

Optimizing applications and data for mobile workloads

Track 3: Extending the mainframe to the mobile enterprise



Where we are in today's 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

Reduce

- Cost
- Risk
- Complexity
- Outage

Manage

- Operational efficiency
- Critical business data
- Security & Compliance
- Skills and resources

Deliver

- Service agility
- Business Intelligence
- Mobile solutions
- Cloud solutions



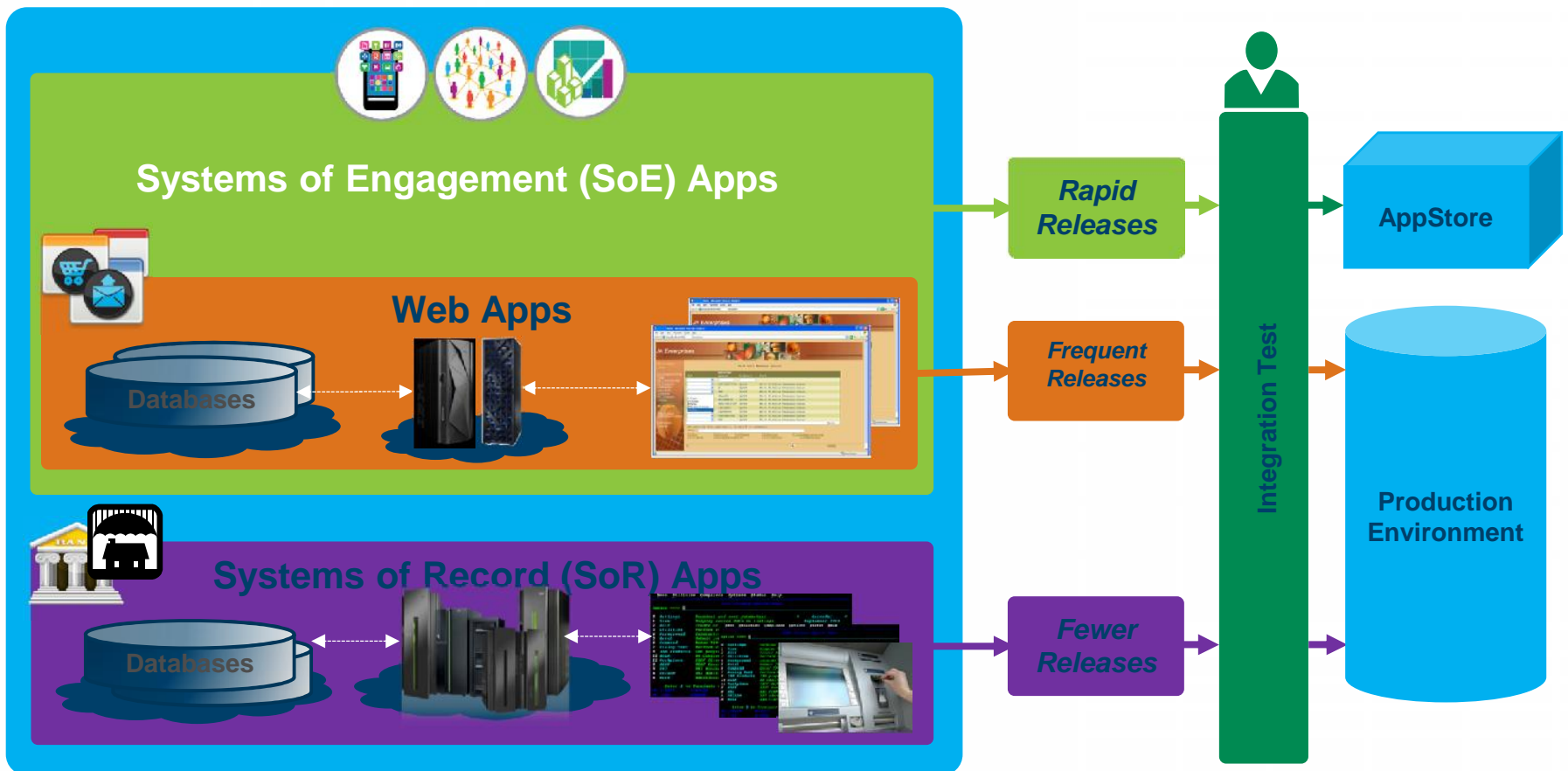
“Agility and accessibility will make the successful organization of the future.”



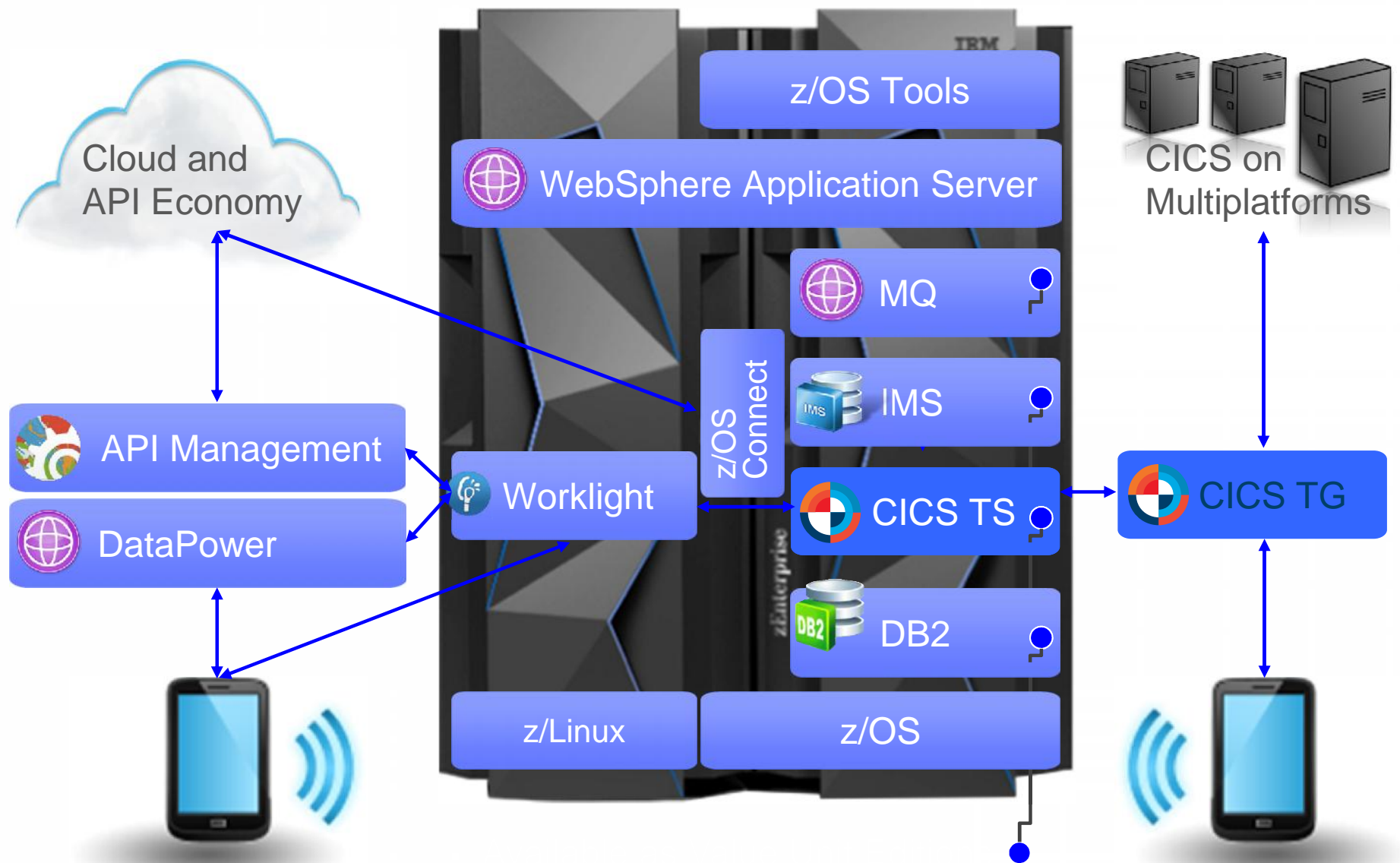
Digital technologies lead CIO technology priorities

