

CICS Transaction Server for z/OS



# CICSplex SM Managing Workloads

*Version 3 Release 2*



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**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 147.

This edition applies to Version 3 Release 2 of CICS Transaction Server for z/OS, program number 5655-M15, and to all subsequent versions, releases, and modifications until otherwise indicated in new editions.

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## Preface

This book provides administration information for the CICSplex<sup>®</sup> SM component of CICS<sup>®</sup> Transaction Server for z/OS<sup>®</sup>. It describes how to establish and maintain the CICSplex SM definitions necessary to perform workload management.

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### Who this book is for

This book is for the individual responsible for administering the CICS systems in your enterprise.

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### What you need to know

It is assumed that you have read:

**CICSplex System Manager User Interface Guide**

For information about using the ISPF user interface to CICSplex SM.

**CICSplex System Manager Concepts and Planning**

For an introduction to CICSplex SM.

**Note:** Many of the views in this book are based on the Starter Set. For useful examples of the definitions and programs described in this book, explore the Starter Set itself, which is described in *CICSplex System Manager Concepts and Planning*.

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### Notes on terminology

In the text of this book, the term **CICSplex SM** (spelled with an uppercase letter 'P') means the IBM<sup>®</sup> CICSplex System Manager element of CICS Transaction Server for z/OS, Version 3 Release 2. The term **CICSplex** (spelled with a lowercase letter 'p') means the largest set of CICS systems to be managed by CICSplex SM as a single entity.

Other terms used in this book are:

**BTS-set**

A set of CICS regions within a CICSplex across which related CICS business transaction services (BTS) processes and activities may execute.

**CICS** The CICS element of CICS TS for z/OS

**CICSplex SM**

The CICSplex SM element of CICS TS for z/OS

**MVS™** The operating system which is a base element of z/OS.

**Requesting region**

A CICS region that initiates a dynamic routing function.

**Routing region**

A CICS region that routes the request for a dynamic routing function.

**Target region**

A CICS region that receives and executes a dynamic routing function.

**WUI**

The Web User Interface component of CICSplex SM.

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## Syntax notation and conventions used in this book

The syntax descriptions of the CICSplex SM commands use the following symbols:

- Braces { } enclose two or more alternatives from which one must be chosen.
- Square brackets [ ] enclose one or more optional alternatives.
- The OR symbol | separates alternatives.

The following conventions also apply to CICSplex SM syntax descriptions:

- Commands and keyword parameters are shown in uppercase characters. If a command or parameter may be abbreviated, the minimum permitted abbreviation is in uppercase characters; the remainder is shown in lowercase characters and may be omitted.
- Variable parameters are shown in lowercase characters. You must replace them with your own information.
- Parameters that are not enclosed by braces { } or brackets [ ] are required.
- A default parameter value is shown like this: KEYWORD. It is the value that is assumed if you do not select one of the optional values.
- Punctuation symbols, uppercase characters, and special characters must be coded exactly as shown.

**Note:** A semicolon ; is shown as the command delimiter in examples using multiple commands. For information about using and changing the command delimiter, see the *CICSplex System Manager User Interface Guide*.

- The ellipsis ... means that the immediately preceding parameter can be included one or more times.

## CICS system connectivity

This release of CICSplex SM can be used to control CICS systems that are directly connected to it.

For this release of CICSplex SM, the connectable CICS systems are:

- CICS Transaction Server for z/OS 3.1
- CICS Transaction Server for z/OS 2.3
- CICS Transaction Server for z/OS 2.2
- CICS Transaction Server for OS/390® 1.3

You can use this release of CICSplex SM to control systems running supported releases of CICS that are connected to, and managed by, your previous release of CICSplex SM. However, if you have any directly-connectable release levels of CICS, as listed above, that are connected to a previous release of CICSplex SM, you are strongly recommended to migrate them to the current release of CICSplex SM, to take full advantage of the enhanced management services. See the *CICS Transaction Server for z/OS Migration from CICS TS Version 2.3* for information on how to do this.

Table 1 on page ix shows which supported CICS systems can be directly connected to which releases of CICSplex SM.

Table 1. Directly-connectable CICS systems by CICSplex SM release

CICS system	CICSplex SM component of CICS TS 3.1	CICSplex SM component of CICS TS 2.3	CICSplex SM component of CICS TS 2.2	CICSplex SM component of CICS TS 1.3
CICS TS 3.1	Yes	No	No	No
CICS TS 2.3	Yes	Yes	No	No
CICS TS 2.2	Yes	Yes	Yes	No
CICS TS 1.3	Yes	Yes	Yes	Yes
TXSeries 4.3.0.4	No	Yes	Yes	No
TXSeries 5.0	No	Yes	Yes	No



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## Summary of changes

This book is based on the CICSplex SM for CICS Transaction Server for z/OS, Version 2 Release 3 edition. It has been updated to incorporate changes made for CICS Transaction Server for z/OS, Version 3 Release 1.

Changes made since the last edition are indicated by vertical bars to the left of the change.

---

### Changes made to this book for CICS Transaction Server for z/OS, Version 3 Release 1

CICSplex SM support for the CICS for Windows component of IBM TXSeries (also known as Windows NT 4.3 and Windows NT 5.0) is no longer provided in CICS Transaction Server for z/OS, Version 3 Release 2. Therefore, it is not now possible to set up a CICSplex SM remote MAS agent for Windows.

However, you can continue to use the CICS Transaction Server Version 2.3 or Version 2.2 for CICSplex SM support of TXSeries.

---

### Changes for CICS Transaction Server for z/OS, Version 2 Release 3

CICS Transaction Server for z/OS, Version 2 Release 3 introduces CICSplex SM support for the Link3270 bridge. This support is covered in the following topics:

- describes the management of Link3270 bridge workloads.
- “Separating Link3270 bridge workloads” on page 15 covers separation of Link3270 bridge workloads by luname.

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### Changes for CICS Transaction Server for z/OS, Version 2 Release 2

There has been a change in CICSplex SM field naming conventions in this release. Data set name fields such as DSNAME, file name fields such as LOCFILE and REMFILE, and transient data queue name fields such as EXTRATDQ and INTRATDQ are now case-sensitive. When entering data set and file names into the CICSplex SM interfaces (EUI, API and WUI), ensure that you enter the data in the correct case. In previous releases of CICSplex SM, the data set names and file names are automatically converted to upper case.

There are no other significant changes to this book for CICS Transaction Server for z/OS, Version 2 Release 2.

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### Changes for CICS Transaction Server for z/OS, Version 2 Release 1

The support for the workload management of enterprise beans provided by CICS Transaction Server for z/OS, Version 2 Release 1 is covered in the following sections:

- “Balancing the work in a workload” on page 7 includes enterprise bean considerations.
- “Separating enterprise beans by transaction” on page 14 covers workload separation of enterprise beans.
- “Enterprise bean considerations” on page 17 for transaction affinities.

- “Enterprise bean considerations” on page 30 when customizing the dynamic routing program.
- “Balancing an enterprise bean workload” on page 98 tells you how to set up and run an enterprise bean workload.

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## Changes for CICS Transaction Server for OS/390, Version 1 Release 3

The following additions and changes have been made to the functions of CICS Transaction Server for OS/390, Version 1 Release 3.

### Dynamic routing

CICS Transaction Server for OS/390, Version 1 Release 3 introduces extensions to the CICSplex SM dynamic routing program (called the dynamic *transaction* routing program in previous releases). You can dynamically route:

- Transactions initiated at a terminal
- Eligible EXEC CICS START requests that are associated with a terminal
- Eligible EXEC CICS START requests that are not associated with a terminal
- Dynamic program link (DPL) requests that are received using:
  - The CICS Web support
  - The CICS Transaction Gateway
  - External CICS interface (EXCI) client programs
  - Any CICS client workstation products using the External Call Interface (ECI)
  - Distributed Computing Environment (DCE) remote procedure calls (RPCs)
  - Open Network Computing (ONC) RPCs
  - Internet Inter-Object Request Block Protocol (IIOP)
  - Any function that issues an EXEC CICS LINK PROGRAM request
- Transactions associated with CICS business transaction services (CICS BTS) activities.

These new functions allow you to integrate workload management for requests from all these sources and thereby improve performance and workload throughput.

You specify which transactions and programs may be dynamically routed, and the CICS regions in which they may be run.

The following terms have been introduced to describe the CICS regions involved in dynamic routing:

#### Requesting region

The CICS region in which the dynamic routing request originates. For transactions initiated at a terminal, and inbound client DPL requests, this is typically a TOR. For terminal-related EXEC CICS START commands, for non-terminal-related EXEC CICS START commands, for peer-to-peer DPLs, and for CICS BTS activities, the requesting region is typically an AOR.

#### Routing region

The CICS region in which the decision is taken on where the transaction or program should be run. For transactions initiated at a terminal, for EXEC CICS START commands associated with a terminal, and for inbound client DPL requests, this is typically a TOR. For non-terminal-related EXEC CICS START commands, for peer-to-peer DPL requests, and for CICS BTS activities, the routing region is typically an AOR.

### **Target region**

The CICS region in which the transaction or program runs. For all dynamically-routed requests, this is typically an AOR.

### **Benefits**

The new dynamic routing function enables more of the work in a CICSplex to be workload balanced, resulting in more consistent response times. You will be able to:

- Route dynamically all program link request types to improve performance and reliability.
- Route a subset of EXEC CICS START commands dynamically to improve performance and reliability of applications that use these commands.

### **External control blocks**

In support of this function, CICSplex SM external control blocks have been changed. You should recompile any programs using EYURWTRA, EYURWCOM, EYURCCOM, EYURPCOM, EYURLCOM, and EYU9WRAM. You should also review your dynamic routing exit logic (EYU9WRAM), if you have customized this exit.

For dynamic program link requests, EYU9WRAM can be used to change the transaction id specified on the work request.

### **BAS implications**

Dynamic routing for START commands is controlled by the Dynamic and Routable fields in the transaction definition. DPL is controlled by the Dynamic field of the program definition. For details, see CICSplex SM Managing Business Applications and CICSplex SM Managing Business Applications.

### **Operations implications**

For routable START requests, the new Routing Status field in the LOCTRAND view indicates whether or not the current transaction may be dynamically routed. For details see CICSplex SM Operations Views Reference. For dynamic DPL requests, the new Dynam Status field in the PROGRAMD view indicates whether or not the current program may be dynamically routed. For details see CICSplex SM Operations Views Reference. The TASKD, TASK2, and TASK3 views have been amended to include dynamic routing information. New views TASK4, TASK5, TASK6, TASK7, TASK8, and TASK9 have been introduced to show detailed monitoring information. For details, see CICSplex SM Operations Views Reference.

### **New views**

Two new summary views are provided:

- WLMWAOS, which is a summary form of the WLMWAOR view, shows summarized information about all target regions that are associated with a workload that is within the CICSplex identified as the context.
- WLMWATOS, which is a summary form of the WLMWATOR view, shows summarized information about all routing regions that are associated with a workload that is within the CICSplex identified as the context.

## **CICS business transaction services**

CICS business transaction services (BTS) extends the CICS API and provides support services that make it easier to model complex business transactions. Using BTS, each action that makes up the business transaction is implemented as one or more CICS transactions, in the traditional manner. However, a top-level program is used to control the overall progress of the business transaction. The top-level

program manages the inter-relationship, ordering parallel execution, commit scope, recovery, and restart of the actions that make up the business transaction.

BTS processes are CICSplex-enabled, and take full advantage of CICSplex SM's workload separation and workload balancing functions. The CICS system group within a CICSplex, across which related BTS processes and activities may run, is known as a **BTS-set**. When you define a BTS-set, you do not need to define any new communication links, beyond those already defined for use by CICSplex SM.

For workload management, BTS is supported by

- A new view, WLMATAFD, which shows a detailed display of the properties of a single BTS activity. This view allows you to look at the contents of the BTS affinity key in hexadecimal format.
- Changes to the TRANGRP and WLMSPEC views to allow you to specify the BTS BAPPL affinity relation, and the BTS ACTIVITY and PROCESS affinity lifetimes.

For full details about BTS, see *CICS Business Transaction Services*.



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## Part 1. Implementing workload management

This part introduces the concept involved with workload management and the dynamic routing of transactions and programs. It then describes the criteria used to identify a workload on the basis of a workload specification, one or more workload definitions and their optional transaction groups, and one or more workload groups. The steps you need to perform in order to activate workload management are detailed.



---

# Chapter 1. Introduction to workload management

This chapter introduces the concepts involved with workload management and the dynamic routing of transactions and programs.

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## Workload management and dynamic routing

CICSplex SM workload management optimizes processor capacity in your enterprise. Workload management achieves this by dynamically routing transactions and programs to whichever CICS region is the most appropriate at the time, taking into account any transaction affinities that exist. Workload management can dynamically route:

- Transactions invoked at a terminal
- Eligible transactions invoked using EXEC CICS START commands that are associated with a terminal
- Eligible transactions invoked using EXEC CICS START commands that are not associated with a terminal
- Distributed program links, including:
  - The CICS Web support
  - The CICS Transaction Gateway
  - EXCI calls
  - CICS Client ECI calls
  - Distributed Computing Environment (DCE) remote procedure calls (RPCs)
  - Open Network Computing (ONC) remote procedure calls (RPCs)
  - Internet Inter Object Request Broker Protocol (IIOP)
  - Any function that issues an EXEC CICS LINK PROGRAM request
  - Link3270 requests
- Transactions associated with CICS business transaction services (BTS) activities.
- Enterprise beans executing in CICS-provided CorbaServers

Alternatively, if you want work to run always in a specified region, you can use **static routing**.

The CICS systems involved in dynamic routing may act as one of the following:

### Requesting region

The CICS system where the request is initiated. For terminal-initiated transactions and for inbound client DPLs, the requesting region is typically a terminal-owning region (TOR); for terminal-related EXEC CICS START commands, for non-terminal-related EXEC CICS START commands, for peer-to-peer DPLs, for CICS BTS activities, and for Link3270 bridge requests, the requesting region is typically an application-owning region (AOR). For *enterprise bean invocations*, the requesting region is typically the external client code that invokes the enterprise bean.

### Routing region

The CICS region that decides where to route the transaction or program. For terminal-initiated transactions and terminal-associated EXEC CICS START commands, the routing region is typically a TOR; for DPLs, for non-terminal-related EXEC CICS START commands, and CICS BTS

activities, and for Link3270 bridge requests, the routing region is typically an AOR. For *enterprise bean invocations*, the routing region is a CICS listener region.

### Target region

The CICS system in which the transaction or program will run. For all dynamically-routed transactions, programs, BTS activities and enterprise bean invocations, the target region is typically an AOR.

In order to manage enterprise bean workloads, you need to create a *logical EJB server*, which will typically consist of a number of cloned enterprise bean listener regions acting as routing regions and cloned target regions. A CICSplex involved in the workload management of enterprise beans may contain one or more logical EJB servers, and regions that are not involved with processing enterprise bean invocations. Each cloned target region may run a number of *CorbaServers*. A CorbaServer provides the execution environment for enterprise beans and stateless CORBA objects.

If the region is the listener, include the statement:

```
MASPLTWAIT(YES)
```

in its EYUPARM file, to ensure that the critical components of the local CICSplex SM environment initialize before any enterprise bean routing requests are presented.

The routing can be based on:

- User, terminal, processtype, and affinity attributes associated with the work requests, which may be the transactions, programs, or BTS processes and activities
- The work requests themselves

When you establish a workload, you are associating the work itself and the CICS systems (acting as requesting, routing, and target regions), to form a single, dynamic entity. Within this entity, you can route the work:

- To a target region selected on the basis of its availability. This type of routing, known as *workload balancing*, allows you to balance work activity across all of the target regions associated with a workload. See “Balancing the work in a workload” on page 7 for additional information.
- To a subset of the target regions based on specific criteria. This type of routing, known as *workload separation*, allows you to separate transaction and program occurrences and direct them to different target region subsets, where activity is balanced across the target regions within the subset.

The criteria you use to separate transactions or programs can be based on:

- The terminal id and user id associated with a transaction or program occurrence.
- The process type associated with the CICS BTS activity.
- The transaction.

See “Separating the work in a workload” on page 10 for additional information.

- To a selected target region based on its affinity relationship and lifetime. This type of routing, based on the *transaction affinity* of the target region, allows you to route specific transaction occurrences to the same target region for a designated period of time. For additional information, see “Taking affinity relations into consideration” on page 16.

Workload balancing and workload separation can be active concurrently within the same or different workloads associated with a CICSplex.

**Note:**

1. You can use the CICSplex SM real-time analysis functions to produce data that will help in the selection of a target region during workload management. See “Using real-time analysis to select a target region for workload balancing” on page 87 for details.
2. For additional information about how CICSplex SM handles dynamic routing and how you can customize this facility, see Chapter 4, “Dynamic routing with CICSplex SM,” on page 25.

---

## Workload requirements

The conditions that make a work request eligible for dynamic routing are given in the *CICS Intercommunication Guide*.

Any CICS system may act as a requesting region, a routing region, or a target region, as long as:

- All of the CICS systems associated with a workload are either part of the same CICSplex, or, for BTS processes and activities, part of the same BTS-set. They do not need to reside in the same MVS image.
- For dynamic routing of both terminal-related and non-terminal-related EXEC CICS START commands, requesting, routing, and target regions must be CICS Transaction Server for OS/390 Version 1 Release 3 or above.
- For dynamic routing of DPLs, routing regions must be CICS Transaction Server for OS/390 Version 1 Release 3 or above; target regions may be any level of CICS.
- For enterprise beans, the routing and target regions must be part of the same IIOF server; that is, the same logical EJB server.
- For CICS BTS activities, the routing region (which is also the requesting region) and the target region must be at CICS Transaction Server for OS/390 Release 3 or later. They must also be in the same sysplex.
- For dynamic routing of transactions and static routing, the CICS system acting as the routing region must be running CICS/ESA 3.3 and later. The CICS systems acting as target regions can be running any version of any CICS platform supported by CICSplex SM (CICS/ESA, CICS/MVS, or CICS for OS/2).
- For dynamic routing of enterprise bean-related transactions, the CICS system acting as the routing region and the target region must be running CICS Transaction Server Version 2 Release 1 and later.
- The routing region must be defined as local to a CMAS involved in managing the CICSplex. It must use CICSplex SM facilities to communicate with that CMAS. For additional information, see Setting up a CICS managed application system (MAS), in the *CICS Transaction Server for z/OS Installation Guide*.
- For Link3270 bridge requests the target regions must be at CICS Transaction Server for z/OS, Version 2 Release 2 or later.

A CICS system can act as a target region in one or more workloads; however, it can act as a routing region in one and only one workload. Note that a CICS system can act as a routing region and a target region in the same workload.

When a CICS system acting as a target region is combined with other target regions to form a CICS system group, each of the target regions should have

access to all of the resources required by any transactions that may be routed to that CICS system group. In the case of a CICS BTS workload, they must all be in the same sysplex.

---

## Chapter 2. Establishing a workload

The criteria used to identify a workload are based on the information provided by a workload specification, one or more workload definitions and their optional transaction groups, and one or more workload groups.

- A *workload specification* identifies the CICS systems or CICS system groups within a CICSplex that are to be treated as routing regions and the default target regions. You can also use a workload specification to identify a default affinity relationship and lifetime.

A CICS region can be associated with none, or one workload specification (WLMSPEC). For the CICS region to be a CICSplex SM routing region, it must be associated with a workload. For the CICS region to be a CICSplex SM target region, it depends on the type of routing being used:

- For Dynamic routing, the target region is not associated with a workload (WLMSPEC), This means that the target region could be a target for one or more workloads.
- For Distributed routing, then the target region must be associated with a workload (WLMSPEC). This means that the target region can be a target for one workload

If you are only using dynamic routing today, we suggest that target regions are targets in only one workload, to make things easier if you decide to implement distributed routing at a later time.

The name of a workload specification becomes the name of the workload itself.

- A *workload definition* includes specific or generic terminal and user names, or a specific or generic process type, that are used when attempting to match a transaction occurrence to a workload definition. It also identifies the target region to which transaction occurrences matching the criteria are to be routed.
- A *transaction group* identifies one or more related transaction identifiers and indicates whether the terminal ID or the user ID specified in the workload definition is to be used as the primary selection criterion in determining which transactions are to be routed to the set of target regions identified in the workload definition. A transaction group is also used to define affinities.
- A *workload group* is a collection of workload definitions that are to be treated as a single entity.

**Note:** When no workload definitions are installed in a workload, all transactions and programs are routed to a target region in the default target scope identified by the workload specification. However, when a workload definition is installed in a workload, all transactions and programs that match the criteria in that workload definition are routed to a target region in the target scope identified by the definition itself. A dynamic routing request that is not associated with any workload definition is routed to a target region in the workload specification's default target scope.

---

### Balancing the work in a workload

You can have all dynamic transactions and programs initiated from a set of requesting regions routed by a routing region to a specific set of target regions within the same CICSplex. The specific target region to which each request is routed is determined by the activity and availability of all target regions in that set.

To establish workload balancing, you need to define only a workload specification; see Specifications - WLMSPEC.

The dynamic routing processes are explained using Figure 1, which illustrates the Starter Set configuration. For dynamic transaction routing, any transaction initiated from a terminal associated with the requesting region EYUMAS1A (a TOR) is routed to the most appropriate target region (an AOR) in the CICS system group EYUCSG01.

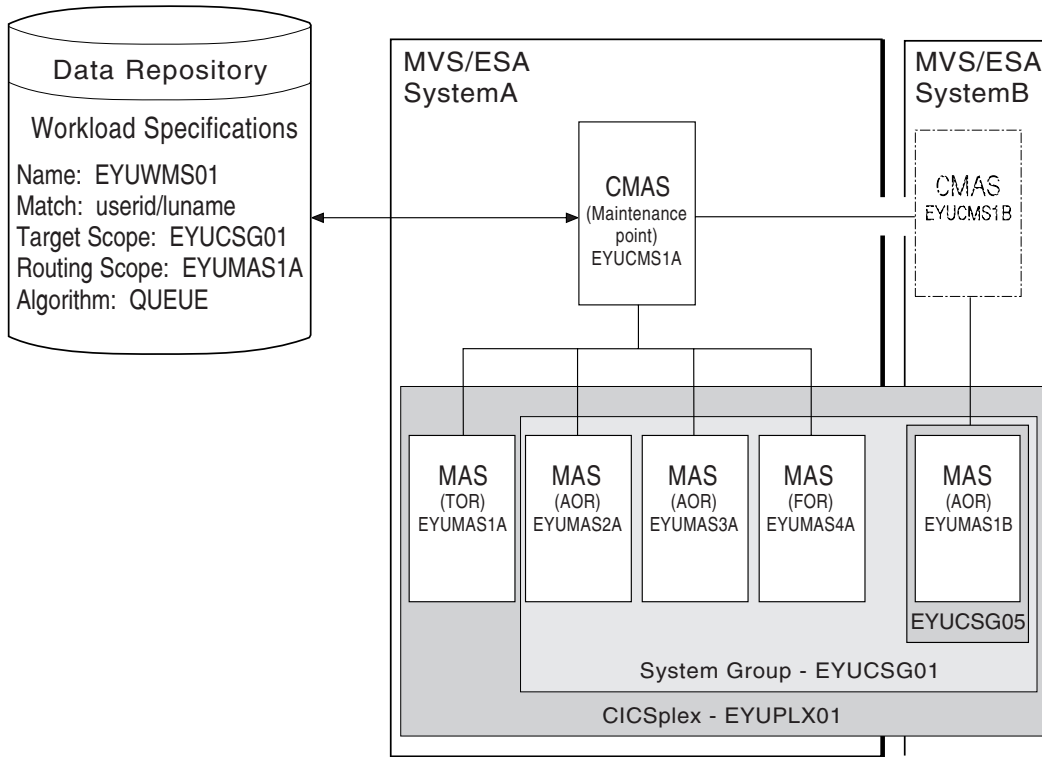


Figure 1. Sample workload balancing definition for dynamic routing

For dynamic routing of EXEC CICS START TRANSID TERMID commands, any transaction initiated in the requesting region EYUMAS2A (an AOR) is sent to EYUMAS1A (a TOR), the routing region associated with the terminal identified in the TERMID option of the START command. The routing region sends the transaction to the most appropriate target region (an AOR) in the CICS system group EYUCSG01.

For dynamic program linking, there are two possible scenarios. For an inbound client request, the request is received in TOR EYUMAS1A, which acts as the requesting region and the routing region. The target region is any AOR in the CICS system group EYUCSG01. For a peer-to-peer request, the request is initiated by a transaction running in EYUMAS2A (an AOR). EYUMAS2A acts as the routing region, and the target region may be any AOR in the CICS system group EYUCSG01.

The routing processes for the workload balancing of enterprise beans are explained using Figure 2 on page 9. The inbound IIOF work request is received by a routing region (listener) in system group EYUSGEJ1 and is matched to an existing request model definition. The routing region routes the transaction identified in the request model to a target region in the CICS system group. The transaction runs in the



CorbaServer identified in the request model definition.

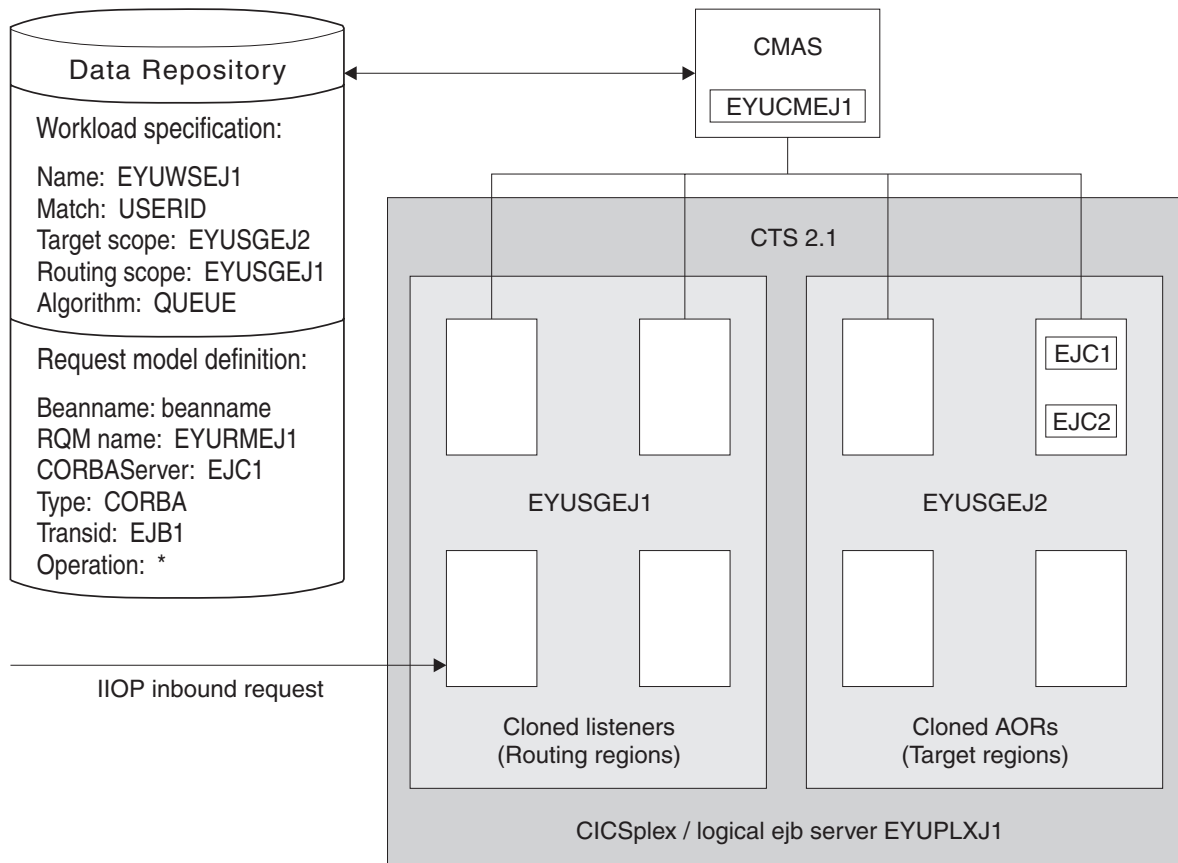


Figure 2. Sample workload balancing definition for dynamic routing of enterprise beans

**Note:** For additional information about the goal algorithm, see the *MVS/ESA SP Version 5 Planning: Workload Management* book.

## Using the queue algorithm

During workload processing using the queue algorithm, CICSplex SM routes all transactions and programs initiated in the requesting region to the most appropriate target region within the designated set of target regions.

## Using the goal algorithm

For systems running MVS 5.1 and higher, CICSplex SM also supports the goal algorithm. The aim of the goal algorithm is to select the target region that is best able to meet the defined, average response-time goals for all work in a workload.

The goal is defined by associating transactions, via the MVS Workload Manager, to a service class. Service classes are assigned on a transaction, LU name, and user ID basis. Service classes can define several types of response-time goals. However, CICSplex SM recognizes average response-time goals only. If transactions are given velocity or discretionary goals, they are assumed to be meeting their goals. CICSplex SM manages at the service-class level (it has no internal knowledge of the transaction characteristics). By consistently allocating service classes to sets of target regions, it minimizes the amount of resource reallocation by the MVS Workload Manager

It is important for the Service Level Administrator to define goals that are realistic for the underlying capacity of the target systems. Transactions of like attributes (for example, transactions that have similar resource consumption, or pseudoconversational transactions) should be assigned to distinct service classes. (The response-time goals can be the same for several service classes.) CICS statistics should be used to help you define these transaction sets. (See the *Performance Guide* for your release of CICS for information about CICS statistics.)

In order for the goal algorithm to be used, all requesting regions, routing regions, and target regions must be on MVS 5.1 or later images running in goal mode. The requesting regions, routing regions, and target regions themselves must be CICS/ESA 4.1 or later regions. Switching any of the images back into System Resource Manager (SRM) mode causes CICSplex SM to revert to the queue algorithm.

The goal algorithm is best suited to a symmetrical target region/MVS configuration (in terms of the number of target regions per MVS image), with a number of service classes that is comparable to the number of target regions in a given MVS image.

---

## Separating the work in a workload

You can separate the work in a workload based on:

- The name of the user, terminal, or both associated with a transaction or program
- The transaction itself.
- The BTS process-type associated with the transaction, if the transaction is associated with a BTS activity.

**Note:** You can separate a workload using either LU name and userid, or process type. You cannot separate a workload using, for example, a generic process type and a user id. Separation of enterprise bean workloads may be implemented only through the user id.

## Separating by terminal or user name

You can create a workload that routes requests from a set of requesting regions to different subsets of target regions based on the name of the terminal, user, or both associated with each occurrence of a transaction. For example, you might want to route all requests initiated by certain individuals from specific terminals to a special subset of target regions.

Figure 3 on page 11 illustrates what such a workload might look like. In this case, if the user and terminal names associated with a transaction begin with SM and NET, respectively, the transaction is routed to the set of target regions identified as EYUCSG05. If either the user or terminal name begins with any other characters, the transaction is routed to the default set of target regions identified as EYUCSG01 on the workload specification.

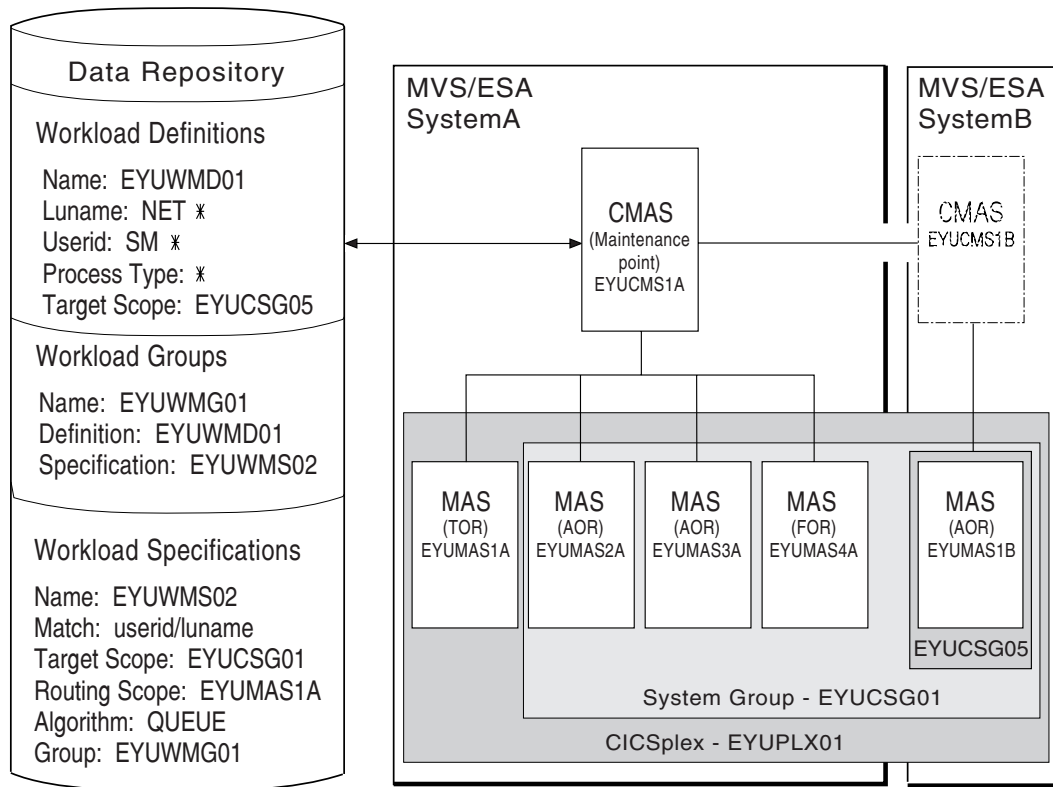


Figure 3. Sample definition separating a workload by terminal and user name

During workload processing, CICSplex SM evaluates the terminal and user names associated with each occurrence of a request to determine where the request should be routed.

