IBM CICS Interdependency Analyzer for z/OS, Version 2.2

Highlights

- ***Automate detection of runtime resource relationships***
- ***Understand application flow with flexible resource-relationship reports***
- ***Accumulate resource-relationship data in a DB2 database***
- ***Build relationship maps to help improve the speed of application maintenance and to help reduce the time to resolve problems***
- ***Compare applications and resources across regions***
- ***Migrate, reuse and extend CICS applications more quickly***
- ***Support SOA implementations with deep application understanding***
- ***Make informed decisions about the best way to split workloads***
- ***Minimize the impact of routine application maintenance for the user***

New in this release

- *Support for IBM CICS® Transaction Server, Version 3.2*
- *Queries to identify threadsafe programs and candidates for refactoring as Web services*
- *Eclipse-based Explorer provides intuitive access to CICS relationship data*
- *Support for Software AG Natural*
- *Capture of secondary resource information*
- *Enhanced information about IBM WebSphere® MQ calls*
- *Information identifying which user exits are exploited in any CICS region*
- *Enhanced database schema*

IBM CICS Interdependency Analyzer for z/OS® is IBM's discovery tool for CICS Transaction Server for z/OS, offering a wide range of new capabilities, as well as supporting completely new function in CICS Transaction Server, Version 3.2.

New capabilities, such as threadsafe and affinity analysis, a new user interface and support for Software AG Natural, make it possible to achieve better reuse, management and control of your applications through improved understanding of an even wider range of CICS systems and resources. CICS Interdependency Analyzer facilitates projects such as CICS version-to-version migration, affinity removal and Web service refactoring that depend for their success on deep knowledge of application, system and resource relationships.

The value of understanding

To stay competitive in today's rapidly changing market environment, businesses are increasingly adopting service oriented architectures (SOAs) that can enable them to respond to marketplace changes with increased speed and agility. To support SOA, you need a flexible and responsive IT infrastructure that allows you to implement changes to your existing business quickly and cost-effectively. At the same time, you are under pressure to optimize your IT operations — improve the performance, availability and reliability of your existing applications, balance increasing workloads and minimize disruption of routine application maintenance to the user.

CICS systems have supported business growth for decades. Over time, a variety of application development techniques and deployment methods have been used to make application and system changes. However, the documentation, and even source code, for these changes might no longer be available or, in the case of packaged applications, you might never have had the detailed documentation that you now require. Even if the documentation and source code are available, it can be difficult to investigate CICS resource relationships manually because of project schedule constraints.

CICS Interdependency Analyzer for z/OS automates detection of runtime relationships among IBM CICS, IBM DB2®, IBM IMS™ and IBM WebSphere MQ resources within your CICS system. It records this data in a DB2 database and enables you to analyze the collected information, build a resource-relationship map, and use this data in your daily development and operations management processes.

Information provided by CICS Interdependency Analyzer can help you improve the availability of your CICS applications, reduce the cost and increase the speed of CICS application maintenance, and help you implement Information Technology Infrastructure Library® (ITIL®) and IBM service management processes, such as change, release and incident management.

If you're running CICS systems without the information provided by CICS Interdependency Analyzer, it can be challenging to perform tasks such as splitting workloads across multiple CICS regions to improve availability or identifying which resources are affected by an application change, making programs threadsafe, or refactoring them as Web services.

Deep understanding of runtime resource usage and application behavior can also support auditing and governance initiatives, for example, to comply with national legislation such as the U.S. Sarbanes-Oxley Act or industry-led regulations such as the Health Insurance Portability and Accountability Act (HIPAA) and Basel II.

Understand CICS resource relationships

CICS Interdependency Analyzer includes components to help programmers and managers to analyze resource-relationship data. The CICS Interdependency Analyzer collector component intercepts potentially interdependent CICS system commands, as well as commands that can create affinities, and it records the details of the resources used. CICS commands monitored by CICS Interdependency Analyzer include an extensive range of CICS application programming interface (API), CICS system programming interface (SPI) and CICS Front End Programming Interface (FEPI) commands. These commands include new and modified commands introduced in the latest release of IBM CICS Transaction Server, V3.2. Non-CICS commands monitored by CICS Interdependency Analyzer include calls to DB2, IMS and WebSphere MQ remote resources. CICS Interdependency Analyzer evaluates data for both intertransaction and transaction-system affinities — information that is essential when implementing dynamic workload balancing.

