

CICS<sup>®</sup> Transaction Server for z/OS<sup>™</sup>



# CICSplex<sup>®</sup> SM Managing Workloads

*Version 2 Release 1*



CICS<sup>®</sup> Transaction Server for z/OS<sup>™</sup>



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*Version 2 Release 1*

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 207.

**First Edition, March 2001**

This edition applies to Version 2 Release 1 of CICS Transaction Server for z/OS, program number 5697–E93, and to all subsequent versions, releases, and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of product.

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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*.

---

### Notes on terminology

In the text of this book, the term **CICSplex SM** (spelled with an uppercase letter 'P') means the IBM CICSplex System Manager element of CICS Transaction Server for z/OS, Version 2 Release 1. 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:

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

**CICSplex SM**

The CICSplex SM element of CICS TS for z/OS

**MVS<sup>™</sup>** 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.

**BTS-set**

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

The phrase *issue the command* is used in this book to mean that a command may be either typed in the COMMAND field of an Information Display panel or invoked

by pressing the PF key to which it is assigned. When the location of the cursor affects command processing, this phrase also means that you can do one of the following:

- Type the command in the COMMAND field, place the cursor on the appropriate field, and press Enter.
- Move the cursor to the appropriate field and press the PF key to which the command is assigned.

---

## 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 may be used to control CICS systems that are directly connected to it, and indirectly connected through a previous release of CICSplex SM.

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

- CICS Transaction Server for z/OS 2.1
- CICS Transaction Server for OS/390 1.3
- CICS Transaction Server for OS/390 1.2
- CICS Transaction Server for OS/390 1.1
- CICS for MVS/ESA 4.1
- CICS for OS/2 3.1
- CICS for OS/2 3.0

CICS systems that are not directly connectable to this release of CICSplex SM are:

- CICS for MVS/ESA 3.3
- CICS for MVS 2.1.2
- CICS/OS2 2.0.1

**Note:** IBM Service no longer supports these CICS release levels.

You can use this release of CICSplex SM to control CICS systems 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 Guide* for information on how to do this.

Table 1 shows which CICS systems may be directly connected to which releases of CICSplex SM.

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

<b>CICS system</b>	<b>CICSplex SM component of CICS TS 2.1</b>	<b>CICSplex SM component of CICS TS 1.3</b>	<b>CICSplex SM 1.3</b>	<b>CICSplex SM 1.2</b>
CICS TS 2.1	Yes	No	No	No
CICS TS 1.3	Yes	Yes	No	No
CICS TS 1.2	Yes	Yes	Yes	No
CICS TS 1.1	Yes	Yes	Yes	Yes
CICS for MVS/ESA 4.1	Yes	Yes	Yes	Yes
CICS for MVS/ESA 3.3	No	No	Yes	Yes
CICS for MVS 2.1.2	No	No	Yes	Yes
CICS for OS/2 3.1	Yes	Yes	No	No
CICS for OS/2 3.0	Yes	Yes	Yes	Yes
CICS/OS2 2.0.1	No	No	Yes	Yes



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## Summary of changes

This book is based on the CICSplex SM Release 3 edition of *CICSplex System Manager Managing Workloads*, SC33-1807-00.

The information in this book has been updated to incorporate changes made to the CICSplex SM element of CICS Transaction Server for z/OS, Version 2 Release 1. Changes made since the last edition are indicated by vertical bars to the left of the change.

---

### 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 by transaction group” on page 14 covers workload separation of enterprise beans.
- “Enterprise bean considerations” on page 16 for transaction affinities.
- “Enterprise bean considerations” on page 29 when customizing the dynamic routing program.
- “Chapter 28. Managing enterprise beans with workload management” on page 157 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 System Manager 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 dynamic DPL requests, the new Dynam Status field in the PROGRAMD view indicates whether or not the current program may be dynamically routed. 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 System Manager Operations Views Reference*.

## New views

Two new summary views are provided:

- WLMAWAOS, which is a summary form of the WLMAWAOR view, shows summarized information about all target regions that are associated with a workload that is within the CICSplex identified as the context.
- WLMAWTOS, which is a summary form of the WLMAWTOR 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**



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# Chapter 1. Introduction to workload management

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

---

## 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
- 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, and for CICS BTS activities, 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 for CICS BTS activities, 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.

## introduction to workload management

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 group.

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 15.

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

### Notes:

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 “Chapter 22. Using real-time analysis to select a target region for workload balancing” on page 137 for details.

2. For additional information about how CICSplex SM handles dynamic routing and how you can customize this facility, see “Chapter 4. Customizing the dynamic routing program” 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/ESA 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, that is, it cannot be a remote MAS. It must use CICSplex SM facilities to communicate with that CMAS. For additional information, see *CICS Transaction Server for z/OS Installation Guide*.

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.

Before you can implement dynamic and distributed routing, you need to specify Yes in the Routing support active field of the CICS system definition. See *CICSplex System Manager Administration*.



---

## 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.

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 "WLMSPEC (Workload specifications)" on page 79.

The dynamic routing processes are explained using Figure 1 on page 8, 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.

## balancing the work in a workload

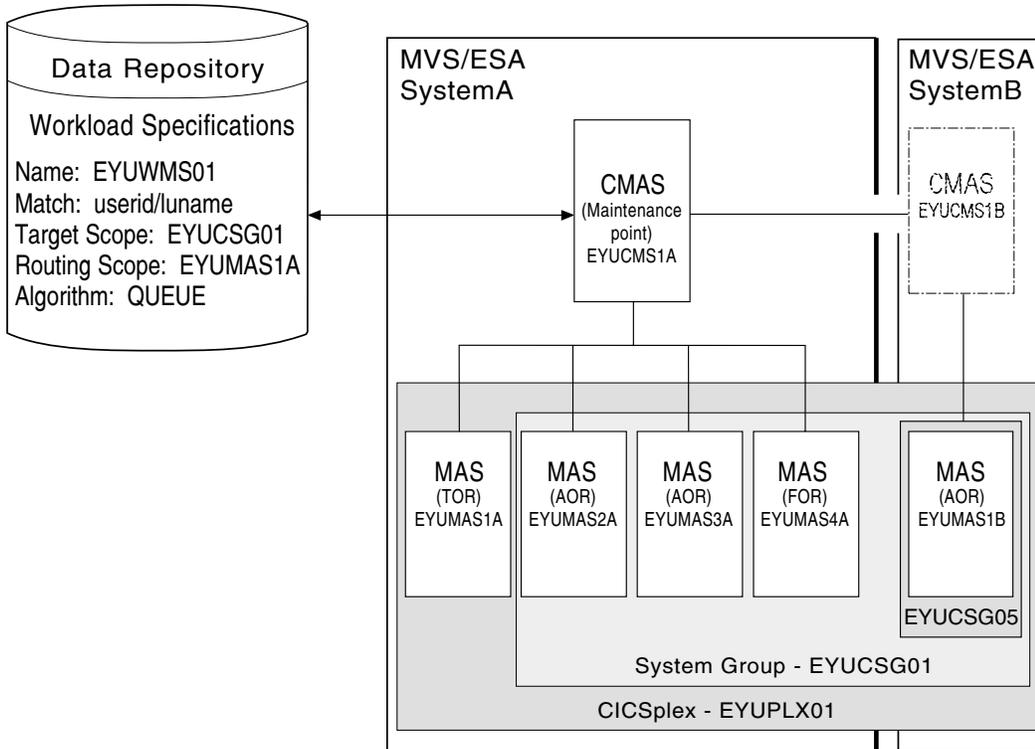


Figure 1. Sample workload balancing definition for dynamic routing

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 IIOP 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.

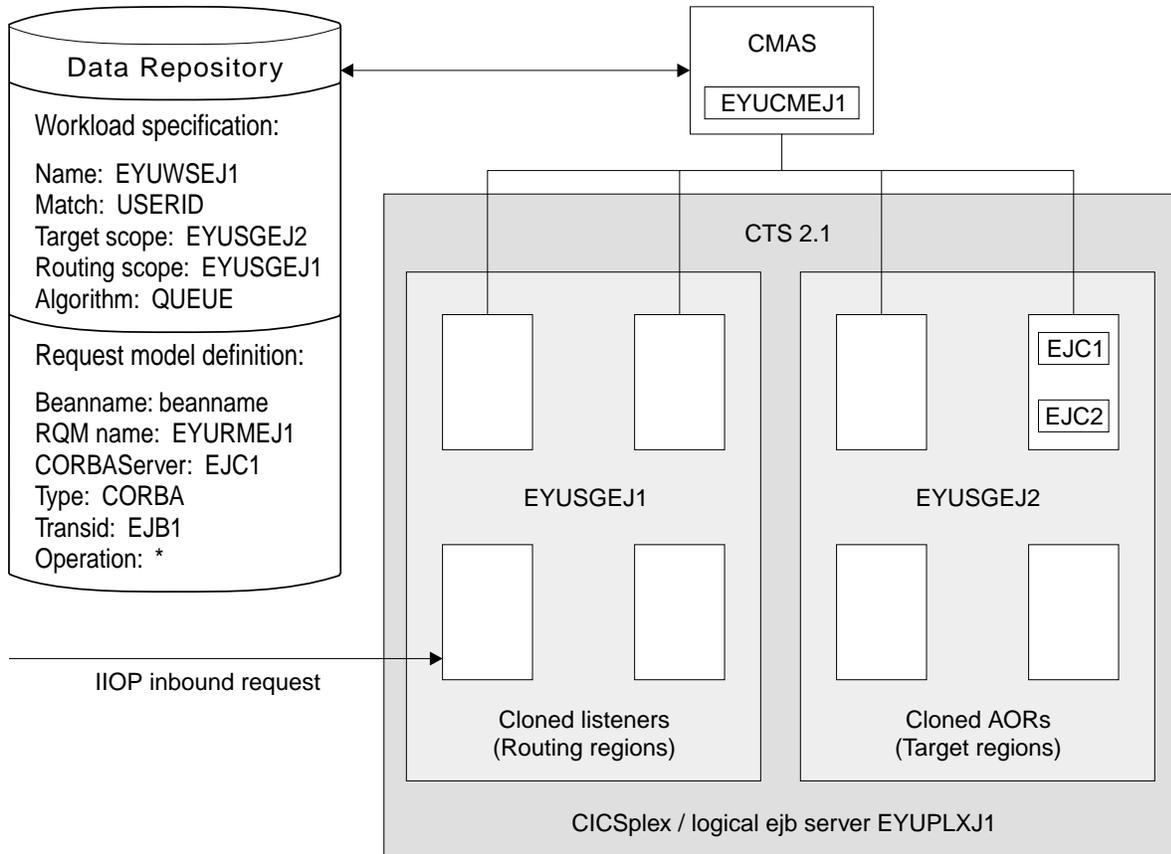


Figure 2. Sample workload balancing definition for dynamic routing of enterprise beans

## 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/ESA 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, luname, and user ID basis. Service classes can define several types of response-time goals. However, CICSplex SM recognizes only average response-time goals. If transactions are given velocity, percentile 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

## balancing the work in a workload

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/ESA 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.

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

---

## 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 group (or the associated transaction group for DPL and enterprise beans)
- 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 luname 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.

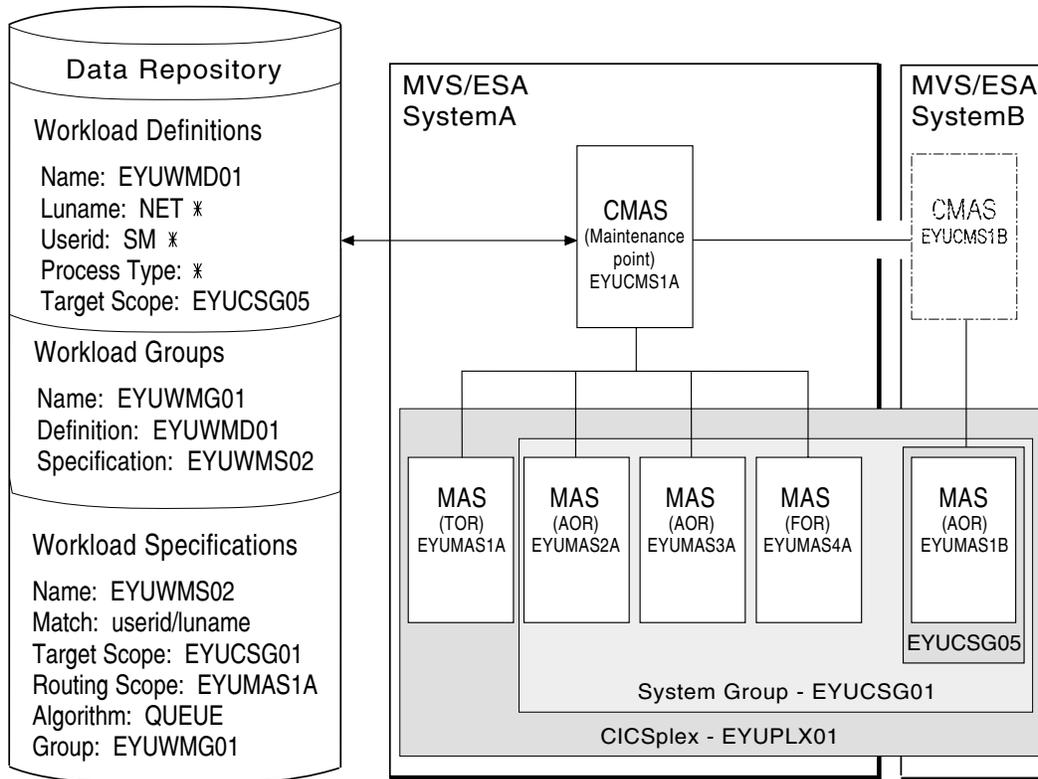


Figure 3. Sample definition separating a workload by terminal and user name

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.

## separating the work in a workload

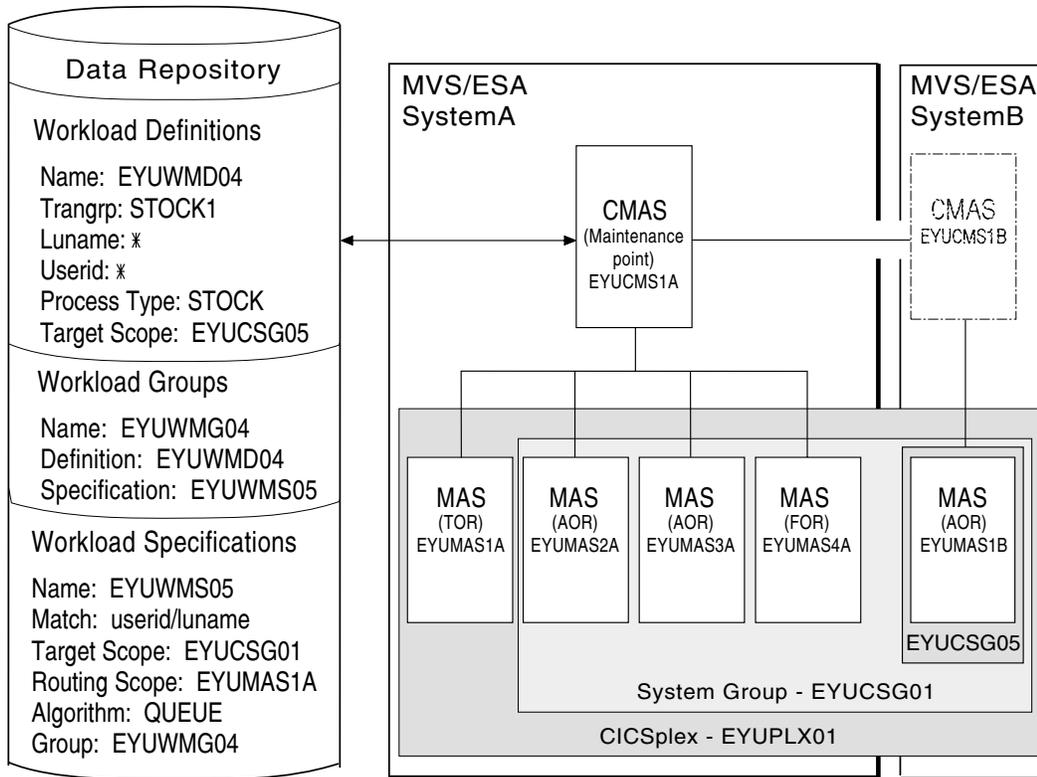


Figure 4. Sample definition separating a workload by process type

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 luname and userid, 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 luname and userid.

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 luname and userid. 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, luname and userid, 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 luname and userid. Thus, if a transaction's associated process type, luname and userid mean that it satisfies the selection criteria specified in two workload definitions, one specifying separation by process type and the other separation by luname and userid, 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 “TRANGRP (Transaction groups)” on page 52.)

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.

## separating the work in a workload

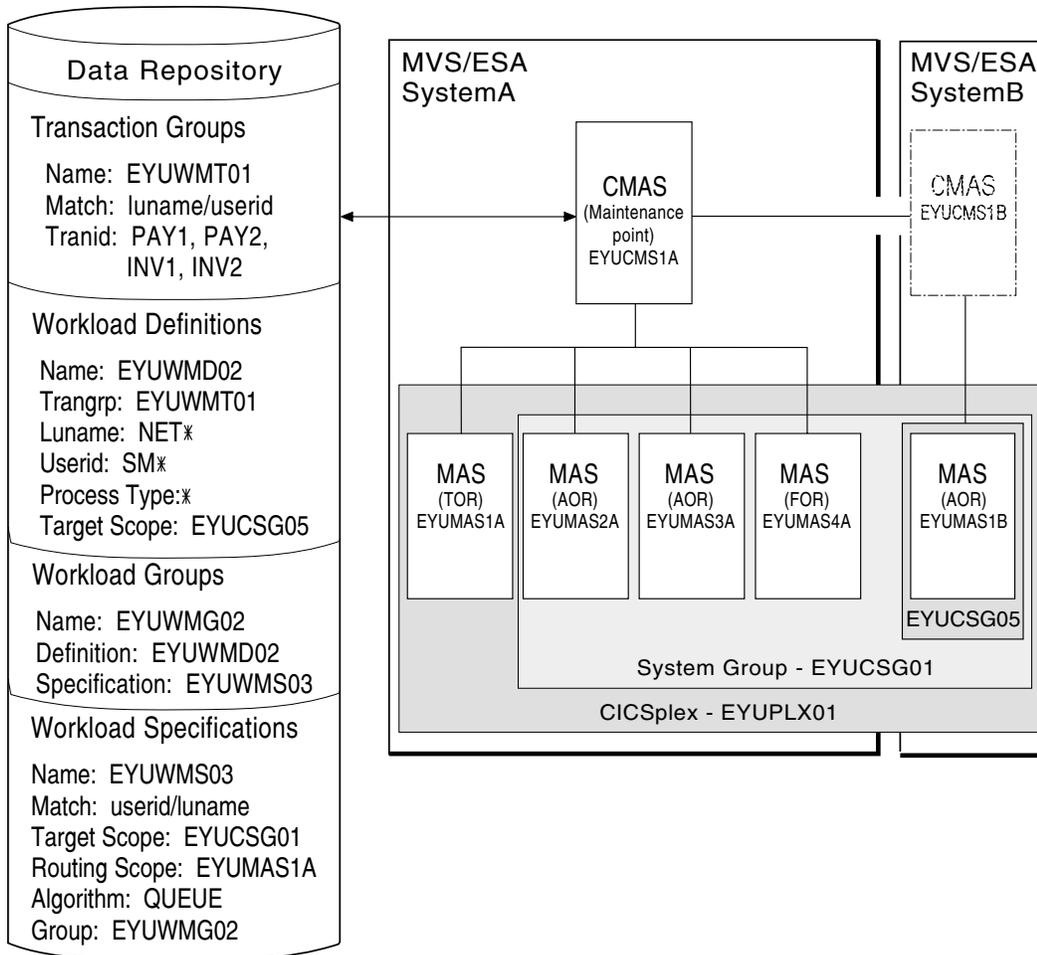


Figure 5. Sample definition separating a workload by transaction

## Separating by transaction group

Workload separation of enterprise beans is by the associated transaction group. 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 beannam 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 IOP

request, the enterprise bean-related transaction is routed to the default target region EYUSGEJ2.

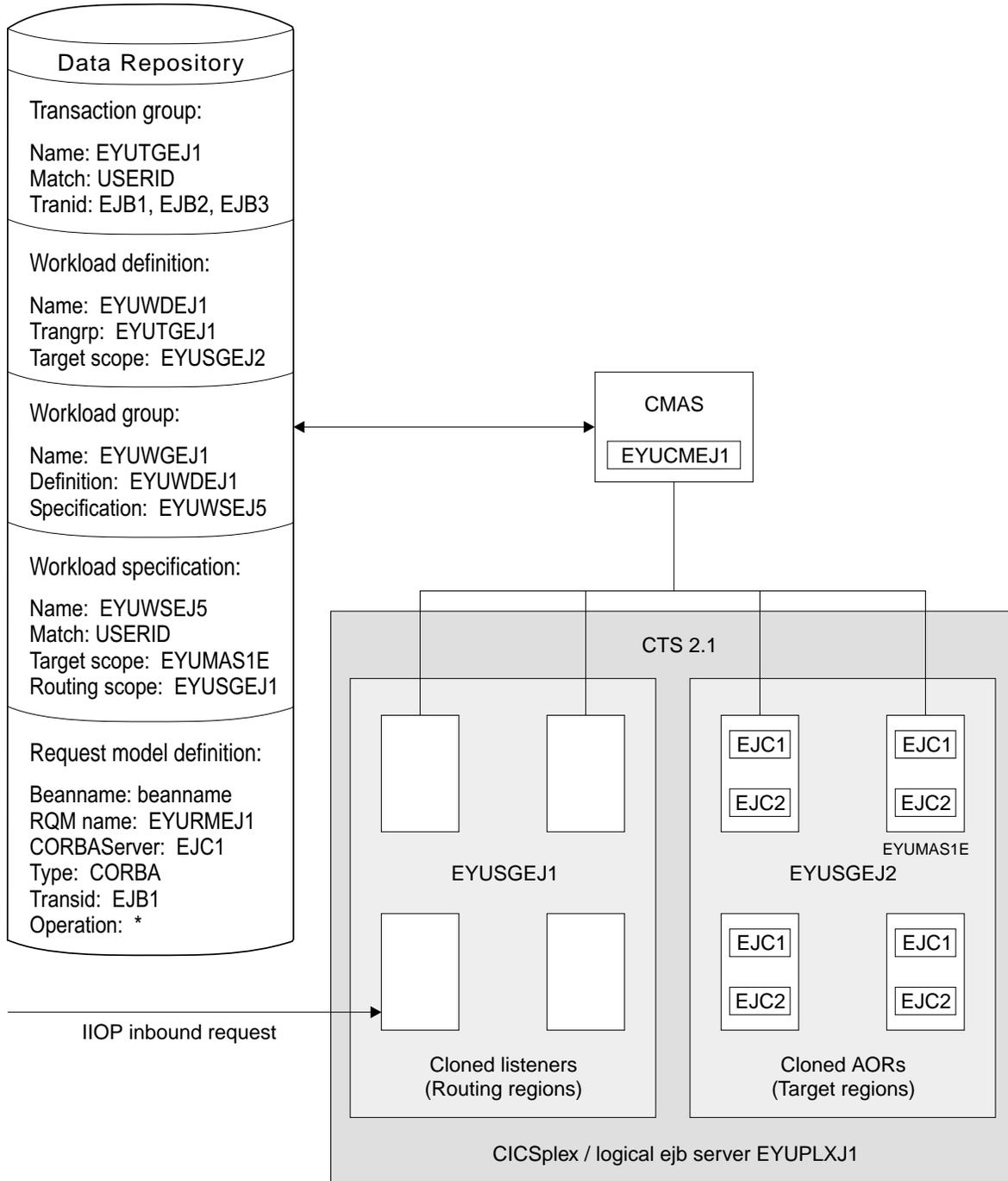


Figure 6. Sample workload separation definition for dynamic routing of enterprise beans

## 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

## adding affinity relations to a workload

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 Table 8 on page 58.

You can use the IBM CICS Transaction Affinities Utility 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 Transaction Affinities Utility Guide*.

**Note:** You cannot use the CICS Transaction Affinities Utility 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.

## Adding affinities into a workload

Figure 7 on page 17 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.

## adding affinity relations to a workload

**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.

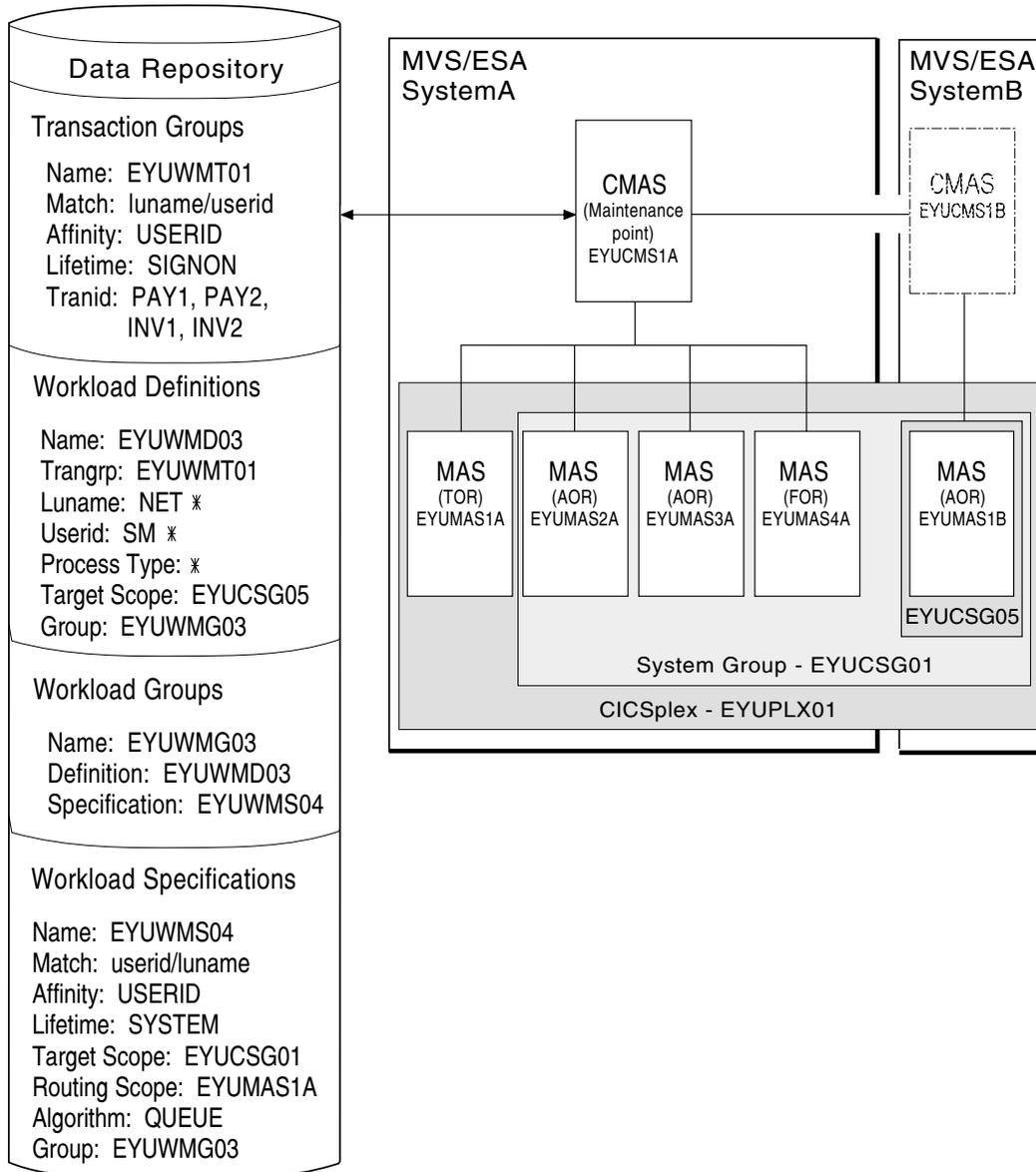


Figure 7. Sample definition adding transaction affinity to a workload

**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:

## adding affinity relations to a workload

- 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.

