White paper
September 2009

Achieving business resilience through integrated systems management

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Introduction

Providing low-risk, resilient IT services that can rapidly adapt to business needs while controlling costs is not an easy task. The task can seem almost impossible with the additional pressures of legislative controls that add to these constraints, such as Sarbanes-Oxley for IT governance, as well as other controls that result from the current economic environment.

These challenges are no longer just the domain of the large enterprise. They are relevant to large and small businesses alike. Positioning your company to compete successfully in this business climate can mean the difference between the survival and failure of your business.

Many factors influence the success of a business. A business depends on a set of highly available services, supported by an underlying server infrastructure that can readily adapt to changing needs. These services help maintain the company's competitive edge.

Changes to existing business services and additions of new services require a productive development environment in which to maintain them with minimal disruption as the changes are deployed. These services in turn require modern server capabilities on which to host these applications.

Manually maintaining and operating complex server configurations with a disparate set of tools is costly in terms of people, learning time, and business agility. This cost is magnified as the number of subsystem types increases to support today's application profiles. Such interactions divert scarce IT budgets away from services crucial to the future of a business. An integrated

Highlights

management experience which can optimize and simplify interactions along with providing more autonomic-based capabilities must be provided to minimize intensive manual interactions.

Base server capabilities, augmented by tools that aid application understanding and support controlled change management processes, must be available to reduce the risk of inadvertent effects on runtime and to provide audit capabilities to satisfy governance requirements.

A solution for today

IBM Rational Developer for System z provides a productive and cost-efficient environment in which to develop CICS applications.

IBM Rational® Developer for System z® provides a modern development environment for both traditional CICS® transactional applications written in COBOL, PL/I, C/C++, or Java™ as well as for the creation of services that will be deployed on IBM System z and the IBM CICS environment. Compared with a basic green-screen editor interface, Rational Developer for System z provides a more productive and cost-efficient environment in which to develop CICS applications.

Tools such as IBM CICS Interdependency Analyzer can help you to understand your applications. IBM CICS Performance Analyzer can highlight the performance characteristics of an application. IBM CICS Configuration Manager can support the change management and auditing needs of a modern enterprise. These tools can also be used to gain a deeper understanding of the underlying CICS server runtime. The value that these tools can bring to the enterprise is discussed further in a 2007 IBM white paper.[1]

Highlights

IBM CICS Transaction Server for z/OS provides a rich set of capabilities, including efficient connectivity with WebSphere, IMS/ESA, and IBM DB2 for z/OS.

IBM CICS Transaction Server for z/OS® provides a rich set of capabilities for the modern enterprise. Coupled with a highly scalable, secure, and robust runtime, it also provides efficient connectivity with IBM WebSphere®, IBM IMS/ESA®, and IBM DB2® for z/OS, along with connectivity with distributed platforms, to cater to applications that instantiate a wide set of application design patterns.

For the small-scale CICS user, 3270-based management facilities consist of dynamic configuration using resource definition online (RDO), runtime management using the CEMT, and post-analysis using IBM System Management Facility (SMF) data recorded by the runtime. Message-based automation is achievable with products such as IBM System Authorization Facility (SAF) and IBM NetView®, leading to some degree of proactive management.

For the large-scale CICS user, these basic capabilities can be expanded by utilizing the IBM CICSPlex® System Manager component of CICS Transaction Server for z/OS. CICSPlex System Manager provides a modern browser-based user interface, the Web User Interface (WUI), from which to manage all your CICS systems.