- If the terminal and user names associated with the transaction match the selection criteria specified in an installed workload definition, the request is routed to the target regions identified in that definition.
- If either the terminal or user name does not match the selection criteria, the request is routed to the default set of target regions identified in the workload specification.

After determining the appropriate set of target regions, CICSplex SM selects one based on the status of the active target regions in that set.

## Separating by process type

You can create a CICS BTS workload that routes requests associated with a certain process type to a specific target region or set of target regions. For example, you may wish to route all the requests associated with the STOCK process type to a special subset of target regions.

Figure 4 on page 12 illustrates what such a workload might look like, if the process type associated with a CICS BTS transaction is STOCK, the transaction is routed to a set of target regions identified as EYUCSG05. If the process type is anything other than STOCK, the transaction is routed to the default set of target regions identified as EYUCSG01 in the workload specification.

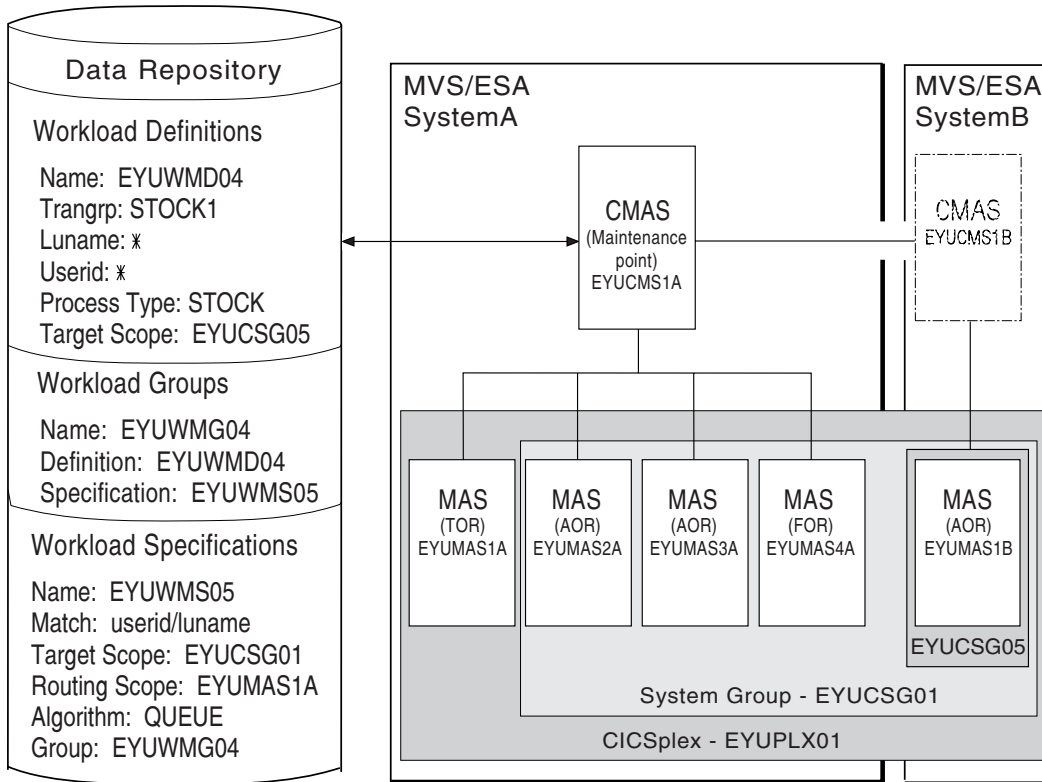


Figure 4. Sample definition separating a workload by process type

If you choose to separate a workload by process type, you must set the Luname and Userid fields to \*. If you separate a workload by LU name and user ID, you must set the Process Type field to \*. If you want to separate an enterprise bean workload, the Luname and Process Type fields must be set to \*. You can separate a workload only either by process type or by LU name and user ID.

You can specify either a specific or a generic process type. During workload separation processing, CICSPlex SM evaluates the process type supplied by CICS to determine to where the transaction should be routed.

- If the process type matches the selection criteria specified in an installed definition, the request is routed to the target regions identified in the definition.
- If the process type does not match the selection criteria, a match may be found based on the transaction's associated LU name and user ID. If a match is found based on these criteria, the request is routed to the target regions identified in the associated definition.
- If no match is found using the process type, LU name and user ID, the request is routed to the default set of target regions identified in the specification.

**Note:** Separation by process type takes precedence over separation by LU name and user ID. Thus, if a transaction's associated process type, LU name and user ID mean that it satisfies the selection criteria specified in two workload definitions, one specifying separation by process type and the other separation by LU name and user ID, the transaction is routed to a region in the target scope specified in the workload definition specifying separation by process type.

## Separating by transaction

You can also separate the work in a workload based on the transactions themselves. For example, you might want all occurrences of payroll-related transactions initiated from terminals in an accounting department to be routed to a specific set of target regions for processing.

Figure 5 on page 14 illustrates how you might separate the work in a workload based on transaction identifiers. In this case, if the user and terminal names associated with any transaction identified in transaction group EYUWMT01 begin with SM and NET, respectively, the transaction is routed to the target regions identified as EYUCSG05. If the transaction identifier, user name, or terminal name does not match the criteria, the transaction is routed to the default target regions identified as EYUCSG01.

During workload processing, CICSplex SM evaluates the transaction identifier supplied by CICS to determine which transaction group to use.

- If the transaction is defined to a transaction group, CICSplex SM notes whether the match key for that group is USERID or LUNAME.
- If the transaction is not part of a transaction group, CICSplex SM uses the match key from the default transaction group for the specification. (The match key is the value specified with the associated specification. For additional information, see Transaction group definitions - TRANGRP.)

CICSplex SM uses the match key value to establish the order in which the terminal and user names associated with the transaction are to be evaluated. The evaluation is used to determine where the transaction should be directed:

- If the terminal and user names associated with the transaction match the selection criteria specified in an installed workload definition, the request is routed to the target regions identified in that definition.
- If the terminal and user names do not match the selection criteria, the request is routed to the default set of target regions identified in the workload specification.

After determining the appropriate set of target regions, one is selected based on the status of the active target regions in that set.

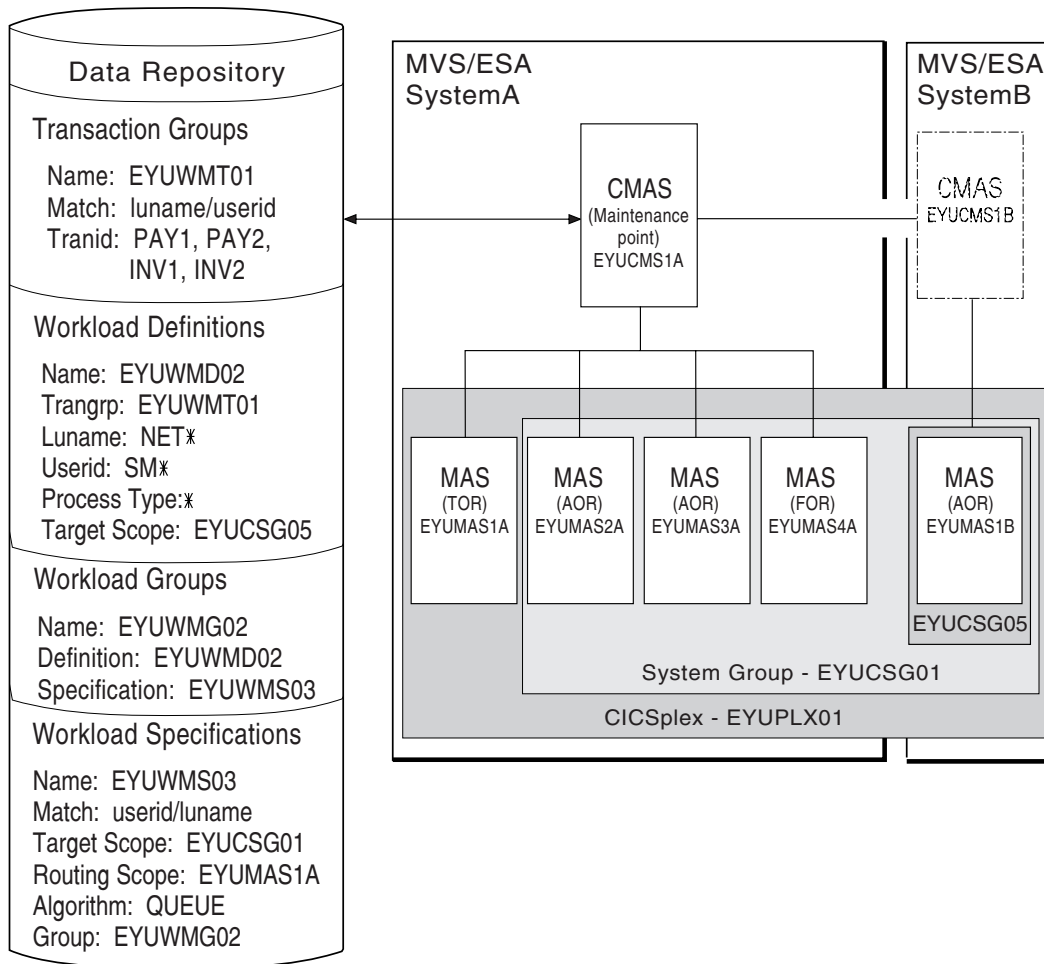


Figure 5. Sample definition separating a workload by transaction

## Separating enterprise beans by transaction

The method for workload separation of enterprise beans is the same as that described in “Separating by transaction” on page 13. For example, you might want all enterprise bean-related transactions to be routed to a specific set of target regions for processing.

An incoming IOP enterprise bean request to CICS includes the bean name, which is matched to a predefined request model definition that is installed in the routing regions (cloned listener regions). The request model identifies, among other things:

- The bean name
- The CICS transaction to be run
- The name of the CorbaServer in the target region in which the transaction is to run.

Figure 6 on page 15 illustrates how you might separate enterprise bean-related transactions. The request definition relates enterprise bean beanname with CICS transaction EJB1, which belongs to transaction group EYUTGEJ1. The workload definition identifies the target scope as EYUSGEJ2. The match key is USERID and you can use a specific or generic user id in the transaction group definition. If the

user id in the transaction group definition does not match that in the incoming IIOP request, the enterprise bean-related transaction is routed to the default target region EYUSGEJ2.

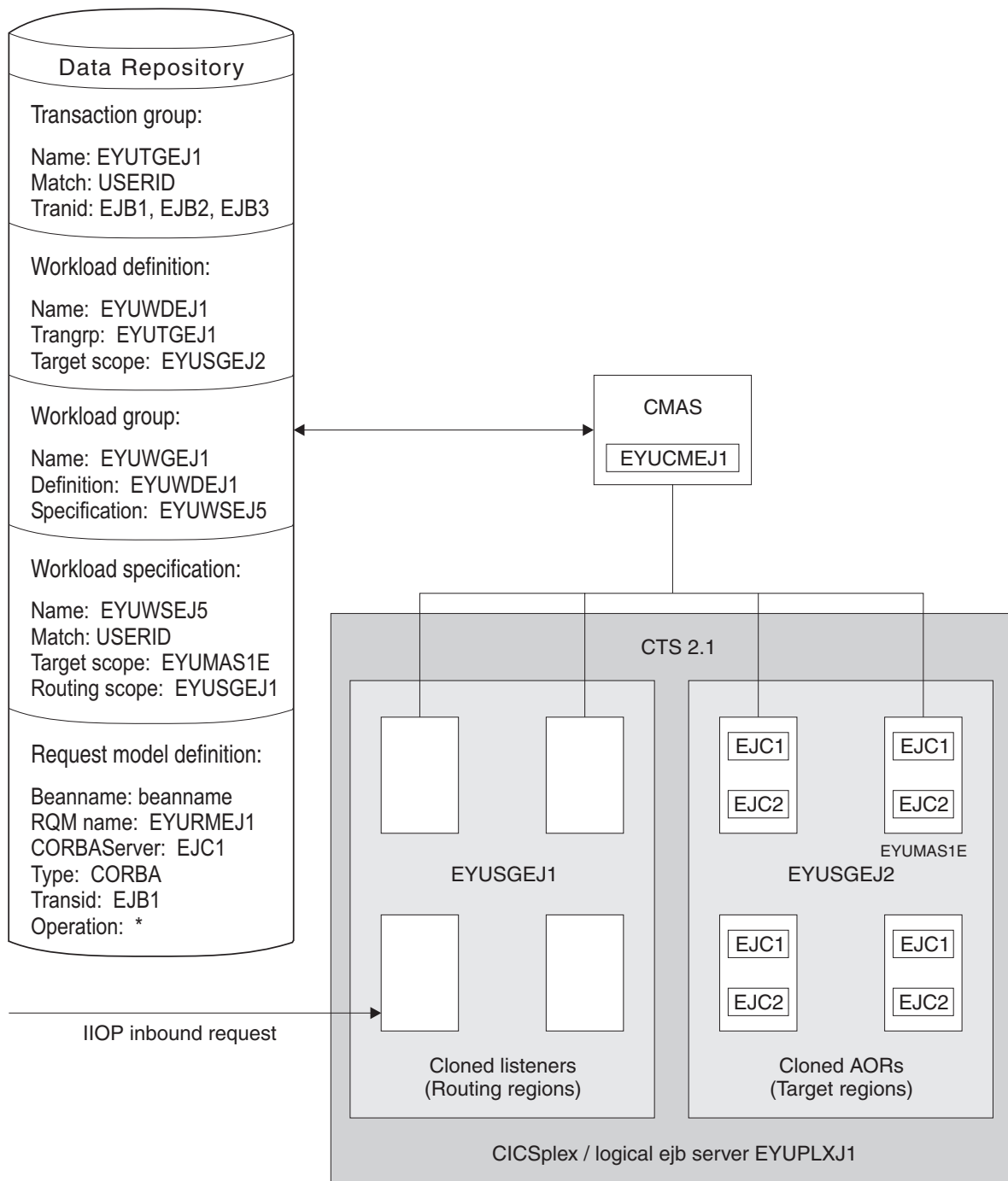


Figure 6. Sample workload separation definition for dynamic routing of enterprise beans

## Separating Link3270 bridge workloads

Link3270 bridge workloads can be separated by user ID, LU name, and transaction group. For Link3270 bridge workloads the LU name can be produced in three different ways:

1. It can be supplied by the user in the BRIH-NETNAME parameter on the Link3270 call.
2. It can be generated randomly by the Link3270 bridge facility.
3. The CICS autoinstall user replaceable program can be used in conjunction with either of the other two methods to accept, reject or modify the supplied or generated NETNAME.

You can separate Link3270 bridge workloads by LU name only if you are using methods 1 or 3 of those listed, so that the LU name is known in advance. If you are using the method 2, the LU name is not known in advance and cannot be used for workload separation.

To separate by the bridge facility NETNAME and not the name associated with the client program that started the Link3270 bridge you must modify the EYU9WRAM module. You can use the CICS API commands:

- EXEC CICS ASSIGN USERID()
- EXEC CICS ASSIGN BRFACILITY NETNAME()

to assign the user ID and LU name. You can use the NETNAME returned from the INQUIRE BRFACILITY() command rather than the NETNAME passed via the DFHDYPDS commarea parameter DYRNETNM to separate the workload.

For more information about Link3270 bridge facility definitions see *CICS External Interfaces Guide*.

---

## Taking affinity relations into consideration

An *affinity* is a relationship that you define between two or more transactions and the duration (or *lifetime*) of that relationship. When an affinity relationship exists between transactions, those transactions must be processed by the same target region. You can use affinities to route transactions from one or more requesting regions to a specific target region based on the rules applying to a particular combination of an affinity relation and lifetime. For a list of affinity relation and lifetime values, see Relations and lifetimes.

When multiple CMASs in the CICSplex manage affinities for the workload, and one of these CMASs is brought down and the local MASs stay up, the workload becomes frozen. When the workload is frozen, it cannot be changed, however the current workload remains active.

When a CMAS is down, and you have any of the following affinity life times and affinity relationships, a new affinity instance cannot be created, and the transaction cannot be routed to the target MAS associated to the to the affinity, because the local TORs cannot be informed of the workload changes while the workload is frozen.

Affinity relation	Affinity lifetime
USERID	<ul style="list-style-type: none"> <li>• SYSTEM</li> <li>• PERMANENT</li> </ul>
LUNAME	<ul style="list-style-type: none"> <li>• SYSTEM</li> <li>• PERMANENT</li> </ul>
GLOBAL	<ul style="list-style-type: none"> <li>• SYSTEM</li> <li>• PERMANENT</li> </ul>



Affinity relation	Affinity lifetime
BAPPL	<ul style="list-style-type: none"> <li>• SYSTEM</li> <li>• PERMANENT</li> <li>• ACTIVITY</li> <li>• PROCESS</li> </ul>

When the CMAS is brought back up and reconnects to the MASs, the workload is un-frozen and is able to be changed.

You can use the IBM CICS Interdependency Analyzer for z/OS to detect existing affinities between transactions and between BTS processes and activities. The output from the Reporter component of that utility can be used as input to the CICSPlex SM batched repository-update facility. For more information, see the *CICS Interdependency Analyzer for z/OS User's Guide and Reference*.

**Note:** You cannot use the IBM CICS Interdependency Analyzer for z/OS to detect affinities between non-terminal-related EXEC CICS START commands, and between DPLs that are not associated with either a user id or a terminal id. For these request types, you should try to remove or avoid all affinities, and ensure that your applications can honor any remaining affinities.

## CICS BTS considerations

Although BTS itself does not introduce any affinities, and discourages programming techniques that do, it does support existing code that may introduce affinities. You must define such affinities to workload management. It is particularly important to specify each affinity's lifetime. Failure to do this may restrict unnecessarily the workload management routing options.

It is important to note that a given activity can be run both synchronously and asynchronously. Workload management is only able to honour invocations that are made asynchronously. Furthermore, you are strongly encouraged not to create these affinities, particularly activity and process affinities, because these affinities are synchronized across the BTS-set. This could have serious performance impacts on your systems.

You should also note that, with CICSPlex SM, the longest time that an affinity can be maintained is while a CMAS involved in the workload is active; that is, an affinity of PERMANENT. If there is a total system failure, or a planned shutdown, affinities will be lost, but activities in CICS will be recovered from the BTS RLS data set.

## Enterprise bean considerations

The CICSPlex SM affinity services have no facilities for the management of affinities between enterprise beans. Transaction affinity relation and lifetime fields in the workload management views should be left blank.

## Link3270 bridge considerations

For Link3270 bridge transactions, affinities are managed by CICS and not by CICSPlex SM. Transaction affinity relation and lifetime fields in the workload management views should be left blank.

## Adding affinities into a workload

Figure 7 illustrates how you might separate the work in a workload based on transaction identifiers and then associate an affinity relation and lifetime with those transactions. With this example, the first occurrence of a transaction named PAY1, where the associated terminal and user names are NET1 and SMITH, respectively, is directed to the appropriate target region within the set of target regions identified as EYUCSG05. The specific target region receiving the transaction and the affinity relation and lifetime associated with the transaction group to which PAY1 belongs are noted. All subsequent occurrences of any transaction in the transaction group that meet the terminal and user name criteria are directed to the same target region for the designated period of time.

**Note:** If you do not specify a default affinity relation and lifetime, then you may use the same workload specification for workload balancing and separation.

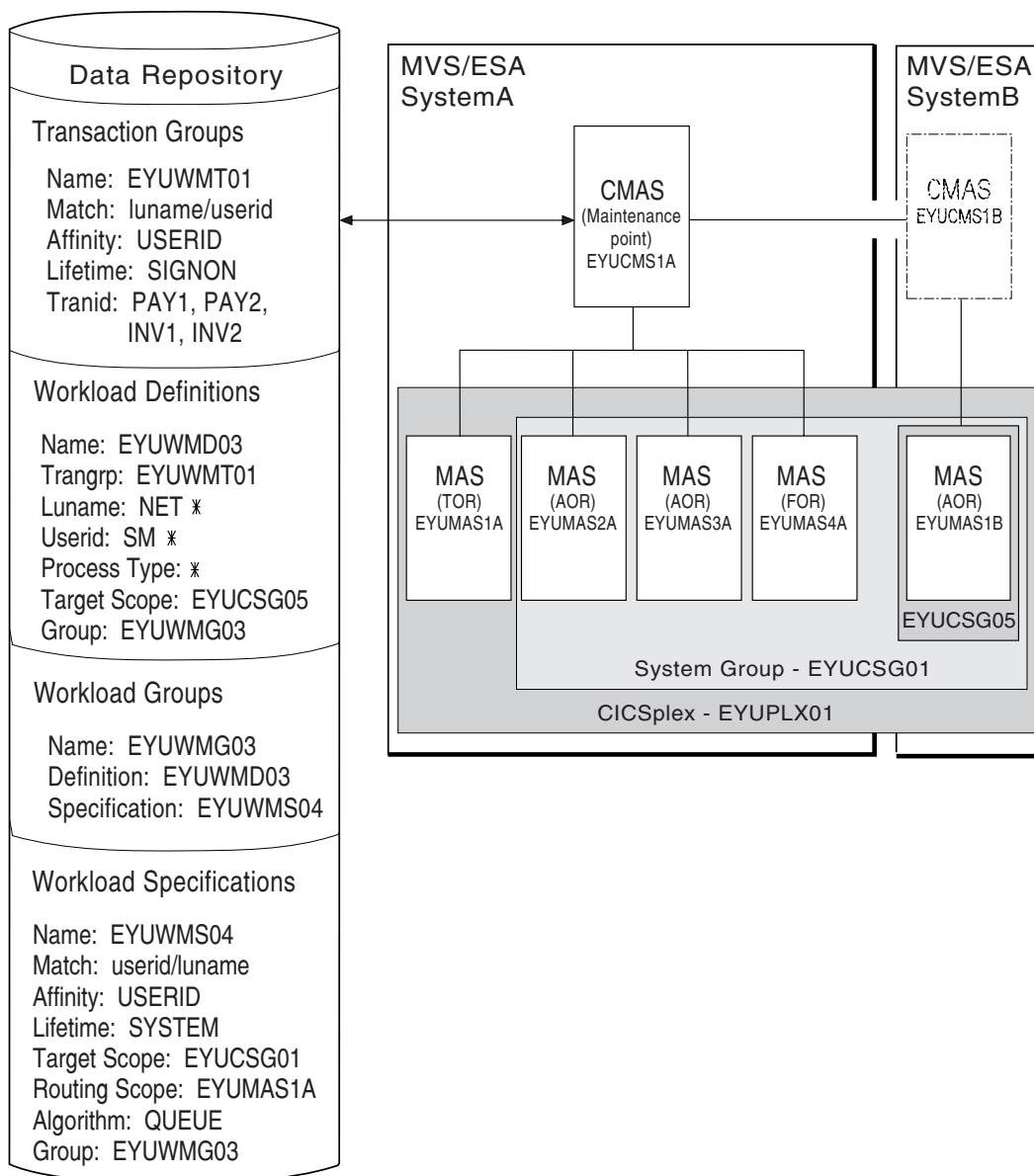


Figure 7. Sample definition adding transaction affinity to a workload

**Note:** During workload processing, CICSplex SM evaluates the transaction identifier supplied by CICS to determine which transaction group to use.

- If the transaction is defined to a transaction group, CICSplex SM notes the match key for that group.
- If the transaction is not part of a transaction group, CICSplex SM uses the match key from the default transaction group for the workload specification.

CICSplex SM uses this value to establish the order in which the terminal and user names associated with the transaction are to be evaluated. The evaluation is to determine where the transaction should be directed:

- If the terminal and user names associated with the transaction match the selection criteria specified in an installed workload definition, CICSplex SM checks to see if an affinity relation and lifetime are associated with the transaction group.
  - When an affinity relation and lifetime are associated with the transaction group:
    - If it is the first occurrence, CICSplex SM notes the affinity relation and lifetime. Based on target region availability, CICSplex SM then selects a target region and directs the transaction to it.
    - If it is not the first occurrence, CICSplex SM routes the transaction to the previously selected target region. As long as the affinity relation and lifetime are applicable, subsequent occurrences of any transaction in the transaction group are directed to the same target region.
  - When no affinity relation and lifetime are associated with the transaction group, the transaction is routed to the most appropriate target region in the designated set of target regions.
- If the terminal and user names do not match the selection criteria, the transaction is routed to the default set of target regions identified in the workload specification. One is selected based on the status of the active target regions in that set.

**Note:** When transactions in a *series* of terminal-initiated transactions are associated with separate transaction groups, affinities for each transaction group follow the rules defined for that transaction group.

---

## Taking abend probabilities into consideration

With CICS/ESA 4.1 and later, CICSplex SM can evaluate both the health and activity (or load) of each target region identified by the Target Scope. This information, along with the abend probability values you provide when defining transaction groups to CICSplex SM, is then used in determining to which target region a particular transaction should be routed. That is, it is used as a guide to avoiding target regions where the abend probability is greater than is acceptable for a given transaction or set of transactions within the transaction group.

**Note:** For any transactions that are not associated with a transaction group, the default abend probability values defined in the workload specification are used.

The probability that a transaction will abend if routed to a particular target region is calculated in one of the following ways:

- When the transaction is associated with a transaction group that either has no defined affinity type and lifetime or uses the default values defined in a workload specification, then the probability of an abend is calculated individually for that transaction.
- When the transaction is associated with a transaction group that has a defined affinity type and lifetime, then the probability of an abend for that transaction is calculated as the probability of an abend for the entire group of transactions.

The abend probability values that you provide cover both the health and load of a potential target region, where:

- If the probability that a given transaction within the set will abend in a specific target region is equal to or greater than the abend health value you specified with the transaction, then that target region is considered unhealthy. CICSplex SM attempts to avoid routing the transaction to that target region. However, if there is no healthier target region, then the transaction may be routed to that target region.
- If the probability that a given transaction within the set will abend in a specific target region is greater than 0% but less than the abend load value you specified, CICSplex SM gradually adjusts the perceived transaction load upward. Once the abend probability reaches the defined load value, the perceived load is doubled, which means the target region is considered to have twice the load that it really has. The target region is still considered healthy, but its perceived load may make it less acceptable as a target for routing. The perceived load continues to increase until the abend probability reaches the defined health value, at which point the target region is considered unhealthy.

**Note:**

1. Abend probabilities are only taken into account if you are using the dynamic routing exit DTRPGM. They are not considered if you are using the distributed routing exit DSRTPGM.
2. Once an affinity is active, all subsequent transactions are routed to the same target region for as long as the affinity remains active, regardless of its abend probability.
3. If a transaction abends in a target region with EXEC CICS HANDLE ABEND in force, CICSplex SM does not receive the information that the abend has occurred. Therefore, CICSplex SM cannot take such abends into account when calculating the probability that a transaction will abend in that target region. In other words, the abend probability might stay low in this situation, even though abends had occurred.

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## Chapter 3. Activating workload management

This chapter contains the steps you need to perform to activate workload management.

For workload management to occur for a particular CICS system, you must:

1. Associate a workload specification with the CICS system, using the WLMSPEC view, as described “Associating a CICS system or system group with a workload specification” on page 51.
2. Identify the dynamic routing program EYU9XLOP to the CICS systems acting as requesting regions and target regions.

If the CICS system is not active, you can make workload management processing available the next time the CICS system starts by setting the CICS system initialization table DTRPGM (SIT) parameter in the requesting region which initiates the request and in any target region which is also to act as a routing region:

```
DTRPGM=EYU9XLOP
```

For non-terminal-related EXEC CICS START commands and BTS activities, and also for all regions within a logical server, set the DSRTPGM SIT parameter in the region that initiates the request and in all potential target regions:

```
DSRTPGM=EYU9XLOP
```

If the CICS system is active, you can use the **CICS regions** detailed view, as described in *CICS regions - CICS RGN*, in the *CICSplex System Manager Operations Views Reference*, to set the name of the dynamic routing program and the distributed routing program.

**Note:** For additional information about this program and dynamic routing, see Chapter 4, “Dynamic routing with CICSplex SM,” on page 25.

3. Activate workload management for the CICS system. You can do this using the views:

### **CICS system definitions**

To change the CICS system definition in the data repository.

### **MASs known to CICSplex**

To activate temporarily workload management for an active CICS system.

When either the first routing region associated with a CICSplex is started, or you use the **MASs known to CICSplex** detailed view to activate workload management for the first routing region in a CICSplex, the appropriate workload specifications are installed automatically. (All CMASs involved in managing the CICSplex are also notified.) All workload definitions and transaction groups, associated with the specification by workload groups, are also installed automatically. As long as the CICS system remains active, additional workload definitions can be installed manually in the CICS system.

**Note:** When a requesting region associated with a CICSplex, and defined with either DTRPGM=EYU9XLOP or DSRTPGM=EYU9XLOP, is starting, it connects to its target CMAS and workload management is activated. However, if the target CMAS is not active when the routing region is starting, any transactions initiated from that routing region and processed by the EYU9XLOP program will wait indefinitely until the CMAS becomes active and the requesting region fully connects to it. Note that once the requesting

region connects to the CMAS and workload management is activated, the CMAS can become inactive and workload management remains active.

Once a workload is active, subsequent changes you make to workload definitions and transaction groups are noted in the data repository. To include these changes in an active workload, you must use action commands to install or discard them.

Installed workload definitions become active immediately and remain active as long as the workload is active or until you discard them. (To verify that the definition is installed in the workload and that all of the CMASs involved in managing the CICSplex using that workload know about the definition, you can use the **Active workload definitions** view, as described in “Active workload views” on page 58.)

How long a workload remains active depends on the affinity lifetime associated with the workload.

- When an affinity lifetime of PERMANENT is in effect, the workload remains active as long as any CMAS involved in managing the workload is active.
- When any other affinity lifetime, or no affinity lifetime, is associated with the workload, the workload remains active as long as any CICS system that is associated with that workload remains connected to a CMAS that manages the CICSplex to which that CICS system belongs.

### **Important**

Once workload management is active, you should not attempt to deactivate it while any workloads are active. When CICSplex SM is balancing or separating the work in a workload, unpredictable results may occur if you attempt to deactivate workload management. Unacceptable results occur if you attempt this action when affinity relations are associated with active workloads. For details, see “Discarding an active transaction from a workload” on page 86.

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## **Part 2. Implementing dynamic routing**

This part describes the CICS release requirements for regions involved in dynamic routing and provides sample source programs; it also explains how to access the CICSplex SM workload management facilities directly from an application program and provides appropriate samples.





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## Chapter 4. Dynamic routing with CICSplex SM

A transaction can be defined to CICS as either local or remote. Local transactions always run in the requesting region; remote transactions can be routed to any CICS system connected to the routing region. Routing of remote transactions can be dynamic, static, or ATI-controlled.

When a remote transaction is initiated, the CICS relay program is invoked. The CICS relay program links to the dynamic routing program EYU9XLOP. EYU9XLOP creates the environment necessary for CICSplex SM-based dynamic routing and sets up the CICSplex SM run-time environment. You must specify EYU9XLOP in the system initialization table (SIT) parameter.

- For static routing, ATI, and dynamic routing, set the DTRPGM SIT parameter associated with the requesting region initiating the transaction:

```
DTRPGM=EYU9XLOP
```

Any target region which is also to act as a routing region must also specify DTRPGM in the SIT and must be set up as a routing region as described in “Associating a CICS system or system group with a workload specification” on page 51..

- For non-terminal-related EXEC CICS START commands, BTS activities, or enterprise beans, set the DSRTPGM SIT parameter in the requesting region that initiates the request, and in all potential target regions that are also set up as a routing region:

```
DSRTPGM=EYU9XLOP
```

**Note:** If the target region is not going to be set up as a routing region, then EYU9XLOP should not be specified in the DTRPGM and DSRTPGM SIT parameters, because this will cause routed transactions to hang in EYU9XLOP waiting for the workload which will never come.

CICS notifies EYU9XLOP of all routing requests. These are:

- Route selection, route selection error, and transaction termination.
- For BTS (All supported releases of CICS), transaction initiation, transaction abend, and routing attempt complete.
- For enterprise beans (All supported releases of CICS), transaction initiation, transaction abend, and routing attempt complete.

When CICS links to EYU9XLOP, it passes the CICS communication area named DFHDYPDS to it.

Control then passes to the CICSplex SM workload management facilities. CICSplex SM initializes the workload management MAS agent code and engages its routing action process. This process is called internally if any of the following conditions are true:

- The EYU9WRAM user-replaceable module is not defined to CICS
- EYU9WRAM is defined to CICS, but is not available
- EYU9WRAM is defined to CICS, is available, and the load module is the assembler version of the module as distributed with CICSplex SM.

The internal routing action process produces the same results as executing the assembler version of EYU9WRAM as it is distributed with CICSplex SM. If no additional dynamic routing control is required at your enterprise, the internal process provides better performance.

