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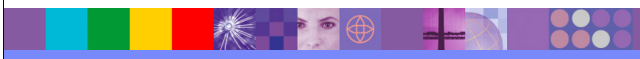
IBM zSeries Tools to Help You Simplify Migration to the New Releases of CICS Transaction Server

Feb 2006



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Preface

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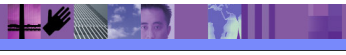

Agenda

- Tools to support version to version migrations
  - CICS Interdependency Analyzer
  - Debug Tool Utilities Advanced Functions
    - Modernizing COBOL Programs
  - CICS Configuration Manager
  - CICS Performance Analyzer
- CICS Version Migration Scenarios
  - Scenario 1 – Migrating to V3.1, resources in CSD
  - Scenario 2 - Migrating to V3.1, resources in CICSPlex SM repository
  - Scenario 3 – Implementing SOA on CICS TS 3.1
- More information

This presentation will give you an overview of the CICS Tools portfolio.

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Migration Considerations

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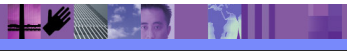
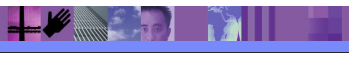
CICS Integration Enhancements

CICS 22	CICS 23	CICS 31
EJB support - Session Beans - EJB deployment tooling - JNDI (COS or LDAP) Link 3270 Bridge ECI over TCP/IP SOAP for CICS	EJB Support - Performance enhancements - JNDI caching - Improved monitoring - IIOP Authentication CCI Connector for CICS	Web services Web service assistants HTTP 1.1 HTTP outbound API Transport layer security SSL performance Additional cipher suites



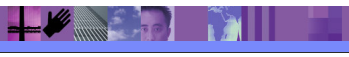
CICS Application Transformation Enhancements

CICS 22	CICS 23	CICS 31
SDK for z/OS 1.3.1 - JVM Resettable mode - JDBC 2.0 XML for COBOL & PLI	SDK for z/OS 1.4.1 -Continuous mode -Shared Class Cache -Storage Protection -zSeries Application Assist Processor JCICS APIs -WEB -Document -Extract Debugging Enhancements	SDK for z/OS 1.4.2 LE assembler Channels & Containers New example application



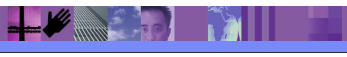
CICS Enterprise Management Enhancements

CICS 22	CICS 23	CICS 31
CICS DB2 enhancements - OTE exploitation - Group Attach - RMI purge Sign-on retention CF rebuild and duplexing	Additional Thread Safe commands - ASKTIME - FORMATTIME - DOCUMENT MRO timeout TN3270 address display Statistics enhancements CPSM Enhancements - Definitional Web User Interface - Workload Management for LINK3270 bridge	OTE exploitation - OPENAPI XPLINK for C & C++ Thread Safe Web Cmds CPSM enhancements - User favorites - Group profiles - Filters - Result set warnings - BATCHREP access



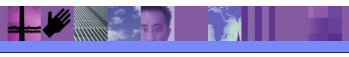
Migration Considerations

- Migration to CICS TS 3.1
  - Is comparable
    - Standard migration activities
      - SIT changes
      - Resource definition changes
      - Global and Task related user exits
      - CICS supplied transactions
      - Systems programming interface (INQ/SET commands)
      - Performance benchmarking
      - Threadsafe considerations
      - Detecting unsupported COBOL versions



Migration Differences

- CICS TS 2.2
  - Translator support for pre-Language Environment compilers is withdrawn
- CICS TS 2.3
  - CICS interfaces for the VS COBOL II, OS PL/I and C/370 runtimes are removed
    - Will need run-time libraries distributed with LE to execute current load modules
  - CICS interfaces for OS/VS COBOL are maintained
    - CICS will create reentrancy environment when program is loaded
- CICS TS 3.1
  - OS/VS COBOL support has been removed

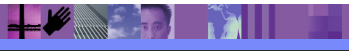


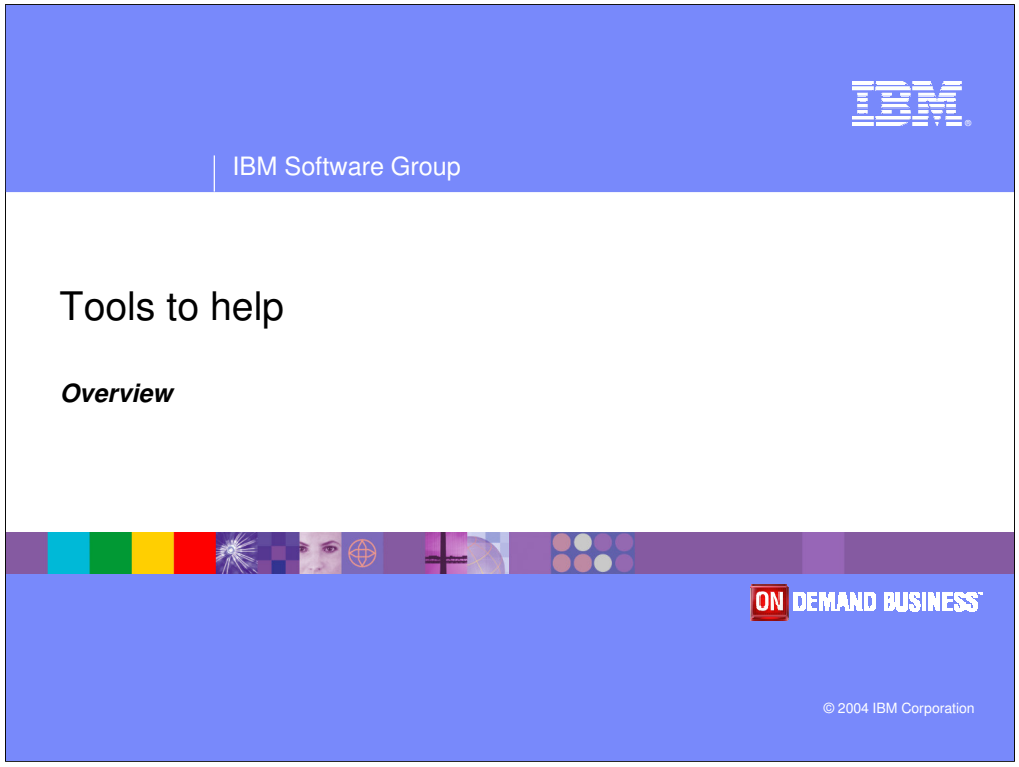
Migration Differences…

- CICS TS 13 to CICS TS 23/31
  - CICS will build a pool of open TCBs for use by DB2
    - TCBLIMIT of DB2CONN definition is a subset of MAXOPENTCBS
  - DB2 CPU time will be included in CICS 110 records
    - DB2 Class 1 time will be included in the CICS CPU time
      - May increase due to now accounting for CREATE Thread
    - L8 CPU time will be greater or equal to DB2 class 1 time
      - May also contain thread create or termination time
      - If application is threadsafe:
        - Will contain CPU time spent in application
        - QR CPU time will decrease
    - DB2WAIT field will be zero
      - Represents elapsed time spent waiting for a DB2 request to complete
      - With OTE there is no CICS dispatcher wait for a subtask
    - Can be large difference between DB2 Class 1 and Class 2 CPU times
      - CICS RMI code and threadsafe application code
      - CICS tracing

Migration Differences…

- CICS TS 2.2 to CICS TS 3.1
  - Migration from the SOAP for CICS Feature
  - Coexistence supported for migration
    - Version 2 feature may be installed on CICS TS 3.1
    - Provides the same level of function as on Version 2
  - Migration to CICS TS 3.1 Web Services requires
    - Modifying your message adapters to use the new interfaces
    - Review your use of containers. The SOAP for CICS feature uses BTS containers; the Web services support in CICS TS V3.1 does not use BTS. The containers names used in the Web services support, are different from the names used in the SOAP feature
    - Replacing the user-written handlers with SOAP header handlers defined in the PIPELINE configuration file

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Tools to help
Overview
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CICS Tools Support for Version to Version Migration

- All tools exploit CICS TS 3.1 functions where relevant
  - Support and new function exploitation at General Availability
- Improved speed of version to version migration projects
  - Prepare for migration: prioritize and optimize
    - Application understanding
      - CICS Interdependency Analyzer and WebSphere Studio Asset Analyzer/ATW
    - Performance and application analysis to improve design and performance
      - CICS Performance Analyzer
  - Improve speed of migration
    - Migrate through Test, Quality Assurance regions and into production faster
      - CICS Configuration Manager for improved productivity and control of CICS resource definitions
      - CICS Interdependency Analyzer for improved quality of testing

CICS Tools Support New Function Exploitation

- Identify candidate applications for new function exploitation
  - Make applications thread safe
    - CICS Interdependency Analyzer helps understand applications that conform to thread safe standards
    - CICS Performance Analyzer reports can show CPU usage by your thread safe CICS applications
  - Enable CICSPlex SM
    - CICS Interdependency Analyzer identifies affinities
    - CICS Configuration Manager can simplify management of resource definitions in a CICSPlex environment
- Improved efficiency to support SOA implementations
  - Use CICS IA, PA and CM to help implement web services
  - CICS Operations management tools help move closer to 24/7 operation, a key requirement for SOA.

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Tools to Simplify Migration

CICS Interdependency Analyzer

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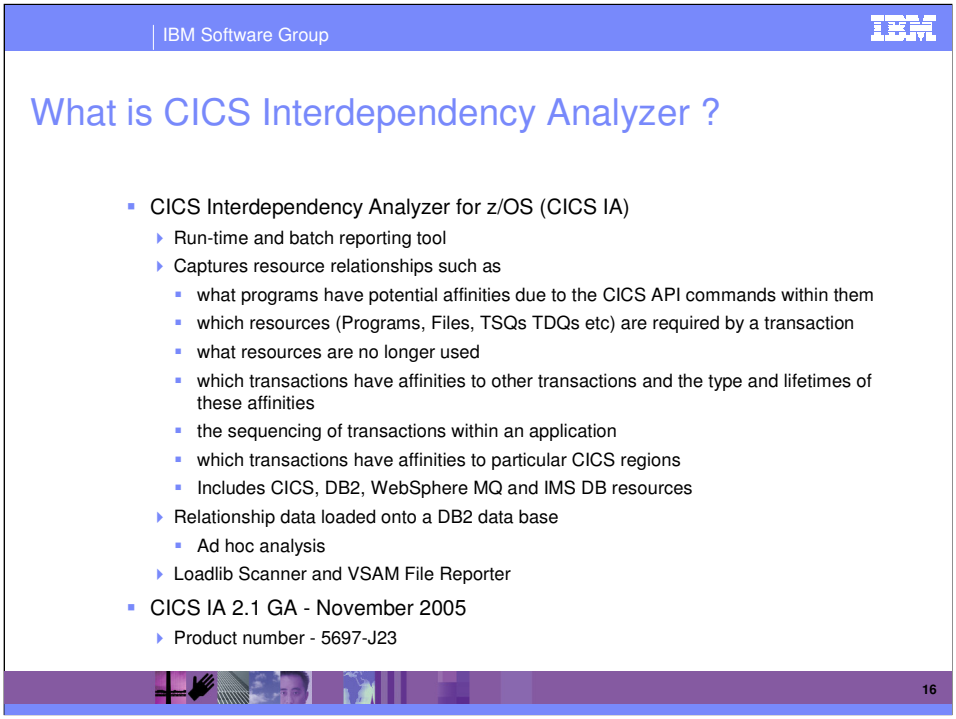
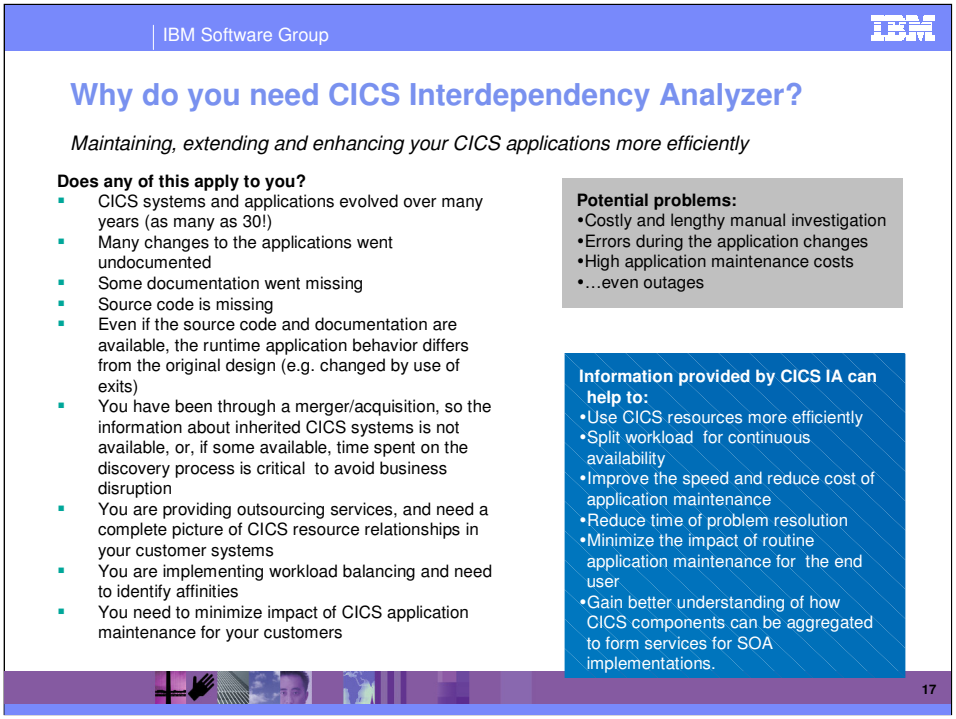
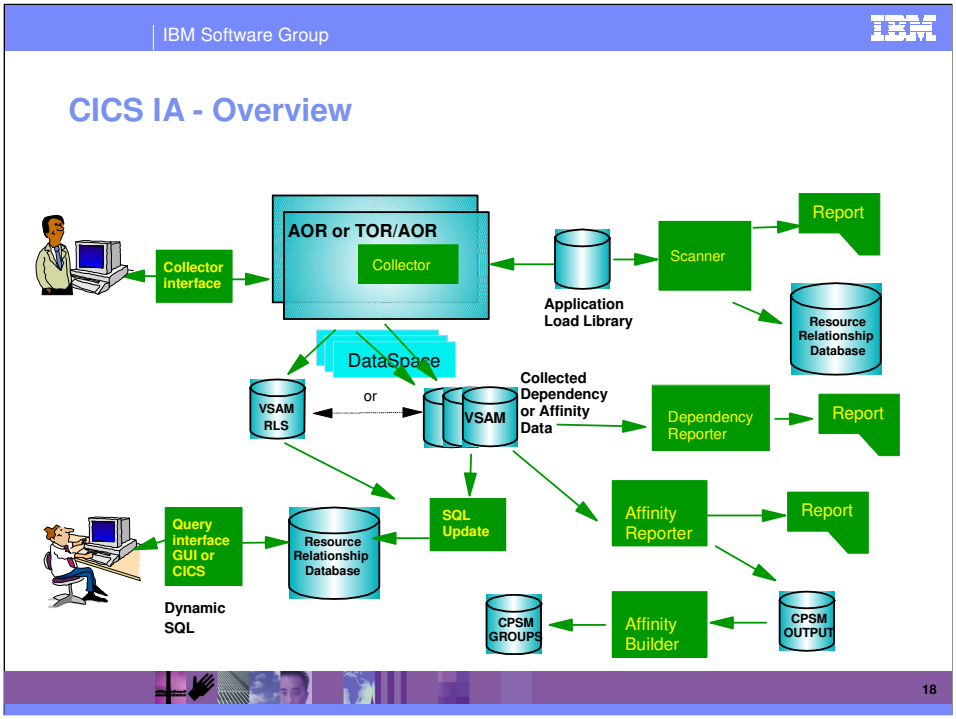