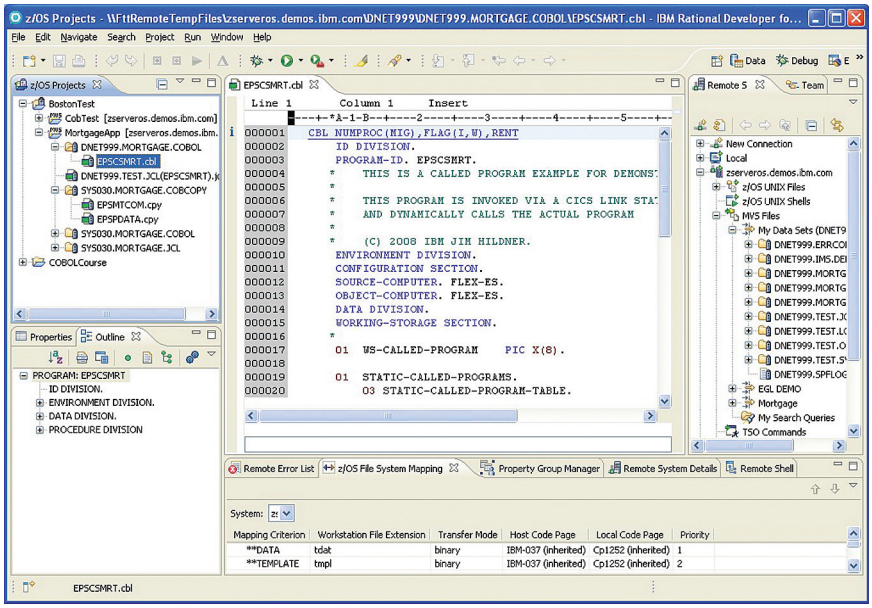

Figure 1: IBM Rational Developer for System z provides a modern development environment for CICS transactional applications.

CICSPlex System Manager provides capabilities to enable management by business application, thereby relating operations more closely to business needs rather than to a set of seemingly disparate resources. Through its single system image (SSI) architecture, it shields the user from the need to understand the physical deployment of resources. This architecture reduces the exposure to impacts on application availability caused by definitional and operational change. As shown in a recent industry survey, over 80 percent of outages are caused by system change.[2]

Highlights

High availability of applications is achieved by exploiting the dynamic workload capabilities of CICSPlex System Manager for a host of workload types in CICS.

High availability of applications is achieved by exploiting the dynamic workload capabilities of CICSPlex System Manager for a host of workload types in CICS. These capabilities integrate with z/OS workload management (WLM) and network balancing facilities to provide a comprehensive management solution that can cope with both expected and unexpected workload variations and server failure.

Proactive management can be realized with the CICSPlex System Manager Real Time Analysis (RTA) component, which provides state-based events based on user-specified customer criteria along with integrated automation. A comprehensive management API is also provided for scripting and for integration with full-function automation products such as NetView.

You can also obtain real-time performance monitoring of the CICS environment with IBM Tivoli® OMEGAMON® XE for CICS on z/OS and IBM Tivoli OMEGAMON XE for CICS Transaction Gateway on z/OS. These products can deploy situations, which can be based on system performance expectations and which can monitor and proactively send alerts when the expectations are not met. In this way, these solutions can help prevent degradation of service and the loss of transaction volumes which can affect the bottom line of a business.

In November 2008, IBM made IBM CICS Explorer™ available. CICS Explorer provides an Eclipse-based Rich Client Platform (RCP), which provides a single point of integration with CICSPlex System Manager data and CICS Interdependency Analyzer, CICS Configuration Manager, and CICS Performance Analyzer.[3] CICS Explorer technology has also been integrated into the Rational Developer for System z developer experience.