CIO technologies	Ranking of technologies CIOs selected as one of their top 3 priorities in 2013				
	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



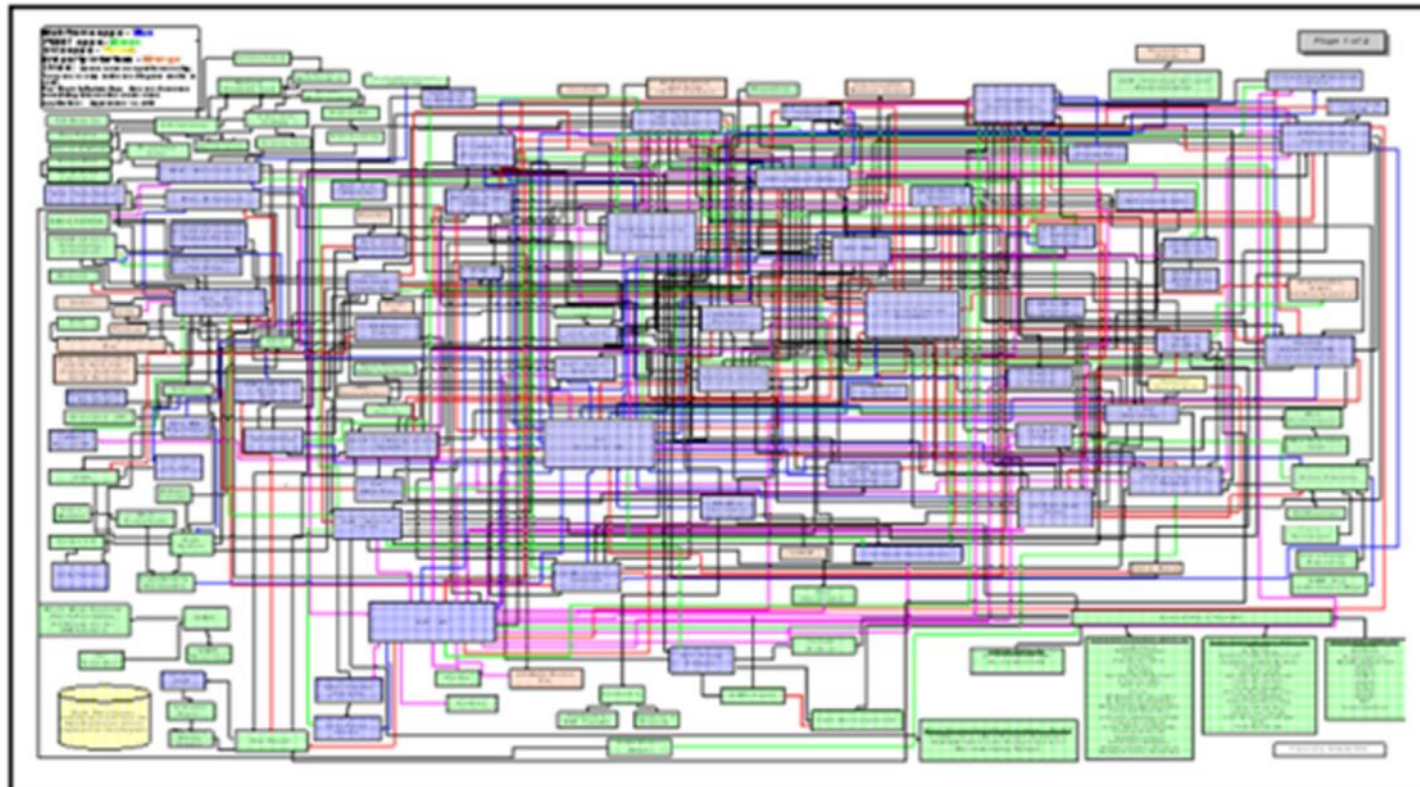
Systems of Record can be complex systems built on decades of continuous & incremental development



Change?

Fix problems?

Optimize?



Modernize?

Where do I start?

Re-use?

Applications

Performance improvement, performance trending, capacity planning

Infrastructure

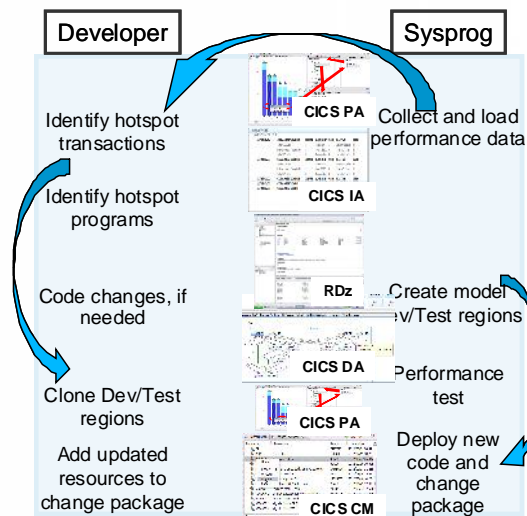
Workload management
Application configuration
Region provisioning

Data

Consistent data management
Automated recovery

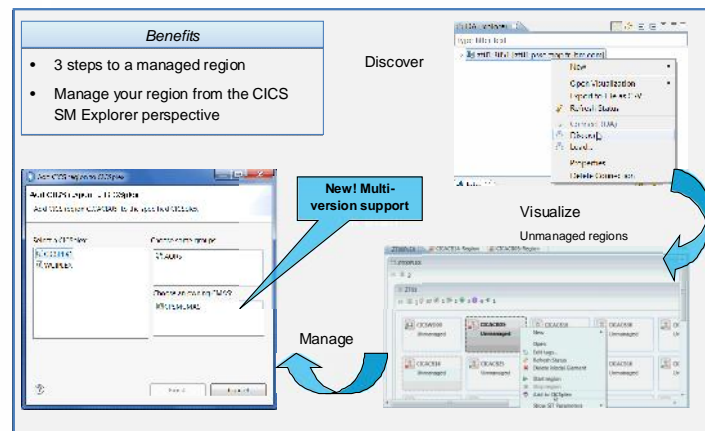
As a **System programmer**, they help me to optimize my applications, data, infrastructure, and processes

