IBM 2007 IMPACT

IBM

CICSPlex Systems Management Overview

Dan Donnelly

Donnelly@uk.ibm.com

Session 4119A

impact·venture*

Overview

- CPSM Benefit and Functions
- CPSM Interfaces
- Operations
- Business Application Services
- Workload Management
- Real Time Analysis

CICSPlex SM Benefits

- **Provides a Single System Image**
  - Allows data from multiple CICS systems to be viewed in a single view.
  - For instance, all Tasks associated with a unit of work can be displayed on one view.
- **Provides a Single Point of Control**
  - Resources can be installed or modified in multiple CICS systems by performing a single action.
  - CICS systems in the CICSplex can be modified from the one view.

CICSPlex SM Benefits

- **Systems management functions via the following interfaces**
  - Web User Interface
  - Batch repository update
  - Application Programming Interface
- **Integrates with Tivoli Business System Manager**
  - Collects and displays CPSM information
  - Can link to the Web User Interface

CICSPlex SM Functions

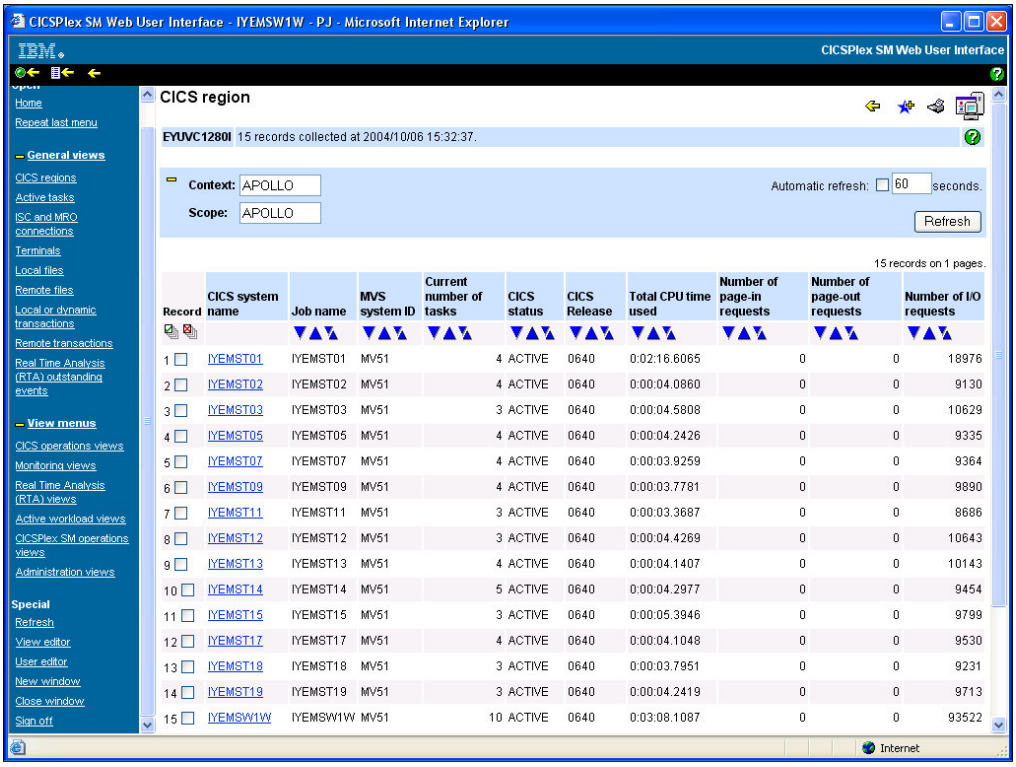
- **Operations**
  - Allows modification of managed CICS systems and modification of resources installed on those systems.
- **Business Application Services**
  - Used to create, update, and install resource definitions. Definitions can be installed on multiple systems in a single action.
  - CICS Configuration Manager can assist with migration of definitions from the CSD to CPSM Data Repository and from the Data Repository to the CSD, it also provides Configuration Management.

CICSPlex SM Functions

- **Real Time Analysis (Threshold Analysis)**
  - Provides automatic, external notifications when certain conditions occur.
  - Can automatically perform simple modifications to a resource when certain conditions occur.
- **Workload Management**
  - Dynamically routes work across CICS systems in the CICSplex to meet defined goals.

CICSPlex SM Interfaces

- **Web User Interface**
  - View and manipulate CICS and CPSM information through a web browser
  - Views can be customized via the View Editor
  - Interface is NLS enabled
  - Browsers connect to a Web User Interface server (a specialized CICS system).



•This screen shows a WUI Tabular View the screen shows information about a number of CICS systems in a CICSPlex. The screen is constructed as follows:

