

Optimizing applications and data for mobile workloads

Track 3: Extending the mainframe to the mobile enterprise





Where we are in todays agenda

- Mobilizing the mainframe
- Modernizing mainframe applications for mobile and more
- Exposing mainframe applications and services to mobile
- Developing an IBM MobileFirst platform application for z Systems
- Optimizing applications and data for mobile workloads
- Client use cases and getting started with mobile and z Systems

CIO Pressures







"Agility and accessibility will make the successful organization of the future."

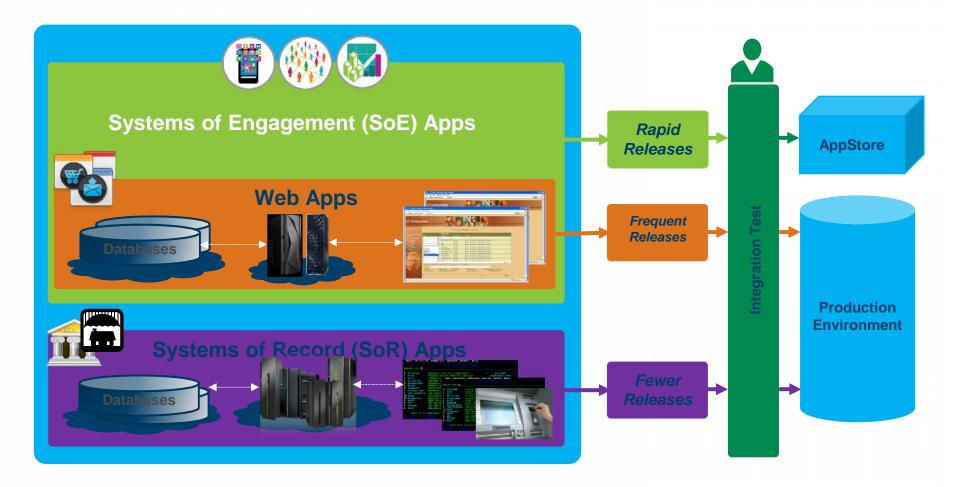


Digital technologies lead CIO technology priorities

CIO technologies	Ranking of technologies CIOs selected as one of their top 3 priorities in 2013							
Ranking	2013	2012	2011	2010	2009			
Analytics and business intelligence	1	1	5	5	1			
Mobile technologies	2	2	3	6	12			
Cloud computing (SaaS, IaaS, PaaS)	3	3	1	2	16			

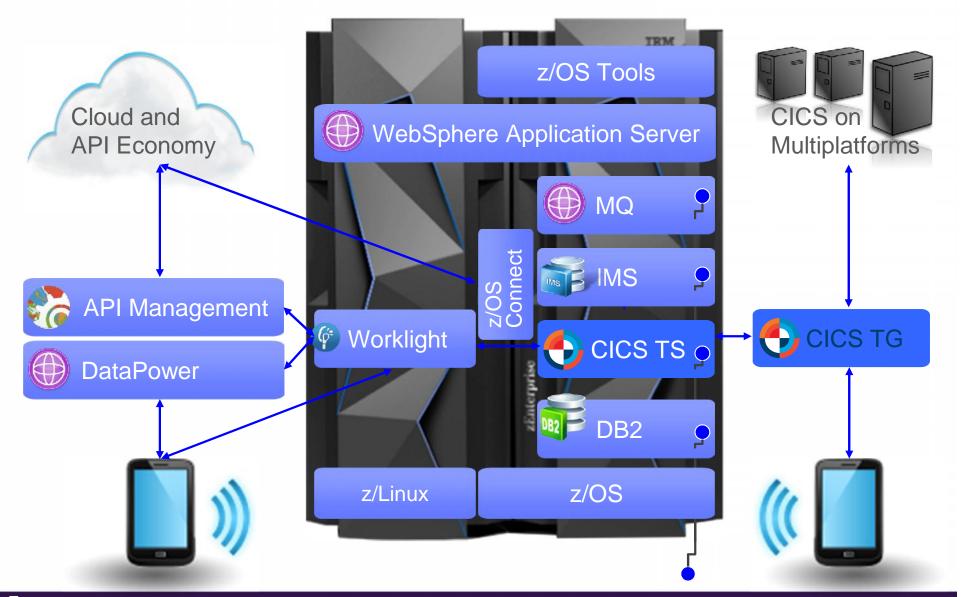


Bringing together the people, processes, and tools across the entire software delivery lifecycle – spanning mobile to mainframe platforms



