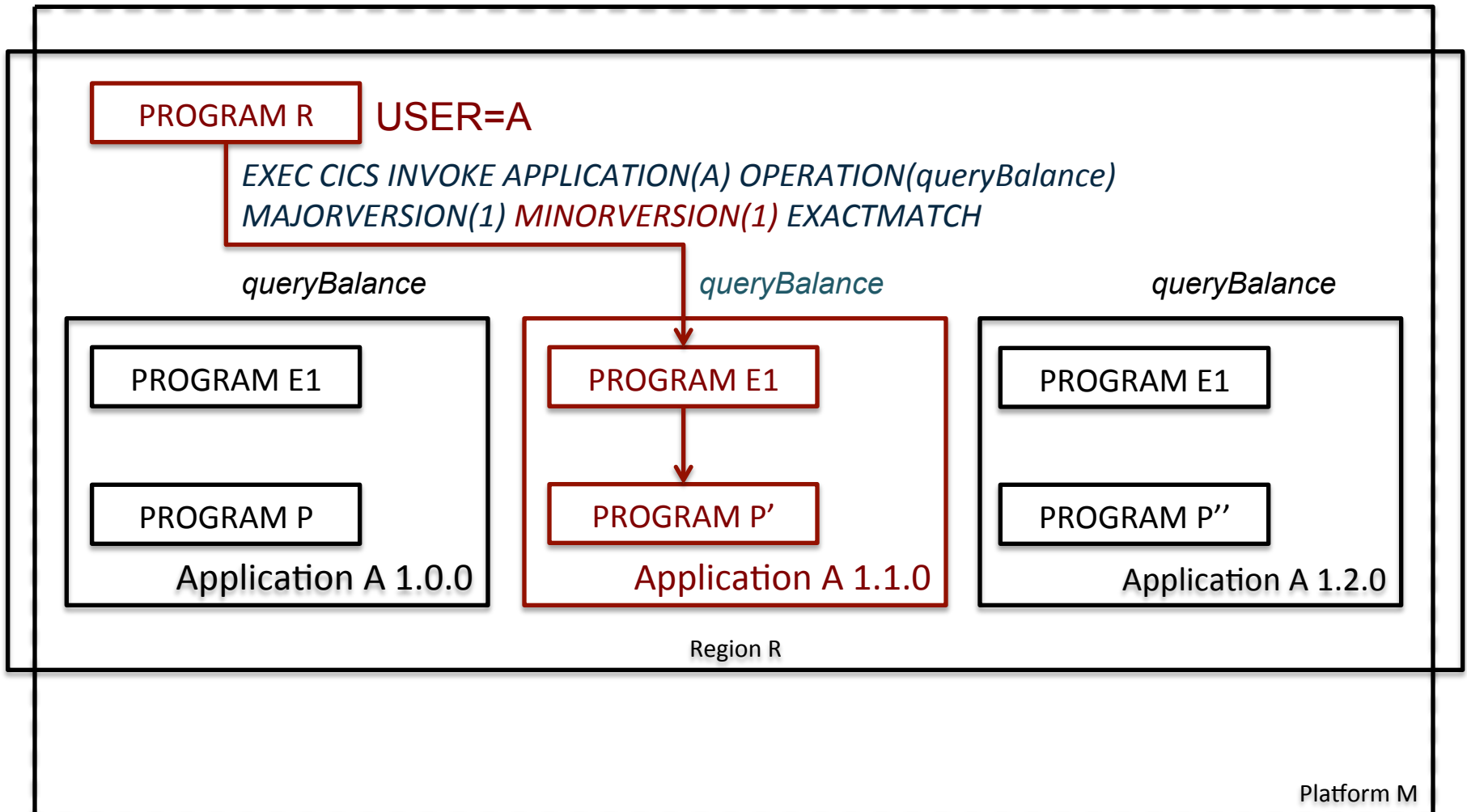
... and users will again have access to
version 1.0.0