CICS Interdependency Analyzer not only builds relationships for program interactions using the CICS LINK, XCTL and LOAD commands, but also for native language calls using Enterprise COBOL and PL/I languages. New in this release is support for Software AG Natural fourth-general language. If you use Natural and would like to know how your Natural programs relate to other CICS resources, this release is appropriate for you.

CICS Interdependency Analyzer provides you with a cross-system view of resources used by a transaction. System ID (SYSID) information for EXEC CICS commands is collected, even when the SYSID is not specified in the command itself but is set by other means, such as in a dynamic workload-balancing exit routine. All collected relationships can be viewed using the highly intuitive Eclipse-based CICS Interdependency Analyzer Explorer, new in V2.2 (see Figure 1).

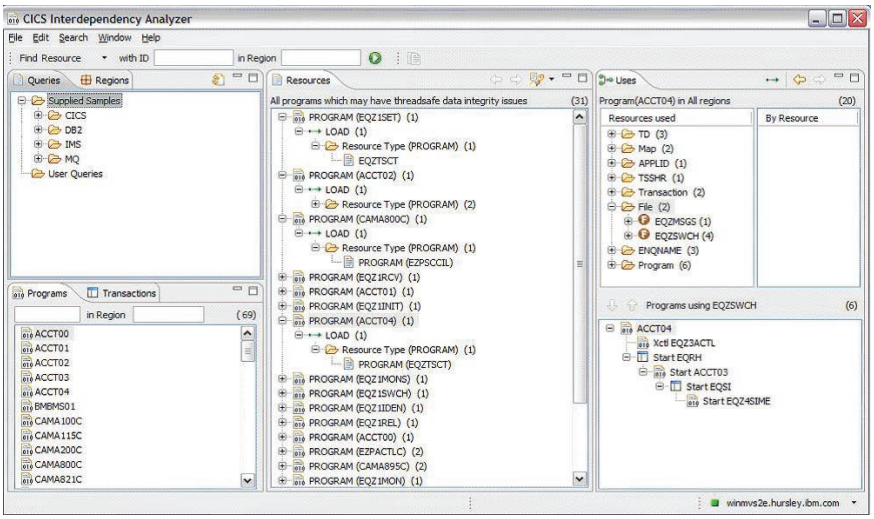


Figure 1. The CICS Interdependency Analyzer Explorer helps you understand application topology.

The collected data is efficiently stored in an IBM System z™ data space to help reduce data-collection overhead, and then offloaded to the collected dependency data component in Virtual Storage Access Method (VSAM) files. Under operator control, the VSAM files are aggregated together and stored in a DB2 database.

Consistent use of the CICS Interdependency Analyzer collector component helps to create a comprehensive online database. You can access the database using the CICS query transaction or the new CICS Interdependency Analyzer Explorer to gain a better understanding of the following artifacts:

- *Selected contents of CICS regions*
- *Resources required for a particular transaction to run*
- *Cross-region applications and dependencies*
- *The resource topology within a particular CICS region*
- *Discovered affinities, by region*
- *The resource flow following a transaction abnormal end (abend)*
- *The effect of opening and closing files*
- *The last time a particular resource was used*
- *Resource relationships, by performing an analysis when planning for dynamic workload balancing*
- *Unused resources*
- *Resources used by different programs*

In each new release, CICS Interdependency Analyzer expands the scope of its data capture. CICS Interdependency Analyzer, V2.2 captures information about the two new resources introduced in CICS Transaction Server, V3.2 (IPCONN and LIBRARY). For the first time, it also captures information about any EXEC CICS command that has more than one resource associated with it. For example, when a channel is associated with an EXEC CICS LINK program, CICS Interdependency Analyzer collects both the program name and the channel name. In this case, the program is referred to as the *primary* resource and the channel as the *secondary* resource. CICS Interdependency Analyzer maintains such information about related resources so that CICS Interdependency Analyzer Explorer can present a useful hierarchical view of resource relationships.