The EYU9WRAM module (or its equivalent internal process) receives the CICSplex SM-based communication area EYURWCOM. (An entry for EYU9WRAM is added to the CICS system definition file, DFHCSD, for each CICS system during installation.) As distributed with CICSplex SM, EYU9WRAM drives CICSplex SM workload management processing. EYU9WRAM does this by first obtaining the appropriate list of target region candidates based on the transaction group, and the terminal id, luname, user id, or process type. Then EYU9WRAM selects a target region from the list of candidates.

---

## CICS release requirements for dynamic routing

The CICS release requirements for regions involved in dynamic routing.

- For dynamic transaction routing:

**Routing regions**

Any supported release of CICS (see CICS system connectivity)

**Target regions**

Any release of CICS (see CICS system connectivity)

- For EXEC CICS START commands:

**Requesting regions**

Any supported release of CICS

**Routing regions**

Any supported release of CICS

**Target regions**

Any supported release of CICS

- For CICS BTS:

**Requesting regions**

Any supported release of CICS

**Routing regions**

Any supported release of CICS

**Target regions**

Any supported release of CICS

- For DPL:

**Routing regions**

Any supported release of CICS

**Target regions**

Any supported release of CICS (see CICS system connectivity)

- For enterprise beans:

**Routing regions**

Any supported release of CICS

**Target regions**

Any supported release of CICS

- For Link3270 bridge:

## Routing regions

CICS Transaction Server for z/OS, Version 2 Release 3 or later

## Target regions

Any supported release of CICS

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## Sample source programs and copy books

Following installation, the module EYU9WRAM is loaded into CICSplex SM. It is an assembler-language, command-level program; its corresponding copy books are:

### EYURWCOM

Defines the communication area

### EYURWCOD

Defines literals for EYURWCOM

### EYURWSVE

Defines each element of a target region scope list

### EYURWSVD

Defines literals for EYURWSVE

To assist you in your customization effort, sample source programs and copy books for assembler, C, COBOL, and PL/I are distributed with CICSplex SM. Copy books are located in language-specific libraries. All sample programs are located in the SEYUSAMP library. The names of the sample programs and copy books, and the CICSplex SM libraries in which they can be found are listed in Table 2.

Table 2. Sample programs and copy books

Language	Member name	Alias	Library
Assembler:			
Program	EYUAWRAM	EYU9WRAM	SEYUSAMP
Copybook 1	EYUAWCOM	EYURWCOM	SEYUMAC
Copybook 2	EYUAWCOD	EYURWCOD	SEYUMAC
Copybook 3	EYUAWSVE	EYURWSVE	SEYUMAC
Copybook 4	EYUAWSVD	EYURWSVD	SEYUMAC
COBOL:			
Program	EYULWRAM	EYU9WRAM	SEYUSAMP
Copybook 1	EYULWCOM	EYURWCOM	SEYUCOB
Copybook 2	EYULWCOD	EYURWCOD	SEYUCOB
Copybook 3	EYULWSVE	EYURWSVE	SEYUCOB
Copybook 4	EYULWSVD	EYURWSVD	SEYUCOB
PL/I:			
Program	EYUPWRAM	EYU9WRAM	SEYUSAMP
Copybook 1	EYUPWCOM	EYURWCOM	SEYUPL1
Copybook 2	EYUPWCOD	EYURWCOD	SEYUPL1
Copybook 3	EYUPWSVE	EYURWSVE	SEYUPL1
Copybook 4	EYUPWSVD	EYURWSVD	SEYUPL1
C:			
Program	EYUCWRAM	EYU9WRAM	SEYUSAMP
Copybook 1	EYUCWCOM	EYURWCOM	SEYUC370
Copybook 2	EYUCWCOD	EYURWCOD	SEYUC370
Copybook 3	EYUCWSVE	EYURWSVE	SEYUC370
Copybook 4	EYUCWSVD	EYURWSVD	SEYUC370

---

## Modifying dynamic routing

You can customize normal CICSplex SM workload management processing by modifying the module EYU9WRAM.

EYU9WRAM uses the CICSplex SM dynamic routing application programming interface (API), which is a special-purpose, call-level interface that provides the mechanism needed to request workload management actions. All calls are constructed using standard CALL statements. The CALL statement generates the linkage between the EYU9WRAM module and the CICSplex SM Workload Manager component. The format of the CALL statement is shown here:

```
CALL WAPIENPT(DA_TOKEN,function)
```

where:

### **DA\_TOKEN**

Identifies the dynamic routing API token supplied via the EYURWCOM communication area. This token is used by EYU9WAPI and must not be altered.

### **function**

Is the function to be performed, specified as:

#### **SM\_SCOPE**

Returns a list of eligible target regions.

#### **SM\_BALANCE**

Selects a target region from the list of eligible target regions.

#### **SM\_ROUTE**

Routes a transaction to a specific target region.

#### **SM\_CREAFF**

Creates an affinity.

#### **SM\_DELAFF**

Deletes an active affinity.

You can use SM\_SCOPE and SM\_BALANCE together to obtain a list of target regions and then select the target region to which a transaction is to be routed.

If you know that a transaction is always to be directed to a specific target region, you can use just SM\_ROUTE.

As distributed, EYU9WRAM issues SM\_SCOPE and SM\_BALANCE calls. It does not include any SM\_ROUTE calls. It includes unexecuted calls to SM\_CREAFF and SM\_DELAFF. You can modify the program to issue these calls as desired.

Although all of the examples in this chapter use the assembler language form of the dynamic routing API verbs, you can also use these verbs in programs written in C, COBOL, and PL/I. Sample programs distributed with CICSplex SM contain examples of the CALL statements for each of these languages.

## **Important**

As distributed, EYU9WRAM handles the workload balancing and separation established via the workload management definitions by using the API verbs. Any changes you make to EYU9WRAM, therefore, may adversely impact the CICSplex SM workload management facilities. For example, if you do not use

SM\_SCOPE, SM\_BALANCE, or SM\_ROUTE, each transaction occurrence is routed to the default target region identified when the transaction was defined to CICS. Thus, all CICSplex SM workload management definitions are bypassed.

## Nondynamic transaction considerations

For CICS/ESA 4.1 and later, you do not need to include any calls through the API if a transaction is statically routed or is started by ATI. In these cases, the target region may not be changed. The routing function in those cases will be route notify. The route notify function is intended to notify the EYU9WRAM program that such a transaction is being routed.

If you do include any of these functions, the following occurs:

- An SM\_SCOPE call returns a single entry in the SCOP\_VECT. The entry is the target region associated with the statically defined transaction when it was defined, or with the destination specified on the EXEC CICS START command for ATI transactions.
- An SM\_BALANCE call selects the target region associated with the transaction when it was defined to CICS. The CICSplex SM Workload Manager will not create any affinity for the transaction.
- An SM\_ROUTE call returns an exception response.

When EYU9WRAM is called for:

- Notification, any existing affinity relations are ignored and none are created.
- Route selection error, any existing affinity relations are ignored and none are created. In addition, the EYU9WRAM program as delivered will write a terminal message and terminate.
- Routing attempt complete, for CICS BTS transactions only. Any existing affinities are ignored. Any dynamic routing API function call results in a bad response. See “Non-terminal-related STARTs and CICS BTS considerations.”
- Transaction initiation, for CICS BTS transactions only. Any existing affinities are ignored. Any dynamic routing API function call results in a bad response. See “Non-terminal-related STARTs and CICS BTS considerations.”
- Transaction termination, any existing affinities are ignored. Any dynamic routing API function call results in an error response.
- Transaction abend, any existing affinities are ignored. Any dynamic routing API function call results in an error response.

## Non-terminal-related STARTs and CICS BTS considerations

When routing a transaction associated with either a CICS BTS activity or a non-terminal-related EXEC CICS START command, the routing program, identified in the DSRTPGM SIT parameter, is invoked for both static and dynamic routing. In the case of statically routed transactions, the EYU9WRAM program cannot alter the target region; see “Nondynamic transaction considerations.” In the case of dynamically routed transactions, the EYU9WRAM program may alter the target region; see “Selecting a target region from a set of target regions” on page 30. However, in both cases, the EYU9WRAM program is invoked only for:

- In the requesting region:
  - Notification
  - Route selection
  - Route selection error
  - Route attempt complete
- In the target region:

- Transaction initiation
- Transaction termination
- Transaction abend

For details of the function of route initiation, see *CICS Intercommunication Guide*.

## Enterprise bean considerations

When routing a transaction associated with an enterprise bean invocation, the routing program, identified in the DSRTPGM SIT parameter, is invoked for both static and dynamic routing. In the case of statically routed transactions, the EYU9WRAM program cannot alter the target region; see “Nondynamic transaction considerations” on page 29. In the case of dynamically routed transactions, the EYU9WRAM program may alter the target region; see “Selecting a target region from a set of target regions.” However, in both cases, the EYU9WRAM program is invoked only for:

- In the routing region:
  - Notification
  - Route selection
  - Route selection error
  - Route attempt complete
- In the target region:
  - Transaction initiation
  - Transaction termination
  - Transaction abend

For details of the function of route initiation, see *CICS Intercommunication Guide*.

## Selecting a target region from a set of target regions

As distributed, EYU9WRAM uses SM\_SCOPE and SM\_BALANCE to select a target region from the list of target regions defined for a transaction. Specifically, issuing:

- SM\_SCOPE causes a list of target regions to be returned for the current transaction occurrence. The target regions are those that are explicitly or implicitly associated with the requesting region by a workload specification.
- SM\_BALANCE causes a target region to be selected from the list of candidate target regions returned by SM\_SCOPE.

After an SM\_SCOPE or SM\_BALANCE call, the result of the operation is indicated in the response and reason fields of the EYURWCOM communication area.

### Actions during route selection

A dynamic route selection occurs when a transaction or program is scheduled for routing.

- Issuing SM\_SCOPE results in the EYURWCOM communication area Scope Vector pointer being updated with the address of the target region scope list description area, SCOP\_VECT. Also, the element count field is updated to contain the count of elements in the scope vector. Each element in the scope vector, as described in “EYURWSVE” on page 121, identifies a candidate target region and indicates its current status.

During SM\_BALANCE processing, the target region appearing first in the ordered list is selected for routing, unless the scope vector element EYURWSVE is marked ignore.

- When no affinity is associated with the current transaction occurrence, an SM\_SCOPE call causes the SCOP\_VECT elements to be sorted so that the target region that is the best candidate is placed first in the list. During SM\_BALANCE processing, the APPLID and SYSID of the most suitable target region are placed in the fields WCOM\_SEL\_AOR and WCOM\_SEL\_SYSID, respectively. Typically, this will be the first target region represented in the scope vector. However, if the EYU9WRAM program has marked the WSVE-IGNORE field on some of the SCOP\_VECT elements to denote that the target region is to be ignored, the first target region in the scope vector which is not marked to be ignored will be selected.

**Note:**

1. If the transaction identifier and the ids of the terminal and user associated with that transaction match a transaction group to which an affinity is defined, the affinity is made active during SM\_BALANCE processing.
  2. Note that, with DPL, you can update the transaction id before the SM\_SCOPE call.
- When an affinity is associated with the current transaction occurrence, an SM\_SCOPE call normally causes only the target region with which the affinity exists to be identified in SCOP\_VECT. An SM\_BALANCE call then selects that target region. If the target region is not available for routing, the SM\_BALANCE function will set a warning indicator. It will not attempt to select another target region.
  - For CICS/ESA 4.1 and later, if the transaction is defined as a DTRTRAN, the EYURWCOM communication area will contain indicators denoting that the transaction is a DTRTRAN and that it will not be rejected by the Workload Manager. Processing is generally identical to the normal, non-DTRTRAN, case. Issuing SM\_SCOPE returns a SCOP\_VECT. Issuing SM\_BALANCE selects a target region.

The EYU9WRAM module may opt to reject the transaction prior to issuing the SM\_SCOPE call. In this case, the Workload Manager returns to CICS/ESA with the reject indicator set to Y in the DFHDYPDS communication area. The sample EYU9WRAM program causes a DTRTRAN transaction to be rejected only if the transaction identifier is all blanks.

**Actions during notification**

Notification occurs when a static transaction or ATI transaction is being scheduled for routing.

- For CICS/ESA 4.1 and later, for statically routable transactions, ATI transactions, and BTS static routing requests, issuing SM\_SCOPE causes the scope vector to contain a single target region. This is the target region associated with the transaction.

**Actions during routing attempt complete**

None, but you can tidy up and release any resources at this stage.

**Actions during route selection error**

A route selection error call occurs if the CICS link between the requesting region and target region is not available or is not defined.

- When no affinity is active: issue SM\_SCOPE again. The candidate target regions identified by the SCOP\_VECT it returns will not include the target region that caused the error. You can then use SM\_BALANCE to select a new target region.
- When affinity became active as a result of the previous route selection:

- If the lifetime associated with the affinity is PERMANENT, SYSTEM, ACTIVITY, or PROCESS, the target region causing the error will be included in scope list returned by SM\_SCOPE. SM\_BALANCE is required by affinity rules to select that target region. It also returns a warning to EYU9WRAM. EYU9WRAM should then notify the user that an error has occurred.
- If the lifetime associated with the affinity is SIGNON, LOGON, DELIMIT, or PCONV, the active affinity status is removed before control returns to EYU9WRAM. When you reissue SM\_SCOPE, the target region causing the error will not be included in the scope list. If the workload specification is defined with Create Affinity YES for the transaction group, EYU9WRAM is notified that an affinity is defined and will be activated when you issue SM\_BALANCE.
- When affinity was activated by a previous transaction instance, and you issue SM\_SCOPE again, the scope list returned contains the previously selected target region. Since SM\_BALANCE is required by affinity rules to select that target region, a warning is returned to EYU9WRAM. EYU9WRAM should then notify the user that an error has occurred.

### **Actions during transaction termination**

Transaction termination occurs when a transaction has terminated normally.

- EYU9WRAM should release any resources it may have acquired.
- Issuing SM\_SCOPE or SM\_BALANCE or SM\_ROUTE causes an exception response to be returned.

### **Actions during transaction abend**

Transaction abend occurs when a transaction has terminated abnormally.

- EYU9WRAM should release any resources it may have acquired.
- Issuing SM\_SCOPE or SM\_BALANCE or SM\_ROUTE causes an exception response to be returned.

### **Actions during transaction initiation**

Transaction initiation occurs when a CICS BTS-related transaction, or an enterprise bean-related transaction, has been routed to the target region. No specific action is taken. The call is issued for information purposes only.

## **Selecting a specific target region**

SM\_ROUTE requests that a specific target region be selected for routing. Use SM\_ROUTE when you have application- or data-dependent requirements for explicit routing. For example, you might want to route a transaction associated with a specific user ID to a specific target region.

After an SM\_ROUTE call, the result of the operation is stored in the response and reason fields of the EYURWCOM communication area.

A sample SM\_ROUTE call is show here:

```
CALL WAPIENPT(DA_TOKEN,SM_ROUTE)
```

DA\_TOKEN identifies the dynamic routing API token supplied via the EYURWCOM communication area. This token is used by EYU9WAPI and must not be altered.

### **Actions during route selection**

The actions during route selection are:

- If there is only one connection between a requesting region and the target region, you can supply either the SYSID or the APPLID of the target region



(CICSplex SM will determine the appropriate, corresponding ID). Place the APPLID in the WCOM\_SEL\_AOR field of the EYURWCOM communication area. Place the SYSID in the WCOM\_SEL\_SYSID field.

If there are multiple connections between a requesting region and the target region, supply both the SYSID and the APPLID, as described previously, to ensure that the correct target region is selected. Note that when both the SYSID and APPLID are supplied, they are not validated.

The target region need not be defined to CICSplex SM. The affinity status is not checked. Thus, no affinity is established as a result of this call and, if an affinity was in effect, it is ignored.

- For CICS/ESA 4.1 and later, issuing SM\_ROUTE during Route Notify processing causes an exception response to be returned.

### **Actions during routing attempt complete**

None, but you can tidy up and release any resources at this stage.

### **Actions during route selection error**

The EYU9WRAM program may issue a message and terminate. You may then issue SM\_ROUTE again specifying a different target region, or issue SM\_SCOPE and SM\_BALANCE.

### **Actions during transaction termination**

- EYU9WRAM should terminate any resources it may have acquired.
- Calling any API function causes an exception response to be returned.

### **Actions during transaction abend**

- Calling any API function causes an exception response to be returned.

### **Actions during transaction initiation**

At transaction initiation:

- EYU9WRAM should terminate any resources it may have acquired.
- Calling any API function causes an exception response to be returned.

## **Creating an affinity**

You can use SM\_CREAFF to create an affinity if one does not already exist in the transaction group established for the transaction. The transaction group must be defined with an affinity type and lifetime. The affinity created will have the same affinity type and lifetime as defined in the transaction group.

You should review “Affinity considerations” on page 34 before using SM\_CREAFF.

Prior to calling SM\_CREAFF, you must first call SM\_SCOPE to obtain a scope list. SM\_CREAFF will not create an affinity to a target region that is not in the scope list. In addition, you should set the EYUWRCOM communication area fields WCOM\_SEL\_AOR and WCOM\_SEL\_SYSID to the APPLID and SYSID, respectively, of the target region for which you want the affinity created.

EYU9WRAM contains a fragment of unexecuted code that you can use as a template for implementing the SM\_CREAFF function.

The SM\_CREAFF function cannot be called during:

- Route termination
- Route abend

- Route notify
- Route initiate
- Route complete

## Deleting an affinity

You can use SM\_DELAFF to delete an active affinity.

You should review “Affinity considerations” before using SM\_DELAFF.

Prior to calling SM\_DELAFF, you must first call SM\_SCOPE to obtain a scope list. The WCOM\_AFF\_STAT field in the EYURWCOM communication area contains a value indicating whether an affinity is active or committed. An active affinity can be deleted using SM\_DELAFF. A committed affinity has a lifetime of SYSTEM or PERMANENT and cannot be deleted using SM\_DELAFF.

EYU9WRAM contains a fragment of unexecuted code that you can use as a template for implementing the SM\_DELAFF API function.

The SM\_DELAFF function cannot be called during:

- Route notify
- Route initiate
- Route complete

## Affinity considerations

Once created, an affinity normally exists until the lifetime of the affinity has expired. The expiration for each lifetime is as follows:

### **Permanent**

When the workload of which the target region is a part terminates.

### **System**

When the target region terminates.

### **Logon**

When the terminal user logs off.

### **Signon**

When the terminal user signs off.

### **Pconv**

When a transaction uses EXEC CICS RETURN specifying no NEXTTRANSID or the PCONV mode of the transaction is END.

CICS does not support pseudoconversations for APPC (LUTYPE6.2) devices.

### **Delimit**

When the PCONV mode of the transaction is END.

### **Activity**

When the CICS BTS activity ends.

### **Process**

When the CICS BTS process ends.

There are circumstances when SM\_SCOPE generates a scope list containing a single affinity target region, but the target region is not available for routing. This happens when:

- The target region is down.

- The CICS link to the target region is down.
- The target region is currently active but it was shutdown and restarted after the affinity was created.

In these cases, the EYU9WRAM default processing issues a terminal message indicating that the affinity target region is not available and causes the transaction to terminate. If the affinity lifetime is PCONV (pseudoconversation), CICSplex SM automatically deletes the affinity because it has expired (there is no NEXTTRANSID). However, the default EYU9WRAM processing does not delete any other affinities because the characteristics of the actual affinity to the target region are unknown. For example, a LOGON affinity may involve the use of the TCTUA to pass information to the target region. If the affinity is deleted when the target region is not available, the next transaction for the transaction group would cause a new target region to be selected. The transaction might fail upon using the TCTUA contents when routed to the new target region.

The sample EYU9WRAM program, which implements the default processing, contains a subroutine that checks on affinity status after a call to SM\_SCOPE. When an affinity is active to an target region, but not committed, and the affinity target region status is not OK, the subroutine sends a message to the terminal user and then exits so that the EYU9WRAM program terminates. The subroutine contains an unexecuted code fragment that can be used to delete the affinity using the SM\_DELAFF call. Prior to the unexecuted code fragment is a series of tests for the affinity lifetime of the active affinity. One or more of the branches can be changed to jump to the code fragment. The code fragment itself deletes the affinity, issues a message, and then returns so that the EYU9WRAM program exits, thereby causing the transaction to terminate. This processing can be modified so that the affinity is deleted, no message is issued, and the subroutine exits causing the mainline process to reexecute the SM\_SCOPE call. In that case, a new set of target regions is received for use by SM\_BALANCE.

The same subroutine also contains an unexecuted code fragment that can be enabled to create an affinity. In this case, the subroutine has determined that an affinity is defined but not active. It then checks the WCOM\_AFF\_AUTO indicator to determine whether CICSplex SM should automatically create affinities during SM\_BALANCE. The subroutine exits normally no matter what the answer is. You can enable the SM\_CREAFF fragment in order to cause an affinity to be created. The SM\_CREAFF call may be used regardless of whether WCOM\_AFF\_AUTO does or does not indicate the automatic creation of affinities during SM\_BALANCE. The SM\_CREAFF call can therefore be used to:

- Create an affinity when CICSplex SM will not.
- Create an affinity to a target region that CICSplex SM would ordinarily not select.

The SM\_CREAFF code fragment creates an affinity to the target region that appears first in the scope list returned by SM\_SCOPE.

The following fields in the EYURWCOM communication area provide information regarding CICSplex SM affinity processing.

- WCOM\_AFF\_STAT
- WCOM\_AFFAOR\_STAT
- WCOM\_AFF\_TYPE
- WCOM\_AFF\_LIFE
- WCOM\_AFF\_AUTO

- WCOM\_WORK\_NAME
- WCOM\_TGRP\_NAME

These fields are described in “EYURWCOM” on page 113.

---

## CICSplex SM data areas

The EYU9WRAM program uses the following data areas:

- Communication area EYURWCOM. Literals for EYURWCOM are defined in EYURWCOD.
- Scope vector element EYURWSVE. Literals for EYURWSVE are defined in EYURWSVD.

The names of the copy books that you can use to map these data areas are identified in Table 2 on page 27.

The format of EYURWCOM is shown in “EYURWCOM” on page 113.

The scope vector element, EYURWSVE, contains information about the individual target regions associated with the list of candidate target regions returned by SM\_SCOPE. The format of the SCOP\_VECT element is shown in “EYURWSVE” on page 121.

---

## Creating a user-replacement module for EYU9WRAM

You can use the sample procedures provided in CICSTS32.CPSM.SEYUPROC to create replacement modules for EYU9WRAM. The procedure members are:

Assembler	EYUEITAL
C	EYUEITDL
PL/I	EYUEITPL
COBOL	EYUEITVL

Samples may be found in “Sample user-replacement modules” on page 131. Copy these procedures to a cataloged system procedure library. Next, use the JCL samples to execute the procedure and create the replacement module for EYU9WRAM. Note that lower case values shown in the sample JCL should be replaced with the appropriate values for your site.

**Note:** The CICSplex SM API cannot be used from within EYU9WRAM.

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## Chapter 5. Requesting additional dynamic routing support

This chapter contains Product-sensitive Programming Interface Information.

### Note

If you are running CICS Transaction Server for OS/390 Version 1 Release 3 and later, it is recommended that you use the CICSplex SM-supplied program EYU9XLOP for all your dynamic routing requirements. You need the information in this chapter only if you wish to continue to use this function during migration to CICS Transaction Server for OS/390 Version 1 Release 3.

If your routing regions are CICS Transaction Server for OS/390 Version 1 Release 3 and later, or if you are using CICS BTS or enterprise beans, you do not need the information in this chapter. You should use the distributed routing facilities described in Chapter 4, “Dynamic routing with CICSplex SM,” on page 25.

This chapter describes how to access the CICSplex SM workload management facilities directly from an application program. To write such a program, you should be familiar with:

- The interface between the CICS relay program and the defined dynamic routing program.
- CICSplex SM workload management processing, as described in Chapter 1, “Introduction to workload management,” on page 3.
- The CICSplex SM workload management routing action module (EYU9WRAM), as described in Chapter 4, “Dynamic routing with CICSplex SM,” on page 25.

The primary method of invoking CICSplex SM workload management is by defining module EYU9XLOP to CICS as the dynamic routing program. This causes EYU9XLOP to be invoked by the CICS relay program, allowing CICSplex SM workload management to make a routing decision about each work request that can be sent to another CICS system.

If necessary, CICSplex SM workload management can be invoked directly from an application program, without going through the CICS relay program. You can use this interface, from CICS releases before CICS Transaction Server for OS/390 Version 1 Release 3, to workload management to determine the best target region for a dynamic program load (DPL) from a requesting region. The application program you write must follow certain guidelines:

- The program must run in a CICS system that is defined and running as a routing region. You cannot access CICSplex SM workload management from a target region.
- The program must issue its INIT and TERM calls from the same task. CICSplex SM expects the program to imitate the processing done by the CICS relay program, which always calls at route initiation and route termination.

**Note:** Accessing workload management through a program that issues an EXEC CICS START command is not recommended with an asynchronous transaction start. Furthermore, EXEC CICS START commands that are not related with either a terminal or a user should not be used for transactions that have affinity relationships, as those relationships cannot be correctly resolved using this interface.

Accessing workload management from a program using a dynamic program load is not supported. CICSplex SM workload management uses the CICS application programming interface to gather information about the current environment in which it is running. Due to DPL restrictions some of that information will not be available, and unpredictable results may occur.

In order to make a routing decision, CICSplex SM workload management needs certain information that is normally supplied by the CICS relay program. (The CICS relay program derives the information from data available to CICS for the instance of the transaction being relayed.) When you invoke CICSplex SM workload management directly, you need to provide this information, including terminal-oriented data and the equivalent of a transaction name to identify the work to be routed.

---

## How to invoke CICSplex SM workload management

To invoke the CICSplex SM workload management facilities, use an EXEC CICS LINK command, specifying EYU9XLOP as the program and identifying EYURWTRA as the communication area. The format of the command is:

```
EXEC CICS LINK  
  PROGRAM(EYU9XLOP)  
  COMMAREA(EYURWTRA)  
  LENGTH(=AL2(WTRA_LENGTH))
```

Much of the data normally passed from the CICS relay program to the dynamic routing program in the DFHDYPDS communication area must be generated by your program and passed to CICSplex SM workload management. Other data that is normally derived by CICSplex SM workload management from a transaction- and terminal-oriented environment must also be provided by your program. The assembler copy book EYURWTRA provides a map of the communication area to be passed to CICSplex SM workload management.

The corresponding copy books and the CICSplex SM libraries in which they can be found are:

Language	Member name	Library
Assembler	EYUAWTRA	SEYUMAC
COBOL	EYULWTRA	SEYUCOB
PL/1	EYUPWTRA	SEYUPL1
C	EYUCWTRA	SEYUC370

Prior to invoking CICSplex SM workload management, you must initialize the EYURWTRA communication area. The format of EYURWTRA is shown in “EYURWTRA” on page 123.

For a list of the possible response and reason code values that can be returned in WTRA\_API\_RESP and WTRA\_API\_REAS, refer to the assembler copy book member EYURWCOD.

---

## Processing considerations

After CICSplex SM workload management processing, the WTRA\_RESPONSE field contains a return code of either zero (0) or 8. If the return code is 0, WTRA\_SYSID contains the SYSID of the selected target region, and WTRA\_APPLID contains its APPLID. With that information, you can proceed to route the unit of work to the target region.

If the return code is 8, you should inspect the WTRA\_API\_RESP and WTRA\_API\_REAS fields for more information. These fields contain the last response and reason codes returned to the CICSplex SM workload management routing action module (EYU9WRAM). In most cases, the response and reason codes describe what caused CICSplex SM workload management to generate the return code of 8. Based on that information, you can decide how to proceed.

In some cases, however, the WTRA\_RESPONSE field may contain a return code of 8, while the WTRA\_API\_RESP and WTRA\_API\_REAS fields have not been set by CICSplex SM workload management. In those cases, an error was detected prior to invoking the routing action process. CICSplex SM user trace records are written to the CICS trace data set for those types of errors. When this happens, your program should terminate processing.

When the return code is 8, you should also inspect the WTRA\_OPTER field. If its value is WTRA\_CALLYES:

1. Set the WTRA\_FUNC field to WTRA\_FUNCTRM for route termination.
2. Reinvoke CICSplex SM workload management.
3. Terminate processing for the proposed unit of work.

If the WTRA\_OPTER field contains a value of WTRA\_CALLNO, terminate further processing for the proposed unit of work.

After the unit of work has completed in the target region, set the WTRA\_FUNC field according to how the unit of work completed. If the unit of work completed successfully:

1. Set the WTRA\_FUNC field to WTRA\_FUNCTRM for route termination.
2. Optionally, set the WTRA\_NEXTTRAN field to the ID of the next transaction to be used in the process. If there is no next transaction, set the field to all blanks.
3. Reinvoke CICSplex SM workload management to request termination processing for the transaction.

If the unit of work abended or generated an error that you consider abnormal:

1. Set the WTRA\_FUNC field to WTRA\_FUNCABD to notify CICSplex SM workload management that the routed transaction abended.
2. Reinvoke CICSplex SM workload management to request abnormal termination processing for the transaction.

## Route error considerations

After you receive the SYSID and APPLID of a target region, you can attempt to route the unit of work to the target region. However, the routing attempt may result in an error condition if the system is unavailable. When this happens, you should:

1. Set the WTRA\_FUNC field to WTRA\_FUNCERR to indicate a routing error.
2. Specify the reason for the error in the WTRA\_ERR field.
3. Reinvoke CICSplex SM workload management.

CICSplex SM workload management provides another target from the scope list, if possible. If no other systems are available, the WTRA\_RESPONSE field is set to 8 and the WTRA\_API\_RESP and WTRA\_API\_REAS fields describe the reason for the failure. You may have to invoke CICSplex SM workload management more than once for routing errors until you receive a valid target region.

## Transaction affinity considerations

If the WTRA\_TRANID, WTRA\_USERID and WTRA\_LUNAME fields cause CICSplex SM workload management to select a transaction group that includes an affinity, the rules of transaction affinities are obeyed. In this case, you should ensure that the WTRA\_NEXTTRAN field is initialized with the ID of the next transaction before calling the route termination function.

If your units of work, or any subset of them, have an affinity relation defined, be careful in how you define that affinity. Since your program cannot provide SIGNOFF or LOGOFF processing, an affinity lifetime of SIGNON or LOGON, though valid, may cause an affinity relation to be built that is not removed until either the requesting region or the target region terminates.

The WTRA\_NEXTTRAN field is most useful for pseudoconversation affinities. For this affinity lifetime, CICSplex SM workload management normally issues the EXEC CICS ASSIGN NEXTTRANSID command to retrieve the next transaction ID, if any, for the facility. Since that command is not available when CICSplex SM workload management is invoked by your program, it is your responsibility to provide the ID of the next transaction.

For a description of CICSplex SM workload management affinity processing, see “Taking affinity relations into consideration” on page 16. For details on specifying affinity relation and lifetime values, see “Creating a transaction group” on page 53.

## Abend compensation considerations

If the target region is running CICS/ESA 4.1 and later, transactions initiated by your program can participate in abend compensation processing, provided that the active CICSplex SM workload specifies it. You should note that, if the work requests are either non-terminal-related EXEC CICS START commands, or BTS activities, the routing and target regions must be within the same MVS image for the routing region to detect that an abend has occurred.

Your program should notify CICSplex SM workload management that a particular unit of work abended by specifying WTRA\_FUNCABD in the WTRA\_FUNC field. Then, if possible, CICSplex SM workload management will tend to avoid selecting the same target region for the transaction (or set of transactions, if an affinity is defined) on subsequent route select functions.

For a description of CICSplex SM workload management abend compensation processing, see “Taking abend probabilities into consideration” on page 19. For details on requesting abend compensation, see “Creating a workload specification” on page 51.

## MVS workload management considerations

When the MVS image where your program is running operates in GOAL mode, transactions initiated by your program can be processed using the goal algorithm, provided the active CICSplex SM workload specifies it.



Because the service class token is not known and may not exist for a specific route select function, CICSplex SM workload management uses a pseudo-service class token for all transactions initiated by your program. CICSplex SM assumes that transactions in that service class always meet their goal.

For details on requesting the GOAL algorithm, see the section Workload balancing.

## **CMAS availability considerations**

If your program issues an EXEC CICS LINK for EYU9XLOP, but the requesting region in which your program is running has not yet fully connected to its target CMAS, you will see message EYUXL0020I, indicating that an ESSS connection is in progress. Your program will wait indefinitely until the CMAS becomes available and the requesting region is joined to a workload. If you have connected successfully to the CMAS and the MAS, but the CMAS has not installed any workload definitions to the MAS, you will see a message indicating that the requesting region is waiting for a workload. You may need to set up and install workloads to rectify this situation. Note that, once the requesting region has successfully connected to the CMAS, the CMAS can become inactive and workload management remains active.

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## **Sample calling sequence**

“Sample calling sequence” on page 129 illustrates a sample calling sequence for a program that will access CICSplex SM workload management facilities. It is not intended to be used as a sample program and is, therefore, not complete in every detail.



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## Part 3. Managing workloads

This part provides the WUI views that display information about workload management and control its use when a CICS system is active. It contains a description, together with examples, of tasks involved in creating and maintaining workload management definitions.