Systems of Engagement meet Systems of Record



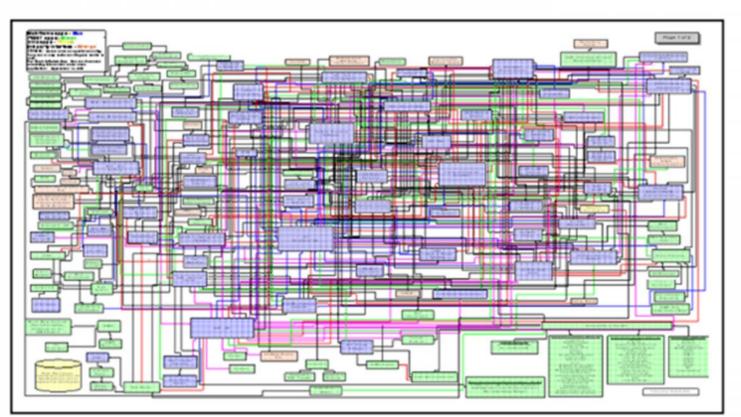




Change?

Fix problems?

Optimize?



Modernize?

Where do I start?

Re-use?

Optimization



Applications

Performance improvement, performance trending, capacity planning

Infrastructure

Workload management Application configuration Region provisioning

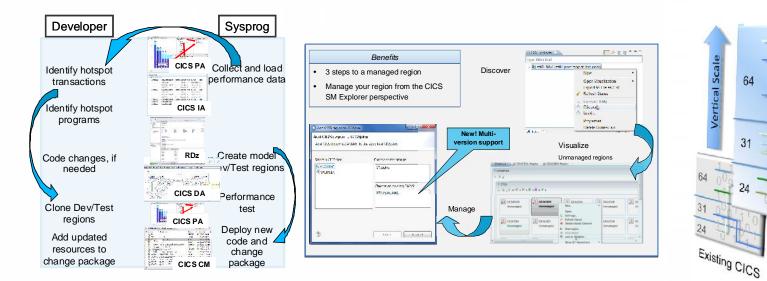
Data

Consistent data management Automated recovery As a **System programmer**, they help me to optimize my applications, data, infrastructure, and processes

Three steps to CICS optimization



Optimize applications, systems, and processes to achieve more with less



Step 2

Workload Management to cope with mobile scalability and availability needs

Step 3 Region Consolidation to reduce management overhead and CPU utilization (up to 10%)

Horizontal Scale

64

31

Human

Step 1

Threadsafe analysis and

implementation to reduce

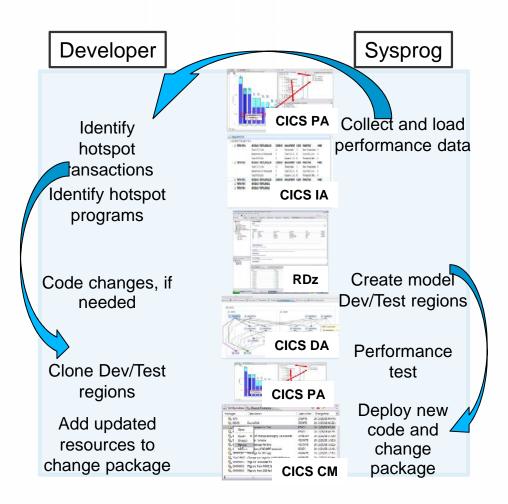
CPU utilization by up to 20%

"Improved application performance by 10–20 percent and reduced the cost of processing claims, positioning it to handle growing numbers of claims"