Transform application assets

CICS Interdependency Analyzer provides invaluable assistance when you are planning to implement Web services. Supplied queries identify existing programs that are candidates for refactoring as Web services, for example, programs that are called with a communication area (COMMAREA) or channel, or programs without presentation logic. CICS Interdependency Analyzer, V2.2 captures resource information for EXEC CICS commands that are considered to be presentation logic.

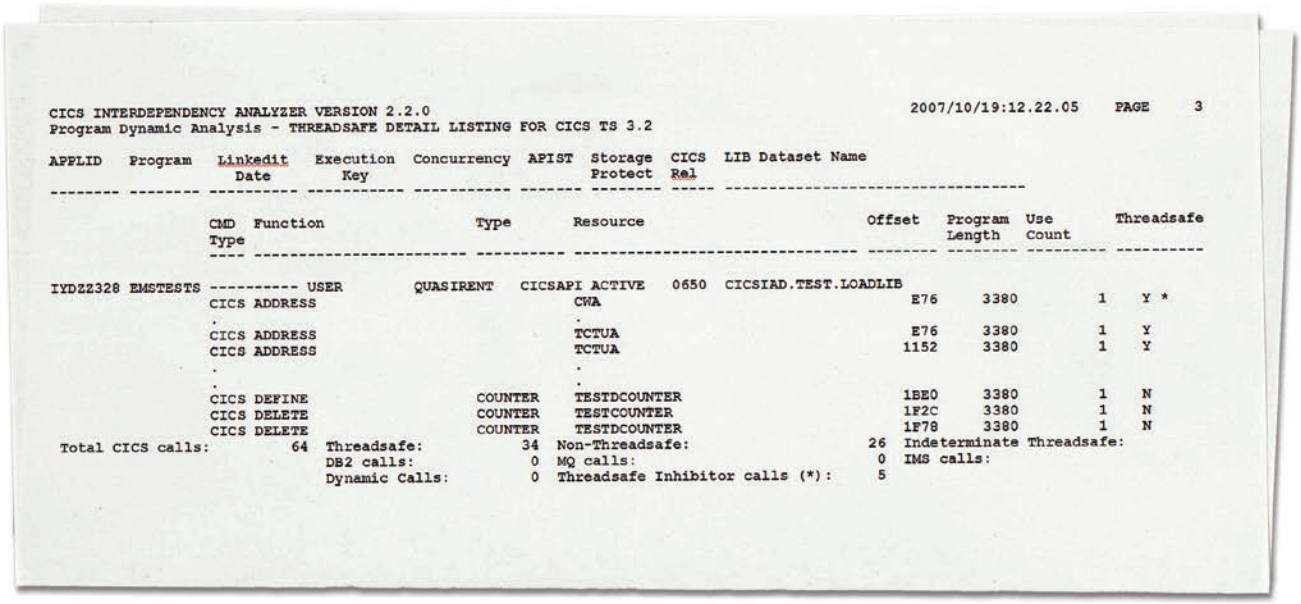
CICS Interdependency Analyzer, V2.2 now also captures key resource information for CICS Web services — the program name, URIMAP, container, pipeline, mapping levels, Web Services Description Language (WSDL) file name and WSBIND file name — all of which enable you to understand what resources are required when deploying your Web service from development into test, and from test into production.

Manage heavier workloads

CICS Interdependency Analyzer helps you analyze resource interdependencies and affinities, and assess the impact of application changes quickly and efficiently, allowing you to respond to the constantly changing needs of the marketplace. Your programmers and managers can make better-informed decisions to split workloads efficiently and move applications across CICS regions accordingly. Using resource-relationship data provided by CICS Interdependency Analyzer, you can build more flexible CICS systems, balance workloads across IBM CICSPlex® and IBM Parallel Sysplex® systems, and have the ability to adapt to the fluid conditions inherent in agile business today.