IBM CICS Interdependency Analyzer for z/OS and OS/390 (CICS IA) is a unique run-time tool that helps you identify resource relationships within your CICS system using report data stored in a DB2 data base. These reports, which can be interrogated on-line, will help you to improve your ability to maintain, enhance, and migrate your business applications.



CICS customers are looking to reuse and maintain their core asset, CICS applications, more efficiently, at a lower cost. As you can see from this chart, CICS Interdependency Analyzer offer the capabilities CICS customers need to reduce time and effort of application reuse and maintenance. CICS IA helps our customers to understand their CICS applications (some over 30 years old! With documentation lost or incomplete) in order to maintain and update these applications with the full knowledge of resource relationships involved.



CICS IA automates the process of collecting the data on the relationships between CICS resources.
CICS IA collects Interdependency data or Affinity data.
CICS IA works in two ways - off-line and online.

Online Components
The Collector intercepts CICS commands which may be involved in an interdependency and records the details of the resources used. For efficiencies sake the data is stored in a data space, which under user control, may be offloaded to the Collected dependency data component. These data sets may be aggregated together and stored in a DB2 Database.

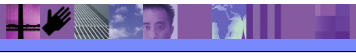
Off-line Components
The Dependency Reporter presents the dependency information collected by the Collector for a selected CICS region, in a structured format.

The Affinity Reporter presents the affinity information collected by the Collector for a selected CICS region, in a structured format. It also provides input to the Builder function. The Builder Function generates CPSM groups for those affinities reported.

The Scanner provides the additional capability to scan the load module data sets detecting EXEC CICS commands that may cause transaction resource dependency or affinities and to produce a printed report. The scanner data can be loaded into DB2 tables.

New in CICS Interdependency Analyzer for z/OS V2.1

- An Eclipse-based graphical user interface and improved query management facilities
  - make it easy for you to access the collected data and use it in the day-to-day analysis.
  - The GUI is based on the XML application programming interface (API), so automated processes can query the database as well.
- Timer based Collector control,
  - allows the user to start the collector for a given time of day to enable targeted data collection
    - For example, you can set the tool to schedule collection in different regions throughout the data collection process.
  - Helps you to
    - work around high volume time periods
    - target collection for when an application is active.
- Enhanced single point of control capabilities
  - You can turn data collection for multiple CICS regions on and off with a single CINT command to speed selection.
- A selective program and transaction Exclude list to eliminate extraneous data and reduce overhead during data capture.
- Provision of CSD dataset name and group-list information
- Automation of tracking of runtime impact on application change by providing program version information, enabling removal of old data by version and comparison of data by program version.
- Improved installation and customisation, as well as other enhancements



Why use CICS IA?

- Helps you understand your active Application Inventory
  - Documentation lost or incomplete
  - Time pressure
  - Merger / Acquisition
- Helps you maintain or enhance Applications
  - Identifies the resources that are affected directly and indirectly
    - Transactions, programs, data elements:
      - Files , Queues , Screens, ...
  - Helps formulate the request for change
    - What to change, what to build, what to test, what needs to be communicated to roles involved
  - Looks across boundaries, including through shared data - files, databases or queues
- Need to balance CICS work across regions for greater availability?
  - CICS IA helps quickly identify resource relationships which need to be changed to enable transactions run anywhere
  - CICS IA helps quickly clone regions
- Version to version migration assistance
  - Build a database of application topology knowledge to reference throughout the migration process
  - Make applications threadsafe
    - CICS IA provides information needed to understand which applications conform to threadsafe standards
  - Identify OS/VS COBOL programs
- CICSplex SM enablement
  - CICS IA identifies system and transaction affinities

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Tools to Simplify Migration

Debug Tool Utilities Advanced Functions V5

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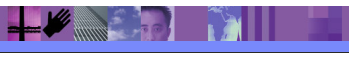
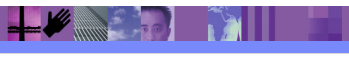
IBM COBOL Modernization Solutions:

- IBM Websphere Asset Analyzer
  - Static z/OS Analysis and Reporting tool
    - Reports CICS, batch, IMS TM, and DB2 program dependencies
    - Determines Inventory validation
    - Reports change impact analysis
  - IBM CICS Interdependency Analyzer
    - Runtime reporting
- IBM Debug Tool Utilities and Advanced Functions
  - Debug Tool COBOL Modernization Utility
  - Debug Tool Coverage Utility
  - Debug Tool Interactive Debugger
    - Supports all versions of IBM COBOL



What is Debug Tool Utilities and Advanced Functions?

- IBM Debug Tool Utilities and Advanced Functions
  - Debug Tool COBOL Modernization (conversion) Utility
  - Debug Tool Code Coverage Utility
  - Debug Tool Interactive Debugger
    - Supports all versions of IBM COBOL
- How does it help in the migration effort?
  - Helps convert old COBOL:
    - OS/VS COBOL
    - VS COBOLII (or later) w/ CMPR2
  - To ANSI 1985 conforming COBOL, Language Environment LE
  - Once in 1985 standard you can change compilers at any time
  - Migrate gradually
  - Before putting back in production, utilize DTUAF code coverage and debugger to confirm code was properly tested.



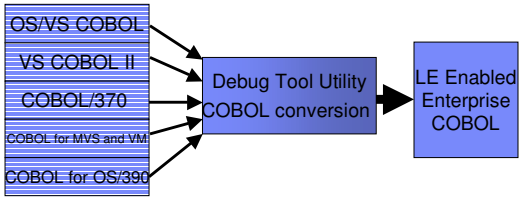
Debug Tool COBOL Modernization Utility

- Analyze, Report, and Convert COBOL source to be compliant with supported versions of COBOL
  - Assess the current COBOL source inventory and report the “size” of the conversion effort
  - Convert COBOL source to be compliant with supported LE COBOL compilers
  - Facilitate the project management of the conversion effort

Portion of a sample conversion report

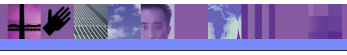
```
1       2       3
000179          IF ERROR-FLAG = ZERO
000180             MOVE "TEST CASE LCPTST09 IS SUCCESSFUL." TO OUTPUT-RECORD
000181             WRITE OUTPUT-RECORD                                  4   5   6
000182  *OLD**  OTHERWISE                                    ABJ6021 00 OTHERWISE REPLACED BY ELS
000183          ELSE
000184             MOVE "TEST CASE LCPTST09 FAILED." TO OUTPUT-RECORD
000185             WRITE OUTPUT-RECORD.
000186
000187          COPY CLOSEA.
000188+         CLOSE IN-FILE1.
000189+         CLOSE IN-FILE2.
000190+         CLOSE OUT-FILE.
000191+         CLOSE PRINT-FILE.
000192          STOP RUN.
```

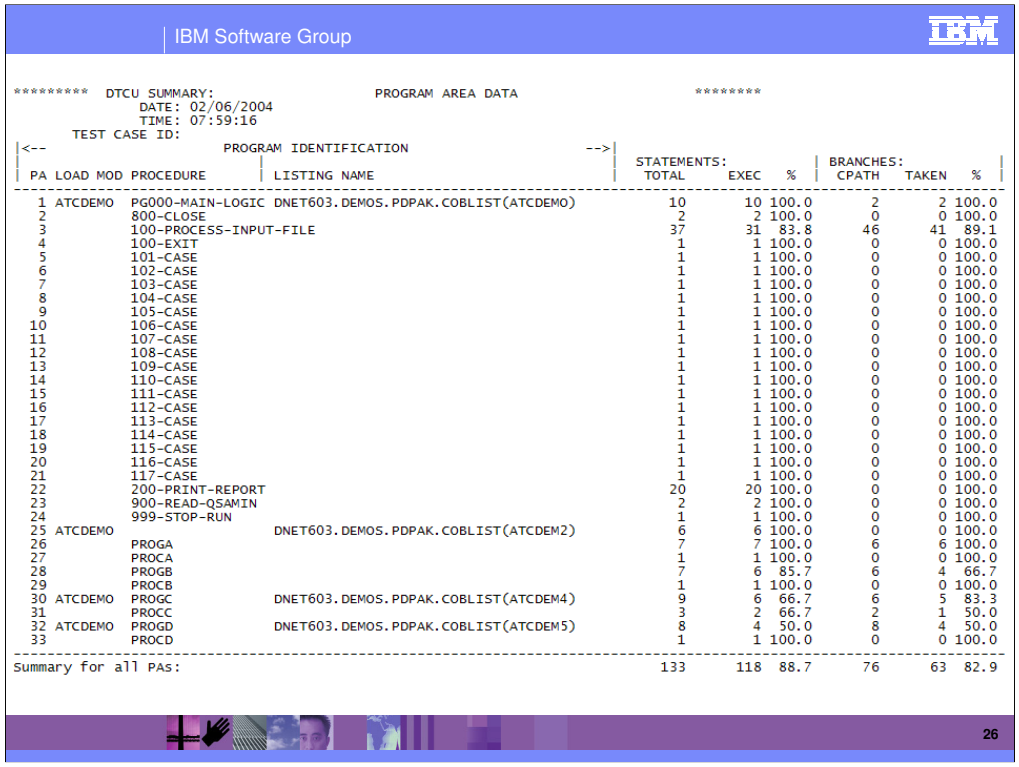
Old language syntax replaced by conversion utility



Debug Tool Code Coverage Utility

- Application runtime tool that will collect and report called and executed COBOL programs at a source statement level
  - Identify the call sequence of programs invoked by a CICS transactions, IMS TM transactions, and batch jobs to define groups of COBOL programs for conversion
  - After COBOL conversion, validate the testing of converted COBOL programs
- See sample summary report on next page
  - Lists total number of code statements and the number executed, as well as number of branches and number of branches executed
  - Lists statements that were not executed
  - Lists conditional branches that have not had both paths executed