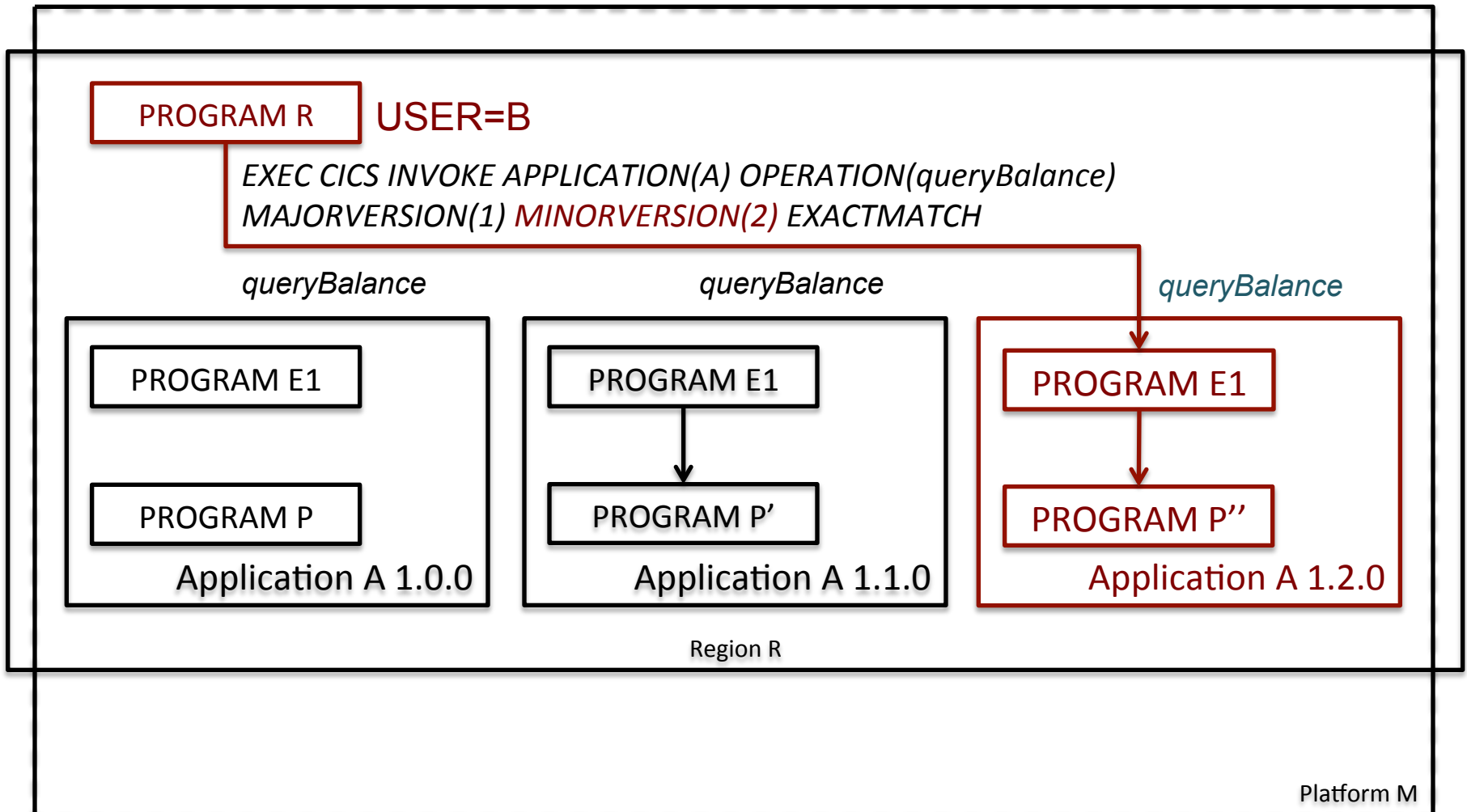
MQ Scenario: Phase In

“When rolling out a new version of an application I want to initially give access to just 10% of my users. That way I can reduce the impact of any potential problems related to either the new features or to the platform because of performance. The requests arrive over MQ so I want to use origin data to route each one to the appropriate application version”

Most users get application version 1.1.0



“Early access” users get the latest application version 1.2.0

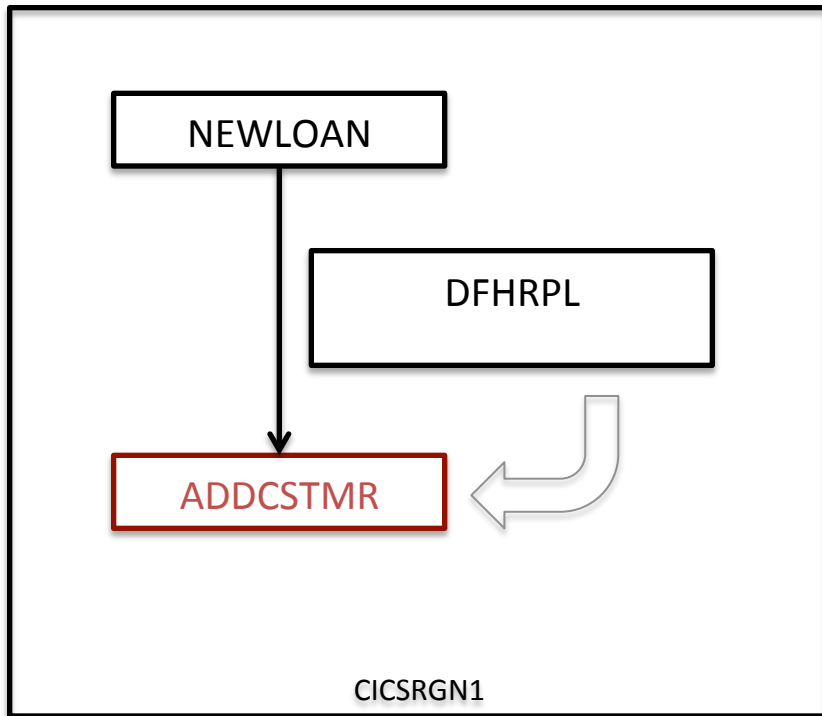


Server Consolidation Scenario

“I have two applications (one of which was developed by a company we acquired) that currently run on different sets of CICS regions. I’d like to take advantage of the recent scalability improvements especially being able to increase MAXTASK. However, I know that there are PROGRAM name clashes which prevent these applications from being hosted together.”

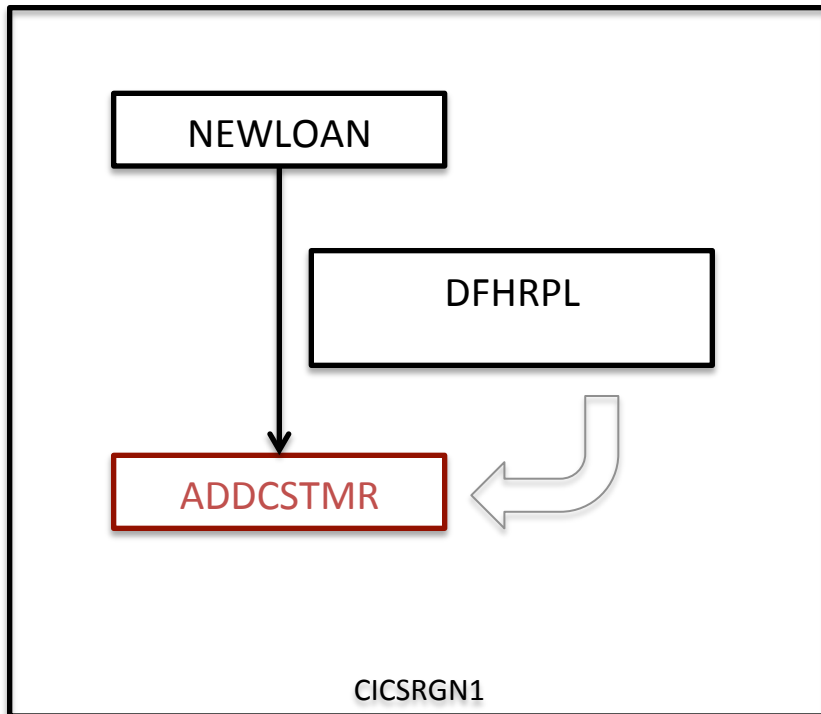
The Home Loan application has an ADDCSTMR program