© 2015 IBM Corporation



Threadsafe analysis and implementation to reduce CPU utilization by up to **15%**





- •Reduce CPU usage
- •Defer capacity upgrades
- •Improve response times
- Increase multi-processing
- Insight
- Analysis
- Change control

"By making only one major application threadsafe we were able to save 700 MIPS" Major US Bank

CICS IA gives Deeper Threadsafe Analysis



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One of the largest insurance companies in Germany. Insures more than 8.5 million clients.

Challenge

- Reduce CPU usage in its IBM System z9® Enterprise Class mainframe to cut operating costs.
- Solution
 - Implemented threadsafe following hands-on usage of the IBM CICS tools (Performance Analyzer, Interdependency Analyzer, and Configuration Manager).

Benefit

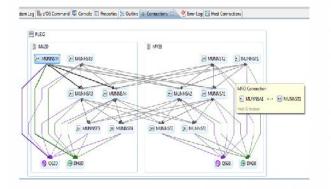
We've embraced threadsafe functionality to help us cut our CPU usage by 550 MIPs, or about US \$440,000 in annual operating expense, which really proves the efficiency of IBM CICS technology."

IBM Case Study

http://www-05.ibm.com/de/follow-z/pdf/Referenz-april-HUK-COBURG_EN.pdf

Availability workload management





Clone a CICS re-	0	MAS nan	ne match			
New APPLID:	IYDZEJ09					
New CICS Sysid:	EJ09					
New MAS Name:	REDOVA43					
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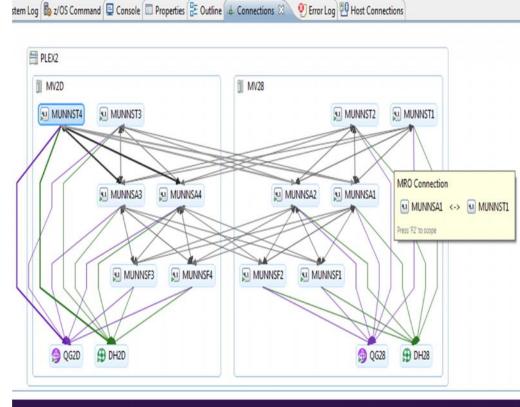
Understand the system & application's performance and topology **Extend** the environment and **implement** workload management definitions Validate the results

CICS Deployment Assistant for z/OS



Step 1 and 2

- Use CICS DA to Discover and Manage your CICS topology quickly.
- Use CICS DA to Clone your regions.



CICS DA provides...

- Visualize and manage your CICS topology
- Discover existing regions and sub-systems
- Clone Regions
- Automation creates new CICSplex
- Plexify and clone CICS regions
- Start and stop a CICS region
- Share model with other applications

CICS Performance Analyzer for z/OS



Step 3

 Use CICS PA for performance analysis comparison of transactions using Transaction Profiling to Validate results.

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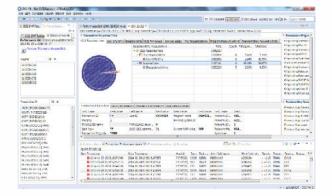
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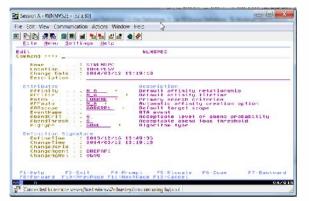
- Comprehensive Performance Reporting
- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
- Faster problem resolution
- Evaluation and tuning of CICS system efficiency to improve system performance

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Performance workload management







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Understand current performance