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## Chapter 6. Managing workloads

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### Workload management definitions and their related views

You use the Web User Interface (WUI) workload management administration views to define a variety of workload management attributes. Figure 8 on page 46 provides an overview of the workload management views from the perspective of the CICSplex SM object model. In addition to these views, you can use the views described in “Active workload views” on page 58 to display information about and manage active workloads. You can also display a visual map of your workload management definitions by using the MAP button.

Figure 9 on page 47 illustrates the relationship between the components of a workload in a CICSplex and the views used to establish the workload.

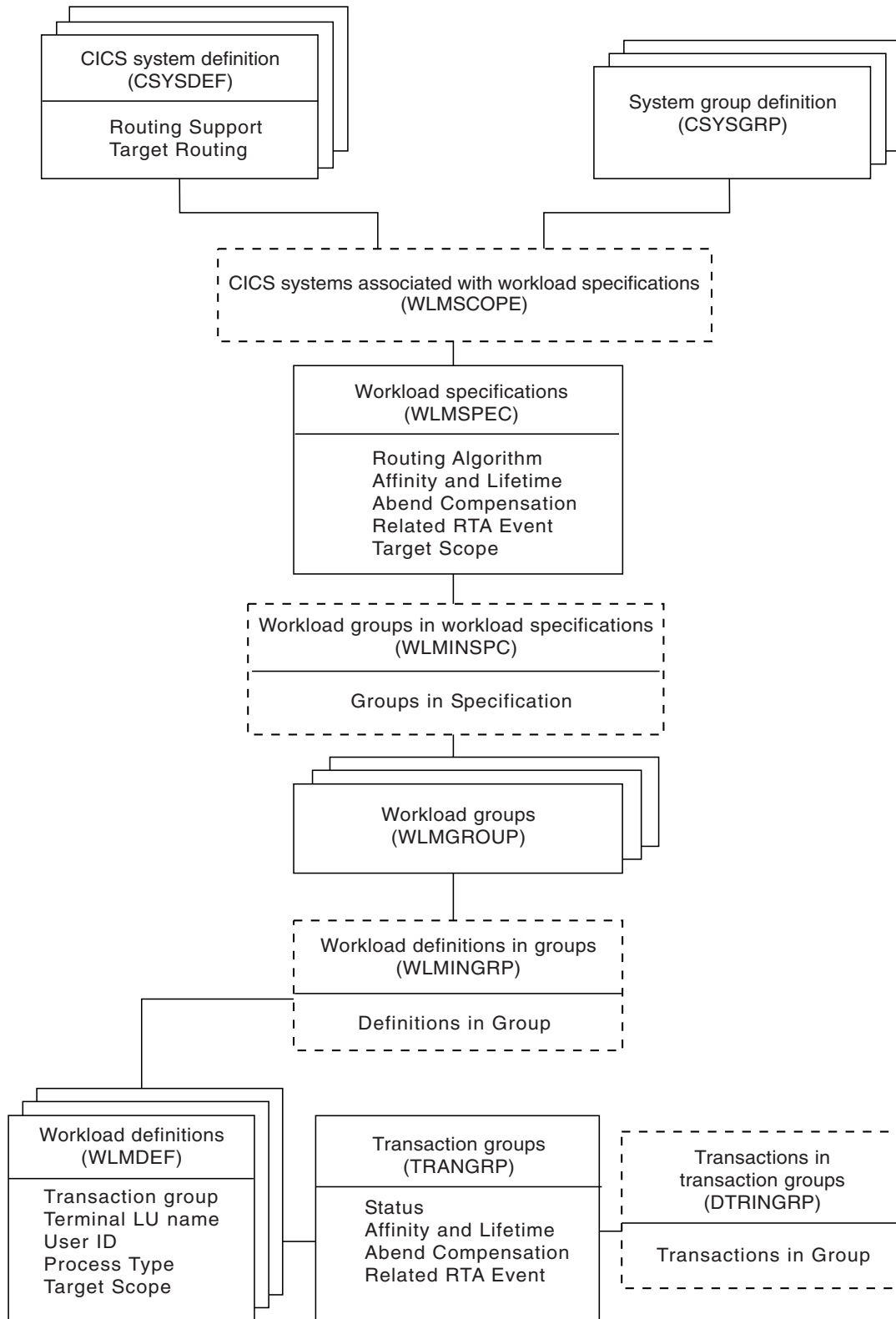


Figure 8. Views for creating workload management objects and associations

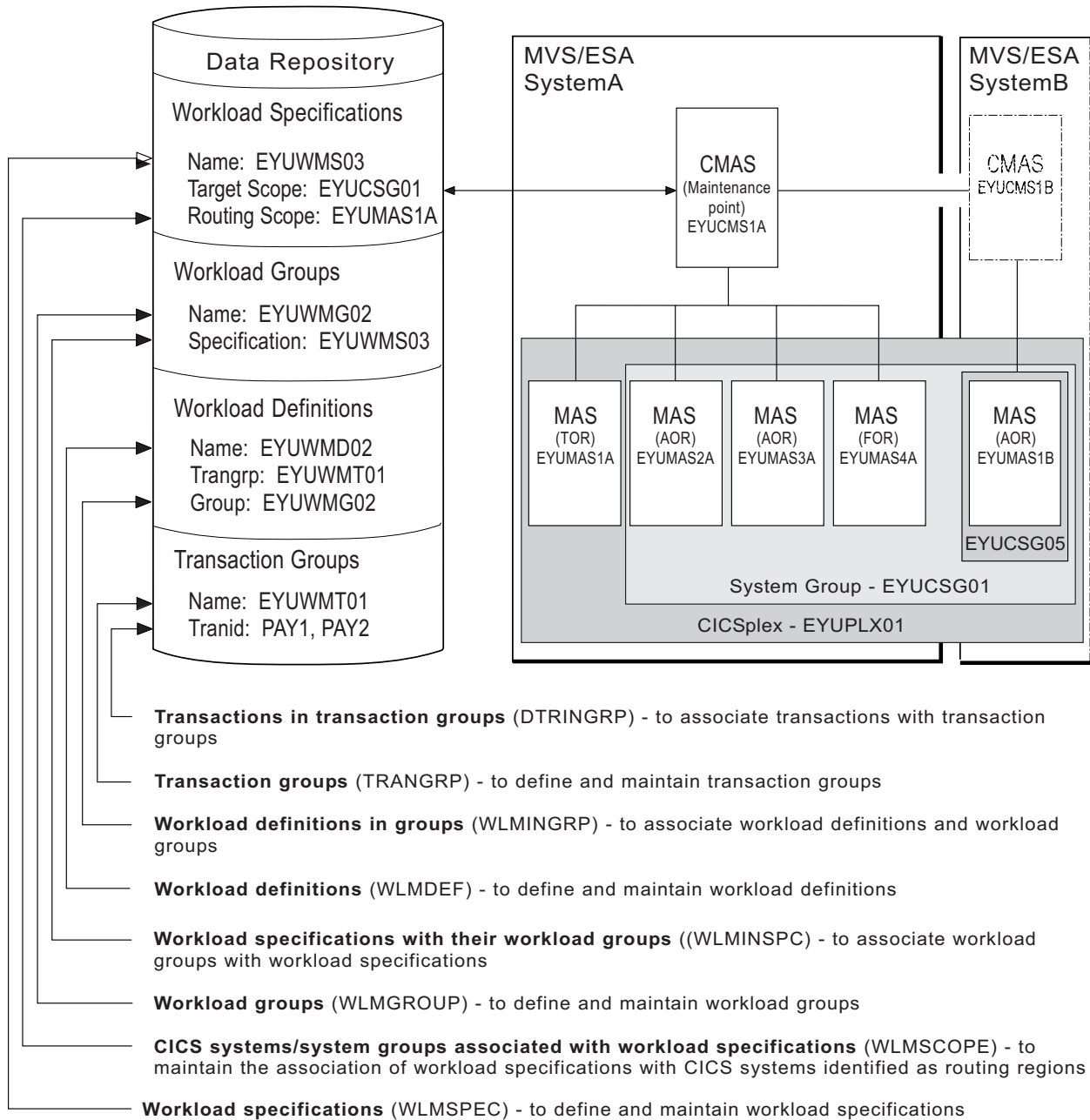


Figure 9. The relationship between a workload and the workload management views

Table 3 on page 48 shows the views you can use to create workload management definitions. It also indicates the information you can display and the actions you can perform using these views. To access these views in the Web User Interface, from the main menu, click **Administration views > Workload manager administration views**.

Table 3. Views to create and maintain workload management definitions

WUI view	Object name	Tasks Supported	Page
Transactions in transaction groups	DTRINGRP	<ul style="list-style-type: none"> <li>• Display all transaction groups within the current context.</li> <li>• Remove a transaction from a transaction group.</li> <li>• Display a map of workload definitions using the designated transaction group as a starting point.</li> </ul>	Transactions in transaction groups - DTRINGRP
CICS system groups associated with workload specifications	LNKSWSCG	<ul style="list-style-type: none"> <li>• Display, create or remove the association between a workload specification and a CICS system group.</li> </ul>	Specifications to system links - LNKSWSCS
CICS systems associated with workload specifications	LNKSWSCS	<ul style="list-style-type: none"> <li>• Display, create, update or remove a link between a workload specification and a CICS system.</li> <li>• Display a map of workload definitions using the designated definition as a starting point.</li> </ul>	Specifications to system group links - LNKSWSCG
Transaction groups	TRANGRP	<ul style="list-style-type: none"> <li>• Display, create, display, update, remove, or update a transaction group.</li> <li>• Add a transaction to a transaction group.</li> <li>• Install</li> <li>• Display a map of workload definitions using the designated transaction group as a starting point.</li> </ul>	Transaction group definitions - TRANGRP
Workload definitions	WLMDEF	<ul style="list-style-type: none"> <li>• Create, change, or remove a workload definition.</li> <li>• Add an association between a workload definition and a workload group.</li> <li>• Install a workload definition into a workload.</li> </ul>	Definitions - WLMDEF



Table 3. Views to create and maintain workload management definitions (continued)

WUI view	Object name	Tasks Supported	Page
Workload groups	WLMGROUP	<ul style="list-style-type: none"> <li>• Display, create, update, or remove a workload group.</li> <li>• Add an association between a workload group and a workload specification.</li> <li>• Install workload definitions associated with a workload group into a workload.</li> <li>• Display a map of workload definitions using the designated workload group as the starting point.</li> </ul>	Groups - WLMGROUP
Workload definitions in groups	WLMINGRP	<ul style="list-style-type: none"> <li>• Add or remove the association between a workload definition and a workload group.</li> </ul>	Definitions in WLM groups - WLMINGRP
Workload specifications	WLMSPEC	<ul style="list-style-type: none"> <li>• Display, create, update, or remove a workload specification.</li> <li>• Add an association between a workload specification and a CICS system.</li> <li>• Add an association between a workload specification and a CICS system group.</li> <li>• Display a map of workload definitions using the designated workload specification as a starting point.</li> </ul>	Specifications - WLMSPEC
Workload groups in workload specifications	WLMINSPC	<ul style="list-style-type: none"> <li>• Remove the association between a workload group and a workload specification.</li> <li>• Display a map of workload definitions using the designated definition as a starting point.</li> </ul>	WLM groups in specifications - WLMINSPC

Table 4 on page 50 shows the views you can use to manage active workloads. It also indicates the information you can display and the actions you can perform using these views. To access these views in the Web User Interface, from the main menu, click **Active workload views**.

Table 4. Views to manage active workloads

WUI view	Object name	Tasks Supported	Page
Active workloads	WLMAWORK	<ul style="list-style-type: none"> <li>• Display active workloads within the current context.</li> </ul>	“Active workloads - WLMAWORK” on page 58
Routing regions in an active workload	WLMAWTOR	<ul style="list-style-type: none"> <li>• Display active routing regions that are associated with a workload.</li> </ul>	“Routing regions - WLMAWTOR” on page 63
Target regions in an active workload	WLMAWAOR	<ul style="list-style-type: none"> <li>• Display target regions that are associated with a workload.</li> <li>• Activate a target region associated with an active workload.</li> <li>• Quiesce a target region associated with an active workload.</li> </ul>	“Target regions in an active workload - WLMAWAOR” on page 64
Active workload definitions	WLMAWDEF	<ul style="list-style-type: none"> <li>• Display active workload definitions associated with a workload.</li> <li>• Discard an active workload definition.</li> </ul>	“Definitions - WLMAWDEF” on page 66
Active workload transaction groups	WLMATGRP	<ul style="list-style-type: none"> <li>• Display active transaction groups associated with a workload.</li> <li>• Change the status of a transaction group to active.</li> <li>• Change the status of an active transaction group to dormant.</li> </ul>	“Transaction groups - WLMATGRP” on page 68
Active workload dynamic transactions	WLMATRAN	<ul style="list-style-type: none"> <li>• Display active transactions associated with a workload.</li> <li>• Discard a transaction from a transaction group.</li> </ul>	“Dynamic transactions - WLMATRAN” on page 71
Active workload transaction group affinities	WLMATAFF	<ul style="list-style-type: none"> <li>• Display the active affinities for a transaction group associated with a workload.</li> <li>• Discard an affinity entity.</li> </ul>	“Transaction group affinities - WLMATAFF” on page 72

## Creating workload management definitions using the WUI

This section contains examples of the tasks involved in creating and managing workload management definitions using the WUI. Unless noted otherwise, only the context is recognized when you are creating and maintaining workload management definitions.

## Creating a workload specification

A WLM specification identifies a workload and one or more CICS systems acting as target regions. It also defines the attributes of the default transaction group. An example of how to use this view can be found in “Routing a specific transaction to a specific target region” on page 80.

To create a workload specification and add it to the data repository:

- From the main menu, click **Administration views > Workload manager administration views > Specifications** to open the **WLM specifications** tabular view.

This view displays a list of existing workload specifications. It has action buttons that allow you to create, update, and remove workload specifications, and to associate CICS systems and CICS system groups with a workload specification.

- Click the **Create...** button. To use some of the information from an existing definition in the creation of your new definition, select an existing definition by selecting an adjacent check box in the **Record** column.
- Click the **Create...** button.
- Complete the fields and click the **Yes** button to create the new specification. Otherwise, click **No** to abandon the process.

The **WLM specification** view is redisplayed and includes an entry for the new definition.

### Related reference

Specifications - WLMSPEC

A WLM specification identifies a workload and one or more CICS systems acting as target regions. It also defines the attributes of the default transaction group.

## Associating a CICS system or system group with a workload specification

Each workload specification has a default target scope and one or more CICS systems or CICS system groups associated with it. These associated CICS systems or groups are known as the routing scope. The default target scope is identified when you create the specification. Associated CICS systems and system groups are identified when you add the routing region to the specification.

Follow this procedure to associate a CICS system group to an existing workload specification:

1. Click **Administration views > Workload manager administration views—>Specifications** to open the **WLM specifications** view.  
This view displays a list of existing workload specifications.
2. Select a workload specification and click the **Associate CICS group...** button.  
This opens the **Associate CICS group...** view.
3. In the **CICS system group field**, enter the specific or generic name of an existing CICS system group that represents one or more routing regions.

**Note:** A CICS system or CICS system group acting as a routing region can be associated with only one workload specification at a time. A specification, however, can be associated with any number of CICS systems and CICS system groups.

4. Select one of the following options to indicate how the CICS systems that make up the CICS system group are to use the workload specification associated with the CICS system group:

## **FORCE**

All CICS systems currently associated with the CICS system group are to use the workload specification. (The workload specification attribute for each CICS system changes to INHERIT, indicating that the specification was acquired from the CICS system group). If you add a new CICS system to the CICS system group, it does not automatically inherit the FORCE option. You must specify NULL or FORCE when adding a CICS system to a CICS system group.

**NULL** Those CICS systems in the CICS system group that are not associated with a workload specification are to use this workload specification. (The workload specification attribute for those CICS systems changes to INHERIT, indicating that the specification was acquired from the CICS system group.)

**NONE** Only the CICS system group is to be associated with the workload specification. The CICS systems in the CICS system group are not affected. That is, if there is no association between a CICS system and a workload specification, none is established; if there is an association, either explicitly established or inherited from another CICS system group, it is unchanged.

### **Note:**

- a. If the CICS system group includes other CICS system groups, all of the CICS systems, including those in subordinate CICS system groups, are affected by the value specified in this field.
  - b. The CICS systems designated as the default target scope when you created the workload specification must be accessible to the CICS systems identified as the routing scope. Therefore, you should verify that the appropriate CICS connections exist between each routing region and all of the CICS systems in the target scope identified here.
5. Click **Yes** to update the workload specification in the data repository. Otherwise, click **No** to abandon the process.

Once you associate a CICS system or system group to a workload specification, the specification is automatically installed whenever an associated CICS system is started. Any workload definitions associated with the specification through workload groups are also automatically installed.

However, if you associate the workload specification with a CICS system that is already active, the new specification is not immediately available. To turn workload management on:

1. Click **Administration views > Topology administration views > System definitions** to display a list of active CICS systems.
2. Select the CICS system and click the **Update...** button
3. In the **Workload manager status** field, specify **YES**, and click the **Yes** button to turn on workload management. Otherwise, click **No** to abandon the process.

## **Updating a link between a WLM specification and a CICS system**

1. From the main menu, click **Administration views > Workload manager administration views**.
2. From the Workload manager administration views menu, click **Specifications to system links**. The WLM specifications to CICS system links view (LNKSWSCS object) is displayed.

3. Check the box for the WLM specification to be updated. You can check more than one box.
4. Click the **Change Spec Association** button to display the Change Spec Association (EYUSTARTLNKSWSCS.CHGSPEC) view.
5. Type the new name in the **New WLM specification name** field and select an appropriate inherit option.
  - Click **Yes** to update the link between a monitor specification and a CICS system group.
  - Click **No** to abandon the process.

### Updating a link between a WLM specification and a CICS system group

1. From the main menu, click **Administration views > Workload manager administration views**.
2. From the Workload manager administration views menu, click **Specifications to system group links**. The WLM specifications to CICS system links view (LNKSWSCG object) is displayed.
3. Check the box for the WLM specification to be updated. You can check more than one box.
4. Click the **Change Spec Association** button to display the Change Spec Association (EYUSTARTLNKSWSCG.CHGSPEC) view.
5. Type the new name in the **New WLM specification name** field and select an appropriate inherit option.
  - Click **Yes** to update the link between a monitor specification and a CICS system group.
  - Click **No** to abandon the process.

## Creating a transaction group

A transaction group is an association of logically similar transactions. The similarity may be based on affinity requirements, common shared processing requirements, or any other user-determined characteristic. This section describes how to create a transaction group definition and add it to the data repository.

1. Click **Administration views > Workload manager administration views > Transaction group definitions** to open the **Transaction group definitions** view.

This view displays a list of existing transaction group definitions. It has action buttons that allow you to create, update, and remove transaction group definitions, and to add a transaction to a transaction group.

2. If you want to use some of the information from an existing definition in the creation of your new definition, select an existing definition by selection by selecting an adjacent check box in the **Record** column.
3. Click the **Create...** action button.
4. Provide the following information, as appropriate:

#### Transaction group name

Specify a 1- to 8-character name for the transaction group. The name can contain alphabetic, numeric, or national characters. However, the first character must be alphabetic.

#### Description

(Optional.) Specify a 1- to 30-character description of the transaction group.

### **Affinity relation and lifetime checking status**

Specify whether the affinity relation and lifetime values are to be used when processing a transaction associated with this transaction group:

#### **ACTIVE**

Recognize the affinity relation and lifetime settings.

#### **DORMANT**

Recognize the affinity settings only when the lifetime is pseudoconversation (PCONV). Otherwise, do not recognize the affinity relation and lifetime settings.

### **Primary search criterion**

Designate whether a user name (USERID) or logical unit name (LUNAME) is to be used as the search criteria for the transaction group. This field is ignored if the associated workload definition specifies separation by process type rather than by lname and user ID.

**Note:** The specific or generic user and terminal names that are to be used as the search criteria are defined as part of the workload definition to which this transaction group is associated.

### **Affinity relationship**

(Optional.) Indicate the affinity relation that is to be used when processing the transactions associated with this transaction group.

Specify:

**N\_a** Not defined.

#### **USERID**

Base transaction affinity on the user ID.

#### **LUNAME**

Base transaction affinity on the terminal logical unit name.

#### **GLOBAL**

Base transaction affinity on all users at all terminals.

#### **BAPPL**

Base transaction affinity on the CICS BTS application.

If you do not specify a value, no affinity relation is recognized for transactions associated with this transaction group. All dynamic transactions in the group that are initiated from any routing region by any user can be routed to any CICS system associated with the target scope.

### **Affinity lifetime**

(Required when you specify a value in the **Affinity relationship** field.)

Indicate the affinity lifetime to be used when processing transactions associated with this transaction group. Specify:

**N\_a** Not defined.

#### **DELIMIT**

Maintain transaction affinity until a transaction with a pseudoconversation mode of END is encountered.

#### **LOGON**

Maintain transaction affinity for the duration of the terminal session.

#### **PCONV**

Maintain transaction affinity for the duration of the pseudoconversation. That is, as long as each transaction ends with an EXEC CICS RETURN TRANSID command to invoke the next transaction in the sequence and no pseudoconversation mode of END is encountered.

CICS does not support pseudoconversations for APPC (LUTYPE 6.2) devices.

**PERMANENT**

Maintain transaction affinity as long as the workload containing this transaction group is active.

**SIGNON**

Maintain transaction affinity as long as the user's session is active.

**SYSTEM**

Maintain transaction affinity as long as the target region to which transactions are directed remains active.

**ACTIVITY**

Maintain transaction affinity until the associated BTS activity ends.

**PROCESS**

Maintain transaction affinity until the associated BTS process ends.

**Note:** The **Affinity relationship** and **Affinity lifetime** fields are related. If you specify a value in the **Affinity relationship** field, you must specify a value in the **Affinity lifetime** field. See Relations and lifetimes for valid affinity and lifetime combinations.

**Automatic affinity creation option**

(Required when you specify a value in the Affinity relationship and Affinity lifetime fields.) Indicate whether CICSplex SM should automatically create an affinity relationship for transactions associated with this transaction group.

**YES (or blank)**

CICSplex SM creates an affinity using the values specified in the **Affinity relationship** and **Affinity lifetime** fields.

**NO**

CICSplex SM does not automatically create an affinity. However, you can create one by using the SM\_CREAFF function in the dynamic routing program (EYU9WRAM). The SM\_CREAFF function provides greater control over the creation of affinities. For example, you can create an affinity to a target region that CICSplex SM might not ordinarily select for dynamic routing. Refer to Chapter 4, "Dynamic routing with CICSplex SM," on page 25 for details on EYU9WRAM and SM\_CREAFF.

**N/A**

Affinity not defined (**Affinity relationship** and **Affinity lifetime** fields are blank).

**RTA event name**

(Optional.) Enter the specific or generic name of an analysis definition (RTADEF) or status definition (STATDEF) that may affect transactions associated with this transaction group. If you enter a generic value, a list of valid definitions is displayed.

If a real-time analysis event is generated by this definition during the target region selection process, the severity level, if any, associated with the definition is used as part of the criteria in selecting a target region.

**Acceptable level of abend probability**

Specify the abend probability for a transaction associated with this group that should cause a target region to be considered unhealthy:

**0**

Ignore target region abend probability calculations.

**value**

Specify a value between 2 and 99 (inclusive) that indicates an

unacceptable abend probability. For example, if you specify 25, a target region with a 25% or greater probability of abending for a transaction associated with this group is considered unhealthy and is avoided, if possible.

#### **Acceptable target region load level**

Specify the abend probability for a transaction associated with this group that should cause a target region's load level to be doubled:

**0** Required when the Abend Health field is set to 0.

**value** Specify a value that is greater than 0 and less than the Abend Health value.

For example, if you specified 25 as the Abend Health value, you must specify a value, *x*, between 1 and 24 (inclusive) as the Abend Load value. Then, if the probability of abend for a transaction being routed to a given target region is between 0% and *x*%, the perceived load on that target region is adjusted upward. Once the abend probability reaches *x*%, the perceived load is doubled, which means the target region is considered to have twice the load that it really has. This loading factor makes the region less desirable as a target for routing.

#### **Note:**

- a. Once an affinity is active, all subsequent transactions are routed to the same target region for as long as the affinity remains active, regardless of its abend probability.
  - b. For additional information about specifying abend health and abend load values, see “Taking abend probabilities into consideration” on page 19.
5. Click **Yes** to create the new definition.  
The Transaction group definition view is redisplayed with an entry for the new definition.

## **Creating a workload definition**

You can use workload definitions to route work requests to a specific set of target regions based on the terminal and user names, or the process types, associated with those work requests. The terminal and user names may be either specific or generic. For example, you can create a workload definition that causes all transactions initiated by any user from terminals with logical unit names starting with NET to be routed to the target scope identified as EYUCSG01. This section describes how to create a workload definition and add it to the data repository.

1. Click **Administration views**—>**Workload manager administration views**—>**Workload definitions** to open the **Workload management definition** view.

This view displays a list of existing workload management definitions. It has action buttons that allow you to create, update, remove and install workload definitions, and to add a workload definition to a workload group.

2. If you want to use some of the information from an existing definition in the creation of your new definition, select an existing definition by selection by selecting an adjacent check box in the **Record** column.
3. Click the **Create** action button.
4. Provide the following information, as appropriate:



**Workload management definition name**

Specify a 1- to 8-character name for the workload definition. The name can contain alphabetic, numeric, or national characters. However, the first character must be alphabetic.

**Description**

(Optional) Specify a 1- to 30-character description of the definition.

**Trangroup group name**

(Optional) Enter the specific or generic name of a transaction group. If you enter a generic value, a list of valid transaction groups is displayed.

If you do not identify a transaction group, the default transaction group for the specification is assumed. (For a description of this transaction group, see Transaction group definitions - TRANGRP.)

**Terminal LU name**

Enter a specific logical unit name or a pattern, using the format:

[network\_qualifier\_name.]luname

where both the network\_qualifier\_name and the luname are between 1 and 8 characters in length.

A pattern can include the characters + (plus sign), \* (asterisk), or both.

**User ID**

Enter a specific user ID or a pattern. A pattern can include the characters + (plus sign), \* (asterisk), or both.

**Note:** The Terminal Luname and User ID values are used when CICSplex SM attempts to match a transaction with this definition. (See page Separating by transaction for additional information.)

**BTS process type**

Enter a specific process type or a pattern. A pattern may include + (plus sign), \* (asterisk), or both.

**Note:** If you specify anything other than an \* in this field, the luname and user id fields must be set to an \*. Similarly, if there is anything other than an \* in either luname and user id, this field must be set to \*. You cannot separate a workload by process type, luname and user id.

**Scope name of set of target systems**

Enter the specific or generic name of a CICS system or CICS system group to be used as target regions for dynamic routing requests. If you enter a generic value, a list of valid CICS systems and CICS system groups is displayed.

**Note:** The specified CICS system or CICS system group must be accessible to the CICS systems identified as the routing scope with the workload specification to which this definition is associated. Therefore, you should verify that the appropriate CICS connections exist between each routing region and all of the CICS systems identified here as the target scope.

5. Click **Yes** to create the new definition.

The **Workload management definition** view is redisplayed and includes an entry for the new definition.

## Creating a workload group

A workload group is used to associate one or more related workload definitions. An example of how to use this view can be found in “Routing a specific transaction to a specific target region” on page 80. This section describes how to create a workload group definition and add it to the data repository.

- Click **Administration views**—>**Workload manager administration views**—>**Groups** to open the **WLM groups** view.

This view displays a list of your existing workload management group definitions. It has action buttons that allow you to create, update, remove and install workload groups, and to add a group to a workload specification.

- If you want to use some of the information from an existing definition in the creation of your new definition, select an existing definition by selecting an adjacent check box in the **Record** column.
- Click the **Create** action button.
- 

Provide the following information, as appropriate:

### **Workload management group name**

Specify a 1- to 8-character name for the workload group. The name can contain alphabetic, numeric, or national characters. However, the first character must be alphabetic.

### **Description**

(Optional.) Specify a 1- to 30-character description of the workload group.

- Click **Yes** to create the new definition.

The **Workload management group** view is redisplayed and includes an entry for the new definition.

---

## Active workloads view reference

This topic describes the WUI view sets used to obtain information about active workloads and the transactions and transaction groups comprising those workloads.

**Note:** Workload management is performed on a CICSplex-wide basis. These views ignore any scope that may be in effect.

## Active workload views

The active workload views display information about active workloads and the transactions and transaction groups comprising those workloads. Note: Workload management is performed on a CICSplex-wide basis. These views ignore any scope that may be in effect.

### **Active workloads - WLMWORK**

The **Active workloads** (WLMWORK) views display information about an active workload within the CICSplex identified as the context.

### **Supplied views**

To access from the main menu, click:

**Active workload views > Active workloads**

Table 5. Views in the supplied **Active workloads** (WLMWORK) view set

View	Notes
Active workloads EYUSTARTWLMWORK.TABULAR	Tabular information about all active workloads within the current context.
Active workloads EYUSTARTWLMWORK.DETAILED	Detailed information about a selected active workload.

## Actions

None.

## Fields

Table 6. Fields in WLMWORK views

Field	Attribute name	Input values
Algorithm type	ALGTYPE	The algorithm being used to select the best target region from those available: <ul style="list-style-type: none"> <li>• QUEUE - Routes transactions to the target region that has the shortest queue of work, is least affected by conditions such as short-on-storage, and is the least likely to cause the transaction to abend.</li> <li>• GOAL - Routes transactions to the target region which is best able to meet the transaction's average response time goal, as predefined using z/OS Workload Manager, and is the least likely to cause the transaction to abend.</li> </ul>
Default target scope	AORSCOPE	The name of the CICS system or CICS system group that is to be the target for any dynamic transactions or programs not associated with a transaction or program group.
Acceptable target region load level	ABENDTHRESH	The abend probability for a transaction associated with the default transaction group that should cause a target region's load level to be doubled.  A value of 0 means WLM is not calculating abend loads for the workload.

Table 6. Fields in WLMWORK views (continued)

Field	Attribute name	Input values
Default affinity relation	AFFINITY	The default affinity relation applied to transactions not associated with any installed transaction group. The affinity relation values are: <ul style="list-style-type: none"> <li>• GLOBAL - All users at all terminals.</li> <li>• LUNAME - Terminal logical unit name.</li> <li>• NONE - No affinity relation was defined.</li> <li>• USERID - User ID.</li> <li>• BAPPL - Business Application.</li> </ul>
Shared status	SHARED	Indicates whether the workload has been shared with a pre-CICS TS 1.3 CMAS. If it has installs of CICS BTS related definitions are inhibited.
Automatic affinity creation	AFFAUTO	Indicates whether CICSplex SM is to automatically create an affinity relationship for transactions that are not associated with any installed transaction group. <ul style="list-style-type: none"> <li>• YES <ul style="list-style-type: none"> <li>– An affinity is created using the values in the Affinity Relation and Affinity Lifetime fields.</li> </ul> </li> <li>• NO <ul style="list-style-type: none"> <li>– An affinity is not automatically created (but can be created by a customized version of the dynamic routing program EYU9WRAM).</li> </ul> </li> <li>• N/A <ul style="list-style-type: none"> <li>– There are no values in the <b>Affinity Relation</b> and <b>Affinity Lifetime</b> fields, therefore, no affinity is created.</li> </ul> </li> </ul>
Active routing regions	TORCNT	The number of active CICS systems, identified as routing regions, that are associated with the workload.
Name	WORKLOAD	The name of the workload. This is also the name of the installed workload specification definition.
Description	DESC	The description of the workload.

Table 6. Fields in WLMWORK views (continued)

Field	Attribute name	Input values
Workload status	STATUS	<p>The status of the workload as one of the following:</p> <ul style="list-style-type: none"> <li>ACTIVE - All the target and routing region connections that this workload depends upon are available.</li> <li>FROZEN - A target or routing region connection that this workload depends upon has been broken.</li> </ul> <p>If a workload remains frozen:</p> <ul style="list-style-type: none"> <li>Transactions will continue to be routed according to any existing affinities.</li> <li>New affinities can be created if they do not involve other CMASs. Global or permanent affinities which require other CMASs to be notified, cannot be created.</li> <li>Install (INS) and discard (DSC) action commands are not allowed for any aspect of the workload.</li> </ul> <p>The cause of a broken connection might be the target or routing region, one of the CMASs that manage the workload, or a connection between the CMASs. To determine why a workload is frozen:</p> <ul style="list-style-type: none"> <li>Check the contact status in the target region in active workload (WLMAWAOR) and active workload routing regions (WLMAWTOR) views to determine which target or routing region is affected.</li> <li>Check the <b>MAS</b> view to determine the status of the target or routing region.</li> <li>Check the status of all connections for the target or routing region.</li> </ul> <p>Determine which connection(s) were broken and take appropriate action to re-establish the connections.</p>
Owning system ID	WRKLOWNER	The CICS system ID of the CMAS that created the workload.
Active target regions	AORCNT	The number of active CICS systems, identified as target regions for the workload.