Home Loan

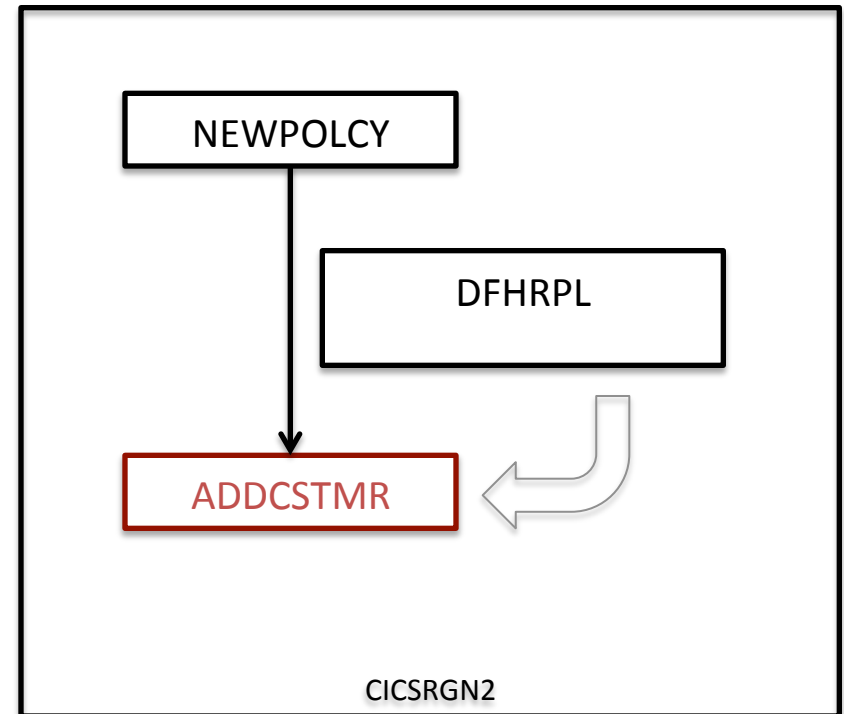


Unfortunately the Fire Insurance application also has an ADDCSTMR program so must be kept separate