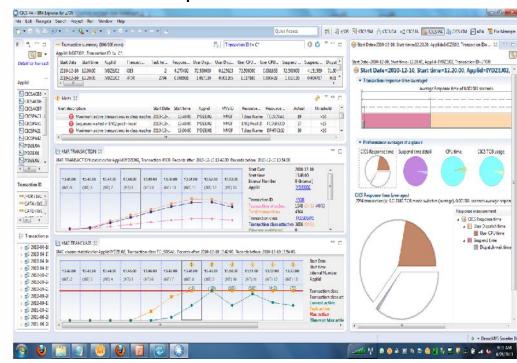
Implement an adaptable workload management system Validate the results

CICS Performance Analyzer for z/OS



Step 1

 Use CICS PA for performance analysis of individual transactions to determine problem transactions and evaluate areas for improvement.



CICS PA provides...

- Comprehensive Performance Reporting
- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
 Faster problem resolution
 Evaluation and tuning of CICS system efficiency to improve system performance

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CICS Configuration Manager for zOS



Step 2

 With CICS CM - CICSPlex SM Topology and Workload Management resource types can be managed, so that you can reconfigure dynamic mobile workloads quickly.

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CICS CM provides...

- Manage changes throughout the life-cycle
- Create reports to identify redundant definitions, show resource relationships, and change management history Manage audit, back-out and change authorizations

CICS Performance Analyzer for z/OS



Step 3

 Use CICS PA for performance analysis comparison of transactions using Transaction Profiling to Validate results.

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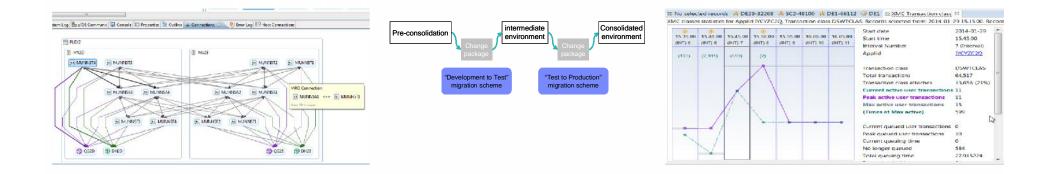
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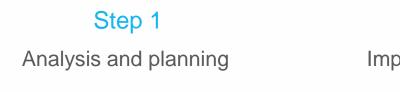
- Comprehensive Performance Reporting
- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
- Faster problem resolution
- Evaluation and tuning of CICS system efficiency to improve system performance





Region Consolidation to reduce CPU utilization (up to 10%) and management overhead





Step 2

Implementation & tuning

Step 3

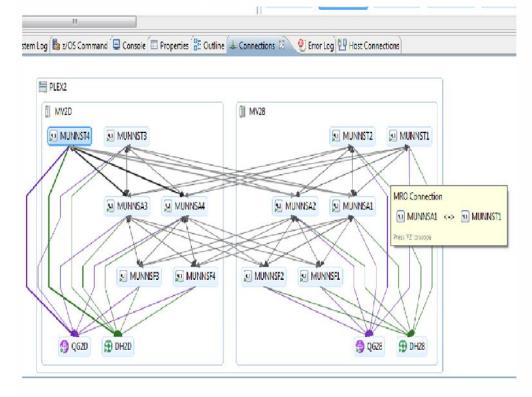
Validate Scalability and Performance

CICS Deployment Assistant for z/OS



Step 1

• Use CICS DA to Discover and Manage your CICS topology quickly.



CICS DA provides...

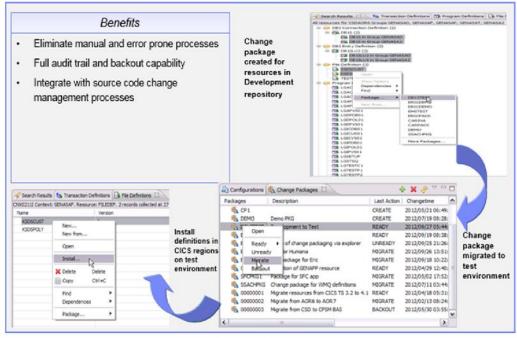
- Visualize and manage your CICS topology
- Discover existing regions and sus-systems
- Clone Regions
- Automation creates new CICSplex
- Plexify and clone CICS regions
- Start and stop a CICS region
- Share model with other applications

CICS Configuration Manager for zOS



Step 2

• Use CICS CM manage and consolidate resource definitions for CICS across multiple CICS regions.