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## 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

## taking abend probabilities into consideration

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:** 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.

**taking abend probabilities into consideration**

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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 on page 84.
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 modifying the CICS system initialization table (SIT) parameters to include:

```
DTRPGM=EYU9XLOP
```

and, for non-terminal-related EXEC CICS START commands and BTS activities and also for all regions within a logical server:

```
DSRTPGM=EYU9XLOP
```

If the CICS system is active, you can use the CICSRGND view, described in *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. Customizing the dynamic routing program” on page 25.

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

### **CICSSYS**

To change the CICS system definition in the data repository.

**MAS** 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 MAS 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.

## activating workload management

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 WLMWDEF view, as described in Table 4 on page 49.)

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 “Chapter 20. Discarding an active transaction from a workload” on page 133.

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## Part 2. Implementing dynamic routing



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## Chapter 4. Customizing the dynamic routing program

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, you have to set the DTRPGM SIT parameter associated with the requesting region initiating the transaction, and all potential target regions:

```
DTRPGM=EYU9XLOP
```

- For non-terminal-related EXEC CICS START commands, BTS activities, or enterprise beans, you have to set the DSRTPGM SIT parameter:

```
DSRTPGM=EYU9XLOP
```

CICS notifies EYU9XLOP of all routing requests. These are:

- Route selection, route selection error, and transaction termination.
- For CICS/ESA 4.1 and later, routed transaction abend and notification.
- For BTS (CICS Transaction Server for OS/390 Version 1 Release 3 and later), transaction initiation, transaction abend, and routing attempt complete.
- For enterprise beans (CICS Transaction Server Version 2 Release 1 and later), 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 are:

- For dynamic transaction routing:

**Routing regions**

CICS/ESA Version 3.3 and later (but see “CICS system connectivity” on page x)

**Target regions**

Any release of CICS (but see “CICS system connectivity” on page x)

- For EXEC CICS START commands:

**Requesting regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

**Routing regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

**Target regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

- For CICS BTS:

**Requesting regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

**Routing regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

**Target regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

- For DPL:

**Routing regions**

CICS Transaction Server for OS/390 Version 1 Release 3 or later

**Target regions**

Any release of CICS (but see “CICS system connectivity” on page x)

- For enterprise beans:

**Routing regions**

CICS Transaction Server for OS/390 Version 2 Release 1 or later

**Target regions**

CICS Transaction Server for OS/390 Version 2 Release 1 or later

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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/370™, COBOL 2, and PL/I are distributed with CICSplex SM. The

names of the sample programs and copy books, and the CICSplex SM libraries in which they can be found are shown 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	SEYUCOB
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	SEYUPL1
Copybook 1	EYUPWCOM	EYURWCOM	SEYUPL1
Copybook 2	EYUPWCOD	EYURWCOD	SEYUPL1
Copybook 3	EYUPWSVE	EYURWSVE	SEYUPL1
Copybook 4	EYUPWSVD	EYURWSVD	SEYUPL1
C:			
Program	EYUCWRAM	EYU9WRAM	SEYUC370
Copybook 1	EYUCWCOM	EYURWCOM	SEYUC370
Copybook 2	EYUCWCOD	EYURWCOD	SEYUC370
Copybook 3	EYUCWSVE	EYURWSVE	SEYUC370
Copybook 4	EYUCWSVD	EYURWSVD	SEYUC370

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## 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.

## modifying dynamic routing

### **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/370, COBOL 2, 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:

## modifying dynamic routing

- 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 comand, 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 28. 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 28. 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 routing region:
  - Notification
  - Route selection
  - Route selection error
  - Route attempt complete

- In the target region:
  - Transaction initiation

## modifying dynamic routing

- 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 185, 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.

#### Notes:

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

## modifying dynamic routing

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.

## modifying dynamic routing

- 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” 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.

## modifying dynamic routing

### 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.

## modifying dynamic routing

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 177.

---

## 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 Figure 70 on page 178.

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 Figure 71 on page 185.

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## Creating a user-replacement module for EYU9WRAM

You can use the sample procedures provided in CICSTS21.CPSM.SEYUPROC to create replacement modules for EYU9WRAM.

**NOTE TO REVIEWERS:** The HLQ will be changed globally for all books at some future date.

The procedure members are:

Assembler

EYUEITAL

## creating a user-replacement for EYU9WRAM

C/370  
PL/I  
COBOL II

EYUEITDL  
EYUEITPL  
EYUEITVL

Samples may be found in “Sample user-replacement modules” on page 195. 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 should use the dynamic routing facilities described in “Chapter 4. Customizing the dynamic routing program” on page 25, in order for CICSplex SM to manage your work requests more effectively.

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. Customizing the dynamic routing program” 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

## requesting additional dynamic routing support

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 Figure 72 on page 188.

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.

## processing considerations

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 15. For details on specifying affinity relation and lifetime values, see “Creating a transaction group” on page 54.

## 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 18. For details on requesting abend compensation, see “Creating a workload specification” on page 81.

## MVS/ESA workload management considerations

If the MVS/ESA 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,

## processing considerations

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 “Creating a workload specification” on page 81.

## 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.

---

## Sample calling sequence

Figure 73 on page 193 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.



---

## **Part 3. Managing workloads**



---

## Chapter 6. Workload management definitions and their related views

You can use the 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 Table 4 on page 49 to display information about and manage active workloads. You can also display a visual map of your workload management definitions by using the MAP action command, as described in *CICSplex System Manager User Interface Guide*.

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.

## workload management definitions and their views

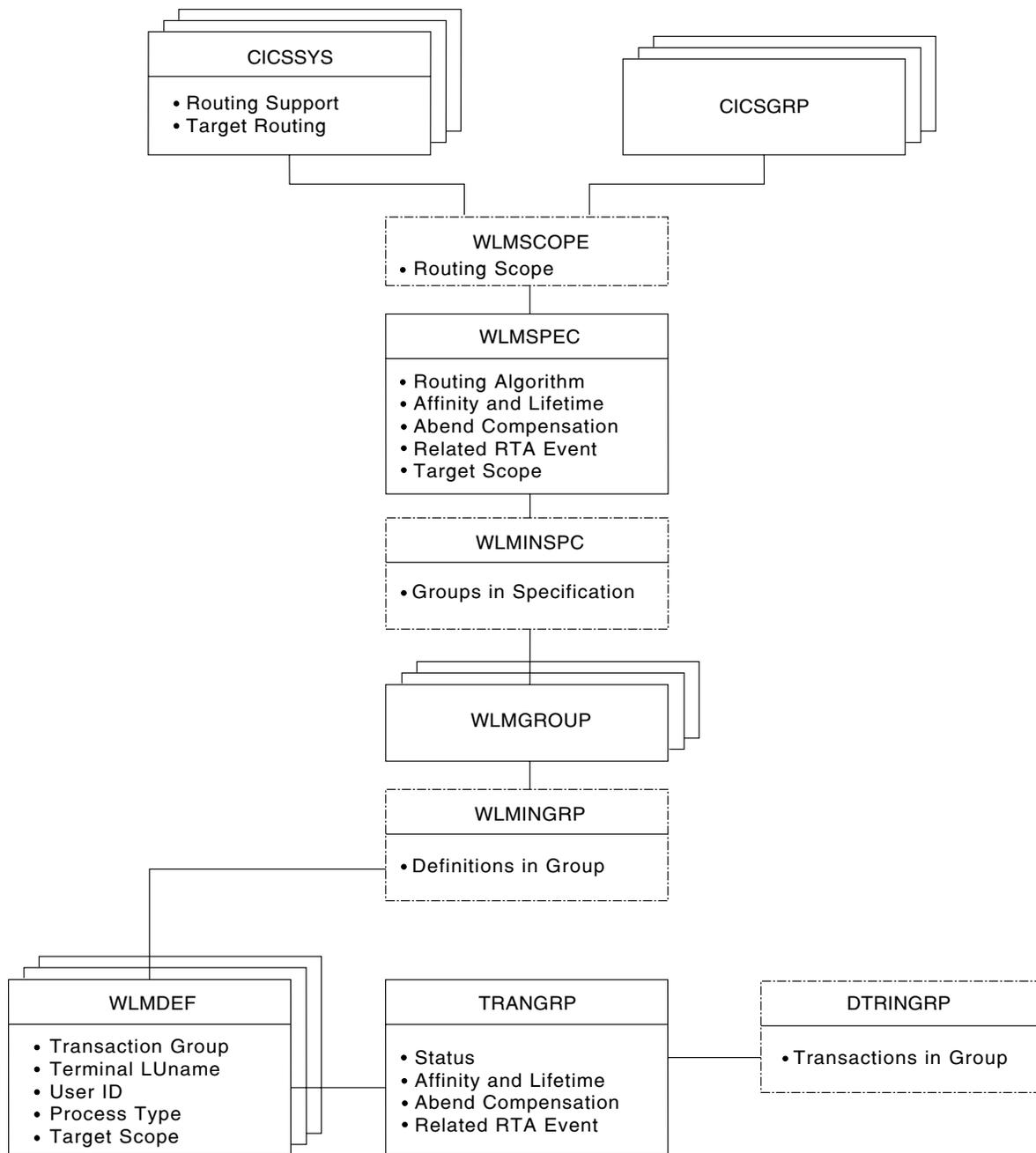


Figure 8. Views for creating workload management objects and associations

## workload management definitions and their views

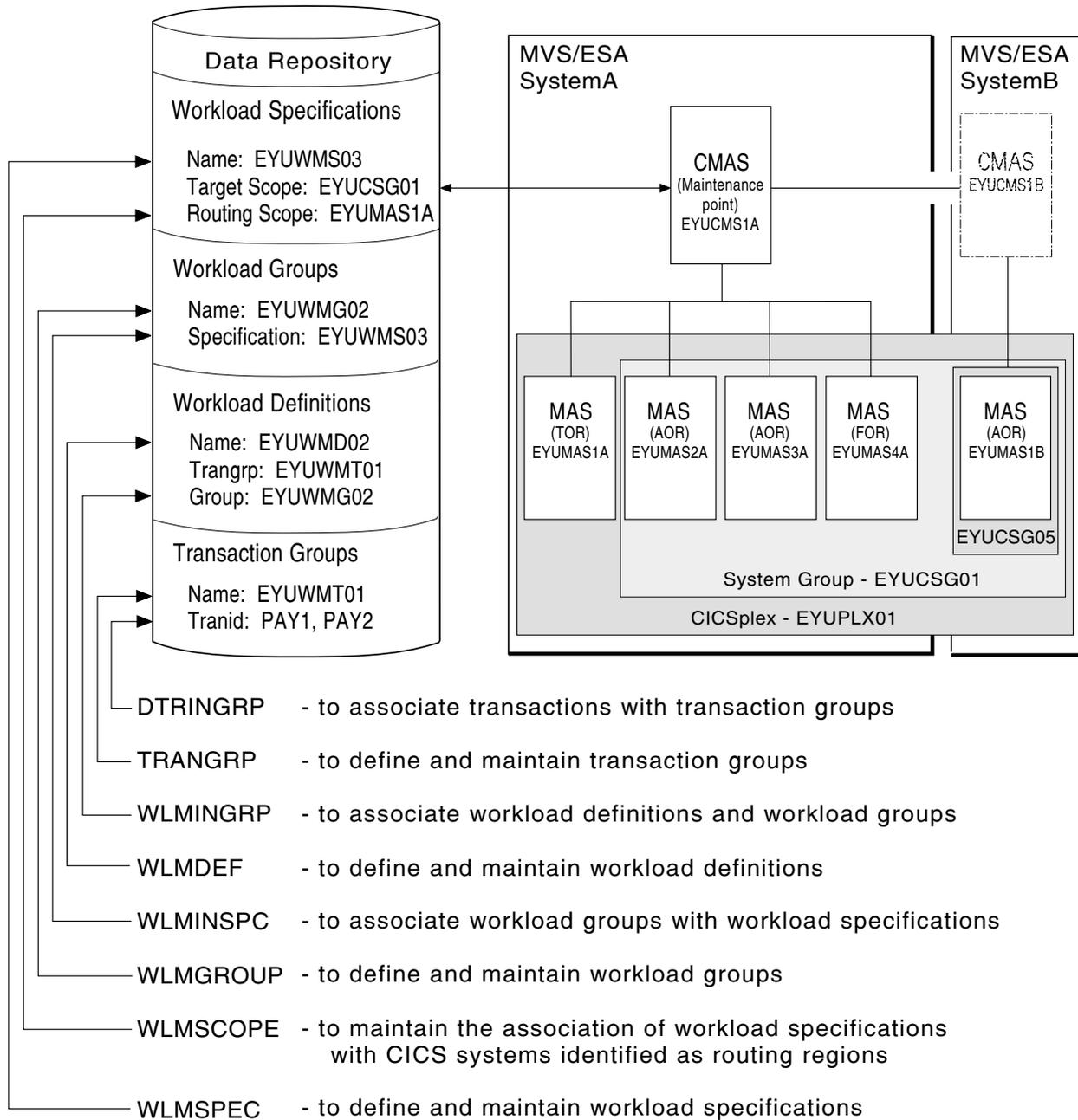


Figure 9. The relationship between a workload and the workload management views

Table 3 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.

Table 3. Views to create and maintain workload management definitions

Display	Actions Supported	View	Page
CICS systems and CICS system groups associated with workload specification	<ul style="list-style-type: none"> <li>Change or remove the association between a routing scope and a workload specification.</li> </ul>	WLMSCOPE	75

## workload management definitions and their views

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

Display	Actions Supported	View	Page
Transaction groups	<ul style="list-style-type: none"> <li>• Create, browse, change, remove, or update a transaction group.</li> <li>• Add a transaction to a transaction group.</li> </ul>	TRANGRP	52
Transactions in transaction groups	<ul style="list-style-type: none"> <li>• Remove a transaction from a transaction group.</li> </ul>	DTRINGRP	51
Workload definitions	<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>	WLMDEF	60
Workload groups	<ul style="list-style-type: none"> <li>• Create, change, 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 CICS system or CICS system group.</li> </ul>	WLMGROUP	67
Workload groups with their workload definitions	<ul style="list-style-type: none"> <li>• Add or remove the association between a workload definition and a workload group.</li> </ul>	WLMINGRP	72
Workload specifications	<ul style="list-style-type: none"> <li>• Create, browse, change, or remove a workload specification.</li> <li>• Add an association between a workload specification and a scope identified as one or more routing regions.</li> </ul>	WLMSPEC	79
Workload specifications with their workload groups	<ul style="list-style-type: none"> <li>• Add or remove the association between a workload group and a workload specification.</li> </ul>	WLMINSPC	73

## Chapter 7. Views for managing definitions

When a CICS system is active, you can use the views identified in Table 4 to display information about and control its use of workload management.

Table 4. Views to manage active workload management definitions

Display	Actions Supported	View	Page
Transaction affinities	<ul style="list-style-type: none"> <li>• Display detailed information about the properties of a single active CICS BTS activity. This view allows you to look at the contents of the CICS BTS affinity key in hexadecimal format.</li> </ul>	WLMATAFD	95
Target regions	<ul style="list-style-type: none"> <li>• Display information about all target regions associated with a specific workload.</li> <li>• Change the status of a target region to active or quiesced.</li> </ul>	WLMAWAOR	95
Summary of target regions	<ul style="list-style-type: none"> <li>• Display summary information about all target regions associated with a specific workload.</li> </ul>	WLMAWAOS	97
Routing regions	<ul style="list-style-type: none"> <li>• Display information about active routing regions associated with a specific workload.</li> </ul>	WLMAWTOR	102
Summary of routing regions	<ul style="list-style-type: none"> <li>• Display summary information about active routing regions associated with a specific workload.</li> </ul>	WLMAWTOS	103
Transactions	<ul style="list-style-type: none"> <li>• Display information about all active transactions associated with a specific workload.</li> <li>• Discard a transaction from a transaction group.</li> </ul>	WLMATRAN	93
Transaction affinities	<ul style="list-style-type: none"> <li>• Display information about the active transaction affinities for a transaction group associated with a specific workload.</li> <li>• Discard an affinity entry.</li> </ul>	WLMATAFF	89
Summary of transaction affinities	<ul style="list-style-type: none"> <li>• Display summary information about the active transaction affinities for a transaction group associated with a specific workload.</li> <li>• Discard an affinity entry.</li> </ul>	WLMATAFS	91
Transaction groups	<ul style="list-style-type: none"> <li>• Display information about transaction groups associated with a specific workload.</li> <li>• Change the status of a transaction group to active or dormant.</li> </ul>	WLMATGRP	91
Workloads	<ul style="list-style-type: none"> <li>• Display information about active workloads.</li> </ul>	WLMAWORK	100
Workload definitions	<ul style="list-style-type: none"> <li>• Display information about active workload definitions associated with a specific workload.</li> <li>• Discard an active workload definition.</li> </ul>	WLMAWDEF	97



---

## Chapter 8. Creating workload management definitions

This chapter contains detailed descriptions of the views used to create and maintain workload management definitions. You can access these views by:

- Issuing the appropriate workload management view command.
- Issuing the MENU ADMWLM command and selecting a view from the menu. (An example of this menu is shown in Figure 10.)
- Initiating a hyperlink from one view to another by placing the cursor on a hyperlink field and pressing Enter.

```
26FEB2001 22:02:28 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1      ALT WIN ==>
W1 =MENU=====EYUPLX01=EYUPLX01=26FEB2001==22:02:28=CPSM=====10===
CMD Name          Description
-----
ADMWLM           Workload Manager Administration Views
WLMSPEC          Workload Specifications
WLMGROUP         Workload Groups
WLMDEF           Workload Definitions
TRANGRP          Transaction Groups
=====
WLMSCOPE         Members Associated with Workload Specifications
WLMINSPC         Workload Groups in Specifications
WLMINGRP         Workload Definitions in Groups
DTRINGRP         Transactions in Transaction Groups
```

Figure 10. The ADMWLM menu

For additional information about accessing views, see *CICSplex System Manager User Interface Guide*.

Unless noted otherwise, only the context is recognized when you are creating and maintaining workload management definitions. For additional information about setting the context, see *CICSplex System Manager User Interface Guide*.

The remainder of this chapter contains detailed descriptions of the workload management views.

---

### DTRINGRP (Transactions in transaction groups)

To display information about the transactions associated with one or more transaction groups, issue the command:

```
DTRINGRP [trangroup]
```

where `trangroup` is a specific or generic transaction group name. If you omit this parameter, the view, illustrated in Figure 11 on page 52, includes information about all existing transaction groups within the current context.

## creating workload management definitions

```
26FEB2001 18:29:11 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =DTRINGRP=====EYUPLX01=EYUPLX01=26FEB2001==18:29:11=CPSM=====6===
CMD Trangrp  Trans  PCONV
--- Name---- Name---- Mode----
EYUTRG01  ETVP
EYUTRG05  ETD1
EYUTRG05  ETD2
EYUTRG05  ETD3
EYUTRG06  ETL1      START
EYUTRG06  ETL2      END
```

Figure 11. The DTRINGRP view

## Action commands

Table 5 summarizes the action commands you can use with the DTRINGRP view.

Table 5. DTRINGRP view action commands

Primary command	Line command	Description
n/a	MAP	Display a visual map of workload management definitions using the specified transaction group as a starting point.
n/a	REM	Remove a transaction from a transaction group.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.

## Hyperlink fields

There are no hyperlink fields on the DTRINGRP view.

---

## TRANGRP (Transaction groups)

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.

Examples of how to use this view can be found in:

- “Chapter 15. Routing a specific transaction to a specific target region” on page 117
- “Chapter 16. Routing particular transactions from a given user to a specific target region” on page 121
- “Chapter 17. Honoring a pseudoconversational transaction” on page 125

By including transaction groups as part of a workload definition, you can identify one or more transactions that are to be routed to a specific set of target regions. For example, suppose you want to route only occurrences of the transaction PAY that are initiated from certain terminals to a target region in the CICS system group EYUCSG99. To do this, create a transaction group that contains the transaction identifier PAY and indicates the order in which the user and terminal names

## creating workload management definitions

associated with that transaction are to be evaluated. Then associate the transaction group with a workload definition, where the workload definition identifies EYUCSG99 as the target region scope.

Any transaction may be identified in a transaction group, but CICSplex SM routes only eligible transactions. The conditions that need to be fulfilled for a transaction to be eligible for dynamic routing are in *CICS Intercommunication Guide*.

Transactions scheduled as a result of automatic transaction initiation (ATI) and transactions defined as static are routed to the target region identified in their resource definitions.

### Default transaction group

Any transaction that is not explicitly associated with a user-defined transaction group is routed according to the default transaction group. The default transaction group (\$\$DTGA\$\$) is based on the attributes of the workload specification that is associated with the CICS system. If the default transaction group is not associated with any workload definitions, the names of the terminal and user associated with such a transaction are not evaluated.

To display information about existing transaction groups, issue the command:

```
TRANGRP [trangroup]
```

where trangroup is a specific or generic transaction group name. If you omit this parameter, the view, illustrated in Figure 12, includes information about all existing transaction groups within the current context.

```
26FEB2001 21:41:53 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
>W1 =TRANGRP=====EYUPLX01=EYUPLX01=26FEB2001==21:41:53=CPSM=====3===
CMD Trangrp Affinity Affinity Cre Match State Event Description
--- Name---- Relation Lifetime- Aff Key---- Name-----
EYUTRG01          NO USERID ACTIVE          SSet - Related to
EYUTRG05          NO USERID ACTIVE          EYURTD20 SSet - Applicatio
EYUTRG06 USERID   PCONV      NO USERID ACTIVE          SSet - Existing a
```

Figure 12. The TRANGRP view

## Action commands

Table 6 summarizes the action commands you can use with the TRANGRP view.

Table 6. TRANGRP view action commands

Primary command	Line command	Description
n/a	ADD	Add a transaction to a transaction group, as described on page 59.

## creating workload management definitions

Table 6. TRANGRP view action commands (continued)

Primary command	Line command	Description
n/a	BRO	Browse a transaction group definition in the data repository.  The format of the resulting panel is similar to that shown in Figure 13 on page 55. The panel fields are not modifiable.
CREate	CRE	Create a transaction group definition and add it to the data repository, as described in “Creating a transaction group”.  When you use the primary command CREate, some fields in the new view may contain values supplied by CICSplex SM; you may change these values. When you enter the line command CRE next to the name of a transaction group definition, fields in the new view contain values to be modelled (from the existing transaction group definition).
n/a	MAP	Display a visual map of workload management definitions using the specified transaction group as a starting point.
n/a	REM	Remove a transaction group definition from the data repository. <b>Note:</b> Removing a transaction group causes all transactions associated with it to be removed also.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.
n/a	UPD	Update a transaction group definition in the data repository.  The format of the resulting input panel is similar to that shown in Figure 13. You can change the contents of any field in the panel except Trangroup Name.

## Hyperlink fields

Table 7 shows the hyperlink field on the TRANGRP view.

Table 7. TRANGRP view hyperlink fields

Hyperlink field	View displayed	Description
Trangrp Name	DTRINGRP	Detailed information about the transactions comprising the designated transaction group.

## Creating a transaction group

Figure 13 on page 55 shows the format of the panel produced when you use the create primary (CREate) or line (CRE) action command from the TRANGRP view.

```

----- Create Trangroup for EYUPLX01 -----
COMMAND ==>

Trangroup name ==>
Description ==> SSet - Related transactions

Status ==> ACTIVE Transaction Group Status
(ACTIVE,DORMANT)
Match Key ==> USERID Primary WLMDEF search criterion
(USERID,LUNAME)
Affinity Relation ==> Optional affinity relation may be:
(USERID,LUNAME,GLOBAL,BAPPL)
Affinity Lifetime ==> Optional affinity lifetime may be:
(SIGNON,LOGON,PCONV,DELIMIT,SYSTEM,PERMANENT,
ACTIVITY,PROCESS)
Create Affinity ==> Create Auto Affinity (YES, NO, N/A)
Event Name ==> RTADEF/STATDEF or generic

Abend Health ==> 0 Target ABEND Health Factor (0 - 99)
Abend Load ==> 0 Target ABEND Load Factor (0 - 99)
Press Enter to create Trangroup.
Type END or CANCEL to cancel without creating.

```

Figure 13. Creating a transaction group

Provide the following information, as appropriate:

**Trangroup 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.

**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.

**Match Key**

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 luname 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 Relation**

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

**USERID**

Base transaction affinity on the user ID.

## creating workload management definitions

### **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 Relation field.) Indicate the affinity lifetime to be used when processing transactions associated with this transaction group. Specify:

### **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 (LUTPE6.2)  
# 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 Relation and Affinity Lifetime fields are related. If you specify a value in the Affinity Relation field, you must specify a value in the Affinity Lifetime field. See Table 8 on page 58 for valid affinity and lifetime combinations.

### **Create Affinity**

(Optional.) Indicate whether CICSplex SM should automatically create an affinity relationship for transactions associated with this transaction group.

## creating workload management definitions

### YES (or blank)

CICSplex SM creates an affinity using the values specified in the Affinity Relation 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. Customizing the dynamic routing program” on page 25 for details on EYU9WRAM and SM\_CREAFF.

### N/A

Affinity not defined (Affinity Relation and Affinity Lifetime fields are blank).

### 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.

### Abend Health

(For CICS/ESA 4.1 or later.) 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 1 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.

### Abend Load

(For CICS/ESA 4.1 or later.) 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 1 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 2 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.

## creating workload management definitions

### Notes:

1. 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.
2. For additional information about specifying abend health and abend load values, see "Taking abend probabilities into consideration" on page 18.

Press Enter to add the transaction group definition to the data repository.