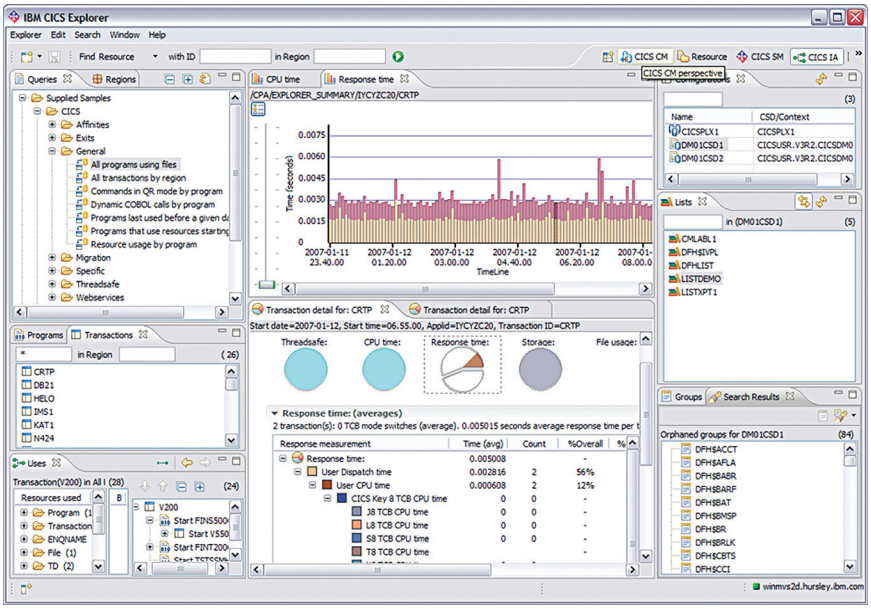

Figure 2: IBM CICS Explorer leverages an Eclipse-based RCP which provides integration with many CICS applications and products.

Highlights

CICS Transaction Server for z/OS V4.1 introduces the CICS Management Client Interface, enabling access to the full management capabilities of CICS and CICSPlex System Manager over TCP/IP in a REST-based style.

IBM CICS Transaction Server for z/OS V4.1

A simple-to-use, integrated management environment allows existing staff to work more efficiently and also mitigates the effects of the skills decline on z/OS. CICS Transaction Server for z/OS V4.1 introduces the CICS Management Client Interface, based on a consistent public model of CICS, which can address both base CICS and CICSPlex System Manager. With this interface, users can access the full management capabilities of CICS and CICSPlex System Manager over TCP/IP in a modern representational state transfer (REST)-based style. With the release of CICS Transaction Server for z/OS V4.1, CICS Explorer is now fully supported and leverages the new interface.

The small-scale user can exploit CICS Explorer directly with a single CICS region, providing access to basic operational capabilities and resource definition through the CSD. Small enterprises can therefore benefit from a modern management interface and integration with CICS tools. Exploitation takes a matter of minutes, requiring minimal setup, with the single-region version of the CICS Management Client Interface initializing the first time that a request is made to the region. All you have to do is to make a few simple changes to your CICS region startup.

Highlights

If you are taking advantage of the extensive capabilities provided by CICSPlex System Manager, you can use CICS Explorer to access the CICSPlex System Manager environment. In contrast to the previous support pack edition based on CICS Transaction Server for z/OS V3, which was read-only, this interface now leverages the CICS Management Client Interface, which can also take actions on resources. Establishing access is again a simple activity, even for a first-time CICSPlex System Manager user. For existing CICSPlex System Manager users, access is virtually immediate.

As users migrate to the advanced facilities of CICSPlex System Manager, the CICS Explorer experience expands into this new set of capabilities, eliminating the learning curve that is so often experienced when introducing new management capabilities.

Enterprise-specific capabilities can easily be added to CICS Explorer with the CICS Explorer SDK, enabling enterprises to meet site-specific needs.

Enterprise-specific capabilities can easily be added to CICS Explorer with the CICS Explorer Software Development Kit, enabling enterprises to precisely fit site-specific needs into this CICS-centric management interface.

As not only new resources but also more existing resources come under CICS dynamic management control, management is also simplified. The latest of these simplifications is the addition of the CICS-MQ Group Attach facility.

Highlights

New capabilities are enabled in CICS Transaction Server for z/OS V4.1, including event-driven processing and CICS data Atom feeds.

An enhanced development environment

Rational Developer for System z also incorporates this new CICS Explorer function for those scenarios relevant to a developer community, thus improving productivity. Developers can create and install definitions through exploitation of System z Application Deployment Manager, which allows developers to create resources without queuing requests to system administrators and enables developers to be more productive. However, control of system resources can be maintained by administrators who specify policies relating to the creation of these resources.

Exploiting the latest technologies for competitive advantage

New application design patterns are enabled in this release by the introduction of facilities such as event-driven processing along with integration with WebSphere Business Events.[4] Web 2.0 applications are enabled by the introduction of Atom services.[5] CICS Transaction Server for z/OS V4.1 also augments existing dynamic resource definition management with a new packaging capability modeled on Service Component Architecture (SCA).