CICS CM provides...

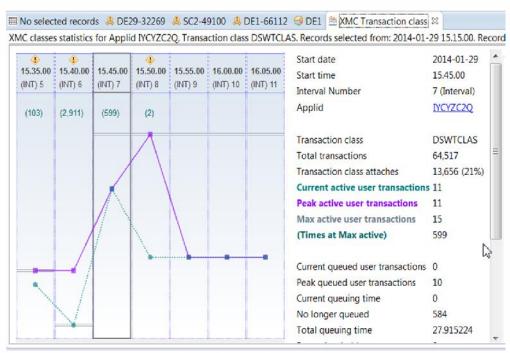
- Manage changes throughout the life-cycle
- Create reports to identify redundant definitions, show resource relationships, and change management history Manage audit, back-out and change authorizations

CICS Performance Analyzer for z/OS



Step 3

Use CICS PA for CICS utilization of CPU and Storage reporting to assist with scalability and performance considerations



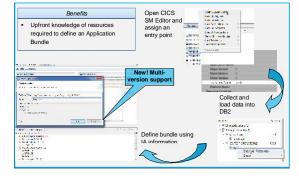
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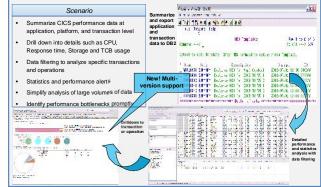
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- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
 - Faster problem resolution
- Evaluation and tuning of CICS system efficiency to improve system performance



Support CICS cloud initiatives to simplify system management and rapid application deployment.







Step 1

Analysis and definition of CICS cloud Applications

Step 2

Plan and build CICS cloud **Platforms**

Step 3

Deploy and manage CICS cloud Applications and Platforms

z/OS Explorer-Cloud Explorer defines and deploys



⁽²⁾ Cloud Explorer ⁽²⁾ Server: CPSM	New Application Def	nition	
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Applications	Description:	Using the zOS Explorer to create the GENAPP V	/1.0.0
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Application Definition (ZSUMMIT) S *zSummit Bundle Overview	a zsummít_bundle ⊠		
General Information This section describes general information about this bund ID: zsummit_bundle Version: 1.0.0	ile.	Actions You can perform the following actions on this bundle 1. Add or remove CICS resource definitions using 2. Create an entry point to define an application 3. Apply a policy to an application operation 4. Export the bundle to a platform or specific loce	operation
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CICS IA provides a list of Application Resources



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CICS PA gives CICS cloud Performance insight

Scenario



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Row 1 to 6 of 6

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Summarize File Edit View Communication Actions Window Help and export Summarize CICS performance data at ٠ BA # 5 application File Options Help application, platform, and transaction level and transaction HDB Templates Drill down into details such as CPU, Response ٠ data to DB2 Command ===> time, Storage and TCB usage Select to edit Template. Enter NEW command to define a new Template. Data filtering to analyze specific transactions and ٠ Description / Name Type operations APPLNM51 SUMMARY Explorer HDB for Appl Context Explorer HDB for CICS TS V3.1 EXPLOR31 SUMMARY Statistics and performance alerts Explorer HDB for CICS TS V3.2 ٠ EXPLOR32 SUMMARY EXPLOR41 SUMMARY Explorer HDB for CICS TS ¥4.1 Simplify analysis of large volumes of data EXPLOR42 SUMMARY Explorer HDB for CICS TS V4.2 ٠ EXPLOR51 SUMMARY Explorer HDB for CICS TS V5.1 Identify performance bottlenecks promptly ٠ 5.025+ 5.02530 7.342549 2.342549 2.342549 2.342549 2.342549 1.744675 1.744675 1.256479 3.25569 2.325669 2.325669 2.325669 2.325669 And an analy Duto Avenue 0 000 12 0 000 12 0 000 14 0 000 140 0 000 140 0 000 140 0 000 140 0 000 140 0 000 140 0 000 140 Drilldown to transaction or operation 2012/01/02 2012/02/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/02/02 2012/0 e a 2000 e 20 150