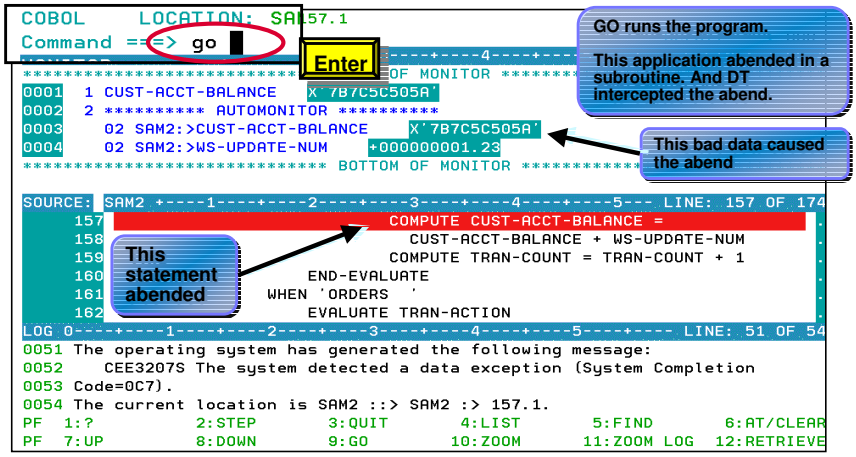
```
*********  DTCU SUMMARY:                    PROGRAM AREA DATA                    ********
              DATE: 02/06/2004
              TIME: 07:59:16
      TEST CASE ID:
|<--                    PROGRAM IDENTIFICATION                        -->|
|                                                                          |  STATEMENTS:          | BRANCHES:          |
| PA LOAD MOD PROCEDURE        | LISTING NAME                              |   TOTAL     EXEC   %  |  CPATH   TAKEN   %  |
-------------------------------------------------------------------------------------------------------------------------
   1 ATCDEMO  PG000-MAIN-LOGIC DNET603.DEMOS.PDPAK.COBLIST(ATCDEMO)          10       10 100.0       2       2 100.0
   2          800-CLOSE                                                       2        2 100.0       0       0 100.0
   3          100-PROCESS-INPUT-FILE                                         37       31  83.8      46      41  89.1
   4          100-EXIT                                                        1        1 100.0       0       0 100.0
   5          101-CASE                                                        1        1 100.0       0       0 100.0
   6          102-CASE                                                        1        1 100.0       0       0 100.0
   7          103-CASE                                                        1        1 100.0       0       0 100.0
   8          104-CASE                                                        1        1 100.0       0       0 100.0
   9          105-CASE                                                        1        1 100.0       0       0 100.0
  10          106-CASE                                                        1        1 100.0       0       0 100.0
  11          107-CASE                                                        1        1 100.0       0       0 100.0
  12          108-CASE                                                        1        1 100.0       0       0 100.0
  13          109-CASE                                                        1        1 100.0       0       0 100.0
  14          110-CASE                                                        1        1 100.0       0       0 100.0
  15          111-CASE                                                        1        1 100.0       0       0 100.0
  16          112-CASE                                                        1        1 100.0       0       0 100.0
  17          113-CASE                                                        1        1 100.0       0       0 100.0
  18          114-CASE                                                        1        1 100.0       0       0 100.0
  19          115-CASE                                                        1        1 100.0       0       0 100.0
  20          116-CASE                                                        1        1 100.0       0       0 100.0
  21          117-CASE                                                        1        1 100.0       0       0 100.0
  22          200-PRINT-REPORT                                               20       20 100.0       0       0 100.0
  23          900-READ-QSAMIN                                                 2        2 100.0       0       0 100.0
  24          999-STOP-RUN                                                    1        1 100.0       0       0 100.0
  25 ATCDEMO                  DNET603.DEMOS.PDPAK.COBLIST(ATCDEM2)           6        6 100.0       0       0 100.0
  26          PROGA                                                           7        7 100.0       6       6 100.0
  27          PROCA                                                           1        1 100.0       0       0 100.0
  28          PROGB                                                           7        6  85.7       6       4  66.7
  29          PROCB                                                           1        1 100.0       0       0 100.0
  30 ATCDEMO  PROGC           DNET603.DEMOS.PDPAK.COBLIST(ATCDEM4)           9        6  66.7       6       5  83.3
  31          PROCC                                                           3        2  66.7       2       1  50.0
  32 ATCDEMO  PROGD           DNET603.DEMOS.PDPAK.COBLIST(ATCDEM5)           8        4  50.0       8       4  50.0
  33          PROCD                                                           1        1 100.0       0       0 100.0
-------------------------------------------------------------------------------------------------------------------------
Summary for all PAs:                                                        133      118  88.7      76      63  82.9
```


This is the generic report showing how this tool collects coverage stats at a program statement level for each CU. It also collects branch information. This report shows four load modules. It could be thousands.

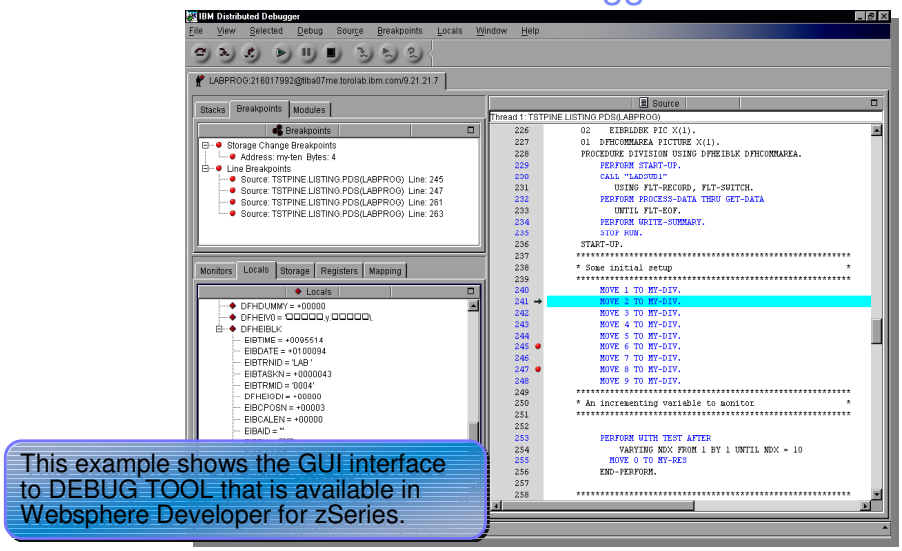
This report information is also generated in XML for import into other tools.

Debug Tool Interactive Debugger

- Source level interactive debugger supporting all versions of COBOL (i.e. OS/VS COBOL, COBOL II, Enterprise COBOL, etc)
  - Diagnose and fix COBOL conversion issues
  - Capture baseline and post baseline execution runtime results for test validation



GUI Interface for Interactive Debugger



This example shows the GUI interface to DEBUG TOOL that is available in Websphere Developer for zSeries.

This is the first introduction to the GUI. Make sure and say that this is a no charge feature and that it is an “ease of use” alternative to the MFI.

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CICS Configuration Manager

Overview

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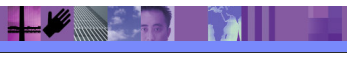
What's the problem?

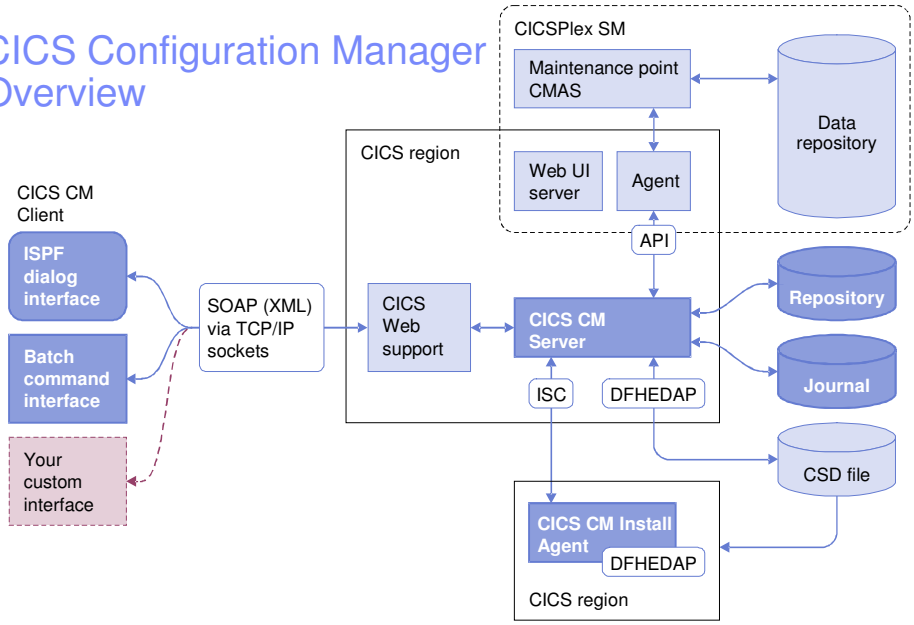
- Configuring CICS systems consists of
  - Server configuration
  - Resource provisioning
  - Application deployment
- All three require creation/modification of CICS resource definitions
- Definitions must be migrated from development, to test, to production environments
- Topology of CICS regions can be complex; different topologies in each environment can require changes to the definitions
- Definitions can be stored in CSD files or CICSPlex SM data repositories
- Migration to an new version of CICS Transaction Server adds an extra dimension of complexity



What is CICS Configuration Manager?

- CICS Configuration Manager for z/OS enables you to
  - Manage CICS resource definitions in CSDs within your enterprise from a single point of control
  - Manipulate definitions seamlessly across CSD files and CICSPlex System Manager data repositories
  - Create, edit, compare, copy, move and remove definitions, individually or in groups
  - Edit definitions whether the CICS regions that use them are active or inactive
  - Migrate multiple definitions in a single step with the option to transform definitions automatically to match the target environment
  - Use the audit trail to generate reports and back out changes to any previous version of the definitions
  - Create reports to identify redundant definitions, analyze resource definition status, relationships and history, across any combination of CSD files and data repositories
  - Take advantage of the optional change control capability where approval is required from authorized users before migrating definitions
  - Use an XML SOAP API and batch facility for scripting and integration with your existing applications
- Current release – CICS Configuration Manager for z/OS V1.1
  - GA April 2005
  - CICS Configuration Manager V1.2 announced 2 May in plan for GA 9 June
  - Product number - 5697-I78

CICS Configuration Manager Overview

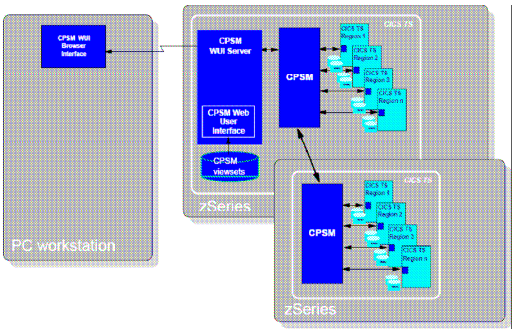


Configuration Manager Benefits

- Helps IT Managers, System Programmers and Application Developers to be more productive, as it:
  - Improves productivity of day-to-day CICS system management and administration.
  - Simplifies managing new application development through test and deployment.
  - Improves change control and auditability.
  - Ease migration between releases of CICS Transaction Server, especially to Version 3.1
  - Simplifies CICS systems administration thus lowering costs and reducing downtime due to administrative errors.

CICSPlex SM at a glance

- Enterprise systems management for CICS on z/OS via
  - Web User Interface
  - Batch repository update
  - Application Programming Interface
- Single System Image & Single Point Control
  - Resource definition
  - Operations
  - Monitoring
  - Workload Management
  - Threshold Analysis
  - Automation
- Tivoli Business System Manager Integration



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Tools to Simplify Migration

CICS Performance Analyzer

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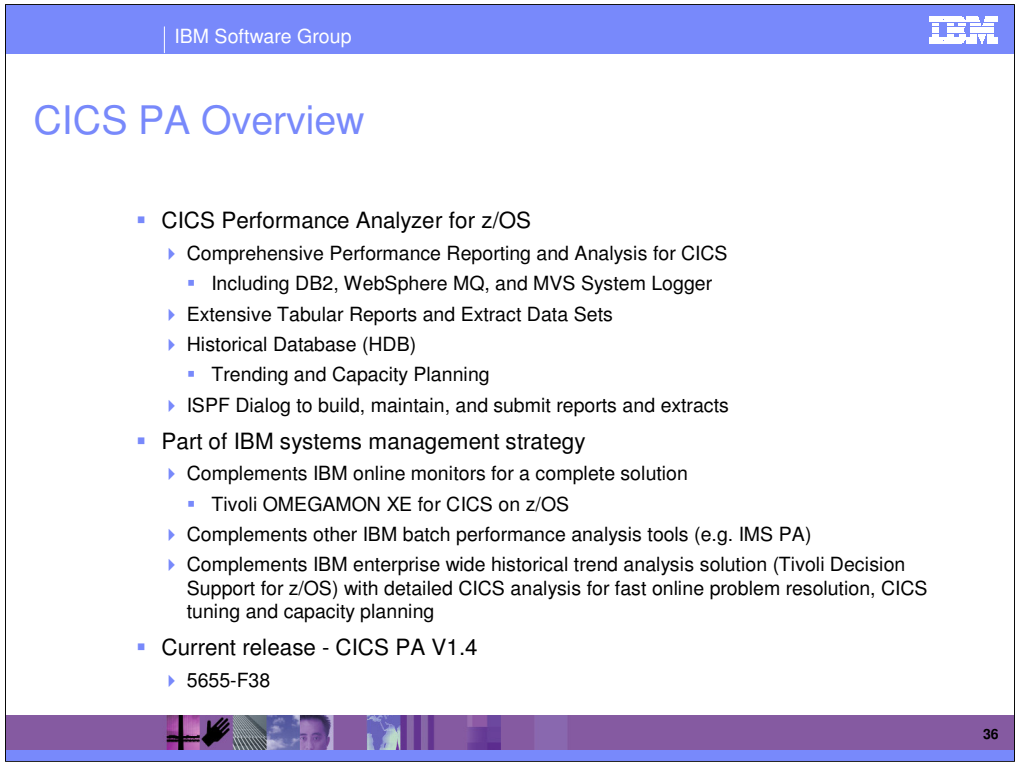
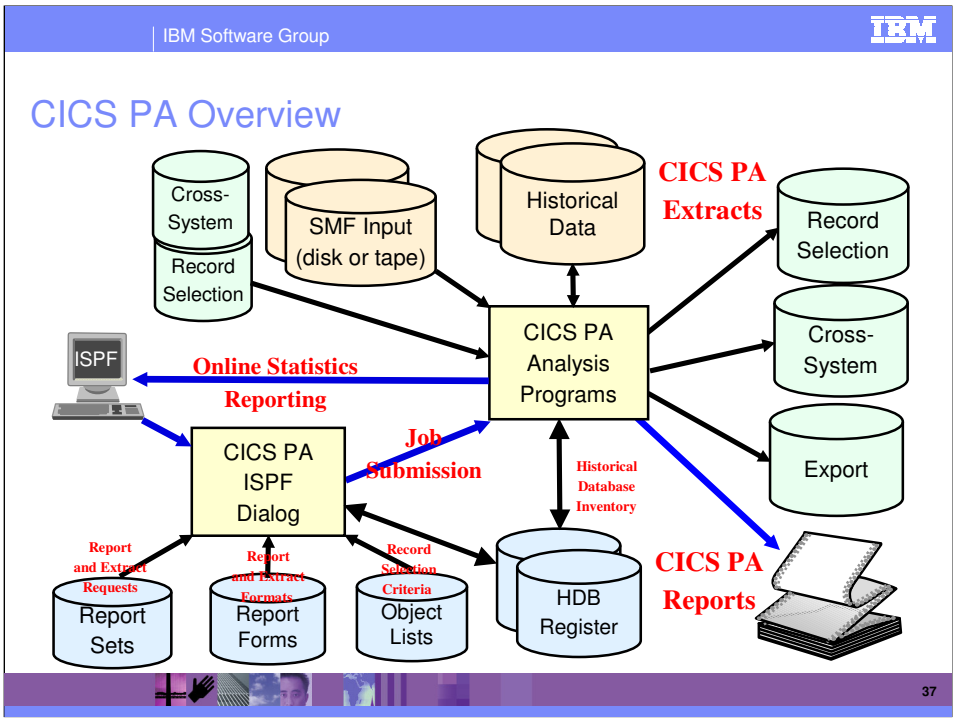


IBM CICS® Performance Analyzer for z/OS V1.4 is a powerful off-line reporting tool that analyzes the System Management Facilities (SMF) records created by the CICS Monitoring Facility (CMF), CICS Statistics, CICS Server Statistics, as well as SMF data from the related subsystems (DB2 and WebSphere® MQ®), to produce a wide range of reports and extracts that will help you tune and manage your CICS systems. CICS PA also provides z/OS system logger reports using the system logger data.