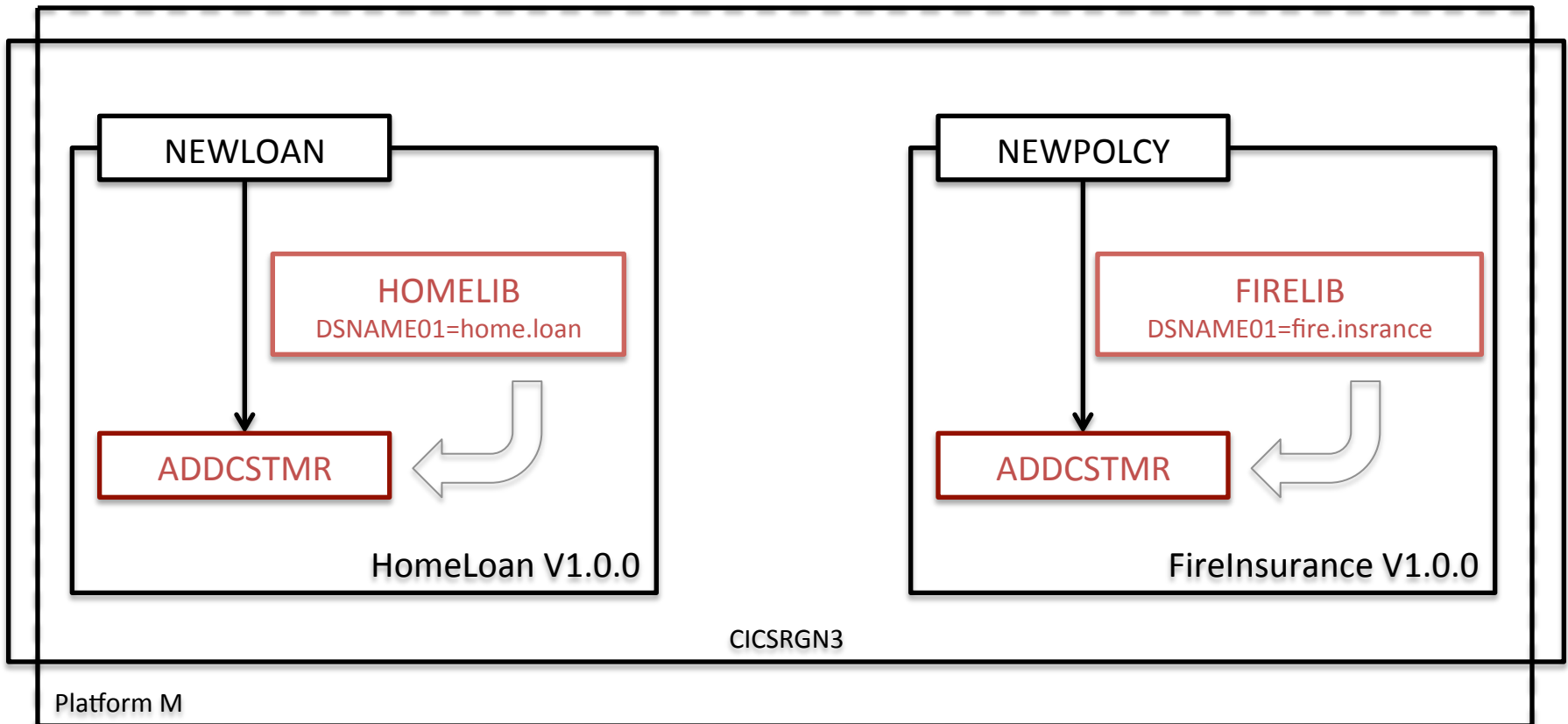
Home Loan



Fire Insurance



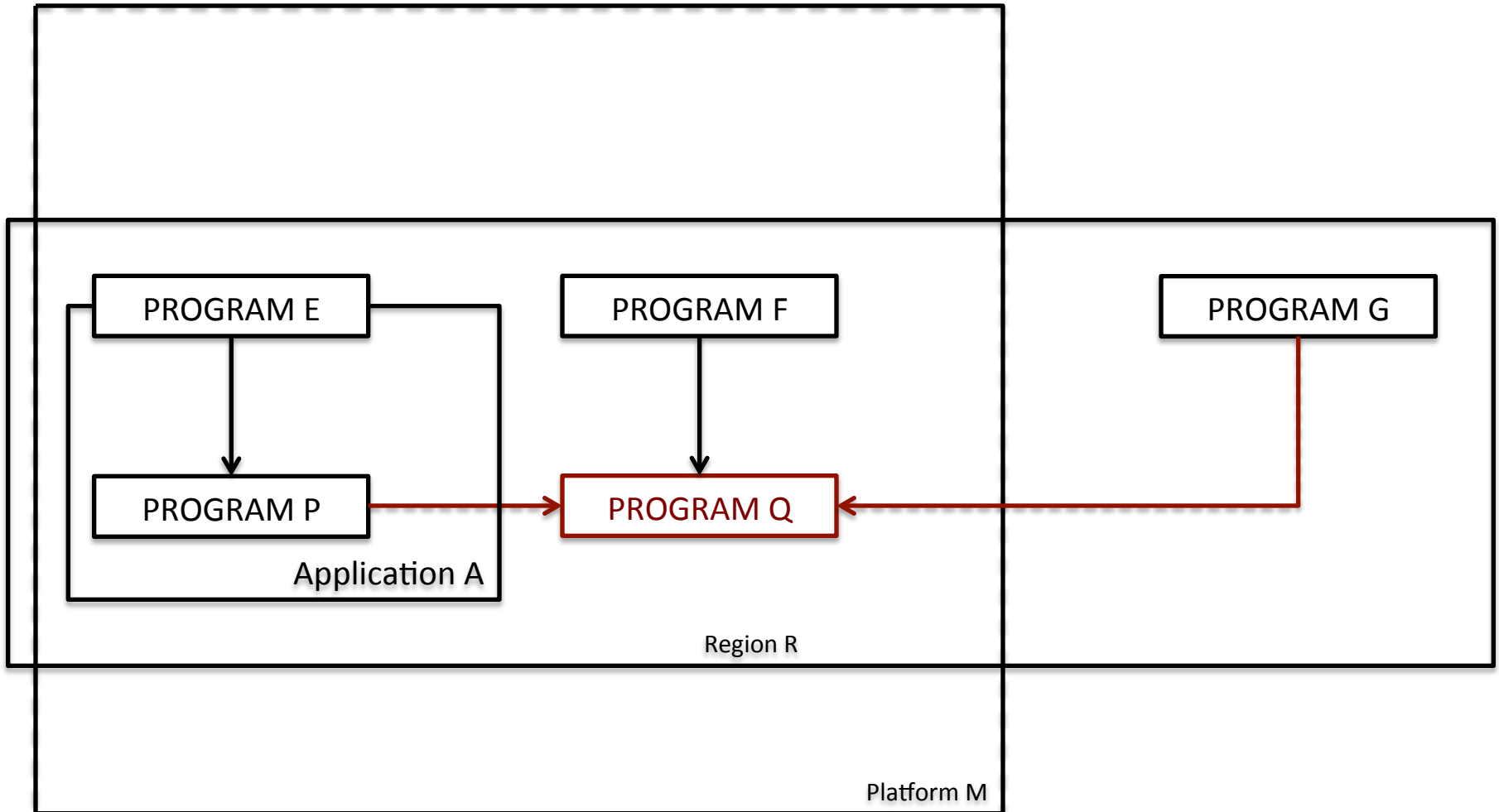
HomeLoan and FireInsurance both with ADDCSTMR installed into the same Region(s)



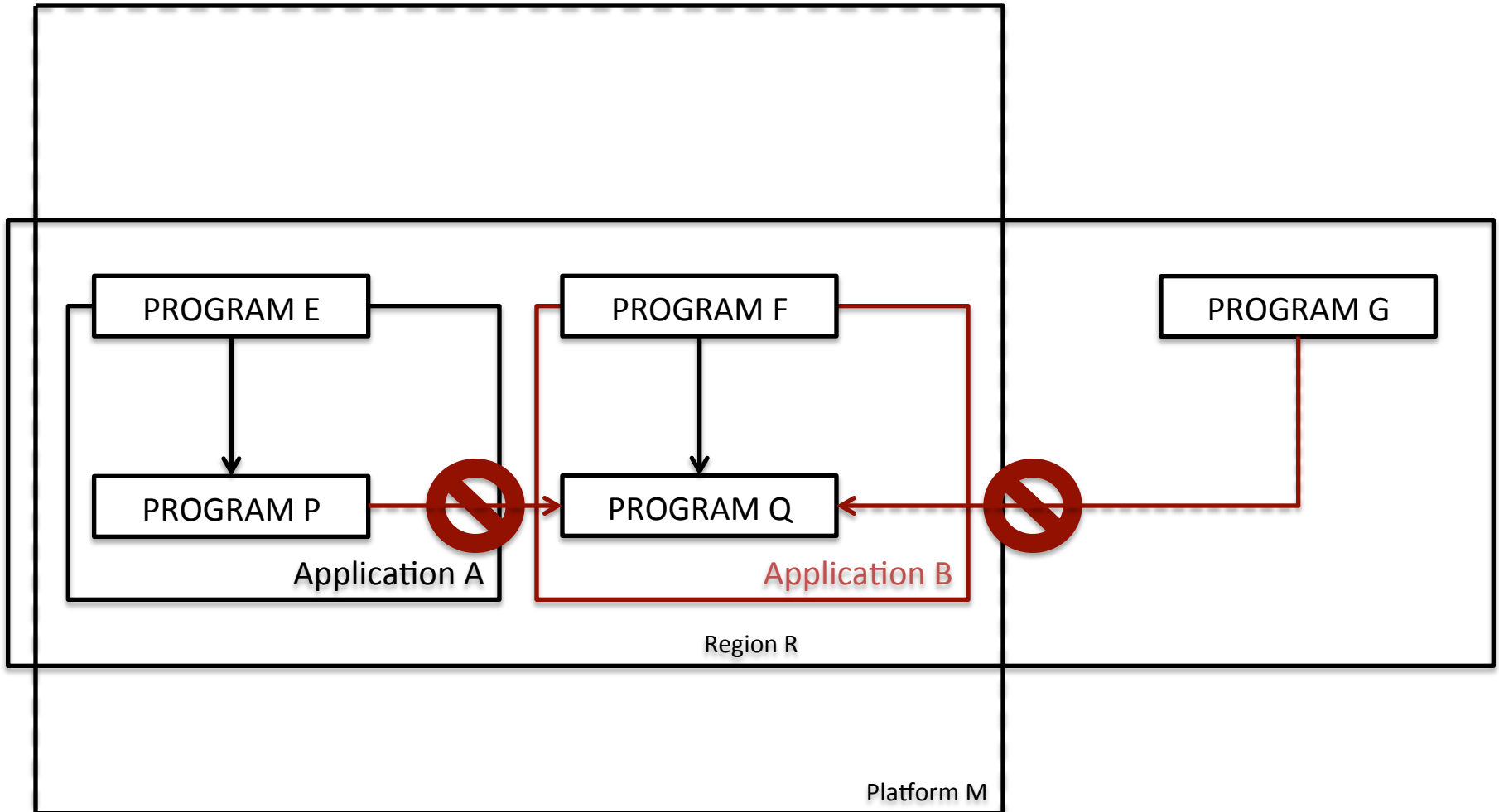
Application Modernization Scenario

“We have spent a lot of time using CICS Interdependency Analyzer (IA) to understand the call structure of one of our applications. This has enabled us to add more validation logic to avoid ABENDs when a copybook changes and someone hasn’t recompiled all the right modules. But now we need to ensure no one bypasses these new checks.”