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Detailed performance and statistics analysis with data filtering



Faster problem identification and resolution

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Step 2

Automated fault and performance alerts with diagnostic advice Drill-down into problems with analysis tools

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Step 3

Fix problem, for example, make a change in data

HSBC C

"We've **increased programmer productivity by 10 percent** and cut development costs. Not only that, but we've **experienced significant decreases in the number of transaction failures** within our applications." Roberto L De Hoz, manager mainframe support, HSBC Bank Argentina S.A

IBM Fault Analyzer



Step 1

- Use Fault Analyzer to provide detailed information on the instructions and variables involved at the time of the Abend.
- IBM Fault Analyzer improves developer productivity and decreases deployment costs by helping to analyze and correct application failures quickly (CICS/DB2/IMS/MQ/COBOL/PLI/ASM/ C/C++/ASM/JAVA).
- Develop and test new and existing applications more productively, helping to reduce costs along the way.
- Proven 3270-based interface and free graphical user interface.

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1	
2 3 4	
5	
67	
8	A program-interruption code 0007 (Data Exception) is associated with this abend
10	
11	A decimal digit or sign was invalid.
12	
13	The cause of the failure was program SAM2 in module SAM2. The COBOL source code
14	that immediately preceded the failure was:
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16	Source
17	Line #
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19	
20	
21	000090 BALANCE-TOTAL + CUST-ACCT-BALANCE
22	
	The COBOL source code for data fields involved in the failure:
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	4
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Helps to identify the cause, analyze the failure, and fix the problem

Main Report Event Details Abend Information System-Wide Information Miscellaneous

momys demonstra ibm com:2800/EAUI TANI V13R1 HIST/100767)-Report

IBM Debug Tool



Step 2

 Use IBM Debug Tool to test and determine if the cause of the abend is logic or data.

> •The powerful and user friendly GUI interface provides productivity for the end users.

- IBM Debug Tool can help you increase debugging efficiencies and reduce application development cycle times.
- Program testing and analysis aid that helps you examine, monitor, and control the execution of application programs on z/OS (CICS/DB2/IMS/ COBOL/PLI/ASM,C/C++/ASM/JAVA w Toolkit)
- Code Coverage Analytics
- Proven 3270-based interface and free graphical user interface.

246	*******	
247	PROCEDURE DIVISION.	
248	*********************	
249		
250	000-MAIN.	
251	ACCEPT CURRENT-DATE FROM DATE.	
252	ACCEPT CURRENT-TIME FROM TIME.	
253	DISPLAY 'SAM1 STARTED DATE = ' CURRENT-MONTH '/'	
254	CURRENT-DAY '/' CURRENT-YEAR ' (mm/dd/yy)'.	
255	DISPLAY ' TIME = ' CURRENT-HOUR ':'	
256		Source and debugging to
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258	PERFORM 900-OPEN-TRAN-AND-RPT-F	
259	PERFORM 800-INIT-REPORT .	improve development
260		
261	PERFORM 100-PROCESS-TRANSACTION	
262	UNTIL WS-TRAN-FILE-EOF	productivity
263		productivity
264	PERFORM 905-CLOSE-TRAN-AND-RPT-FILES.	
265		
256	GOBACK .	

IBM File Manager



Step 3

- Use File Manager to manipulate data when working with z/OS data sets, DB2, CICS, IMS or WebSphere MQ data.
- IBM File Manager allows you to manage production, test, and development data across multiple formats and storage media.
- Create, edit, copy, browse, extract, print, and compare enterprise data (VSAM/DB2/IMS,CICS/MQ)
- 3270-based interface and graphical user interface.