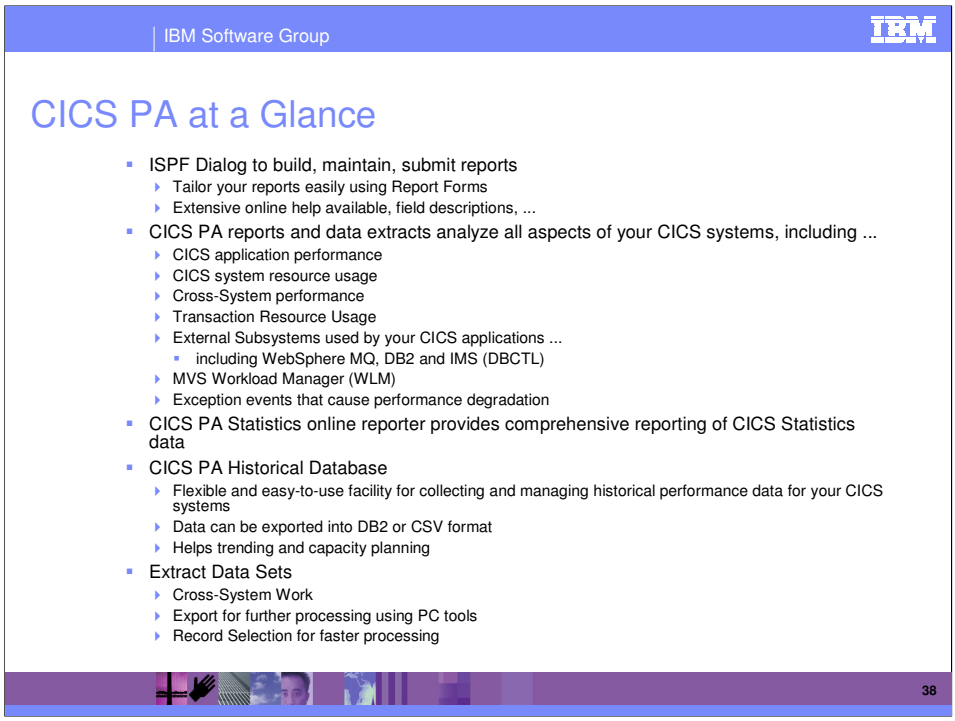
CICS Performance Analyzer for z/OS V1.4 is built to address the needs of everyone involved in CICS performance analysis, and CICS system tuning and planning capacity for future use, including those who build, manage, and deploy complex mainframe CICS applications.

CICS Performance Analyzer provides the level of detail and flexibility that easily helps you find new ways to improve CICS system performance, lower maintenance costs, and strategically plan IT investments.

CICS PA complements your online monitoring tools, like IBM Tivoli® OMEGAMON® XE for CICS® on z/OS®, as it can help to respond quickly to online performance issues by drilling down deeply into CICS performance data to identify the cause of the problem. CICS PA also complements the enterprise-wide historical performance capabilities of IBM Tivoli Decision Support for z/OS with the additional deep and detailed CICS-related performance data, which can be used for focused CICS performance problem determination, bottleneck analysis, tuning and capacity planning.



This visual shows the main components of CICS PA; including the TSO Interactive System Productivity Facility (ISPF) dialog, it's related data sets and the CICS PA batch analysis, reporting programs and data sets.



Here are some of the types of reports and extracts that can be produced using CICS PA.

The flexibility of CICS PA allows you to easily tailor your report and extract requests to meet your specific performance reporting and analysis requirements. CICS PA allows you to keep pace with the ever-changing nature of CICS by providing a flexible and easy to use dialog that allows you to report on all aspects of your CICS system's performance.

CICS Transaction Server for z/OS Version 2.2 collects over 239 specific performance data fields in 17 groups. Also, if the monitoring MCT options APPLNAME=YES and RMI=YES are specified, an additional 10 performance data fields in 2 groups are collected. And, if used, DBCTL adds a further 32 specialized fields. With the advent of CICS Transaction Server Version 2 and EJB support, the number of groups and data fields within existing groups continues to grow.

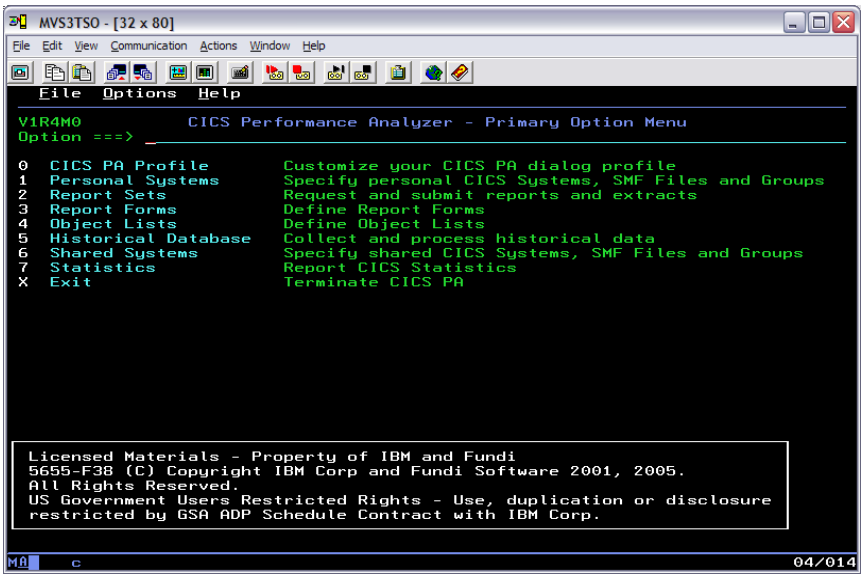
CICS PA can process CMF data from a single CICS system, or from multiple CICS systems that share the transaction workload by using MRO or ISC. Using the **Cross-System report** provides a consolidated report showing the complete transaction activity across connected CICS systems.

The **Transaction Resource Usage reports** provide a detailed analysis of the Resource class records collected by the CICS Monitoring Facility (CMF).

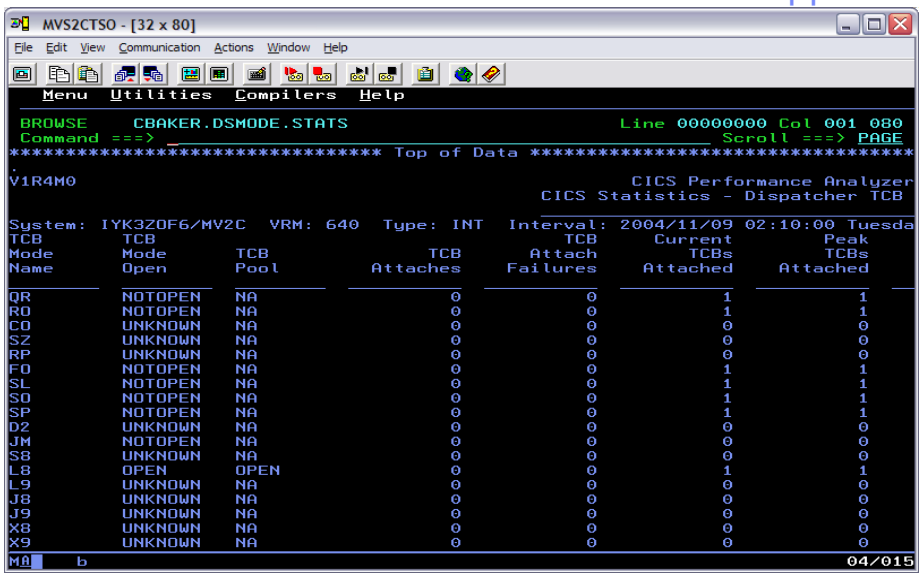
The **Workload Activity report** provides a detailed and/or summary report highlighting the MVS Workload Manager (WLM) Service Class and Report Class, and reporting phase for each transaction.

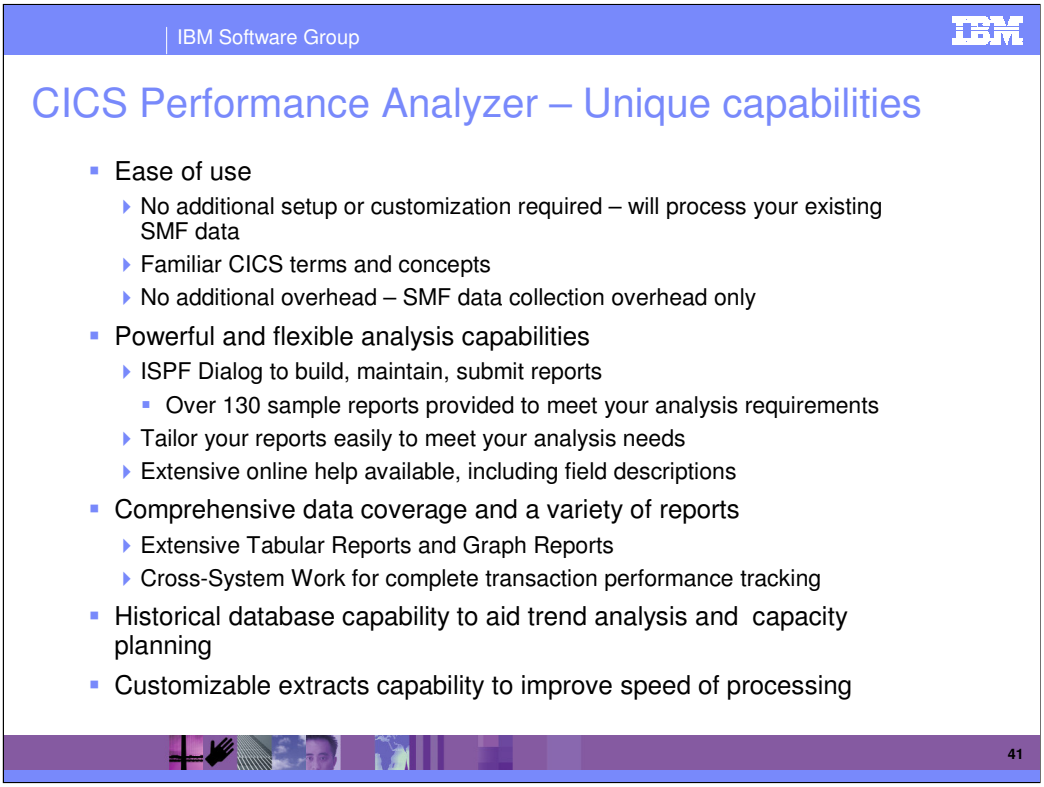
The **CICS Business Transaction Services (BTS) report** is a detailed report that shows the correlation of the transactions performed by the same or different CICS systems on behalf of a single CICS Business Transaction Services (BTS) process.

CICS PA Overview



CICS Statistics and CICS Server Statistics Support





CICS PA is easy to use:

- No additional setup or customization required

- Familiar CICS terms and concepts

CICS PA reports on all aspects of CICS system activity and resource usage. The flexibility of CICS PA allows you to easily tailor your report requests to meet your specific requirements. You can use the ISPF dialog to generate your report and extract requests. The dialog assists you in building reports and extracts specific to your requirements without you having to understand the complexity of the CMF data.

CICS PA's ISPF dialog interface can be used to create the command language and JCL that is used to run the reporting program in batch.

CICS PA has extensive online help facilities and a powerful command language that is used to select, sort and customize the report formats and data extracts.

CICS PA provides a comprehensive suite of reports and data extracts for use by:

System Programmers - to track overall CICS system performance, evaluate the effects of CICS system tuning efforts, ...

Applications Programmers - to analyze the performance of their applications and the resources they use.

DBAs - to analyze the usage and performance of CICS Resource Managers and database systems such as IMS and DB2.

Managers - to ensure transactions are meeting their required Service Levels and measure trends to help plan future requirements and strategies.