It has been shown that running CICS applications as threadsafe can save as much as 15 percent of processor usage. CICS Interdependency Analyzer, V2.2 delivers a DB2 table that indicates, by CICS version, which APIs and SPIs are considered to be threadsafe (that is, they do not perform a swap to the quasi-reentrant task control block). This CICS Interdependency Analyzer table, along with detailed information about programs and files, can be used to produce a report for a given program (as shown in Figure 2) that will provide information including counts and details of threadsafe and nonthreadsafe calls. CICS Interdependency Analyzer provides the most comprehensive analysis available of threadsafe attributes, to give you the information needed to assess and modify applications and remove constraints to improved performance.

Using information gathered by CICS Interdependency Analyzer, you can safely divide one CICS region into multiple, cloned regions in response to increased business workload. You can even automatically generate affinity group information ready-formatted for input into CICSPlex System Manager, saving you time and reducing the chance of transcription errors.



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CICS INTERDEPENDENCY ANALYZER VERSION 2.2.0                                  2007/10/19:12.22.05    PAGE     3
Program Dynamic Analysis - THREADSAFE DETAIL LISTING FOR CICS TS 3.2

APPLID   Program   Linkedit    Execution  Concurrency  APIST  Storage  CICS  LIB Dataset Name
                     Date         Key                         Protect  Rel
-------- -------- ---------- ----------- ----------- ------- -------- ----- --------------------------------

                  CMD  Function                Type       Resource                        Offset   Program  Use       Threadsafe
                  Type                                                                               Length   Count
                  ---- ----------------------- ---------- ------------------------------- -------- -------- --------- ----------

IYDZZ328 EMSTESTS ---------- USER        QUASIRENT   CICSAPI ACTIVE   0650  CICSIAD.TEST.LOADLIB
                  CICS ADDRESS                          CWA                                 E76      3380         1    Y *
                  .                                     .
                  CICS ADDRESS                          TCTUA                               E76      3380         1    Y
                  CICS ADDRESS                          TCTUA                              1152      3380         1    Y
                  .                                     .
                  .                                     .
                  CICS DEFINE                 COUNTER   TESTDCOUNTER                       1BE0      3380         1    N
                  CICS DELETE                 COUNTER   TESTCOUNTER                        1F2C      3380         1    N
                  CICS DELETE                 COUNTER   TESTDCOUNTER                       1F78      3380         1    N
 Total CICS calls:         64  Threadsafe:          34  Non-Threadsafe:                  26  Indeterminate Threadsafe:
                               DB2 calls:            0  MQ calls:                         0  IMS calls:
                               Dynamic Calls:        0  Threadsafe Inhibitor calls (*):   5
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Figure 2. CICS threadsafe information provided in CICS Interdependency Analyzer report

Maintain business applications

CICS Interdependency Analyzer identifies CICS resources used by individual CICS transactions and their relationships to other CICS resources, as well as identifying CICS calls to DB2, IMS and WebSphere MQ resources. The captured resource relationships include CICS affinities, as well as other types of resource interdependencies.

You can use the collected data to help identify resource relationships within your CICS systems. System managers can gain access — either online or offline — to this information and use it to maintain the integrity of your CICS systems, enhance the performance of your business applications and plan application changes, such as migrating to new servers, performing CICS version-to-version upgrades or creating new interfaces to enable your core applications to participate in SOAs.

Navigating relationships with CICS Interdependency Analyzer Explorer

CICS Interdependency Analyzer provides three ways to query collected resource-relationship data online: a CICS-based query interface, a batch reporter and the Explorer interface, built on Eclipse technology. The CICS Interdependency Analyzer Explorer, introduced in this release, helps you to navigate intuitively through your CICS resource-relationship data and provides easier-to-use facilities to manage this data and use it in day-to-day analysis. The query interface enables you to interrogate the recorded data to display end-to-end relationships dynamically, such as the files used by a transaction and the functions involved, such as browse or update.