Table 6. Fields in WLMWORK views (continued)

Field	Attribute name	Input values
Default affinity lifetime	AFFLIFE	<p>The default affinity lifetime used with the default affinity relation. This value is applied to transactions that are not associated with any installed transaction group. After the first instance of a transaction, subsequent instances of the transaction are run on the same target region. The affinity lifetime values are:</p> <ul style="list-style-type: none"> <li>• DELIMIT - Until the pseudoconversation mode is END.</li> <li>• LOGON - For the duration of the terminal session.</li> <li>• PCONV - For the duration of the pseudoconversation.</li> <li>• PERMANENT - As long as the workload is active.</li> <li>• SIGNON - Until the terminal user signs off.</li> <li>• SYSTEM - Until the target region terminates.</li> <li>• ACTIVITY - As long as the CICS BTS activity is active.</li> <li>• PROCESS - As long as the CICS BTS process is active.</li> <li>• NONE - No affinity lifetime was defined.</li> </ul>
Acceptable level of abend probability	ABENDCRIT	<p>The abend probability for a transaction associated with the default transaction group that should cause a target region to be considered unhealthy.</p> <p>A value of 0 means WLM is not calculating abend probabilities for the workload.</p>

Table 6. Fields in WLMWORK views (continued)

Field	Attribute name	Input values
Event name	EVENTNAME	<p>The name of a real-time analysis event that will affect the routing of transactions in this workload. If a real-time analysis event is generated, WLM uses the information as part of the target selection criteria.</p> <p>An event can optionally be associated with a workload when the workload specification is created. If this field is blank, no event is associated with the workload.</p> <p>The name of an event is the same as an installed real-time analysis definition (RTADEF) or status definition (STATDEF)</p>

## Routing regions - WLMAWTOR

The **Routing regions in an active workload** (WLMAWTOR) views display information about all active routing regions that are associated with a workload that is within the CICSplex identified as the context.

### Supplied views

To access from the main menu, click:

#### Active workload views > Routing regions

Table 7. Views in the supplied **Active workload routing regions** (WLMAWTOR) view set

View	Notes
Active workload routing regions EYUSTARTWLMAWTOR.TABULAR	Tabular information about all active routing regions that are associated with a workload.
Active workload routing regions EYUSTARTWLMAWTOR.DETAILED	Detailed information about a selected active routing region.

### Actions

Table 8. Actions available for WLMAWTOR views

Action	Description
GET	The name of the workload specification.

### Fields

Table 9. Fields in WLMAWTOR views

Field	Attribute name	Input values
Workload name	WORKLOAD	The name of the workload specification.

Table 9. Fields in WLMAWTOR views (continued)

Field	Attribute name	Input values
Name of controlling CMAS	TOROWNER	The name of the controlling CMAS.
System ID of workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.
Routing region name	TOR	The name of an active CICS system, acting as a routing region, to which the workload is associated.
Routing region contact status	CON_STATUS	The status of the connection between the routing region and the CMAS. Values are: <ul style="list-style-type: none"> <li>• LOSTCON - The connection between the routing region and the CMASs has been lost.</li> <li>• N_A - The connection between the routing region and the CMASes managing the workload is available.</li> </ul>

### Target regions in an active workload - WLMAWAOR

The **Target regions in an active workload** (WLMAWAOR) views display information about all target regions that are associated with a workload that is within the CICSplex identified as the context.

### Supplied views

To access from the main menu, click:

#### Active workload views > Target regions in an active workload

Table 10. Views in the supplied **Target region in active workload** (WLMAWAOR) view set

View	Notes
Target region in active workload EYUSTARTWLMAWAOR.TABULAR	Tabular information about target regions that are associated with a workload that is within the CICSplex identified as the context.
Target region in active workload EYUSTARTWLMAWAOR.DETAILED	Detailed information about a selected target region.



Table 10. Views in the supplied **Target region in active workload (WLMAWAOR)** view set (continued)

View	Notes
Target region in active workload EYUSTARTWLMAWAOR.QUIESCE	Cause the specified target region to be removed from workload management.  This means that no further transactions are routed to the target region unless they share an affinity with earlier transactions. For example, if you are engaged in a pseudoconversation when a target region begins quiescing, the transactions that constitute the pseudoconversation continue to be routed to the same target region until the end of the affinity lifetime. When the affinity is no longer active, the target region is fully quiesced and subsequent transactions are routed to a different target region in the target scope.
Target region in active workload EYUSTARTWLMAWAOR.ACTIVATE	Cause the specified target region to be recognized so that it can participate in workload management.

## Actions

Table 11. Actions available for WLMAWAOR views

Action	Description
QUIESCE	Cause the specified target region to be removed from workload management.  This means that no further transactions are routed to the target region unless they share an affinity with earlier transactions. For example, if you are engaged in a pseudoconversation when a target region begins quiescing, the transactions that constitute the pseudoconversation continue to be routed to the same target region until the end of the affinity lifetime. When the affinity is no longer active, the target region is fully quiesced and subsequent transactions are routed to a different target region in the target scope.
ACTIVATE	Cause the specified target region to be recognized so that it can participate in workload management.

## Fields

Table 12. Fields in WLMAWAOR views

Field	Attribute name	Input values
Workload name	WORKLOAD	The name of the workload specification.
Target region name	AOR	The name of an active CICS system, acting as a target region, to which the workload is associated.

Table 12. Fields in WLMWAOR views (continued)

Field	Attribute name	Input values
Target region status	STATUS	<p>The current status of the target region associated with the workload, as one of the following:</p> <ul style="list-style-type: none"> <li>• ACTIVE - The target is available to participate in workload management.</li> <li>• QUIESCING - The target is being quiesced. No new transactions are routed to this target. Transactions currently being routed to this target are routed to another target, unless an affinity relation exists. If there is an affinity relation, transactions continue to be routed to this target until the affinity lifetime expires. Note that if a target has an affinity lifetime of PERMANENT, it will remain in a QUIESCING state indefinitely.</li> <li>• QUIESCED - The target is not available to participate in workload management.</li> </ul> <p>Input Values: ACTIVE   QUIESCE</p>
System ID of workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.
Target region contact status	CON_STATUS	<p>The status of the connection between the routing region and the CMAS. Values are:</p> <ul style="list-style-type: none"> <li>• LOSTCON - The connection between the routing region and the CMASs has been lost.</li> <li>• N_A - The connection between the routing region and the CMASes managing the workload is available.</li> </ul>

### Definitions - WLMWDEF

The **Active workload definitions** (WLMWDEF) views display information about active workload definitions installed in a workload that is within the CICSplex identified as the context.

### Supplied views

To access from the main menu, click:

**Active workload views > Definitions**

Table 13. Views in the supplied **Active workload definitions (WLMAWDEF)** view set

View	Notes
Active workload definitions EYUSTARTWLMAWDEF.DISCARD	Discard an active workload definition.
Active workload definitions EYUSTARTWLMAWDEF.TABULAR	Tabular information about active workload definitions associated with a workload that is within the CICSplex identified as the context.
Active workload definitions EYUSTARTWLMAWDEF.DETAILED	Detailed information about a selected workload definition.

## Actions

Table 14. Actions available for WLMAWDEF views

Action	Description
DISCARD	Discard an active workload definition.

## Fields

Table 15. Fields in WLMAWDEF views

Field	Attribute name	Input values
Workload name	WORKLOAD	The name of the workload specification to which the workload definition is associated.
Terminal LU name	LUNAME	The logical unit name used in matching a transaction with the workload definition.
Process type	PROCESSTYPE	The specific or generic process type used in matching a transaction with the workload definition.  Terminal LU name and User ID must both be set to '*'. A Transaction group of blanks or a specific name can be specified. You may only separate a workload by Transaction group and Process type or by Transaction group, Terminal LU name and User ID.
Description	DESC	A description of the workload definition.
User ID	USERID	The user ID used in matching a transaction with the workload definition.
Scope name of set of target systems	AORSCOPE	The name of the CICS system or CICS system group to which transactions associated with the workload definition are directed.

Table 15. Fields in WLMWDEF views (continued)

Field	Attribute name	Input values
System ID of workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.
Workload definition	NAME	The name of the workload definition.
Transaction group	TRANGRP	<p>The name of the transaction group associated with the workload definition.</p> <p>If this field is blank, it means no transaction group was defined; the workload definition is using the default transaction group associated with its workload specification.</p> <p><b>Note:</b> The hyperlink to the WLMATGRP view is not valid when this field is blank.</p>

## Transaction groups - WLMATGRP

The **Active workload transaction groups** (WLMATGRP) views display information about transaction groups installed in a workload that is within the CICSplex identified as the context.

### Supplied views

To access from the main menu, click:

#### Active workload views > Transaction groups

Table 16. Views in the supplied **Active workload transaction groups** (WLMATGRP) view set

View	Notes
Active workload transaction groups EYUSTARTWLMATGRP.TABULAR	Tabular information about transaction groups associated with a workload that is within the CICSplex identified as the context.
Active workload transaction groups EYUSTARTWLMATGRP.DETAILED	Detailed information about a selected transaction group.
Active workload transaction groups EYUSTARTWLMATGRP.DORMANT	Set the workload dormant.
Active workload transaction groups EYUSTARTWLMATGRP.ACTIVE	Set the workload active.

### Actions

Table 17. Actions available for WLMATGRP views

Action	Description
GET	(Required) The name of an active workload.

Table 17. Actions available for WLMATGRP views (continued)

Action	Description
DORMANT	Set the workload dormant.
ACTIVE	Set the workload active.

## Fields

Table 18. Fields in WLMATGRP views

Field	Attribute name	Input values
Workload	WORKLOAD	The name of the workload in which the transaction group is active.
Acceptable target region load level	ABENDTHRESH	The abend probability for a transaction associated with the default transaction group that should cause a target region's load level to be doubled.
Transaction group status	STATUS	Identifies whether affinity relation and lifetime values are to be recognized when processing a transaction associated with the transaction group.  Input Values: ACTIVE   DORMANT
Workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.
Affinity relationship	AFFINITY	The affinity relation used when processing occurrences of the transaction group. The affinity relation values are: <ul style="list-style-type: none"> <li>• GLOBAL - All users at all terminals.</li> <li>• LUNAME - Terminal logical unit name.</li> <li>• NONE - No affinity was defined.</li> <li>• N/A - This field is not applicable.</li> <li>• USERID - User ID.</li> <li>• BAPPL - CICS BTS Business Application.</li> </ul>

Table 18. Fields in WLMATGRP views (continued)

Field	Attribute name	Input values
Affinity lifetime	AFFLIFE	<p>The affinity lifetime to be used when processing occurrences of the transaction group. The affinity lifetime values are:</p> <ul style="list-style-type: none"> <li>• DELIMIT - Until the pseudoconversation mode is END.</li> <li>• LOGON - For the duration of the terminal session.</li> <li>• PCONV - For the duration of the pseudoconversation.</li> <li>• PERMANENT - As long as the workload is active.</li> <li>• SIGNON - As long as the user session is active.</li> <li>• SYSTEM - As long as the AOR to which transactions are routed is active.</li> <li>• ACTIVITY - As long as the CICS BTS activity is active</li> <li>• PROCESS - As long as the CICS BTS process is active</li> <li>• NONE - No affinity lifetime was defined</li> <li>• N/A - This field is not applicable</li> </ul>
Primary search criterion	FILTER	<p>Identifies whether the user name (USERID) or the logical unit name (LUNAME) is to be used as the primary search criteria for transactions associated with the transaction group.</p>
Acceptable abend level	ABENDCRIT	<p>The abend probability for a transaction associated with the default transaction group that should cause a target region to be considered unhealthy.</p>

Table 18. Fields in WLMATGRP views (continued)

Field	Attribute name	Input values
Automatic affinity creation	AFFAUTO	<p>Indicates whether CICSplex SM is to automatically create an affinity relationship for transactions associated with the transaction group.</p> <ul style="list-style-type: none"> <li>• YES <ul style="list-style-type: none"> <li>– An affinity is created using the values in the Affinity relationship and Affinity lifetime fields.</li> </ul> </li> <li>• NO <ul style="list-style-type: none"> <li>– An affinity is not automatically created but can be created by a customized version of the dynamic routing program EYU9WRAM.</li> </ul> </li> <li>• N/A <ul style="list-style-type: none"> <li>– There are no values in the <b>Affinity Relationship</b> and <b>Affinity Lifetime</b> fields, therefore, no affinity is created.</li> </ul> </li> </ul>
Transaction group	TRANGRP	The name of the transaction group.
Event name	EVENTNAME	<p>The name of an analysis definition (RTADEF) or status definition (STATDEF) that may affect the routing of transactions in this workload. If a real-time analysis event is generated by this definition, WLM uses the information as part of the AOR selection criteria.</p> <p>An analysis or status definition can optionally be associated with a workload when the workload specification is created. If this field is blank, no analysis or status definition is associated with the workload.</p> <p><b>Note:</b> The EVENT view is displayed only if an event of the specified type has occurred.</p>

### Dynamic transactions - WLMATRAN

The **Active workload dynamic transactions** (WLMATRAN) views display information about installed dynamic transaction definitions associated with a workload that is within the CICSplex identified as the context.

## Supplied views

To access from the main menu, click:

### Active workload views > Dynamic transactions

Table 19. Views in the supplied **Active workload dynamic transactions** (WLMATRAN) view set

View	Notes
Active workload dynamic transactions EYUSTARTWLMATRAN.TABULAR	Tabular information about active transactions associated with a workload that is within the CICSplex identified as the context.
Active workload dynamic transactions EYUSTARTWLMATRAN.DETAILED	Detailed information about a selected active transaction.
Active workload dynamic transactions EYUSTARTWLMATRAN.FORCE	Discard a transaction from a transaction group.

## Actions

Table 20. Actions available for WLMATRAN views

Action	Description
FORCE	Discard a transaction from a transaction group.

## Fields

Table 21. Fields in WLMATRAN views

Field	Attribute name	Input values
Workload name	WORKLOAD	The name of the workload in which the transaction group is active.
System ID of workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.
Transaction	TRANID	The identifier of an active transaction.
Start or end of pseudo-conversation	PSEUDOMODE	Indicates whether the transaction is the first (START) or last (END) transaction in a pseudo-conversation. If this field is blank, it means the transaction is neither the first nor the last in a pseudo-conversation.
Transaction group	TRANGRP	The name of the transaction group.

## Transaction group affinities - WLMATAFF

The **Active workload transaction group affinities** (WLMATAFF) views display information about the active affinities for a transaction group installed in a workload within the CICSplex identified as the context. An affinity becomes active when the first transaction associated with the transaction group is routed to a target region.



## Supplied views

To access from the main menu, click:

### Active workload views > Transaction group affinities

Table 22. Views in the supplied **Active workload transaction group affinities** (WLMATAFF) view set

View	Notes
Active workload transaction group affinities EYUSTARTWLMATAFF.TABULAR	Tabular information about the active affinities for a transaction group associated with a workload within the CICSplex identified as the context.
Active workload transaction group affinities EYUSTARTWLMATAFF.DETAILED	Detailed information about a selected active affinity.
Active workload transaction group affinities EYUSTARTWLMATAFF.FORCE	Discard an affinity entry.  The affinity is reestablished when the next transaction within the affected transaction group is encountered.

## Actions

Table 23. Actions available for WLMATAFF views

Action	Description
FORCE	Discard an affinity entry.  The affinity is reestablished when the next transaction within the affected transaction group is encountered.

## Fields

Table 24. Fields in WLMATAFF views

Field	Attribute name	Input values
Routing region	TORNAME	The name of the CICS system to which transactions associated with the transaction group are to be routed.
Terminal LU name	LUNAME	The logical unit name of the terminal of the CICS system to which transactions associated with the transaction group are to be routed.
Routing region terminal	TERMID	The terminal ID of the CICS system to which transactions associated with the transaction group are to be routed.

Table 24. Fields in WLMATAFF views (continued)

Field	Attribute name	Input values
Affinity relationship	AFFINITY	The affinity relation used when processing a transaction associated with the transaction group. The affinity relation values are: <ul style="list-style-type: none"> <li>• GLOBAL - All users at all terminals.</li> <li>• LUNAME - Terminal logical unit name.</li> <li>• NONE - No affinity relation was defined.</li> <li>• USERID - User ID.</li> <li>• BAPPL - CICS BTS Business application.</li> </ul>
Key that identifies creator of affinity	KEY	Up to 52 characters identifying who invoked a transaction, comprising the transaction group and their location. Depending on the affinity relation and lifetime values, this key will be some combination of the user ID, logical unit name, routing region name, and terminal ID, in the following format: <code>userid.luname.rtrname.termid</code> . If one or more of these values does not apply to the affinity, that part of the key is left blank.  For BAPPL affinities, this field contains the Activity ID of the CICS BTS activity.  A value of <b>GA</b> is displayed for global affinities.
Transaction group	TRANGRP	The name of an active transaction group. A value of <b>\$\$DTG\$\$</b> represents the default transaction group, which is used for any transactions that are not associated with a transaction group.
The activity ID of the CBTS activity	RESERVD2	The ID of the CBTS activity.
Workload name	WORKLOAD	The name of the workload in which the transaction group is active.
User identifier	USERID	The user identifier ID.
Target region	AOR	The name of the CICS system to which transactions associated with the transaction group are to be routed.
System ID of workload owner	WRKLOWNER	The 4-character CICS system ID of the CMAS that created the workload.

Table 24. Fields in WLMATAFF views (continued)

Field	Attribute name	Input values
BTS activity ID	CBTSKEY	The hexadecimal representation of the Affinity Key. It is shown in this additional format because part of the key may not be displayable in normal character representation.
Affinity lifetime	LIFETIME	The affinity lifetime used when processing a transaction associated with the transaction group. The affinity lifetime values are: <ul style="list-style-type: none"> <li>• DELIMIT - Until the pseudoconversation mode is END.</li> <li>• LOGON - For the duration of the terminal session.</li> <li>• NONE - No affinity lifetime was defined.</li> <li>• PCONV - For the duration of the pseudoconversation.</li> <li>• PERMANENT - As long as the workload is active.</li> <li>• SIGNON - As long as the user session is active.</li> <li>• SYSTEM - As long as the target region is active.</li> <li>• ACTIVITY - As long as the CICS BTS activity is active.</li> <li>• PROCESS - As long as the CICS BTS process is active.</li> </ul>

## Example tasks

These sections include a number of typical workload management example tasks and illustrates how these tasks can be carried out using the Web User Interface (WUI).

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSAPA01, CICSAPA02, and CICSAPA03. You will see how the roles played by these CICS regions vary, depending on the nature of the individual task.

For any task, you must be aware of the scope, that is, of the CICS systems, with which you are working. If the scope is a single CICS system, any data you retrieve from CICSplex SM relates to that single system. If the scope is a group of CICS systems, the data relates to all of the systems in the group. If the scope is a CICSplex, the data relates to every system in that CICSplex. For all of the examples in these sections, the initial scope is CICSplex PLXPROD1.

## Balancing a workload

This example describes how to use the Web User Interface (WUI) to get CICSplex SM to balance a workload - that is, to route all work from a single routing region to a suitable target region.

For this task, a “suitable” target region is the one with the shortest queue of work requests, relative to the maximum number of tasks permitted in the target region. This queue of work, also called the load count, is the queue of all active and queued user tasks. By default, tasks queued for both MAXTASKS and TRANCLASS are included in the load count. Use of the WLMLOADCOUNT EYUPARM allows sites to exclude tasks queued for TRANCLASS from the load count. Please refer to CICSplex SM system parameters for more information about the WLMLOADCOUNT EYUPARM.

The TOR (CICSPT01) is the requesting region and the routing region, and the three AORs (CICSPA01, CICSPA02, and CICSPA03) are all target regions. None of the CICS regions are currently running.

If some of your work requests can't be routed freely (perhaps you want work requests from a particular user always to go to the same target region, for example), don't worry. You'll see how to add that requirement in a later example task (“Routing a specific transaction to a specific target region” on page 80).

1. Create a CICS system group that will include all of the target regions among which the work requests (“the workload”) can be routed dynamically.

- From the main menu, click **Administration views > Topology administration views > System groups** to open the **System group definitions** tabular view.

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- Click the **Create...** button, to open the **System group definitions** create view.
- Type in the following:

System group name	CSGTGTS1
Description	All target regions in CICSplex PLXPROD1

- Click **Yes** to create the system group

The **System group definitions** tabular view is redisplayed, this time showing an entry for CICS system group CSGTGTS1.

At this point, the group CSGTGTS1 exists, but is empty.

2. The next step is to tell CICSplex SM which target regions belong to the group. To add target regions to CICS system group CSGTGTS1:

- From the main menu click **Administration views > Topology administration views > System definitions** to open the **CICS system definitions** tabular view
- Select the entries for the CICS systems CICSPA01, CICSPA02 and CICSPA03 and click the **Add to CICS system group...** button.
- In the **Group which member will join** field, type in CSGTGTS1 and click **Yes to 3 remaining**. This adds the three selected systems to your new group.

3. Create a workload specification:

- From the main menu click **Administration views > Workload manager administration views > Specifications** to open the **WLM specifications** tabular view.
- Click the **Create...** button, and provide the following information:

WLM specification name	WLSPAY01
Description	Balance payroll workload in PLXPROD1
Primary search criterion	USERID
Default target scope	CSGTGTS1

Algorithm type

QUEUE

Leave the remaining fields empty or accept the defaults.

**Note:**

- A **Primary search criterion** value of USERID is shown in this example, though in fact it does not matter whether you specify USERID or LUNAME, because the **Primary search criterion** value has no effect on simple workload balancing. It is used only for some kinds of workload separation, which is the subject of a later example. You have to supply a value because CICSplex SM doesn't know, at this stage, that you aren't going to use this workload specification for workload separation.
- The **Default target scope** value is the name of the single target region, or group of target regions, to which work requests can be routed.
- The **Algorithm type** value, QUEUE, tells CICSplex SM to select the target region that has the shortest queue of work requests.
- The **Description** is optional, but is worth providing. (When you are confronted with a list of specification names, and have no way of telling one from another, you will appreciate its value.)

Click **Yes**. The **WLM specification** tabular view is redisplayed, this time showing an entry for the new WLM Specification, WLSPAY01.

4. The next step is to tell CICSplex SM about the region that is going to be routing the work requests to the target regions in group CSGTGTS1. To associate the workload specification with a routing region:
  - In the **WLM specifications** view, select the entry for the WLSPAY01 specification, and click the **Associate CICS system...** button.
  - In the **CICS system** field, enter the name of the routing region (CICSPT01, in this example) and click **Yes**.

To check that the association between the routing region and the workload specification has worked:

- On the **WLM specifications** tabular view, click on the name WLSPAY01 to display the details of this specification.
- Click the link **CICS systems associated with this workload specification** to display the **WLM specifications to CICS system links** tabular view (LNKSWSCS object).

**Note:** You can also access this view from the main menu by clicking **Administration views > Workload management administration views > Specifications to system links**.

5. Activate workload balancing in the routing region:
  - From the main menu click **Administration views > Topology administration views > System definitions** to open the **CICS system definitions** tabular view.
  - Select the entry for CICSPT01 and click the **Update...** button, to open a detail view of CICSPT01.
  - Change the **Routing region active at startup** field to YES. Click **Yes** to return to the **CICS system definition** tabular view.

This change takes effect when the target region CICSPT01 is next started.
6. Activate workload balancing in the target regions:
  - From the **CICS system definitions** tabular view, select the entry for CICSPT01 and click the **Update...**, to open a detail view of CICSPT01.

- Change the **Target region active at startup** field to YES. Click **Yes** to return to the **CICS system definition** tabular view.

This change takes effect when the target region CICSPA01 is next started.

Repeat this step for target regions CICSPA02 and CICSPA03.

When the routing region and the target regions have been started, you can check that the workload is active from the main menu by clicking **Active workload views > Active workloads**. This opens the **Active workloads** tabular view, showing the workload specification WLSPAY01 as active.

To see which target regions are being routed to, click **Active workload views > Target regions in an active workload**. The displayed view shows all active target regions being routed to by workload WLSPAY01. All of the target regions listed belong to the CICS system group CSGTGTS1.

## Adding a region to an existing target region scope

This example describes how to use the Web User Interface (WUI) to increase the number of regions in an existing target scope without disrupting an existing workload. Assume that you have implemented workload balancing in CICSplex PLXPROD1, via workload specification WLSPAY01, and that work requests are being routed among target regions CICSPA01, CICSPA02, and CICSPA03. These target regions all belong to CICS system group CSGTGTS1. Now you want to add a fourth region CICSPA04 to group CSGTGTS1. Region CICSPA04 has been defined to CICSplex PLXPROD1 and is running and is linked to the routing region CICSPT01

1. Add target region CICSPA04 to CICS system group CSGTGTS1.
  - From the Web User Interface main menu click **Administration views > Topology administration views > System definitions** to open the **CICS system definitions** tabular view.
    - If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Select the entry for CICSPA04, and click the **Add to CICS system group...** button. The **Add to CICS system group** view is displayed.
  - In the **Group which member will join** field, enter the name CSGTGTS1 and click **Yes**.
2. Update the CICSplex SM definition of target region CICSPA04:
  - From the **CICS system definitions** tabular view, select the entry for CICSPA04 and click the **Update...** button.
  - Change the **Workload manager status** field to YES from the menu. Click **Yes** to confirm the update.

This change takes effect when the target region CICSPA04 is next started.

When the target region CICSPA04 has been started, you can check that the workload is active by clicking **Active workload views > Target regions in an active workload**. This opens the **Target region in an active workload** view showing all target regions (including CICSPA04) to which work requests in this workload can be routed.

## Removing a region from a target region scope

CICS system group CSGTGTS1 contains four target regions (CICSPA01, CICSPA02, CICSPA03, and CICSPA04) in CICSplex PLXPROD1. Work requests are balanced among these target regions, and the routing is controlled by workload specification WLSPAY01.

This example describes how to use the Web User Interface (WUI) to remove region CICSPA04 from the group CSGTGTS1, without disrupting the active workload.

1. Remove target region CICSPA04 from CICS system group CSGTGTS1:
  - From the Web User Interface main menu click **Administration views > Topology administration views > System groups** to open the **System group definitions** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click CSGTGTS1 in the **System group name** field to open a detail view and click the **CICS systems in this CICS system group** link. This opens the **CICS system to CICS system group links** tabular view.
  - Click the Record check box beside the entry for CICSPA04 and click the **Remove...** button. This opens the **Remove** confirmation view.
  - Click **Yes** to confirm the update.
2. To check that CICSPA04 has been removed, from the main menu click **Active workload views > Target regions in an active workload**. This opens the **Target region in an active workload** view showing all target regions to which the workload can be routed. CICSPA04 should not appear in the list.

## Adding a routing region to an active workload

This example describes how to use the Web User Interface (WUI) to add a routing region to an active workload, without disrupting that workload. Assume that you are still balancing the workload in CICSplex PLXPROD1, via workload specification WLSPAY01, and that work requests are being routed by CICSPT01 among the target regions in CICS system group CSGTGTS1. Now you want to add a second routing region - CICSPT02 - to the workload. Region CICSPT02 has been defined to CICSplex PLXPROD1 (via the **CICS system definitions** views), is running, and is linked to the target regions CICSPA01, CICSPA02, and CICSPA03.

1. Update the CICSplex SM definition for CICS system CICSPT02:
  - From the Web User Interface main menu click **Administration views > Topology administration views > System definitions** to open the **CICS system definitions** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Select the record for CICSPT02 and click the **Update...** button.
  - Change the **AOR dynamic routing mode** field to YES.
  - Click **Yes** to confirm the update. This change takes effect when routing region CICSPT02 is next started.
2. Associate CICSPT02 with workload specification WLSPAY01:
  - From the main menu, click **Administration views > Workload manager administration views > Specifications**.
  - On the **WLM specifications** view, click the Record check box beside the entry for WLSPAY01 and click the **Associate CICS system...** button.
  - In the **CICS system** field, type in CICSPT02 and click **Yes** to confirm the update.

When CICSPT02 has been restarted, you can verify that it has been added to WLSPAY01 as follows:

- Open the **WLM specification** tabular view and click on the entry for WLSPAY01. This opens a detail view.
- Click the **CICS systems associated with this workload specification** link. Both CICSPT01 and CICSPT02 should be listed in the **WLM specifications to CICS system links** tabular view.

To check that CICSPT02 is part of the active workload, from the main menu, click **Active workload views > Routing regions in an active workload**. This opens a tabular view showing entries for both CICSPT01 and CICSPT02.

## Quiescing a target region in an active workload

This example describes how to use the Web User Interface (WUI) to quiesce the target region CICSIPA03, which belongs to the active workload WLSPAY01. You might need to do this so that you can apply maintenance to a region, for example. The regions CICSPT01 and CICSPT02 are routing work requests among three target regions (CICSIPA01, CICSIPA02, and CICSIPA03) when you perform this task.

1. List the target regions associated with workload WLSPAY01.
  - From the Web User Interface main menu click **Active workload views > Target regions in an active workload** to open the **Target region in active workload** view.
 

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - In the **Workload name** field type WLSPAY01 and click **Refresh**. This redisplay the **Target region in active workload** view. The three CICS regions CICSIPA01, CICSIPA02 and CICSIPA03 are listed. Their status is active.
2. Quiesce target region CICSIPA03:
  - On the **Target region in active workload** view, select the entry for target region CICSIPA03 and click the **Quiesce...** button. This opens the **Quiesce** confirmation view.
  - Click **Yes** to confirm the action. The **Target region in active workload** view is redisplayed, showing the **Target region status** value for CICSIPA03 changed to QUIESCED. No new work requests are routed to the target region, though any work already running there is allowed to complete.

## Routing a specific transaction to a specific target region

The example tasks described so far in these sections have all been concerned with workload balancing. This example describes how to use the Web User Interface (WUI) to define some workload separation requirements to CICSplex SM. Specifically, you want CICSplex SM always to route the transaction PAY1 to the target region CICSIPA02, which belongs to CICS system group CSGTGTS1. Note that you are still working in CICSplex PLXPROD1, and that workload balancing, from a single CICSPT01 among target regions in the group CSGTGTS1, is in effect.

1. If the transaction to be routed is to be started with EXEC CICS START, it should be defined as ROUTABLE.
2. Create a transaction group:
  - From the main menu, click **Administration views > Workload manager administration views > Transaction group definitions**. This opens the **Transaction group definitions** view.
 

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click the **Create...** button, and provide the following information:

Name	TRGPAY01
Description	Send PAY1 to CICSIPA02
Affinity relation and lifetime checking status	ACTIVE
Primary search criterion	USERID

You can leave the remaining fields or accept the defaults.



Click **Yes**. The **Transaction group definitions** view is redisplayed, now showing the name of the transaction group TRGPAY01.

3. Add transaction PAY1 to transaction group TRGPAY01:
  - In the **Transaction group definitions** view, select the entry for TRGPAY01, and click the **Add transaction...** button.
  - In the **Transaction name** field, type the name PAY1 and click **Yes** to confirm. The **Transaction group definitions** view is redisplayed.
4. Create a workload definition:
  - From the main menu, click **Administration views > Workload manager administration views > Definitions**. This opens the **WLM definitions** view, listing any workload definitions already created in PLXPROD1.
  - Click the **Create...** button, and provide the following information:

Workload management definition	WLDAPAY01
Description	Separate TRGPAY01 to CICSSPA02
Transaction group name	TRGPAY01
Scope name of set of target systems	CICSSPA02

- Click **Yes** to confirm.
5. Create a workload group. (A workload group is essential if you want a workload definition to be installed automatically when the routing region that's routing the transactions is started.)
    - From the main menu, click **Administration views > Workload manager administration views > Groups**. This opens the **WLM groups** view, listing any workload groups already created in PLXPROD1.
    - Click the **Create...** button, and type in the following:

Workload management group	WLGPAY01
Description	Workload group for WLDAPAY01

- Click **Yes** to confirm. The **WLM groups** view is redisplayed.
6. Add the workload group WLGPAY01 to the existing workload specification WLSPAY01:
    - In the **WLM groups** view, select the entry for WLGPAY01, and click the **Add to WLM specification...** button.
    - In the **Specification name** field, enter the name of the existing workload specification, WLSPAY01 and click **Yes**. The **WLM groups** view is redisplayed.
  7. Add the workload definition to the workload group:
    - From the main menu, click **Administration views > Workload manager administration views > Definitions** to open the **WLM definitions** view.
    - Select the entry for WLDAPAY01, and click the **Add to WLM group...** button.
    - In the **Resource group name** field, type WLGPAY01 and click **Yes**. The **WLM definition** view is redisplayed.
  8. Install the workload group into the active workload.

Because the workload WLSPAY01 is already active, you have to install the new workload group WLGPAY01 explicitly. If you did not install WLGPAY01, it would not take effect until the routing region CICSPT01 and the target regions in CICS system group CSPTGTS1 were next started.

    - From the main menu, click , **Administration views > Workload manager administration views > Groups** to open the **WLM groups** tabular view.
    - Select the entry for WLGPAY01 and click the **Install...** button.
    - In the **Workload name** field, type WLSPAY01, and, in the **Workload owner** field, type in the SYSID of the system on which the workload specification WLSPAY01 was created.

Click **Yes** to confirm

Because you are reusing a workload specification that is already active in CICSplex PLXPROD1, and have installed the workload group, the workload separation you have defined in this example takes immediate effect.

You can check that the new workload definition WLDAPY01 is active by opening the **WLM definitions** view. This should include an entry for WLDAPY01 in workload WLSPAY01. When transaction PAY1 is next started, by any user and from any terminal, CICSplex SM will route it to target region CICSPA02.