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CICS Version To Version Migration Scenarios

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Scenario 1: Migration to CICS TS 3.1 - CICS resource definitions remain on CSD in target environment

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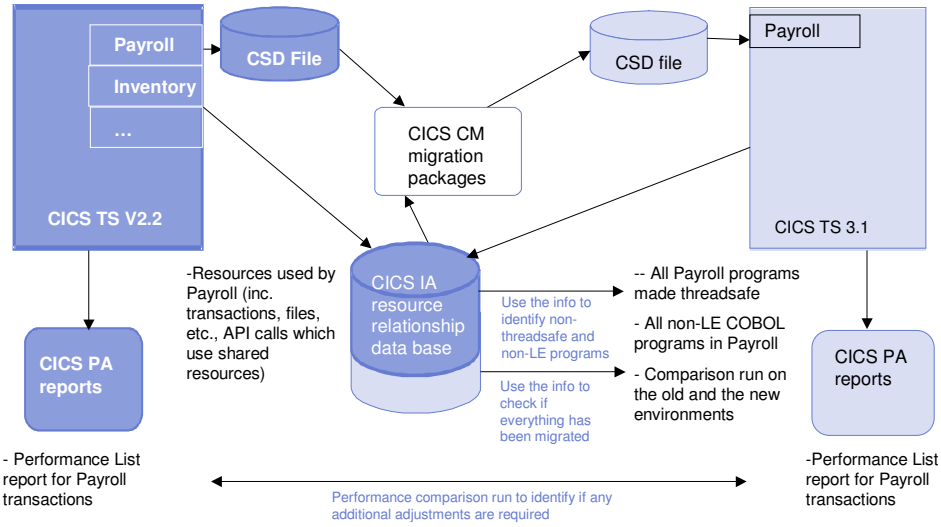
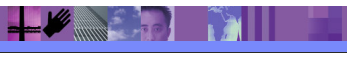
Migration to CICS TS 3.1 - CICS resource definitions remain on CSD in target environment



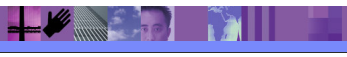
Scenario 1: Migration to CICS TS 3.1 - CICS resource definitions remain on CSD in target environment

1. CICS IA identifies resources for each set of applications that needs to be migrated (in runtime and via the load lib scanner). This info can be used to:
   1. Identify non-LE and OS VS Cobol programs. If any are found, Debug Tool Utilities & Advanced Functions can be used to convert these.
   2. Identify applications which do not conform to threadsafe standards. In order to improve performance (if needed) on CICS TS 3.1, CICS applications need to conform to threadsafe standards
   3. Identify a group of resources for each application which need to be migrated from the current CICS TS test environment to CICS TS 3.1 test environment. This info will be used by CICS CM.
2. Use CICS CM to build change packages based on the information provided by CICS IA to migrate resources to CICS TS 3.1 test regions. CICS CM transformation rules can also be applied to enable transformation of resource attributes during migration to target CSD.
3. Before switching into production you might want to run CICS IA in the new environment, and use the info to compare resources in the two environments, to check if everything you need has been migrated.
4. Following the migration, CICS PA Performance List reports can be run for comparison between the two environments.



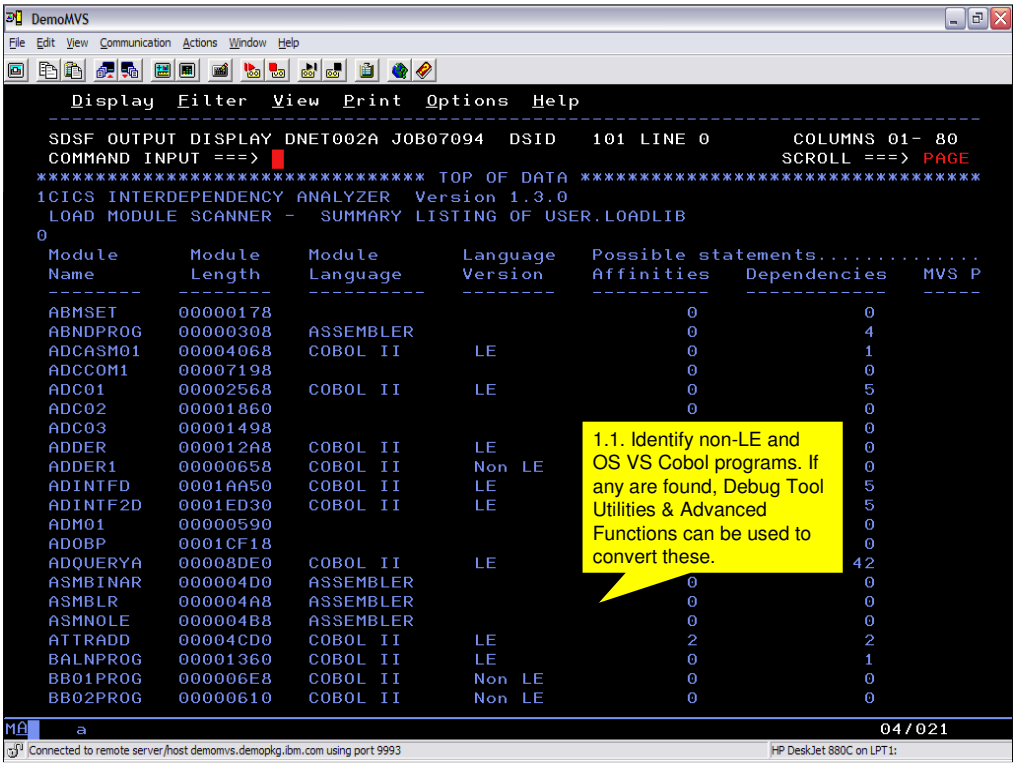
Status of OS/VS COBOL and COBOL II with CICS:

- CICS TS 2.2 announcement:
  - Translator support for the earlier (pre-Language Environment) compilers is withdrawn in this release
  - “It is planned that run-time support for OS/VS COBOL programs, regardless of run-time library used, and for any other programs running under pre-Language Environment run-time libraries will be withdrawn in the next release.”
- CICS TS 2.3
  - OS/VS COBOL load module must run with the LE runtime
  - Any modules attempting to use the OS/VS COBOL runtime will abend at initialization
- CICS TS 3.1
  - CICS interfaces for the VS COBOL II, OS PL/I and C/370 runtimes are removed
    - Will need run-time libraries distributed with LE to execute current load modules
  - CICS interfaces for the OS/VS COBOL are removed
    - CICS will terminate any OS/VS COBOL program with an APCE abend



Identifying OS/VS COBOL programs with CICS IA

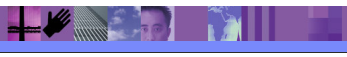
- What the CICS IA scanner provides for is as follows :-
- It attempts to find the language type from the Language byte in the API call. if it has not identified it from the API call then it checks the prologue (stub) for DFHYA for Assembler etc.
- It reports the following types
  - ASSEMBLER - Assembler language constant
  - COBOL II - COBOL II language constant (or any COBOL after OS/VS, COBOL FOR MVS etc,)
  - C/370 - C/370 language constant
  - COBOL - COBOL language constant (OS/VS COBOL)
  - PL/I - PL/I language constant
- We also identify if the program is runable under LE/370.
- The CICS IA scanner will identify OS/VS COBOL programs and informs you whether they have been linked with LE or not.


DemoMVS
File Edit View Communication Actions Window Help
Display Filter View Print Options Help
SDSF OUTPUT DISPLAY DNET002A JOB07094 DSID 101 LINE 0 COLUMNS 01- 80
COMMAND INPUT ===> SCROLL ===> PAGE
********** TOP OF DATA **********
1CICS INTERDEPENDENCY ANALYZER Version 1.3.0
LOAD MODULE SCANNER - SUMMARY LISTING OF USER.LOADLIB
0
Module Name | Module Length | Module Language | Language Version | Possible statements... Affinities | Dependencies | MVS P
ABMSET 00000178 0 0
ABNDPROG 00000308 ASSEMBLER 0 4
ADCASM01 00004068 COBOL II LE 0 1
ADCCOM1 00007198 0 0
ADC01 00002568 COBOL II LE 0 5
ADC02 00001860 0 0
ADC03 00001498 0 0
ADDER 000012A8 COBOL II LE 0 0
ADDER1 00000658 COBOL II Non LE 0 0
ADINTFD 0001AA50 COBOL II LE 0 5
ADINTF2D 0001ED30 COBOL II LE 0 5
ADM01 00000590 0 0
ADOBP 0001CF18 0 0
ADQUERYA 00008DE0 COBOL II LE 0 42
ASMBINAR 000004D0 ASSEMBLER 0 0
ASMBLR 000004A8 ASSEMBLER 0 0
ASMNOLE 000004B8 ASSEMBLER 0 0
ATTRADD 00004CD0 COBOL II LE 2 2
BALNPROG 00001360 COBOL II LE 0 1
BB01PROG 000006E8 COBOL II Non LE 0 0
BB02PROG 00000610 COBOL II Non LE 0 0
1.1. Identify non-LE and OS VS Cobol programs. If any are found, Debug Tool Utilities & Advanced Functions can be used to convert these.
MA a 04/021
Connected to remote server/host demomvs.demopkg.ibm.com using port 9993
HP DeskJet 880C on LPT1:

How CICS IA can help with making programs threadsafe ?

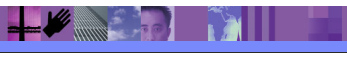
A threadsafe program:

- Must be written to threadsafe standards.
  - Must use appropriate serialization techniques when accessing any shared resources.
- Must be Language Environment-conforming or assembler programs.
- Must be capable of executing concurrently on multiple TCBs
- Cannot rely on QR to serialize access to shared resources and storage.
  - Use serialization techniques
    - Compare and swap
    - Enqueue/Dequeue
  - All programs accessing a shared resource must be threadsafe.



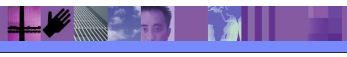
What are the shared resources ?

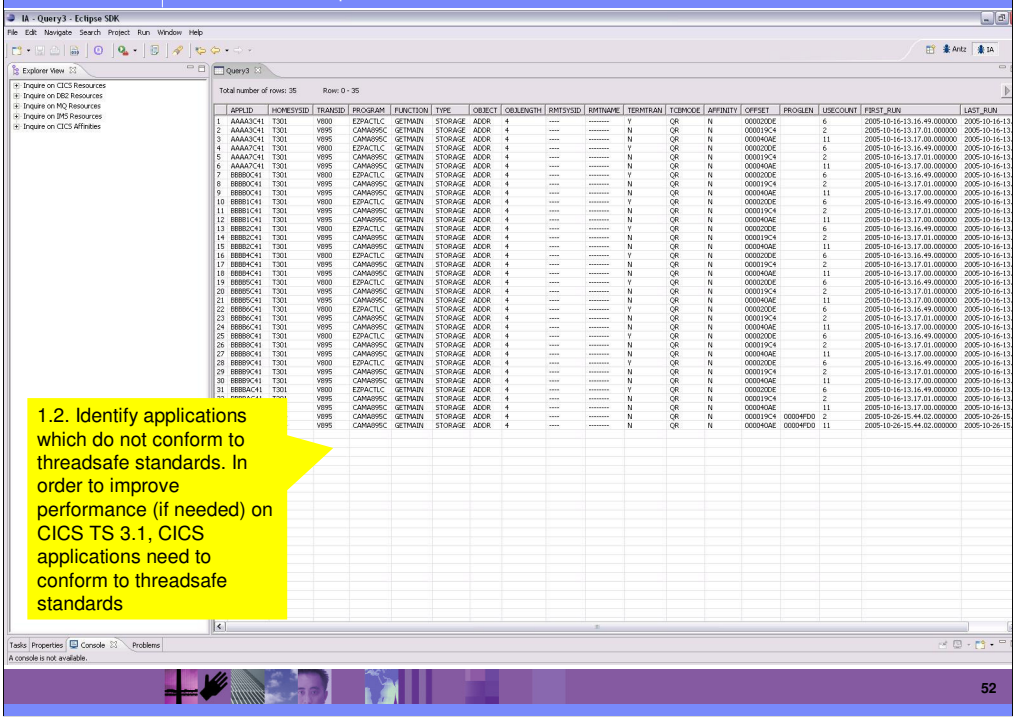
- Typical examples of shared resources are the CICS CWA, global user exit global work areas and storage acquired explicitly by the application program with the shared option.
- You can check whether your application programs use these types of shared storage by looking for occurrences of the following EXEC CICS commands:
  - ADDRESS CWA
  - EXTRACT EXIT GASET
  - GETMAIN SHARED
- CICS IA collects and records this information



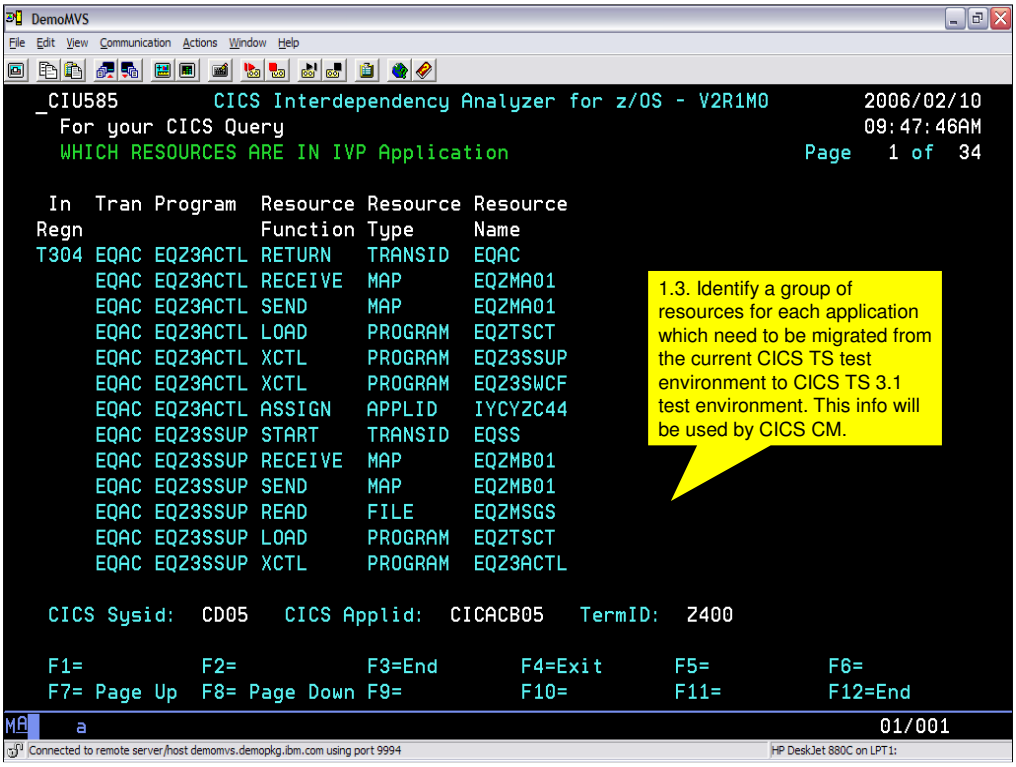
What else can CICS IA do ?

- CICS IA reports the current TCB mode for each EXEC CICS (or DB2,MQ,DLI) call.
- Users who are converting their programs to threadsafe can use this during testing to assist in finding out which TCB modes their program runs in. This helps to identify programs that have CICS API calls that are not threadsafe and cause TCB mode swapping.
- Users can run a query on the relationship DB2 database for the list of API calls that are not threadsafe to identify programs that use these calls.