The new Explorer interface delivers all the queries available with the CICS interface, and enables point-and-click navigation, making it much easier to follow a sequence of resource relationships (see Figure 3). You can also use the Explorer's data filtering, helping to reduce the volume of data displayed, so that you can identify the required relationships more easily.

The ability to easily see both *uses* and *where used* relationships is particularly valuable when changing record, table or message layouts. A simple right-click of the mouse will show you all of the programs that use a particular file, so that you can plan your development activities with confidence.

Comprehensive query management

A comprehensive set of Structured Query Language (SQL) queries provided with CICS Interdependency Analyzer enables you to use the collected data to run comparisons of applications across regions or all interdependencies across regions. This capability can help you to determine, for example, if all the resources required by an application are available following migration from a quality-assurance region to a production region.

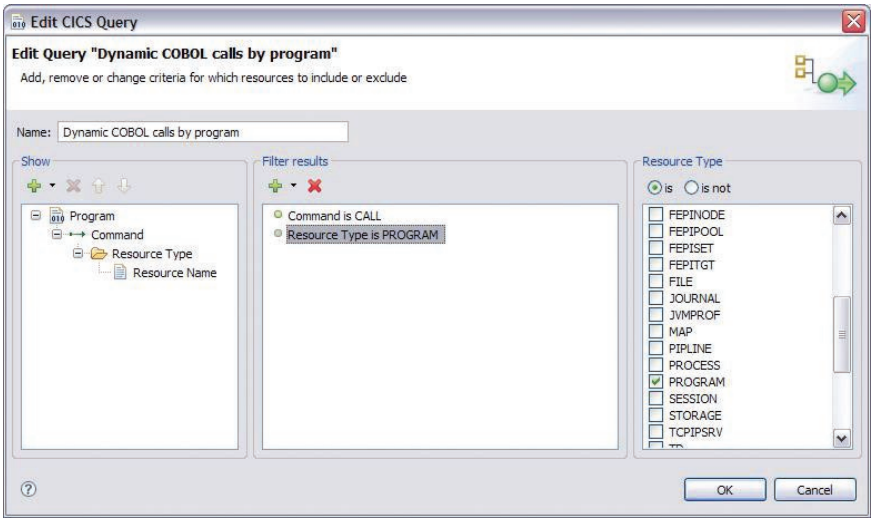

Figure 3. Use the CICS Interdependency Analyzer Explorer to build and organize your customized queries.

Queries can include all the resource types collected by the latest level of CICS Transaction Server. For example, you can collect data to identify all transactions that use a resource type of container. Using the Explorer, you can display the full resource name, without the 80-character restriction of the query interface. As a result, you can display enqueue-dequeue resources, which can be up to 256 characters in length.

A wide range of standard queries are supplied and you can easily modify these or create new ones to meet your individual needs. When using the Explorer, you can create simple or complex folder structures to save your queries (see Figure 3). Queries created using the Explorer can be used with the CICS query interface.

The output from queries can be saved for subsequent analysis or printing. Saved output from two or more queries can also be used in the new query differencing function. This automatically compares the output from multiple queries, for example, to show those programs that are both threadsafe and affinity-free, or to see relationship changes after an updated version of an application is deployed, or to highlight changes following deployment of a new version of an application to ensure that all identified affinities have been removed.

With CICS Interdependency Analyzer, you can also identify the version of CICS programs that you are running. Using this information, you can compare resource and relationship data for different program versions and identify application changes. For example, CICS Interdependency Analyzer can show if a new type of resource dependency is introduced by a new version of a program. You can use this information to maintain your dependency database, such as to remove data about obsolete levels of programs.

You can access resource-relationship data collected in the DB2 database offline using the CICS Interdependency Analyzer reporter component to produce a comprehensive, printed report of the dependency information for a selected CICS region. The CICS Interdependency Analyzer scanner component allows you to scan the load-module data sets to detect and report the EXEC CICS commands that can cause transaction-resource dependency. Summary or detailed reports about each identified application load-library module are available.