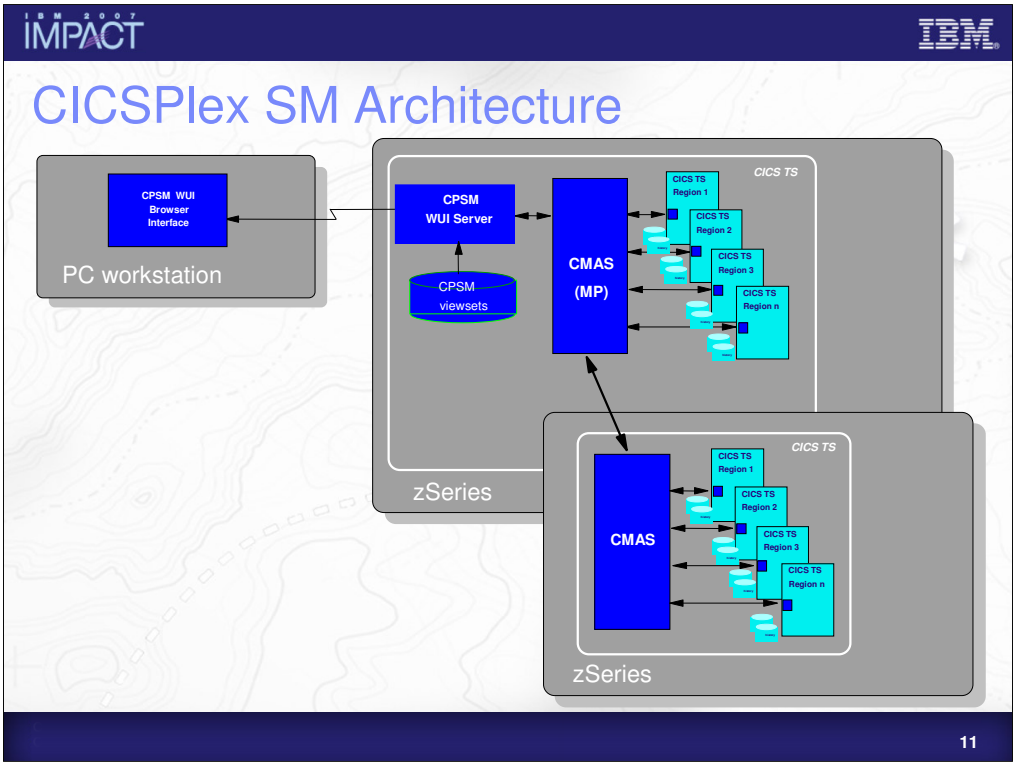
- •On the left of the screen there is a Navigation Menu for going directly to views containing information
- •The main part of the screen starts with the view title (in the case CICS region)
- •There is then a message area
- •Then there are a series of filters and a button for refreshing the screen
- •Next there are a series of columns that show selected information about about CICS system in the CICSplex (for example “Job name” “Current number of tasks” and “CICS status”

CICSPlex SM Interfaces

- **Application Programming Interface**
  - Allows you to write programs to monitor and control resources and CICS systems
  - Allows you to write programs that perform functions on CPSM administrative functions
  - Can be used with C, PL/I, Cobol, REXX and Assembler via EXEC CPSM verb
- **Batched Repository Update**
  - Can be used to create new definitions
  - Assists with migration from the CSD
  - Assists with migration from one CICSplex to another
  - Jobs can be started via the WUI or via JCL

CICSPlex SM Interfaces

- **CPSMUTIL**
  - Alternative migration tool to using BATCHREP
    - Avoids to need to update BATCHREP input during migration by providing overrides
  - Compiled REXX program
    - Includes Rexx Alternate Runtime Library
  - Available as an unsupported Support pack for CICS TS 1.3, 2.2, 2.3 and 3.1
    - Known as CS1G
    - Available from:
      - http://www-1.ibm.com/support/docview.wss?uid=swg24011552

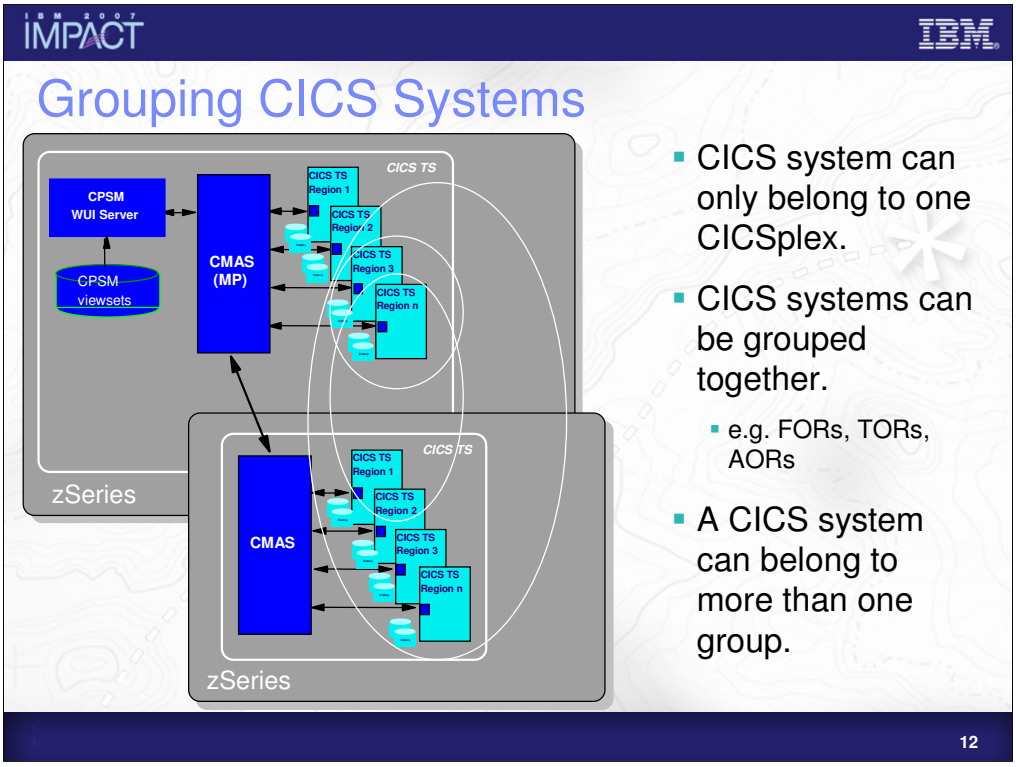


This diagram shows a set of CICS systems participating in a CICSplex. The CICSplex is split across two MVS images.