## Routing particular transactions from a given user to a specific target region

This example task again describes how to use the Web User Interface in a refinement of the previous example (“Routing a specific transaction to a specific target region” on page 80). This time, the user ID value is to be an additional factor in determining where transactions are to be routed: transactions PAY6, PAY7, PAY8, and PAY9, when started from user ID USRPAY03, must be routed to target region CICSPA03 in CICSplex PLXPROD1.

1. Create a transaction group.
  - From the Web User Interface main menu, click **Administration views > Workload manager administration views > Transaction group definitions**. This opens the **Transaction group definitions** tabular view. If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click the **Create...** button, and provide the following information:

Name	TRGPAY02
Description	Send USRPAY03's transactions to CICSPA03
Affinity relation and lifetime checking status	ACTIVE
Primary search criterion	USERID

You can leave the remaining fields or accept the defaults.

- Click **Yes** to confirm. The **Transaction group definitions** tabular view is redisplayed.
2. Identify the transactions that belong to group TRGPAY02:
    - In the **Transaction group definitions** tabular view, select the entry for TRGPAY02, and click the **Add transaction...** button.
    - In the **Transaction name** field, type in the name of the first transaction PAY6, and click **Yes** to confirm. Repeat this step for three more transactions: PAY7, PAY8, and PAY9.
  3. Create a workload definition:
    - From the main menu, click , **Administration views > Workload manager administration views > Definitions**. This opens the **WLM definitions** tabular view, listing any workload definitions already created in PLXPROD1.
    - Click the **Create...** button, and provide the following information:

Workload management definition	WLDAPY02
Description	Separate TRGPAY02 to CICSPA03
Transaction group name	TRGPAY02
User ID	USRPAY03
Scope name of set of target systems	CICSPA03

- Click **Yes** to confirm.
4. Add the workload definition to the existing workload group:
    - From the main menu, click , **Administration views > Workload manager administration views—>Definitions** to open the **WLM definition** view.
    - Select the entry for WLDAPY0 and click the **Add to WLM group** button.
    - In the **Resource group name** field, type WLGPAY01 (the name of the workload group you created in the previous example). Workload group WLGPAY01 is already associated with the active workload specification WLDAPY01.
    - Click **Yes** to confirm.
  5. Install the new workload definition into the active workload:
 

Because group WLGPAY01 is already associated with the active workload WLDAPY01, changes you make to that group will not take effect until the routing region CICSPT01, and the target regions in CICS system group CSGTGTS1, are next started. To make the new workload definition take effect immediately, you must install it explicitly in WLDAPY01:

    - Open the **WLM definitions** view again, select the entry for WLDAPY02, and click the **Install...** button.
    - In the **Workload name** field, type in WLDAPY01 and in the **Workload owner** field, type in the SYSID of the system on which the workload specification WLDAPY01 was created.

Because you have explicitly installed the workload definition WLDAPY02 in the active workload WLDAPY01, the workload separation requirements you have defined in this example take immediate effect.

## Honoring a pseudoconversational transaction

This example describes how to use the Web User Interface (WUI) to ensure that multiple transactions, among which there is an affinity, are routed to the same target region. As before, you are working in CICSplex PLXPROD1 and are routing transactions from CICSPT01 to the target regions in CICS system group CSGTGTS1.

1. Create a transaction group:
  - From the main menu, click **Administration views > Workload manager administration views > Transaction group definitions**. This opens the **Transaction group definitions** tabular view.
  - If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click the **Create...** button, and provide the following information:

Name	TRGPAY03
Description	Pseudoconversational transaction
Affinity relation and lifetime checking status	ACTIVE
Primary search criterion	USERID
Affinity relationship	USERID
Affinity lifetime	PCONV

Notice that the **Affinity relationship** and **Affinity lifetime** fields must be completed. These values tell CICSplex SM that the transactions in this group constitute a pseudoconversational transaction (PCONV), and that this affinity lasts while those transactions are coming from the same user ID (USERID). If one of them is initiated from a different user ID, CICSplex SM can select a

different target region. Of course, the same type of affinity will then come into play in that second target region. You can ignore any fields that have been left blank or accept the defaults.

- Click **Yes** to confirm. The **Transaction group definitions** tabular view is redisplayed.

2. Identify the transactions that belong to group TRGPAY03:

- In the **Transaction group definitions** tabular view, select the entry for TRGPAY03 and click the **Add transaction...** button.
- In the **Transaction name** field, type in the name of the first transaction PAY2 and click **Yes** to confirm.

Repeat this step for three more transactions: PAY3, PAY4, and PAY5.

You can see that PAY2 starts the pseudoconversation and PAY5 ends it.

3. Create a workload definition:

- From the main menu, click **Administration views > Workload manager administration views > Definitions**. This opens the **WLM definitions** view, listing any workload definitions already created in PLXPROD1.
- Click the **Create...** button, and provide the following information:

Workload management definition	WLDAPAY03
Description	TRGPAY03 to the same target region
Transaction group name	TRGPAY03
Scope name of set of target systems	CSGTGTS1

- Click **Yes** to confirm.

4. Add the workload definition to the workload group:

- From the main menu, click **Administration views > Workload manager administration views > Definitions** to open the **WLM definitions** tabular view.
- Select the entry for WLDAPAY03 and click the **Add to WLM group...** button.
- In the **Resource group name** field, type WLGPAY01.
- Click **Yes** to confirm.

5. Because group WLGPAY01 is already associated with the active workload WLSPAY01, changes you make to that group will not take effect until the routing region CICSPT01, and the target regions in CICS system group CSGTGTS1, are next started. To make the new workload definition take effect immediately, you must install it explicitly in WLSPAY01. To install the new workload definition into the active workload:

- Open the **WLM definitions** view again, select the entry for WLDAPAY03, and click the **Install...** button.
- In the **Workload name** field, type in WLSPAY01, and in the **Workload owner** field, type in the SYSID of the system on which the workload specification WLSPAY01 was created.

Because you have explicitly installed the workload definition WLDAPAY03 in the active workload WLSPAY01, CICSplex SM is able to honor this pseudoconversational transaction immediately. Be aware that you are able to use the single workload specification WLSPAY01 for both workload balancing and workload separation because you did *not* specify default **Affinity relationship** and **Affinity lifetime** values in WLSPAY01. Had you done so, you would have had to create different workload specifications for workload balancing and workload separation.

## Deactivating a workload definition

This example describes how to use the Web User Interface (WUI) to deactivate the workload definition WLDAPAY02 created in the example “Routing particular transactions from a given user to a specific target region” on page 82.

1. Display active workload definitions:
  - From the main menu, click **Active workload views > Definitions**. This opens the **Active workload definitions** view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - In the **Active workload definitions** view, type WLDAPAY02 and click **Refresh**. The active workload definitions associated with workload specification WLDAPAY02 are listed.
2. Discard workload definition WLDAPAY02:
  - a. Select the entry for WLDAPAY02, and click the **Discard...** button. This opens the **Discard** confirmation view.
  - b. Click **Yes** to confirm the action.

Be aware that, when you deactivate an active workload definition, you also deactivate any transaction groups associated with it if they aren't referenced by another workload definition in the same workload.

## Updating an active workload definition

This example describes how to use the Web User Interface (WUI) to update an active workload definition and then reinstall it in the active workload. In the example “Routing particular transactions from a given user to a specific target region” on page 82, you created the transaction group TRGPAY02 and named it in the workload definition WLDAPAY02. In this example, you'll see how to remove TRGPAY02 and replace it with a new transaction group, TRGPAY04, which has already been created.

1. Display active workload definitions:
  - From the main menu, click **Active workload views > Definitions**. This opens the **Active workload definitions** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - In the **Active workload definitions** view, type WLDAPAY02 and click **Refresh**. The active workload definitions associated with workload specification WLDAPAY02 are listed.

Make a note of the value in the **System ID of workload owner** field for WLDAPAY02 (CM1B, in this example).

2. Update workload definition WLDAPAY02.
  - From the main menu, click **Administration views > Workload manager administration views > Definitions** to open the **WLM definition** tabular view.
  - Select the entry for WLDAPAY02 and click the **Update...** button. The **WLM definitions** create view is displayed.
  - In the **WLM definitions** create view, change the **Transaction group name** to TRGPAY04 and change the **Description** text to “Separate TRGPAY04 to CICSPA03”
  - Click **Yes**. The **WLM definitions** tabular view is redisplayed.

3. Install the updated workload definition in WLDAPAY01:

In the **WLM definitions** tabular view, select the entry for WLDAPAY02 and click the **Install...** view. The **Install** view is displayed. In the **Workload name** field, type WLDAPAY01. In the **Workload owner** field, type the 4-character ID of the

workload owner that you made a note of in step 1 on page 85. Click **Yes**. The updated workload definition is installed in workload WLSPAY01.

4. Check that the updated workload definition has been installed:
  - From the main menu, click **Active workload views > Definitions**. This opens the **Active workload definitions** tabular view showing the updated definition. Check that TRGPAY02 has been replaced by TRGPAY04.
5. Check that transaction group TRGPAY02 is inactive and that transaction group TRGPAY04 is now active:
  - From the main menu, click **Active workload views > Transaction groups** to view the status of the two transaction groups.

#### Note:

Updating the **User ID**, **Terminal LU name**, **BTS process type**, or **Scope name of set of target systems** fields in a workload definition prevents the workload definition from being reinstalled dynamically. To reinstall the workload definition into an active workload, you must:

- From the **Active workload definitions** tabular view, click the **Discard...** button to discard the active workload definition
- From the workload management **Definitions** view, click the **Install...** button to install the workload definition into the workload.

Alternatively, to reinstall workload definitions with changed attributes, use a batch API program to disable access to the affected application, discard the **Active workload definitions** view, install the **WLM definitions** view, and re-enable the affected application.

## Discarding an active transaction from a workload

This example describes how to use the Web User Interface (WUI) to discard an active transaction from a workload.

1. Display active transactions.
  - From the main menu, click **Active workload views > Dynamic transactions**.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - The **Active workload dynamic transactions** tabular view shows the active transactions associated with workload specification EYUWLS02
2. Discard transaction PAY2:
  - From the **Active workload dynamic transactions** view, select transaction PAY2, and click the **Force...** button. The **Force** confirmation view is displayed.
  - Click **Yes** to confirm the action.

## Updating a workload specification

This example describes how to use the Web User Interface to update the workload specification WLSPAY01, which you created in the example “Balancing a workload” on page 75. Be aware that, although this task is a very simple one, its effects need to be considered carefully. In particular, the updated workload specification cannot take effect immediately unless you also stop and then restart both the routing region with which the workload specification is associated and the target regions to which the routing region routes transactions.

1. Update workload specification WLSPAY01.

- From the Web User Interface main menu click **Administration views > Workload manager administration views > Specifications** to open the **WLM specifications** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
- Select the entry for WLSPAY01 and click the **Update...** button.
- Change the **Algorithm type** field from QUEUE to GOAL
- Click **Yes**. The view is redisplayed showing the updated entry for WLSPAY01.

2. Display the **Active workload** view:

- From the main menu, click **Active workload views > Active workloads**.
- In the **Active workloads** tabular view, type in the workload name WLSPAY01 and click **Refresh**.

The **Active workloads** tabular view is redisplayed. You will see that the algorithm type for WLM specification WLSPAY01 is still QUEUE. This is because region CICSPT01 doesn't know about the changes you've made.

If you want the updated workload specification to take effect immediately, use the **CICS regions** view to stop the routing regions and the target regions to which they route, and then restart them. When you have done this, display the **Active workloads** tabular view and you will see that the **Algorithm type** field has been updated to GOAL.

## Using real-time analysis to select a target region for workload balancing

This Web User Interface (WUI) example describes how to use CICSplex SM's real-time analysis functions to produce data that will help in the selection of a target region during workload balancing. In particular, the number of items on the temporary storage queue will be monitored for each target region to which work can be routed. When the number of items goes above 50, a real-time analysis event notification (severity HS) and an external message will be issued. When an event notification is issued, CICSplex SM's workload-balancing function is notified and uses the information, in addition to the standard queue algorithm criteria, in selecting the best target region.

A CICS system group CSGTGTS3 has already been created and contains four target regions (CICSPA01, CICSPA02, CICSPA03, and CICSPA04). The target regions are currently running. Work is currently being balanced among these target regions by the routing region CICSPT03.

1. Create a real-time analysis evaluation definition:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Evaluations**. This opens the **Evaluation definitions** tabular view, listing any evaluation definitions already created in PLXPROD1.

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- Click the **Create...** button, and provide the following information:

Name	RTEPAY15
Description	TSQ NUMITEMS > 50
Sample interval	300
Resource table name	MTSQGBL
Instance identifier of evaluated resource	*
Method of evaluating results in result set	ANY
Separate task indicator	NO
Name of field being evaluated	PUTQAUX
Evaluation type	VALUE

Evaluation logical operator	GT
Evaluation data value	50
Severity assigned when result meets criteria	HS
Name of a view that may provide extra information	MTSQGBL

- Click **Yes** to create the new evaluation definition.

2. Create a real-time analysis action definition:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Actions**. This opens the **Action definitions** view.
- Click the **Create...** button, and provide the following information:

Action	RTAPAY15
Description	NUMITEMS IN TSQ > 50
Generate event option	YES
Name of view that may provide useful information	TSQ
Action priority	255
Message to send when event occurs	AUX TSQUEUE PUTQ ITEMS > 50
Generate external message option	YES
External message sent when event occurs	AUX TSQUEUE PUTQ ITEMS > 50
External message sent when event is cleared	AUX TSQUEUE PUTQ ITEMS < 50
Generate SNA generic alert option	NO
MVS automatic restart	NO

- Click **Yes** to create the new RTA action definition. The **Action definitions** tabular view is redisplayed.

3. Create an analysis definition:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Definitions**. This opens the **RTA definitions** view.
- Click the **Create...** button, and provide the following information:

Name	RTDPAY15
Description	TSQ NUMITEMS FOR WLM /RTA
Execute evaluation modification string	NO
Analysis interval	300
Action definition name	RTAPAY15
Count of true evaluations before VLS raised	0001
Count of false evaluations before VLS resolved	0001
Count of true evaluations before LS raised	001
Count of false evaluations before LS resolved	001
Count of true evaluations before LW raised	001
Count of false evaluations before LW resolved	001
Count of true evaluations before HW raised	001
Count of false evaluations before HW resolved	001
Count of true evaluations before HS raised	001
Count of false evaluations before HS resolved	0001



Count of true evaluations before VHS raised	0001
Count of false evaluations before VHS resolved	0001
Count of false evaluations before VHS resolved	0001
Evaluation expression	RTEPAY15

- Click **Yes** to create the new analysis definition. The **Analysis definitions** tabular view is redisplayed.

4. Create an analysis group:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Groups**. This opens the **RTA groups** tabular view.
- Click the **Create...** button, and provide the following information:

RTA group	RTGPAY09
Description	RTA/WLM Group

- Click **Yes** to create the new analysis group. The **RTA groups** tabular view is redisplayed.

5. Add the analysis definition to the analysis group:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Definitions**. This opens the **RTA definitions** view.
- Click the Record check box beside the entry for RTDPAY15 and click the **Add to RTA group...** button. The **Add to RTA group** view is displayed
- In the **Resource group name** field type RTGPAY09 and click **Yes**. The **RTA definitions** tabular view is redisplayed

6. Create an analysis specification:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Specifications**. This opens the **RTA specifications** tabular view.
- Click the **Create...** button, and provide the following information:

RTA specification name	RTSPAY09
Description	Workload balancing with RTA

- Click **Yes** and the **RTA specifications** tabular view is redisplayed, listing the new RTA specification.

7. Add the analysis group to the analysis specification:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Groups**. This opens the **RTA groups** tabular view.
- Click the record check box beside the entry for RTGPAY09 and click the **Add to RTA specification...** button. The **Add to RTA specification** view is displayed
- In the **RTA specname** field, type RTSPAY09 and click **Yes**. The **RTA groups** tabular view is redisplayed

8. Set the scope of the analysis specification.:

- From the main menu, click **Administration views > RTA MAS resource monitoring > Specifications**. This opens the **RTA specifications** tabular view.
- Click the record check box beside the entry for RTGPAY09 and click the **Associate CICS group...** button. The **Associate CICS group** view is displayed
- In the **CICS system group** field, type CSGTGTS3 and select the **Force** option. Click **Yes** and the **RTA specifications** tabular view is redisplayed.

9. Activate real-time analysis in the target regions in CSGTGTS3:
  - From the main menu, click **Administration views > RTA system availability monitoring > CICS system definitions**. This opens the **CICS system definitions** tabular view.
  - Click the record check box beside the entry for CICS system CICSPA01, click the **Update...** button, and provide the following information:

CICS system definition name	CICSPA01
Description	Target region 1 on System A
Real time analysis status	YES
Severity for system availability monitoring event	NO
Severity for short-on-storage (SOS) event	NO
Severity for system dump event	NO
Severity for transaction dump event	NO
Severity for CICS-at-maximum-tasks event	NO
Severity for CICS-stalled event	NO

- Click **Yes** to confirm the change. The CICS system definition is updated and the change, which is permanent, takes immediate effect. You do not have to restart CICS system CICSPA01. Repeat this step for the target regions CICSPA02, CICSPA03, and CICSPA04.
10. The workload specification WLSPAY02 is already being used for workload balancing among the target regions in CSGTGTS3. You have to update the specification to add the real-time analysis data to the standard target region selection criteria. To update the workload specification:
    - From the main menu, click **Administration views > Workload manager administration views > Specifications**. This opens the **WLM specifications** tabular view.
    - Click the record check box beside the entry for WLSPAY02, click the **Update...** button, and provide the following information:

Name	WLSPAY02
Description	Workload using RTA for target region selection
Primary search criterion	USERID
Default target scope	CSGTGTS3
RTA event name	RTDPAY15
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	QUEUE

- Click **Yes** to update the specification.
- Notice that the **RTA event** field value is the name of the analysis definition you created in step 3 on page 88.

When the routing region CICSPT03 and the target regions in CICS system group CSGTGTS3 are next started, the routing region routes transactions among the target regions using both the standard queue algorithm criteria and the analysis definition RTDPAY15 to select a target region.

## Dynamic routing with EXEC CICS START TERMID

This example describes how to use the Web User Interface (WUI) to set up dynamic routing capability for a transaction started with EXEC CICS START, that specifies a terminal ID and a transaction ID, and to use the GOAL algorithm to select the target region.

**Note:** You should check the system requirements before trying to route EXEC CICS START TERMID dynamically. See “Workload requirements” on page 5.

In this example, a program running in CICSPA01 begins with EXEC CICS START, which is associated with terminal TRM1, to run transaction PAY1, for which you require a 2-second response time. Terminal TRM1 is associated with region CICSPT01. Transaction PAY1 may execute in any region connected to CICSPT01, that is, in CICSPA01, CICSPA02, or CICSPA03.

This example uses the environment that has already been created as part of earlier examples. You are working in CICSplex PLXPROD1, which comprises TOR CICSPT01 and AORs CICSPA01, CICSPA02, and CICSPA03 in CICS system group CSGTGTS1. Transaction group TRGPAY03 has transactions PAY1, PAY2, PAY3, and PAY4 associated with it. Workload definition WLDAPY03 was defined to tell CICSplex SM that transactions in group TRGPAY03 must go to a target region in CICS system group CSGTGTS1.

As you wish to use the GOAL algorithm, you need to define, in MVS Workload Manager, a Service Class with the required response time and allocate that Service Class to transaction PAY1. For example, you could specify:

- A Service Class of Fast that has an average response time of 2 seconds.
- A classification rule that associates Classification Subsystem CICS with transaction ID PAY1 and Service Class Fast.

For more information about Service Classes, see Service classes.

In CICSplex SM:

1. Create a workload specification.
  - From the main menu, click **Administration views > Workload manager administration views > Specifications**. This opens the **WLM specifications** tabular view.

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- Click the **Create...** button, and provide the following information:

Name	WLSDYN01
Description	Dynamic routing START
Primary search criterion	USERID
Default target scope	CSGTGTS1
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	GOAL

- Click **Yes** to create the specification.

You must supply:

- A name for the specification (WLSDYN01 in this example).

- A **Primary search criterion** value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the **Primary search criterion** value has no effect on simple workload balancing. It is used only for some kinds of workload separation, but you have to supply a value because CICSplex SM doesn't know, at this stage, that you aren't going to use this workload specification for workload separation.
- A **Default target scope** value, which is the name of the single target region, or group of target regions, to which transactions can be routed.
- An **Algorithm type** value. For this example, use GOAL, because the criteria for selecting the target region are based on the requirement that the transaction has a response time of 2 seconds.

When you click **Yes**, the **WLM specifications** tabular view is redisplayed, this time showing an entry for the new workload specification, WLSDYN01.

2. The next step is to tell CICSplex SM about the region that's going to be routing the work requests to the target regions in group CSGTGTS1. To associate the workload specification with a routing region:
  - On the **WLM specifications** tabular view, click the Record check box beside the entry for the WLSDYN01 specification and click the **Associate CICS system...** button.
  - Type WLSDYN01 in the **CICS system** field and click **Yes**. The **WLM specifications** tabular view is redisplayed and you can check that the association between the routing region and the workload specification has been created.
3. Activate workload balancing in the routing region:
  - From the main menu, click **Administration views > Topology administration views > System definitions**. This opens the **CICS system definitions** tabular view.
  - Click the Record check box beside the entry for CICSPT01 and click the **Update...** button.
  - In the **Workload manager status** field, select YES from the drop-down menu. This change takes effect when CICSPT01 is next started.
4. Activate workload balancing in the target regions.
  - From the main menu, click **Administration views > Topology administration views > System definitions**. This opens the **CICS system definitions** tabular view.
  - Click the Record check box beside the entry for CICSPA01 and click the **Update...** button.
  - In the **AOR dynamic routing mode** field, select YES from the drop-down menu. This change takes effect when the target region CICSPA01 is next started.

Repeat this step for target regions CICSPA02 and CICSPA03.

5. Install program definitions:
  - From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Program definitions**. This opens the **Program definitions** tabular view.
  - Click the Record check box beside the entry for CICSPA01 and click the **Update...** button.
  - Set the **Dynamic routing status** field to NO from the drop-down box.
  - Click **Yes** to confirm. The **Program definitions** tabular view is redisplayed.
  - Click the Record check box beside the entry for CICSPA01 and click the **Install...** button.
  - Type CICSPA01 in the **Target scope value** field and click Yes to confirm.

Repeat this step for CICSPA02 and CICSPA03.

6. Install transaction definitions:

- From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Transaction definitions**. This opens the **Transaction definitions** tabular view.
- From the **Transaction definitions** view, select PAY1 and click the **Install...** button. Type CICSPA01 in the **Target scope value** field.
- Click Yes to confirm.

You can either update the transaction definitions to specify these field values, or you can specify override values when you install the transaction definitions. For details, see *CICSplex System Manager Managing Business Applications*.

In this example task, a program running in CICSPA01, the requesting region, issues an EXEC CICS START command that specifies a transaction ID of PAY1 and a terminal ID TRM1. The START command is function shipped to CICSPT01, the TOR that owns the specified terminal. CICSPT01 acts as the routing region and invokes the dynamic routing exit, which selects the target region. All the AORs in CICS system group CSGTGS1 are possible target regions; the actual target region is selected on the basis of the GOAL criterion of a response time of 2 seconds. CICSplex SM obtains the Service Class of transaction PAY1 and the identity of the target region to which that Service Class is allocated, from a CICSplex SM-maintained table.

## Dynamic routing of an inbound client DPL request

This example describes how to use the Web User Interface (WUI) to set up dynamic routing capability for a DPL request from a CICS client, and to use the GOAL algorithm to select the target region.

**Note:** You should check the system requirements before trying to dynamically route inbound client DPL requests. See “Workload requirements” on page 5.

In this example, a request is received to run transaction PAY1 to invoke client program PAYPROG1. PAYPROG1 issues an EXEC CICS LINK command to server program PAYPROG2. You require transaction PAY1 to have a 2-second response time.

This example uses the environment that was used for “Dynamic routing with EXEC CICS START TERMID” on page 91.

As you wish to use the GOAL algorithm, you need to define, in MVS Workload Manager, a Service Class with the required response time and allocate that Service Class to the transaction. For example, you could specify:

- A Service Class of Fast with a average response time of 2 seconds.
- A classification rule that associates Classification subsystem CICS with transaction ID PAY1 and Service Class Fast.

For more information about Service Classes, see *Service classes*.

In CICSplex SM:

1. The first step is to set the dynamic routing status value for program PAYPROG1. To do this:
  - From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Program definitions**. This opens the **Program definitions** tabular view.If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- Click the Record check box beside the entry for PAYPROG1 and click the **Update...** button. From the drop-down box, set the **Dynamic routing status** field to NO.
  - Click **Yes** to confirm.
2. Install program definitions:
- From the **Program definitions** tabular view, click the Record check box beside the entry for PAYPROG1 and click the **Install...** button.
  - Type CICSPA01 in the **Target scope value** field.
  - Click **Yes** to confirm.

Repeat this step to install PAYPROG1 in target scopes CICSPA02 and CICSPA03.

For details of defining and installing program definitions, see *CICSplex System Manager Managing Business Applications*.

3. Install the transaction definition:
- From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Transaction definitions**. This opens the **Transaction definitions** tabular view.
- If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
- From the **Transaction definitions** view, click the Record check box beside the entry for PAY1 and click the **Install...** button.
  - Type CICSPA01 in the **Target scope value** field.
  - Click **Yes** to confirm.

Repeat this step to install PAY1 in target scopes CICSPA02 and CICSPA03.

The transaction definition should point to the mirror program DFHMIRS. For details of defining and installing transaction definitions, see Transaction resource definitions, in the *CICSplex System Manager Managing Business Applications* book.

## Dynamic routing of a peer-to-peer DPL request

This example describes how to use the Web User Interface (WUI) to set up dynamic routing for a peer-to-peer DPL request, and to use the GOAL algorithm to select the target region.

**Note:** You should check the system requirements before trying to dynamically route peer-to-peer DPL requests. See “Workload requirements” on page 5.

In this example, transaction PAY1 runs program PAYPROG1, which issues an EXEC CICS LINK command to program PAYPROG2. You require transaction PAY1 to have a response time of 4 seconds.

This example uses the environment that was used for “Dynamic routing with EXEC CICS START TERMID” on page 91. However, because this is a peer-to-peer dynamic linking request, only the AORs are involved and each AOR may act as a requesting, routing, or target region.

As you wish to use the GOAL algorithm, you need to define, in MVS Workload Manager, a Service Class with the required response time and allocate that Service Class to the transaction. For example, you could specify:

- A Service Class of Medium with an average response time of 4 seconds.
- A classification rule associating Classification Subsystem CICS with transaction ID PAY1 and Service Class Medium.

For more information about Service Classes, see “Using the goal algorithm” on page 9.

In CICSplex SM:

1. The first step is to set the dynamic routing status value for program PAYPROG1. To do this:
  - From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Program definitions**. This opens the **Program definitions** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click the Record check box beside the entry for PAYPROG1 and click the **Update...** button.
  - Set the **Dynamic routing status** field to NO from the drop-down box.
  - Click **Yes** to confirm.
2. Install program definitions:
  - From the **Program definitions** tabular view, click the Record check box beside the entry for PAYPROG1 and click the **Install...** button.
  - Type CICSPA01 in the **Target scope value** field.
  - Click **Yes** to confirm.

Repeat this step to install PAYPROG1 in target scopes CICSPA02 and CICSPA03.

For details of defining and installing program definitions, see *CICSplex System Manager Managing Business Applications*.

You don't need to install program definition PAYPROG2 in the regions, but if you do, PAYPROG2 should be defined as dynamic.

3. Install the transaction definition:
  - From the main menu, click **Administration views > Basic CICS resource administration views > Resource definitions > Transaction definitions**. This opens the **Transaction definitions** tabular view.  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - From the **Transaction definitions** tabular view, Click the Record check box beside the entry for PAY2 and click the **Install...** button.
  - Type CICSPA01 in the **Target scope value** field.
  - Click **Yes** to confirm.

The transaction definition should point to the mirror program DFHMIRS.

Repeat this step to install PAY2 in target scopes CICSPA02 and CICSPA03.

## Balancing CICS BTS activities

This example describes how to use the Web User Interface (WUI) to balance a CICS BTS-related workload.

This example uses the configuration that has been used for earlier examples. You are working in CICSplex PLXPROD1, which comprises AORs CICSPA01, CICSPA02, and CICSPA03 in CICS system group CSGTGTS1. These three systems may act as routing and target regions. In addition, it is assumed that the RLS file for the BTS process type is accessible to all CICS system in CICS system group CSGTGTS1, and that all the systems in CICS system group CSGTGTS1 are interconnected.

**Note:** You should check the system requirements before trying to dynamically route CICS BTS activities. See “Separating CICS BTS activities” on page 97 and “CICS release requirements for dynamic routing” on page 26.

1. Activate workload balancing for the systems in CSGTGTS1.
  - From the main menu, click **Administration views > Topology administration views > System definitions**. This opens the **System Definitions** tabular view.
 

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
  - Click the record check box beside the entry for CICSPA01 and click the **Update...** button.
  - Select YES from the drop-down box for both the **Workload manager status** field and in the **AOR dynamic routing mode** field . These changes takes effect when the target region CICSPA01 is next started.

Repeat this step for target regions CICSPA02 and CICSPA03.

2. Create a workload specification:
  - From the main menu, click **Administration views > Workload manager administration views > Specifications**. This opens the **WLM specifications** tabular view.
  - Click the **Create...** button, and provide the following information:

Name	WLSCBTS
Description	Routing CICS BTS activity
Primary search criterion	USERID
Default target scope	CSGTGTS1
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	QUEUE

- Click **Yes** to confirm. The **WLM specifications** tabular view is redisplayed.
- You must supply :
- A name for the specification (WLSCBTS in this example).
  - A primary search criterion value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the primary search criterion value has no effect on simple workload balancing. It is used only for some kinds of workload separation, but you have to supply a value because CICSplex SM doesn't know, at this stage, that you aren't going to use this workload specification for workload separation.
  - A default target scope value, which is the name of the single target region, or group of target regions, to which transactions can be routed. In this example, use CSGTGTS1.
  - An Algorithm Type value. For this example, use QUEUE.
3. Associate the workload specification with routing region scope CSGTGTS1.
    - Click the Record check box beside the entry for WLSCBTS and click the **Associate CICS system...** button.
    - In the **CICS system** field, type CSGTGTS1.
    - Click **Yes** to confirm. The **WLM specifications** tabular view is redisplayed.
  4. Specify the system initialization parameter DSRTPGM is set to EYU9XLOP.
 

You can do this either in the system initialization parameter of each region in the CICS system group, or by using the **CICS system definitions** view.
  5. Activate workload management:
    - From the main menu, click **CICSplex SM operations views > MASs known to CICSplex**. This opens the **MASs known to CICSplex** tabular view.



- Click on CICS system name CICSPA01 open the **MASs known to CICSplex** detailed view for CICSPA01.
- In the **Workload manager status** field, select YES from the drop-down list to start managing workloads for this CICS system.
- Click **Apply changes**.

Repeat this step to activate workload management for CICSPA02 and CICSPA03.

6. Program your BTS activities to run asynchronously.

When the routing and target regions in system group CSGTGS1 are next started, BTS activities are balanced among the target regions.

## Separating CICS BTS activities

This example describes how to use the Web User Interface (WUI) to separate a CICS BTS-related workload.

In this example, BTS activity BTSACT1 has an affinity of LIFETIME and runs under transaction ID BTS1 and process type SALES. This example uses the configuration that has been used for the example in “Balancing CICS BTS activities” on page 95. Similarly, the system initialization parameter DSRTPGM must be set to EYU9XLOP.

**Note:** You should check the system requirements before trying to dynamically route CICS BTS activities. See CICS system connectivity and “CICS release requirements for dynamic routing” on page 26.

1. Create a transaction group:
  - From the main menu, click **Administration views > Workload manager administration views > Transaction groups definitions**. This opens the **Transaction group definitions** tabular view.

If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- Click the **Create...** and provide the following information:

Name	TRGCBTS1
Description	CICS BTS transaction group
Affinity relation and lifetime checking status	ACTIVE
Primary search criterion	USERID
Affinity relationship	BAPPL
Affinity lifetime	ACTIVITY
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	QUEUE

You can ignore any fields that have been left blank.

- Click **Yes** to redisplay the **Transaction group definitions** tabular view, now showing the name of the transaction group TRGCBTS1.

Notice that the **Affinity relationship** and **Affinity lifetime** fields must be completed. These values tell CICSplex SM that the transactions in this group constitute a BTS affinity, and that this affinity lasts while those transactions are coming from the same BTS application. If one of them is initiated from a different BTS application, CICSplex SM can select a different target region. Of course, the same type of affinity will then come into play in that second target region.