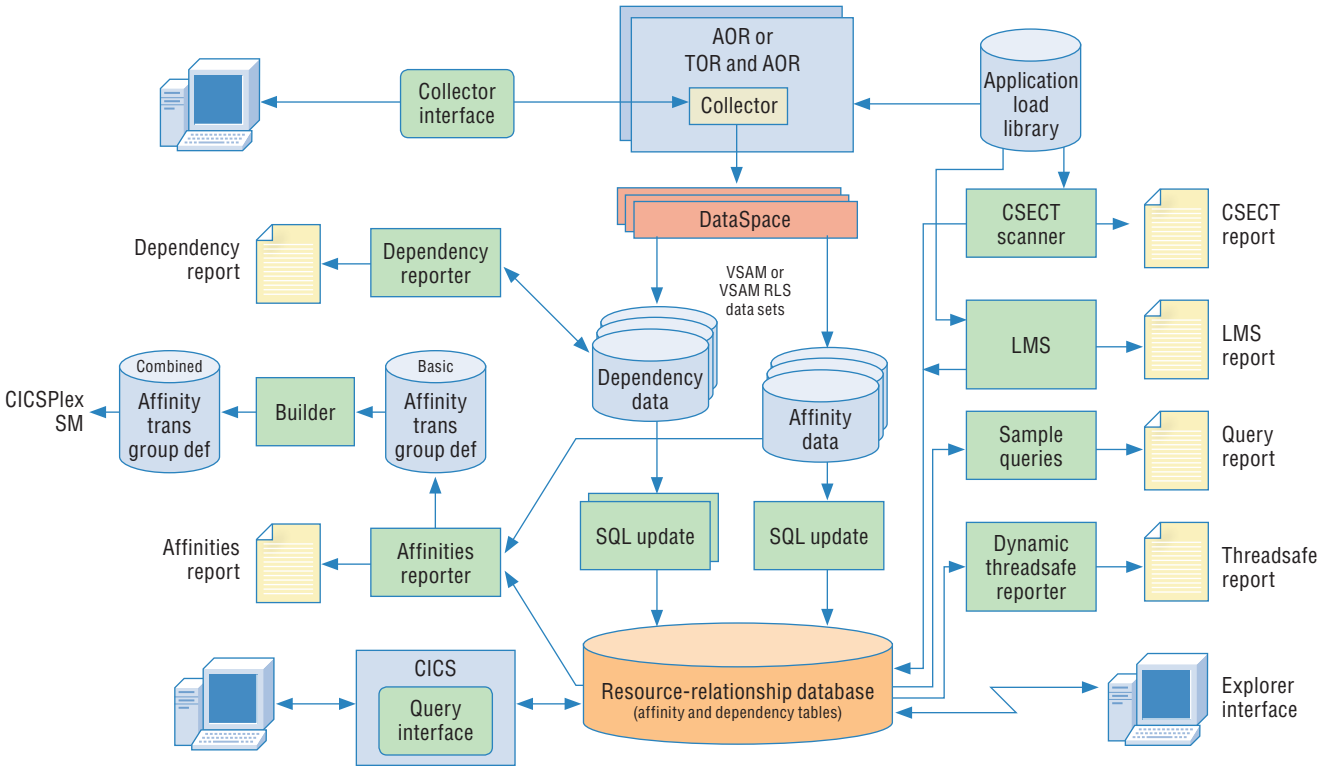

Figure 4. CICS Interdependency Analyzer for z/OS, Version 2.2, architecture diagram showing components and data flows (AOR = Application owning region; TOR = Terminal owning region; CSECT = Control section; LMS = Load module scanner)

Control data collection

Using an online interface, you can maintain the status of the CICS Interdependency Analyzer collectors in all enabled CICS regions from one CICS terminal, as you can see in the CICS Interdependency Analyzer architecture diagram (see Figure 4). This capability provides a single point of control for configuring CICS Interdependency Analyzer options for each region. You can turn data collection for multiple CICS regions on and off, or pause it with a single CINT command to speed selection. This capability helps eliminate the need to edit all CICS regions using the configuration menus to select the resources to be collected.