The administration and operation of these new facilities are integrated into CICS Explorer and Rational Developer for System z. CICS tools also support these important new additions to the CICS programming model. Adopters of CICS Transaction Server for z/OS V4.1 are therefore well placed to exploit the latest technologies that can unlock their existing assets and help them maintain their competitive advantage.

Highlights

The dynamic workload capabilities of CICSPlex System Manager have been enhanced for workloads operating in a sysplex environment.

Enhanced availability

Immediate access to services has never been more important. Denial of access for even a short period of time can result in your customer moving to a competitor.

For customers exploiting the dynamic workload capabilities of CICSPlex System Manager, this capability has been enhanced in this release for workloads operating in a sysplex environment. Improved throughput has been observed in test environments, particularly for distributed workloads, by exploiting the z/OS coupling facility. General improvements relate to faster notification of target system states and modifications to the routing algorithms employed. This enhancement also eliminates the "batching effect" sometimes noticed with distributed START requests, particularly when generated by inbound traffic from IBM WebSphere MQ.

Changing to this mode is simple. You add a CICS coupling facility data table (CFDT) server, or use an existing one, and switch the workload into this mode. No application changes are required.

CICS continues to move to TCP/IP-based networks. Transaction routing and starts can now be dynamically routed across TCP/IP connections, further extending the types of work requests that can be routed across this connectivity. Using TCP/IP reduces the reliance on IBM Systems Network Architecture (SNA) knowledge, which is becoming less common in the industry. Performance over this transport has also improved (see "Performance gains" section below).

With the introduction of CICS-MQ Group Attach, connections to WebSphere MQ can be dynamically re-established to a different group. This connectivity is now managed as a standard CICS resource, providing further simplification.

Corresponding functionality in the IBM CICS Tools family, such as the new cold start analysis feature of IBM CICS Configuration Manager for z/OS, also allows you to confidently predict whether restart of a CICS region will impact service availability.

As the enterprise evolves with new lines of business, new customer expectations are now higher than ever as IT commits to achieving goals and objectives to support service level agreements (SLAs). Response time management is a key component for SLAs and the objectives defined by the business. IT can now sense, isolate, diagnose, and repair what users would previously have perceived as slow performance from the business. IBM Tivoli Composite Application Manager (ITCAM) for Transactions can be used to measure a transaction or a unit of work as it flows across the enterprise infrastructure.

The ability to narrow down the location of a bottleneck from a topology view speeds up the isolation of response time problems. When identified, using the Tivoli OMEGAMON XE for CICS on z/OS product with CICS transactions, you can diagnose why there is a bottleneck. This information can be passed over to CICS Performance Analyzer, where this condition can now be further diagnosed and repaired. This synergy and integration of tools is the new breed in end-to-end solutions based on service level management.

Highlights

New performance data metrics have been provided by CICS for Web and Web service applications, enabling improved performance reporting and analysis of these applications.

Better instrumentation

Efficient exploitation of existing computing assets can lead to financial savings. Understanding the processing needs for the future can allow you to adapt in a timely manner without impacting the growth of your company. You can further both of these objectives by better understanding the usage profile of your computing assets.

With the proliferation of Web and Web service usage, the scalability attributes of CICS and System z become more important. To optimize this exploitation, new performance data metrics have been provided by CICS for Web and Web service applications, enabling improved performance reporting and analysis of these applications. New transaction resource class monitoring data is provided for distributed program link (DPL) requests, enabling users to better understand the workload management of these applications. You can now dynamically set the monitoring options that limit the number of distributed program links, files, and temporary storage queues for which CICS is to perform transaction resource monitoring. To help reduce the volume of monitoring record output, CICS now compresses these monitoring records by default. CICS Performance Analyzer has also been extended to support these new metrics.

The IBM sysplex-optimized z/OS Workload Manager facility also extends the management information available to understand the loads on the various systems, providing statistics not available until this release. CICS Interdependency Analyzer also supports these new metrics.