2. Identify the transactions in group TRGCBTS1:

- From the **Transaction group definitions** view select the entry for TRGCBTS1 and click the **Add transaction...** to open the **Add transaction** tabular view.
  - In the **Transaction name** field, type BTS1 and click **Yes** to add the transaction to the Transaction group. The **Transaction group definition** view is redisplayed.
3. Create a workload definition:
    - From the main menu, click **Administration views > Workload manager administration views > Definitions**. This opens the **WLM definitions** tabular view.
    - Click the **Create...** button and provide the following information:

Workload management definition	WLDCBTS3
Description	Separate CICS BTS activities
Transaction group name	TRGCBTS1
BTS process type	SALES
Scope name of set of target systems	CSGTGTS1

- Click **Yes** and the **WLM definitions** tabular view is redisplayed.
- These values tell CICSplex SM that transactions in group TRGCBTS1, and of process type SALES, must go to a target region in group CSGTGTS1. CICSplex SM can select the most appropriate target region at the time the transaction is initiated.
4. Add the workload definition to the workload group:
    - In the **WLM definition** tabular view, click the Record check box beside the entry for the WLDCBTS1 and click the **Add to WLM group...** button. The **Add to WLM group** view is displayed.
    - In the **Resource group name** field, type WLGCBTS1 and click **Yes**. The **WLM definitions** tabular view is redisplayed.
  5. Add the workload group to a workload specification:
    - From the main menu, click **Administration views > Workload manager administration views > Groups**. This opens the **WLM group** tabular view.
    - In the **WLM group** view, click the Record check box beside the entry for the WLDCBTS1 and click the **Add to WLM specification...** button. The **Add to WLM specification** view is displayed.
    - In the **Specification name** field, type WLGCBTS1 and click **Yes**. The **WLM groups** tabular view is redisplayed.

## Balancing an enterprise bean workload

This example describes how to use the Web User Interface (WUI) to balance an enterprise bean workload.

In an enterprise bean environment, the TOR CICSPT01 is the listener, and the enterprise bean may run in any of the AORs, CICSAPA01, CICSAPA02, and CICSAPA03 in response to a client request. There are MRO links between the regions.

### Defining the workload management environment

- Define the CICS region environment:
  1. Set the DSRTPGM system initialization parameter in all regions to EYU9XL0P in one of the following ways:
    - In the system initialization table (see *CICS System Definition Guide*).
    - On the PARM parameter in the startup job (see *CICS System Definition Guide*).

- In the **Distributed routing program** field of the **CICS region** detailed view (see *CICSplex System Manager Operations Views Reference*).
- 2. Set the IIOPLISTENER system initialization parameter to NO in the AORs. (The default value is YES which is correct for the listener region.)
- 3. Use the **CICS system definitions** view to define the listener region (CICSPT01) and the AORs. Set the **Workload manager status** fields to YES in all regions. Set the **AOR dynamic routing mode** field to YES in the AORs. If the listener region is not an AOR, set the **AOR dynamic routing mode** field to NO. See *CICSplex System Manager Administration*.

If you are using BAS, you should include the statement:

```
MASPLTWAIT(YES)
```

in the EYUPARM file for all listener regions, to ensure that the local CICSplex SM environment is properly established at MAS initialization time. If you do not, and there are enterprise beans queued for execution when the MAS initializes, it is possible that the routing requests for the first few enterprise beans will be rejected. By including this EYUPARM statement, the CICS PLTPI processing will suspend until the critical components of the local CICSplex SM environment complete their initialization.

**Note:** You may still see the "Waiting for workload" message in the MAS message log. Assuming that your WLM definitions relating to the MAS are correct, this is not an error condition. It is reporting that execution of any queued enterprise beans is temporarily suspended until the local workload is established. When workload integration completes, the queued beans will continue to be processed automatically.

- 4. Create two CICS system groups using the **System group definitions** view. The first group (EJBCSG01 in this example) contains the listener region and the AORs. The second group (EJBCSG02) should contain only the AORs. See *CICSplex System Manager Administration*.
- Create the enterprise bean environment. See *Java Applications in CICS* for a detailed discussion of the environment needed for running enterprise beans under CICS.
  - Use CEDA or BAS to define and install the following:
    1. A TCP/IP Service definition for the IP port number, which specifies the enterprise bean request receiver CIRR as the **CICS transaction ID** (TRANSACTION) attribute. See *CICS Resource Definition Guide* for details of the CEDA definition or *CICSplex System Manager Managing Business Applications* for details of the BAS definition.
    2. A CorbaServer definition for a logical server comprising the three AORs. The TCP/IP Service name must be specified in the CorbaServer **TCP/IP service for unauthenticated protocol** (UNAUTH) attribute. See *CICS Resource Definition Guide* for details of the CEDA definition or *CICSplex System Manager Managing Business Applications* for details of the BAS definition.
    3. A transaction definition for the default request processor transaction CIRP (program DFHJIIRP). See *CICS Resource Definition Guide* for details of the CEDA definition or *CICSplex System Manager Managing Business Applications* for details of the BAS definition.
    4. A definition for the DJAR that your beans are to be deployed into. See *CICS Resource Definition Guide* for details of the CEDA definition or *CICSplex System Manager Managing Business Applications* for details of the BAS definition.
    5. Install the TCP/IP definition in the listener region and the AORs.

6. Install transaction CIRP as dynamic in the listener region.
7. Install the CorbaServer and DJAR definitions in the AORs.

- Create the workload management definitions:

If all enterprise beans are to be balanced across all available AORs, the only definition you need is a workload specification (WLMSPEC object):

1. Create the workload specification:
  - a. From the main menu, click **Administration views > Workload manager administration views > Specifications**. This opens the **WLM specifications** tabular view.
  - b. Click the **Create...** button, and provide the following information:

Workload management specification name	EJBSPEC1
Description	Balanced EJB Workload
Primary search criterion	USERID
Automatic affinity creation option	N/A
Default target scope	EJBCSG02
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	QUEUE

- c. Click **Yes** to create the workload specification.

In this definition, the **Default target scope** field specifies the group which contains AORs only (EJBCSG02). This is because all dynamic transactions are to be routed to the AORs through this **WLM specifications** view.

2. Add the workload management specification to the group of all MASs (EJBCSG01).

This is because the scope of the WLM balancing processing must cover all of the regions, the listener region for routing decisions and the AORs, so that their workloads are made visible to CICSplex SM. On the other hand, the target scope of the transactions directed by the workload management specification covers just the regions in which the routed transactions may be executed. In other words, all regions must be aware of this workload management specification, but only the group of AORs may execute the dynamic transactions routed through it.

3. You can use the **WLM specifications to system group links** view to display the system groups associated with specification EJBSPEC1:

- From the main menu, click **Administration views > Workload manager administration views**.
- From the **Workload manager administration views** menu, click **Specifications to system group links** to display the **WLM specifications to system group links** view.

When all of the MASs are started, ensure that each MAS confirms:

```
EYUNL0160I xxxxxxxx Workload registration complete
```

where xxxxxxxx is the corresponding MAS name. At that point, the workload management environment should be ready to balance the execution of enterprise beans.

### Running the enterprise bean workload balancing task

Restart the MASs and ensure that all the resources needed by each region are installed. You can use the **CorbaServers** view to monitor the CorbaServer status:

- From the main menu, click **CICS operations views > Enterprise Java component operations views**.

- From the **Enterprise Java component operations views** menu, click **CorbaServers** to display the **CorbaServers** tabular view.

You can use the **CICS-deployed JAR files** view to monitor DJAR status:

- From the main menu, click **CICS operations views > Enterprise Java component operations views**.
- From the **Enterprise Java component operations views** menu, click **CICS-deployed JAR files** to display the **CICS-deployed JAR files** tabular view.

When all the CorbaServers and their associated DJARs are INSERVICE:

- Display the **CorbaServers** tabular view.
- Select each CorbaServer in one of the AORs by clicking the Record check box beside each entry.
- Click the **Publish...** button. This causes the attributes of the CorbaServer, its associated DJARs, and the beans contained in them to be identified to the Java Naming and Directory Interface (JNDI).

On completion, the CICS routing and execution environment should be ready to run the enterprise beans.

When the initial process is run on the client, it uses the services of JNDI to identify a TCP/IP port. This port is used to pass a bean execution request to the configured listener region. The request receiver transaction CIRP is invoked within that region and issues a START request to the request processor transaction CIRP. This transaction has been redefined as dynamic and so the listener calls the DSRTPGM routing exit program to select a target region. In this case that program is EYU9XLOP, which will drive the workload balancing services of CICSplex SM to select a suitable AOR. This AOR name is returned to the routing exit in the listener, which will route the execution of CIRP to the selected AOR. Finally, the CorbaServer in the target AOR receives the request and executes the enterprise bean on behalf of the original client. The usage count value of the CIRP transaction across each of the AORs should increase with each execution of the client program. This can be verified by checking **Number of times transaction used** field for the CICSplex SM transaction ID CIRP in the **Local or dynamic transactions** view.

## Separating enterprise beans in a workload

You can use the normal workload management workload definition commands to isolate the execution of enterprise beans to specific CorbaServers in specific regions.

To do this, you must associate a bean name with a CICS transaction, so that workload management can route that transaction to a predetermined CICS region.

You also need a larger definition set than for simple enterprise bean workload balancing. As well as a workload specification to control the workload operation, you need sets of workload management definitions and transaction group definitions beneath it to implement the bean separation.

Using the workload balancing definition set described in “Balancing an enterprise bean workload” on page 98 as a starting point, add the following definitions to it:

1. Copy the definition of the CIRP transaction that you created for workload balancing under a different transaction name for each bean that you wish to be separated, in the listener and all the AORs.

For example, if you wish to separate three beans (*Alpha, Beta and Gamma*), copy the current CIRP definition three times as transactions EJB1, EJB2 and EJB3.

2. When you have completed the transaction definitions, you must define request models for each of the beans to associate the bean name with a transaction. If you specify the **Interface name** (INTERFACE) attribute as BOTH, you need define only one request model for each bean. See the *CICS Resource Definition Guide* or *CICSplex System Manager Managing Business Applications* for more details.
3. Install the TCP/IP service definition in the listener and the AORs, and the request model definitions in the listener.
4. Install the request processor transaction CIRP as dynamic in the listener region, and the CIRP clones (EJB1, EJB2 and EJB3) in the listener and the AORs.
5. Create transaction group definitions (TRANGRP objects) to isolate the CICS transactions:
  - From the main menu, click **Administration views > Workload manager administration views > Transaction group definitions**. This opens the **Transaction group definitions** tabular view.
  - Click the **Create...** button, and provide the following information:

Name	EJBTRGP1
Description	Group for Alpha Bean transid
Affinity relation and lifetime checking status	ACTIVE
Primary search criterion	USERID
Automatic affinity creation option	N/A
Acceptable level of abend probability	0
Acceptable abend load threshold	0

- Click **Yes**. The **Transaction group definitions** view is redisplayed, now showing the name of the transaction group EJBTRGP1.

Note that CICSplex SM cannot manage any logical affinities that may exist between enterprise beans, so ensure that the **Affinity relationship** field and the **Affinity lifetime** field are left blank and the **Acceptable level of abend probability** field is zero. (Any values specified here will be ignored by CICSplex SM affinity processing.) Repeat this definition for transaction groups EJBTRGP2 and EJBTRGP3.

6. Adding transaction EJB1 to group EJBTRGRP1
  - From the main menu, click **Administration views > Workload manager administration views > Transaction group definitions**. This opens the **Transaction group definitions** tabular view.
  - Select transaction group EJBTRGRP1 and click the **Add transaction...** button.
  - In the **Add transaction** view, type EJB1 in the **Transaction name** field.
  - Click **Yes** to add EJB1 to group EJBTRGRP1

Repeat this to add transaction EJB2 to group EJBTRGRP2 and transaction EJB3 to group EJBTRGRP3.

7. Create a workload definition for each of the transactions to be separated:
  - From the main menu, click **Administration views > Workload manager administration views > Definitions**. This opens the **WLM definitions** view, listing any workload definitions already created.
  - Click the **Create...** button, and provide the following information:

Workload management definition	EJBWDEF1
--------------------------------	----------

Description	Alpha Bean
Transaction group	EJBTRGP1
Scope name of set of target systems	CICSPA01

- Click **Yes** to confirm.

This definition associates the transactions in group EJBTRGP1 (in this case just the EJB1 transaction) with a specific scope (EJBTRGP1). Repeat this definition twice to separate transaction group EJBTRGP2 to MAS CICSPA02 and transaction group EJBTRGP3 to CICSPA03.

8. Create the workload management specification:
  - From the main menu, click **Administration views > Workload manager administration views > Specifications** to open the **WLM specifications** tabular view.
  - Click the **Create...** button, and provide the following information:

WLM specification name	EJBSPEC2
Description	Separated EJB Workload
Primary search criterion	USERID
Automatic affinity creation option	N/A
Default target scope	EJBCSG02
Acceptable level of abend probability	0
Acceptable abend load threshold	0
Algorithm type	QUEUE

- Click **Yes** to confirm.

9. Create a workload management group to allow the association of the workload management definitions to the workload management specification. Create a group named EJBGRP1 and add workload management definitions EJBWDEF1, EJBWDEF2, and EJBWDEF3 to it.

10. Add the new group to a WLM specification.

From the **WLM groups** view, click the record check box beside the entry for EJBGRP1 and click **Add to WLM specification** to add EJBGRP1 to the workload specification you have just defined (EJBSPEC2). You can verify the management definition hierarchy by selecting this workload management specification and clicking the **Map** button.

11. Add the workload manager specification to the system group comprising all MASs, that is, the listener and the AORs. The target scope is still the group which consists of the AOR MASs only (EJBCSG02).
  - From the main menu, click **Administration views > Workload manager administration views**.
  - From the **Workload manager administration views** menu, click **Specifications** to display the **WLM specifications** tabular view.
  - Select the entry for EJBSPEC2 and click the **Associate CICS group...** button.
  - Type into EJBCSG01 in the **CICS system group** field and click one of the options Force, Null, or None.
  - Click **Yes** to create the association between WLM specification EJBSPEC2 and CICS system group EJBCSG01.
  - From the main menu, click **Administration views > Workload management administration views > Specifications to system group**

**links** to display the **WLM specifications to system group links** view, which will confirm the association between specification EJBSPEC2 and CICS system group EJBCSG01.

12. When all of the MASs are restarted, ensure that each MAS confirms:  
EYUNL0160I xxxxxxxx Workload registration complete  
where xxxxxxxx is the corresponding MAS name. At that point, the workload management environment should be ready to separate execution of enterprise bean *Alpha* to MAS CICSPA01, *Beta* bean to MAS CICSPA02, and *Gamma* bean to MAS CICSPA03.
13. To inspect the use counts for each transaction and expect to see them incremented each time one of these beans is driven from your client:
  - From the main menu, click **Local or dynamic transactions**.
  - On the **Local or dynamic transactions** tabular view (LOCTRAN object), enter EJB\* into the Transaction ID field and click **Refresh**.. The EJB\* transactions are displayed with a count of the number of times each transaction is used.

You may, if you wish, introduce more granularity into the separation of your enterprise beans by separating them by bean method calls. Thus, for example, you can send Bean1.method1() to CICS1 and Bean1.method2() to CICS2. To do this you must define your transactions, copying the CIRP transaction definition as described earlier. For each of the methods to be separated, you need to define a request model with the **Interface type** (INTERFACE) attribute defined as REMOTE and associate one of the transactions with it. You also need a request model with **Interface type** (INTERFACE) attribute defined as either HOME or BOTH to handle calls to the local region and direct them to the appropriate AOR. Then continue with the instructions for separation of enterprise beans given earlier

## Managing a Link3270 bridge workload

These examples describe how to use the Web User Interface (WUI) to manage a Link3270 bridge workload.

In the case of Link3270 bridge requests, the client application in the requester region calls the Link3270 bridge using EXEC CICS LINK, EXCI or ECI, and passes a communication area to the bridge router program, DFHL3270, which runs in the router region. The transaction ID that is used for Link3270 bridge workload balancing is the name that is passed to DFHL3270 in the communication area and is not necessarily the same as the transaction name entered at the terminal or workstation. The target regions contain the bridge environment in which the target transaction runs. The target regions must be at CICS Transaction Server for z/OS, Version 2 Release 2 or later because earlier releases do not contain the correct Link3270 bridge environment.

When CICSplex SM is in use and the CICSplex SM routing exit, EYU9XLOP, is specified as the system initialization parameter DTRPGM parameter, DFHL3270 uses CICS distributed program linking to pass control to EYU9XLOP. The mirror program, DFHMIRS, passes the following information to EYU9XLOP in the DFHDYPDS communication area:

- A DYRTYPE value of 8, which indicates a Link3270 bridge request type
- An eight-character bridge token in the DYRBRTK field
- The transaction ID of the transaction that is to execute in the target region in the DYRTRAN field



For more information about the Link3270 bridge see the *CICS External Interfaces Guide*.

CICS distributed program linking is described in detail in the *CICS Intercommunication Guide*

### Balancing a Link3270 bridge workload

In this example CICSPT01 is the router region and the target regions are CICSPA01, CICSPA02 and CICSPA03.

1. If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.
2. Set the DTRPGM system initialization parameter to EYU9XLOP in all regions. (See *CICS System Definition Guide*.)
3. Update definitions
  - a. From the Web User Interface main menu, click **Administration views > Topology administration views > System definitions** to open the **CICS system definition** tabular view.
  - b. Select the entry for CICSPT01 and click **Update** to open a detail view of CICSPT01.
  - c. Scroll down to the **Workload manager status** field and select **YES** from the menu.
  - d. Scroll down to the **AOR dynamic routing mode** field and select **YES** from the menu .
  - e. Click **Yes** at the bottom of the view to return to the **CICS system definitions** tabular view. (See *CICSplex System Manager Administration* for a description of the CICS system definition view.)

This change takes effect when the target region CICSPA01 is next started.

Repeat this for the regions CICSPA01, CICSPA02 and CICSPA03.

4. Create a CICS system group
  - a. From the main menu click **Administration views > Topology administration views > System groups** to open the **System group definitions** tabular view.
  - b. Scroll to the bottom of the view and click **Create**, to create a system group called CSGTGTS1  
CSGTGTS1, in this example, is to contain the regions that are to act as targets. (See *CICSplex System Manager Administration* for a description of the **System group definitions** view.)

5. Add the target regions to CSGTGTS1.

6. Create a workload specification
  - a. From the main menu click **Administration views > Workload manager administration views > Specifications** to open the **WLM specifications** tabular view (WLMSPEC object).

- b. Scroll to the bottom of the view, click **Create**, and provide the following information:

**WLM specification name**

BRSPEC01

**Description**

Link3270 Bridge Workload

**Primary search criterion**

USERID

**Automatic affinity creation option**

N/A

**Default target scope**

BRITGTS1

## Algorithm type QUEUE

Leave the remaining fields empty or accept the defaults.

You must supply:

- The name of the workload specification. In this example it is called BRSPEC01.
  - A **Primary search criterion** value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the **Primary search criterion** value has no effect on simple workload balancing. It is used only for some kinds of workload separation, but you have to supply a value because CICSplex SM doesn't know, at this stage, that you aren't going to use this workload specification for workload separation.
  - A **Default target scope**, which is the name of the region or group of regions (BRITGTS1 in this example) to which work is to be routed.
  - An **Algorithm type**. This example uses QUEUE but you can specify either QUEUE or GOAL for Link3270 bridge requests.
7. Associate the workload specification with the routing region scope
- On the **WLM specifications** tabular view, select the record for BRSPEC01 and click the **Associate CICS system...** button.
  - Enter the routing region scope into the **CICS system** field and click **Yes**.

When the regions are next restarted, the workload will be balanced across the target regions. You can use the **Active workloads** view (WLMWORK object) to check that workload specification BRSPEC01 is active. You can use the **Target region in active workload** view (WLMWAOR object) to see to which target regions workloads are being routed.

## Separating a Link3270 bridge workload

This example uses the same configuration as that described in “Creating workload management definitions using the WUI” on page 50.

You can separate Link3270 bridge workloads by user ID, or transaction group. You can also separate by LU name, but only if you are overriding the NETNAME which the bridge generates automatically. You should also know that in the case of Link3270 bridge workloads the LU name is the eight-character NETNAME of the terminal running the client transaction that started the Link3270 bridge, rather than the NETNAME of the bridge facility itself. To separate by bridge facility NETNAME you must modify the EYU9WRAM module. See “Separating Link3270 bridge workloads” on page 15 for more information. CICS will route all transactions running under the same bridge facility to the same target region. You cannot force them to go to different regions.

The following example describes how to separate a bridge workload by userid and transaction group. Add the following definitions to those that you created in “Creating workload management definitions using the WUI” on page 50.

1. Creating a transaction group
  - a. From the Web User Interface main menu, click **Administration views**—>**Workload manager administration views**—>**Transaction group definitions**. This opens the **Transaction group definition** view, listing any transaction groups already defined in PLXPROD1.  
  
If the current context is not PLXPROD1, specify PLXPROD1 in the **Context** field and click **Refresh**.

- b. Scroll to the bottom of the view, click **Create**, and provide the following information:

**Transaction group name**  
TRGBRI01  
**Description**  
Link3270 bridge transaction group  
**Affinity relation and lifetime checking status**  
ACTIVE  
**Primary search criterion**  
USERID  
**Automatic affinity creation option**  
N/A

You can leave the remaining fields or accept the defaults.

- c. Click **Yes**. The **Transaction group definition** view is redisplayed, now showing the name of the transaction group TRGBRI01.

The **Affinity relationship** and **Affinity lifetime** fields must be left blank and the **Automatic affinity creation option** field set to **N/A** because CICSPlex SM does not handle affinities between Link3270 bridge transactions.

A complete description of the **Transaction group definition** view is given in Transaction group definitions - TRANGRP.

2. Identify the transactions in group TRGBRI01.
  - a. In the **Transaction group definition** view, select the entry for TRGPAY03, and click **Add transaction**.
  - b. Type the name BRI1 in the **Transaction name** field, and click **Yes** to confirm. The **Transaction group definition** is redisplayed.
3. Repeat the previous two steps for any further transactions that you wish to be routed to different regions.
4. Create a workload definition.
  - a. From the main menu, click **Administration views—>Workload manager administration views—>Definitions**. This opens the **Workload management definition** view.
  - b. Scroll to the bottom of the view, click **Create**, and provide the following information:

**Workload management definition name**  
WLDBRI01  
**Description**  
Separate Link3270 bridge activities  
**Transaction group name**  
TRGBRI01  
**Terminal LU name**  
\*  
**User ID**  
BRIUSER1  
**BTS process type**  
\*  
**Scope name of set of target systems**  
CICSPA01

- c. Click **Yes** to confirm.

These values indicate that transactions in group TRGBRI01 entered by BRIUSER1 are to be routed to CICSPA01.

A complete description of the **Workload definitions** view is given in Definitions - WLMDEF.

5. Repeat the previous step for any further transaction groups you have created for transactions that are to be routed to different regions.
6. Create a workload group.

A workload group is essential if you want a workload definition to be installed automatically when the routing region that's routing the transactions is started.

- a. From the main menu, click , **Administration views—>Workload manager administration views—>Groups**. This opens the **Workload management group** view, listing any workload groups already created in PLXPROD1.

- b. Click **Create** and type in the following:

**Workload management group name**

WLGBRI01

**Description**

Workload Group for WLDBRI01

- c. Click **Yes** to confirm. The **Workload management group** view is redisplayed.

A complete description of the **Workload management group** view is given in Groups - WLMGROUP.

7. Add the workload definition WLDBRI01 and any other workload definitions you have created to WLGBRI01:

Create a workload definition.

- a. From the main menu, click , **Administration views—>Workload manager administration views—>Definitions**. This opens the **Workload management definition** view.

- b. Select the entry for WLDBRI01, click **Add to WLM group**, and provide the following information:

**Workload management definition name**

WLDPAY01

**Description**

Link3270 bridge workload definition

**Resource group name**

WLGBRI01

- c. Click **Yes** to confirm.

- d. Repeat for any additional workload definitions that you created earlier.

8. Add workload group WLGBRI01 to workload specification BRSPEC01.

- a. From the main menu, click **Administration views—>Workload manager administration views—>Groups**. This opens the **Workload management (WLM) group** view.

- b. Select the entry for WLGBRI01, click **Add to WLM specification**, and type BRSPEC01 in the **Specification name** field.

- c. Click **Yes** to confirm.

9. Install definition into the active workload.

- a. From the main menu, click **Administration views—>Workload manager administration views—>Definitions**. This opens the **Workload management definition** view.

- b. Select the entry for WLDBRI01, click **Install** to install it into the active workload. Click **Yes** to confirm. This ensures that the workload separation definitions you have just created take effect immediately.

- c. Click **Yes** to confirm.

You can check that the workload definition is active using the **Workload definition installed in active workload** view.

**Note:** If you wish to separate by luname you must enter LUNAME in the **Primary search criterion** field of the **Transaction group definition** create view and the luname in the **Terminal LU name** field of the **Workload management definition** create view. Refer to “Separating Link3270 bridge workloads” on page 15

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page 15 for a description of the restrictions on the use of luname when separating Link3270 bridge workloads.



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## Part 4. Appendixes





## Appendix A. Copy books

This chapter contains:

- “EYURWCOM”
- “EYURWSVE” on page 121
- “EYURWTRA” on page 123

**Note:** Unless otherwise indicated, the data fields described in this chapter are read-only. Fields that are not described here are reserved for CICSplex SM; unpredictable results may occur if these fields are changed.

### EYURWCOM

**Note:** Unless otherwise indicated, the data fields described in this chapter are read-only. Fields that are not described here are reserved for CICSplex SM; unpredictable results may occur if these fields are changed.

The format of EYURWCOM is shown below:

EYURWCOM	DSECT	,	EYU9WRAM communication area
WCOM_PREFIX	DS	0CL20	EYU9WCOM prefix
WCOM_SLENGTH	DS	AL2	Structure Length
WCOM_ARROW	DS	C	&gt; delimiter
WCOM_NAME	DS	CL8	EYURWCOM
WCOM_BLANK	DS	C	Blank
WCOM_PGMNAME	DS	CL8	EYU9WRAM
WCOM_PFX_LEN	EQU	*-WCOM_PREFIX	Length of prefix
WCOM_CTYPE	DS	C	Call Type
WCOM_ERR_ROUTE	DS	C	Route Selection Error Code
WCOM_INIT_CTYPE	DS	C	Initial Call Type. This field has meaning if the WCOM_CTYPE value is WCOM_CTYPE_ERR. Its value will be the initial CTYPE value for the Transaction and will be either WCOM_CTYPE_SEL or WCOM_CTYPE_NOT
WCOM_CALLER	DS	CL1	WorkLoad Manager Caller
WCOM_REM_SYSID	DS	CL4	Default Remote SYSID
WCOM_REM_TRANID	DS	CL8	Default Remote TRANSID
WCOM_REM_APPLID	DS	CL8	Default Remote APPLID
WCOM_CALL_COUNT	DS	F	Invocation Count
WCOM_INP_BUFF	DS	A	Address of Input Buffer
WCOM_INP_BUFFL	DS	F	Length of Input Buffer
WCOM_TASK_PRIO	DS	H	Task Priority
WCOM_SCLASS	DS	XL4	Task Service Class
WCOM_DYRTYPE	DS	CL1	Request type
WCOM_DYRLPROG	DS	CL8	DPL Program name
WCOM_WORK_AREA	DS	A	Address of WRAM program workarea
WCOM_WORK_LNTH	DS	F	Length of Task Work Area
WCOM_STATUS	DS	C	CPSM Status
WCOM_TERM_TYPE	DS	C	Terminal Type flag
WCOM_FILL3	DS	CL2	Reserved
WCOM_DA_TOKEN	DS	XL4	API Token Value
WCOM_RET_RESP	DS	F	EYU9WRAM result indicator
WCOM_ERR_APPLID	DS	CL8	APPLID of the last selected AOR if the WCOM_CTYPE indicator is set to WCOM_CTYPE_ERR

WCOM_ERR_SYSID	DS	CL4	SYSID of the last selected AOR if the WCOM_CTYPE indicator is set to WCOM_CTYPE_ERR
WCOM_TRANSID	DS	CL8	Transaction Identifier
WCOM_USERID	DS	CL8	USERID
WCOM_LUNAME	DS	CL17	LUNAME (NETID.NETNAME) blank pad
WCOM_FILL4	DS	CL3	Reserved
WCOM_API_RESP	DS	F	API RESPONSE Code
WCOM_API_REASON	DS	F	API REASON Code
WCOM_SCOP_VECT	DS	A	Address of SCOP_VECT
WCOM_SCOP_CNT	DS	F	Count of elements in SCOP_VECT
WCOM_SEL_AOR	DS	CL8	APPLID of SM_BALANCE AOR
WCOM_SEL_SYSID	DS	CL4	SYSID of SM_BALANCE AOR and the SM_ROUTE selected target region
WCOM_AFF_STAT	DS	C	Affinity Status
WCOM_DTRTRAN_IND	DS	CL1	DTRTRAN indicator
WCOM_DTRREJ_IND	DS	CL1	DTRTRAN Reject Indicator
WCOM_AFFAOR_STAT	DS	CL1	Affinity AOR status. Defined if Affinity is active
WCOM_AFF_TYPE	DS	CL1	Transaction Group affinity type
WCOM_AFF_LIFE	DS	CL1	Transaction Group affinity life
WCOM_AFF_AUTO	DS	CL1	WLM Automatic affinity create status
WCOM_FILL5	DS	CL1	Reserved
WCOM_WORK_NAME	DS	CL8	WorkLoad Name
WCOM_TGRP_NAME	DS	CL8	Transaction Group name
WCOM_EVENT_NAME	DS	CL8	Event Name defined in the Trangroup for this transaction (Blanks if none)
WCOM_COMMAREA	DS	A	Address of Transaction Commarea
WCOM_COMMAREAL	DS	F	Length of Transaction Commarea
WCOM_PROCESS_NAME	DS	CL36	CICS BTS process name
WCOM_PROCESS_TYPE	DS	CL8	CICS BTS process type
WCOM_PROCESS_ID	DS	CL52	CICS BTS process id
WCOM_ACTIVITY_ID	DS	CL52	CICS BTS activity id
WCOM_ACTIVITY_NAME	DS	CL16	CICS BTS activity name
WCOM_PROCESS_COMP	DS	CL1	CICS BTS process completing
WCOM_ACTIVITY_COMP	DS	CL1	CICS BTS activity completing
WCOM_LENGTH	EQU	*-EYURWCOM	Length of structure

The EYURWCOM communication area fields are:

#### **WCOM\_ACTIVITY\_COMP**

Specifies whether or not the CICS BTS activity is completing.

**0** The activity is not completing.

**1** The activity is completing.

#### **WCOM\_ACTIVITY\_ID**

Specifies the CICS BTS activity id.

#### **WCOM\_ACTIVITY\_NAME**

Specifies the CICS BTS activity name.

#### **WCOM\_AFFAOR\_STAT**

Specifies the status of the affinity target region. This field contains a value only if WCOM\_AFF\_STAT is set to C (committed) or A (active).

**0** The target region is active.

**1** The target region is not active.

**2** The target region is active, but was shutdown and restarted since the affinity was created.

- 3 The target region is active, but the link between the TOR and target region is not available.

#### **WCOM\_AFF\_AUTO**

Specifies, as a 1-byte data-value, whether CICSplex SM creates an affinity during SM\_BALANCE.

- 0 CICSplex SM does not automatically create an affinity during SM\_BALANCE.
- 1 CICSplex SM automatically creates an affinity during SM\_BALANCE.
- 2 No affinity is defined for the transaction group.

#### **WCOM\_AFF\_LIFE**

Specifies, as a 1-byte data-value, the affinity lifetime.

- 0 No affinity is defined.
- 1 PCONV (pseudoconversational).
- 2 SIGNON.
- 3 LOGON.
- 4 SYSTEM.
- 5 PERMANENT.
- 6 DELIMIT.
- 7 ACTIVITY.
- 8 PROCESS.

This field corresponds to the Affinity Lifetime field on the Create WLM Specification panel. Refer to page Creating a WLMSPEC specification for a description of each value.

#### **WCOM\_AFF\_STAT**

Specifies, as a 1-byte data-value, whether an affinity relationship exists.

- blank** (Unknown) The affinity cannot be determined at this time.
- U** (Undefined) No affinity is defined.
- C** (Committed) An affinity is active and will be selected by SM\_BALANCE. The affinity cannot be deleted using SM\_DELAFF (it has a lifetime of SYSTEM or PERMANENT).
- D** (Defined) An affinity is defined and will become active on the next SM\_BALANCE call, provided that the workload specification is defined with Create Affinity YES for the transaction group. Alternatively, you can use the SM\_CREAFF function to create the affinity.
- A** (Active) An affinity is active and can be deleted using SM\_DELAFF.

#### **WCOM\_AFF\_TYPE**

Specifies the type of affinity. This field corresponds to the Affinity Relation field on the Create WLM Specification panel. Refer to page Creating a WLMSPEC specification for a detailed description of each value.

- 0 No affinity is defined for this transaction group.
- 1 GLOBAL.

- 2 USERID.
- 3 LUNAME.
- 4 BAPPL.

**WCOM\_API\_REASON**

Specifies the dynamic routing API reason code. The copybook EYURWCOD contains a list of all available reason codes.

**WCOM\_API\_RESP**

Specifies the dynamic routing API response code.

- 0 Normal response.
- 1 Invalid request. Check the reason.
- 2 Parameter error. Check the reason.
- 3 SM\_ROUTE warning. Check the reason.
- 4 Reserved for SM\_ROUTE error.
- 5 SM\_SCOPE warning. Check the reason.
- 6 Reserved for SM\_SCOPE error.
- 7 SM\_BALANCE warning. Check the reason.
- 8 Reserved for SM\_BALANCE error.
- 9 Disaster.
- 10 SM\_CREAFF warning. Check the reason.
- 11 Reserved for SM\_CREAFF error.
- 12 Reserved for SM\_DELAFF warning.
- 13 Reserved for SM\_DELAFF error.