There is a CMAS in each imaging managing the systems in that image. A CMAS is a specialized CICS system that manages the participation of CICS systems in a CICSplex.

One of the CMAS is labelled MP, this means it is the Maintenance Point CMAS. The MP CMAS has overall responsibility for managing the whole of the CICSplex.

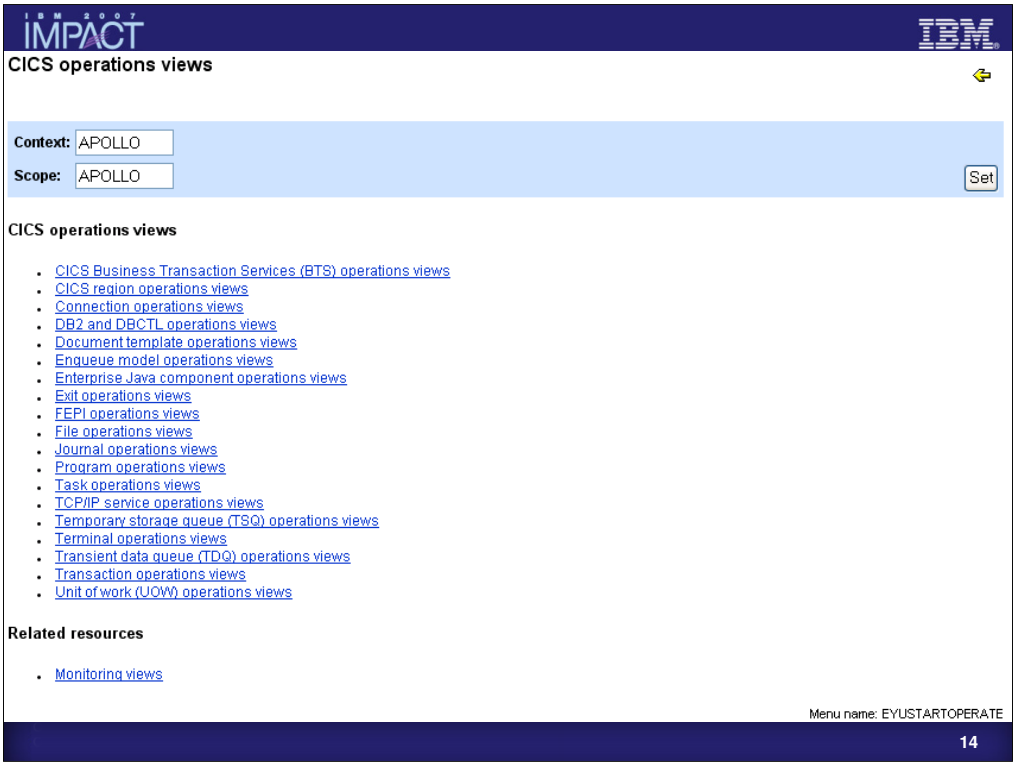
Connected to the MP CMAS is a CPSM WUI Server. This is a specialized CICS region that serves up HTML pages to users Web Browsers when they are interacting with CPSM via the Web User Interface.



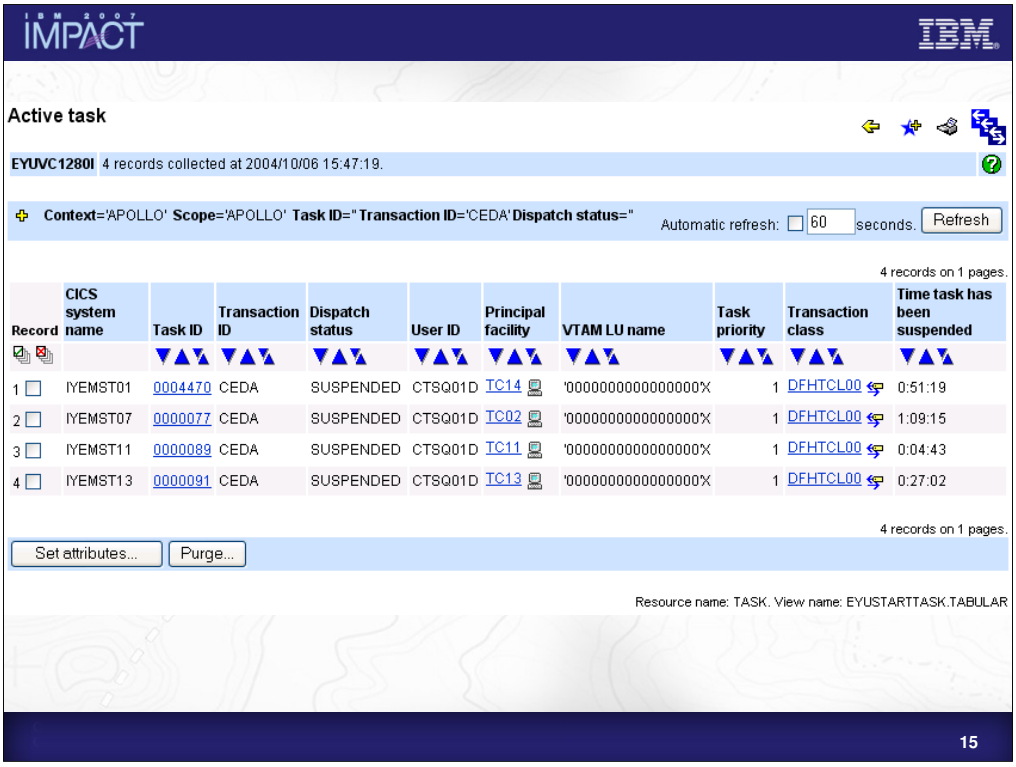
This diagram shows that CICS regions in a CICSplex can be grouped in any you like. Regions do not have to be in the same MVS Image to belong to the same group, and a region may belong to more than one group at the same time.