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



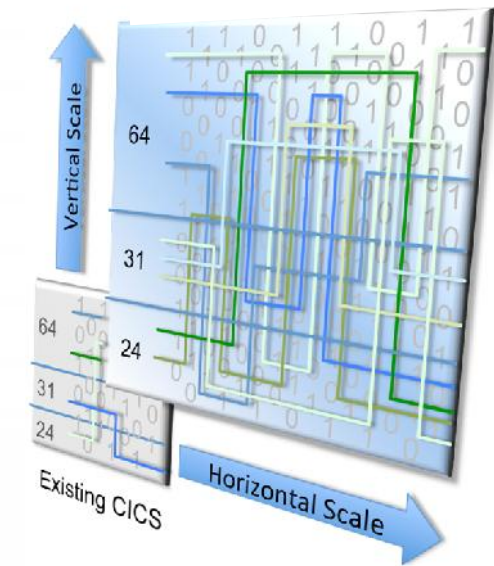
Step 1

Threadsafe analysis and implementation to reduce CPU utilization by up to 20%



Step 2

Workload Management to cope with mobile scalability and availability needs



Step 3

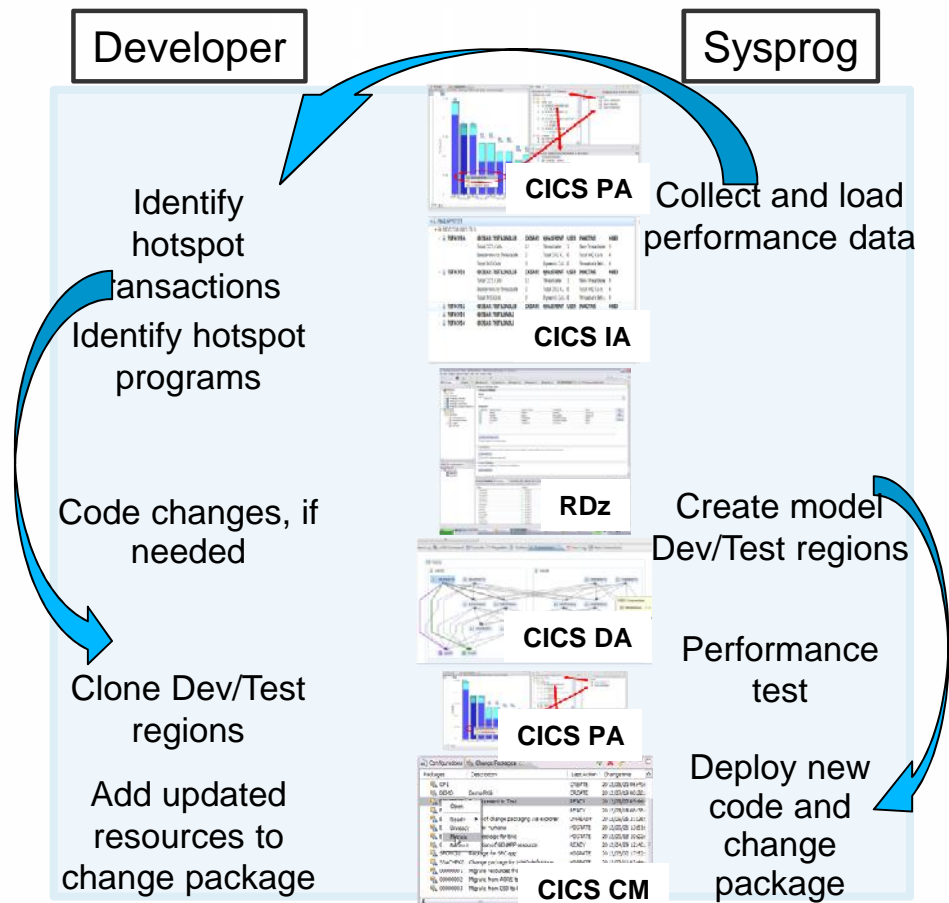
Region **Consolidation** to reduce management overhead and CPU utilization (up to 10%)

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

Extracting Optimum Performance from CICS



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



Show Resources Affinities *Report View CICS TS level: Region Collection ID: *

Program	LIB Dataset Name	APIST	Concurrency	Exe...	Storage Protect	CIC...
APPLVERSIONS						
IDZZ528 (CICS TS 5.						
LGICDB01		CICSAPI	QUASIRENT	USER	INACTIVE	0690
LGICUS01		CICSAPI	QUASIRENT	USER	INACTIVE	0690
LGSTSQ		CICSAPI	QUASIRENT	USER	INACTIVE	0690
LGTESTC1	CICSIAD.GENAPP.V510.L...	CICSAPI	QUASIRENT	USER	INACTIVE	0690
	Total CICS Calls	11	Threadsafe	0	Non-Threadsafe	4
	Indeterminate Threadsafe	7	Total DB2 C...	0	Total MQ Calls	0
	Total IMS Calls	0	Dynamic Cal...	0	Threadsafe Inhi...	0
	Total CPSM Calls	0	Threadsafe	0	Non-Threadsafe	0
LGTSTNC1	CICSIAD.GENAPP.V511.L...	CICSAPI	QUASIRENT	USER	INACTIVE	0690

Comma...	Function	Type	Object	Offset	Use cou...	Threads...	Inhibitor
CICS	HANDLE	AID		00000B...	2	Y	N
CICS	HANDLE	CONDITI...		00000C...	2	Y	N
CICS	LINK	PROGRA...	LGICUS01	00000D...	1	Y	N
CICS	RECEIVE	MAP	SSMAPC1	00000C...	2	N	N
CICS	RECEIVE	MAPSET	SSMAP	00000C...	2	N	N
CICS	RETURN	TRANSID	SSC1	000013...	1	Y	N
CICS	SEND	MAP	SSMAPC1	00000B...	1	N	N
CICS	SEND	MAP	SSMAPC1	000016...	1	N	N
CICS	SEND	MAPSET	SSMAP	00000B...	1	N	N
CICS	SEND	MAPSET	SSMAP	000016...	1	N	N
CICS	SEND	TEXT	SEND TEXT	000014...	1	N	N



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**

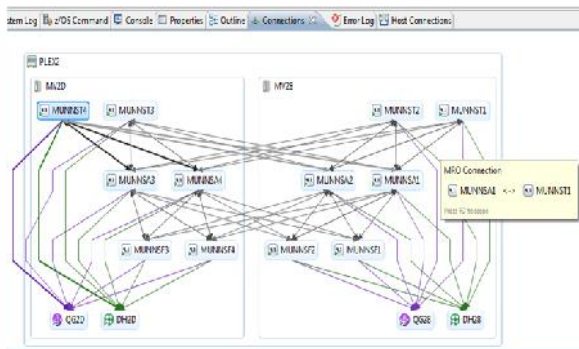
- ▶ Implemented threadsafe following hands-on usage of the IBM CICS tools (Performance Analyzer, Interdependency Analyzer, and Configuration Manager).

▪ **Benefit**

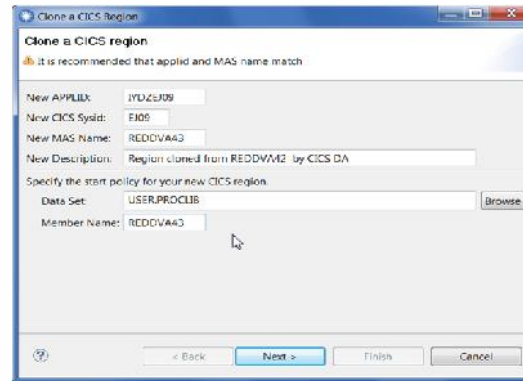
- ▶ “We’ve embraced threadsafe functionality to **help us cut our CPU usage by 550 MIPs, or about US \$440,000 in annual operating expense**, which really proves the efficiency of IBM CICS technology.”