Table 8. Valid relation and lifetime combinations and their meanings

Affinity Relation and Meaning	Lifetime and Meaning
<p><b>USERID</b></p> <p>All dynamic requests identified in the transaction group that are both:</p> <ul style="list-style-type: none"> <li>• Initiated from a terminal, by an EXEC CICS START command associated with a terminal, or by a BTS activity</li> <li>• Associated with the same <i>user</i></li> </ul> <p>are to be directed to the same target region.</p>	<p><b>SIGNON</b></p> <p>The affinity continues as long as the user's terminal session is active.</p>
	<p><b>DELIMIT</b></p> <p>The affinity continues until a transaction with a pseudoconversation mode of END is encountered.</p>
	<p><b>PCONV</b></p> <p>The affinity continues as long as the pseudoconversation transaction is active. That is, as long as each transaction ends with an EXEC CICS RETURN TRANSID and no pseudoconversation mode of END is encountered.</p>
	<p><b>SYSTEM</b></p> <p>The affinity continues as long as that target region is active.</p>
	<p><b>PERMANENT</b></p> <p>The affinity continues as long as any CMAS involved in managing the CICSplex using the workload is active.</p>
<p><b>LUNAME</b></p> <p>All dynamic requests identified in the transaction group that are either initiated from, or associated with (using the EXEC CICS START command), the same <i>terminal</i>, are to be directed to the same target region.</p>	<p><b>LOGON</b></p> <p>The affinity continues as long as the terminal session is active.</p>
	<p><b>DELIMIT</b></p> <p>The affinity continues until a transaction with a pseudoconversation mode of END is encountered.</p>
	<p><b>PCONV</b></p> <p>The affinity continues as long as the pseudoconversation transaction is active. That is, as long as each transaction ends with an EXEC CICS RETURN TRANSID and no pseudoconversation mode of END is encountered.</p>
	<p><b>SYSTEM</b></p> <p>The affinity continues as long as that target region is active.</p>
	<p><b>PERMANENT</b></p> <p>The affinity continues as long as any CMAS involved in managing the CICSplex using the workload is active.</p>

## creating workload management definitions

Table 8. Valid relation and lifetime combinations and their meanings (continued)

Affinity Relation and Meaning	Lifetime and Meaning
<b>GLOBAL</b>  All dynamic requests identified in the transaction group that are either initiated from, or associated with (using the EXEC CICS START command), any terminal by any user, or by any BTS process, are to be directed to the same target region.	<b>SYSTEM</b>  The affinity continues as long as that target region is active.
	<b>PERMANENT</b>  The affinity continues as long as any CMAS involved in managing the CICSplex using the workload is active.
<b>BAPPL</b>  All dynamic requests identified in the transaction group that are associated with the same BTS process are to be directed to the same target region.	<b>ACTIVITY</b>  The affinity continues as long as the associated activity exists.
	<b>PROCESS</b>  The affinity continues as long as the associated process exists.
	<b>SYSTEM</b>  The affinity continues as long as that target region is active.
	<b>PERMANENT</b>  The affinity continues as long as any CMAS involved in managing the CICSplex using the workload is active.

## Adding a transaction to a transaction group

Figure 14 illustrates the panel produced when you use the add (ADD) line action command from the TRANGRP view.

```

----- Add Transaction to Trangroup for EYUPLX01 -----
COMMAND ==>

  Trangroup          EYUWMT03

    Transaction      PCONV Mode      Error
  ==> INV1           ==> START
  ==> INV2           ==> END
  ==> PAY1           ==>
  ==> PAY2           ==>
  ==>                ==>
  ==>                ==>
  ==>                ==>
  ==>                ==>
  ==>                ==>

Press Enter to add Transaction to Trangroup.
Type END or CANCEL to cancel without adding.
    
```

Figure 14. Adding a transaction to a transaction group

## creating workload management definitions

Provide the following information, as appropriate:

### Transaction

Specify a 1- to 4-character transaction identifier. The transaction ID is automatically converted to upper case characters. To add a transaction ID in mixed or lower case characters, you must use the batched repository-update facility, as described in *CICSplex System Manager Administration*.

### PCONV Mode

(Required for only the first or last transaction participating in a pseudoconversation.) Identify the location of the transaction in the pseudoconversation. Specify:

#### START

Identifies the transaction as starting a new pseudoconversation and ending any previous pseudoconversation.

#### END

Identifies the transaction as ending the current pseudoconversation.

Press Enter. Before adding the transactions to the transaction group definition in the data repository, the group is checked to determine if either of the following conditions is true:

Tran already in a group  
Tran already in group  
Group no longer exists

If either condition is true, the appropriate message is displayed in the panel. Correct the condition before continuing.

### Notes:

1. To include more than ten transactions in a transaction group, reissue the ADD action command.  
Although there is no limit to the number of transactions you can associate with a transaction group, a transaction can be associated with only one transaction group in a single CICSplex.
2. Although you can include static transactions and transactions scheduled as a result of ATI, only transactions defined to CICS as dynamic are eligible for routing.

Pseudoconversational transaction considerations:

- If the affinity lifetime for a transactions group is pseudoconversation and no PCONV Mode value is specified, the current affinity status is honored.
- If one of the transactions in the group issues an EXEC CICS RETURN without identifying the next transaction, the pseudoconversation is ended.

---

## WLMDEF (Workload definitions)

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.

Examples of how to use this view can be found in:

- "Chapter 15. Routing a specific transaction to a specific target region" on page 117

## creating workload management definitions

- “Chapter 16. Routing particular transactions from a given user to a specific target region” on page 121
- “Chapter 17. Honoring a pseudoconversational transaction” on page 125
- “Chapter 19. Updating an active workload definition” on page 131

To display information about existing workload definitions, issue the command:

```
WLMDEF [wlmdef]
```

where wlmdef is a specific or generic workload definition name. If you omit this parameter, the view, illustrated in Figure 15, includes information about all existing workload definitions within the current context.

```

26FEB2001 22:02:37 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
>W1 =WLMDEF=====EYUPLX01=EYUPLX01=26FEB2001==22:02:37=CPSM=====3===
CMD Def      Trangrp Luname          Userid  Process Target  Description
--- Name----- Name----- Type----- Scope-----
EYUWLD01 EYUTRG01 *          *      *      EYUCSG04 SSet - Separa
EYUWLD05 EYUTRG05 *          *      *      EYUCSG03 SSet - Applic
EYUWLD06 EYUTRG06 *          *      *      EYUMAS1B SSet - Existn

```

Figure 15. The WLMDEF view

**Note:** Scroll to the right in the view to see all of the Description field.

## Action commands

Table 9 summarizes the action commands you can use with the WLMDEF view. Table 10 on page 62 identifies the overtypable fields you can modify when you use the SET action command.

Table 9. WLMDEF view action commands

Primary command	Line command	Description
n/a	ADD	Add an association between a workload definition and a workload group, as described on page 65.
n/a	BRO	Browse a workload definition in the data repository.
CREate	CRE	Create a workload definition and add it to the data repository, as described on page 62.  The format of the resulting panel is similar to that shown in Figure 16 on page 63. The panel fields are not modifiable.  When you use the primary command CREate, some fields in the new view may contain values supplied by CICSplex SM; you may change these values. When you enter the line command CRE next to the name of a workload definition, fields in the new view contain values to be modelled (from the existing workload definition).
n/a	INS	Install a workload definition into a workload, as described on page 66.
n/a	MAP	Display a visual map of workload management definitions using the specified definition as a starting point.

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Table 9. WLMDEF view action commands (continued)

Primary command	Line command	Description
n/a	REM	Remove a workload definition from the data repository.
n/a	SET	Change a workload definition using oertype fields (see Table 10.) <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you oertype a field.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.
n/a	UPD	Update a workload definition in the data repository.  The format of the resulting input panel is similar to that shown in Figure 16 on page 63. You can change the contents of any field in the panel except Entry Name.

Table 10. WLMDEF view oertype fields

Field name	Value
Trangrp Name	1- to 8-character name of a transaction group.
Luname	Specific or generic logical unit name.
Userid	Specific or generic user ID.
Process type	Specific or generic process type.
Target Scope	Name of a CICS system or CICS system group.
Description	1- to 30-character description of the workload definition.

## Hyperlink fields

Table 11 shows the hyperlink field on the WLMDEF view.

Table 11. WLMDEF view hyperlink fields

Hyperlink field	View displayed	Description
Trangrp Name	DTRINGRP	Detailed information about the transactions in the specified transaction group.

**Note:** The Trangrp Name field is recognized as a hyperlink field only when it contains a value.

## Creating a workload definition

Figure 16 on page 63 shows the format of the panel produced when you use the create primary (CREate) or line (CRE) action command from the WLMDEF view.

## creating workload management definitions

```
----- Create Workload Definition for EYUPLX01 -----
COMMAND ==>

Definition Name ==>
Description      ==> SSet Separate ETUP

Trangroup Name  ==> EYUTRG01      Specific Trangroup, Generic, or Blank
Terminal Luname ==> *              Specific or pattern Luname
User ID         ==> *              Specific or pattern Userid
Process Type    ==> *              Specific or pattern Process Type
Target Scope    ==> EYUCSG04      CICS System, Group, or Generic

Press Enter to create definition.
Type END or CANCEL to cancel without creating.
```

Figure 16. Creating a workload definition

Provide the following information, as appropriate:

### 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 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 “TRANGRP (Transaction groups)” on page 52.)

### Terminal Luname

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 Transaction match criteria for additional information.)

### 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

## creating workload management definitions

than an \* in either lname and user id, this field must be set to \*.  
You cannot separate a workload by process type, lname and user id.

### Target Scope

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.

Press Enter to add the workload definition to the data repository.

**Transaction match criteria**

The criteria CICSplex SM uses to determine if a transaction should be routed are:

- Is the transaction identifier part of a transaction group associated with the workload definition?
- Is there a definition specifying separation by process type? Is there a match? If so, use this definition. If not, is there a definition specifying separation by luname and user id?
- In what order should the terminal and user names associated with the transaction be evaluated; that is, which name is to be used as the primary filter?
- Do the user and terminal names associated with the transaction match the name patterns specified with the workload definition.

The rules for establishing terminal and user name patterns are:

1. When there are multiple workload definitions, the field containing the name identified as the primary filter can contain the same specific or generic pattern; the contents of the field used as the secondary filter must always be unique. For example, the following definitions are valid when USERID is the primary filter and LUNAME is the secondary filter. They are not valid, however, when LUNAME is the primary filter because the user identifiers are not unique.

```
Entry Name      : EYUWMD01 EYUWMD02 EYUWMD03
Trangroup Name : EYUTNG01 EYUTNG01 EYUTNG01
Terminal Luname: LUR*   LUL*   LUT*
User ID        : PIE*   PIE*   PIE*
```

2. When a generic name is specified, the pattern with the most matching leading characters has precedence. For example, with the patterns:

```
A37AR*
A37+R*
```

Pattern A37AR\* is selected when the input is A37AR123. Pattern A37+R\* is selected when the input is A37RTAP.

3. Luname patterns are matched on the concatenated values of network name and luname. The following are valid luname patterns:

```
NETWORK1.LU12345678 - A specific luname
NETWORK1.LU1*       - Generic lunames in the network
NETWORK1.*          - All lunames in the network
NET*                 - All lunames in a generic network
.LU12345678         - A specific luname within all networks
.* or *             - All lunames within all networks
```

**Adding an association to a workload group**

Figure 17 on page 66 illustrates the panel produced when you use the add (ADD) line action command from the WLMDEF view.

## creating workload management definitions

```
----- Add WLM Definition to Workload Group for EYUPLX01 -----  
COMMAND  ===>  
  
Workload Definition      EYUWMD05  
Description              Test workload definition  
  
Workload Group          ===>          Group Name or Generic  
  
Press Enter to add WLM Definition to Workload Group.  
Type END or CANCEL to cancel without adding.
```

Figure 17. Adding an association between a workload definition and a workload group

Provide the following information:

### Workload Group

Enter the specific or generic name of an existing workload group. If you enter a generic value, a list of valid workload groups is displayed.

Press Enter to add the workload group to the designated workload definition.

To remove a workload definition from a workload group, use the WLMINGRP view, as described on page 72.

**Note:** If an appropriate workload group does not currently exist, you must first create the group, as described on page 69. Then add the workload definition to the workload group using either this action command or the one described on page 73.

## Installing a workload definition in a workload

You can install a workload definition into the workloads in one or more active CICS systems that are within the CICSplex identified as the context.

**Note:** A workload definition can be automatically installed in a workload when the CICS system using that workload starts. For this to occur, associate the definition with a workload group. Then associate that workload group with a workload specification that is associated with a CICS system.

Figure 18 on page 67 illustrates the panel produced when you use the install (INS) line action command from the WLMDEF view.

```

----- Install WLMDEF for EYUPLX01 -----
COMMAND ==>

Name          EYUWMD01
Description    Test workload definition

Type          WLMDEF

Workload ==>   Active Workload in which to install the WLMDEF
                Or Generic
Owner   ==>   Owner of the Workload in which to install the WLMDEF
                Or Generic

Press Enter to install Workload Definition.
Type END or CANCEL to cancel without installing.
    
```

Figure 18. Installing a workload definition

Provide the following information:

### Workload

Enter the specific or generic name of an active workload into which the workload definition is to be installed. If you enter a generic value, a list of valid workloads is displayed.

### Owner

Enter a 1- to 4-character, specific or generic SYSID of the system on which the workload was initially created. If you enter a generic value, a list of valid SYSIDs is displayed.

Press Enter to install the workload definition into the CICS system or CICS system group associated with the designated workload specification.

For information about workload management requirements that must be met in order for an installation to succeed, see “Chapter 3. Activating workload management” on page 21.

To deactivate an installed workload definition, use the WLMWDEF view, as described in Table 4 on page 49.

---

## WLMGROUP (Workload groups)

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 “Chapter 15. Routing a specific transaction to a specific target region” on page 117

To display information about workload groups, issue the command:

```
WLMGROUP [wlmgroup]
```

where wlmgroup is a specific or generic name of a workload group. If you omit this parameter, the view, illustrated in Figure 19 on page 68, includes information about all workload groups within the current context.

## creating workload management definitions

```

26FEB2001 22:02:49 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>          SCROLL ==> PAGE
W1 =WLMGROUP=====EYUPLX01=EYUPLX01=26FEB2001==22:02:49=CPSM=====3===
CMD Workload Description
--- Group-----
EYUWLG01 SSet - EYUA AOR groupings
EYUWLG04 SSet - All AOR groupings
EYUWLG05 SSet - EYUB AOR grouping
    
```

Figure 19. The WLMGROUP view

## Action commands

Table 12 summarizes the action commands you can use with the WLMGROUP view. Table 13 on page 69 identifies the overtyp field you can modify when you use the SET action command.

Table 12. WLMGROUP view action commands

Primary command	Line command	Description
n/a	ADD	Add an association between a workload group and a workload specification, as described on page 69.
n/a	ASC	Add an association between a workload definition and a workload group, as described on page 70.
n/a	BRO	Browse a workload group in the data repository.
CREate	CRE	Create a workload group and add it to the data repository, as described on page 69.
n/a	INS	Install the workload definitions associated with a workload group into a workload, as described on page 71.
n/a	MAP	Display a visual map of workload management definitions using the specified group as a starting point.
n/a	REM	Remove a workload group from the data repository. <b>Note:</b> Any associations that exist between the workload group and its workload definitions are also removed when you perform this action.
n/a	SET	Change a workload group description using an overtyp field. (See Table 13). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you overtyp a field.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.
n/a	UPD	Update a workload group in the data repository.

The format of the resulting input panel is similar to that shown in Figure 20. You can change the Description field.

Table 13. WLMGROUP view ovrtype field

Field name	Value
Description	1- to 30-character description of the workload group.

## Hyperlink fields

Table 14 shows the hyperlink field on the WLMGROUP view.

Table 14. WLMGROUP view hyperlink field

Hyperlink field	View displayed	Description
Workload Group	WLMINGRP	Detailed information about the associations that exist between the designated workload group and workload definitions.

## Creating a workload group

Figure 20 shows the format of the panel produced when you issue the create primary (CREate) or line (CRE) actions command from the WLMGROUP view.

```

----- Create WLM Group for EYUPLX01 -----
COMMAND  ==>

Group Name      ==>
Description     ==> Test Workload Group

Press Enter to create Workload Group.
Type END or CANCEL to cancel without creating.
    
```

Figure 20. Creating a workload group

Provide the following information, as appropriate:

### 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.

To add the workload group to the data repository, press Enter.

## Adding a workload group to a workload specification

Figure 21 on page 70 illustrates the panel produced when you use the add (ADD) line action command from the WLMGROUP view.

## creating workload management definitions

```
----- Add WLM Group to Workload Specification for EYUPLX01 -----  
COMMAND ==>  
  
Workload Group          EYUWMG01  
Description             Test workload group  
  
Specification Name ==>          Specification Name or Generic  
  
Press Enter to add WLM Group to WLM Specification.  
Type END or CANCEL to cancel without adding.
```

Figure 21. Associating a workload group with a workload specification

Provide the following information:

### Specification name

Enter the specific or generic name of an existing workload specification. If you enter a generic value, a list of valid workload specifications is displayed.

Press Enter to add the workload group to the designated workload specification in the data repository.

If a workload specification appropriate for this workload group does not currently exist, you must first create one, as described on page 81. You can then use either this ADD action command or the ADD action command described on page 75 to associate the workload group with a workload specification.

## Associating a workload definition with a workload group

Figure 22 illustrates the panel produced when you use the associate (ASC) line action command from the WLMGROUP view.

```
----- Add Workload Definition to Group for EYUPLX01 -----  
COMMAND ==>  
  
Workload Group Name      EYUWOG01  
Description              Sample workload group  
  
Workload Definition Name ==> EYUMOD01   Workload Definition or Generic  
  
Press Enter to add Workload Definition to Group.  
Type END or CANCEL to cancel without adding.
```

Figure 22. Associating a workload definition with a workload group

Provide the following information, as appropriate:

### Workload Definition Name

Enter the specific or generic name of an existing workload definition that is to be associated with the workload group. If you specify a generic value, a list of valid workload definitions is displayed.

Press Enter to associate the workload definition with the workload group in the data repository.

## Installing a workload group

When you install a workload group, all of the workload definitions associated with that group are installed in the designated workload.

The workload definitions associated with a workload group can be automatically installed in a workload when the CICS system using that workload starts. For this to occur, the workload group must be associated with a workload specification that is defined to the CICS system.

Figure 23 illustrates the panel produced when you use the install (INS) line action command from the WLMGROUP view.

```

----- Install WLMGROUP for EUPLX01 -----
COMMAND ==>

Name          EYUWMG01
Description   Test workload group

Type          WLMGROUP

Workload      ==>      Active Workload in which to install the WLMGROUP
                  Or Generic
Owner         ==>      Owner of the Workload in which to install the WLMGROUP
                  Or Generic

Press Enter to install definitions.
Type END or CANCEL to cancel without installing.
    
```

Figure 23. Installing a workload group

Provide the following information:

### Workload

Enter the specific or generic name of an active workload into which the workload definitions associated with this workload group are to be installed. If you enter a generic value, a list of valid workloads is displayed.

### Owner

Enter a 1- to 4-character, specific or generic SYSID of the system on which the workload was initially created. If you enter a generic value, a list of valid SYSIDs is displayed.

Press Enter to install the workload definitions, within the workload group, into the CICS system or CICS system group associated with the designated workload.

For information about workload management requirements that must be met in order for an installation to succeed, see "Chapter 3. Activating workload management" on page 21.

To deactivate an installed workload definition, use the WLMWDEF view, as described in Table 4 on page 49.

## WLMINGRP (Workload definitions in workload groups)

To display the names of workload groups and the workload definitions associated with them, issue the command:

```
WLMINGRP [wlmgroup [wlmdef]]
```

where:

**wlmgroup**

Is a specific or generic name of a workload group, or a blank or an \* (asterisk) for all workload groups.

**wlmdef** Is a specific or generic name of a workload definition. If you omit this parameter, the view includes information about all workload definitions associated with the designated workload group.

If you do not specify any parameters, the view, illustrated in Figure 24, includes information about all workload groups and their associated workload definitions within the current context.

```

26FEB2001 22:03:07 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMINGRP=====EYUPLX01=EYUPLX01=26FEB2001==22:03:07=CPSM=====3===
CMD Group   Def
--- Name--- Name---
EYUWLG01 EYUWLD01
EYUWLG04 EYUWLD05
EYUWLG05 EYUWLD06
    
```

Figure 24. The WLMINGRP view

## Action commands

Table 15 summarizes the action commands you can use with the WLMINGRP view.

Table 15. WLMINGRP view action commands

Primary command	Line command	Description
n/a	ADD	Add an association between a workload definition and a workload group, as described on page 73.
n/a	BRO	Browse the association between a workload definition and a workload group.
n/a	MAP	The format of the resulting panel is similar to that shown in Figure 25 on page 73. The panel fields are not modifiable. Display a visual map of workload management definitions using the specified group as a starting point.
n/a	REM	Remove the association between a workload definition and a workload group.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.

## Hyperlink fields

Table 16 shows the hyperlink fields on the WLMINGRP view.

Table 16. WLMINGRP view hyperlink fields

Hyperlink field	View displayed	Description
Group Name	WLMGROUP	Detailed information about the designated workload group.
Def Name	WLMDEF	Detailed information about the designated workload definition.

## Adding a workload definition to a workload group

Figure 25 illustrates the panel produced when you use the add (ADD) line action command from the WLMINGRP view.

```

----- Add WLM Definition to Workload Group for EYUPLX01 -----
COMMAND ==>

Workload Group      ==>  EYUWMO01  Workload Group or Generic
Workload Definition ==>  EYUWMD01  Workload Definition or Generic

Press Enter to add WLM Definition to Workload Group.
Type END or CANCEL to cancel without adding.
    
```

Figure 25. Adding a workload definition to a workload group

Provide the following information:

### Workload Group

Enter the specific or generic name of an existing workload group. If you enter a generic value, a list of valid workload groups is displayed.

### Workload Definition

Enter the specific or generic name of an existing workload definition that is to be associated with the workload group. If you enter a generic value, a list of valid workload definitions is displayed.

Press Enter to add the workload definition to the workload group.

---

## WLMINSPC (Workload groups in workload specifications)

To display the names of workload specifications and the workload groups associated with them, issue the command:

```
WLMINSPC [w1mspec [w1mgroup]]
```

where:

### w1mscope

Is a specific or generic name of a workload specification or \* (asterisk) for all workload specifications.

### w1mgroup

Is a specific or generic name of a workload group. If you omit this

## creating workload management definitions

parameter, the view includes information about all workload groups associated with the designated workload specifications.

If you do not specify any parameters, the view, illustrated in Figure 26, includes information about all workload specifications and their associated workload groups within the current context.

```

26FEB2001 22:03:22 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>          SCROLL ==> PAGE
W1 =WLMINSPC=====EYUPLX01=EYUPLX01=26FEB2001==22:03:22=CPSM=====3===
CMD Spec      Group
--- Name----- Name-----
EYUWLS01 EYUWLG01
EYUWLS01 EYUWLG04
EYUWLS01 EYUWLG05

```

Figure 26. The WLMINSPC view

## Action commands

Table 17 summarizes the action commands you can use with the WLMINSPC view.

Table 17. WLMINSPC view action commands

Primary command	Line command	Description
n/a	ADD	Add an association between a workload group and a workload specification, as described on page 75.
n/a	BRO	Browse the association between a workload group and a workload specification.
n/a	MAP	The format of the resulting panel is similar to that shown in Figure 27 on page 75. The panel fields are not modifiable. Display a visual map of workload management definitions using the designated specification as a starting point.
n/a	REM	Remove the association between a workload group and a workload specification. <b>Note:</b> Any associations that exist between the workload group and its the workload definitions are also removed when you perform this action.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.

## Hyperlink fields

Table 18 shows the hyperlink fields on the WLMINSPC view.

Table 18. WLMINSPC view hyperlink fields

Hyperlink field	View displayed	Description
Spec Name	WLMSPEC	Detailed information about the designated workload specification.

Table 18. WLMINSPC view hyperlink fields (continued)

Hyperlink field	View displayed	Description
Group Name	WLMGROUP	Detailed information about the designated workload group.

## Adding a workload group to a workload specification

Figure 27 illustrates the panel produced when you use the add (ADD) line action command from the WLMINSPC view.

```

----- Add WLM Group to Specification for EUPLX01 -----
COMMAND ==>

Specification Name ==> EYUWMS01  Spec Name or Generic

WLM Group Name      ==> EYUWMG01  Group Name or Generic

Press Enter to add WLM Group to Specification.
Type END or CANCEL to cancel without adding.
    
```

Figure 27. Adding a workload group to a workload specification

Provide the following information:

### Specification Name

Enter the specific or generic name of an existing workload specification. If you enter a generic value, a list of valid workload specifications is displayed.

### WLM Group Name

Enter the specific or generic name of an existing workload group. If you enter a generic value, a list of valid workload groups is displayed.

Press Enter to add the workload group to the designated workload specification in the data repository.

---

## WLMSCOPE (Workload specifications assigned a scope)

To display information about the CICS systems or CICS system groups acting as routing regions that are associated with a workload specification, issue the command:

```
WLMSCOPE [w1mspec]
```

where w1mspec is a specific or generic name of a workload specification. If you omit this parameter, the view, illustrated in Figure 28 on page 76, includes information about all workload specifications, and the associated routing scope information, within the current context.

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```

26FEB2001 22:03:43 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMSCOPE=====EYUPLX01=EYUPLX01=26FEB2001==22:03:43=CPSM=====1===
CMD WLM      Scope  Scope  Scope  Scope  Update
--- Spec---- Name---- Type---- Mode---- Link---- Option--
EYUWLS01 EYUMAS1A CICSSYS EXPLICIT
  
```

Figure 28. The WLMSCOPE view

## Action commands

Table 19 summarizes the action commands you can use with the WLMSCOPE view. Table 20 on page 77 identifies the overtypable fields you can modify when you use the SET action command.

Table 19. WLMSCOPE view action commands

Primary command	Line command	Description
n/a	BRO	Browse the association between a routing region scope and a workload specification.  The format of the resulting panel is similar to that shown in Figure 29 on page 77. The panel fields are not modifiable.
n/a	MAP	Display a visual map of workload management definitions using the designated specification as a starting point.
n/a	REM	Remove the association between a routing region scope and a workload specification, as described on page 78.
n/a	SET	Change the association between a routing scope and a workload specification using overtypable fields (see Table 13 on page 69). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you overtypable a field.
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.
n/a	UPD	Update the association between a routing scope and a workload specification, as described in “Updating a scope-to-workload specification association” on page 77.

When you change or remove the workload specification associated with a CICS system group, you must indicate how the CICS systems comprising that group are to be affected.

Based on the value you specify, the number of entries shown in the WLMSCOPE view may increase or decrease. For example, you might specify a value that causes a CICS system within a CICS system group to be explicitly associated with a

## creating workload management definitions

specification rather than inherit it from its CICS system group. When this happens, the resulting WLMSCOPE view still contains a line identifying the CICS system group (which retains its association with a specification) and a new line identifying the CICS system that is now explicitly associated with a specification (which may be the same as or different from the specification with which the CICS system group is associated).

Table 20. WLMSCOPE view overtyping fields

Field name	Value
WLM Spec	1- to 8-character name of an existing workload specification that is to be associated with the CICS system or CICS system group.
Update Option	FORCE   KEEP   NAME   NULL

### Notes:

1. When the scope of the workload specification is a CICS system group, you must indicate how the CICS systems comprising the CICS system group are to use the specification by overtyping the contents of the Update Option field.  
If the CICS system group includes other CICS system groups, all of the CICS systems, including those in the subordinate CICS system groups, are affected by the value specified in the Update Option field.
2. If you update the workload specification for a CICS system that is already active, you must restart the CICS system for the new specification to become active.

## Hyperlink fields

Table 21 shows the hyperlink field on the WLMSCOPE view.

Table 21. WLMSCOPE view hyperlink fields

Hyperlink field	View displayed	Description
WLM Spec	WLMSPEC	Detailed information about the designated workload specification.

## Updating a scope-to-workload specification association

Figure 29 illustrates the panel produced when you use the update (UPD) line action command from the WLMSCOPE view.