Operations

- Similar to CEMT
  - Some views show more information than CEMT (e.g. for CICS regions)
- Can view information on a resources across all CICS systems in a scope
- Can perform action on resources across all systems in a scope in one operation



The above diagram shows a the “CICS operations views” menu from the Web User Interface. It is possible to see details of all your regions and the resources installed within them from this menu.



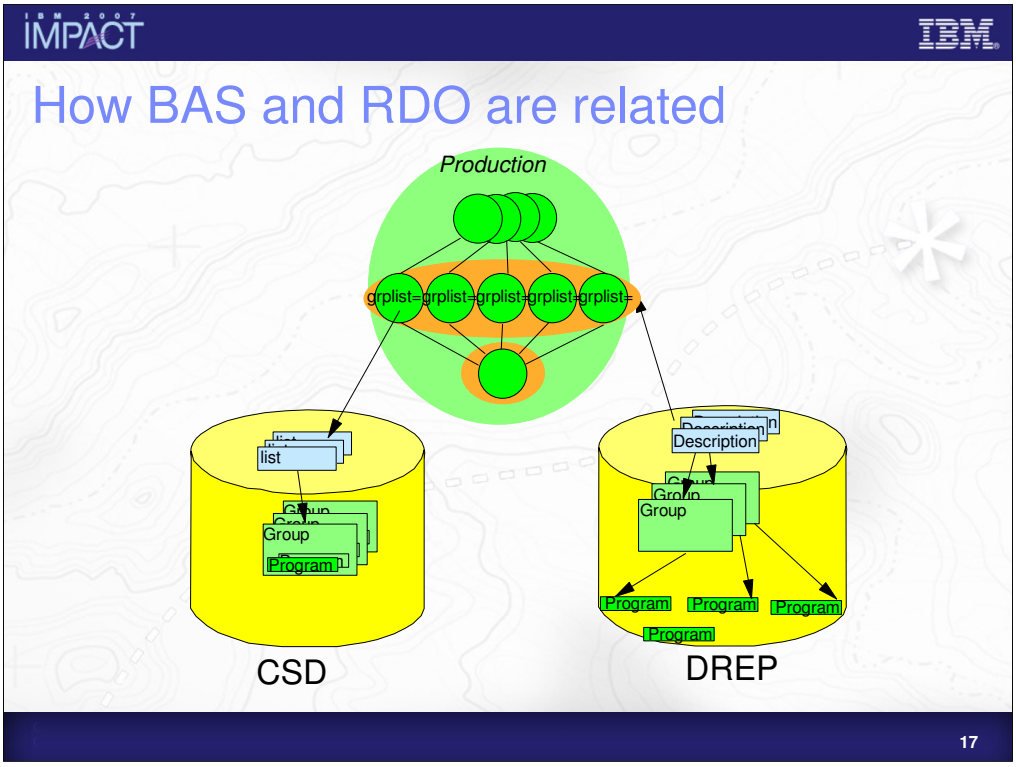
This diagram shows the “Active task” view from the Web User Interface. If shows some details of tasks that have a Transaction ID of CEDA in four different CICS regions in a CICSplex.

Detailed information for a specific task is available by clicking on a Task ID you are interested in.

Users can also set alterable attributes of the task or perform a task Purge from this view.

Business Application Services (BAS) – Defining Resources

- **BAS is similar to RDO, except**
  - A resource can belong to more than one group
  - Allows creation of resource definitions for all supported releases of CICS
  - Resource Assignments enables flexible resource deployment
  - Logical Scoping, e.g. resources can be grouped according to the application they are used in
  - SYSLINK construct simplifies connection installation



The above diagram shows the ways in which RDO and BAS are related.

RDO definitions reside on the CSD, while BAS definitions reside on the CPSM Data repository.

In RDO resources are contained within groups and a resource can belong to only one group.

In BAS resources can exist without belonging to a Group and can belong to more than one group at once.