IBM Case Study

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



Understand the system & application's performance and topology



Extend the environment and **implement** workload management definitions

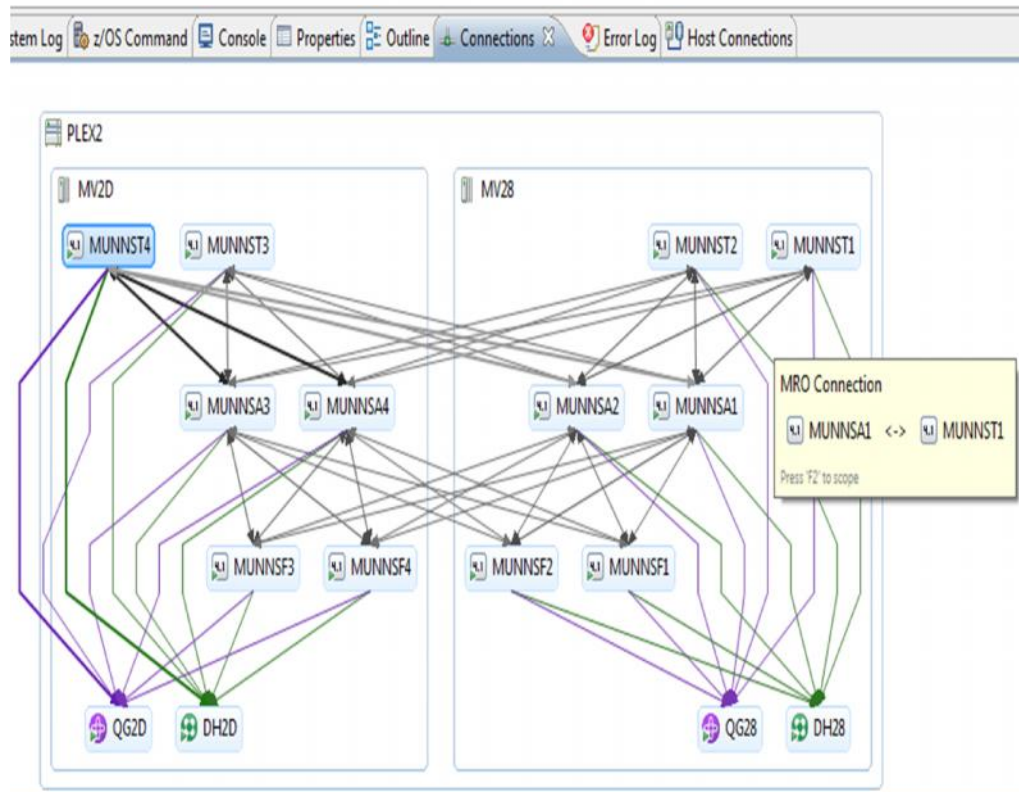
Trans	#Tasks	Response Time	Dispatch Over	Over CPU	Suspend	Blocked	FC Wait	FC Wait	IR Wait	SC Wait	Count	Count
232 Report	1391	1897	-215.3	2532	-556.1	-2399	2000	0	-4020	2352	1391	
232 Baseline	3639	3858	-5493	3025	-1405	-6398	3000	0	-6443	2225	13373	
232 Delta	-2248	+1661	-3339	-1508	+1409	-4000	3000	0	+4000	-893	-10042	
232 Claspot	-16-95	+31-22	-21-88	-21-88	+21-88	-30-21	0	0	-15	-51-61	-11-61	-5-83



Validate the results

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

Step 3

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

V5R1 CICS Performance Analyzer Transaction Profiling

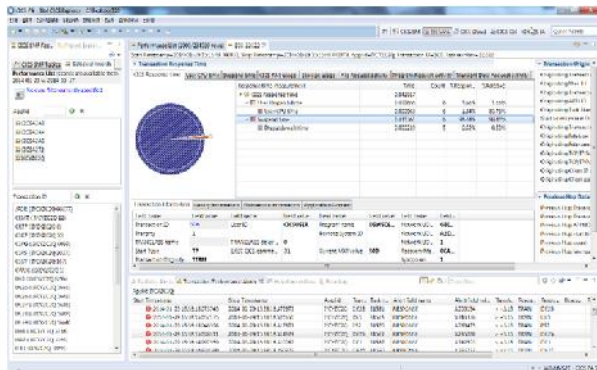
FRCP0001 Printed at 13:54:44 8/02/2013 Report Data from 17:24:42 7/31/2013 to 18:29:59 7/31/2013 Page 1
 Baseline Data from 16:17:32 7/31/2013 to 16:44:59 7/31/2013

Tran		#Tasks	Avg Response	Avg Dispatch	Avg User	Avg CPU	Avg Suspend	Avg Dispatch	Avg FC	Avg Wait	Avg FCAN	Avg IR	Avg Wait	Avg SC24UHM	Avg SC31UHM
			Time	Time	Time	Time	Time	Time	Time	Time	Count	Time	Count	Count	Count
DE1	Report	1308	.1097	.0532	.0032	.0564	.0009	.0000	0	.0550	2572	159457			
DE1	Baseline	3628	.0888	.0433	.0023	.0455	.0008	.0000	0	.0442	2205	155273			
	Delta	-2320	+.0208	+.0099	+.0008	+.0109	+.0000	.0000	0	+.0108	+367	+4184			
	Change%	-63.95	+23.52	+23.04	+37.80	+24.00	+10.27	.00	.00	+24.40	+16.64	+2.69			
SC1	Report	12	.0175	.0082	.0017	.0093	.0005	.0000	0	.0086	5098	142952			
SC1	Baseline	44	.0893	.0425	.0038	.0467	.0015	.0000	0	.0444	2588	233438			
	Delta	-32	-.0717	-.0343	-.0020	-.0374	-.0009	.0000	0	-.0358	+2419	-90486			
	Change%	-72.73	-80.33	-80.69	-53.63	-80.03	-64.50	.00	.00	-80.65	+93.48	-38.76			
PS2	Report	18	.0463	.0221	.0033	.0241	.0008	.0000	0	.0230	2432	271272			
PS2	Baseline	20	.0509	.0239	.0038	.0269	.0011	.0000	0	.0252	2188	257806			
	Delta	-2	-.0046	-.0017	-.0005	-.0028	-.0003	.0000	0	-.0022	+243	+13465			
	Change%	-10.00	-9.04	-7.33	-13.73	-10.55	-26.20	.00	.00	-8.91	+11.11	+5.22			
NACT	Report	6	.0556	.0275	.0043	.0280	.0003	.0000	0	.0275	2432	301853			
IT1	Report	4	.2208	.1091	.0063	.1117	.0004	.0000	0	.1102	2504	96276			
IT1	Baseline	4	.1482	.0741	.0192	.0740	.0002	.0000	0	.0737	2528	96276			
	Delta	0	+.0726	+.0349	-.0129	+.0376	+.0002	.0000	0	+.0364	-24	0			
	Change%	.00	+48.99	+47.11	-66.94	+50.90	+102.00	.00	.00	+49.39	-.95	.00			

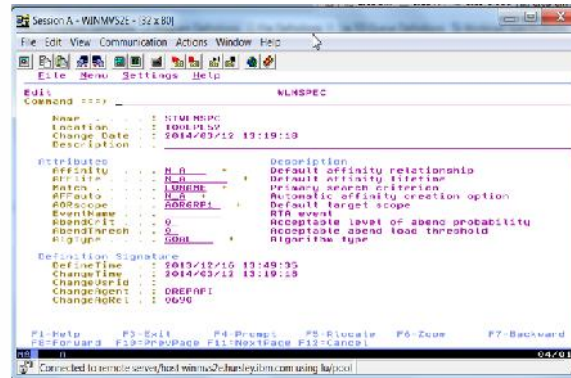
CICS PA provides...