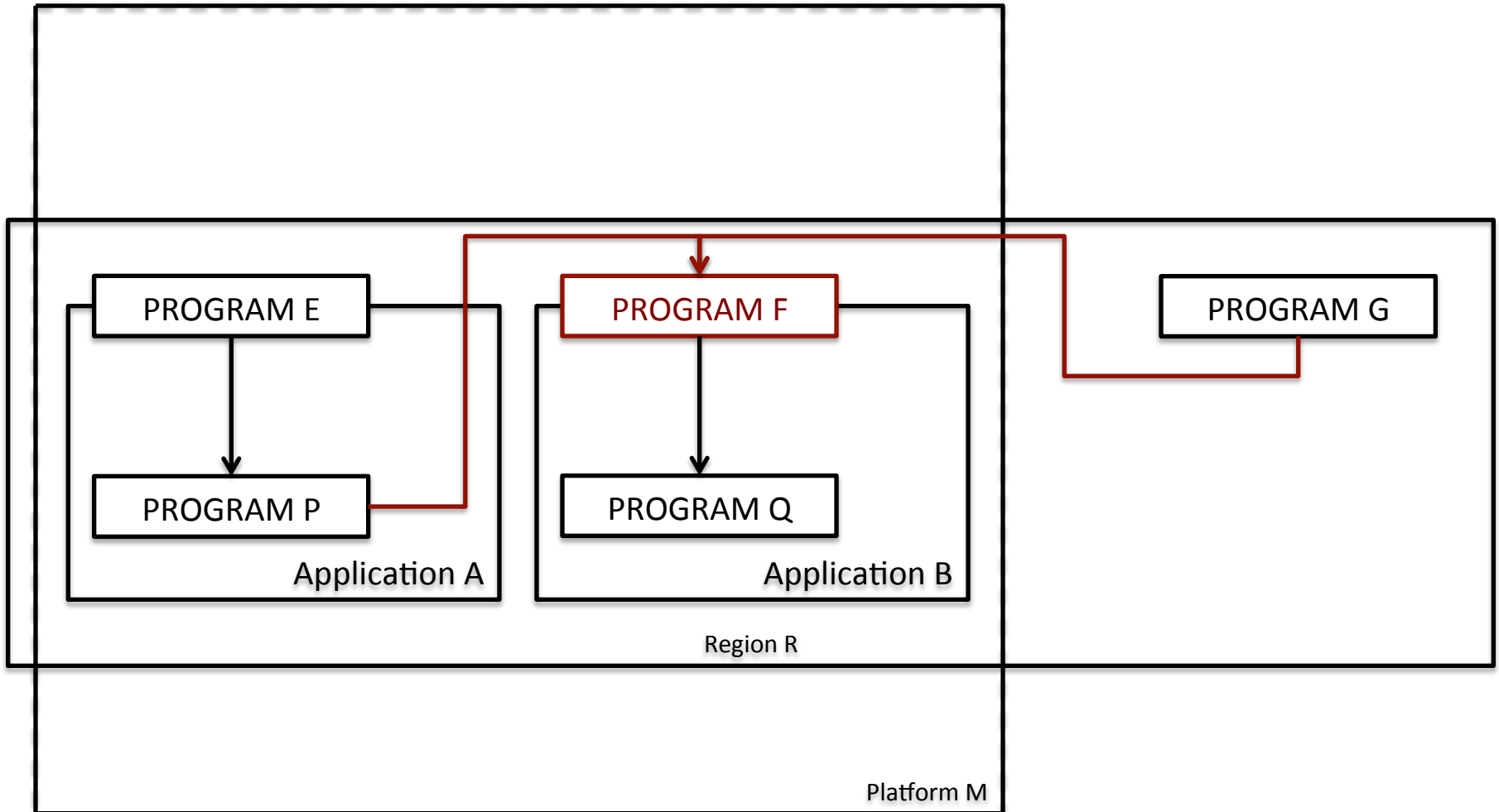
Any PROGRAM in the Region can LINK to PROGRAM Q avoiding the checks in PROGRAM F