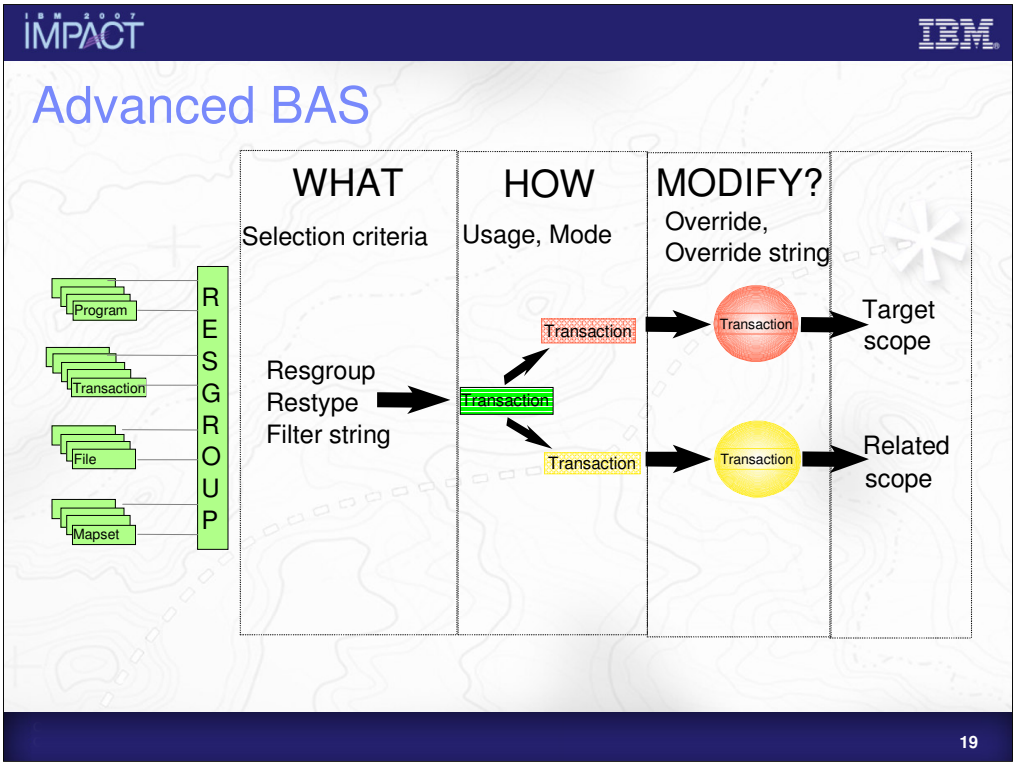
To install RDO resources upon system start up, resources are added to a List and this List is then specified in the JCL for the region.

In BAS this is done through the use of a Resource Description which (through CPSM) is associated with a CICS region or a group of CICS regions.

BAS and RDO comparison

- RDO
  - Repository
    - Sysplex shared
    - Discrete - need copies
  - Data
    - volume - baseline
    - consistency - CHECK cmd
  - Access control
    - dataset RACF
    - records LOCK/UNLOCK
  - Install span of control
    - Coldstart
    - region -> Sysplex
  - Runtime
    - Single system
  - API access
    - No access to CSD data
    - EXEC CICS CREATE
  - Integration into runtime
    - None
  - Interface
    - 3270 from within CICS

- BAS
  - Repository
    - Globally shared
    - No need to copy things around
  - Data
    - volume - less due to sharability
    - consistency - increased
  - Access control
    - dataset RACF
    - records RACF
  - Install span of control
    - Coldstart
    - Global
  - Runtime
    - Global
  - API Access
    - Full access from CICS, batch, TSO, NetView
  - Integration into runtime
    - enables subset resource management
  - Interface
    - Web Browser via WUI



This diagram shows how Resource Assignments can be used in BAS.

A Resource Assignment allows you to alter how a resource is installed (at install-time) without changing the definition itself.

In the example above we want to install a specific transaction as dynamic in one system and static in another.

The transaction is defined as static on the data repository.

The resource assignment allows us to do the following:

Select which transaction we wish to alter at install time

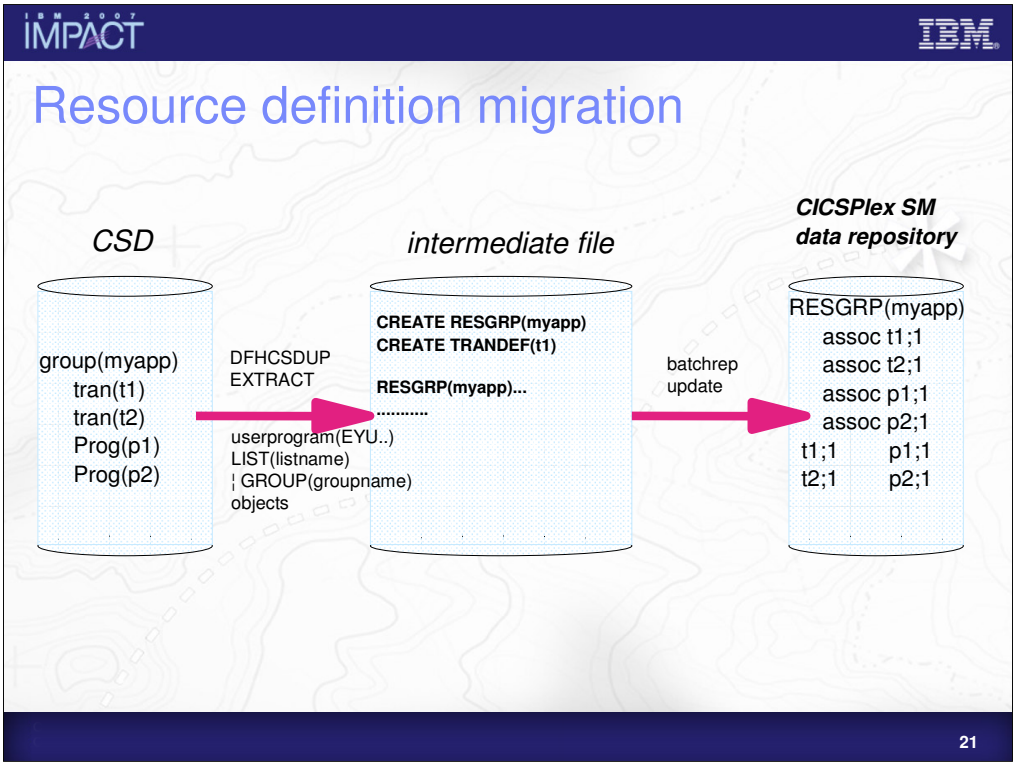
Change how it is installed

Modify any resource attributes

So we select the transaction we want and install it as Remote in one system and Static in another system.

Resource Assignment Advantages

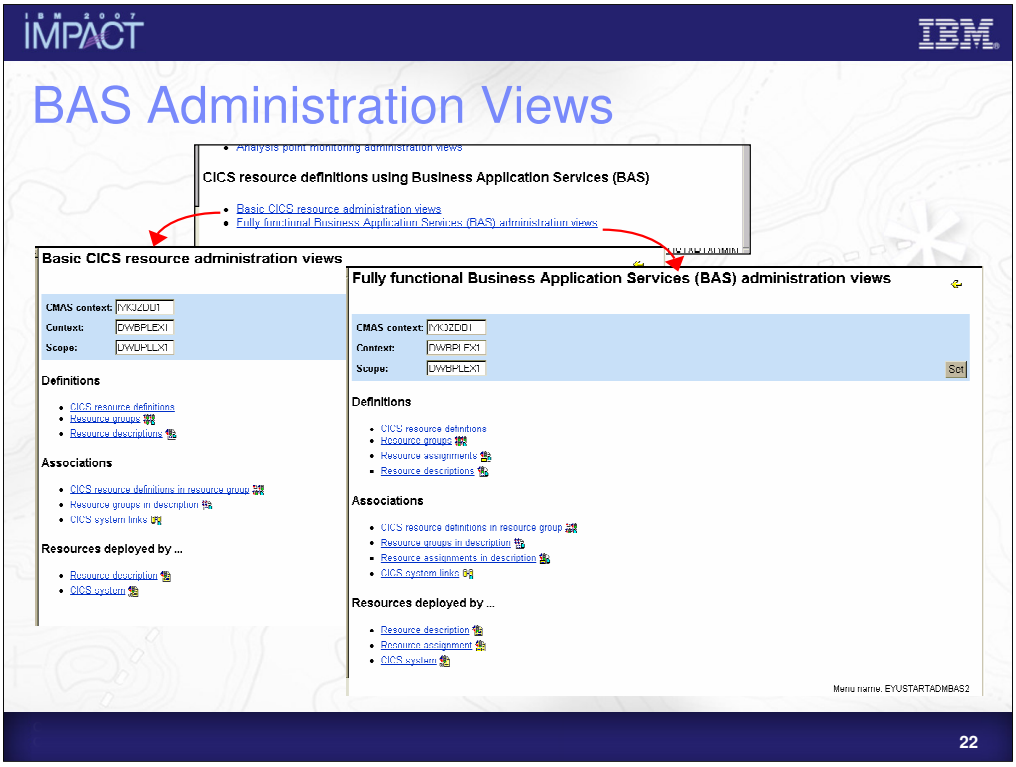
- Easier to see where resources are assigned and how
- Can share resources across multiple environments
- Easier to do global change
- Increased consistency - no mismatches
- Movement from test; QA; production
- No need to edit resource definitions to adapt to topology change
- New application version becomes Resource Description, Resource assignments and changed definitions



The diagram above shows the migration of definitions from a CSD to the CPSM Data Repository.