Highlights

Better match to available skills

As more types of work can be transported over a TCP/IP network, the dependency on traditional SNA skills diminishes. CICS Explorer better matches the skills and abilities of the new set of users emerging in the industry, providing an efficient way to pass on best practices to the next generation of IT professionals. A host of usability enhancements to the CICSPlex System Manager Web User Interface have also been provided for existing users who prefer a browser-based environment.

The ability to launch and move between operational service consoles such as the IBM Tivoli Enterprise Portal, which delivers plug-ins for the CICS Explorer with context-sensitive information, improves the ability to bring the right information to end users based on the problems they are trying to resolve.

Improved governance

CICS resources now support resource definition signatures that capture user activity data, along with runtime signatures that allow tracking of the runtime object back to the one in the definitional repository.

Identifying "who did what, when" can lead to faster recovery from failure. In the area of governance, CICS resources now support resource definition signatures that identify "who changed what last, when, and how," along with runtime signatures that provide similar information. This runtime signature allows tracking of the runtime object back to the one in the definitional repository. CICS Configuration Manager exploits this new information, which augments its extensive auditing and reporting capabilities.

Highlights

With the introduction of z/OS V1.11 by the end of 2009, CICS Transaction Server for z/OS V4.1 can use the forthcoming z/OS identity propagation capabilities that allow security identities operating in the distributed environment to be associated with security identities used on the server (z/OS user IDs).[6] This enables CICS applications to participate in end-to-end security solutions, thus benefiting from improved cross-platform accountability and auditing and providing an alternative to custom-written identity mapping.

Improved security

Users of Web services can now exploit basic authentication. Establishment of security between CICS and DB2 is simplified by passing the security context between CICS and DB2.

A better end-to-end story

CICS Discovery Library Adaptor provides integration with the Tivoli product portfolio, allowing users to exploit Tivoli CCMDB and Tivoli Business Service Manager.

As services span multiple subsystems and platforms, the end-to-end perspective becomes more difficult to establish, possibly leading to increased downtime. Integration with the Tivoli product portfolio is provided by CICS Discovery Library Adaptor, which populates the IBM Tivoli Change and Configuration Management Database (CCMDB) with CICS topology, and is exploited by such products as IBM Tivoli Business Service Manager for cross-subsystem application management.

Performance gains

Several performance improvements have been observed when running workloads on CICS Transaction Server for z/OS V4.1 regions in comparison with CICS Transaction Server for z/OS V3.2 in a controlled test environment. Although such data should not lead to over-generalization, the results nevertheless point to potential improvements in several areas.

Throughput improvements with CICSPlex System Manager workload management: Users who exploit the z/OS Workload Manager component should see throughput improvements, particularly for distributed workload requests when exploiting the new sysplex-optimized workload management facilities.

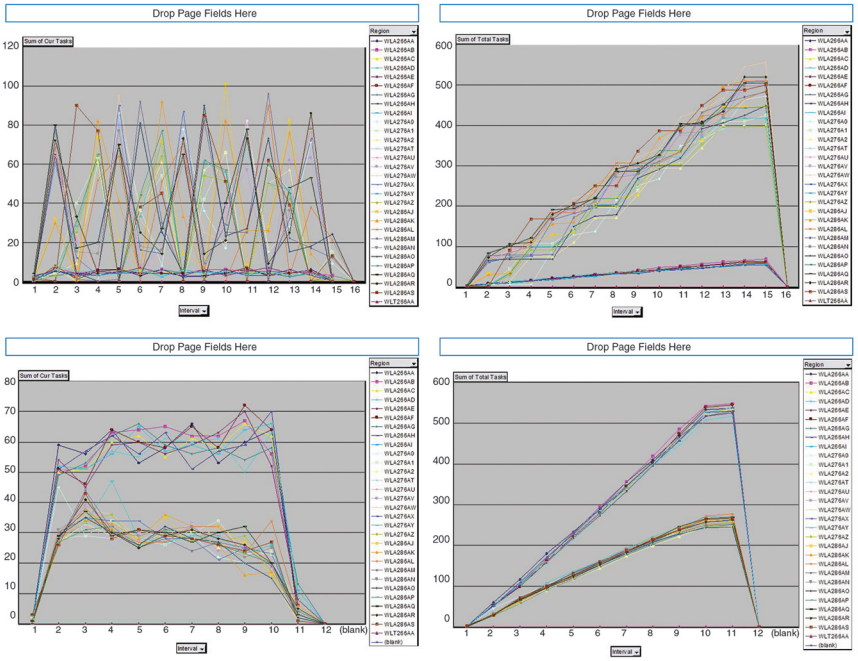

Figure 3: IBM CICSPlex System Manager workload management capabilities can enable throughput improvements, particularly for distributed workload requests.