PROGRAM Q is now private to Application B



Must LINK through entry point PROGRAM F

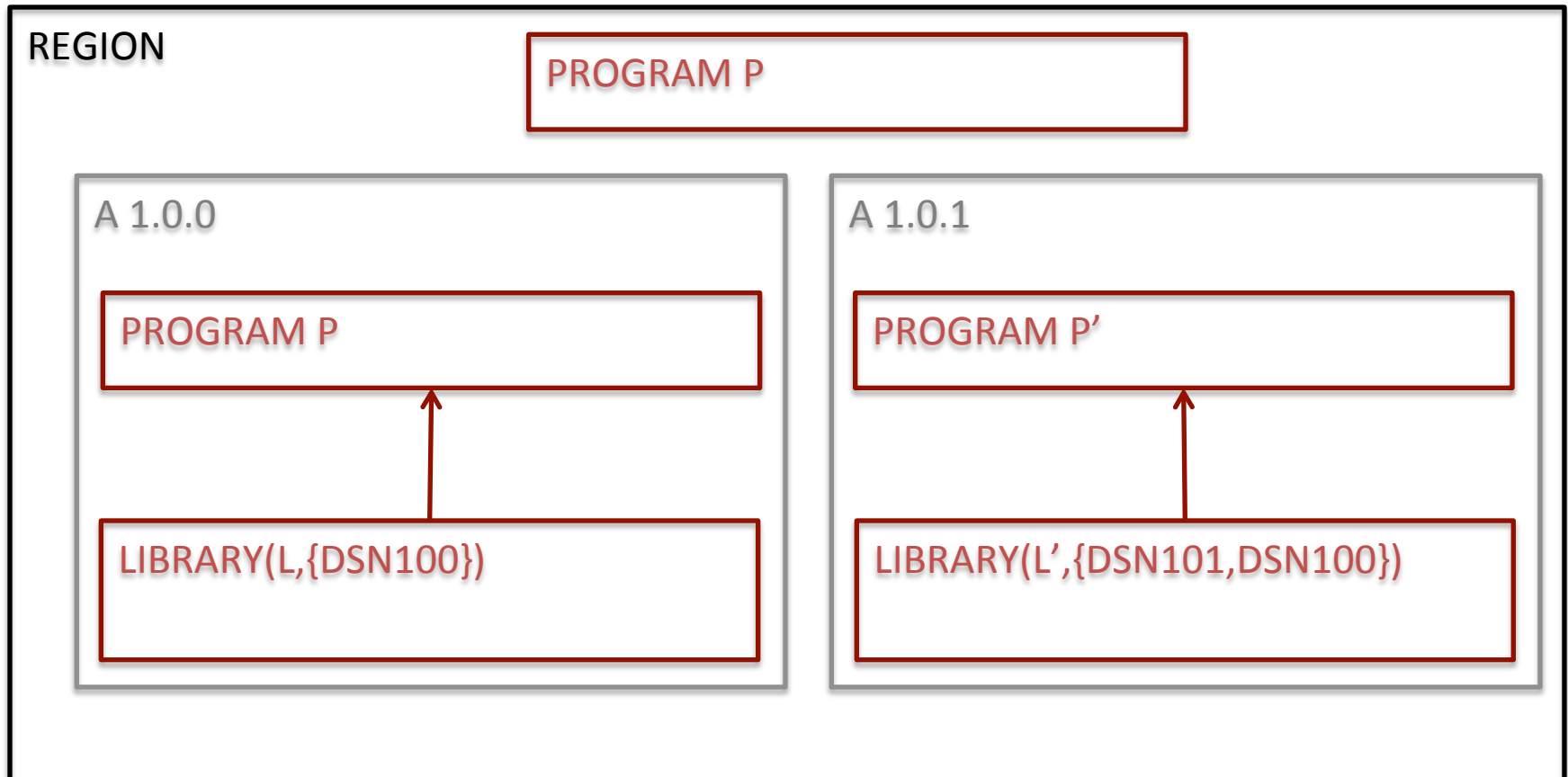


HOW DOES IT WORK?

Application Multi-versioning

- **Entry Points**
 - PROGRAM, URIMAP
- **Resources**
 - LIBRARY, PROGRAM, POLICY
- **Capability**
 - Provide end user access to two or more versions of an application hosted on the same platform by using the new private **PROGRAM** and **LIBRARY** resources
 - Quickly switch back and forth between two different versions of an application using the **AVAILABLE | UNAVAILABLE** state
 - Route requests from users to different versions of an application using the new **INVOKE APPLICATION API**

LIBRARY Resources not added to global search order



AVAILABLE | UNAVAILABLE application status

- New AVAILABLE | UNAVAILABLE state
 - CICS application
 - CICS bundle
 - URIMAP entry point
- UNAVAILABLE
 - “Close the door”
 - Existing tasks complete normally
 - No new requests
- AVAILABLE
 - “Open the door”
 - Measure resource usage
 - Enforce policy
 - Control access (for packaged resources)

EXEC CICS INVOKE APPLICATION

- EXEC CICS LINK PROGRAM()
- EXEC CICS INVOKE APPLICATION()
 - OPERATION()
 - OPERATION() MAJORVERSION()
MINORVERSION() MINIMUM
 - OPERATION() MAJORVERSION() MINORVERSION()
EXACTMATCH PLATFORM()
- JCICS Application.invoke()

CICS CLOUD EXPLORER

Managing Multi-Versioned Applications

The screenshot displays the Eclipse IDE interface for managing CICS Cloud applications. The main window is titled "CICS Cloud - Deployed Application 'demo.liberty.app' in 'PLEXMAS' - Eclipse SDK".

Cloud Explorer: Shows the project structure for "demo.liberty.platform ACTIVE,ENABLED". Under "Applications", two versions are listed: "demo.liberty.app v1.0.0 ENABLED,AVAILABLE" and "demo.liberty.app v1.1.0 ENABLED,UNAVAILABLE". These two items are circled in red.