CICS Interdependency Analyzer provides a timer-based, collector-control capability that enables you to set the data collector to start at a given time of day to fit your schedule. For example, you can set it to collect data at critical times, such as at year end, or to avoid the risk of affecting performance at times of highest workload. You can also choose to set it to collect data for a particular region for one hour of the day and then for another region for the next hour.

CICS Interdependency Analyzer also enables you to exclude defined programs and transactions from data collection. This capability means that data is collected only for programs and transactions that you choose, which helps eliminate extraneous data and reduce overhead during data capture.

Use IBM discovery solutions to support mixed-workload applications

Applications can be an IT organization's biggest asset. Reusing application constructs helps accelerate application development through the life cycle by requiring less new code and reusing previously tested code. If you're developing new Web service applications and wish to reuse your current CICS assets, using CICS Interdependency Analyzer with IBM WebSphere Studio Asset Analyzer can help speed your time to market. New support in CICS Interdependency Analyzer Explorer lets you launch the WebSphere Studio Asset Analyzer Web interface in context (see Figure 5). For example, if CICS Interdependency Analyzer has identified candidate programs for refactoring as Web services, you can link automatically to the WebSphere Studio Asset Analyzer views for these programs, saving you time.

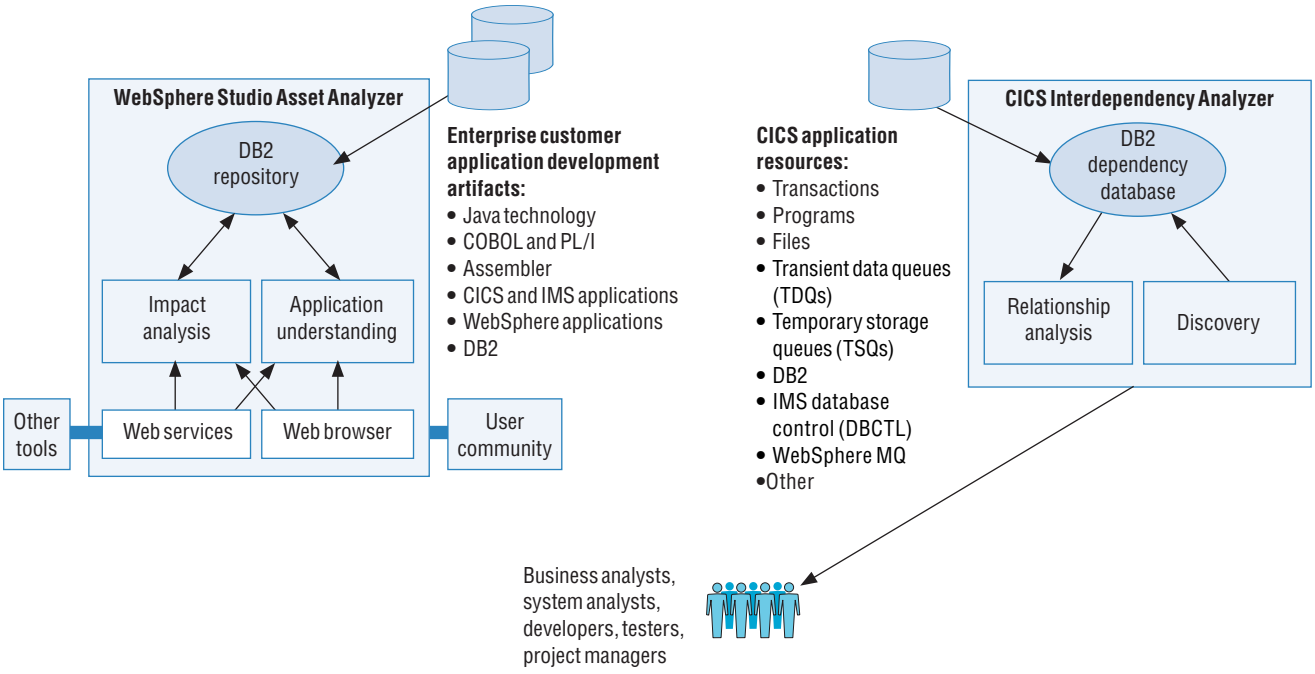

Figure 5. CICS Interdependency Analyzer automates application discovery for mixed-workload environments.