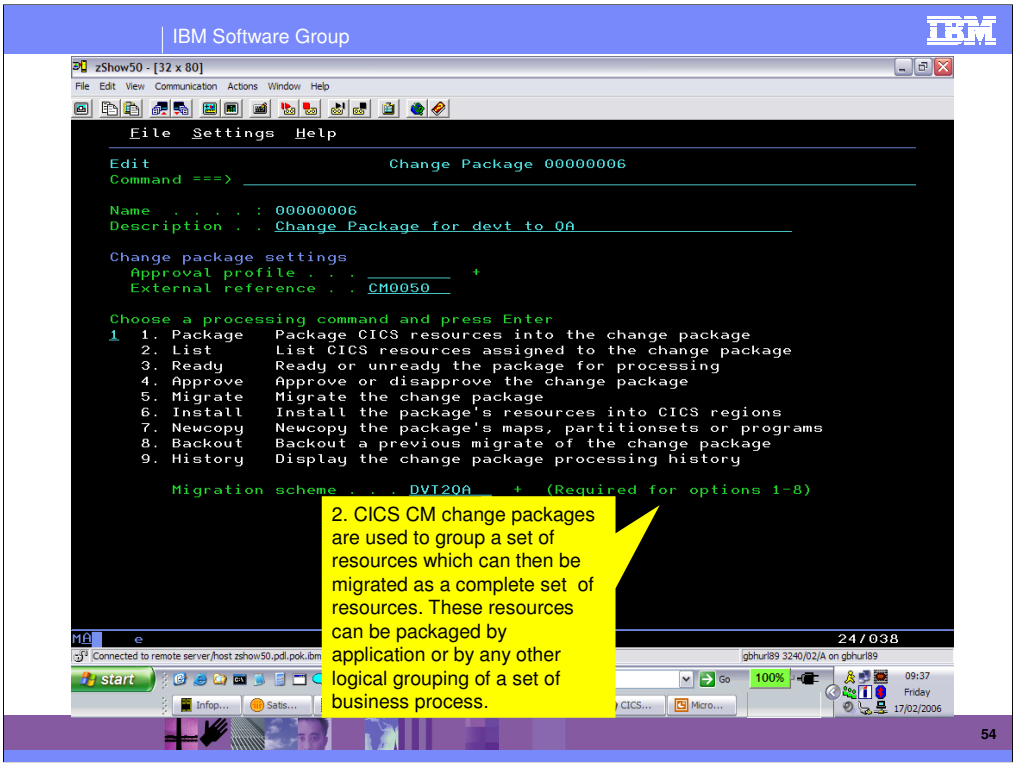




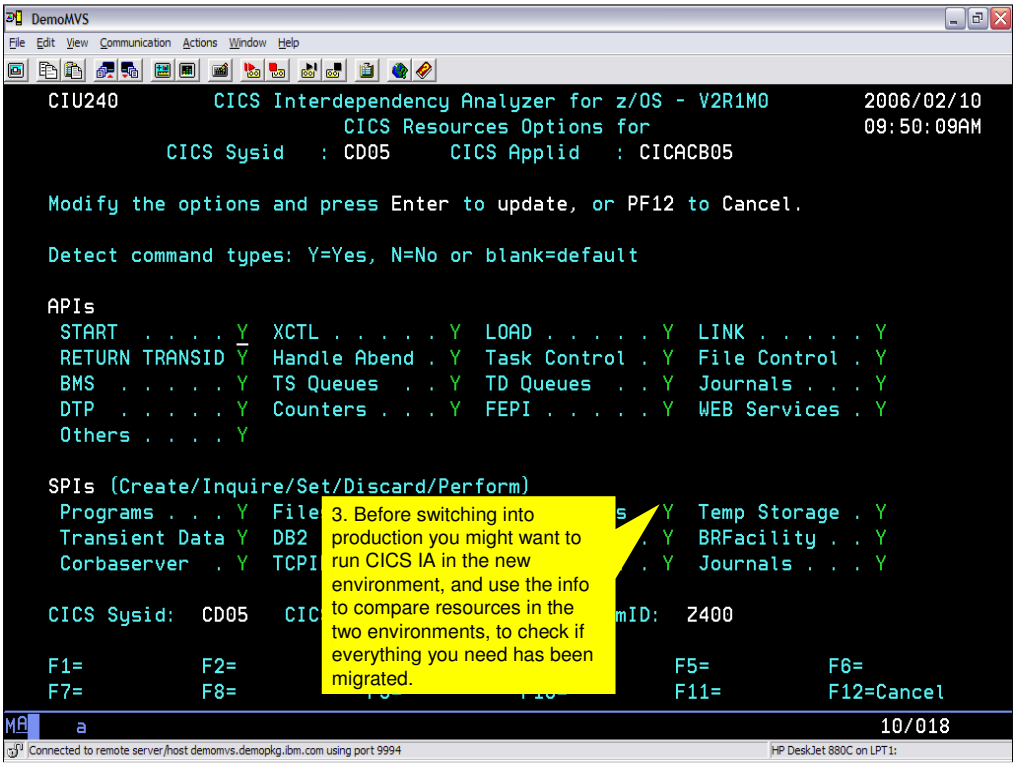
1.2. Identify applications which do not conform to threadsafe standards. In order to improve performance (if needed) on CICS TS 3.1, CICS applications need to conform to threadsafe standards



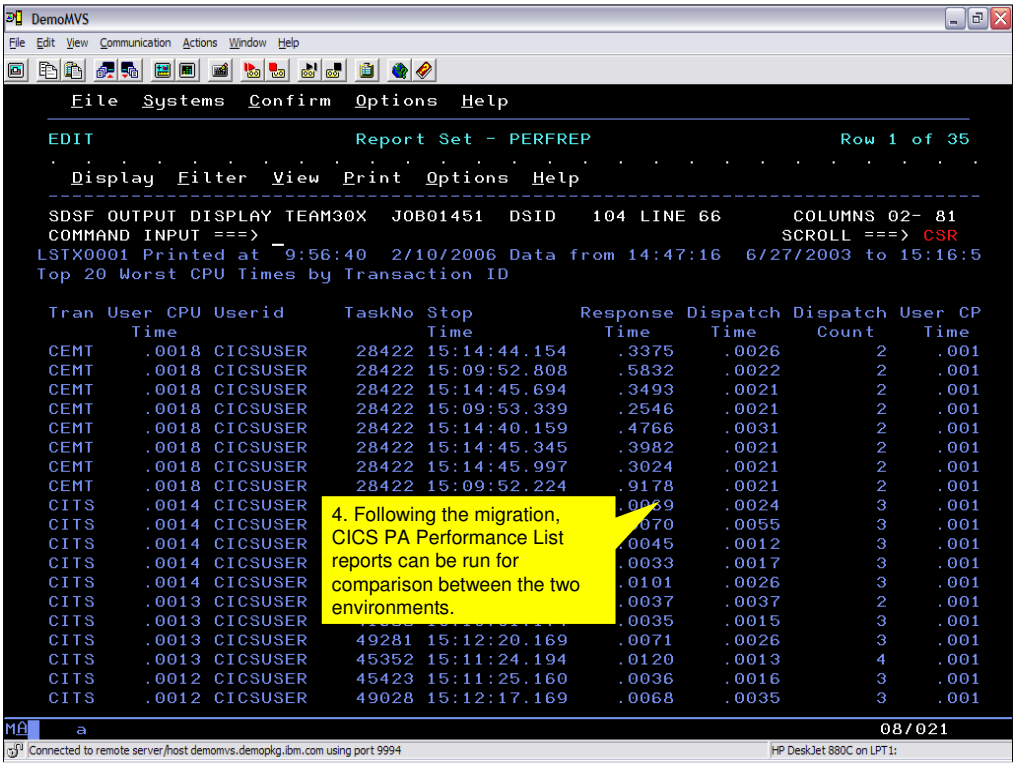
1.3. Identify a group of resources for each application which need to be migrated from the current CICS TS test environment to CICS TS 3.1 test environment. This info will be used by CICS CM.



2. CICS CM change packages are used to group a set of resources which can then be migrated as a complete set of resources. These resources can be packaged by application or by any other logical grouping of a set of business process.



3. Before switching into production you might want to run CICS IA in the new environment, and use the info to compare resources in the two environments, to check if everything you need has been migrated.


DemoMVS
File Edit View Communication Actions Window Help
File Systems Confirm Options Help
EDIT Report Set - PERFREP Row 1 of 35
Display Filter View Print Options Help
SDSF OUTPUT DISPLAY TEAM30X JOB01451 DSID 104 LINE 66 COLUMNS 02- 81
COMMAND INPUT ===> SCROLL ===> CSR
LSTX0001 Printed at 9:56:40 2/10/2006 Data from 14:47:16 6/27/2003 to 15:16:5
Top 20 Worst CPU Times by Transaction ID
Tran User CPU Time Userid TaskNo Stop Time Response Time Dispatch Time Dispatch Count User CP Time
CEMT .0018 CICSUSER 28422 15:14:44.154 .3375 .0026 2 .001
CEMT .0018 CICSUSER 28422 15:09:52.808 .5832 .0022 2 .001
CEMT .0018 CICSUSER 28422 15:14:45.694 .3493 .0021 2 .001
CEMT .0018 CICSUSER 28422 15:09:53.339 .2546 .0021 2 .001
CEMT .0018 CICSUSER 28422 15:14:40.159 .4766 .0031 2 .001
CEMT .0018 CICSUSER 28422 15:14:45.345 .3982 .0021 2 .001
CEMT .0018 CICSUSER 28422 15:14:45.997 .3024 .0021 2 .001
CEMT .0018 CICSUSER 28422 15:09:52.224 .9178 .0021 2 .001
CITS .0014 CICSUSER .0069 .0024 3 .001
CITS .0014 CICSUSER .0070 .0055 3 .001
CITS .0014 CICSUSER .0045 .0012 3 .001
CITS .0014 CICSUSER .0033 .0017 3 .001
CITS .0014 CICSUSER .0101 .0026 3 .001
CITS .0013 CICSUSER .0037 .0037 2 .001
CITS .0013 CICSUSER .0035 .0015 3 .001
CITS .0013 CICSUSER 49281 15:12:20.169 .0071 .0026 3 .001
CITS .0013 CICSUSER 45352 15:11:24.194 .0120 .0013 4 .001
CITS .0012 CICSUSER 45423 15:11:25.160 .0036 .0016 3 .001
CITS .0012 CICSUSER 49028 15:12:17.169 .0068 .0035 3 .001
MA a 08/021
Connected to remote server/host demomvs.demopkg.ibm.com using port 9994
HP DeskJet 880C on LPT1:
4. Following the migration, CICS PA Performance List reports can be run for comparison between the two environments.

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Scenario 2: Migration from to CICS TS 3.1 - CICS resource definitions are moved to CPSM BAS in target environment

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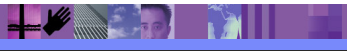
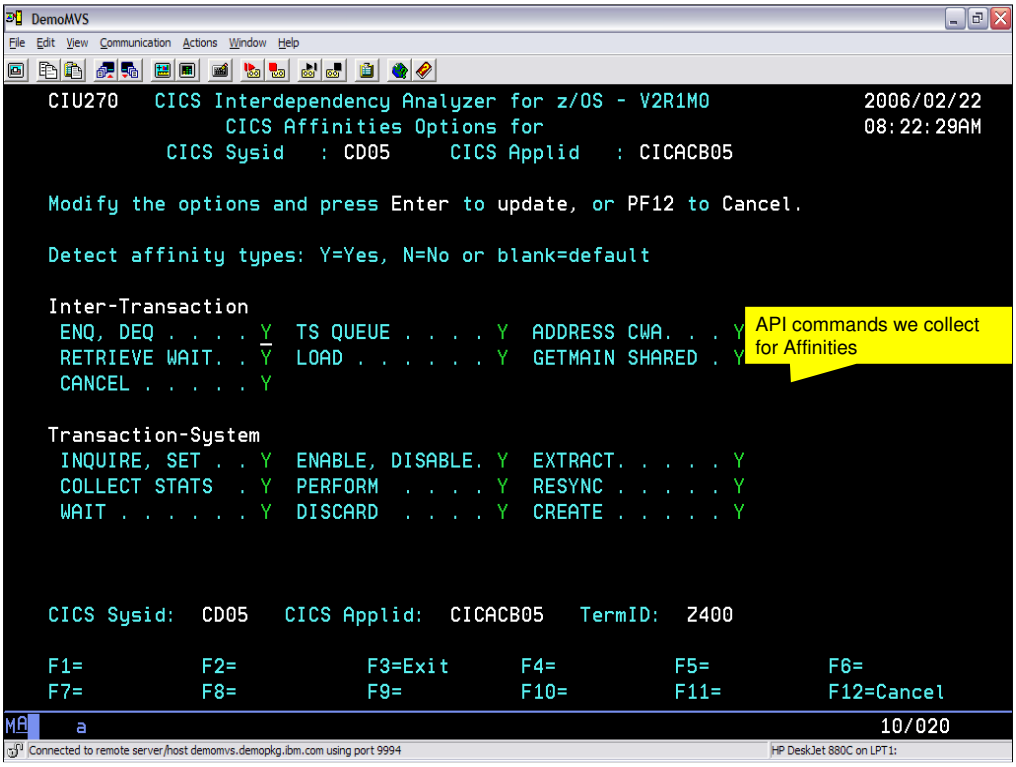
Scenario 2: Migration to CICS TS 3.1 - CICS resource definitions are moved to CICSPlex SM BAS in target environment

1. CICS IA identifies resources for each set of applications that needs to be migrated (in runtime and via the load lib scanner). This info can be used to:
   1. Identify non-LE and OS VS Cobol programs. If any are found, Debug Tool Utilities & Advanced Functions can be used to convert these.
   2. Identify applications which do not conform to threadsafe standards. In order to improve performance (if needed) on CICS TS 3.1, CICS applications need to conform to threadsafe standards
   3. Identify a group of resources for each application which need to be migrated from the current CICS TS test environment to CICS TS 3.1 test environment. This info will be used by CICS CM to create CICSPlex SM BAS definitions to be stored in CICSPlex SM repository.
   4. Identify Affinities and use this information to build CICSPlex SM definitions. CICS IA creates and enables you to manage affinity groups. Alternatively, this information can be used to to eliminate affinities prior to CICSPlex SM enablement.
2. Use CICS CM to build change packages based on the information provided by CICS IA to help migrate resources to CICS TS 3.1 test regions. CICS CM transformation rules are also applied to enable transformation of resource attributes during migration to target CICSPlex SM Data Repository.
3. Before switching into production you might want to run CICS IA in the new environment, and use the info to compare resources in the two environments, to check if everything you need has been migrated, and that new affinities have not been introduced.
4. Following the migration, CICS PA Performance List reports can be run for the CICS TS 2.3 and CICS TS 3.1 environment for comparison. CICS PA Cross Systems report can also be run if and workload separation or workload balancing is implemented as part of the move to exploit CICSPlex SM capabilities.
5. Use CICS PA for measure



CICS IA 2.1 - Affinity Analysis

- What are transaction affinities and why do we care ?
  - Exist when persistent state data is created in a CICS Application Owning Region.
  - Subsequent instances MUST execute in the same AOR.
- What does CICS IA provide for those planning to use CICS workload management
  - Single point of data collection for both, interdependencies and affinities
  - Single point of access to interdependency and affinity data in the DB2 data base
  - Ability to create CICSPlex SM definitions and manage groups of definitions in DB2
  - Flexible and easy to use interface for managing affinity data, to help you answer questions like:
    - show me all Inter Transaction Affinities by region
    - show me all ENQ/DEQ type affinities by application
    - show me all affinities for program ABCD
    - show me Transaction System Affinities for transaction XXXX
    - show me all affinity groups which have CPSM groups built.