- 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

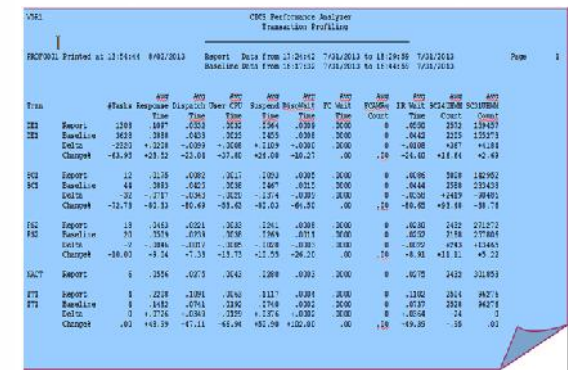
Performance workload management



Understand current performance



Implement an adaptable workload management system



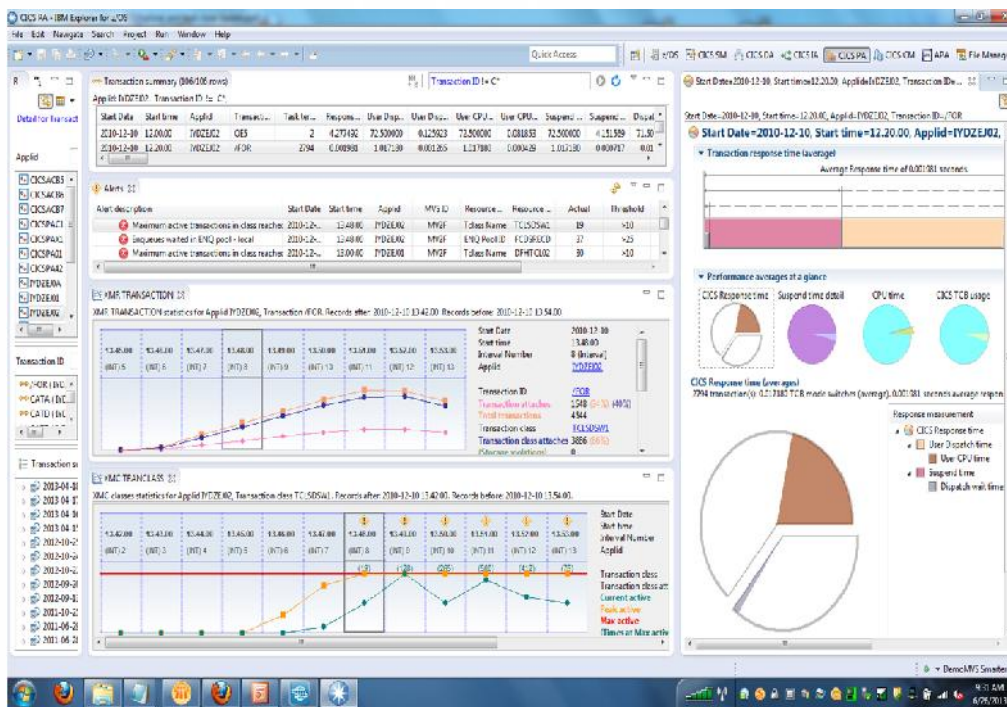
Validate the results

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
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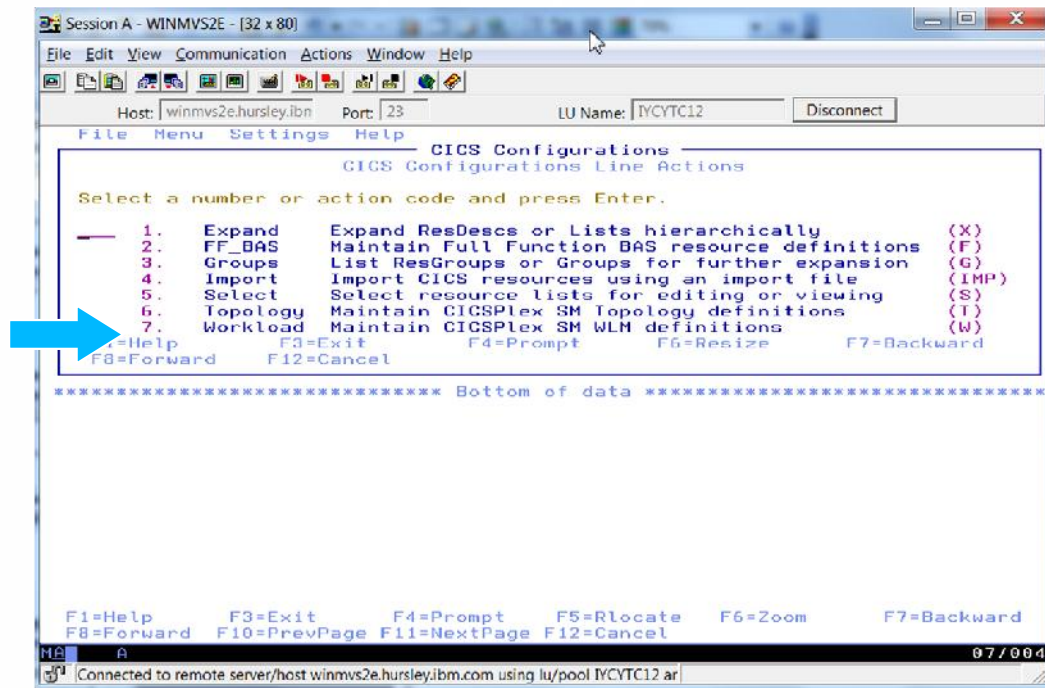


Step 2

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

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



Step 3

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

V5R1 CICS Performance Analyzer Transaction Profiling

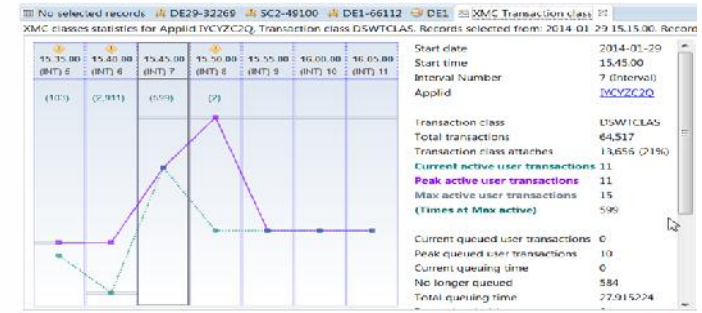
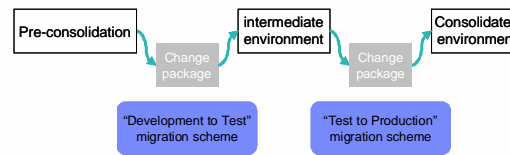
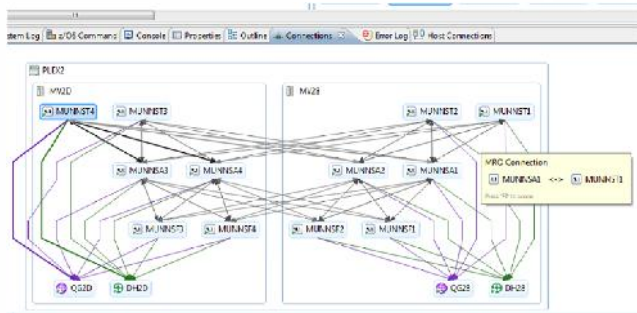
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Tran		#Tasks	Avg Response	Avg Dispatch	Avg User	Avg CPU	Avg Suspend	Avg Dispatch	Avg FC Wait	Avg FCAN	Avg IR Wait	Avg SC24UHM	Avg SC31UHM
			Time	Time	Time	Time	Time	Time	Time	Count	Time	Count	Count
DE1	Report	1308	.1097	.0532	.0032	.0564	.0009	.0000	.0000	0	.0550	2572	159457
DE1	Baseline	3628	.0888	.0433	.0023	.0455	.0008	.0000	.0000	0	.0442	2205	155273
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	Change%	-63.95	+23.52	+23.04	+37.80	+24.00	+10.27	.00	.00	.00	+24.40	+16.64	+2.69
SC1	Report	12	.0175	.0082	.0017	.0093	.0005	.0000	.0000	0	.0086	5098	142952
SC1	Baseline	44	.0893	.0425	.0038	.0467	.0015	.0000	.0000	0	.0444	2588	233438
	Delta	-32	-.0717	-.0343	-.0020	-.0374	-.0009	.0000	.0000	0	-.0358	+2419	-90486
	Change%	-72.73	-80.33	-80.69	-53.63	-80.03	-64.50	.00	.00	.00	-80.65	+93.48	-38.76
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NACT	Report	6	.0556	.0275	.0043	.0280	.0003	.0000	.0000	0	.0275	2432	301853
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	Delta	0	+.0726	+.0349	-.0129	+.0376	+.0002	.0000	.0000	0	+.0364	-24	0
	Change%	.00	+48.99	+47.11	-66.94	+50.90	+102.00	.00	.00	.00	+49.39	-.95	.00