Optimized use of MVS timer services: When compared with CICS Transaction Server for z/OS V3.2, a traditional workload consisting primarily of COBOL programs accessing virtual storage access method (VSAM) data running in CICS Transaction Server for z/OS V4.1 provided better performance characteristics, including a reduction of between 1 percent to 5 percent CPU, because of optimizations in the use of MVS timer services.[7] The CPU savings varied according to the frequency with which the MVS timer service IEATTUSD was used by CICS when running the workload on IBM System z9® and IBM System z10™.

Faster XML processing: When compared with CICS Transaction Server for z/OS V3.2, a workload consisting of Web services connectivity running in CICS Transaction Server for z/OS V4.1 showed a reduction in the CPU time used to parse XML messages as a result of the introduction of the z/OS XML parser in CICS. In addition, some aspects of XML processing can now be offloaded from general processors to IBM System z Application Assist Processors (zAAPs), which can result in better performance and cost savings.

Improved capacity and faster intersystem connectivity: When compared to workloads currently using IBM Logical Unit 6.2 (LU6.2) and IBM VTAM® for transaction routing or dynamic program link (DPL), CICS Transaction Server for z/OS V4.1 showed a reduced response time and overall CPU usage by migrating to TCP/IP and the IP interconnectivity (IPIC) function. In addition, the migration to TCP/IP can provide further performance improvements because of capabilities in the System z networking infrastructure, including gigabit network exploitation provided by the Open Systems Adapter-Express (OSA-Express) and the IBM System z Integrated

Information Processor (zIIP)-Assisted HiperSockets™ available in z/OS V1.10. In addition, CICS Transaction Server for z/OS V4.1 users also migrating to z/OS V1.11 can benefit from improved performance for wide-area networks through dynamic tuning of the TCP windows size. For further details about z/OS V1.10 function, refer to IBM U.S. Software Announcement letter 208-186.[8] For z/OS V1.11 function, refer to IBM U.S. Software Announcement letter 209-029.[8]

System z9 and z10 hardware: Users who upgrade to CICS Transaction Server for z/OS V4.1 could see a reduction in CPU per transaction for those applications running on IBM System z9 or IBM System z10 resulting from the exploitation of new hardware.

Improved efficiency and resilience management: Users of the CICSPlex System Manager APIs, CICS Management Client Interface (new in this release), Web User Interface, and CICS Explorer should see benefits from more efficient and resilient management with the introduction of CICSPlex System Manager topology changes that now track more resource types and provide customizable limits on the number of resources to be returned to the requestor. These changes reduce cycles and dataspace consumption, including backing storage.

Highlights

Improved instrumentation allows users to proactively predict and adapt to future needs, enhancing service availability.

Summary

Users of CICS Transaction Server for z/OS V4.1 should be well-positioned to maintain their competitive edge through the technologies introduced in this release. Integrated, simple-to-use interfaces for both development and service management alike can offset operational cost and mitigate zSeries® skills issues.

Availability of services is enhanced through numerous configuration and operational enhancements in this release. Better understanding can be achieved through improved instrumentation, which allows users to proactively predict and adapt to future needs. In several areas, potential performance improvements could be made over previous releases.

Better end-to-end integration is also realized through integration into the Tivoli portfolio of products, including products such as Tivoli Business Service Manager and Tivoli OMEGAMON.

For more information

To learn more about how integrated systems management can help you achieve business resilience, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/cics.

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IBM Systems and Technology Group
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Somers, NY 10589
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Produced in the United States of America
September 2009

ZSW03130-USEN-00