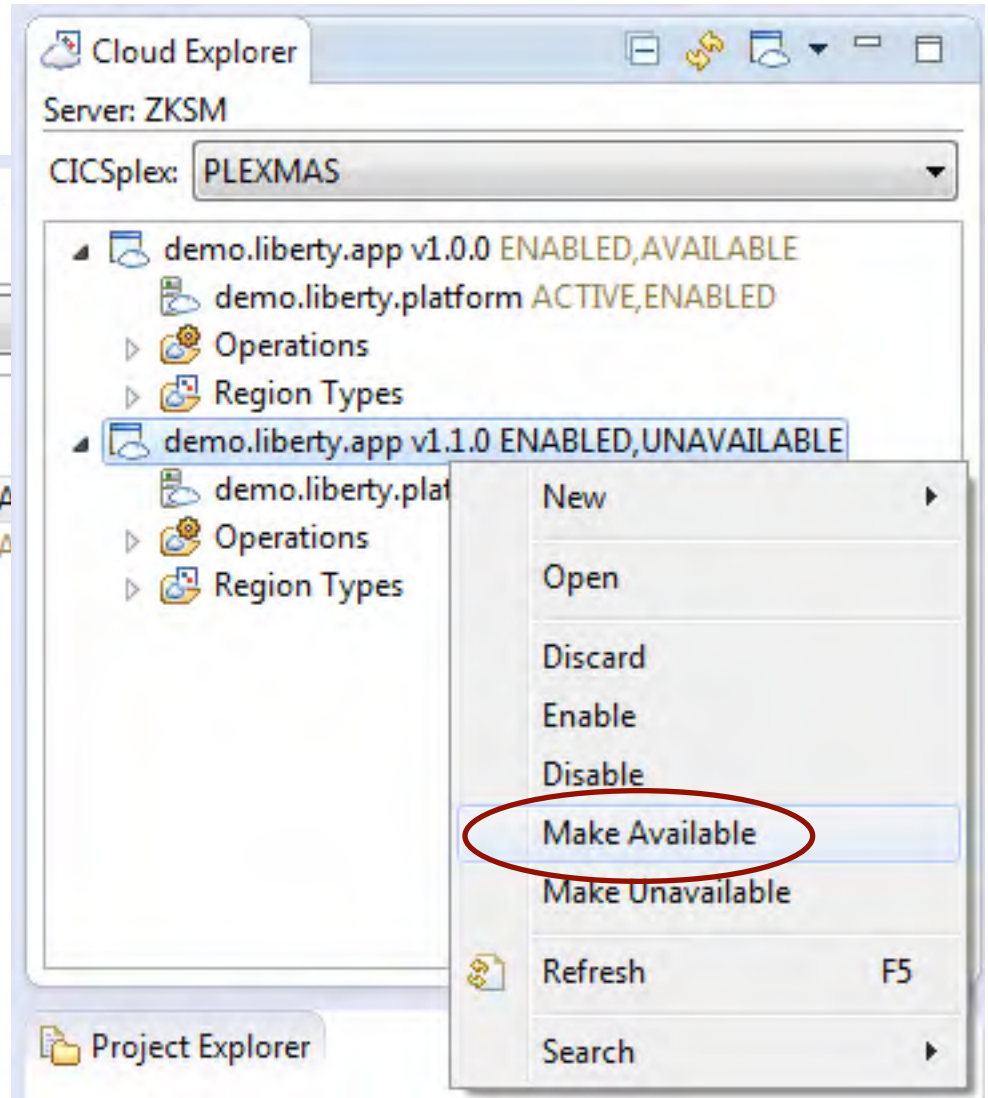
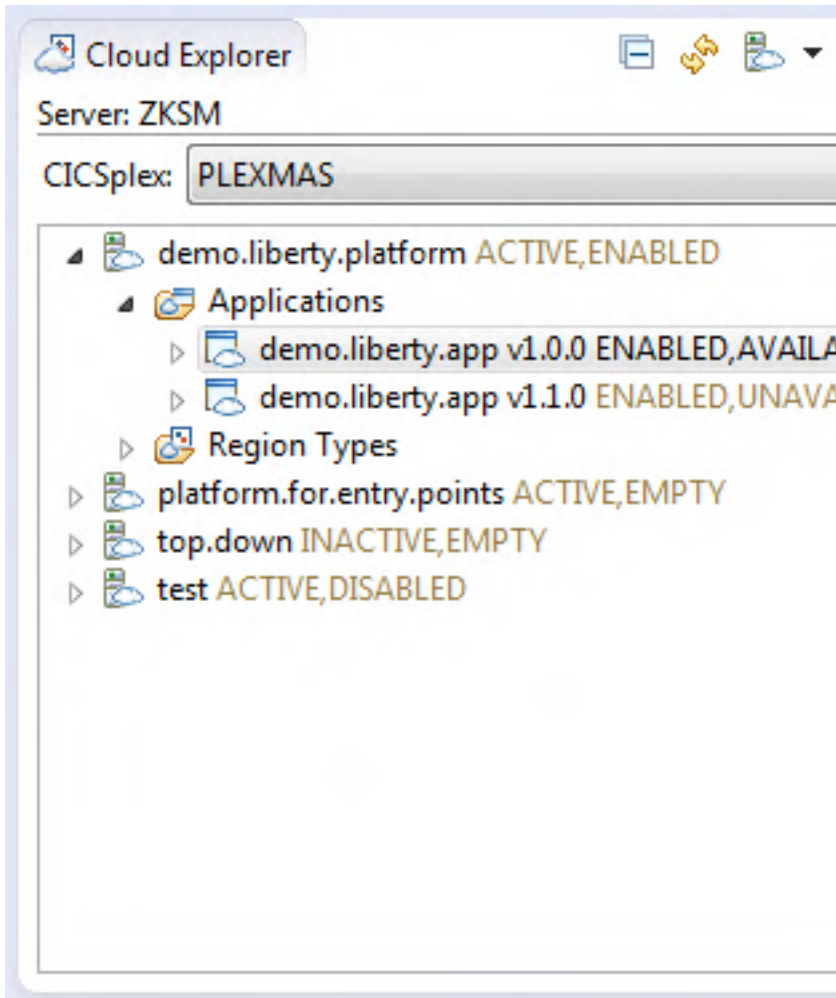
Application Overview: The "Overview" tab is active, showing the following details for "demo.liberty.app":

- General Information:** Name: demo.liberty.app, Version: 1.0.0, Description: App, Status: ENABLED, Availability: AVAILABLE.
- Actions:** A list of actions including "Change the status of the application", "View private resources", "View details of this application", and "Refresh the editor".
- Entry Points:** A table showing "showinformation (INDEX)".
- CICS Bundles:** A list of bundles including "demo.liberty.app.binding.web v1.0.0", "demo.liberty.app.logic.appinfo v1.0.0", and "demo.liberty.app.web.servlet v1.0.0".

Properties View: The "Basic" tab is active, showing the following properties:

Property	Value
Application Definition Name	DEMOAPP
Application Directory	/var/cicsts/PLEXMAS/demo.liberty.platform/applications/demo.liberty.app_1.0.0/
Availability	AVAILABLE
Binding Directory	/var/cicsts/PLEXMAS/demo.liberty.platform/bindings/demo.liberty.app.binding_1.0.0/
Changeagent	DREPAPI
Changeagrel	0690
Changetime	05-Feb-2014 10:08:30
Changeusrid	CICSUSER
Createtime	05-Feb-2014 10:08:30
Description	App
Enable Status	ENABLED
Major Version	1

Application Lifecycle



New *Online* Application Editor

The screenshot shows the 'Overview' tab of the application editor. The interface is divided into several sections:

- General Information:** This section describes general information about the application. It includes fields for Name (demo.liberty.app), Version (1.0.0), and Description (App). The Status is set to ENABLED, with 'Enable' and 'Disable' buttons. Availability is set to AVAILABLE, with 'Make Available' and 'Make Unavailable' buttons.
- CICS Bundles:** This section shows the CICS bundles installed as part of this application. It lists three bundles: demo.liberty.app.binding.web v1.0.0 (ENABLED, AVAILABLE), demo.liberty.app.logic.appinfo v1.0.0 (ENABLED, NOTAPPLIC), and demo.liberty.app.web.servlet v1.0.0 (ENABLED, NOTAPPLIC).
- Actions:** This section lists actions that can be performed on the application:
 - Change the status of the application in the General Information section.
 - View private resources for this application using the [Private Resources](#) tab.
 - View details of this application using the [Attributes](#) tab.
 - [Refresh](#) the editor to reflect changes.
- Entry Points:** This section shows all entry points defined in this application. It lists one entry point: showInformation (INDEX).

At the bottom of the window, there are tabs for 'Overview', 'Private Resources', and 'Attributes'. The 'Overview' tab is currently selected.