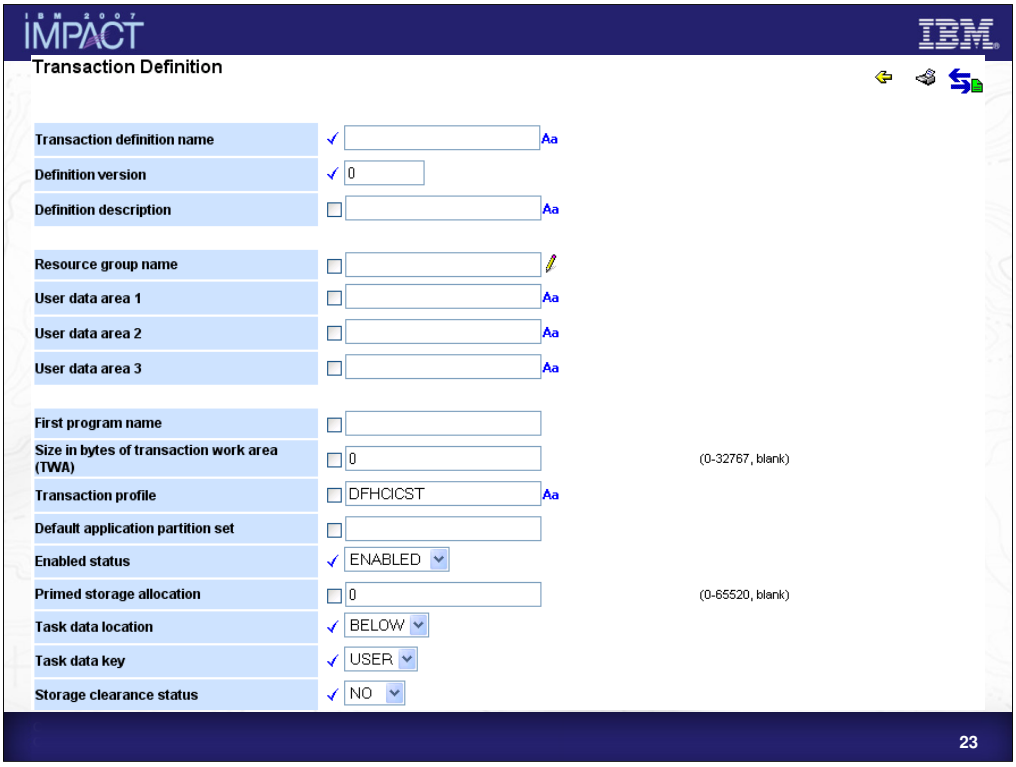
NOTE!! If you are not using the BAS function in CPSM you do not need to migrate off the CSD, you can continue using RDO as normal.

Resource definitions are extracted from the CSD using DFHCSDUP. This creates a flat file which can be used as input to a BATCHREP job to load the resource definitions into the Data Repository.



The above diagram shows the two types of BAS menu in the Web User Interface.

When not using Resource Assignments you may want to use the “Basic” menu and the “Full” menu for when you do. However, when not using Resource Assignments either menu can be used.



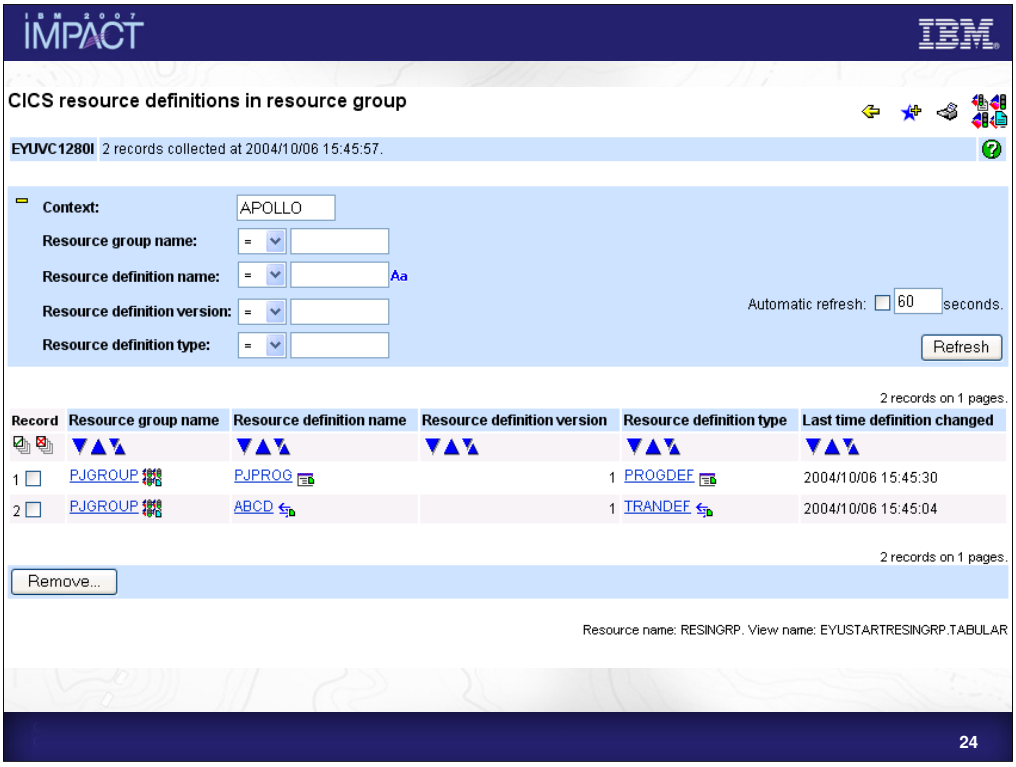
The above diagram shows what it looks like when defining BAS resources in the Web User Interface. The resource we are defining in this case is a Transaction Definition.

Most fields are exactly the same as the ones you will find in RDO but there are a few differences:

•“Definition versions” allow you to create up to 15 versions of a resource using the same definition name.

•User data areas allow you to enter site specific information

•As CPSM allows different releases of CICS in a CICSplex there may be additional attributes in the view to support previous CICS releases



The above view is from the Web User Interface. It shows a Program definition (PJPROG) and a Transaction definition (ABCD) associated with Resource group PJGROUP.

Workload Management

- Balances work from multiple routing regions across multiple target regions
- Target region selected using one of two methods:
  - Queue.
  - MVS Goal.
- Workload Separation
  - Work can be balanced across a sub-set of target regions.
- Affinity Handling
  - e.g. if all transactions must run in same system
- The following work can be routed:
  - Transactions, Dynamic program link requests, EXEC CICS START TRANSID TERMID requests, BTS processes and activities, 3270 bridge requests, EJB requests, non-terminal STARTs.