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

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



Step 1

Analysis and planning

Step 2

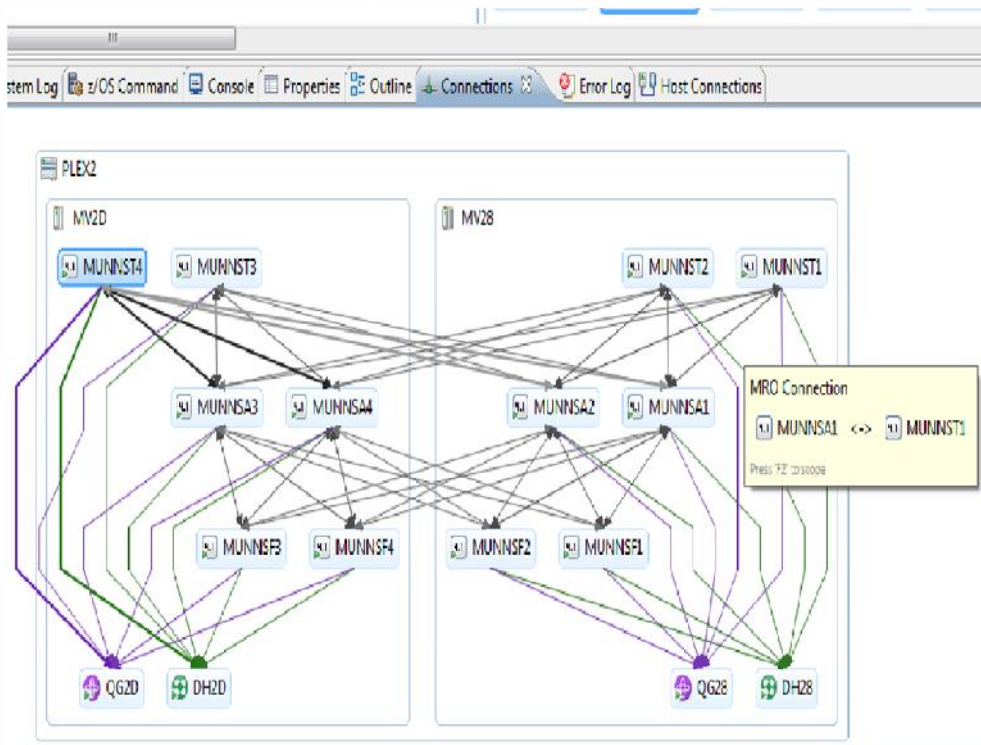
Implementation & tuning

Step 3

Validate Scalability and Performance

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

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

Benefits

- Eliminate manual and error prone processes
- Full audit trail and backout capability
- Integrate with source code change management processes

Change package created for resources in Development repository

Install definitions in CICS regions on test environment

Change package migrated to test environment

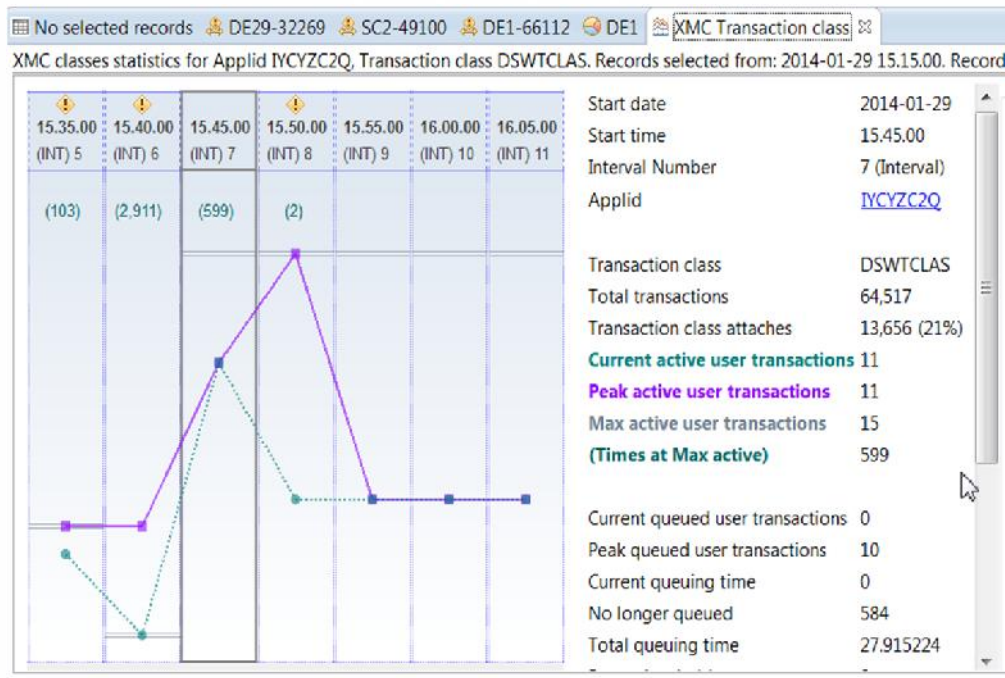
Packages	Description	Last Action	Changeltime
CP1		CREATE	2012/05/21 06:49:
DEMO	Demo PIG	CREATE	2012/07/19 08:28:
Open	ppment to Test	READY	2012/09/27 05:44:
Ready	of change packaging via explorer	READY	2012/09/19 08:28:
Unready	or Humana	UNREADY	2012/09/25 13:26:
Migrate	ackage for Eric	MGRATE	2012/09/26 13:51:
Backout	ion of GENAPP resource	MGRATE	2012/04/29 10:22:
SFCPKG1	PACKAGE for SFC app	MGRATE	2012/05/02 17:52:
SSACHPKG	Change package for WMQ definitions	MGRATE	2012/07/11 03:44:
00000001	Migrate resources from CICS TS 3.2 to 4.1	MGRATE	2012/04/18 05:31:
00000002	Migrate from ACR6 to ACR7	MGRATE	2012/02/13 08:24:
00000003	Migrate from CSD to CPM BAS	BACKOUT	2012/05/30 03:55:

Step 3

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

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

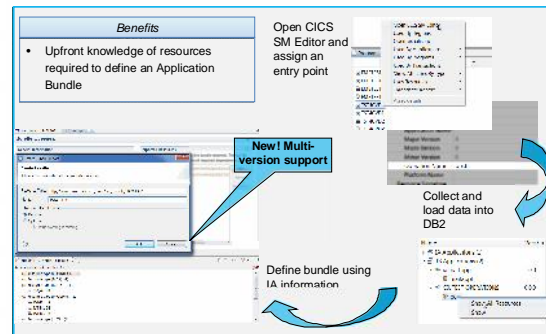


Support CICS cloud initiatives to simplify system management and rapid application deployment.



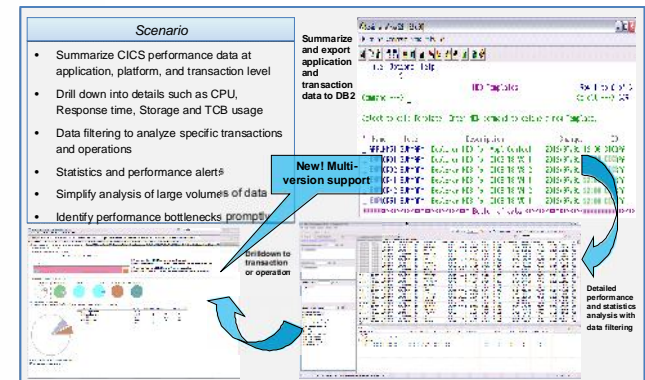
Step 1

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



The screenshot displays the IBM Cloud Explorer interface. On the left, a tree view shows the server structure for 'CPSM' and 'CICSplex: CICSPLX1'. The main area is split into two panes. The top pane, titled 'New Application Definition', contains a form for creating an application definition. The bottom pane, titled 'Bundle Overview', shows details for a bundle named 'zsummit_bundle'.

New Application Definition

Create Application Definition

Enter a value for Application Directory.

CICSplex:* CICSPLX1

Name:* GENNAPP

Description: Using the z/OS Explorer to create the GENAPP V1.0.0

Platform Definition:* ECAT

Version:* 1.0.0

Bundle Overview

General Information

This section describes general information about this bundle.

ID: zsummit_bundle

Version: 1.0.0

Defined Resources

Specify the CICS resources that are installed and managed by this bundle.

Imported Resources

Specify CICS resources on which this bundle depends. The bundle will only become ENABLED when all required dependencies are met.