Private Resources

Application (demo.liberty.app)

Private Resources

Structure

- demo.liberty.app v1.0.0
 - logic
 - IYK3ZKSW
 - web
 - IYK3ZKSW

Private Resources

Programs

Name:

CNX0211I Context: IYK3ZKSW. Resource: PROGRAM. 1 records collected at 24-Feb-2014 15:32:36

Region	Name	Status	Concurrent ...	Language	Operation N...
IYK3ZKSW	BDCGETAI	ENABLED	0	C	

Overview Private Resources A

Private Resources

Programs

Name:

CNX0211I Context: IYK3ZKSW. Resource: LIBRARY. 1 records collected at 24-Feb-2014 15:30:01

Region	Name	Search Position	Ranking	Critical Status	Enable Sta...	Numdsnames
IYK3ZKSW	APPMV	1	50	NONCRITICAL	ENABLED	1

Private Resources

Programs

Name:

CNX0211I Context: IYK3ZKSW. Resource: LIBDSN. 1 records collected at 24-Feb-2014 15:30:27

Region	Name	D..	DS Name	DS Name Search Position
IYK3ZKSW	APPMV	1	BENCOX.APP-MV.DEMO.LOAD	1001

Application demo.liberty.app 1.0.0 vs. 1.1.0: BUNDLE

Application (demo.liberty.app) Overview

General Information
This section describes general information about this application.

Name: demo.liberty.app
Version: 1.0.0
Description: App
Status: ENABLED [Enable] [Disable] ▾
Availability: AVAILABLE [Make Available] [Make Unavailable]

CICS Bundles
The CICS bundles installed as part of this application are shown here.

- demo.liberty.app.binding.web v1.0.0 ENABLED, AVAILABLE
- demo.liberty.app.logic.appinfo v1.0.0 ENABLED, NOTAPPLIC
- demo.liberty.app.web.servlet v1.0.0 ENABLED, NOTAPPLIC

Overview Private Resources Attributes

Application (demo.liberty.app) Overview

General Information
This section describes general information about this application.

Name: demo.liberty.app
Version: 1.1.0
Description: App
Status: ENABLED [Enable] [Disable] ▾
Availability: UNAVAILABLE [Make Available] [Make Unavailable]

CICS Bundles
The CICS bundles installed as part of this application are shown here.

- demo.liberty.app.binding.web v1.1.0 ENABLED, UNAVAILABLE
- demo.liberty.app.logic.appinfo v1.1.0 ENABLED, NOTAPPLIC
- demo.liberty.app.web.servlet v1.1.0 ENABLED, NOTAPPLIC

Overview Private Resources Attributes

Application demo.liberty.app 1.0.0 vs. 1.1.0: PROGRAM

Application (demo.liberty.app) v1.0.0

Private Resources

Structure

- demo.liberty.app v1.0.0
 - logic
 - IYK3ZKSW
 - web
 - IYK3ZKSW

Private Resources

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: IYK3ZKSW. Resource: PROGRAM. 1 records collected at 24-Feb-2014 15:32:36

Region	Name	Status	Concurrent ...	Language	Operation N...
IYK3ZKSW	BDCGETAI	ENABLED	0	C	

Application (demo.liberty.app) v1.1.0

Private Resources

Structure

- demo.liberty.app v1.1.0

Private Resources

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: PLEXMAS. Resource: PROGRAM. 1 records collected at 24-Feb-2014 15:51:20

Region	Name	Status	Concurrent ...	Language	Operation N...
IYK3ZKSW	BDCGETAI	ENABLED	0	C	

Application demo.liberty.app 1.0.0 vs. 1.1.0:

Private Resources

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: IYK3ZKSW. Resource: LIBRARY. 1 records collected at 24-Feb-2014 15:30:01

Region	Name	Search Position	Ranking	Critical Status	Enable Sta...	Numdsnames
IYK3ZKSW	APPMV	1	50	NONCRITICAL	ENABLED	1

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: IYK3ZKSW. Resource: LIBDSN. 1 records collected at 24-Feb-2014 15:30:27

Region	Name	D..	DS Name	DS Name Search Position
IYK3ZKSW	APPMV	1	BENCOX.APP-MV.DEMO.LOAD	1001

Private Resources

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: PLEXMAS. Resource: LIBRARY. 1 records collected at 24-Feb-2014 16:04:01

Region	Name	Search Position	Ranking	Critical Status	Enable Sta...	Numdsnames
IYK3ZKSW	APPMV	1	50	NONCRITICAL	ENABLED	1

Programs LIBRARYs LIBRARY DS Names

Name:

CNX0211I Context: PLEXMAS. Resource: LIBDSN. 1 records collected at 24-Feb-2014 15:51:25

Region	Name	DS Number	DS Name	DS Name Search Position
IYK3ZKSW	APPMV	1	BENCOX.APP-MV.DEMO.LOAD2	1001

Summary

- Use a CICS cloud to deploy new applications, application features or bug fixes while minimizing any impact to existing users or requiring additional infrastructure
- Implement the different scenarios using private PROGRAM and LIBRARY resources, the AVAILABLE | UNAVAILABLE application status, and INVOKE APPLICATION API
- Manage CICS cloud with Explorer

More Information

- **IBM Redbooks publication:**
<http://www.redbooks.ibm.com/abstracts/sg248114.html?Open>
- **Blog:**
<https://www.ibm.com/developerworks/mydeveloperworks/blogs/cicsdev/tags/blog?lang=en>
 - *What is CICS Application Multi-versioning?*
 - *How can I phase in the new version of a CICS Application?*
 - *Quick start CICS Explorer projects for “Cloud Enabling CICS”*
- **Demos:** <http://www.ibm.com/software/hcp/cics/tserver/v52/library/demos.html>
 - *Provisioning application updates with no loss of service*
 - *Hosting two versions of a CICS application concurrently on the same platform*
- **Podcasts:** <http://www.ibm.com/software/os/systemz/podcasts/websphereonz/>
 - *CICS V5.2 - Multi-Versioning*
- **Scenarios:**
https://www-01.ibm.com/support/knowledgecenter/#/SSGMCP_5.1.0/com.ibm.cics.ts.scenarios.doc/topics/Scenarios.html
 - *Updating an application on a platform*
 - *Hosting two versions of a CICS application concurrently on the same platform*



Cloud Enabling IBM CICS



Upcoming Events

- **January 14th: Enterprise IT. The new generation of IBM z Systems**

<https://engage.vevent.com/index.jsp?eid=556&seid=76377>

- **January 21st: Achieving application agility with custom patterns: Implementing cloud workloads for IBM System z**

<http://ibm.co/1BQO4SW>

THANK YOU