DemoMVS
File Edit View Communication Actions Window Help
CIU270 CICS Interdependency Analyzer for z/OS - V2R1M0 2006/02/22
CICS Affinities Options for 08:22:29AM
CICS Sysid : CD05 CICS Applid : CICACB05
Modify the options and press Enter to update, or PF12 to Cancel.
Detect affinity types: Y=Yes, N=No or blank=default
Inter-Transaction
ENQ, DEQ . . . . Y TS QUEUE . . . . Y ADDRESS CWA. . . Y
RETRIEVE WAIT. . Y LOAD . . . . . Y GETMAIN SHARED . Y
CANCEL . . . . . Y
Transaction-System
INQUIRE, SET . . Y ENABLE, DISABLE. Y EXTRACT. . . . . Y
COLLECT STATS . Y PERFORM . . . . Y RESYNC . . . . . Y
WAIT . . . . . Y DISCARD . . . . Y CREATE . . . . . Y
CICS Sysid: CD05 CICS Applid: CICACB05 TermID: Z400
F1= F2= F3=Exit F4= F5= F6=
F7= F8= F9= F10= F11= F12=Cancel
MA a 10/020
Connected to remote server/host demomvs.demopkg.ibm.com using port 9994
HP DeskJet 880C on LPT1:
API commands we collect for Affinities

IBM Software Group

Scenario 3: Exploiting WebServices capabilities in CICS TS 3.1 - Converting existing CICS business logic into WebServices.

ON DEMAND BUSINESS

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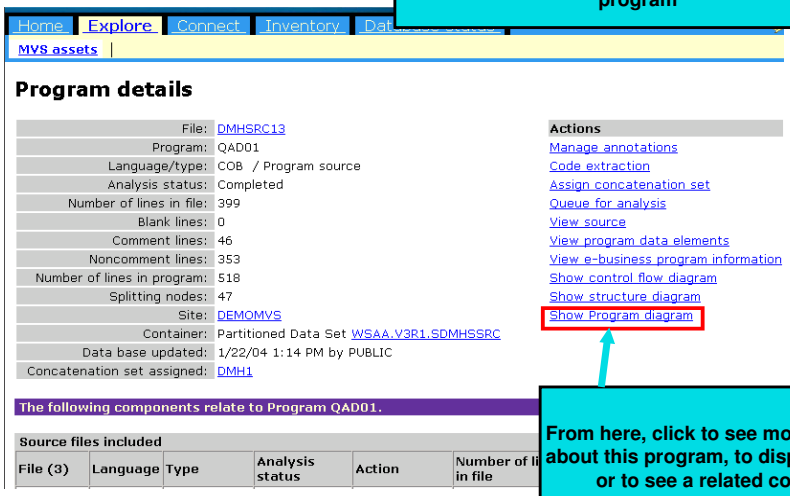
Sample Scenario: Exploiting WebServices capabilities in CICS TS 3.1 - Converting existing CICS business logic into WebServices.

1. ATW and WSAA identify business processes to be exposed as WebServices and componentize them.
2. CICS IA provides application topology and program linkage to determine a set of programs to be exposed as WebServices.
3. WDz used to develop these programs as CICS WebServices
4. CICS CM used to create the required resource definitions - PIPELINE, WEBSERVICE, URIMAP, TCPIPSERVICE
5. CICS PA CICS WebServices reports used to provide performance data for the new developed CICS WebServices and for comparison with baselines CICS TS 2.3 Performance List report
6. Any performance problems can be further investigated using Application Performance Analyzer.

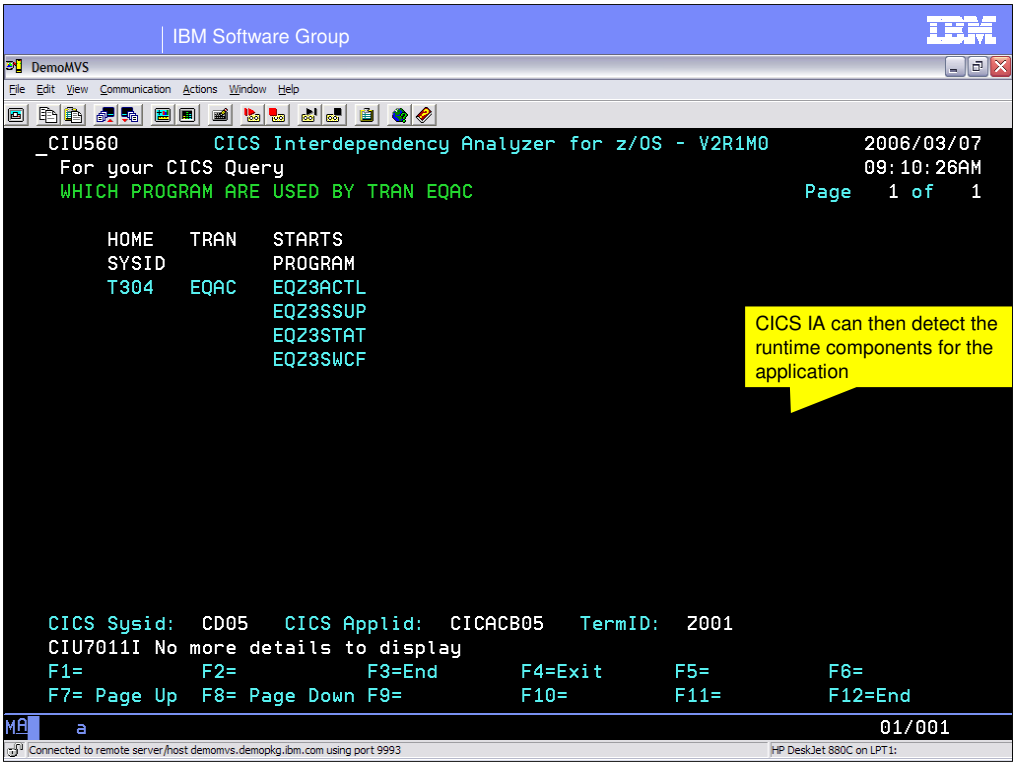
Explore

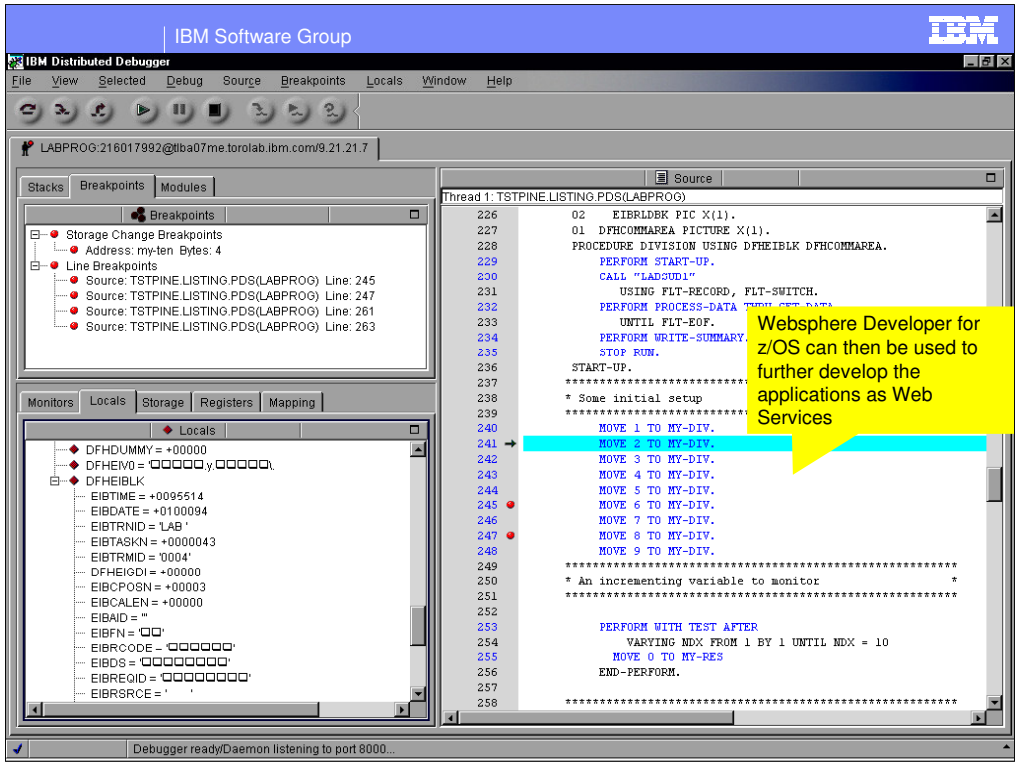
- WSAA identifies those programs that are good candidates for conversion to Web Services

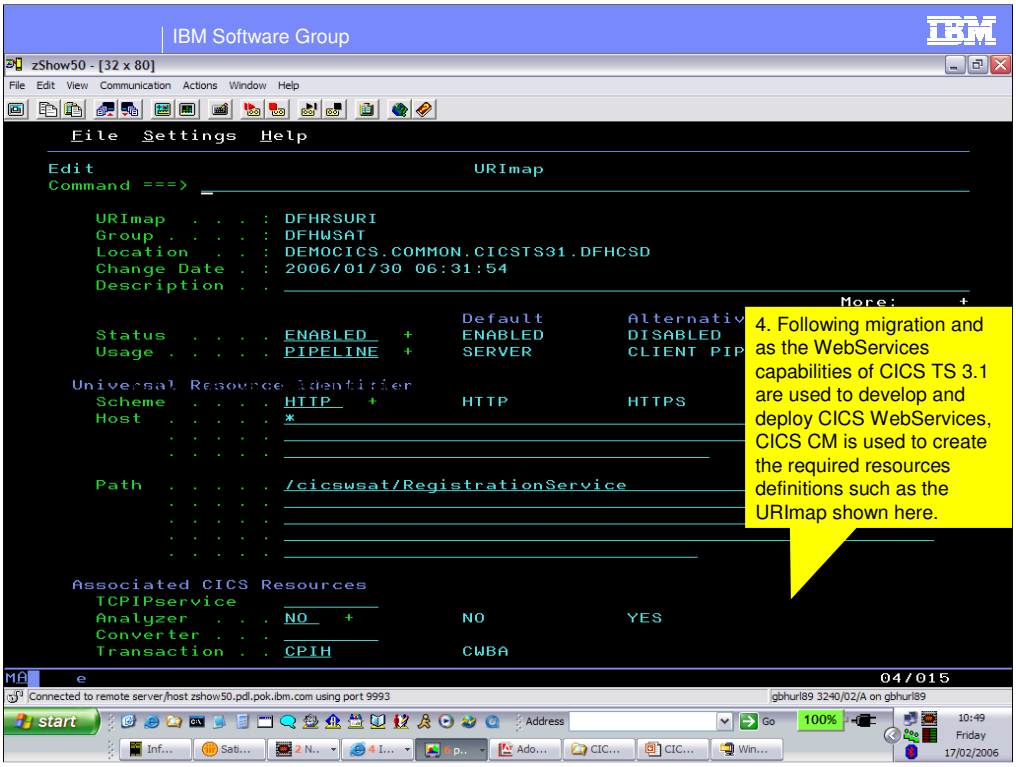
In this example we are looking at details for a program



From here, click to see more information about this program, to display diagrams, or to see a related component