```
----- Update WLM Specification to Scope for EYUPLX01 -----  
COMMAND  ==>  
  
Specification Name  ==> EYUWMS01  Specification name or Generic  
Scope              EYUCSG01  
Scope Type        SYSGROUP  
  
Option            ==>          FORCE, KEEP, NAME, or NULL  
  
Press ENTER to update.  
Type END or CANCEL to cancel without updating.
```

Figure 29. Updating the association between a scope and a workload specification

The Option field does not appear on this panel when the scope is a CICS system (CICSSYS).

Change the following information, as appropriate:

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### Specification Name

Enter the specific or generic name of an existing workload specification. If you enter a generic value, a list of valid workload specifications is displayed.

### Option

When the scope of the workload specification is a CICS system group, you must indicate how the CICS systems comprising the CICS system group are to use the specification. To do this, specify one of the following:

#### FORCE

All CICS systems in the CICS system group are to inherit the new specification.

**KEEP** Any CICS system that inherited a specification from the CICS system group is to be explicitly assigned the old specification; all other CICS systems in the group are to be unaffected.

**NAME** Any CICS system that inherited a specification from the CICS system group is to be explicitly assigned the new specification; all other CICS systems in the group are to be unaffected.

**NULL** Any CICS system in the CICS system group that is not explicitly associated with a specification is to inherit the new specification; all other CICS systems in the group are to be unaffected.

#### Notes:

1. If the CICS system group includes other CICS system groups, all of the CICS systems, including those in the subordinate CICS system groups, are affected by the value specified in the Option field.
2. For the new specification to become active, you must restart the CICS systems with which it is associated.

## Removing a scope-to-workload specification association

Figure 30 illustrates the panel produced when you use the remove (REM) line action command from the WLMSCOPE view.

```
----- Confirm Removal of WLM Spec to Scope from EYUPLX01 -----  
COMMAND  ==>  
  
Specification Name      EYUWMS01  
Scope                  EYUCSG01  
Scope Type             SYSGROUP  
  
Option                  ==>          KEEP or Blank  
  
WARNING:  For this definition type, removal will cascade through  
          related associations.  
  
Press ENTER to remove.  
Type END or CANCEL to cancel without removing.
```

Figure 30. Removing the association between a scope and a workload specification

The Option field does not appear on this panel when the scope is a CICS system (CICSSYS).

Provide the following information when the scope is a CICS system group:

**Option**

Indicate how the CICS systems comprising the CICS system group are to use the workload specification associated with that CICS system group. Specify:

**KEEP** Those CICS systems that inherited the specification from the CICS system group are explicitly assigned that specification.

**blank** Those CICS system that inherited the specification from the CICS system group are not to use that specification.

If the CICS system group includes other CICS system groups, all of the CICS systems, including those in the subordinate CICS system groups, are affected by the value specified in this field.

Press Enter to remove the scope from the designated workload specification in the data repository.

## WLMSPEC (Workload specifications)

A workload specification identifies a workload and one or more CICS systems acting as target regions. It also defines the attributes of the default transaction group. The default transaction group (\$\$DTGA\$\$) is used for routing any transaction that is not explicitly associated with a user-defined transaction group. Once the workload specification is associated with a routing scope, it is automatically activated when the first routing region in the scope connects to the CICSplex.

Examples of how to use this view can be found in:

- "Chapter 10. Balancing a workload" on page 105
- "Chapter 13. Adding a routing region to an active workload" on page 113
- "Chapter 21. Updating a workload specification" on page 135
- "Chapter 22. Using real-time analysis to select a target region for workload balancing" on page 137

To display information about existing workload specifications, issue the command:

```
WLMSPEC [w1mscope]
```

where w1mscope is a specific or generic workload specification name. If you omit this parameter, the view, illustrated in Figure 31, includes information about all existing workload specifications within the current context.

```

26FEB2001 22:03:16 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
>W1 =WLMSPEC=====EYUPLX01=EYUPLX01=26FEB2001==22:03:16=CPSM=====1===
CMD Name      Affinity Affinity Target  Cre Match Event   Description
---          -
----- Relation Lifetime Scope--- Aff Key--- Name-----
EYUWLS01          EYUCSG03      USERID      SSet - Basic worklo
    
```

Figure 31. The WLMSPEC view

## creating workload management definitions

### Action commands

Table 22 summarizes the action commands you can use with the WLMSPEC view.

Table 22. WLMSPEC view action commands

Primary command	Line command	Description
n/a	ADD	Add an association between a workload specification and a scope identified as one or more routing regions, as described on page 84.
n/a	BRO	Browse a workload specification in the data repository.
CREate	CRE	<p>The format of the resulting panel is similar to that shown in Figure 32 on page 81. The panel fields are not modifiable.</p> <p>Create a workload specification and add it to the data repository, as described in Creating a workload specification.</p> <p>When you use the primary command CREate, some fields in the new view may contain values supplied by CICSplex SM; you may change these values. When you enter the line command CRE next to the name of a workload specification, fields in the new view contain values to be modelled (from the existing workload specification).</p>
n/a	MAP	Display a visual map of workload management definitions using the designated specification as a starting point.
n/a	REM	<p>Remove a workload specification from the data repository.</p> <p>When you remove a workload specification, associations with workload groups and the CICS system and CICS system group identified as the scope are also removed.</p>
TEMPMP cmasid	n/a	Change the temporary maintenance point CMAS to a specific CMAS or display a selection list based on a generic CMAS ID.
n/a	UPD	<p>Update a workload specification in the data repository.</p> <p>The format of the resulting panel is similar to the panel shown in Figure 32 on page 81. You can change the contents of any field in the panel except WLM Spec Name.</p>

### Hyperlink fields

Table 23 shows the hyperlink field on the WLMSPEC view.

Table 23. WLMSPEC view hyperlink field

Hyperlink field	View displayed	Description
Name	WLMINSPC	Detailed information about the associations that exist between the designated workload specification and its workload groups.

## Creating a workload specification

Figure 32 shows the format of the panel produced when you use the create primary (CREate) or line (CRE) action command from the WLMSPEC view.

```

----- Create WLM Specification for EYUPLX01 -----
COMMAND  ==>

WLM Spec Name      ==>
Description        ==> SSet - Basic Workload

Affinity Relation  ==>          Default Affinity Relation
                               (USERID, LUNAME, GLOBAL,BAPPL)
Affinity Lifetime  ==>          Default Affinity Lifetime
                               (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV,DELIMIT,
                               ACTIVITY, PROCESS)
Match Key          ==> USERID   Default Primary search criterion
                               (USERID,LUNAME)
Create Affinity    ==>          Create Auto Affinity (YES, NO, N/A)
Target Scope       ==> EYUCSG03 Default CICS System,Group or Generic
Event Name         ==>          RTADEF, STATDEF, or Generic

Abend Health       ==> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ==> 0        Target ABEND Load Factor (0 - 99) - 99)
Algorithm Type     ==> Queue   Algorithm Type (GOAL, QUEUE)

Press Enter to create WLM Specification.
Type END or CANCEL to cancel without creating.
    
```

Figure 32. Creating a workload specification

Provide the following information, as appropriate:

### WLM Spec Name

Specify a 1- to 8-character name for the workload specification. This name also becomes the name of the workload. The name can contain alphabetic, numeric, or national characters. However, the first character must be alphabetic. This name becomes the name of the workload and must be unique within the CICSplex.

### Description

Specify a 1- to 30-character description of the workload specification.

### Affinity Relation

(Optional.) Indicate the default affinity relationship that is to be used if a transaction cannot be matched to a transaction group. Specify:

#### 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 the default transaction group.

For workload management of enterprise beans, this field must be blank.

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### Affinity Lifetime

(Required when you specify a value in the Affinity Relation field.) Indicate the default affinity lifetime that is to be used when a transaction cannot be matched to a transaction group. Specify:

#### DELIMIT

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

Because an END pseudoconversation mode cannot be assigned to a transaction by default, using DELIMIT as a default is comparable to specifying a lifetime of SIGNON or LOGON.

#### 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 (LUTYPE6.2) devices.

#### PERMANENT

Maintain transaction affinity as long as the workload containing the default 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 BTS activity ends.

#### PROCESS

Maintain transaction affinity until the BTS process ends.

For workload management of enterprise beans, this field must be blank.

**Note:** The Affinity Relation and Affinity Lifetime fields are related. If you specify a value in the Affinity Relation field, you must specify a value in the Affinity Lifetime field. See Table 8 on page 58 for valid affinity and lifetime combinations.

### Match Key

Designate whether the user name (USERID) or logical unit name (LUNAME) is to be used as the default primary search criterion for a transaction that cannot be matched to a transaction group.

### Create Affinity

(Optional.) Indicate whether CICSplex SM should automatically create an affinity relationship for transactions that cannot be matched to a transaction group.

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### YES (or blank)

CICSplex SM creates an affinity using the values specified in the Affinity Relation 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 transaction 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. Customizing the dynamic routing program” on page 25 for details on EYU9WRAM and SM\_CREAFF.

### N/A

Affinity not defined (Affinity Relation and Affinity Lifetime fields are blank).

### Target Scope

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

### Event Name

(Optional.) Enter the specific or generic name of an analysis definition (RTADEF) or status definition (STATDEF) that may affect transactions associated with the default 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 for selecting a target region.

### Abend Health

(For CICS/ESA 4.1 or later.) Specify the abend probability for a transaction associated with the default transaction group that should cause a target region to be considered unhealthy:

**0**

Ignore target region abend health calculations.

**value**

Specify a value between 1 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 the default transaction group is considered unhealthy and is avoided, if possible.

### Abend Load

(For CICS/ESA 4.1 and later.) Specify the abend probability for a transaction associated with the default transaction 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 1 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 2 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

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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.

### Notes:

1. For additional information about specifying abend health and abend load values, see "Taking abend probabilities into consideration" on page 18.
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.

### Algorithm Type

Identify the algorithm to be used when selecting the best target region in the Target Scope to which a transaction should be routed. Specify:

#### QUEUE

Route the transaction to the target region that:

- Is the healthiest
- Has the least queue depth (or load)
- Has the fastest CICS link from the routing region
- Has the least transaction abend probability, when calculated

**GOAL** Supported in MVS/ESA 5.1 and higher where the MVS Workload Manager (MVS/WLM) is also supported. Additionally, the CICS system(s) specified in the target region Scope field must be CICS/ESA 4.1 and later. Route the transaction to the target region that:

- Is the healthiest
- Has the least load
- Has the fastest CICS link from the routing region
- Has the least transaction abend probability, when calculated
- Is the most likely to allow the transaction to meet the response time goal set for it and other transactions in its MVS workload management class

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

Press Enter to add the workload specification to the data repository.

## Adding a scope to a workload specification

Each workload specification has a target and routing scope associated with it. The target scope is identified when you create the specification; the routing scope is identified when you add the routing region to the specification.

**Note:** While WLMSPEC is active, you cannot directly modify the default target scope. However, you can create a new WLMDEF with an luname of \* (asterisk), a user id of \* (asterisk), a process type of \* (asterisk), no transaction group name, and a new target scope. If you then install the new WLMDEF, transactions will be routed according to the default transaction group for the new target scope.

Once you add a routing scope to a workload specification, the specification is automatically installed whenever a CICS system associated with that scope is started. Any workload definitions associated with the specification through workload groups are also automatically installed.

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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, you must display the MAS view and use the UPD action command. Specify YES in the WLM Active field and press Enter; workload management becomes active using the new workload specification.

Figure 33 illustrates the panel produced when you use the add (ADD) line action command from the WLMSPEC view.

```
----- Add Scope for Specification for EYUPLX01 -----
COMMAND  ==>

WLM Spec Name      EYUWMS04
Description        Test workload specification

Scope              ==>          CICS System, Group or Generic
Option             ==>          FORCE, NULL, or NONE for System Group

Press Enter to add Workload Specification Scope.
Type END or CANCEL to cancel without adding.
```

Figure 33. Adding a scope to a workload specification

Provide the following information, as appropriate:

**Scope** Enter the specific or generic name of an existing CICS system or group that represents one or more routing regions. If you enter a generic value, a list of valid CICS systems and CICS system groups is displayed.

All routing regions represented by the specified CICS system or group must be local MASs. That is, they must be running on an MVS image on which there is a CMAS.

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.

### Option

(Required when the scope is a CICS system group.) Indicate how the CICS systems that make up the CICS system group are to use the workload specification associated with the CICS system group. Specify:

#### FORCE

All CICS systems in 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.)

#### 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

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association, either explicitly established or inherited from another CICS system group, it is unchanged.

### Notes:

1. If the CICS system group identified as the scope 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. Press Enter to add the scope to the designated workload specification in the data repository.
2. The CICS systems designated as the 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.

---

## Chapter 9. Managing workloads

This chapter describes how you can obtain information about active workloads and the transactions and transaction groups comprising those workloads.

While the views described in this chapter are presented in alphabetical order, they can be subdivided into the following categories:

- Active workloads

### **WLMWORK**

Displays information about active workloads.

### **WLMWORD**

Displays detailed information about an active workload.

### **WLMAWTOR**

Displays information about active routing regions within a workload.

### **WLMAWTOS**

Displays summary information about active routing regions within a workload.

### **WLMAWAOR**

Displays information about active target regions within a workload.

### **WLMAWAOS**

Displays summary information about active target regions within a workload.

### **WLMAWDEF**

Displays information about active workload definitions.

- Transactions and transaction groups comprising an active workload

### **WLMATGRP**

Displays information about transaction groups associated with a workload.

### **WLMATAFD**

Displays a detailed view of the properties of a single active CICS BTS affinity.

### **WLMATAFF**

Displays information about transaction affinities for a transaction group or the affinities created using the default workload affinity.

### **WLMATAFS**

Displays a summary view of transaction affinities for a transaction group or the affinities created using the default workload affinity.

### **WLMATRAN**

Displays information about transactions associated with a workload.

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

You access the workload management operations views by:

- Issuing the appropriate workload management operations view command.
- Issuing the MENU WORKLOAD command and selecting a view from the menu. (An example of this menu is shown in Figure 34 on page 88.)

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- Initiating a hyperlink from one view to another by placing the cursor in the hyperlink field and pressing Enter.

```
26FEB2001 18:02:59 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =MENU=====EYUPLX01=EYUPLX01=26FEB2001==18:02:59=CPSM=====8===
CMD Name          Description
-----
WORKLOAD          Workload Operations Views
WLMWORK           Active Workloads
WLMAWTOR          Routing regions in an Active Workload
WLMAWTOS          Routing regions in an Active Workload Summary
WLMAWAOR          Target regions in an Active Workload
WLMAWAOS          Target regions in an Active Workload Summary
WLMAWDEF          Active Workload Definitions
WLMATGRP          Transaction Groups Associated with an Active Workload
WLMATAFF          Transaction Affinities for an Active Workload
WLMATRAN          Transactions Associated with an Active Workload
```

Figure 34. The WORKLOAD menu

For additional information about accessing views, see *CICSplex System Manager User Interface Guide*.

---

## WLMATAFD (Transaction affinities for an active workload)

The WLMATAFD view provides a detailed display of the properties of a single active CICS BTS affinity. This is useful when you need to view the contents of the CICS BTS affinity key in hexadecimal format.

### Access

#### Issue command:

```
WLMATAFD workload owner trangroup key
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

trangroup

Is the name of a specific transaction group or \$\$DTG\$\$\$. \$\$DTG\$\$\$ is the name of the default transaction group created by CICSplex SM and used by any transaction that is not explicitly assigned to a user-created transaction group.

key

Is the affinity key of the item to be detailed.

#### Hyperlink from:

The Key field of the WLMATAFF view.

Figure 35 is an example of the WLMATAFD view.

```

26FEB2001 11:30:30 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMATAFF=WLMATAFD=EYUPLX01=EYUPLX01=26FEB2001==11:30:30=CPSM=====
Trangrp.....          WL01
Workload.....          WLMSPEC1
Workload Owner        C6C1
Affinity.....          BAPPL
Lifetime.....          ACTIVITY
Target system.        EYUMAS2A
Key.....          BTSFILE1..GBIBMIYA..IGCS232..Krc... WLMTEST-COMplete
Key (Hex 1-26) C2C1D4C6C9D3C5F11910C7C2C9C2D4C9E8C14BC9C7C3E2F2F3F2
                (Hex 27-52) 1925D2D98335000130E6D3D4E3C5E2E360C3D6D4D7D3C5E3C540
    
```

Figure 35. The WLMATAFD view

### Action commands

None.

### Hyperlink fields

None.

---

## WLMATAFF (Transaction affinities for an active workload)

The WLMATAFF view shows information about the active affinities for a transaction group associated with 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.

### Access

**Issue command:**

```
WLMATAFF workload owner trangroup
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

trangroup

Is the name of a specific transaction group or \$\$DTGAS\$. \$\$DTGAS\$ is the name of the default transaction group created by CICSplex SM and used by any transaction that is not explicitly assigned to a user-created transaction group.

**Select:**

WLMATAFF from a menu of WORKLOAD views, being sure to specify the required parameters.

**Hyperlink from:**

The Affinity field of the WLMATGRP, WLMWORD or WLMWORK view.

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Figure 36 is an example of the WLMATAFF view.

```

26FEB2001 11:30:30 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMATAFF=====EYUPLX01=EYUPLX01=26FEB2001==11:30:30=CPSM=====
CMD Trngrp  Workload Ownr Affinity Lifetime Target  Key
-----
EYUWMT01  EYUWMS01 AOR1  USERID  PCONV   EYUMAS2A BTSFILE1..GBIBMIYA.IG
EYUWMT02  EYUWMS02
  
```

Figure 36. The WLMATAFF view

**Note:** The Key field contains either:

- A combination of user ID, logical unit name, routing region ID, and requesting region ID that matches the search criteria. This value is presented in the form:

```
userid.luname.route_id.request_id
```

If one or more components do not apply to the affinity, that portion of the key is blank.

For BAPPL affinities, this field contains the activity id of the CICS BTS activity.

- \$\$\$G\$\$\$, when the affinity is GLOBAL.

Since a key can be up to 52 characters in length, you may have to scroll the view to the right to see the entire key.

## Action commands

Table 24 shows the action command you can issue from the WLMATAFF view.

Table 24. WLMATAFF view action commands

Primary command	Line command	Description
n/a	FOR	Discard an affinity entry.  The affinity is reestablished when the next transaction within the affected transaction group is encountered.

## Hyperlink fields

Table 25 shows the hyperlink fields on the WLMATAFF view.

Table 25. WLMATAFF view hyperlink fields

Hyperlink field	View displayed	Description
Workload	WLMAWORK	Detailed information about the specified workload.
Trngrp	WLMATGRP	Detailed information about the specified transaction group.
Key (valid for CICS BTS affinities only)	WLMATAFD	Detailed information about the properties of a single active CICS BTS affinity.

---

## WLMATAFS (Summary of transaction affinities)

The WLMATAFS view shows summarized information about the active affinities for a transaction group associated with a workload within the CICSplex identified as the context. WLMATAFS is a summary form of the WLMATAFF view.

### Access

**Issue command:**

WLMATAFS workload owner trangroup

Where the parameters are the same as those for WLMATAFF on page 89.

**Select:**

WLMATAFS from a menu of WORKLOAD views, being sure to specify the required parameters.

**Summarize:**

Issue the SUM display command from a WLMATAFF view.

The WLMATAFS view looks like the WLMATAFF view shown in Figure 36 on page 90 with one addition: the Count field. This field appears next to the CICS System field, and indicates how many resources were combined to form each line of summary data.

By default, the view is summarized by CICS system. If you place the cursor on a field of data and issue the SUM display command, the view is summarized by the data in that field.

### Action commands

Table 26 shows the action command you can issue from the WLMATAFS view. This action command affects all of the affinities that were combined to form the summary line of data.

*Table 26. WLMATAFS view action commands*

Primary command	Line command	Description
n/a	FOR	Discard an affinity entry.  The affinity is reestablished when the next transaction within the affected transaction group is encountered.

**CAUTION:**

**Unacceptable results may occur if you attempt to discard an affinity when it is in effect.**

### Hyperlink fields

From the WLMATAFS view, you can hyperlink from the Count field to the WLMATAFF view to expand a line of summary data. The WLMATAFF view includes only those resources that were combined to form the specified summary line.

---

## WLMATGRP (Transaction groups associated with an active workload)

The WLMATGRP view shows information about transaction groups associated with a workload that is within the CICSplex identified as the context.

## managing workloads

### Access

#### Issue command:

```
WLMATGRP workload [owner[ACTIVE|DORMANT]]
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

ACTIVE|DORMANT

Limits the view to either active or dormant transaction groups. If you omit this parameter, transaction groups are included in the view regardless of their status.

#### Select:

WLMATGRP from a menu of WORKLOAD views, being sure to specify the required parameters.

#### Hyperlink from:

The Trangrp field of the WLMATAFF, WLMATRAN, or WLMWDEF view.

Figure 37 is an example of the WLMATGRP view.

```
26FEB2001 22:11:06 ----- INFORMATION DISPLAY -----
COMMAND ==> SCROLL ==> PAGE
CURR WIN ==> 1 ALT WIN ==>
>W1 =WLMATGRP=====EYUPLX02=EYUPLX02=26FEB2001==22:11:06=CPSM=====3==
CMD Trangrp Workload Ownr Status Cre Match Affinity Lifetime Event--- -Abe
----- Aff Key--- ----- Name--- Crit
EYUTRG02 EYUWLS02 CM1B ACTIVE NO LUNAME LUNAME LOGON 0 0
EYUTRG03 EYUWLS02 CM1B ACTIVE NO USERID NONE NONE 0 0
EYUTRG04 EYUWLS02 CM1B ACTIVE NO USERID NONE NONE 0 0
EYUTRGTS EYUCBTS1 CM1B ACTIVE YES USERID BAPPL ACTIVITY 0 0
```

Figure 37. The WLMATGRP view

**Note:** \$\$DTG\$\$ is the name of the default transaction group created by CICSplex SM. This transaction group is used by any transaction that is not explicitly assigned to a user-created transaction group.

### Action commands

Table 27 on page 93 shows the action command you can issue from the WLMATGRP view. The overtime field is shown in Table 28 on page 93.

Table 27. WLMATGRP view action commands

Primary command	Line command	Description
n/a	SET	Changes the status of a transaction group according to the value you specify in the overtyp field (see Table 28). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you overtyp a field.

Table 28. WLMATGRP view overtyp field

Field name	Values
Status	ACTIVE DORMANT  where:  <b>ACTIVE</b> Select a target region from the target region scope identified with the associated workload definition.  <b>DORMANT</b> Use the target region associated with the transaction when it was defined to CICS. Recognize the affinity settings only when the lifetime is pseudoconversation (PCONV). Otherwise, do not recognize the affinity relation and lifetime settings.

## Hyperlink fields

Table 29 shows the hyperlink fields on the WLMATGRP view.

Table 29. WLMATGRP view hyperlink fields

Hyperlink field	View displayed	Description
Workload	WLMWORK	Detailed information about the specified workload.
Affinity	WLMATAFF	Detailed information about the specified affinity.
Event Name	EVENT	Detailed information about a real-time analysis event that may affect the routing of transactions in the workload.

**Notes:**

- The Affinity field can be used as a hyperlink field only when it contains a value.
- The Event Name field displays the EVENT view only if an event of the specified type has occurred. If no event is outstanding, the following message is displayed:

**BBMXBD15I**

There is no data that satisfies your request

## WLMATRAN (Transactions associated with an active workload)

The WLMATRAN view shows information about all active transactions associated with a workload that is within the CICSplex identified as the context.

## managing workloads

### Access

#### Issue command:

```
WLMATRAN workload owner  
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

#### Select:

WLMATRAN from a menu of WORKLOAD views, being sure to specify the required parameters.

Figure 38 is an example of the WLMATRAN view.

```
26FEB2001 22:11:42 ----- INFORMATION DISPLAY -----  
COMMAND ==> SCROLL ==> PAGE  
CURR WIN ==> 1 ALT WIN ==>  
W1 =WLMATRAN=====EYUPLX02=EYUPLX02=26FEB2001==22:11:42=CPSM=====9===  
CMD Transid PCONV Trngrp Workload Ownr  
--- ----- Mode- -----  
ETA1 EYUTRG04 EYUWLS02 CM1B  
ETA2 EYUTRG04 EYUWLS02 CM1B  
ETA3 EYUTRG04 EYUWLS02 CM1B  
ETA4 EYUTRG04 EYUWLS02 CM1B  
ETL1 EYUTRG03 EYUWLS02 CM1B  
ETL2 EYUTRG03 EYUWLS02 CM1B  
ETL3 EYUTRG03 EYUWLS02 CM1B  
ETL4 EYUTRG03 EYUWLS02 CM1B  
ETVP EYUTRG02 EYUWLS02 CM1B
```

Figure 38. The WLMATRAN view

### Action commands

Table 30 shows the action command you can issue from the WLMATRAN view.

Table 30. WLMATRAN view action commands

Primary command	Line command	Description
DiSCard	DSC	Discard a transaction from a transaction group.

tran workload owner

#### Where:

**tran** Is the specific or generic name of a transaction.

#### workload

Is the specific or generic name of an active workload.

**owner** Is the specific or generic CICS system ID of a CMAS that created the workload.

**Note:** Discarding a transaction that is part of a pseudoconversation (as indicated by the PCONV Mode field); could have an adverse effect on the pseudoconversation.

## Hyperlink fields

Table 31 shows the hyperlink fields on the WLMATRAN view.

Table 31. WLMATRAN view hyperlink fields

Hyperlink field	View displayed	Description
Workload	WLMAWORK	Detailed information about the specified workload.
Trangrp	WLMATGRP	Detailed information about the specified transaction group.

## WLMAWAOR (Target regions in an active workload)

The WLMAWAOR view shows information about all target regions that are associated with a workload that is within the CICSplex identified as the context.

### Access

**Issue command:**

```
WLMAWAOR workload [owner]
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

**Select:**

WLMAWAOR from a menu of WORKLOAD views, being sure to specify the required parameters.

**Hyperlink from:**

The Target Scope field of the WLMAWORK view or the Target Count field of the WLMAWORD view.

Figure 39 is an example of the WLMAWAOR view.

```

26FEB2001 22:04:37 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1      ALT WIN ==>
W1 =WLMAWAOR=====EYUPLX01=EYUPLX01=26FEB2001==22:04:37=CPSM=====2===
CMD Workload Ownr Target  Status  Connection
----- Lost-----
EYUWLS01 CM1A EYUMAS2A ACTIVE
EYUWLS01 CM1A EYUMAS3A ACTIVE
    
```

Figure 39. The WLMAWAOR view

The Status field shows the current condition of each target region within the workload and reflects a subset of the possible status conditions for a CICS system. To determine the current status of all CICS systems, use the MAS view, as described in *CICSplex System Manager Operations Views Reference*.

## managing workloads

### Action commands

Table 32 shows the action command you can issue from the WLMWAOR view. The overtyp field is shown in Table 33.

Table 32. WLMWAOR view action commands

Primary command	Line command	Description
n/a	SET	Change target region routing activity according to the value you specify in the overtyp field (see Table 33). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you overtyp a field.

Table 33. WLMWAOR view overtyp field

Field name	Values
Status	ACTIVE QUIESCED  where: <b>ACTIVE</b> Causes the specified target region to be recognized so that it can participate in workload management. <b>QUIESCED</b> Causes 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.

### Hyperlink fields

Table 34 shows the hyperlink field on the WLMWAOR view.

Table 34. WLMWAOR view hyperlink field

Hyperlink field	View displayed	Description
Target	CICSRGND	Detailed information about the specified target region.