**WCOM\_ARROW**

Specifies, as a 1-byte data-value, a constant of >.

**WCOM\_BLANK**

Specifies, as a 1-byte data-value, a blank.

**WCOM\_BRIDGE\_TOKEN**

Specifies, as an 8-character data-value, the bridge facility token.

**WCOM\_BUFFL**

Specifies the length of the input buffer.

**WCOM\_CALL\_COUNT**

Specifies the number of times EYU0WDTR has been invoked for a single transaction. This value is useful in determining when to stop trying to route a transaction or program to a specific target region.

**WCOM\_CALLER**

Specifies the Workload Manager Caller identifier, which may be one of the following:

- 0 CICS/ESA Relay Program
- 1 External Service Program
- 2 Scheduler Services

**WCOM\_COMMAREA**

For CICS/ESA 4.1 and later, provides the address of the transaction communication area. This field is zero for transactions routed by Scheduler Services.

**WCOM\_COMMAREAL**

For CICS/ESA 4.1 and later, provides the length of the transaction communication area. This field is zero for transactions routed by Scheduler Services.

**WCOM\_CTYPE**

Specifies, as a 1-byte data-value, the type of call, which can be:

- 0 Route selection.
- 1 Route error.
- 2 Route termination.
- 3 Route abend.
- 4 (Available with CICS/ESA 4.1 and later.) Route notification. Occurs when a transaction is either ATI or is defined as static.
- 5 Route initiate (occurs only when the caller is Scheduler Services).
- 6 Route complete (occurs only when the caller is Scheduler Services).

**WCOM\_DA\_TOKEN**

Identifies the dynamic routing API token value.

**WCOM\_DTRREJ\_IND**

Specifies, for a dynamically routed transaction, whether or not the transaction should be rejected. This indicator may be set by the EYU9WRAM module.

- 0 The transaction should not be rejected (the default).
- 1 The transaction should be rejected.

**WCOM\_DTRTRAN\_IND**

Specifies whether or not the transaction can be dynamically routed:

- 0 The transaction cannot be dynamically routed.
- 1 The transaction can be dynamically routed.

**WCOM\_DYRLPROG**

Specifies an 8-byte data-value. For Dynamic Program Link, this field contains the name of the program to be executed. For Dynamic Transaction Routing, this field contains the name of an alternate program to be loaded if the transaction executes in the local region. For User Service Calls, the value will be returned in the User Service Program Commarea (EYURWTRA) field WTRA\_DYRLPROG. This field may be modified, but the modified value will be ignored unless WCOM\_CTYPE equals 0 (Route Selection) or 1 (Route Error).

**WCOM\_DYRTYPE**

Specifies the type of routing request:

- 0 For routing a transaction from a terminal.
- 1 For notification that an ATI request is to be statically routed.

- 2 For routing a transaction initiated by an EXEC CICS START command, where there is no data associated with the START.
- 3 For routing a transaction initiated by an EXEC CICS START command, where there is data associated with the START.
- 4 For routing, notification, or termination of a program-link request.
- 5 For routing a CICS BTS request.
- 6 For routing a non-terminal START request.
- 7 For routing of an IIOF request.
- 8 Link3270 bridge requests.
- 9 For routing, notification, or termination of a program-link request, where there is a channel associated with the program-link.
- A For routing a transaction initiated by an EXEC CICS START command, where there is a channel associated with the START.
- B For routing a non-terminal START command, where there is a channel associated with the START.

**WCOM\_ERR\_APPLID**

Identifies the APPLID of the last selected target region when the WCOM\_CTYPE indicator contains a 1 (for route error).

**WCOM\_ERR\_ROUTE**

Specifies, as a 1-byte data-value, the route selection error code.

- 0 The selected sysid is unknown.
- 1 The selected sysid is not in service.
- 2 The selected system is in service, but no sessions are available.
- 3 The allocate request has timed out.
- 4 A queue of allocate requests has been purged.
- 5 Dynamically routed START commands are not supported in the target region
- 6 The EXEC CICS LINK command returned LENGERR.
- 7 The EXEC CICS LINK command returned PGMIDERR.
- 8 The EXEC CICS LINK command returned INVREQ.
- 9 The EXEC CICS LINK command returned NOTAUTH.
- A The EXEC CICS LINK command returned TERMERR.
- B The EXEC CICS LINK command returned ROLLBACK.
- C The non-terminal initiated START returned TRANSIDERR.
- D The non-terminal initiated START returned IOERR.
- E The non-terminal initiated START returned USERIDERR.
- F The non-terminal initiated START or EXEC CICS LINK command failed because the RESUNAVAIL (Resource Unavailable) condition was raised by the XICERES or XPCERES CICS Global User Exits.

**WCOM\_ERR\_SYSID**

Identifies the SYSID of the last selected target region when the WCOM\_CTYPE indicator contains a 1 (for route error).

**WCOM\_EVENT\_NAME**

Specifies, as an 8-byte data-value, the event name, if any, defined for the transaction group to which the transaction is associated.

**WCOM\_INIT\_CTYPE**

Specifies, as a 1-byte data-value, the initial route selection function if a route error occurs; that is, if the WCOM\_CTYPE field value is 1. The value is one of the following:

- 0 Route selection.
- 4 Route notification.

**WCOM\_INP\_BUFF**

Specifies the address of the input buffer, which contains the data entered with the transaction. The data may be in lowercase or mixed case, unless UCTRAN(YES) is specified on the TYPETERM definition.

For APPC transaction routing, the first 4 bytes of the buffer contain a value that reflects the total length of all the data sent; followed by some or all of the data itself. Note that, depending on the size of the initial TIOA, the buffer may not be big enough to contain all the data.

For non-APPC transaction routing, the buffer contains TIOA terminal data.

**WCOM\_LUNAME**

Identifies the 8-byte logical unit name, preceded by a period (.luname).

Depending on how EYU9XLOP is called, the LUNAME is set from:

- EXEC CICS ASSIGN NETNAME, when called from the CICS relay program
- WTRA\_LUNAME, when called from a user-written dynamic routing program (as described in Chapter 5, "Requesting additional dynamic routing support," on page 37).

**WCOM\_NAME**

Specifies, as an 8-byte data-value, a constant of EYURWCOM.

**WCOM\_PFX\_LEN**

Specifies the length of the prefix area.

**WCOM\_PGMNAME**

Specifies, as an 8-byte data-value, the name of your program.

**WCOM\_PREFIX**

Specifies the start of a 20-character prefix area.

**WCOM\_PROCESS\_COMP**

Specifies whether or not the CICS BTS process is completing.

- 0 The process is not completing.
- 1 The process is completing.

**WCOM\_PROCESS\_ID**

Specifies the BTS process id.

**WCOM\_PROCESS\_NAME**

Specifies the BTS process name.

**WCOM\_PROCESS\_TYPE**

Specifies the BTS process type.

**WCOM\_REM\_APPLID**

Specifies the remote application identifier.

**WCOM\_REM\_SYSID**

Specifies the name of the remote system to which the transaction is to be routed.

**WCOM\_REM\_TRANID**

Specifies the remote transaction identifier.

Depending on how EYU9XL0P is called, this transaction ID is set from:

- DYRTRAN in DFHDYPDS, when called from the CICS relay program
- WTRA\_TRANID, when called from a user-written dynamic routing program (as described in Chapter 5, "Requesting additional dynamic routing support," on page 37).

For DPL, WCOM\_REM\_TRANID may be set by EYU9WRAM before the SM\_SCOPE call. In this way, you can modify the transaction identifier under which the DPL runs in the target system.

**WCOM\_RET\_RESP**

Identifies the response. You can set the contents of this field to one of the following values:

- 0 Successful.
- 1 Message issued.
- 2 Abort.

**WCOM\_SCLASS**

Specifies the task service class

**WCOM\_SCOP\_CNT**

Specifies the number of elements in SCOP\_VECT that are available targets.

**WCOM\_SCOP\_VECT**

Specifies the address of SCOP\_VECT.

**WCOM\_SEL\_AOR**

Specifies the APPLID of the target region that was returned by SM\_BALANCE or that you set for SM\_ROUTE.

**WCOM\_SEL\_SYSID**

Specifies the SYSID of the target region that was returned by SM\_BALANCE or that you set for SM\_ROUTE.

**WCOM\_SLENGTH**

Specifies, as a halfword binary data-value, the length of the EYURWTRA communication area.

**WCOM\_STATUS**

Specifies, as a 1-byte data-value, the status of CICSplex SM.

- 0 CICSplex SM services are available.
- 1 CICSplex SM services are not available.

**WCOM\_TASK\_PRI0**

Specifies the task priority.

**WCOM\_TERM\_TYPE**

Specifies, as a 1-byte data-value, the type of terminal that started the transaction occurrence.

- 0 LU2.



- 1 LU6.
- 2 Logical unit type is unknown.
- 3 Transaction has no terminal.

#### WCOM\_TGRP\_NAME

Specifies, as an 8-byte data-value, the name of the transaction group for this transaction.

#### WCOM\_TRANSID

Specifies, as an 8-byte data-value, the local transaction identifier.

Depending on how EYU9XLOP is called, this transaction ID is set from:

- EIBTRNID in DFHDYPDS, when called from the CICS relay program
- WTRA\_TRANID, when called from a user-written dynamic routing program (as described in Chapter 5, “Requesting additional dynamic routing support,” on page 37).

#### WCOM\_USERID

Specifies, as an 8-byte data-value, the user identifier.

#### WCOM\_WORK\_AREA

Specifies the address of the EYU9WRAM program work area.

#### WCOM\_WORK\_LNTH

Specifies the length of the task work area.

#### WCOM\_WORK\_NAME

Specifies, as an 8-byte data-value, the name of the workload specification for this transaction.

## EYURWSVE

**Note:** Unless otherwise indicated, the data fields described in this chapter are read-only. Fields that are not described here are reserved for CICSplex SM; unpredictable results may occur if these fields are changed.

The element description area, EYURWSVE, contains information about the individual target regions associated with the list of candidate target regions returned by SM\_SCOPE.

The format of the SCOP\_VECT element description area is shown below.

EYURWSVE	DSECT	,	Define a SCOP_VECT element
WSVE_TOKEN	DS	D	Target region TOKEN
WSVE_APPLID	DS	CL8	Target region APPLID
WSVE_LOAD_CNT	DS	F	Target region Load Count
WSVE_RTERR_IND	DS	CL1	Route Error indicator
WSVE_FILL0	DS	CL2	Reserved
WSVE_SEL_IND	DS	CL1	Target region Selectable Indicator
WSVE_WEIGHT	DS	D	Target region Weight
WSVE_SYSID	DS	CL4	Target region SYSID
WSVE_IGNORE	DS	C	IGNORE Indicator
WSVE_STAT_WSVE	DS	C	Scope Vector entry status
WSVE_AOR_STATE	DS	C	AOR State
WSVE_FILL1	DS	C	Reserved
WSVE_HLTH_IND	DS	0CL12	HEALTH indicators
WSVE_HLTH_SOS	DS	C	Short on Storage indicator
WSVE_HLTH_MAXT	DS	C	Maxtask Indicator
WSVE_HLTH_STALL	DS	C	Stall Indicator
WSVE_HLTH_DUMP	DS	C	DUMP Indicator

WSVE_LINK_STAT	DS	C	Communications LINK indicator
WSVE_EVENT_SEV	DS	C	Target region severity indicator for the event specified in the Transaction Group for which the Transaction is defined.
WSVE_RELID	DS	0CL4	Target region release level
WSVE_RELID_TYPE	DS	CL1	Target region release type
WSVE_RELID_VERS	DS	CL3	Target region release version
WSVE_FILL2	DS	CL2	Reserved
WSVE_FILL3	DS	F	Reserved
WSVE_LENGTH	EQU	*-EYURWSVE	Length Of SCOP_VECT element

The information provided for each target region is:

#### **WSVE\_AOR\_STATE**

Identifies the current condition of the target region.

- 0** The target region has been quiesced (as a result of a SET QUIESCE action on the WLMAWAOR view). The target region has no outstanding transaction affinity relationships and is not accepting any additional work.
- 1** The target region is active and accepting work.
- 2** The target region is not active.
- 3** The target region is quiescing (as a result of a SET QUIESCE action on the WLMAWAOR view). Only transactions that are bound by outstanding affinity relationships can be routed to this target region. Such transactions can be routed to the target region only until the end of the affinity lifetime.
- 4** The target region state is unknown.

#### **WSVE\_APPLID**

Specifies the APPLID of the target region. Unpredictable results may occur if you modify the contents of this field.

#### **WSVE\_EVENT\_SEV**

Specifies target region severity for the event specified for the transaction group to which the transaction is associated.

- 0** Very low severe.
- 1** Low severe.
- 2** Low warning.
- 3** Normal.
- 4** High warning.
- 5** High severe.
- 6** Very high severe.
- N** No event is defined for the transaction group.

#### **WSVE\_HLTH\_SOS**

Specifies whether the target region is short on storage.

- 0** The target region is not short on storage.
- 1** The target region is short on storage.
- 2** The target region state is unknown.

**WSVE\_HLTH\_MAXT**

Specifies whether the target region has reached the maximum number of tasks.

- 0 The target region has not reached its maxtask level.
- 1 The target region has reached its maxtask level.
- 2 The target region state is unknown.

**WSVE\_HLTH\_STALL**

Specifies whether the target region is active but not doing any application work.

- 0 The target region is active but not doing any application work.
- 1 The target region is active and is doing application work.
- 2 The target region state is unknown.

**WSVE\_HLTH\_DUMP**

Specifies whether the target region is currently processing a transaction or system dump.

- 0 The target region is processing a dump.
- 1 The target region is not processing a dump.
- 2 The target region state is unknown.

**WSVE\_IGNORE**

Specifies whether this target region can be used by SM\_BALANCE. You can set the contents of this field to one of the following values:

- 0 The entry is valid for SM\_BALANCE.
- 1 The entry should be ignored for SM\_BALANCE.

**WSVE\_LINK\_STAT**

Specifies the condition of the communications link between the requesting region and target region.

- 0 The link is active.
- 1 The link is not active.
- 2 The link is not defined.

**WSVE\_STAT\_WSVE**

Identifies the scope vector entry status.

- 0 The entry is valid for use.
- 1 Only the APPLID field is valid.
- 2 Only the SYSID field is valid.

**WSVE\_SYSID**

Specifies the SYSID of the target region. Unpredictable results may occur if you modify the contents of this field.

**EYURWTRA**

The format of EYURWTRA is shown below.

EYURWTRA	DSECT	,	Workload MGR DR COMM area
WTRA_PREFIX	DS	0CL20	WTRA prefix I
WTRA_SLENGTH	DS	AL2	Structure Length

WTRA_ARROW	DS	C	> delimiter
WTRA_NAME	DS	CL8	EYURWTRA
WTRA_BLANK	DS	C	Blanks
WTRA_PGMNAME	DS	CL8	name of calling service pgm.
WTRA_PFX_LEN	EQU	*-WTRA_PREFIX	Length of prefix
WTRA_FUNC	DS	C	Function ID I
WTRA_DYRTYPE	DS	C	Request type I
WTRA_DYRLPROG	DS	CL8	DPL program name IO
WTRA_ERR	DS	C	Error type if Route Error I
WTRA_OPTER	DS	C	Call Back Option. 0
	DS	C	Reserved.
WTRA_RESPONSE	DS	F	Response 0
*			0 = Normal
*			8 = ABORT
WTRA_BUFFADDR	DS	F	Address of input buffer I
WTRA_BUFFLNTH	DS	F	Length of input buffer I
WTRA_TRANID	DS	CL8	Transaction Identifier IO
WTRA_USERID	DS	CL8	USERID I
WTRA_TERMID	DS	CL4	Principal Facility ID I - normally obtained from EIBTRMID
WTRA_APPLID	DS	CL8	APPLID of default/ selected target region IO
WTRA_SYSID	DS	CL4	SYSID of default/ selected target region IO
WTRA_LUNAME	DS	CL17	LUNAME to use
	DS	CL3	Reserved
WTRA_NEXTTRAN	DS	CL8	The Identifier of the I Transaction which will be executed after the current one completes. This should be set prior to calling using the Route Termination Function.
WTRA_API_RESP	DS	F	Last API RESPONSE to WRAM 0
WTRA_API_REAS	DS	F	Last API REASON to WRAM 0
WTRA_COMMAREA	DS	A	COMMAREA address (0 if none) I
WTRA_COMMAREAL	DS	F	COMMAREA length (0 if none) I
	DS	XL16	Reserved.
WTRA_USERAREA	DS	CL128	128 byte user area RESERVED for IO use by EYU9XLOP.
WTRA_LENGTH	EQU	*-EYURWTRA	Length of communication area

**Note:** **I** indicates that a field is used for input, **O** indicates that a field is used for output, and **IO** indicates the field can be used for input and output. Fields that are not described here are reserved for CICSplex SM; unpredictable results may occur if these fields are changed.

#### WTRA\_API\_REAS

Specifies a value of zero (0).

#### Note:

1. The WTRA\_TRANID, WTRA\_USERID, and WTRA\_LUNAME fields are used by CICSplex SM workload management to identify an appropriate transaction group and target scope list for the unit of work. The scope list identifies the set of target regions to which the unit of work can be routed. These fields (TRANID, USERID, and LUNAME) are passed to the CICSplex SM workload management routing action module (EYU9WRAM) along with an indication that the caller is an external program. The default route action processing does not make use of the fields, but a customized version of EYU9WRAM may.
2. If the transaction group identified for the unit of work defines an affinity, the values in the WTRA\_USERID, WTRA\_TERMID, and

WTRA\_LUNAME fields may appear as part of an affinity key on the WLMATAFF view. For this reason, you may want to specify values that are readable on a display terminal.

OR

Specifies, as a fullword binary data-value, the last reason code returned to the EYU9WRAM routing action process. You should inspect this field when the WTRA\_RESPONSE field does not contain a return code of zero (0). This field, in conjunction with the WTRA\_API\_RESP field, describes why the function failed.

**WTRA\_API\_RESP**

Specifies a value of zero (0).

OR

Specifies, as a fullword binary data-area, the last response code returned to the EYU9WRAM routing action process. You should inspect this field when the WTRA\_RESPONSE field does not contain a return code of zero (0). This field, in conjunction with the WTRA\_API\_REAS field, describes why the function failed.

**WTRA\_APPLID**

Specifies, as an 8-byte data-value, the application ID of the selected target region, provided that the WTRA\_RESPONSE field contains a return code of zero (0).

**WTRA\_ARROW**

Specifies, as a one-byte data-value, a constant of >. This field must be set before calling EYU9XLOP,

**WTRA\_BLANK**

Specifies, as a one-byte data-value, a blank space. This field must be set before calling EYU9XLOP,

**WTRA\_BRIDGE\_TOKEN**

Specifies, as an 8-character data-value, the bridge facility token.

**WTRA\_BUFFADDR**

Specifies, as a fullword binary data-value, the address of the buffer to be passed to the starting transaction.

**WTRA\_BUFFLNTH**

Specifies, as a fullword binary data-value, the length of the buffer to be passed to the starting transaction.

**WTRA\_DYRLPROG**

Specifies, as an 8-character data-value, the name of the DPL program.

**WTRA\_DYRTYPE**

This field, which must be set before calling EYU9XLOP, specifies, as a 1-byte data-value, the request type:

- 0 The request type is dynamic transaction routing.
- 1 The request type is Notify,
- 2 The request type is a dynamic START command.
- 3 The request type is a dynamic START command with data.
- 4 The request type is a dynamic program link.
- 5 The request type is CICS BTS request routing.

- 6 The request type is a non-terminal START command.
- 7 The request type is an IIO request.
- 8 Link3270 bridge requests
- 9 The request type is a dynamic program link with channel.
- A The request type is a dynamic START command with channel.
- B The request type is a non-terminal START command with channel.

#### **WTRA\_ERR**

Specifies, as a one-byte data-value, the reason for the error. This field is valid when the WTRA\_FUNC field indicates a routing error (1). This field may be one of the following:

- 0 The selected sysid is unknown.
- 1 The selected sysid is not in service.
- 2 The selected system is in service, but no sessions are available.
- 3 The allocate sessions request was rejected.
- 4 A queue of allocate requests has been purged.
- 5 The selected system does not support this function.
- 6 The EXEC CICS LINK command returned LENGERR.
- 7 The EXEC CICS LINK command returned PGMIDERR.
- 8 The EXEC CICS LINK command returned INVREQ.
- 9 The EXEC CICS LINK command returned NOTAUTH.
- A The EXEC CICS LINK command returned TERMERR.

#### **WTRA\_FUNC**

Specifies, as a one-byte data-value, the routing function, which identifies the reason CICSplex SM workload management is being invoked. This field may be one of the following:

- 0 For route selection.
- 1 When an error occurs in route selection or a previous route error.
- 2 For route termination.
- 3 To notify CICSplex SM workload management that the transaction should be routed to the named APPLID.
- 4 To notify CICSplex SM workload management that the routed transaction abended.

#### **WTRA\_LUNAME**

Specifies a logical unit name that CICSplex SM workload management should use to classify the unit of work. This LUNAME might also be used to construct workload affinities.

An LUNAME usually consists of a period (.) followed by the netname of the terminal from which the transaction was initiated. Since there may be no terminal associated with the transaction that is invoking CICSplex SM workload management (or if there is, it may not be one you want to use), you can initialize this field with any string of characters. Be careful,

however, not to include a question mark (?), plus sign (+), or asterisk (\*) in the string; these characters indicate a generic name, which is not supported.

**WTRA\_NAME**

Specifies, as an 8-byte data-value, a constant of EYURWTRA.

**WTRA\_NEXTTRAN**

Specifies, as an 8-byte data-value, the name of a transaction to be invoked after the current transaction is complete. If there is no next transaction, set the field to all blanks.

**WTRA\_OPTER**

Specifies, as a one-byte data-value, the call back option, as one of the following:

- 0 Call CICSplex SM workload management back with a route termination function (WTRA\_FUNCTRM).
- 1 Do not call CICSplex SM workload management back with a route termination function.

**WTRA\_PREFIX**

Specifies the start of a 20-character prefix area.

**WTRA\_PFX\_LEN**

Specifies the length of the prefix area.

**WTRA\_PGMNAME**

Specifies, as an 8-byte data-value, the name of the program invoking EYU9XLOP.

**WTRA\_RESPONSE**

Specifies, as a fullword binary data-value, the return code, as one of the following:

- 0 Continue processing.
- 8 Terminate processing.

**WTRA\_SLENGTH**

Specifies, as a halfword binary data-value, the length of the EYURWTRA communication area. This field must be set before calling EYU9XLOP,

**WTRA\_SYSID**

Specifies the system ID of the CICS system that will serve as the default target region.

OR

Specifies, as a 1-byte data-value, the system ID of the selected target region, provided that the WTRA\_RESPONSE field contains a return code of zero (0).

**WTRA\_TERMID**

Specifies a terminal ID that can be used to construct workload affinities. This terminal ID need not be defined to CICS.

This field usually contains the CICS facility ID. Since this may not be appropriate for your use, you should initialize the field to your own value.

**WTRA\_TRANID**

Specifies, as a 4-byte data-ref, a transaction ID that CICSplex SM workload management should use to classify the unit of work. This transaction ID need not be defined to CICS.

**WTRA\_USERID**

Specifies a user ID that CICSplex SM workload management should use to classify the unit of work. This user ID might also be used to construct workload affinities. It need not be defined to CICS.

For a list of the possible response and reason code values that can be returned in WTRA\_API\_RESP and WTRA\_API\_REAS, refer to the assembler copy book member EYURWCOD.



## Appendix B. Sample programs

This chapter contains sample programs.

### Sample calling sequence

The code example below illustrates a sample calling sequence for a program that will access CICSplex SM workload management facilities. It is not intended to be used as a sample program and is, therefore, not complete in every detail.

```
*-----*
          DFHEISTG ,           Define Workarea
WRK_WTRA  DS  CL(WTRA_LENGTH)
          DS  0D
WRK_UOWCOMM DS  0C
WRK_UOW_RESP DS  F
WRK_UOWCOMM_L EQU *-WRK_UOWCOMM
          COPY EYURWTRA           Include DSECT to map WTRA
SRVPGM   DFHEIENT EIBREG=R11,DATAREG=R13,CODEREG=R12

*-----*
* Initialize the WTRA COMMAREA.
*-----*
          LA  R8,WRK_WTRA           --> WTRA
          USING EYURWTRA,R8         *** USING WTRA ***
          MVC WTRA_SLENGTH,=AL2(WTRA_LENGTH)
                                     Set length of block.
          MVI WTRA_ARROW,C'>'      Set arrow.
          MVC WTRA_NAME,=C'EYURWTRA' Set the name.
          MVI WTRA_BLANK,C' '      Set blank delimit.
          MVC WTRA_PGMNAME,=CL8'SRVPGM '
                                     Set program name.
          MVC WTRA_TERMID,=CL4'TRM1' Set TermID.
          MVC WTRA_USERID,=CL8'USR1' Set USERID.
          MVC WTRA_LUNAME(8),=CL8'.NET1'
                                     Set LUNAME.
          MVC WTRA_TRANID,=CL8'TRN1' Set TRANID.
          MVC WTRA_SYSID,=C'SYS1'  Set SYSID.
          MVC WTRA_APPLID,=C'APPLID1' Set Applid.
          MVI WTRA_FUNC,WTRA_FUNCSEL Set the Route Select Function.
          MVI WTRA_DYRTYPE,WTRA_DYRTYPE_DYN

*-----*
* Invoke the WLM MAS Agent for Route Select.
*-----*
ROUTE_SELECT DS  0H
          BAS  R5,LINK WLM           Go do it.
          CLC  WTRA_RESPONSE,=F'0'   Call go OK?
          BNE  CHECK_OPTER           ..no.
          BAS  R5,START_UOW          Go Start the UOW.
          LTR  R15,R15               Work Completed?
          BZ   ROUTE_TERM            ..yes.
          BP  ROUTE_ABND             UOW gave non zero return code.
          C   R15,=F'-4'            SYSID error?
          BNE  ROUTE_ABND           ..no.

*-----*
* Invoke the WLM MAS Agent for Route Error.
*-----*
ROUTE_ERROR  DS  0H
          MVI  WTRA_FUNC,WTRA_FUNCERR Set the Termination Function.
          MVI  WTRA_ERR,WTRA_ERRROUT Say out of service.
          B    ROUTE_SELECT         Go Get another system.

*-----*
```

```

* Invoke the WLM MAS Agent for Route Abend.                                     *
*-----*
ROUTE_ABND      DS  0H
                MVI  WTRA_FUNC,WTRA_FUNCABD  Set the Abend function.
                BAS  R5,LINK_WLM             Go terminate.
                CLC  WTRA_RESPONSE,=F'0'     OK?
                BE   EXIT_ABD                 ..yes.
CHECK_OPTER     DS  0H
                CLI  WTRA_OPTER,WTRA_CALLYES Call WLM for Term?
                BNE  WLM_CALLERR             ..no.

*-----*
* Invoke the WLM MAS Agent for Route Termination                             *
*-----*
ROUTE_TERM      DS  0H
                MVI  WTRA_FUNC,WTRA_FUNCTRM  Set the Termination Function.
                MVC  WTRA_NEXTTRAN,=CL8'TRN2' X
                BAS  R5,LINK_WLM             Set the next TRANID.
                CLC  WTRA_RESPONSE,=F'0'     Go terminate.
                BE   EXIT_TERMOK            OK?
                BE   EXIT_TERMOK            ..yes.

*-----*
* The WLM MAS AGENT returned an 8 in WTRA_RESPONSE                         *
*-----*
WLM_CALLERR     DS  0H

*-----*
* Process completed successfully                                           *
*-----*
EXIT_TERMOK     DS  0H

*-----*
* Route Abend Call returned a 0                                           *
*-----*
EXIT_ABD        DS  0H
EXIT            DS  0H
                EXEC CICS RETURN

*-----*
* LINK_WLM      : Link to the WLM MAS AGENT                               *
*-----*
LINK_WLM        DS  0H
                EXEC CICS LINK PROGRAM(EYU9XLOP) X
                COMMAREA(EYURWTRA) LENGTH(=AL2(WTRA_LENGTH)) X
                BR   R5                      Exit routine.

*-----*
* START_UOW     : Start the Unit Work.                                     *
*-----*
START_UOW       DS  0H
                EXEC CICS LINK PROGRAM(UOWPGM) X
                COMMAREA(WRK_UOWCOMM) LENGTH(=AL2(WRK_UOWCOMM_L)) X
                SYSID(WTRA_SYSID) X
                RESP(WRK_EIBRESP)
                CLC  WRK_EIBRESP,DFHRESP(NORMAL) X
                BE   START_UOWL              Did call go ok?
                BE   START_UOWL              ..yes.
                L    R15,=F'-4'             Assume SYSIDERR
                CLC  WRK_EIBRESP,DFHRESP(SYSIDERR) X
                BE   START_UOWX              Is there one?
                BE   START_UOWX              ..yes.
                L    R15,=F'-8'             Load Failure code.
                B    START_UOWX              Go exit.
START_UOWL      DS  0H
                L    R15,WORK_UOW_RESP      Load Response Code.
START_UOWX      DS  0H
                BR   R5                      Exit routine.

```

---

## Sample user-replacement modules

The sample user-replacement module procedures are:

### Assembler language

```
//APPLPROG EXEC EYUEITAL,
//      OUTC=*,
//      CPSMHLQ='CPSM230',
//      CICS HLQ='CICS630',
//      LMODDSN='user.load.library',
//      TRNPARM=('NOPROLOG,NOEPILOG'),
//      LNKPARM=('RENT,REUS,AMODE=31,RMODE=ANY,XREF,MAP,LIST')
//TRN.SYSIN DD DISP=SHR,DSN=user.source.library(EYU9WRAM)
//LKED.SYSIN DD *
INCLUDE SYSLIB(EYU9WAPI)
NAME EYU9WRAM(R)
/*
```

Figure 10. Sample JCL for replacement module for Assembler language

### C language

```
//APPLPROG EXEC EYUEITDL,
//      OUTC=*,
//      CPSMHLQ='CPSM230',
//      CICS HLQ='CICS630',
//      EDCHLQ='SYS1',
//      COMHLQ='SYS1',
//      LMODDSN='user.load.library',
//      CPARM=('RENT,SOURCE,SHOWINC,TERM',
//            'AGGREGATE,LIST,OFFSET'),
//      LNKPARM=('RENT,REUS,AMODE=31,RMODE=ANY,XREF,MAP,LIST')
//TRN.SYSIN DD DISP=SHR,DSN=user.source.library(EYU9WRAM)
//LKED.SYSIN DD *
INCLUDE SYSLIB(EYU9WAPI)
NAME EYU9WRAM(R)
/*
```

Figure 11. Sample JCL for replacement module for C language

**Note:** When the EYU9WRAM sample is compiled using Version 1.0 of the IBM C/370 compiler, EDC0244 warning message will occur because the compiler truncates some of the field names.

### PL/I language

```
//APPLPROG EXEC EYUEITPL,
//      OUTC=*,
//      CPSMHLQ='CPSM230',
//      CICS HLQ='CICS630',
//      PLIHLQ='SYS1.IBMSYS.SYS',
//      LMODDSN='user.load.library',
//      PLIPARM=('OBJECT,NODECK,INCLUDE,SYNTAX,LIST,MAP',
//            'STORAGE,OFFSET,XREF',
//            'LANGLVL(OS,SPROG),SYSTEM(CICS)'),
//      LNKPARM=('RENT,REUS,AMODE=31,RMODE=ANY,XREF,MAP,LIST')
//TRN.SYSIN DD DISP=SHR,DSN=user.source.library(EYU9WRAM)
//LKED.SYSIN DD *
INCLUDE SYSLIB(EYU9WAPI)
NAME EYU9WRAM(R)
/*
```

Figure 12. Sample JCL for replacement module for PL/I language

## COBOL language

```
//APPLPROG EXEC EYUEITVL,  
//          OUTC=*,  
//          CPSMHLQ='CPSM230',  
//          CICS630='CICS630',  
//          LMODDSN='user.load.library',  
//          COBPARM=('LIB,OBJECT,RENT,RES',  
//                'APOST,MAP,XREF,TRUNC(BIN) '),  
//          LNKPARM=('RENT,REUS,AMODE=31,RMODE=ANY,XREF,MAP,LIST')  
//TRN.SYSIN DD DISP=SHR,DSN=user.SOURCE.library(EYU9WRAM)  
//LKED.SYSIN DD *  
  INCLUDE SYSLIB(EYU9WAPI)  
  NAME EYU9WRAM(R)  
/*
```

Figure 13. Sample JCL for replacement module for COBOL language

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## Bibliography

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<i>CICS Family: Client/Server Programming</i>	SC33-1435
<i>CICS Transaction Gateway for z/OS Administration</i>	SC34-5528
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Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

You can perform most tasks required to set up, run, and maintain your CICS system in one of these ways:

- using a 3270 emulator logged on to CICS
- using a 3270 emulator logged on to TSO
- using a 3270 emulator as an MVS system console

IBM Personal Communications provides 3270 emulation with accessibility features for people with disabilities. You can use this product to provide the accessibility features you need in your CICS system.



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Version 3 Release 2**

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