Actions

You can perform the following actions on this bundle:

1. Add or remove CICS resource definitions using this editor
2. Create an entry point to define an application operation
3. Apply a policy to an application operation
4. Export the bundle to a platform or specific location in z/ES

Imported Resources List:

- CICS Atom Configuration file
- CICS Event Binding
- CICS Event Processing Adapter
- CICS Event Processing Adapter Set
- File Definition
- OSGi Bundle Project Reference
- JVM Server Definition
- LIBRARY Definition
- Pipeline Definition
- Policy Definition
- Program Definition
- TCP/IP Service Definition
- Transaction Definition
- URI Map Definition
- Web Service Definition

CICS IA provides a list of Application Resources



The screenshot displays the CICS IA interface with several panels:

- Top Panel:** Navigation tabs for z/OS, CICS SM, CICS PA, CICS IA (selected), File Manager, APA, MQ Explorer, CICS DA, Fault Analyzer, CICS CM, and CICS Cloud.
- Collection IDs Panel:** Shows a list of collection IDs: `_collid_`, `AFFTDATA`, and `GENAPP_IVP`. A search filter is set to (8).
- Search Results Panel:** Shows a search for `GENAPAOR` with (1) result.
- Programs Panel:** Shows a list of programs: `SSC1`, `SSP1`, `SSP2`, `SSP3`, and `SSP4`. A search filter is set to (5).
- Show Resources Panel:** Displays a tree view of resources for `GENAPAOR`. The resources are categorized by type:
 - Resource type (CHANNEL) (1): `ICOM`
 - Resource type (CONTAINER) (1): `ICOM-Data`
 - Resource type (MAP) (5): `SSMAPC1`, `SSMAPP1`, `SSMAPP2`, `SSMAPP3`, `SSMAPP4`
 - Resource type (MAPSET) (1): `SSMAP`
 - Resource type (PROGRAM) (9): `LGICDB01`, `LGICUS01`, `LGIPDB01`, `LGIPOL01`, `LGTESTC1`, `LGTESTP1`, `LGTESTP2`, `LGTESTP3`, `LGTESTP4`
 - Resource type (TABLE) (2): `CUSTOMER`, `POLICY`
 - Resource type (TEXT) (1): `SEND TEXT`
 - Resource type (TRANSID) (5): `SSC1`, `SSP1`, `SSP2`, `SSP3`, `SSP4`

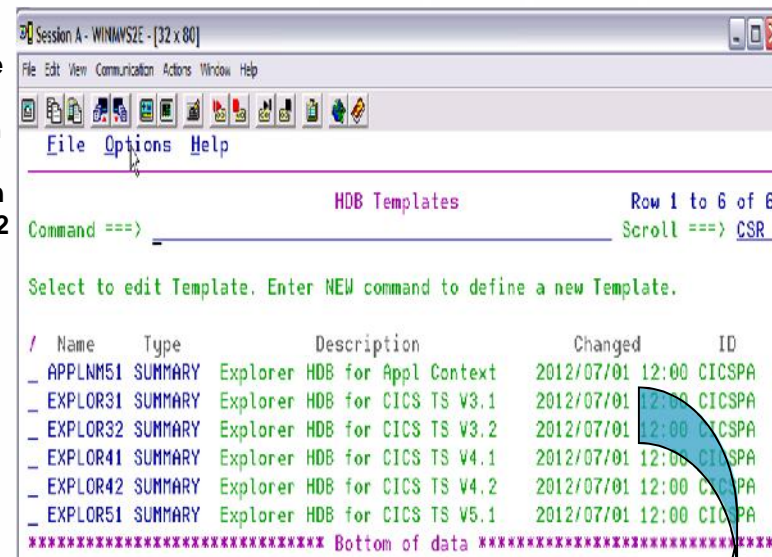
CICS PA gives CICS cloud Performance insight



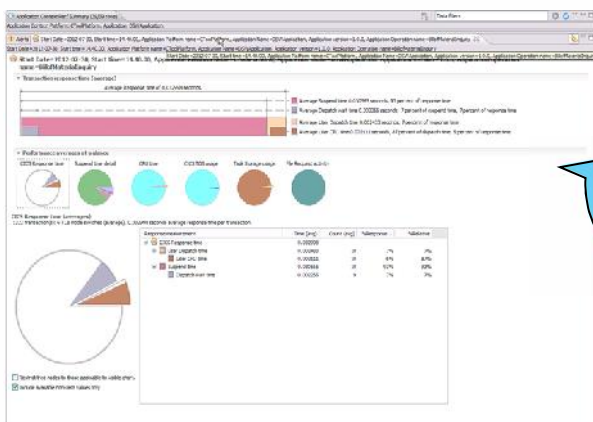
Scenario

- Summarize CICS performance data at application, platform, and transaction level
- Drill down into details such as CPU, Response time, Storage and TCB usage
- Data filtering to analyze specific transactions and operations
- Statistics and performance alerts
- Simplify analysis of large volumes of data
- Identify performance bottlenecks promptly

Summarize and export application and transaction data to DB2



Drilldown to transaction or operation



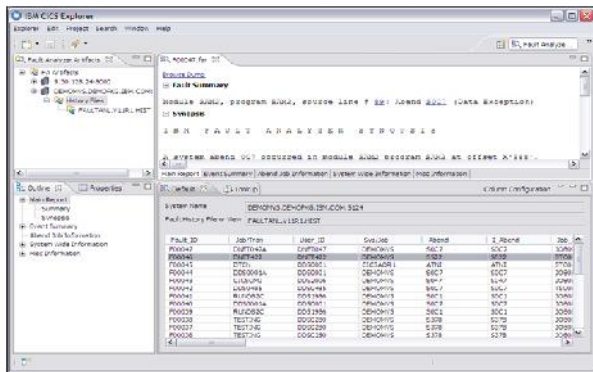
Name	Start Date	End Date	Action	CPUs	Response	Request	Queue	Wait	Wait	Wait
APPLNMS1	2012-07-01	2012-07-01	FCQ2001	100	100	100	100	100	100	100
EXPLOR31	2012-07-01	2012-07-01	FCQ2002	100	100	100	100	100	100	100
EXPLOR32	2012-07-01	2012-07-01	FCQ2003	100	100	100	100	100	100	100
EXPLOR41	2012-07-01	2012-07-01	FCQ2004	100	100	100	100	100	100	100
EXPLOR42	2012-07-01	2012-07-01	FCQ2005	100	100	100	100	100	100	100
EXPLOR51	2012-07-01	2012-07-01	FCQ2006	100	100	100	100	100	100	100

Detailed performance and statistics analysis with data filtering

Three steps to Problem Diagnosis

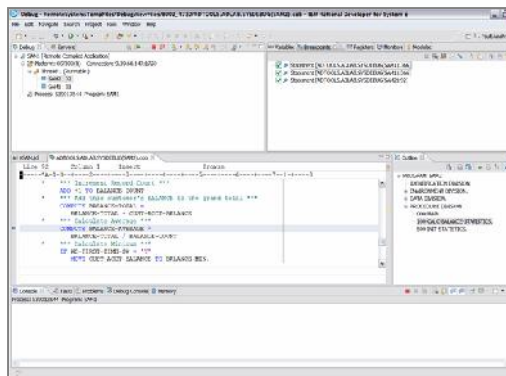


Faster problem identification and resolution



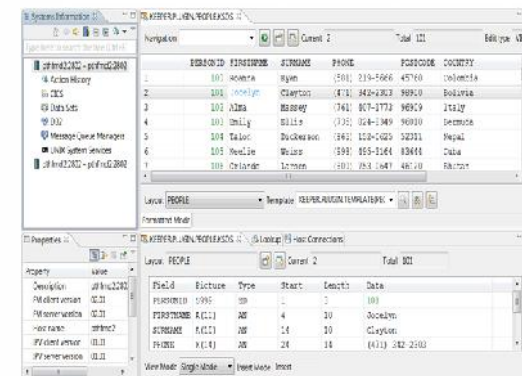
Step 1

Automated fault and performance alerts with diagnostic advice



Step 2

Drill-down into problems with analysis tools



Step 3

Fix problem, for example, make a change in data



“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

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.

```
demomvms.demopkg.ibm.com:2800/FAULTANLV13R1.HIST(J00767)-Report
1=
2=Module SAM2, program SAM2, source line # 89: Abend S0C7 (Data Exception)
3 IBM FAULT ANALYZER SYNOPSIS
4
5
6 A system abend 0C7 occurred in module SAM2 program SAM2 at offset X'39A'.
7
8 A program-interruption code 0007 (Data Exception) is associated with this abend
9 and indicates that:
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:
15
16 Source
17 Line #
18 -----
19 000088 * *** Add this customer's BALANCE to the grand total ***
20 000089 COMPUTE BALANCE-TOTAL =
21 000090 BALANCE-TOTAL + CUST-ACCT-BALANCE
22
23 The COBOL source code for data fields involved in the failure:
24
--
Main Report | Event Details | Abend Information | System-Wide Information | Miscellaneous
```