**Note:** The CICSRGND view requires a scope. If there is either no scope in effect or the target region is not part of the specified scope, there will be no data for the CICSRGND view. Make sure an appropriate scope is in effect before you hyperlink to CICSRGND.

---

## WLMAWAOS (Target regions in an active workload summary)

The WLMAWAOS view shows summarized information about all target regions that are associated with a workload that is within the CICSplex identified as the context. WLMAWAOS is a summary form of the WLMAWAOR view.

### Access

**Issue command:**

WLMAWAOS workload owner

Where the parameters are the same as those for WLMAWAOR on page “Access” on page 95.

**Select:**

WLMAWAOS from a menu of WORKLOAD views, being sure to specify the required parameters.

**Summarize:**

Issue the SUM display command from a WLMAWAOR view.

The WLMAWAOS view looks like the WLMAWAOR view shown in Figure 39 on page 95 with one addition: the Count field. This field appears next to the Ownr field, and indicates how many resources were combined to form each line of summary data.

By default, the view is summarized by CICS system. If you place the cursor on a field of data and issue the SUM display command, the view is summarized by the data in that field.

### Action commands

Table 35 shows the action command you can issue from the WLMAWAOS view.

*Table 35. WLMAWAOS view action commands*

Primary command	Line command	Description
n/a	SET	Change target region routing activity according to the value you specify in the ovrtype field (see Table 33 on page 96). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you ovrtype a field.

### Hyperlink fields

From the WLMAWAOS view, you can hyperlink from the Count field to the WLMAWAOR view to expand a line of summary data. The WLMAWAOR view includes only those resources that were combined to form the specified summary line.

---

## WLMAWDEF (Active workload definitions)

The WLMAWDEF view shows information about active workload definitions associated with a workload that is within the CICSplex identified as the context.

## managing workloads

### Access

**Issue command:**

```
WLMWDEF workload [owner [wlmdef]]  
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

wlmdef

Is the specific or generic name of a workload definition. If you omit this parameter, the view includes information about all definitions currently active in the specified workload.

**Select:**

WLMWDEF from a menu of WORKLOAD views, being sure to specify the required parameters.

**Hyperlink from:**

The Ownr field of the WLMWORK view.

Figure 40 is an example of the WLMWDEF view.

**Note:** A description can be 30 characters in length. You may have to scroll the view to the right to see the entire description.

### Action commands

Table 36 shows the action command you can issue from the WLMWDEF view.

```
26FEB2001 22:10:58 ----- INFORMATION DISPLAY -----  
COMMAND ==>  
CURR WIN ==> 1      ALT WIN ==>  
>W1 =WLMWDEF=====EYUPLX02=EYUPLX02=26FEB2001==22:10:58=CPSM=====3==  
CMD Name      Workload Ownr  Trngrp  Luname      Userid  Process Target  
-----  
EYUWLD02  EYUWLS02  CM1B  EYUTRG02  *          *      *      EYUMAS3B  
EYUWLD03  EYUWLS02  CM1B  EYUTRG03  *          *      *      EYUMAS1C  
EYUWLD04  EYUWLS02  CM1B  EYUTRG04  *          *      *      EYUCSG07
```

Figure 40. The WLMWDEF view

Table 36. WLMWDEF view action commands

Primary command	Line command	Description
DiSCard	DSC	Discard an active definition.
defname workload owner		
<b>Where:</b>		
<b>defname</b>		Is the specific or generic name of an active workload definition.
<b>workload</b>		Is the specific or generic name of an active workload.
<b>owner</b>		Is the specific or generic CICS system ID of a CMAS that created the workload.

**Important**

When you discard a workload definition, the transaction groups associated with that definition are also discarded if not referenced by any other workload definition. This means that any affinity relation and lifetime currently in effect for transactions associated with the transaction groups are lost. Thus, discarding a workload definition could have an unpredictable affect on active transactions that are associated with these transaction groups.

Before discarding a workload definition, you should use the WLMATGRP view, as described on page 91, to determine the status of transaction groups associated with the definition. You may want to set a transaction group dormant so that the target region associated with the transaction is recognized. Otherwise, the transaction will be routed to a target region associated with the default transaction group \$\$DTGA\$\$.

## Hyperlink fields

Table 37 shows the hyperlink fields on the WLMWDEF view.

*Table 37. WLMWDEF view hyperlink fields*

Hyperlink field	View displayed	Description
Workload	WLMWORK	Detailed information about the specified workload.
Trangrp	WLMATGRP	Detailed information about the specified transaction group.

**Note:** The Trangrp field can be used as a hyperlink field only when it contains a value.

---

## WLMWORD (Details of an active workload)

### Access

**Issue command:**

```
WLMWORD workload
workload
```

Is the name of an active workload.

**Select:**

WLMWORD from a menu of WORKLOAD views, being sure to specify the required parameters.

**Hyperlink from:**

The Name field of the WLMWORK view.

Figure 41 on page 100 is an example of the WLMWORD view.

## managing workloads

```
26FEB2001 22:04:19 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMWORK=WLMWORD=EYUPLX01=EYUPLX01=26FEB2001==22:04:09=CPSM=====1===
Workload Name.... EYUWLS01 Description SSet - Basic workload balance
Owner Name.....  CM1A
Router Count....    1
Target Count.....  2
Affinity.....      NONE
Affinity Lifetime  NONE
Target Scope.....  EYUCSG03
Event Name.....
Status.....        ACTIVE
Create Affinity..  NO
Algorithm Type...  QUEUE
Abend Health.....  0
Abend Load.....   0
```

Figure 41. The WLMWORD view

**Note:** A description can be 30 characters in length. You may have to scroll the view to the right to see the entire description.

## Action commands

None.

## Hyperlink fields

Table 38 shows the hyperlink fields on the WLMWORD view.

Table 38. WLMWORD view hyperlink fields

Hyperlink field	View displayed	Description
Affinity	WLMATAFF	Detailed information about the specified affinity.
Router Count	WLMAWTOR	The number of active CICS systems, identified as routing regions, associated with the workload.
Target Count	WLMAWAOR	The number of active CICS systems, identified as target regions, associated with the workload.

---

## WLMWORK (Active workloads)

The WLMWORD view shows information about an active workload within the CICSplex identified as the context. A workload is active within a CICSplex as long as:

- A CICS system that is acting as a routing or target region and is participating in the workload is connected to that CICSplex.
- Any transaction causes an affinity lifetime of PERMANENT to be established.

## Access

### Issue command:

```
WLMWORK [workload]
workload
```

Is the specific or generic name of an active workload. If you omit this parameter, the view includes information about all active workloads within the context.

**Select:**

WLMWORK from a menu of WORKLOAD views.

**Hyperlink from:**

The Workload field of the WLMATAFF, WLMATGRP, WLMATRAN, or WLMWDEF view.

Figure 42 is an example of the WLMWORK view.

```

26FEB2001 22:09:30 ----- INFORMATION DISPLAY -----
COMMAND ==> SCROLL ==> PAGE
CURR WIN ==> 1 ALT WIN ==>
>W1 =WLMWORK=====EYUPLX02=EYUPLX02=26FEB2001==22:09:30=CPSM=====1===
CMD Name   Ownr Rout Targ Affinity Lifetime Scope Event Status Cre Alg
-----
          Cnt- Cnt- -----
          Name----- Aff --
EYUWLS02 CM1B 1 1 NONE NONE EYUCSG06 ACTIVE NO QUE
    
```

Figure 42. The WLMWORK view

**Note:** Scroll to the right to see the description associated with each workload.

**Action commands**

None.

**Hyperlink fields**

Table 39 shows the hyperlink fields on the WLMWORK view.

Table 39. WLMWORK view hyperlink fields

Hyperlink field	View displayed	Description
Name	WLMWORD	Detailed information about the specified workload.
Ownr	WLMWDEF	Lists of the workload definitions associated with the workload.
Rout Cnt	WLMWTOR	Number of active CICS systems, identified as routing regions, that are associated with the workload.
Targ Cnt	WLMWAOR	Number of active CICS systems, identified as target regions, that are associated with the workload.
Affinity	WLMATAFF	Detailed information about the specified affinity.
Event Name	EVENT	Detailed information about a real-time analysis event that may affect the routing of transactions in the workload.

**Notes:**

- Affinity can be used as a hyperlink field only when it contains a value.
- Event Name displays the EVENT view only if an event of the specified type has occurred. If no event is outstanding, the following message is displayed:

**BBMXBD15I**

There is no data that satisfies your request

## WLMAWTOR (Routing regions in an active workload)

The WLMAWTOR view shows information about all active routing regions that are associated with a workload that is within the CICSplex identified as the context.

### Access

**Issue command:**

```
WLMAWTOR workload [owner]
workload
```

Is the name of an active workload.

owner

Is the specific or generic 4-character CICS system ID of a CMAS that created the workload.

**Select:**

WLMAWTOR from a menu of WORKLOAD views, being sure to specify the required parameters.

**Hyperlink from:**

The Routing field of the WLMAWORK view or the Rout Cnt field of the WLMAWORD view.

Figure 43 is an example of the WLMAWTOR view.

```

26FEB2001 22:04:27 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMAWTOR=====EYUPLX01=EYUPLX01=26FEB2001==22:04:27=CPSM=====1===
CMD Workload Ownr Router  Connection
----- Lost-----
EYUWLS01 CM1A EYUMAS1A
    
```

Figure 43. The WLMAWTOR view

### Action commands

None.

### Hyperlink fields

Table 40 shows the hyperlink field on the WLMAWTOR view.

Table 40. WLMAWTOR view hyperlink field

Hyperlink field	View displayed	Description
Router	CICSRGND	Detailed information about the specified routing region.

**Note:** The CICSRGND view requires a scope. If there is either no scope in effect or the target region is not part of the specified scope, there will be no data for the CICSRGND view. Make sure an appropriate scope is in effect before you hyperlink to CICSRGND.

## WLMAWTOS (Routing regions in an active workload summary)

The WLMAWTOS view shows summarized information about all routing regions that are associated with a workload that is within the CICSplex identified as the context. WLMAWTOS is a summary form of the WLMAWTOR view.

### Access

**Issue command:**

WLMAWTOS workload owner

Where the parameters are the same as those for WLMAWTOR on page 102.

**Select:**

WLMAWTOS from a menu of WORKLOAD views, being sure to specify the required parameters.

**Summarize:**

Issue the SUM display command from a WLMAWTOR view.

The WLMAWTOS view looks like the WLMAWTOR view shown in Figure 43 on page 102 with one addition: the Count field. This field appears next to the Ownr field and indicates how many resources were combined to form each line of summary data.

By default, the view is summarized by CICS system. If you place the cursor on a field of data and issue the SUM display command, the view is summarized by the data in that field.

### Action commands

Table 41 shows the action command you can issue from the WLMAWTOS view.

*Table 41. WLMAWTOS view action commands*

Primary command	Line command	Description
n/a	SET	Change target region routing activity according to the value you specify in the oertype field (see Table 33 on page 96). <b>Note:</b> The value you specified in the Require Set field on the CICSplex System Manager entry panel determines whether or not you must use the SET command when you oertype a field.

### Hyperlink fields

From the WLMAWTOS view, you can hyperlink from the Count field to the WLMAWTOR view to expand a line of summary data. The WLMAWTOR view includes only those resources that were combined to form the specified summary line.



## Chapter 10. Balancing a workload

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows what you have to do 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 going to be the one with the shortest queue of work requests. The TOR (CICSPT01) is the requesting region and the routing region, and the three AORs (CICSIPA01, CICSIPA02, and CICSIPA03) 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 (“Chapter 15. Routing a specific transaction to a specific target region” on page 117).

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Create a CICS system group.

The group will include all of the target regions among which the work requests (“the workload”) can be routed dynamically.

From the current view, issue the command CICSGRP. From the CICSGRP view, issue the command CRE. Complete the Create System Group panel as shown here, and press Enter:

```
----- Create System Group for PLXPROD1 -----  
COMMAND  ==>  
  
System Group name ==> CSGTGTS1  
Description       ==> All target regions in CICSplex PLXPROD1  
  
Press Enter to Create System Group.  
Type END or CANCEL to cancel without creating.
```

The CICSGRP view is redisplayed, this time showing an entry for CICS system group CSGTGTS1.

At this point, the group CSGTGTS1 exists, but is empty. The next step is to tell CICSplex SM which target regions belong to the group.

3. Add target regions to CICS system group CSGTGTS1.

Tab to the CSGTGTS1 entry in the CICSGRP view, and issue ADD from the line-command field. Complete the Add Member to System Group panel as shown here, and press Enter:

```

----- Add Member to System Group for PLXPROD1 -----
COMMAND  ===>

System Group Name  CSGTGTS1
Description        All target regions in CICSplex PLXPROD1
Member            ===> CICSSPA01          CICS System, Group or Generic

Component Spec     Inherit

Press Enter to add Member to System Group.
Type END or CANCEL to cancel without adding.

```

(You'll find that the System Group Name and Description fields are filled in already. The Member name field is the only one you need to complete. You can ignore the rest of the panel.)

Repeat this step for target regions CICSSPA02 and CICSSPA03.

4. Create a workload specification.

Issue the command WLMSPEC from the current view. From the WLMSPEC view, issue the command CRE. Complete the Create WLM Specification panel as shown here, and press Enter:

```

----- Create WLM Specification for PLXPROD1 -----
COMMAND  ===>

WLM Spec Name      ===> WLSPAY01
Description        ===> Balance payroll workload in PLXPROD1

Affinity Relation  ===>          Default Affinity Relation
                   (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ===>          Default Affinity Lifetime
                   (SIGNON, LOGON, SYSTEM, PERMANENT,PCONV,DELIMIT,
                   ACTIVITY, PROCESS)
Match Key          ===> USERID   Default Primary search criterion
                   (USERID,LUNAME)
Create Affinity    ===>          Create Auto Affinity (YES, NO)
Target Scope      ===> CSGTGTS1  Default CICS System,Group or Generic
Event Name        ===>          RTADEF, STATDEF, or Generic

Abend Health      ===> 0         Target ABEND Health Factor (0 - 99)
Abend Load        ===> 0         Target ABEND Load Factor (0 - 99)
Algorithm Type    ===> QUEUE     Algorithm Type (GOAL, QUEUE)

Press Enter to create WLM Specification.
Type END or CANCEL to cancel without creating.

```

You must supply:

- A name for the specification (WLSPAY01 in this example).
- A Match Key value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the Match Key value has no effect on simple workload balancing. It's 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.
- A Target Scope value, which is the name of the single target region, or group of target regions, to which work requests can be routed.

- An Algorithm Type value. (For this example, use QUEUE, which tells CICSplex SM to select the target region that has the shortest queue of work requests.)

You should also provide a Description value. This is optional, but it's worth providing. (When you're confronted with a list of specification names, and have no way of telling one from another, you'll appreciate its value.)

When you press Enter, the WLMSPEC view is redisplayed, this time showing an entry for the new WLM Specification, WLSPAY01.

**Note:** For a complete description of the WLMSPEC view, see "WLMSPEC (Workload specifications)" on page 79.

5. Associate the workload specification with a routing region.

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.

- a. In the WLMSPEC view, tab to the entry for the WLSPAY01 specification, and issue ADD from the line-command field.
- b. In the Scope field of the Add Scope for Specification panel, enter the name of the routing region (CICSPT01, in this example). You can ignore the Option field, which must be completed only when the Scope field contains the name of a CICS system group of routing regions.

You can check that the association between the routing region and the workload specification has worked by looking at the WLMSCOPE view. Issue the command WLMSCOPE WLSPAY01 from the current view.

6. Activate workload balancing in the routing region.

Issue the command CICSSYS from the current view. In the CICSSYS view, tab to the line-command field for the CICSPT01 entry and issue the UPD command. Page forward until you see the Update System - Workload Attributes panel. In the Routing support active field, enter YES. This change takes effect when CICSPT01 is next started.

7. Activate workload balancing in the target regions.

In the CICSSYS view, tab to the line-command field for the CICSPA01 entry and issue the UPD command. Page forward until you see the Update System - Workload Attributes panel. In the Target routing at startup field, enter YES. 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 by issuing the command WLMWORK WLSPAY01 from the current view. The WLMWORK view is displayed, showing the workload specification WLSPAY01 as active.

To see which target regions are being routed to, issue the command WLMWAOR WLSPAY01 from the current view. The WLMWAOR view is displayed, showing all active target regions being routed to within workload WLSPAY01. All of the target regions listed belong to the CICS system group CSGTGTS1. If you're interested in knowing how work is being shared out among the target regions in CSGTGTS1, change the scope to CSGTGTS1 and look at the LOCTRAN view.



---

## Chapter 11. Adding a region to an existing target region scope

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example task shows how you can 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 (via the CICSSYS panels) and is running.

1. If the current context isn't PLXPROD1, issue the command `CON PLXPROD1`.
2. Add target region CICSPA04 to CICS system group CSGTGTS1.

From the current view, issue the command `CICSGRP`. The `CICSGRP` view is displayed. Move the cursor to the entry for CSGTGTS1, and issue `ADD` from the line-command field. The Add Member to System Group panel is displayed. In the Member field, enter the name CICSPA04.

3. Update the CICSplex SM definition of target region CICSPA04.

From the current view, issue the command `CICSSYS`. In the `CICSSYS` view, type `UPD` in the line-command field against the entry for CICSPA04. Then, page forward (using PF8) until you see the Update System - Workload Attributes panel. In the Target routing at startup field, enter `YES`. The `CICSSYS` view is redisplayed. This change takes effect when the target region CICSPA04 is next started.

When the target region CICSPA04 has been restarted, you can verify that CICSPA04 can be routed to by issuing the command `WLMWAOR WLSPAY01` from the current view. The `WLMWAOR` view is displayed, showing all target regions (including CICSPA04) to which work requests in this workload can be routed.



---

## Chapter 12. Removing a region from a target region scope

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

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. Now you want to remove region CICSPA04 from the group CSGTGTS1, without disrupting the active workload.

1. If the current context isn't PLXPROD1, issue the command `CON PLXPROD1`.
2. Remove target region CICSPA04 from CICS system group CSGTGTS1.

From the current view, issue the command `SYSGRPC CSGTGTS1`. The `SYSGRPC` view is displayed, showing all target regions in the group. Tab to the entry for CICSPA04, and issue `REM` from the line-command field. The `Remove System from System Group` panel is displayed. To confirm that CICSPA04 should be removed from the group, simply press `Enter`.

3. To check that CICSPA04 has indeed been removed, issue the command `WLMAWAOR WLSPAY01` from the current view. The `WLMAWAOR` view is displayed, showing target regions to which the workload can be routed. CICSPA04 does not appear in the list.



---

## Chapter 13. Adding a routing region to an active workload

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example task shows how 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 CICSSYS panels) and is running.

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Update the CICSplex SM definition for CICS system CICSPT02.

From the current view, issue the command CICSSYS. In the CICSSYS view, type UPD in the line-command field against the entry for CICSPT02. Then, page forward (using PF8) until you see the Update System - Workload Attributes panel. In the field Routing support active, type YES and press Enter. The CICSSYS view is redisplayed. This change takes effect when routing region CICSPT02 is next started.

3. Associate CICSPT02 with workload specification WLSPAY01.

From the current view, issue the command WLMSPEC. In the WLMSPEC view, move the cursor to the entry for WLSPAY01 and issue ADD from the line-command field. The Add Scope for Specification panel is displayed. Enter CICSPT02 in the Scope field. The WLMSPEC view is redisplayed.

**Note:** For a complete description of the WLMSPEC view, see “WLMSPEC (Workload specifications)” on page 79.

When CICSPT02 has been restarted, you can verify that it has been added to WLSPAY01 by issuing the command WLMSCOPE WLSPAY01 from the current view. The WLMSCOPE view, showing both CICSPT01 and CICSPT02 in the Scope Name field, is displayed.

To check that CICSPT02 is part of the active workload, issue the command WLMAWTOR WLSPAY01 from the current view. The WLMAWTOR view, showing entries for both CICSPT01 and CICSPT02, is displayed.



## Chapter 14. Quiescing a target region in an active workload

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example task shows you how 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. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. List the target regions associated with workload WLSPAY01.

From the current view, issue the command WLMWAOR WLSPAY01. The WLMWAOR view for workload specification WLSPAY01 is displayed:

```
26FEB2001 22:04:37 ----- INFORMATION DISPLAY -----
COMMAND ==>                                SCROLL ==> PAGE
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMWAOR=====PLXPROD1=PLXPROD1=26FEB2001==22:04:37=CPSM=====3===
CMD Workload Ownr Target  Status  Connection
----- Lost-----
      WLSPAY01 CM1A CICSIPA01 ACTIVE
      WLSPAY01 CM1A CICSIPA02 ACTIVE
      WLSPAY01 CM1A CICSIPA03 ACTIVE
```

3. Quiesce target region CICSIPA03.

Tab to the entry for target region CICSIPA03, overwrite the Status value ACTIVE with QUIESCED, and press Enter. (If simple overtyping of values is not possible in your CICSplex SM environment, you have to type SET in the line-command field of the entry for CICSIPA03 before you overwrite ACTIVE with QUIESCED.) The Target Status value changes to QUIESCED. No new work requests are routed to the target region, though any work already running there is allowed to complete.



## Chapter 15. Routing a specific transaction to a specific target region

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

The example tasks described so far in this chapter have all been concerned with workload balancing. This example shows how to define some workload separation requirements to CICSplex SM. Specifically, you want CICSplex SM always to route the transaction PAY1 to the target region CICSPA02, 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 current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a transaction group.
  - a. From the current view, issue the command TRANGRP. The TRANGRP view is displayed, listing any transaction groups already created in PLXPROD1.
  - b. From the TRANGRP view, issue the command CRE. The Create Trangroup panel is displayed. Complete the panel as shown here:

```
----- Create Trangroup for PLXPROD1 -----
COMMAND  ===>

Trangroup name  ===> TRGPAY01
Description     ===> Send PAY1 to CICSPA02

Status          ===> ACTIVE           Transaction Group Status
                                         (ACTIVE,DORMANT)
Match Key       ===> USERID          Primary WLMDEF search criterion
                                         (USERID,LUNAME)
Affinity Relation ===>                Optional affinity relation may be:
                                         (USERID,LUNAME,GLOBAL, BAPPL)
Affinity Lifetime ===>              Optional affinity lifetime may be:
                                         (SIGNON,LOGON,PCONV,DELIMIT,SYSTEM,PERMANENT,
                                         ACTIVITY, PROCESS)
Create Affinity ===>                Create Auto Affinity (YES, NO, N/A)
Event Name      ===>                RTADEF/STATDEF, or Generic
Abend Health    ===> 0              Target ABEND Health Factor (0 - 99)
Abend Load      ===> 0              Target ABEND Load Factor (0 - 99)
Press Enter to create Trangroup.
Type END or CANCEL to cancel without creating.
```

Press Enter. The TRANGRP view is redisplayed, now showing the name of the transaction group TRGPAY01.

**Note:** For a complete description of the TRANGRP view, see “TRANGRP (Transaction groups)” on page 52.

3. Add transaction PAY1 to transaction group TRGPAY01.  
In the TRANGRP view, tab to the entry for TRGPAY01, and issue ADD from the line-command field. The Add Transaction to Trangroup panel is displayed. Type the name PAY1 in the Transaction Name field, and press ENTER. The TRANGRP view is redisplayed.
4. Create a workload definition.
  - a. From the command line of the current view, issue the command WLMDEF. The WLMDEF view is displayed, listing any workload definitions already created in PLXPROD1.
  - b. From the WLMDEF view, issue the command CRE. The Create Workload Definition panel is displayed. Complete the panel as shown here:

```

----- Create Workload Definition for PLXPROD1 -----
COMMAND  ===>

Definition Name      ===> WLDAPY01
Description          ===> Separate TRGPAY01 to CICSIPA02

Trangroup Name      ===> TRGPAY01      Specific Trangroup, Generic, or Blank
Terminal Luname     ===> *             Specific or pattern Luname
User Id             ===> *             Specific or pattern Userid
Process Type        ===> *             Specific or pattern Process Type
Target Scope        ===> CICSIPA02     CICS System, Group, or Generic

Press Enter to create definition.
Type END or CANCEL to cancel without creating.

```

The Target Scope value is the name of the target region to which you want transactions in group TRGPAY01 to be routed.

Press Enter. The WLMDEF view is redisplayed.

**Note:** For a complete description of the WLMDEF view, see “WLMDEF (Workload definitions)” on page 60.

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.)

  - a. Issue the command WLMGROUP from the current view. The WLMGROUP view is displayed, listing any workload groups already created in PLXPROD1.
  - b. From the WLMGROUP view, issue the command CRE. The Create WLM Group panel is displayed. Complete the panel as shown here:

```

----- Create WLM Group for PLXPROD1 -----
COMMAND  ===>

Group Name          ===> WLGPAY01
Description         ===> Workload Group for WLDAPY01

Press Enter to create Workload Group.
Type END or CANCEL to cancel without creating.

```

Press Enter. The WLMGROUP view is redisplayed.

**Note:** For a complete description of the WLMGROUP view, see “WLMGROUP (Workload groups)” on page 67.

6. Add the workload group WLGPAY01 to the existing workload specification WLSPAY01.
  - a. In the WLMGROUP view, move the cursor to the entry for WLGPAY01, and issue ADD from the line-command field. The Add WLM Group to Workload Specification panel is displayed.
  - b. In the Specification Name field, enter the name of the existing workload specification, WLSPAY01. The WLMGROUP view is redisplayed.
7. Add the workload definition to the workload group.
  - a. From the current view, issue the command WLMDEF WLDAPY01. The WLMDEF view is displayed.
  - b. Move the cursor to the entry for WLDAPY01, and issue ADD from the line-command field. The Add WLM Definition to Workload Group panel is displayed. In the Workload Group Name field, type WLGPAY01 and press Enter. The WLMDEF 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 wouldn't take effect until the routing region CICSPT01 and the target regions in CICS system group CSGTGTS1, were next started.

From the current view, issue the command WLMGROUP. In the WLMGROUP view, tab to the entry for WLGPAY01 and issue INS from the line-command field. Complete the Install WLMGROUP panel as shown here, and press Enter.