Workload Management Algorithms

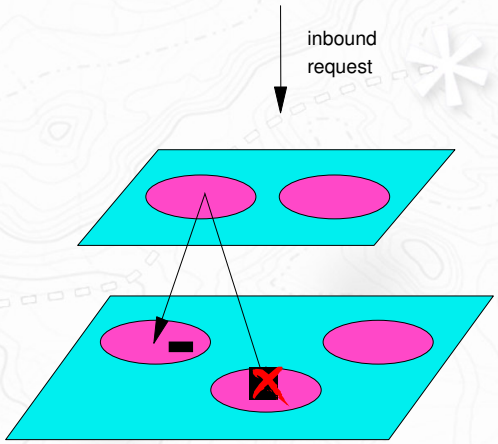
- Work is not balanced in a round-robin fashion
  - WLM selects the system most likely to meet specified criteria (mentioned below).
  - If all target regions can handle the work within a specified criteria then a system is selected at random.
- Queue algorithm
  - Selects the system with shortest queue of work (load count) relative to system MAXTASKS
  - The system least likely to be affected by SOS, SYSDUMP and TRANDUMP conditions
  - The system least likely to cause the transaction to abend

Workload Management Algorithms

- Goal algorithm
  - Is most likely to meet average MVS WLM response time goals
    - Therefore Goals must be defined to MVS WLM

Workload Management Affinities

- Inbound request routed
- Creates data in a region
- Next part routed to different region
- At best request fails
- WLM will honor such affinities to prevent failure



Real Time Analysis

- Can send notifications about any aspect of a resource's state in which you express an interest – not just error conditions.
- Notification take two forms
  - Console messages
  - SNA Generic alerts (can be used by NetView)
  - …or both
- When a condition is triggered, an EVENT also appears in the EVENT view.
- CPSM can also perform simple modifications to resource when a notification is sent.
  - You can create CPSM API applications to listen for RTA events and take actions accordingly.

Real Time Analysis

- RTA is divided into two main areas
  - System Availability Monitoring (SAM)
  - RTA resource monitoring
- RTA resource monitoring divided into two further areas
  - MAS Resource Monitoring (MRM)
  - Analysis Point Monitoring (APM)

RTA System Availability Monitoring

- In a basic setup detects the following conditions
  - Short on Storage
  - System dump in progress
  - Transaction dump in progress
  - System has reached MAXTASKS limit
  - Tasks stalling because of resource contention
- If time period for a CICS system being active is given, a message is sent if the system is not active during this time.
- Messages produced can be customized

RTA MAS Resource Monitoring

- Able to send notifications when the status of a specific (or generic) resource reaches a certain threshold.
- Threshold can be simple
  - e.g. status of Connection SYS1 is RELEASED
- Threshold can be made more sophisticated by combining simple thresholds with logical operators
  - e.g. Use Count of transaction ABCD is greater than 50 OR less than 5
- Possible to specify a number of times the threshold much be breached before CPSM will issue an alert.

RTA MAS Resource Monitoring

- When generic resource being analysed an aggregation of the status can be tested
  - e.g. average Use Count across all transactions matching M*
- MRM allows the use of user-written status programs to monitor resources not managed by CPSM.
- A threshold can apply to an individual system or groups of systems. Each system in the group will issue a notification when required.

RTA Analysis Point Monitoring

- Thresholds can be set in the same way as MRM.
- In a group of systems, one notification is issued when a threshold is reached.
- Useful when there is a group of cloned systems.

RTA – Performing Actions

- RTA can perform SET actions on resources when a threshold is reached.
- Products such as NetView can be set to listen for SNA Generic alerts and run REXX API scripts as required.
- A CPSM API application can use the LISTEN verb to wait for notifications and then take appropriate action.

CICSPlex SM Summary

- Fully functional Single System Image System Management tool
- Provided as part of CICS Transaction Server
- Providing
  - Resource definition
  - Operations
  - Thresholding
  - Automation
  - Dynamic workload management
  - Modern Browser interface
  - Scripting APIs
  - Integration with IBM System Management tooling

IBM 2007 IMPACT

IBM

Questions
and
Answers

impact·venture*

© IBM Corporation 2007. All Rights Reserved.

The workshops, sessions and materials have been prepared by IBM or the session speakers and reflect their own views. They are provided for informational purposes only, and are neither intended to, nor shall have the effect of being, legal or other guidance or advice to any participant. While efforts were made to verify the completeness and accuracy of the information contained in this presentation, it is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, this presentation or any other materials. Nothing contained in this presentation is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software.

References in this presentation to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in this presentation may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. Nothing contained in these materials is intended to, nor shall have the effect of, stating or implying that any activities undertaken by you will result in any specific sales, revenue growth or other results.
Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics may vary by customer.

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries. For a complete list of IBM trademarks, see www.ibm.com/legal/copytrade.shtml
AIX, CICS, CICSPlex, DB2, DB2 Universal Database, i5/OS, IBM, the IBM logo, IMS, iSeries, Lotus, OMEGAMON, OS/390, Parallel Sysplex, pureXML, Rational, RCAF, Redbooks, Sametime, System i, System i5, System z , Tivoli, WebSphere, and z/OS.

Other company, product, or service names may be trademarks or service marks of others.