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4	03003	Prentice, Anna	0.00	7	33 Renshaw	Laramie	WY
5	03390	Deeds, Darren	74.00	3	649 Brown Street	Sandstone	IN
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Data management tool supporting key file structures like VSAM, DB2, CICS, and IMS





- Fault Analyzer Faster problem determination and resolution. Understand what happened, program, where it happened, context within the source code, the variables involved and the value of the variables at the time the exception occurred. Point and shoot navigation and explanation of error messages and codes, GUI interface provides productivity for users.
- Debug Tool Recreate the issue to determine if the problem is Data or Logic related. Test / validate code changes. Use Code Coverage to determine if all changed code was tested.
- File Manager Provides a quick and easy method to access, manipulate or correct VSAM, DB2,IMS, MQ, CICS, zFiles/HFS data.

Three steps to **Performance Problem Elimination**



Looking for Trouble?

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Step 1

Identify CICS transaction needing response time improvement Step 2 Understand transaction's resource consumption at much deeper level

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Step 3

Test changes and measure results to ensure success

U.S. credit card services company used APA to improve performance by 3x"

CICS Performance Analyzer for z/OS



Step 1

 Use CICS PA for performance analysis of individual transactions to determine problem transactions and evaluate areas for improvement.

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CICS PA provides...

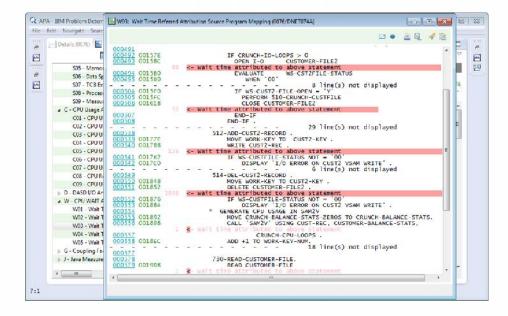
- Comprehensive Performance Reporting
- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
- Faster problem resolution
 Evaluation and tuning of CICS system efficiency to improve system performance

IBM Application Performance Analyzer



Step 2

- Use IBM Application Performance Analyzer to monitor and drill down to subsystem details and the source instructions to determine statements causing bottlenecks.
- IBM Application Performance Analyzer helps maximize the performance of your applications and improve the response time of your online transactions and batch turnaround.
- Identify constraints and improve the entire application's performance no matter where the problem resides (CICS/ IMS/DB2/MQ/COBOL/PLI/ ASM/JAVA)
- 3270-based interface and graphical user interface.



Monitor and optimize performance at the application level

IBM Workload Simulator



Step 3

• Use IBM Workload Simulator to perform stress, performance and capacity testing of applications.

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- IBM Workload Simulator helps eliminate the need for large amounts actual users and time for testing.
- Ideal for stress, performance, regression, function, and capacity planning tests.
- 3270-based interface and graphical user interface.

Simulates a network of users doing actual work on the application.





- CICS Performance Analyzer Analyze CICS transactions for history and trending to determine if a problem is occurring due to changes in the application or changes in the CICS environment where the application(s) execute. Choose candidate transactions for detailed analysis using APA
- Application Performance Analyzer Monitor and analyze transactions to provide details on where time is being spent and resources are being consumed in an application, and areas for improvement. Use APA in the test environment to evaluate changes made using report compare feature.
- Workload Simulator Provides the ability to create test cases for regression and stress testing for proactive analysis of the effect of change on applications. Simulate workload and number of users for analysis of increased workload.