```
----- Install WLMGROUP for PLXPROD1-----  
COMMAND  ===>  
  
Name          WLGPAY01  
Description    Workload Group for WLDAPY01  
  
Type          WLMGROUP  
  
Workload      ===> WLSPAY01 Active Workload in which to install the WLMGROUP  
                Or Generic  
Owner         ===> *      Owner of the Workload in which to install the WLMGROU  
                Or Generic  
  
Press Enter to install definitions.  
Type END or CANCEL to cancel without installing.
```

The Owner value is the SYSID of the system on which the workload specification WLSPAY01 was created. If you enter a generic value in this field, CICSplex SM presents a list from which you can select the correct value.

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 issuing the command WLMWDEF WLSPAY01 from the current view. The WLMWDEF view, showing an entry for WLDAPY01 in workload WLSPAY01 with a Target Scope field value of CICSSPA02, is displayed. When transaction PAY1 is next started, by any user and from any terminal, CICSplex SM will route it to target region CICSSPA02.



## Chapter 16. Routing particular transactions from a given user to a specific target region

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 varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example task is a refinement of the previous example (“Chapter 15. Routing a specific transaction to a specific target region” on page 117). 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 CICSAPA03 in CICSplex PLXPROD1.

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a transaction group.
  - a. From the current view, enter TRANGRP. The TRANGRP view is displayed, listing any transaction groups already defined in PLXPROD1.
  - b. From the TRANGRP view, enter CRE. The Create Trangroup panel is displayed. Complete the panel as shown here:

```
----- Create Trangroup for PLXPROD1 -----
COMMAND  ==>>

Trangroup name  ==>> TRGPAY02
Description     ==>> Send USRPAY03's transactions to CICSAPA03

Status         ==>> ACTIVE           Transaction Group Status
                                         (ACTIVE,DORMANT)
Match Key      ==>> USERID          Primary WLMDEF search criterion
                                         (USERID,LUNAME)
Affinity Relation ==>>              Optional affinity relation may be:
                                         (USERID,LUNAME,GLOBAL, BAPPL)
Affinity Lifetime ==>>              Optional affinity lifetime may be:
                                         (SIGNON,LOGON,PCONV,DELIMIT,SYSTEM, PERMANENT
                                         ACTIVITY, PROCESS)

Create Affinity ==>>              Create Auto Affinity (YES, NO, N/A)
Event Name     ==>>              RTADEF/STATDEF, or Generic
Abend Health   ==>> 0             Target ABEND Health Factor (0 - 99)
Abend Load     ==>> 0             Target ABEND Load Factor (0 - 99)

Press Enter to create Trangroup.
Type END or CANCEL to cancel without creating.
```

You can ignore any fields that have been left blank. Press Enter. The TRANGRP view is redisplayed, now showing the name of the transaction group TRGPAY02.

**Note:** For a complete description of the TRANGRP view, see “TRANGRP (Transaction groups)” on page 52.

3. Identify the transactions that belong to group TRGPAY02.

In the TRANGRP view, tab to the entry for TRGPAY02, and issue ADD from the line-command field. The Add Transaction to Trangroup panel is displayed. Complete four of the Transaction fields with the values PAY6, PAY7, PAY8, and PAY9 respectively, and press Enter. The TRANGRP view is redisplayed.

4. Create a workload definition.
  - a. From the command line of the current view, issue the command WLMDEF. The WLMDEF view is displayed.
  - b. From the WLMDEF view, issue the command CRE. The Create Workload Definition panel is displayed. Complete the panel as shown here:

```

----- Create Workload Definition for PLXPROD1 -----
COMMAND  ==>

Definition Name      ==> WLDAPY02
Description          ==> Separate TRGPAY02 to CICSPA03

Trangroup Name      ==> TRGPAY02      Specific Trangroup, Generic, or Blank
Terminal Luname     ==> *             Specific or pattern Luname
User Id             ==> USRPAY03      Specific or pattern Userid
Process Type        ==> *             Specific or pattern Process Type
Target Scope        ==> CICSPA03      CICS System, Group, or Generic

Press Enter to create definition.
Type END or CANCEL to cancel without creating.

```

These values tell CICSplex SM that transactions in group TRGPAY02 and initiated by user USRPAY03 must be routed to target region CICSPA03.

Press Enter. The WLMDEF view is redisplayed.

**Note:** For a complete description of the WLMDEF view, see “WLMDEF (Workload definitions)” on page 60.

5. Add the workload definition to the existing workload group.
 

In the WLMDEF view, move the cursor to the entry for WLDAPY02, and issue ADD from the line-command field. The Add WLM Definition to Workload Group panel is displayed. In the Workload 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 WLSPAY01. When you press Enter, the WLMDEF view is redisplayed.
6. Install the new workload definition into the active workload.
 

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.

In the WLMDEF view, tab to the entry for WLDAPY02 again and issue INS from the line-command field. The Install WLMDEF panel is displayed. Complete the panel as shown here, and press Enter.

```
----- Install WLMDEF for PLXPROD1 -----
COMMAND ==>

Name          WLDAPY02
Description   Separate TRGPAY02 to CICSPA03

Type          WLMDEF

Workload ==> WLSPAY01 Active Workload in which to install the WLMDEF
                Or Generic
Owner    ==> *      Owner of the Workload in which to install the WLMDEF
                Or Generic

Press Enter to install Workload Definition.
Type END or CANCEL to cancel without installing.
```

The Owner value is the SYSID of the system on which the workload specification WLSPAY01 was created. If you enter a generic value in this field, CICSplex SM presents a list from which you can select the correct value.

Because you have explicitly installed the workload definition WLDAPY02 in the active workload WLSPAY01, the workload separation requirements you have defined in this example take immediate effect. You can check that the new workload definition WLDAPY02 is active by issuing the command WLMWDEF WLSPAY01 from the current view. The WLMWDEF view, showing an entry for WLDAPY02 in workload WLSPAY01 with a Target Scope field value of CICSPA03, is displayed.



## Chapter 17. Honoring a pseudoconversational transaction

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

In this example, you'll learn how 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. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a transaction group.
  - a. From the current view, issue the command TRANGRP. The TRANGRP view is displayed, listing any transaction groups already defined in PLXPROD1.
  - b. From the TRANGRP view, issue the command CRE. The Create Trangroup panel is displayed. Complete the panel as shown here:

```
----- Create Trangroup for PLXPROD1 -----
COMMAND  ==>

Trangroup name  ==> TRGPAY03
Description     ==> Pseudoconversational transaction

Status         ==> ACTIVE           Transaction Group Status
                                     (ACTIVE,DORMANT)
Match Key      ==> USERID         Primary WLMDEF search criterion
                                     (USERID,LUNAME)
Affinity Relation ==> USERID       Optional affinity relation may be:
                                     (USERID,LUNAME,GLOBAL, BAPPL)
Affinity Lifetime ==> PCONV        Optional affinity lifetime may be:
                                     (SIGNON,LOGON,PCONV,DELIMIT,SYSTEM, PERMANENT
                                     ACTIVITY, PROCESS)
Create Affinity ==>                Create Auto Affinity (YES, NO, N/A)
Event Name     ==>                RTADEF/STATDEF, or generic
Abend Health   ==> 0               Target ABEND Health Factor (0 - 99)
Abend Load     ==> 0               Target ABEND Load Factor (0 - 99)
Press Enter to create Trangroup.
Type END or CANCEL to cancel without creating.
```

Notice that the Affinity Relation 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. Press Enter. The TRANGRP view is redisplayed, now showing the name of the transaction group TRGPAY03.

**Note:** For a complete description of the TRANGRP view, see “TRANGRP (Transaction groups)” on page 52.

3. Identify the transactions in group TRGPAY03.

From the TRANGRP view, move the cursor to the entry for TRGPAY03, and issue ADD from the line-command field. The Add Transaction to Trangroup panel is displayed. Complete the panel as shown here:

```

----- Add Transaction to Trangroup for PLXPROD1 -----
COMMAND  ===>

  Trangroup          TRGPAY03

  Transaction        PCONV Mode      Error
===> PAY2            ===> START
===> PAY3            ===>
===> PAY4            ===>
===> PAY5            ===> END
===>
===>
===>
===>
===>
===>
===>

Press Enter to add Transaction to Trangroup.
Type END or CANCEL to cancel without adding.

```

As you can see from this panel, there are four transactions in this group (PAY2, PAY3, PAY4, and PAY5). PAY2 starts the pseudoconversation, and PAY5 ends it. Press Enter. The TRANGRP view is redisplayed.

4. Create a workload definition.
  - a. From the command line of the current view, issue the command WLMDEF. The WLMDEF view is displayed.
  - b. From the WLMDEF view, issue the command CRE. The Create Workload Definition panel is displayed. Complete the panel as shown here:

```

----- Create Workload Definition for PLXPROD1 -----
COMMAND  ===>

  Definition Name     ===> WLDAPAY03
  Description         ===> TRGPAY03 to the same target region
  Trangroup Name     ===> TRGPAY03      Specific Trangroup, Generic, or Blank
  Terminal Luname    ===> *             Specific or pattern Luname
  User Id            ===> *             Specific or pattern Userid
  Process Type       ===> *             Specific or pattern Process Type
  Target Scope       ===> CSGTGTS1     CICS System, Group, or Generic

Press Enter to create definition.
Type END or CANCEL to cancel without creating.

```

These values tell CICSplex SM that transactions in group TRGPAY03, initiated by any user and from any terminal, 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.

Press Enter. The WLMDEF view is redisplayed.

**Note:** For a complete description of the WLMDEF view, see “WLMDEF (Workload definitions)” on page 60.

5. Add the workload definition to the workload group.

In the WLMDEF view, move the cursor to the entry for WLDAPAY03, and issue ADD from the line-command field. The Add WLM Definition to Workload Group panel is displayed. In the Workload Group Name field, type WLGPAY01 and press Enter. The WLMDEF view is redisplayed.

6. Install the new workload definition into the active workload.

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.

In the WLMDEF view, tab to the entry for WLDAPAY03 again and issue INS from the line-command field. The Install WLMDEF panel is displayed. Complete the panel as shown here, and press Enter.

```
----- Install WLMDEF for PLXPROD1 -----
COMMAND  ===>

Name      WLDAPAY03
Description TRGPAY03 to the same target region
Type      WLMDEF

Workload  ===> WLSPAY01 Active Workload in which to install the WLMDEF
              Or Generic
Owner    ===> *      Owner of the Workload in which to install the WLMDEF
              Or Generic

Press Enter to install Workload Definition.
Type END or CANCEL to cancel without installing.
```

The Owner value is the SYSID of the system on which the workload specification WLSPAY01 was created. If you enter a generic value in this field, CICSplex SM presents a list from which you can select the correct value.

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 Relation 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.



## Chapter 18. Deactivating a workload definition

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example task shows you how to deactivate the workload definition WLDAPY02, which you created in the example “Chapter 16. Routing particular transactions from a given user to a specific target region” on page 121.

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Display active workload definitions.

From the current view, issue the command WLMAWDEF WLSPAY01. The WLMAWDEF view, showing active workload definitions associated with workload specification WLSPAY01, is displayed.

```
26FEB2001 22:10:58 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
>W1 =WLMAWDEF=====PLXPROD1=PLXPROD1=26FEB2001==22:10:58=CPSM=====3===
CMD Name      Workload Ownr  Trangrp  Luname      Userid  Process Target
-----
----- Type--- Scope---
WLDAPY01 WLSPAY01 CM1B TRGPAY01 *          *      *      CICSIPA02
WLDAPY02 WLSPAY01 CM1B TRGPAY02 *          USRPAY03 *      CICSIPA03
WLDAPY03 WLSPAY01 CM1B TRGPAY03 *          *      *      CSGTGTS1
```

3. Discard workload definition WLDAPY02.

In the WLMAWDEF view, move the cursor to the entry for WLDAPY02, and issue DSC from the line-command field. The Discard Active Workload Definition panel is displayed. To confirm the deactivation of WLDAPY02, press Enter. The WLMAWDEF view is displayed, minus the entry for WLDAPY02.

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.



## Chapter 19. Updating an active workload definition

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 varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

In this example, you'll see how to update an active workload definition and then reinstall it in the active workload. In the example “Chapter 16. Routing particular transactions from a given user to a specific target region” on page 121, 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. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Display active workload definitions.

From the current view, issue the command WLMWDEF WLSPAY01. The WLMWDEF view, showing all active definitions associated with workload specification WLSPAY01, is displayed. WLDAPAY02 appears in this list:

```
26FEB2001 22:10:58 ----- INFORMATION DISPLAY -----
COMMAND ==>                                SCROLL ==> PAGE
CURR WIN ==> 1          ALT WIN ==>
>W1 =WLMWDEF=====PLXPROD1=PLXPROD1=26FEB2001==22:10:58=CPSM=====3===
CMD Name      Workload Ownr  Trangrp  Luname      Userid  Process Target
-----
WLDAPAY01 WLSPAY01 CM1B TRGPAY01 *           *       *      CICSAPA02
WLDAPAY02 WLSPAY01 CM1B TRGPAY02 *           USRPAY03 *      CICSAPA03
WLDAPAY03 WLSPAY01 CM1B TRGPAY03 *           *       *      CSGTGTS1
```

Make a note of the value in the Ownr field for WLDAPAY02 (CM1B, in this example).

3. Update workload definition WLDAPAY02.

From the current view, issue the command WLMDEF WLDAPAY02. The WLMDEF view, containing the entry for WLDAPAY02, is displayed:

```
26FEB2001 22:02:37 ----- INFORMATION DISPLAY -----
COMMAND ==>                                SCROLL ==> PAGE
CURR WIN ==> 1          ALT WIN ==>
>W1 =WLMDEF=====PLXPROD1=PLXPROD1=26FEB2001==22:02:37=CPSM=====1===
--- Name----- Name-----
WLDAPAY02 TRGPAY02 *           USRPAY03 *      CICSAPA03 Separate TRGPA
```

Tab to the entry for WLDAPAY02. Overtyping TRGPAY02 with TRGPAY04 and overtyping the Description text with the string “Separate TRGPAY04 to CICSAPA03”. Press Enter. The WLMDEF view is redisplayed. (Depending on

your CICSplex SM configuration, you might also have to type SET in the line-command field before pressing Enter.)

**Note:** For a complete description of the WLMDEF view, see “WLMDEF (Workload definitions)” on page 60.

4. Install the updated workload definition in WLSPAY01.

In the WLMDEF view, move the cursor to the entry for WLDAPY02 again, and issue INS from the line-command field. The Install WLMDEF panel is displayed. In the Workload field, type WLSPAY01. In the Owner field, type the 4-character ID of the workload owner that you made a note of in step 2 on page 131. Press Enter. The updated workload definition is installed in workload WLSPAY01.

5. Check that the updated workload definition has been installed.

Issue the command WLMWDEF WLSPAY01. The WLMWDEF view is displayed, showing the updated definition.

```
26FEB2001 22:10:58 ----- INFORMATION DISPLAY -----
COMMAND ==> SCROLL ==> PAGE
CURR WIN ==> 1 ALT WIN ==>
>W1 =WLMWDEF=====PLXPROD1=PLXPROD1=26FEB2001==22:10:58=CPSM=====3===
CMD Name      Workload Ownr  Trangrp  Luname      Userid  Process Target
-----
WLDAPY01 WLSPAY01 CM1B TRGPAY01 *          *          *  CICSPA02
WLDAPY02 WLSPAY01 CM1B TRGPAY04 *          USRPAY03 *  CICSPA03
WLDAPY03 WLSPAY01 CM1B TRGPAY03 *          *          *  CSGTGTS1
```

6. You can check that transaction group TRGPAY02 is inactive, and that transaction group TRGPAY04 is now active, by looking at the WLMATGRP view. To do this, issue the command WLMATGRP WLSPAY01 from the current view.

## Chapter 20. Discarding an active transaction from a workload

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows you how to discard an active transaction from a workload.

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Display active transactions.

From the current view, issue the command WLMATRAN EYUWLS02. The WLMATRAN view, showing active transactions associated with workload specification EYUWLS02, is displayed:

```
26FEB2001 22:11:42 ----- INFORMATION DISPLAY -----
COMMAND ==>
CURR WIN ==> 1          ALT WIN ==>
W1 =WLMATRAN=====PLXPROD1=PLXPROD1=26FEB2001==22:11:42=CPSM=====9===
CMD Transid  PCONV  Trangrp  Workload  Ownr
----- Mode-----
PAY1          EYUTRG04  WLDAPAY01  CM1B
PAY2          EYUTRG04  WLDAPAY01  CM1B
PAY3          EYUTRG04  WLDAPAY01  CM1B
PAY4          EYUTRG04  WLDAPAY01  CM1B
PZY1          EYUTRG03  WLDAPAY01  CM1B
PZY2          EYUTRG03  WLDAPAY01  CM1B
PZY3          EYUTRG03  WLDAPAY01  CM1B
```

3. Discard transaction PAY2.

In the WLMATRAN view, move the cursor to the entry for PAY2, and issue DSC from the line-command field. The Discard Active Workload Transaction panel is displayed. To confirm the discard, press Enter. The WLMATRAN view is displayed, minus the entry for PAY2.



## Chapter 21. Updating a workload specification

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

In this example, you'll see how to update the workload specification WLSPAY01, which you created in the example "Chapter 10. Balancing a workload" on page 105. 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. If the current context isn't PLXPROD1, issue the command CON PLXPROD1.
2. Update workload specification WLSPAY01.
  - a. Issue the command WLMSPEC from the current view. The WLMSPEC view, showing all workload specifications in the CICSplex PLXPROD1, is displayed.
  - b. Tab to the entry for WLSPAY01, and issue UPD from the line-command field. The Update WLM Specification panel is displayed. Change the Algorithm Type to GOAL.

```
----- Update WLM Specification for PLXPROD1 -----
COMMAND  ===>

WLM Spec Name      ===> WLSPAY01
Description        ===> Separate transactions for USRPAY03 to CICSIPA03

Affinity Relation  ===>          Default Affinity Relation
                               (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ===>          Default Affinity Lifetime
                               (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIM
                               ACTIVITY, PROCESS)
Match Key          ===> USERID   Default Primary search criterion
                               (USERID,LUNAME)
Create Affinity    ===>          Create Auto Affinity (YES, NO, N/A)
Target Scope       ===> CSGTGTS1 Default CICS System,Group or Generic
Event Name         ===>          RTADEF, STATDEF, or Generic
Abend Health       ===> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ===> 0        Target ABEND Load Factor (0 - 99)
Algorithm Type     ===> GOAL     Algorithm Type (GOAL, QUEUE)

Press Enter to update WLM Specification.
Type END or CANCEL to cancel without updating.
```

Press Enter. The WLMSPEC view is redisplayed showing the updated entry for WLSPAY01.

**Note:** For a complete description of the WLMSPEC view, see “WLMSPEC (Workload specifications)” on page 79.

3. Display the WLMAWORK view.

Issue the command `WLMAWORK WLSPAY01` from the current view. You'll see that the Algorithm Type 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, you have to stop the routing regions and the target regions to which they route, and then restart them. (If you don't know which routing regions and target regions are involved, you can hyperlink to a list of names for either type of region from the WLMAWORK view.) When you've restarted the routing regions and target regions (using the `CICSRGN` command), issue the command `WLMAWORK WLSPAY01` from the current view. This time, you'll see that the Algorithm Type value has been updated.

---

## Chapter 22. Using real-time analysis to select a target region for workload balancing

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

In this example, you'll see 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.

**Note:** For a complete description of the real-time analysis views used in this example, see *CICSplex System Manager Managing Resource Usage*.

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. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a real-time analysis evaluation definition.

From the current view, issue the command EVALDEF. From the EVALDEF view, issue the command CRE. Complete the first Create Evaluation Definition panel as shown here, and press Enter:

```

----- Create Evaluation Definition for PLXPROD1-----
COMMAND ==>

Name          ==> RTEPAY15
Description   ==> TSQ NUMITEMS > 50

Sample Interval ==> 300          Interval between samples in seconds
TableName     ==> MTSQGBL      Resource Table Name or *
Instance Pattern ==> *          Specific or generic pattern
Result Set Action ==> ANY      Operation (ALL,ANY,SUM,MIN,MAX,AVG,CNT)
Separate Task  ==> NO          Run as a separate task (YES, NO)

Evaluation Column ==> PUTQAUX    Column name to evaluate or *
  either Operator ==> GT        (EQ,NE,LT,GT,LE,GE)
  Value          ==> 50
  Severity       ==> HS        (VLS,LS,LW,HW,HS,VHS)
  or set Thresholds: Provide 3 low and/or 3 high values, N=Normal

VLS          LS          LW  (N)  HW          HS          VHS

View          ==> MTSQGBL      View invoked for this Evaluation

Type DOWN or UP to view other Evaluation Definition screens.
Press Enter to create Evaluation Definition.
Type END or CANCEL to cancel without creating.

```

3. Create a real-time analysis action definition. From the current view, issue the command ACTNDEF. From the ACTNDEF view, issue the command CRE. Complete the Create Action Definition panel as shown here, and press Enter:

```

----- Create Action Definition for PLXPROD1 -----
COMMAND ==>

Action Name   ==> RTAPAY15
Description   ==> NUMITEMS IN TSQ > 50

Event         ==> YES          Generate Event (Yes/No)
Event View    ==> TSQ          View for Event
Priority       ==> 255         Event Priority (1 to 255)
Event Text    ==> AUX TSQUEUE PUTQ ITEMS > 50

External Msg  ==> YES          Generate External Message (Yes/No)
Enter Msg     ==> AUX TSQUEUE PUTQ ITEMS > 50
Exit Msg      ==> AUX TSQUEUE PUTQ ITEMS < 50

Alert         ==> NO          Generate Alert (Yes/No)
CMAS Name     ==>             CMAS to Issue Alert
Enter Text    ==>
Exit Text     ==>

Restart       ==> NO          Cancel for ARM Restart (Yes/No)

Press Enter to create the Action Definition.
Type END or CANCEL to cancel without creating.

```

4. Create an analysis definition.  
From the current view, issue the command RTADEF. From the RTADEF view, issue the command CRE. Complete the Create Analysis Definition panel as shown here, and press Enter:

```

----- Create Analysis Definition for PLXPROD1 -----
COMMAND ==>

Name          ==> RTDPAY15
Description   ==> TSQ NUMITEMS FOR WLM / RTA
Perform Ops   ==> NO          Perform EVALDEF operations changes (YES, NO)
Sample Interval ==> 300       Interval between samples in seconds (1-86400)
Action Name   ==> RTAPAY15   Action definition name or generic

                VLS   LS   LW   HW   HS   VHS
Entry Intervals ==> 0001 0001 0001 0001 0001 0001
Exit Intervals  ==> 0001 0001 0001 0001 0001 0001

Evaluation expression:
==> RTEPAY15
==>
==>
==>
==>
==>

Press Enter to create the Analysis Definition.
Type END or CANCEL to cancel without creating.

```

5. Create an analysis group.

From the current view, issue the command RTAGROUP. From the RTAGROUP view, issue the command CRE. Complete the Create Analysis Group panel as shown here, and press Enter.

```

----- Create Analysis Group for PLXPROD1-----
COMMAND ==>

Group Name     ==> RTGPAY09
Description    ==> RTA/WLM Group

Press Enter to create Analysis Group.
Type END or CANCEL to cancel without creating.

```

The RTAGROUP view is redisplayed.

6. Add the analysis definition to the analysis group.

From the current view, issue the command RTADEF. In the RTADEF view, tab to the entry for RTDPAY15 and issue ADD in the line-command field. The Add RTADEF to Analysis Group panel is displayed. Complete the panel as shown here, and press Enter.

```

----- Add RTADEF to Analysis Group for PLXPROD1 -----
COMMAND ==>

Name          RTDPAY15
Description   TSQ NUMITEMS FOR WLM/RTA

Analysis Group ==> RTGPAY09   Analysis Group or Generic
Active Period  ==>           Period Name or Generic

Press Enter to add RTADEF to Analysis Group.
Type END or CANCEL to cancel without adding.

```

The RTADEF view is redisplayed.

7. Create an analysis specification.

From the current view, issue the command RTASPEC. From the RTASPEC view, issue the command CRE. Complete the Create Analysis Specification panel as shown here, and press Enter.

```

----- Create Analysis Specification for PLXPROD1 -----
COMMAND ==>

RTA Spec Name    ==> RTSPAY09
Description      ==> Workload balancing with RTA

System availability management:

          Action or Generic   Severity
SAM              =>          =>
SOS              =>          =>
SYSDUMP          =>          =>
TRANDUMP         =>          =>
MAXTASK          =>          =>
STALL            =>          =>

Press Enter to create the RTA Specification.
Type END or CANCEL to cancel without creating.

```

You can ignore the System availability management fields.

8. Add the analysis group to the analysis specification.

From the current view, issue the command RTAGROUP. In the RTAGROUP view, tab to the entry for RTGPAY09 and issue ADD from the line-command field. Complete the panel as shown here and press Enter.