CICS Interdependency Analyzer supports runtime analysis by automating the collection of CICS resource-relationship data and helping you understand the object and resource usage in CICS applications. It operates by recording information about the application as it is running. WebSphere Studio Asset Analyzer can help your enterprise to maintain and modernize its existing assets by delivering knowledge generated through static analysis of application source from CICS and other System z runtime subsystems. WebSphere Studio Asset Analyzer also statically analyzes Java™ source and byte-code applications, as well as WebSphere Application Server runtime configurations to provide in-depth insight into dependencies within and among Java application components. You can maintain, extend and transform existing applications through rapid application understanding and impact analysis. And because WebSphere Studio Asset Analyzer can present complex applications in a visual format, applications are easier to understand.

A firm foundation for success

CICS Interdependency Analyzer is part of an extensive portfolio of IBM System z tools, including CICS tools, problem determination (PD) tools and application development tools, supporting the entire application life cycle to help you build, integrate, test, deploy and manage enterprise solutions. As a result, you can make the most of your System z platform investments and take advantage of the latest functions introduced in CICS Transaction Server, Version 3. With these tools, you can optimize your IT operations and transform CICS applications to achieve greater business flexibility, without losing touch with governance and compliance.

The comprehensive portfolio of CICS tools offers the opportunity to realize the full potential of your CICS systems, whatever your business strategy. You have the potential to maintain and manage your core CICS applications more easily and at a lower cost.

CICS tools enhance IBM service management initiatives to optimize IT processes, maximize CICS system availability and reduce total cost of ownership (TCO). Moreover, in today's world of increasing governance and compliance demands, CICS tools can help to meet growing demands for reporting and audit compliance, and improve control over CICS runtime environments.

All IBM CICS, PD and application development tools support the latest releases of CICS Transaction Server, at date of publication, Version 3.2.

For more information

To learn more about IBM CICS Interdependency Analyzer for z/OS, Version 2.2, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/software/htp/cics/ianaly/

To learn more about IBM CICS Tools, visit:

ibm.com/cics/tools

IBM CICS Interdependency Analyzer for z/OS, Version 2.2 at a glance

Hardware requirements

- CICS Interdependency Analyzer, V2.2 runs on any IBM z/Architecture® server on which the applicable operating system and software will run.
- CICS Interdependency Analyzer Explorer runs on any workstation that supports Microsoft® Windows® XP, Microsoft Windows 2000, or Microsoft Windows Vista with 256 MB RAM minimum and 80 MB of free disk space. For mainframe connectivity for DB2 data analysis, the workstation must be configured for TCP/IP network access.

Software requirements

- CICS Interdependency Analyzer, V2.2 is designed to be used with CICS Transaction Server for z/OS, V3.2 (5697-MI5). It can also be used with CICS Transaction Server for z/OS, V3.1, or CICS Transaction Server for z/OS, V2.2 or V2.3 (5697-E93), but at a reduced level of function.
- CICS Interdependency Analyzer, V2.2 will run with any supported level of operating system with which the applicable CICS Transaction Server runs.
- CICS Interdependency Analyzer, V2.2 requires IBM z/OS SMP/E for installation and maintenance.
- CICS Interdependency Analyzer, V2.2 requires access to an IBM DB2 Universal Database™ server for IBM OS/390® and z/OS, V7.1 (5675-DB2), or later.
- CICS Interdependency Analyzer Explorer requires Microsoft Windows XP, Microsoft Windows 2000 or Microsoft Windows Vista.

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