Three steps to Financial optimization



Get more for your money







Step 1

Replace 3rd party products with IBM z/OS Tools Step 2

Save even more with IBM Solution Packs Step 3

Move OpEx to CapEx with CICS TS VUE



- Affordable Pricing generally 25+% less than ISV
- All Inclusive of Languages COBOL, PL/I, Assembler, C/C++
- All Inclusive of Subsystems CICS, IMS, DB2, MQ, WAS
- SMP/E Installed and Maintained reduces impact on Systems Staff
- Can be pre-installed as part of a z/OS upgrade reduces impact on System Staff
- No Software Keys reduces impact on Systems Staff / Supports Disaster Recovery Strategy for Testing / Implementation
- Includes both 3270 and Workstation Interfaces no additional charges, no additional licensing, no per seat limits



CICS Optimization Solution Pack for z/OS V5.2

Quickly optimize performance and availability of CICS systems and applications Interdependency Analyzer, CICS Deployment Assistant, CICS Performance Analyzer, CICS Configuration Manager

CICS Modernization Solution Pack for z/OS V5.2

Understand deployed CICS application and system resources, connect from non-mainframe devices, and create CICS infrastructure to support the increased workload with CICS Interdependency Analyzer, CICS Deployment Assistant, CICS Transaction Gateway for z/OS

IBM Problem Determination Solution Pack for z/OS V1.3

Cost effective problem analysis for z/OS subsystems and languages with both GUI & 3270

interface with File Manager, Fault Analyzer, Debug Tool for z/OS, Workload Simulator, Hour Glass, Data Set Commander

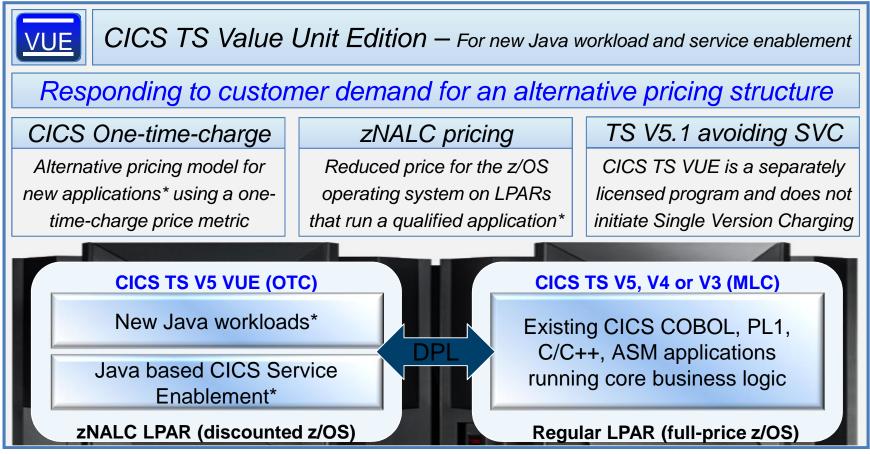
IBM Problem Determination Testing Solution Pack for z/OS V1.3

Reduce testing time, improve application reliability and user diagnosis capabilities, and improving user's ability to regulate and monitor testing activities with Debug Tool, Workload Simulator, Hour Glass

IBM Problem Determination Modernization Solution Pack for z/OS V1.3

Address your problem analysis needs and provides tools that decrease development time, improve performance and reliability and reduce diagnosis time with Application Performance Analyzer, Debug Tool, Fault Analyzer, File Manager





* zNALC approval is required for each application

More information



• Web pages

- http://ibm.com/cics
- http://ibm.com/cics/showcase
- <u>http://ibm.com/cics/tools</u>
- http://ibm.com/software/awdtools/deployment
- Analyst reports
 - IBM CICS Tools: Discovery and Optimization for the Next Generation link
 - IBM PD Tools leads the pack again link
- Threadsafety & Consolidation extracting optimum performance from CICS <u>Prezi</u> <u>YouTube</u>
- Social media
 - Like CICS on Facebook at <u>CICS Hursley</u> or <u>WebSphere and CICS Support</u>
 - Watch videos on YouTube CICS and CICS Tools and IBM System z PD Tools
 - View presentations on Slideshare
 - Follow IBM_CICS on Twitter http://www.ibm.com/support/docview.wss?uid=swg21384915
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