```

-----Add Analysis Group to Analysis Specification for EYUPLX01 -----
COMMAND ==>

Analysis Group    RTGPAY09
Description       RTA/WLM Group

Specification Name ==> RTSPAY09 Specification Name or Generic

Press Enter to add RTA Group to RTA Specification.
Type END or CANCEL to cancel without adding.

```

9. Set the scope of the analysis specification.

Tab to the entry for RTSPAY09 in the RTASPEC view and issue the command ADD from the line-command field. In the Scope field of the Add Scope for Specification panel, type CSGTGTS3. In the Option field, type FORCE. Press Enter. The RTASPEC view is redisplayed.

10. Activate real-time analysis in the target regions in CSGTGTS3.

From the current view, issue the command CICSSYS. In the CICSSYS view, tab to the entry for CICS system CICSAPA01 and issue UPD from the line-command field. Page forward to the Update system - Analysis Attributes panel. Complete the panel as shown here, and press Enter:

```

----- Update System - Analysis Attributes - for PLXPROD1-----
COMMAND ==>

System Name      CICSPA01
Description      Target region 1 on System A

Analysis active   ==> YES      Activate at RTA startup
Analysis specification      Current RTASPEC
Specification source      Type of link to RTASPEC
System group name      System group if implicit source

System availability management:
      Action or      Action      Severity      Severity
      Generic      Inherit
SAM      ==>      ==> NO      ==>      ==> NO
SOS      ==>      ==> NO      ==>      ==> NO
SYSDUMP  ==>      ==> NO      ==>      ==> NO
TRANDUMP ==>      ==> NO      ==>      ==> NO
MAXTASK  ==>      ==> NO      ==>      ==> NO
STALL    ==>      ==> NO      ==>      ==> NO

Type DOWN or UP to view other System Screens.
Press ENTER to Update the System.
Type END or CANCEL to cancel without updating.

```

When you press Enter, 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.

#### 11. Update the workload specification.

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.

Issue the command WLMSPEC from the current view. On the WLMSPEC view, tab to the entry for WLMPAY02. From the WLMSPEC view, issue the command UPD. Complete the Update WLM Specification panel as shown here, and press Enter:

```

----- Update WLM Specification for PLXPROD1 -----
COMMAND ==>

WLM Spec Name    ==> WLSPAY02
Description      ==> Workload using RTA for target region selection
Affinity Relation ==>      Default Affinity Relation
                  (USERID, LUNAME, GLOBAL, BAPPL)

Affinity Lifetime ==>      Default Affinity Lifetime
                  (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIM
                  ACTIVITY, PROCESS)
Match Key        ==> USERID      Default Primary search criterion
                  (USERID,LUNAME)
Create Affinity  ==>      Create Auto Affinity (YES, NO, N/A)
Target Scope     ==> CSGTGTS3    Default CICS System,Group or Generic

Event Name       ==> RTDPAY15    RTADEF, STATDEF, or Generic

Abend Health     ==> 0           Target ABEND Health Factor (0 - 99)
Abend Load       ==> 0           Target ABEND Load Factor (0 - 99)
Algorithm Type   ==> QUEUE      Algorithm Type (GOAL, QUEUE)

Press Enter to update WLM Specification.
Type END or CANCEL to cancel without updating.

```

Notice that the Event Name value is the name of the analysis definition you created in step 4 on page 138.

**Note:** For a complete description of the WLMSPEC view, see “WLMSPEC (Workload specifications)” on page 79.

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.

---

## Chapter 23. Dynamic routing an EXEC CICS START TERMID command

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows you how to set up dynamic routing capability for a transaction started by an EXEC CICS START command, 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 dynamically route EXEC CICS START TERMID commands. See “Workload requirements” on page 5.

In this example, a program running in CICSPA01 issues an EXEC CICS START command, 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–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 CSGTGS1. 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 CSGTGS1.

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 page “Service classes” on page 9.

In CICSplex SM:

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a workload specification.

Issue the command WLMSPEC from the current view. From the WLMSPEC view, issue the command CRE. Complete the Create WLM Specification panel as shown here, and press Enter:

## dynamic routing a START command

```
----- Create WLM Specification for PLXPROD1 -----
COMMAND  ===>

WLM Spec Name      ===> WLSDYN01
Description        ===> Dynamic routing START

Affinity Relation  ===>          Default Affinity Relation
                   (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ===>          Default Affinity Lifetime
                   (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIMIT
                   ACTIVITY, PROCESS)
Match Key          ===> USERID   Default Primary search criterion
                   (USERID,LUNAME)
Create Affinity    ===>          Create Auto Affinity (YES, NO, N/A)
Target Scope       ===> CSGTGTS1 Default CICS System, Group or Generic

Event Name        ===>          RTADEF, STATDEF, or Generic

Abend Health       ===> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ===> 0        Target ABEND Load Factor (0 - 99)

Algorithm Type     ===> GOAL     Algorithm Type (GOAL, QUEUE)

Press Enter to create WLM Specification.
Type END or CANCEL to cancel without creating.
```

You must supply:

- A name for the specification (WLSDYN01 in this example).
- A Match Key value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the Match Key value has no effect on simple workload balancing. It's 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 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 press Enter, the WLMSPEC view is redisplayed, this time showing an entry for the new workload specification, WLSDYN01.

**Note:** For a complete description of the WLMSPEC view, see "WLMSPEC (Workload specifications)" on page 79.

3. Associate the workload specification with a routing region.

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.

- a. In the WLMSPEC view, tab to the entry for the WLSDYN01 specification, and issue ADD from the line-command field.
- b. From the current view, issue the command WLMSCOPE WLSDYN01 to check that the association between the routing region and the workload specification has worked.

4. Activate workload balancing in the routing region.

Issue the command CICSSYS from the current view. In the CICSSYS view, tab to the line-command field for the CICSPT01 entry and issue the UPD command.

## dynamic routing a START command

Page forward until you see the Update System - Workload Attributes panel. In the Routing support active field, enter YES. This change takes effect when CICSPT01 is next started.

5. Activate workload balancing in the target regions.

In the CICSSYS view, tab to the line-command field for the CICSPA01 entry and issue the UPD command. Page forward until you see the Update System - Workload Attributes panel. In the Target routing at startup field, enter YES. This change takes effect when the target region CICSPA01 is next started.

Repeat this step for target regions CICSPA02, CICSPA03, and CICSPA04.

6. Install transaction definitions.

- Install the transaction definition for PAY1 in each potential requesting region CICSPA01, CICSPA02, CICSPA03, and CICSPA04, with attributes of not dynamic and routable.
- Install the transaction definition for PAY1 in routing region CICSPT01, with the dynamic attribute specified.

You can either update the transaction definitions to specify these attributes, 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.



---

## Chapter 24. Dynamic routing of an inbound client DPL request

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSIPA01, CICSIPA02, and CICSIPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows you how 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 “Chapter 23. Dynamic routing an EXEC CICS START TERMID command” on page 143.

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 page “Service classes” on page 9.

In CICSplex SM:

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Install program definitions.

Install the program definition for PAYPROG1 in the routing region with the Dynamic attribute set to Yes, and in each target region with the Dynamic attribute set to No.

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

3. Install transaction definitions.

Install the transaction definition for PAY1 in each target region; the transaction definition should point to the mirror program DFHMIRS.

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

**dynamically route inbound client DPL**

---

## Chapter 25. Dynamic routing of a peer-to-peer DPL request

This example shows you how 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 “Chapter 23. Dynamic routing an EXEC CICS START TERMID command” on page 143. 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 page “Service classes” on page 9.

In CICSplex SM:

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Install transaction definitions.

Install the transaction definition for PAY2 in all regions with the Dynamic and Routable attributes set to No. The transaction definition should point to the mirror program DFHMIRS.

3. Install program definitions.

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

**dynamically route peer-to-peer DPL**

---

## Chapter 26. Balancing CICS BTS activities

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows you how 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 “Chapter 27. Separating CICS BTS activities” on page 153 and “CICS release requirements for dynamic routing” on page 26.

1. If the current context isn't PLXPROD1, issue the command `CON PLXPROD1` from the current view.
2. Activate workload balancing for the systems in CSGTGTS1.  
In the `CICSSYS` view, tab to the line for the `CICSPA01` entry and issue the `UPD` command. Page forward until you see the Update System - Workload Attributes panel. In the Target routing at startup field, enter YES. In the Routing support active field, enter YES. These changes takes effect when the target region `CICSPA01` is next started.  
Repeat this step for target regions `CICSPA02` and `CICSPA03`.
3. Create a workload specification.  
Issue the command `WLMSPEC` from the current view. From the `WLMSPEC` view, issue the command `CRE`. Complete the Create WLM Specification panel as shown here, and press Enter.

## balancing BTS activities

```
----- Create WLM Specification for PLXPROD1 -----
COMMAND  ===>

WLM Spec Name      ===> WLSCBTS
Description        ===> Routing CICS BTS activity

Affinity Relation  ===>          Default Affinity Relation
                   (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ===>          Default Affinity Lifetime
                   (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIM
                   ACTIVITY, PROCESS)
Match Key          ===> USERID   Default Primary search criterion
                   (USERID,LUNAME)
Create Affinity    ===>          Create Auto Affinity (YES, NO, N/A)
Target Scope       ===> CSGTGTS1 Default CICS System, Group or Generic

Event Name        ===>          RTADEF, STATDEF, or Generic

Abend Health       ===> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ===> 0        Target ABEND Load Factor (0 - 99)

Algorithm Type     ===> QUEUE    Algorithm Type (GOAL, QUEUE)

Press Enter to create WLM Specification.
Type END or CANCEL to cancel without creating.
```

You must supply :

- A name for the specification (WLSCBTS in this example).
  - A Match Key value. USERID is shown in this example, though in fact it doesn't matter whether you specify USERID or LUNAME, because the Match Key value has no effect on simple workload balancing. It's 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 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.
4. Associate the workload specification with routing region scope CSGTGTS1.
  5. Specify DSRTPGM=EYU9XLOP.  
You can do this either in the SIT of each region in the CICS system group, or using the CICS RGN view.
  6. Activate workload management.
    - a. From the MAS view, type the UPDATE command by CICSPA01.
    - b. On the general MAS attributes view, type YES in the WLM active field to start managing workloads for this CICS system.
    - c. Press Enter.

Repeat for CICSPA02 and CICSPA03.

7. Program your BTS activities to run asynchronously.

When the routing and target regions in CSGTGTS1 are next started, BTS activities are balanced among the target regions.

## Chapter 27. Separating CICS BTS activities

All the workload management examples are based on the same configuration. The CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSPA01, CICSPA02, and CICSPA03. You will see how the roles played by these CICS regions varies, 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 this chapter, the initial scope is CICSplex PLXPROD1.

This example shows you how 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 “Chapter 26. Balancing CICS BTS activities” on page 151. Similarly, the SIT 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” on page x and “CICS release requirements for dynamic routing” on page 26.

1. If the current context isn't PLXPROD1, issue the command CON PLXPROD1 from the current view.
2. Create a transaction group.
  - a. From the current view, issue the command TRANGRP. The TRANGRP view is displayed, listing any transaction groups already defined in PLXPROD1.
  - b. From the TRANGRP view, issue the command CRE. The Create Trangroup panel is displayed. Complete the panel as shown here:

```
----- Create Trangroup for PLXPROD1 -----
COMMAND  ==>

Trangroup name  ==> TRGCBTS1
Description     ==> CICS BTS transaction group

Status          ==> ACTIVE           Transaction Group Status
                                     (ACTIVE,DORMANT)
Match Key       ==> USERID          Primary WLMDEF search criterion
                                     (USERID,LUNAME)
Affinity Relation ==> BAPPL          Optional affinity relation may be:
                                     (USERID,LUNAME,GLOBAL, BAPPL)
Affinity Lifetime ==> ACTIVITY       Optional affinity lifetime may be:
                                     (SIGNON,LOGON,PCONV,DELIMIT,SYSTEM, PERMANENT
                                     ACTIVITY, PROCESS)
Create Affinity ==>                 Create Auto Affinity (YES, NO, N/A)
Event Name      ==>                 RTADEF/STATDEF, or generic

Abend Health    ==> 0                Target ABEND Health Factor (0 - 99)
Abend Load      ==> 0                Target ABEND Load Factor (0 - 99)

Press Enter to create Trangroup.
Type END or CANCEL to cancel without creating.
```

Notice that the Affinity Relation 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

## separating BTS activities

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. You can ignore any fields that have been left blank. Press Enter. The TRANGRP view is redisplayed, now showing the name of the transaction group TRGCBTS1.

**Note:** For a complete description of the TRANGRP view, see “TRANGRP (Transaction groups)” on page 52.

3. Identify the transactions in group TRGCBTS1.

From the TRANGRP view, move the cursor to the entry for TRGCBTS1, and issue ADD from the line-command field. The Add Transaction to Trangroup panel is displayed. Complete the panel as shown here:

```
----- Add Transaction to Trangroup for PLXPROD1 -----
COMMAND  ===>

Trangroup          TRGPAY03

Transaction        ACTIVITY Mode      Error
===>  BTS1          ===>
===>
===>
===>
===>
===>
===>
===>
===>
===>

Press Enter to add Transaction to Trangroup.
Type END or CANCEL to cancel without adding.
```

Press Enter. The TRANGRP view is redisplayed.

4. Create a workload definition.

- a. From the command line of the current view, issue the command WLMDEF. The WLMDEF view is displayed.
- b. From the WLMDEF view, issue the command CRE. The Create Workload Definition panel is displayed. Complete the panel as shown here:

```
----- Create Workload Definition for PLXPROD1 -----
COMMAND  ===>

Definition Name     ===> WLDCBTS3
Description         ===> Separate CICS BTS activities

Trangroup Name     ===> TRGCBTS1      Specific Trangroup, Generic, or Blank
Terminal Luname    ===> *             Specific or pattern Luname
User Id            ===> *             Specific or pattern Userid
Process Type       ===> SALES      Specific or pattern Process Type
Target Scope       ===> CSGTGTS1    CICS System, Group, or Generic

Press Enter to create definition.
Type END or CANCEL to cancel without creating.
```

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.

Press Enter. The WLMDEF view is redisplayed.

**Note:** For a complete description of the WLMDEF view, see “WLMDEF (Workload definitions)” on page 60.

5. Add the workload definition to the workload group.

In the WLMDEF view, move the cursor to the entry for WLDCBTS1, and issue ADD from the line-command field. The Add WLM Definition to Workload Group panel is displayed. In the Workload Group Name field, type WLGCBTS1 and press Enter. The WLMDEF view is redisplayed.

6. Add the workload group to the a workload specification.

In the WLMGROUP view, tab to the entry for WLDCBTS1, and issue ADD from the line-command field. In the Specification Name field, type WLGCBTS1 and press Enter.

## separating BTS activities

---

## Chapter 28. Managing enterprise beans with workload management

This section differs from the task descriptions given earlier in this book in that its aim is to give a step-by-step description of all the tasks required to define enterprise beans and their execution environment to CICS using CICSplex SM and to establish and execute the workload management of enterprise beans. The first half of the chapter deals with a sample CICSplex SM environment which uses CICSplex SM facilities to define required Enterprise JavaBean components and which implements the basic workload balancing of enterprise bean transactions. The second half describes the balancing environment in more detail and shows how to implement a more complex configuration for workload separation.

---

### Balancing an enterprise bean workload

This task is designed to establish some of the principles of workload balancing with enterprise beans. It illustrates the use of CICSplex SM facilities to define the configuration described for all the sample tasks: the CICSplex, PLXPROD1 consists of one TOR, CICSPT01, and three AORs, CICSAPA01, CICSAPA02, and CICSAPA03. In an EJB 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.

The task then illustrates the optional use of CICSplex SM Business Application Services (BAS) to define the required Enterprise JavaBean components to CICS. Finally, it implements workload balancing of enterprise beans within the sample environment that has been built.

The task is divided into a number of subtasks:

1. "Defining the CICS region environment"
2. "Creating BAS definitions" on page 160
3. "Creating topology definitions" on page 164
4. "Creating workload definitions" on page 165
5. "Running the enterprise bean workload balancing task" on page 167.

### Defining the CICS region environment

To define the workload management environment for this task:

- Set the DSRTPGM system initialization parameter in all regions to EYU9XLOP 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 Dst Route Pgm attribute of the CICSRGND view (see *CICSplex System Manager Operations Views Reference*).
- Set the IRCSTRT system initialization parameter in all regions to YES, so that IRC is started at system initialization. See *CICS System Definition Guide*.
- Create a CICS SYS definition for the listener region CICSPT01. For this example, the Routing support active attribute should be set to YES and the Target routing at startup attribute should be set to NO.

**Note:** If your listener region is also an AOR, the Target routing at startup attribute should be set to YES.

To ensure that local CICSplex SM environment is properly established at MAS initialisation time, you should include the statement

```
MASPLTWAIT(YES)
```

in the EYUPARM file for all listener regions. 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.

The Install Resources attribute should be set to ALWAYS, to ensure that the

```
----- Create System - Workload Attributes - for PLXPROD1 -----  
COMMAND ===>  
  
System Name      CICSPT01  
Description      Enterprise beans listener region  
  
Routing Support active   ===> YES      Routing support to be activated  
  
Target routing at startup ===> NO  
  
Enter DOWN or UP to view other System screens.  
Press Enter to create the System.  
Type END or CANCEL to cancel without creating.
```

Figure 44. Creating a CICS listener system definition — workload attributes

resources are installed automatically when the CICS region is started. Set the Recovery Action attribute to CONTINUE so that if an installation fails, those resources which have not failed can still be installed.

```
COMMAND ===>  
  
System Name      CICSPT01  
Description      Enterprise beans listener region  
  
Install Resources  ===> ALWAYS      (NEVER, ALWAYS, COLDDONLY, WARMONLY)  
  
Recovery Action   ===> CONTINUE  (CONTINUE,PROMPT,TERMINATE,IMMEDIATE,NORMAL)  
  
Enter DOWN or UP to view other System screens.  
Press Enter to create the System.  
Type END or CANCEL to cancel without creating.
```

Figure 45. Creating a CICS system definition - business application services attributes

See *CICSplex System Manager Administration*.

- Create a CICSSYS definition for each of the AORs. The Routing Support active and the Target routing at startup attributes should be set to YES. For CICSPA01:

```
----- Create System - Workload Attributes - for PLXPROD1 -----  
COMMAND ==>  
  
System Name      CICSPA01  
Description      Enterprise beans AOR1  
  
Routing Support active ==> YES      Routing support to be activated  
  
Target routing at startup ==> YES  
  
Enter DOWN or UP to view other System screens.  
Press Enter to create the System.  
Type END or CANCEL to cancel without creating.
```

Figure 46. Creating a CICS AOR system definition - workload attributes

Repeat for the AORs. See *CICSplex System Manager Administration*.

- Create a CICS system group (CICSGRP) for the listener and all the AORs:

```
----- Create System Group for PLXPROD1 -----  
COMMAND ==>  
  
System Group name ==> EJBCSG01  
Description        ==> Enterprise beans listener and AORS  
  
Press Enter to Create the System Group.  
Type END or CANCEL to cancel without creating.
```

Figure 47. Creating a CICS system group definition.

See *CICSplex System Manager Administration*.

- Create a CICS system group (CICSGRP) for just the AORs.  
See *CICSplex System Manager Administration*.

```
----- Create System Group for PLXPROD1 -----  
COMMAND ==>  
  
System Group name ==> EJBCSG02  
Description        ==> Enterprise beans AORs  
  
Press Enter to Create the System Group.  
Type END or CANCEL to cancel without creating.
```

Figure 48. Creating a CICS system group definition.

- Add the listener region and the AORS to CICS system group EJBCSG01 by issuing the GRP line action command from the CICSSYS view.

```

----- Add System to System Group for EYUPLX01 -----
COMMAND ==>

System Name      CICSPT01

Scope           ==> EJBCSG01      System Group Name or Generic

                Current
Component Spec  Source  Group  Inherit Spec
MON          SPEC1  INHERIT  OTHERGRP  NO
RTA          SPEC1  INHERIT  OTHERGRP  YES
WLM          SPEC2  EXPLICIT  OTHERGRP  NO

Press Enter to Add System to System Group.
Type END or CANCEL to cancel without adding.

```

Figure 49. Adding a member to a CICS system group

Press Enter. Repeat for each AOR. See *CICSplex System Manager Administration*.

- Add the AORs to CICS system group EJBCSG02 by issuing the GRP line action command from the CICSSYS view. To add the first AOR, type the system name into the Scope field, as shown:

```

----- Add System to System Group for EYUPLX01 -----
COMMAND ==>

System Name      CICSPT01

Scope           ==> EJBCSG02      System Group Name or Generic

                Current
Component Spec  Source  Group  Inherit Spec
MON          SPEC1  INHERIT  OTHERGRP  NO
RTA          SPEC1  INHERIT  OTHERGRP  YES
WLM          SPEC2  EXPLICIT  OTHERGRP  NO

Press Enter to Add System to System Group.
Type END or CANCEL to cancel without adding.

```

Figure 50. Adding a member to a CICS system group

Press Enter. Repeat for the other two AORs. See *CICSplex System Manager Administration*.

## Creating BAS definitions

- Create a CorbaServer definition (EJCODEF) for a logical server comprising the three AORs. The value of the Port attribute must match that of the TCPDEF Portnumber attribute. The Shelf attributes should refer to valid MVS Open Edition (MVS OE) file specifications that exist on the MVS image in which the CICS region is running. The Host parameter should be either a valid host name or the dotted decimal address of the MVS image on which the CICS region is running. Beans installed in the CorbaServer will be published to the namespace under the JNDI prefix.

**Note:** In order to keep this example as simple as possible, SSL has been set to NO, but any enterprise should, of course, have a fully-implemented security system.

```
COMMAND ==>
Name      ==> EJC1          Version ==> 0
Description ==> CorbaServer 1
RESGROUP  ==> EJBGRP01
User Data  ==>

JNDIPrefix ==> ejbuser1
          ==>
          ==>
          ==>

Sessbeantime ==> 000200          000000-992359 (DDHHMM)
Shelf        ==> /u/ejbuser1/shelf
          ==>
          ==>
          ==>

SERVER ORB ATTRIBUTES
Host        ==> name.org.com
          ==>
          ==>
          ==>
          ==>

Port        ==> 27301          1-65535
SSL         ==> NO           YES | NO | CLIENTCERT
SSLPort     ==>             NO | 1-65535

CLIENT ORB CERTIFICATES
Certificate ==>

Press ENTER to create EJCODEF.
Type END or CANCEL to cancel without creating.
```

Figure 51. Creating a CorbaServer definition

See *CICSplex System Manager Managing Business Applications* for details of EJCODEF.

- Create a TCP/IP service definition (TCPDEF) for the IP port number, which will be supplied by your system administrator. The value of the Portnumber attribute must match the value of the EJCODEF Port attribute. The transaction must be the CICS enterprise bean request receiver CIRR.

**Note:** In order to keep this example as simple as possible, AUTHENTICATE has been set to NO, but any enterprise should, of course, have a fully-implemented security system.

```

COMMAND ==>
Name          ==> EJBTCPS1  Version  ==> 1      Entry version Number
Description   ==> Enterprise bean TCPIP service 1
RESGROUP     ==> EJBGRP1
User Data    ==>

Urm          ==>          Name of user replaceable module
Portnumber   ==> 27301    Port number for this service (1 - 32767)
Certificate  ==>          HFS pathname of certificate

Status       ==> OPEN    Initial status of service (OPEN, CLOSED)
SSL          ==> NO      Use of SSL (NO, YES, CLIENTAUTH)
Transaction  ==> CIRR    Transaction Id to process this service
Backlog      ==> 00000    Requests queued before rejection (0 - 32767)
TSQprefix    ==>          Prefix for temporary storage queue
IPaddress    ==> INADDR_ANY IP address
SocketClose  ==> 002000    Socket close (NO, 0-240000)
Authenticate ==> AUTO    No | Basic | Certificate | Autoregister
                | AUTOMATIC
Protocol     ==> IIOP    HTTP | IIOP

Press ENTER to create TCPDEF.
Enter END or CANCEL to cancel without creating.

F1=HELP      F2=hsplit   F3=END       F4=RETURN    F5=RFIND     F6=RCHANGE
F7=UP        F8=DOWN     F9=SWAP     F10=LEFT    F11=RIGHT    F12=RETRIEVE

```

Figure 52. Creating a TCP/IP service definition

See *CICSplex System Manager Managing Business Applications* for details of TCPDEF.

- Create a resource assignment (RASGNDEF) to install the TCPDEF in the listener region CICSPT01:

```

COMMAND ==>

Name          ==> EJBRAS01
Description   ==> Assignment for listener region

Target Scope  ==> CICSPT01    CICS System or System Group
Related Scope ==>          CICS System or System Group

Resource Group ==> EJBGRP1    RESGROUP Containing definitions
Resource Type ==> TCPDEF    Resource Definition Type

Usage         ==> LOCAL    Assignment type (LOCAL,REMOTE,LINK)
Mode          ==> N/A      Usage Qualifier by Resource Type
Referenced Assign ==>      Resource Assignment Definition name
Override      ==> NONE     Scope of override (TARGET,RELATED,BOTH,
                        NONE)

Press ENTER to create Resource Assignment.
Type UP or DOWN to view other screens.
Enter END or CANCEL to cancel without creating.

```

Figure 53. Creating a resource assignment - Page 1

- Create a transaction definition for CIRP, the default request processor transaction, based on the CEDA-supplied definition and linking to supplied program DFJIIRP:

```

COMMAND ==>
Name          ==> CIRP      Version ==> 1
Description   ==> Default request processor transaction
RESGROUP     ==> EJBGRP01
User Data    ==>

Program      ==> DFJIIRP   Name program to process transaction
Twasize     ==> 0          Transaction work area size (0-32767, blank)
Profile      ==>          Profile definition name
Partitionset ==>          Application partition set (name, KEEP, OWN)
Status       ==> ENABLED   Transaction status (ENABLED, DISABLED)
Taskdataloc ==> ANY        Task storage location (BELOW, ANY)
Taskdatakey ==> USER      Task storage key (USER, CICS)
Storageclear ==> NO        Clear task life-time storage (YES, NO)
Runaway      ==> SYSTEM    Max tasktime (SYSTEM, 0-2700000, blank)
Shutdown     ==> ENABLED   Status during shutdown (DISABLED, ENABLED)
Isolate      ==> YES       Isolate user storage (YES, NO)

Press ENTER to create TRANDEF.
Enter UP or DOWN to view other screens.
Type END or CANCEL to cancel without creating.

```

Figure 54. Creating a transaction definition - Page 1

- Create a resource assignment (RASGNDEF) to install the supplied transaction CIRP as a target in the listener region CICSPT01. The AOR CICS system group should be specified as the related scope. This ensures that the request processor transaction CIRP is routed from the listener region to an AOR.

```

COMMAND ==>

Name          ==> EJBRAS02
Description   ==> Resource assignment for CIRR

Target Scope ==> CICSPT01   CICS System or System Group
Related Scope ==> EJBCSG02   CICS System or System Group

Resource Group ==> EJBGRP01   RESGROUP Containing definitions
Resource Type  ==> TRANDEF    Resource Definition Type

Usage         ==> REMOTE     Assignment type (LOCAL,REMOTE,LINK)
Mode          ==> DYNAM      Usage Qualifier by Resource Type
Referenced Assign ==>       Resource Assignment Definition name
Override      ==> NONE       Scope of override (TARGET,RELATED,BOTH,
                               NONE)

Press ENTER to create Resource Assignment.
Type UP or DOWN to view other screens.
Enter END or CANCEL to cancel without creating.

```

Figure 55. Creating a resource assignment - Page 1

- Create a resource assignment (RASGNDEF) for the CorbaServer to install in all the AORs.