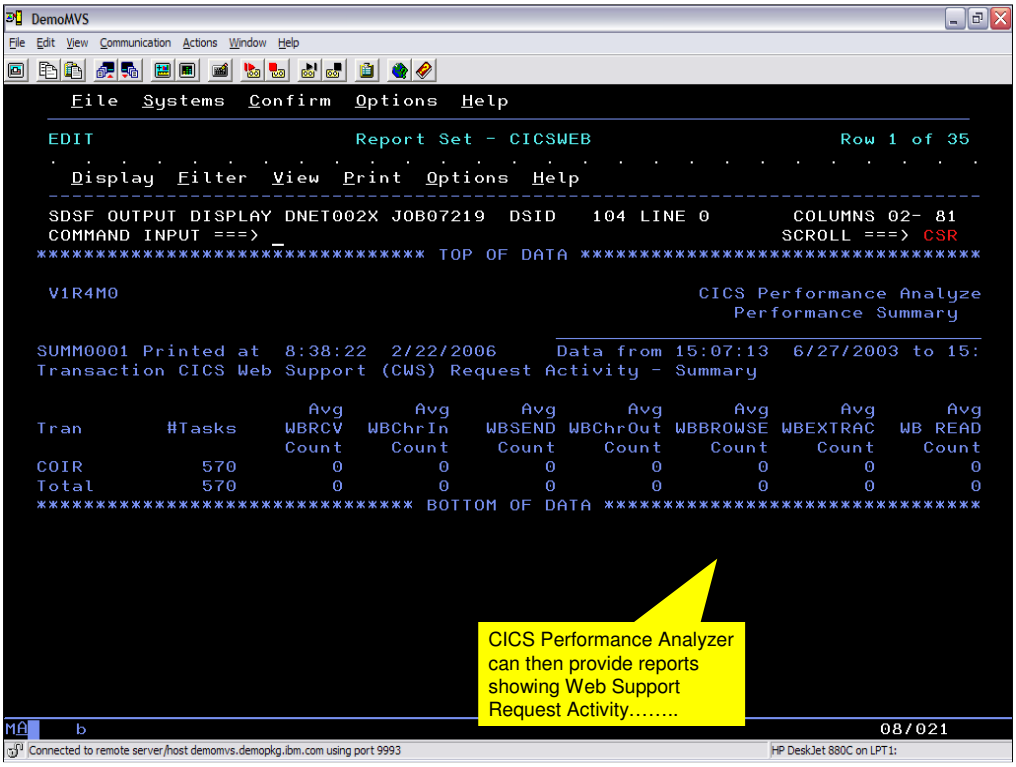

IBM Software Group
DemoMVS
File Edit View Communication Actions Window Help
_CIU560 CICS Interdependency Analyzer for z/OS - V2R1M0 2006/03/07
For your CICS Query 09:10:26AM
WHICH PROGRAM ARE USED BY TRAN EQAC Page 1 of 1
HOME SYSID TRAN STARTS PROGRAM
T304 EQAC EQZ3ACTL
EQZ3SSUP
EQZ3STAT
EQZ3SWCF
CICS IA can then detect the runtime components for the application
CICS Sysid: CD05 CICS Applid: CICACB05 TermID: Z001
CIU7011I No more details to display
F1= F2= F3=End F4=Exit F5= F6=
F7= Page Up F8= Page Down F9= F10= F11= F12=End
MA a 01/001
Connected to remote server/host demomvs.demopkg.ibm.com using port 9993
HP DeskJet 880C on LPT1:

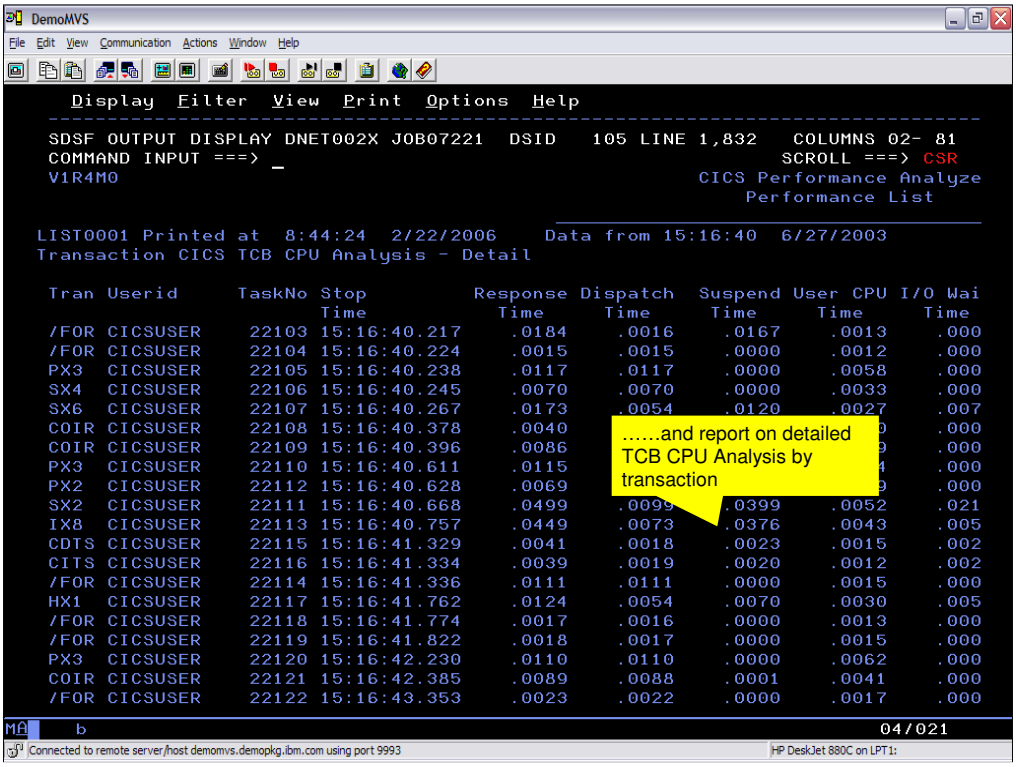

IBM Software Group
IBM Distributed Debugger
File View Selected Debug Source Breakpoints Locals Window Help
LABPROG:216017992@tlba07me.torolab.ibm.com/9.21.21.7
Stacks Breakpoints Modules
Breakpoints
Storage Change Breakpoints
Address: my-ten Bytes: 4
Line Breakpoints
Source: TSTPINE.LISTING.PDS(LABPROG) Line: 245
Source: TSTPINE.LISTING.PDS(LABPROG) Line: 247
Source: TSTPINE.LISTING.PDS(LABPROG) Line: 261
Source: TSTPINE.LISTING.PDS(LABPROG) Line: 263
Monitors Locals Storage Registers Mapping
Locals
DFHDUMMY = +00000
DFHEIV0 = '□□□□□y□□□□□\'
DFHEIBLK
EIBTIME = +0095514
EIBDATE = +0100094
EIBTRNID = 'LAB '
EIBTASKN = +0000043
EIBTRMID = '0004'
DFHEIGDI = +00000
EIBCPOSN = +00003
EIBCALEN = +00000
EIBAID = '"'
EIBFN = '□□'
EIBRCODE = '□□□□□□'
EIBDS = '□□□□□□□□'
EIBREQID = '□□□□□□□□'
EIBRSRCE = ' '
Source
Thread 1: TSTPINE.LISTING.PDS(LABPROG)
02 EIBRLDBK PIC X(1).
01 DFHCOMMAREA PICTURE X(1).
PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
PERFORM START-UP.
CALL "LADSUD1"
USING FLT-RECORD, FLT-SWITCH.
PERFORM PROCESS-DATA
UNTIL FLT-EOF.
PERFORM WRITE-SUMMARY.
STOP RUN.
START-UP.
* Some initial setup
MOVE 1 TO MY-DIV.
MOVE 2 TO MY-DIV.
MOVE 3 TO MY-DIV.
MOVE 4 TO MY-DIV.
MOVE 5 TO MY-DIV.
MOVE 6 TO MY-DIV.
MOVE 7 TO MY-DIV.
MOVE 8 TO MY-DIV.
MOVE 9 TO MY-DIV.
* An incrementing variable to monitor *
PERFORM WITH TEST AFTER
VARYING NDX FROM 1 BY 1 UNTIL NDX = 10
MOVE 0 TO MY-RES
END-PERFORM.
Websphere Developer for z/OS can then be used to further develop the applications as Web Services
Debugger ready/Daemon listening to port 8000...


IBM Software Group
zShow50 - [32 x 80]
File Edit View Communication Actions Window Help
File Settings Help
Edit URImap
Command ===>
URImap . . . : DFHRSURI
Group . . . . : DFHWSAT
Location . . : DEMOCICS.COMMON.CICSTS31.DFHCSD
Change Date . : 2006/01/30 06:31:54
Description . .
More: +
Default Alternativ
Status . . . . ENABLED + ENABLED DISABLED
Usage . . . . . PIPELINE + SERVER CLIENT PIP
Universal Resource Identifier
Scheme . . . . HTTP + HTTP HTTPS
Host . . . . . *
Path . . . . . /cicswsat/RegistrationService
Associated CICS Resources
TCPIPservice
Analyzer . . . NO + NO YES
Converter . . .
Transaction . . CPIH CWBA
MA e 04/015
Connected to remote server/host zshow50.pdl.pok.ibm.com using port 9993
gbhurl89 3240/02/A on gbhurl89
start
Address
Go
100%
10:49
Friday
17/02/2006
4. Following migration and as the WebServices capabilities of CICS TS 3.1 are used to develop and deploy CICS WebServices, CICS CM is used to create the required resources definitions such as the URImap shown here.

CICS Transaction Server for z/OS Version 3.1 Support

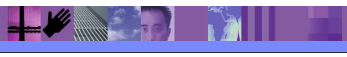
- 5. CICS PA CICS WebServices reports used to provide performance data for the new developed CICS WebServices and for comparison with baselines CICS TS 2.3 Performance List report
- CICS Performance Analyzer provides customize reports …
  - Custom reports are provided which enables extensive performance analysis of the many new functions introduced in CICS Transaction Server V3.1
  - Detailed and summary reports provided include …
    - Transaction CPU Analysis – including CICS TCB usage for …
      - OPENAPI Applications, XPLink, ...
    - Web services applications
    - CICS Web support and Secure Sockets Layer (SSL) enhancements
    - Application Transformation - inter-program data transfer …
      - Channel Container usage, Program request channel activity, …
  - Online Statistics Reporting is available for all CICS statistics data …
    - Including the new statistics data on the CICS resources for Web services ...
      - PIPELINE, URIMAP, and WEBSERVICE
    - And the CICS Web support enhancements to TCP/IP Services


DemoMVS
File Edit View Communication Actions Window Help
File Systems Confirm Options Help
EDIT Report Set - CICSWEB Row 1 of 35
Display Filter View Print Options Help
SDSF OUTPUT DISPLAY DNET002X JOB07219 DSID 104 LINE 0 COLUMNS 02- 81
COMMAND INPUT ===> _ SCROLL ===> CSR
TOP OF DATA
V1R4M0 CICS Performance Analyze
Performance Summary
SUMM0001 Printed at 8:38:22 2/22/2006 Data from 15:07:13 6/27/2003 to 15:
Transaction CICS Web Support (CWS) Request Activity - Summary
Tran #Tasks Avg WBRCV Count Avg WBChrIn Count Avg WBSEND Count Avg WBChrOut Count Avg WBBROWSE Count Avg WBEXTRAC Count Avg WB READ Count
COIR 570 0 0 0 0 0 0 0
Total 570 0 0 0 0 0 0 0
BOTTOM OF DATA
CICS Performance Analyzer can then provide reports showing Web Support Request Activity……..
MA b 08/021
Connected to remote server/host demomvs.demopkg.ibm.com using port 9993
HP DeskJet 880C on LPT1:


DemoMVS
File Edit View Communication Actions Window Help
Display Filter View Print Options Help
SDSF OUTPUT DISPLAY DNET002X JOB07221 DSID 105 LINE 1,832 COLUMNS 02- 81
COMMAND INPUT ===> _ SCROLL ===> CSR
V1R4M0 CICS Performance Analyze
Performance List
LIST0001 Printed at 8:44:24 2/22/2006 Data from 15:16:40 6/27/2003
Transaction CICS TCB CPU Analysis - Detail
Tran Userid TaskNo Stop Time Response Time Dispatch Time Suspend Time User CPU Time I/O Wai Time
/FOR CICSUSER 22103 15:16:40.217 .0184 .0016 .0167 .0013 .000
/FOR CICSUSER 22104 15:16:40.224 .0015 .0015 .0000 .0012 .000
PX3 CICSUSER 22105 15:16:40.238 .0117 .0117 .0000 .0058 .000
SX4 CICSUSER 22106 15:16:40.245 .0070 .0070 .0000 .0033 .000
SX6 CICSUSER 22107 15:16:40.267 .0173 .0054 .0120 .0027 .007
COIR CICSUSER 22108 15:16:40.378 .0040 .000
COIR CICSUSER 22109 15:16:40.396 .0086 .000
PX3 CICSUSER 22110 15:16:40.611 .0115 .000
PX2 CICSUSER 22112 15:16:40.628 .0069 .000
SX2 CICSUSER 22111 15:16:40.668 .0499 .0399 .0052 .021
IX8 CICSUSER 22113 15:16:40.757 .0449 .0073 .0376 .0043 .005
CDTS CICSUSER 22115 15:16:41.329 .0041 .0018 .0023 .0015 .002
CITS CICSUSER 22116 15:16:41.334 .0039 .0019 .0020 .0012 .002
/FOR CICSUSER 22114 15:16:41.336 .0111 .0111 .0000 .0015 .000
HX1 CICSUSER 22117 15:16:41.762 .0124 .0054 .0070 .0030 .005
/FOR CICSUSER 22118 15:16:41.774 .0017 .0016 .0000 .0013 .000
/FOR CICSUSER 22119 15:16:41.822 .0018 .0017 .0000 .0015 .000
PX3 CICSUSER 22120 15:16:42.230 .0110 .0110 .0000 .0062 .000
COIR CICSUSER 22121 15:16:42.385 .0089 .0088 .0001 .0041 .000
/FOR CICSUSER 22122 15:16:43.353 .0023 .0022 .0000 .0017 .000
MA b 04/021
Connected to remote server/host demomvs.demopkg.ibm.com using port 9993
HP DeskJet 880C on LPT1:
.....and report on detailed TCB CPU Analysis by transaction

Summary

IBM zSeries tools help you ease the migration path to CICS TS V3.1 and then continue to provide ongoing productivity benefits:

- Help manage application availability
- Improve day-to-day administration of CICS systems and applications
- Provide detailed information to support application reuse projects, including SOA implementations
- Improve application understanding and provide audit trails to help achieve regulatory compliance (e.g. SOX)

- Visit ibm.com/cics/tools