```

COMMAND ==>

Name           ==> EJBRAS02
Description    ==> Assignment for all AORs

Target Scope   ==> EJBGCS02   CICS System or System Group
Related Scope  ==>           CICS System or System Group

Resource Group ==> EJBGRP01   RESGROUP Containing definitions
Resource Type  ==> EJCODEF   Resource Definition Type

Usage          ==> LOCAL     Assignment type (LOCAL,REMOTE,LINK)
Mode           ==> N/A       Usage Qualifier by Resource Type
Referenced Assign ==>       Resource Assignment Definition name
Override       ==> NONE     Scope of override (TARGET,RELATED,BOTH,
                           NONE)

Press ENTER to create Resource Assignment.
Type UP or DOWN to view other screens.
Enter END or CANCEL to cancel without creating.

```

Figure 56. Creating a resource assignment - Page 1

See *CICSplex System Manager Managing Business Applications* for details of RASGNDEF.

- Create a resource description (RESEDESC) for all the resource assignments:

```

COMMAND ==>

Name           ==> EJBRES01
Description    ==> Enterprise beans

Valid Scope    ==> YES       Add to Topology Scope Set (YES,NO)
Scope Name     ==> EJB       Name to be used as Scope

Model         ==>           Resource Description copy model

ResGroup Scope ==> EJBGRP01   Scope applied to associated ResGroups

Auto Install   ==> YES       Add Description Resources to Scope

Press ENTER to create Resource Description.
Enter UP or DOWN to view other screens.
Type END or CANCEL to cancel without creating.

```

Figure 57. Creating a resource description - Page 1

A scope name of EJB has been specified to allow users to exploit CICSplex SM logical scoping when reviewing the objects installed through this RESEDESC. Auto Install(YES) has been specified to ensure that all objects in this RESEDESC (that are appropriate to a MAS) are automatically installed at MAS initialization .

See *CICSplex System Manager Managing Business Applications* for details of RESEDESC.

## Creating topology definitions

- An MRO link must be established between the listener CICSPT01 and each AOR to allow the exploitation of dynamically routed EJBs. To create these links:

- Create connection definitions (CONNDEF). As MRO must be the connection method, the Access method attribute should be either XM (for MVS cross memory services) or IRC (for the interregion communication program DFHIRP). The AutoConnect attribute should be YES.
- Create session definitions (SESSDEF). The Protocol attribute should be LU61. The Recv/Send prfx attribute should be < , >; this enables CICS to create the session names dynamically, thus avoiding duplicated session names.
- Create the link between the listener region and the first AOR. From the SYSLINK view, issue the CRE command. Complete the panel as shown:

```

COMMAND ==>

Primary System ==> CICSPT01
Secondary System ==> CICSPA01

ConnDef Name ==> EJBCON01          Version ==> 1
SessDef Name ==> EJBSES01          Version ==> 1

Press ENTER to create SYSLINK.
Type END or CANCEL to cancel without creating.

```

Figure 58. Creating a CICS system link

Establish links from the listener to the remaining AORs in a similar manner. This will create three bi-directional pairs of links which will appear on the screen as six physical links.

- Verify the connections by issuing the CONNECT line action command. You should see a pair of connections for each pair of systems. The connection type should be MRO. The connections should be ACQUIRED and INSERVICE for any routing to occur successfully.

**Note:** Occasionally, newly-defined connections fail to acquire successfully until the CICS system partners are restarted.

## Creating workload definitions

Establishing the workload management definitions for generic enterprise beans workload balancing is simple. Assuming that all enterprise beans need to be balanced across all available AORs, the only definition required is a workload specification (WLMSPEC):

```

----- Create WLM Specification for DWPLEXC7 -----
COMMAND ==>

WLM Spec Name      EJBSPEC1
Description        ==> Balanced EJB Workload

Affinity Relation  ==>          Default Affinity Relation
                   (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ==>          Default Affinity Lifetime
                   (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIMIT,
                   ACTIVITY, PROCESS)
Match Key          ==> USERID  Default Primary search criteria
                   (USERID, LUNAME)
Create Affinity    ==> N/A      Create auto affinity (YES, NO, N/A)
Target Scope       ==> EJBCSG02 Default CICS System, Group or Generic

Event Name         ==>          RTADEF, STATDEF or Generic

Abend Health       ==> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ==> 0        Target ABEND Load Factor (0 - 99)
Algorithm Type     ==> QUEUE    Algorithm Type (GOAL, QUEUE)

Press ENTER to create the WLM Specification.
Type END or CANCEL to cancel without creating.

```

Figure 59. Creating a workload specification

The resultant specification must be added to the system group encompassing all MASes. In our example CICSplex, that is the listener region and the three AORs. Note that the Target Scope is the AOR group only. This is because we want to route all dynamic transactions to the AORs through this WLMSPEC. The WLMSPEC is added to the group of all MASes, rather than just the listener, because the scope of the WLM balancing processing itself must cover all of the EJB regions, whereas the target scope of the transactions directed by the WLMSPEC covers just the regions that the routed transactions may be executed in. In other words, all regions must be aware of this WLMSPEC, but only the group which consists of AOR MASes only may execute the dynamic transactions routed through it.

The result of ADDing the WLMSPEC to the EJBCSG01 group may be confirmed with the WLMSCOPE command, which should show:

```

W1 =WLMSCOPE=====DWPLEXC7=ALLMAS==02/02/2001=11:06:24====CPSM=====5====
CMD WLM      Scope  Scope  Scope  Scope  Update
--- Spec--- Name---- Type---- Mode---- Link---- Option--
EJBSPEC1 EJBCSG01 SYSGROUP
EJBSPEC1 EJBAOR1 CICSSYS INHERIT EJBCSG01
EJBSPEC1 EJBAOR2 CICSSYS INHERIT EJBCSG01
EJBSPEC1 EJBAOR3 CICSSYS INHERIT EJBCSG01
EJBSPEC1 EJBTOR1 CICSSYS INHERIT EJBCSG01

```

Figure 60. WLMSCOPE command output

When all of the MASes 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 balance the execution of enterprise beans.

## Running the enterprise bean workload balancing task

- When the CICS regions are restarted, the resource description EJBRES1 will cause all the resources needed by each MAS to be installed automatically in the AORs. From the EJCOSE view, monitor the CorbaServer status by refreshing the view occasionally until the status is INSERVICE for all regions listed.
- When all the CorbaServers are INSERVICE, issue the PUBLISH command against the CorbaServer in one of the AORs. This command 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). When the command completes, 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 CIRR 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 using the CICSplex SM command LOCTRAN CIRP.

---

## Separating enterprise beans in a workload

Isolating the execution of certain enterprise beans to specific CorbaServers in specific regions, may be done with the normal workload management workload definition command suite. To do this, we need to associate a bean name to a CICS transaction code, so that workload management can route that transaction to a predetermined CICS region. We may use the previous workload balancing definition set as a starting point, and add the following definitions to it. As we did in the workload balancing example, we will choose to use CICSplex SM Business Application Services (BAS) to define the extra Enterprise JavaBean components to CICS.

## Creating BAS definitions for enterprise bean separation

As we now want to separate the execution of our enterprise beans, we must define the DJAR that they are deployed into. This is done with an EJCODEF.

```

----- Create Java Archive Definition for DWPLEXC7 -----
COMMAND ==>

Name          EJDJAR01      Version      1

Description   ==> DJAR for retaining Greek beans
RESGROUP     ==> EJBGRP01
User Data     ==>

CorbaServer   ==> EJC1          Associated CorbaServer Name

                                     HFS Path Name of JAR File
HFSFile       ==> /u/userid/ejbjars/MyGreekBeans.jar
              ==>
              ==>
              ==>

Press ENTER to create EJDJDEF.
Type END or CANCEL to cancel without creating.

```

Figure 61. Creating a Java archive definition

The DJAR file must be deployed to the location specified by the HFSFile parameter, and the CorbaServer must also be installed at a target system, before the beans within "MyGreekBeans.jar" will be available for execution. You do not have to define the bean names themselves to CICS. That information can be retrieved from the DJAR after it has been installed at an AOR and is in an INSERVICE state.

Installation of this DJAR will be controlled by the following RASGNDEF.

```

----- Create Resource Assignment for DWPLEXC7 Page 1 -----
COMMAND ==>

Name          EJBRAS4
Description    ==> Assign DJAR to all EJB AORs

Target Scope   ==> EJBCSG02   CICS System or System Group
Related Scope  ==>           CICS System or System Group

Resource Group ==> EJBGRP01   RESGROUP Containing Definitions
Resource Type  ==> EJDJDEF   Resource Definition Type

Usage          ==> LOCAL     Assignment Type (LOCAL, REMOTE)
Mode           ==> N/A      Usage Qualifier by Resource Type
Referenced Assign ==>       Resource Assignment Definition name
Override       ==> NONE     Scope of Override (TARGET, RELATED, BOTH,
                             NONE)

Press ENTER to create Resource Assignment.
Enter UP or DOWN to view other screens.
Enter END or CANCEL to cancel without creating.

```

Figure 62. Creating a resource assignment

When this definition is complete, it should be ADDED to the RESDESC EJBRESD1, to cause automatic DJAR installation when the EJBAOR MASes initialize.

A clone of the CICS CIRP transaction is required for each bean identifier (specific or generic) that needs to be separated through workload management. A dynamic definition of CIRP was already established for the workload balancing, and this may

|  
| be copied under different transaction ids. Assuming that you wish to separate three  
| explicit beans (*Alpha*, *Beta* and *Gamma*), copy the current CIRP definition three  
| times to transaction codes EJB1, EJB2 and EJB3. When creating each of these  
| definitions, you may save time by adding them to the same RESGROUP as the one  
| that CIRP is already associated with, through the RESGROUP parameter on the  
| CREATE TRANDEF panel. In that way, these new TRANDEFs will be automatically  
| associated with the RASGNDEF that will install them dynamically to the listener,  
| and statically to each of the AORs.

|  
| Once the TRANDEFs (to handle the specific bean execution requests) are in place,  
| we need an object to associate the bean name with a transaction code — a request  
| model. Request models are defined using the RQMDEF panel.

```

----- Create Request Model Definition for DWPLEXC7 -----
COMMAND ==>

Name          EJBQM1      Version      1          More:    +
Description   ==> RQModel for Baby Bean
RESGROUP     ==> EJBGRP01
User Data     ==>

Transid       ==> EJB1

CICS TS 2.1 SPECIFIC ATTRIBUTES

CorbaServer   ==> EJC1
Type          ==> EJB          CORBA | EJB | GENERIC

Corba Parameters
Module        ==>
              ==>
              ==>
              ==>
Interface     ==>
Interface     ==>
              ==>
              ==>
              ==>

EJB Parameters
Beanname      ==> Alpha
              ==>
              ==>
              ==>
              ==>

Intfacetype   ==> BOTH          BOTH | HOME | REMOTE | NOTAPPLIC

Common Parameters
Operation     ==> *
              ==>
              ==>

Intfacetype   ==> BOTH          BOTH | HOME | REMOTE | NOTAPPLIC

Common Parameters
Operation     ==> *
              ==>
              ==>
              ==>

              ==>          CICS TS 1.3 SPECIFIC ATTRIBUTES

OMGModule     ==>          <
              IIOP Module Name
OMGInterface  ==>          IIOP Interface Name
OMGOperation  ==>          IIOP Operation Name

Press ENTER to create RQMDEF.
Type END or CANCEL to cancel without creating.
Enter UP or DOWN to view other screens.

```

Figure 63. Creating a request model definition

This definition associates transaction code EJB1 with *Alpha* bean. The critical parameters here are: Transid, CorbaServer, Type and Beanname. Transid must identify the same id as that which we defined as "dynamic" earlier. Type specifies that the IIOp request type is for Enterprise JavaBeans. Beanname is the case-sensitive id of the enterprise bean that we wish to isolate. CorbaServer is the id of the CorbaServer which will host the bean. The definition should be repeated to associate transaction code EJB2 with *Beta* bean and transaction code EJB3 with *Gamma* bean. All three request models should be associated with the EJBGRP01 RESGROUP.

To control the installation of these request models, use the following RASGNDEF.

```
----- Create Resource Assignment for DWPLEXC7 Page 1 -----
COMMAND ==>

Name           EJBAS5
Description    ==> Assign RQModels to Listener

Target Scope   ==> EJBTOR1   CICS System or System Group
Related Scope  ==>           CICS System or System Group

Resource Group ==> EJBGRP01  RESGROUP Containing Definitions
Resource Type  ==> RQMDEF   Resource Definition Type

Usage          ==> LOCAL   Assignment Type (LOCAL, REMOTE)
Mode           ==> N/A     Usage Qualifier by Resource Type
Referenced Assign ==>           Resource Assignment Definition name
Override       ==> NONE    Scope of Override (TARGET, RELATED, BOTH,
                             NONE)

Press ENTER to create Resource Assignment.
Enter UP or DOWN to view other screens.
Enter END or CANCEL to cancel without creating.
```

Figure 64. Creating a resource assignment

When this definition is complete, it should be ADDED to the same RESDESC EJBRES1 as the other EJ resource assignments. Note that the installation scope for these request models, like that of the TCP/IP service definition, applies to the listener region only.

That completes the BAS definition set for enterprise bean workload separation. It comprises a single overall RESDESC, defined with Auto Install(YES) to force resource installation at MAS initialization. Associated with that RESDESC are RASGNDEFs which specify that:

- the CorbaServer and DJAR are locally installed to the AORs,
- the TCP/IP service and request models are locally installed to the listener region,
- the request processor transactions CIRP and EJB1–EJB3 are installed dynamically in the listener region, and locally in each of the AORs.

## Creating workload definitions for enterprise bean separation

Establishing the workload management definitions necessary for the separation of specific enterprise beans requires a larger definition set than for simple enterprise bean workload balancing. In addition to a workload specification to control the workload operation, sets of workload management definitions and transaction group definitions are required beneath it to implement the required bean separation. We will start our definition set at the bottom of the hierarchy and work upwards. At the lowest level, CICS transactions need to be isolated. That is achieved through a TRANGRP definition.

```

----- Create Trangroup for DWPLEXC7 -----
COMMAND ==>

Trangroup name      EJB1
Description         ==> Group for Alpha Bean transid

Status              ==> ACTIVE      Transaction Group Status
                      (ACTIVE,DORMANT)
Match Key           ==> USERID      Primary WLMDEF search criterion
                      (USERID,LUNAME)
Affinity Relation   ==>              Optional affinity relation may be:
                      (USERID,LUNAME,GLOBAL,BAPPL)
Affinity Lifetime   ==>              Optional affinity lifetime may be:
                      (SIGNON,LOGON,PCONV,DELIMIT,SYSTEM,PERMANENT,
                      ACTIVITY,PROCESS)
Create Affinity     ==> N/A          Create Auto Affinity (YES, NO, N/A)
Event Name          ==>              RTADEF/STATDEF or generic

Abend Health        ==> 0            Target ABEND Health Factor (0 - 99)
Abend Load          ==> 0            Target ABEND Load Factor (0 - 99)

Press ENTER to create Trangroup.
Type END or CANCEL to cancel without creating.

```

Figure 65. Creating a TRANGRP definition

Note that CICSplex SM cannot manage any logical affinities that may exist between enterprise beans, so ensure that Affinity Relation and Affinity Lifetime are left blank and Create Affinity is N/A. (Any values specified here will be ignored by CICSplex SM affinity processing). Repeat this definition twice for TRANGRPs EJB2 and EJB3. From the resultant TRANGRP list, issue the ADD prefix command against each of the EJB\* items. This will add transaction EJB1 to TRANGRP EJB1, transaction EJB2 to TRANGRP EJB2 and transaction EJB3 to TRANGRP EJB3.

The next step is to create workload definitions for each of the transactions that we wish to separate, which is achieved by using the WLMDEF command.

```

----- Create Workload Definition for DWPLEXC7 -----
COMMAND ==>

Definition Name     EJB1
Description         ==> Alpha Bean

Trangroup Name      ==> EJB1          Specific Trangroup, Generic, or Blank
Terminal Luname     ==> *             Specific or pattern Luname
User ID             ==> *             Specific or generic Userid
Process Type        ==> *             Specific or generic Process Type
Target Scope        ==> EJBAOR1      CICS System, Group, or Generic

Press ENTER to create definition.
Type END or CANCEL to cancel without creating.

```

Figure 66. Creating a workload definition for enterprise bean separation

This is the point in the definition set where we associate the transactions to be isolated against a specific scope. In this case we want to separate all transactions in TRANGRP EJB1 (in this case just the EJB1 transaction) to MAS EJBAOR1. Repeat this definition twice to separate TRANGRP EJB2 to MAS EJBAOR2 and TRANGRP EJB3 to EJBAOR3. A WLMGROUP will be needed to allow the

association of the WLMDEFs to the WLMSPEC, so CREATE one named EJBGRP1 and ADD WLMDEFs EJB1, EJB2 and EJB3 to it.

The final workload management object required for this scenario is the workload management specification. In this case it will be named EJBSPEC2.

```

----- Update WLM Specification for DWPLEXC7 -----
COMMAND ==>

WLM Spec Name      EJBSPEC2
Description        ==> Separated EJB Workload

Affinity Relation  ==>          Default Affinity Relation
                   (USERID, LUNAME, GLOBAL, BAPPL)
Affinity Lifetime  ==>          Default Affinity Lifetime
                   (SIGNON, LOGON, SYSTEM, PERMANENT, PCONV, DELIMIT,
                   ACTIVITY, PROCESS)
Match Key          ==> USERID   Default Primary search criteria
                   (USERID, LUNAME)
Create Affinity    ==> N/A      Create auto affinity (YES, NO, N/A)
Target Scope       ==> EJBCSG02 Default CICS System, Group or Generic

Event Name         ==>          RTADEF, STATDEF or Generic

Abend Health       ==> 0        Target ABEND Health Factor (0 - 99)
Abend Load         ==> 0        Target ABEND Load Factor (0 - 99)
Algorithm Type     ==> QUEUE    Algorithm Type (GOAL, QUEUE)

Press ENTER to update the WLM Specification.
Type END or CANCEL to cancel without updating.

```

Figure 67. Updating a workload specification for enterprise bean separation

The content of this object is logically the same as that of our balancing WLMSPEC defined previously. However to allow for easier manipulation of the workload management balancing/separation process we recommend that a new WLMSPEC is defined. Return to the WLMGROUP view and ADD EJBGRP1 to this new WLMSPEC, and then issue a MAP command against WLMSPEC EJBSPEC2 to confirm the workload management definition hierarchy.

```

----- MAP of WLMSPEC EJBSPEC2 ----- Row 1 of 3
COMMAND ==>
WLMSPEC      WLMGROUP      WLMDEF      TRANGRP
-----
EJBSPEC2 --- EJBGRP1  +- EJB1      --- EJB1
                   |- EJB2      --- EJB2
                   +- EJB3      --- EJB3
----- End Of Map -----

```

Figure 68. Map of WLMSPEC showing workload management definition hierarchy

As with the balancing specification, the WLMSPEC must be added to the system group comprising all MASes, that is the listener and the AORs. The target scope is still the group which consists of the AOR MASes only.

If the WLMSCOPE command shows that the balancing specification EJBSPEC1 is still defined, issue the REM command against the item applied to the SYSGROUP entry that covers all the MASes. Removing that item will cause automatic deletion of inherited entries logically beneath it. Then return to the WLMSPEC display to

ADD EJBSPEC2 to the EJBCSG01 CICS group. This should be confirmed with the WLMSCOPE command, which should show:

```
W1 =WLMSCOPE=====DWPLEXC7=ALLMAS===02/02/2001=11:06:24====CPSM=====5====
CMD WLM      Scope      Scope      Scope      Scope      Update
--- Spec---- Name----- Type----- Mode----- Link----- Option--
EJBSPEC2 EJBCSG01 SYSGROUP
EJBSPEC2 EJBAOR1  CICSSYS  INHERIT  EJBCSG01
EJBSPEC2 EJBAOR2  CICSSYS  INHERIT  EJBCSG01
EJBSPEC2 EJBAOR3  CICSSYS  INHERIT  EJBCSG01
EJBSPEC2 EJBTOR1  CICSSYS  INHERIT  EJBCSG01
```

Figure 69. WLMSCOPE command output

When all of the MASes 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 EJBAOR1, *Beta* bean to MAS EJBAOR2 and *Gamma* bean to MAS EJBAOR3. Use the command LOCTRAN EJB\* to inspect the use counts for each transaction and expect to see them incremented each time any of these beans are driven from your client.

---

## Part 4. Appendixes



---

## Appendix A. Copy books

This chapter contains:

- “EYURWCOM”
- “EYURWSVE” on page 185
- “EYURWTRA” on page 187

**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 in Figure 70 on page 178.

## copy books

EYURWCOM	DSECT	,	EYU9WRAM communication area
WCOM_PREFIX	DS	0CL20	EYU9WCOM prefix
WCOM_SLENGTH	DS	AL2	Structure Length
WCOM_ARROW	DS	C	> 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

Figure 70. The EYURWCOM communication area (Part 1 of 2)

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

Figure 70. The EYURWCOM communication area (Part 2 of 2)

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.

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- 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 82 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 "Affinity Relation" on page 81 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\_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, as an 8-byte data-value, the program name for DPL.

**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.

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- 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. (Whenever the dynamic routing program is invoked for a program-link request, WCOM\_DYRTYPE is set to '4'.)
- 5 For routing a CICS BTS request.
- 6 For routing a non-terminal START request.
- 7 For routing of an IIOF request.

### 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.

### 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 EYU9XLOP 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

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### **WCOM\_SCOP\_CNT**

Specifies the number of elements in SCOP\_VECT.

### **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\_PRIO**

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 in Figure 71.

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_FILLO	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

Figure 71. The SCOP\_VECT element description area

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**

**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 EYURWTRA is shown in Figure 72 on page 188.

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EYURWTRA	DSECT	,	Workload MGR DR COMM area
WTRA_PREFIX	DS	0CL20	WTRA prefix
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
WTRA_DYRTYPE	DS	C	Request type
WTRA_DYRLPROG	DS	CL8	DPL program name
WTRA_ERR	DS	C	Error type if Route Error
WTRA_OPTER	DS	C	Call Back Option.
	DS	C	Reserved.
WTRA_RESPONSE	DS	F	Response
*			0 = Normal
*			8 = ABORT
WTRA_BUFFADDR	DS	F	Address of input buffer
WTRA_BUFFLNTH	DS	F	Length of input buffer
WTRA_TRANID	DS	CL8	Transaction Identifier
WTRA_USERID	DS	CL8	USERID
WTRA_TERMID	DS	CL4	Principal Facility ID - normally obtained from EIBTRMID
WTRA_APPLID	DS	CL8	APPLID of default/selected target region
WTRA_SYSID	DS	CL4	SYSID of default/selected target region
WTRA_LUNAME	DS	CL17	LUNAME to use
	DS	CL3	Reserved
WTRA_NEXTTRAN	DS	CL8	The Identifier of the 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
WTRA_API_REAS	DS	F	Last API REASON to WRAM
WTRA_COMMAREA	DS	A	COMMAREA address (0 if none)
WTRA_COMMAREAL	DS	F	COMMAREA length (0 if none)
	DS	XL16	Reserved.
WTRA_USERAREA	DS	CL128	128 byte user area for use by routing exit.
WTRA_LENGTH	EQU	*-EYURWTRA	Length of communication area

Figure 72. The EYURWTRA communication area

### WTRA\_API\_REAS

Specifies a value of zero (0).

#### Notes:

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\_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:

- |          |  |
|----------|--|
| <b>0</b> | The request type is dynamic transaction routing.       |
| <b>1</b> | The request type is Notify,                            |
| <b>2</b> | The request type is a dynamic START command.           |
| <b>3</b> | The request type is a dynamic START command with data. |
| <b>4</b> | The request type is a dynamic program link.            |
| <b>5</b> | The request type is CICS BTS request routing.          |
| <b>6</b> | The request type is a non-terminal START command.      |

7 The request type is an IIOIP request.

**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\_FUNC TRM).
- 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

Figure 73 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.
```

Figure 73. A sample calling sequence for CICSplex SM workload management facilities (Part 1 of 3)

## sample calling sequence

```

*-----*
* 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_ERROUT   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
                                                   Set the next TRANID.
               BAS  R5,LINK_WLM             Go terminate.
               CLC  WTRA_RESPONSE,=F'0'    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.

```

Figure 73. A sample calling sequence for CICSplex SM workload management facilities (Part 2 of 3)

```

*-----*
* 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
      Did call go ok?
BE    START_UOWL                                               ..yes.
L     R15,=F'-4'                                               Assume SYSIDERR
CLC   WRK_EIBRESP,DFHRESP(SYSIDERR)                               X
      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.

```

Figure 73. A sample calling sequence for CICSplex SM workload management facilities (Part 3 of 3)

## Sample user-replacement modules

The sample user-replacement module procedures are:

### Assembler language

```

//APPLPROG EXEC EYUEITAL,
//          OUTC=*,
//          CPSMHLQ='CPSM210',
//          CICS HLQ='CICS610',
//          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 74. Sample JCL for replacement module for Assembler language

## sample URMs

### C/370 language

```
//APPLPROG EXEC EYUEITDL,
//          OUTC=*,
//          CPSMHLQ='CPSM210',
//          CICSHLQ='CICS610',
//          EDCHLQ='SYS1',
//          COMHLQ='SYS1',
//          LMODDSN='user.load.library',
//          CPARAM=('RENT,SOURCE,SHOWINC,TERM',
//                 'AGGREGATE,LIST,OFFSET'),
//          LNKPARAM=('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 75. Sample JCL for replacement module for C/370 language

**Note:** When the C/370 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.

### PLI language

```
//APPLPROG EXEC EYUEITPL,
//          OUTC=*,
//          CPSMHLQ='CPSM210',
//          CICSHLQ='CICS610',
//          PLIHLQ='SYS1.IBMSYS.SYS',
//          LMODDSN='user.load.library',
//          PLIPARM=('OBJECT,NODECK,INCLUDE,SYNTAX,LIST,MAP',
//                 'STORAGE,OFFSET,XREF',
//                 'LANGLVL(OS,SPROG),SYSTEM(CICS)'),
//          LNKPARAM=('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 76. Sample JCL for replacement module for PLI language

### COBOL II language

```
//APPLPROG EXEC EYUEITVL,
//          OUTC=*,
//          CPSMHLQ='CPSM210',
//          CICSHLQ='CICS610',
//          LMODDSN='user.load.library',
//          COBPARAM=('LIB,OBJECT,RENT,RES',
//                  'APOST,MAP,XREF,TRUNC(BIN)'),
//          LNKPARAM=('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 77. Sample JCL for replacement module for COBOL language

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# Bibliography

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<i>CICS Transaction Server for z/OS Release Guide</i>	GC34-5701
<i>CICS Transaction Server for z/OS Migration Guide</i>	GC34-5699
<i>CICS Transaction Server for z/OS Installation Guide</i>	GC34-5697
<i>CICS Transaction Server for z/OS Program Directory</i>	GI10-2525
<i>CICS Transaction Server for z/OS Licensed Program Specification</i>	GC34-5698

The above titles are the only unlicensed books available in hardcopy for CICS Transaction Server for z/OS Version 2 Release 1. All the remaining CICS and CICSplex SM books are supplied in softcopy only in the CICS Information Center, which is distributed on CD-ROM.

## CICS books for CICS Transaction Server for z/OS

### General

<i>CICS User's Handbook</i>	SX33-6116
<i>CICS Transaction Server for z/OS Glossary</i>	GC34-5696

### Administration

<i>CICS System Definition Guide</i>	SC34-5725
<i>CICS Customization Guide</i>	SC34-5706
<i>CICS Resource Definition Guide</i>	SC34-5722
<i>CICS Operations and Utilities Guide</i>	SC34-5717
<i>CICS Supplied Transactions</i>	SC34-5724

### Programming

<i>CICS Application Programming Guide</i>	SC34-5702
<i>CICS Application Programming Reference</i>	SC34-5703
<i>CICS System Programming Reference</i>	SC34-5726
<i>CICS Front End Programming Interface User's Guide</i>	SC34-5710
<i>CICS C++ OO Class Libraries</i>	SC34-5705
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<i>Java Applications in CICS</i>	SC34-5881

### Diagnosis

<i>CICS Problem Determination Guide</i>	GC33-5719
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<i>CICS Data Areas</i>	LY33-6096
<i>CICS Trace Entries</i>	SC34-5727
<i>CICS Supplementary Data Areas</i>	LY33-6098

### Communication

<i>CICS Intercommunication Guide</i>	SC34-5712
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### Special topics

<i>CICS Recovery and Restart Guide</i>	SC34-5721
<i>CICS Performance Guide</i>	SC34-5718
<i>CICS IMS Database Control Guide</i>	SC34-5711
<i>CICS RACF Security Guide</i>	SC34-5720

<i>CICS Shared Data Tables Guide</i>	SC34-5723
<i>CICS Transaction Affinities Utility Guide</i>	SC34-5728
<i>CICS DB2 Guide</i>	SC34-5707

## CICSplex SM books for CICS Transaction Server for z/OS

<b>General</b>	
<i>CICSplex SM Concepts and Planning</i>	GC34-5732
<i>CICSplex SM User Interface Guide</i>	SC34-5743
<i>CICSplex SM Commands Reference Summary</i>	SX33-6117
<i>CICSplex SM Web User Interface Guide</i>	SC34-5403
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<i>CICSplex SM Administration</i>	SC34-5729
<i>CICSplex SM Operations Views Reference</i>	SC34-5739
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## Other CICS books

<i>Designing and Programming CICS Applications</i>	SR23-9692
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<i>CICS Family: Client/Server Programming</i>	SC33-1435
<i>CICS Transaction Gateway for OS/390 Administration</i>	SC34-5528
<i>CICS Family: General Information</i>	GC33-0155
<i>CICS 4.1 Sample Applications Guide</i>	SC33-1173
<i>CICS/ESA 3.3 XRF Guide</i>	SC33-0661

**Note:** The *CICS Transaction Server for OS/390: Planning for Installation* book that was part of the library for CICS Transaction Server for OS/390, Version 1 Release 3, is now merged with the *CICS Transaction Server for z/OS Installation Guide*. If you have any questions about the CICS Transaction Server for z/OS library, see *CICS Transaction Server for z/OS Installation Guide* which discusses both hardcopy and softcopy books and the ways that the books can be ordered.

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Subsequent updates will probably be available in softcopy before they are available in hardcopy. This means that at any time from the availability of a release, softcopy versions should be regarded as the most up-to-date.

For CICS Transaction Server books, these softcopy updates appear regularly on the *Transaction Processing and Data Collection Kit* CD-ROM, SK2T-0730-xx. Each reissue of the collection kit is indicated by an updated order number suffix (the -xx part). For example, collection kit SK2T-0730-06 is more up-to-date than SK2T-0730-05. The collection kit is also clearly dated on the cover.

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