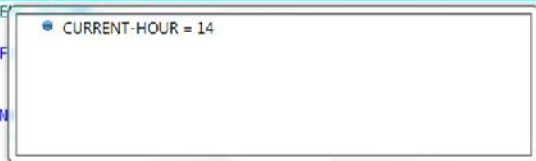
*Helps to identify the cause,
analyze the failure, and fix the
problem*

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 'SAMI STARTED DATE = ' CURRENT-MONTH '/'
254 CURRENT-DAY '/' CURRENT-YEAR ' (mm/dd/yy)'.
255 DISPLAY ' TIME = ' CURRENT-HOUR ':'
256 CURRENT-MINUTE ':' CURRE
257
258 PERFORM 900-OPEN-TRAN-AND-RPT-F
259 PERFORM 800-INIT-REPORT .
260
261 PERFORM 100-PROCESS-TRANSACTION
262 UNTIL WS-TRAN-FILE-EOF
263
264 PERFORM 905-CLOSE-TRAN-AND-RPT-FILES.
265
266 GOBACK .
```



Source code debugging to improve development productivity

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.

DNET187.ADLAB.CUST1

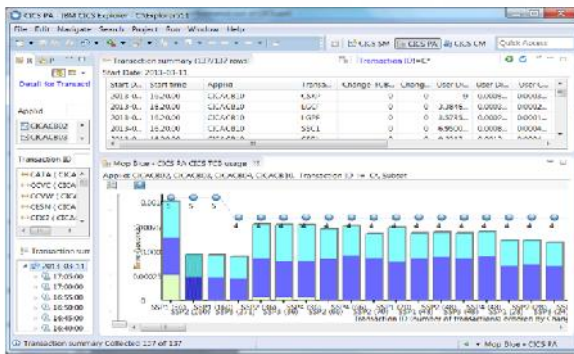
Navigation Column# 1 Cursor Current

	CUST-ID	NAME	ACCT-BALANCE	ORDERS-YTD	ADDR	CITY	STATE
1	01001	Lynn, Amanxx	67.68	9	119 North Lake Road	Spirit Lake	ID
2	02200	Graham, Anna	610.05	10	89 Clay Springs Rd	Atwon	NV
3	02202	Major, Art	1234.56	5	1512 Pine Bluff	Harmon	MN
4	03003	Prentice, Anna	0.00	7	33 Renshaw	Laramie	WY
5	03390	Deeds, Darren	74.00	3	649 Brown Street	Sandstone	IN
6	05570	Parker, Ford	233.27	12	3039 Manning St.	Dearborn	MI
7	06101	Early, Brighton	311.08	10	9662 Summit Road	Buxford	NE
8	06106	Lander, Annette	489.84	7	6127 Cedar Street	Taledega	AL
9	06711	Dubree, Dustin	192.98	11	9229 Delegate's Row	Indianapolis	IN
10	06900	Bacon, Chris P.	1001.01	0	1134 Rosetta	Lisle	IL
11	07008	Houston, Roger	296.97	10	4411 Northside Pkway	Banner Elk	NC
12	07044	Schauer, April	88.83	7	7331 Gulf Shore Dr.	Naples	FL
13	07077	Mann, Mr. E.	621.05	1	24 Valentine Rd	Danville	TN
14	07707	Clime, Hilda	232.20	9	5545 Crystal Springs	Dowagiac	MI
15	07870	Furst, April	122.15	1	955 Dundas	London	ON

Data management tool supporting key file structures like VSAM, DB2, CICS, and IMS

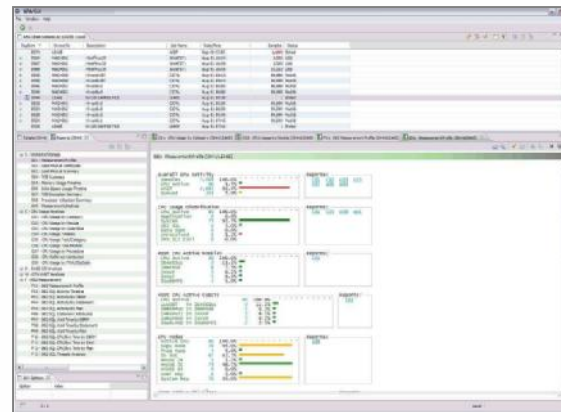
- **Fault Analyzer** - Faster problem determination and resolution. Understand what happened, program, where it happened, context within the source code, the variables involved and the value of the variables at the time the exception occurred. Point and shoot navigation and explanation of error messages 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.

Looking for Trouble?



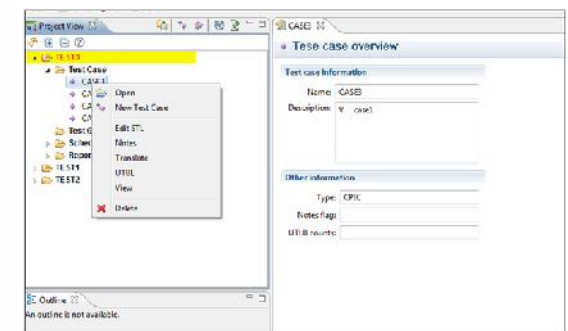
Step 1

Identify CICS transaction needing response time improvement



Step 2

Understand transaction's resource consumption at much deeper level



Step 3

Test changes and measure results to ensure success

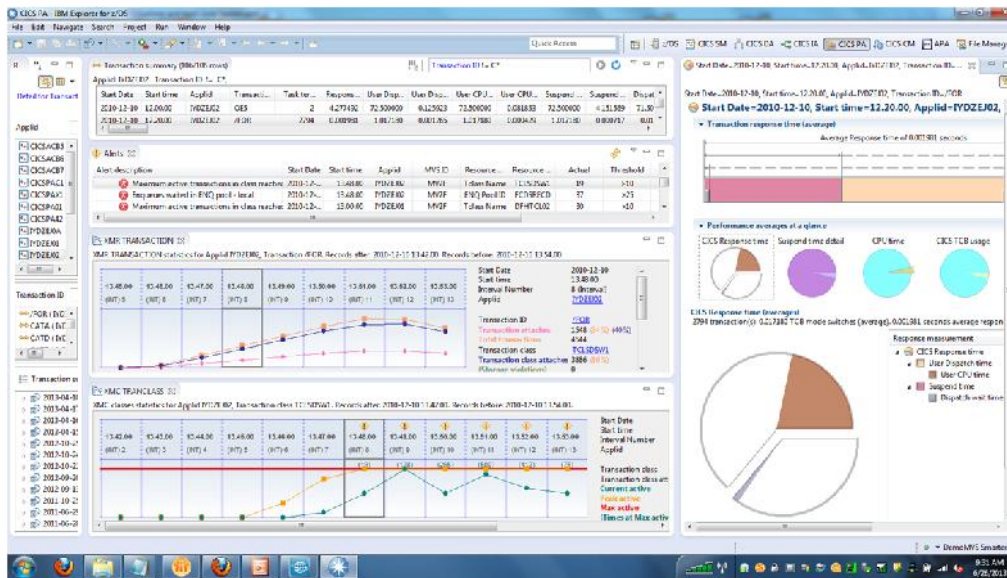
U.S. credit card services company used APA to improve performance by 3x"

Step 1

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

CICS PA provides...

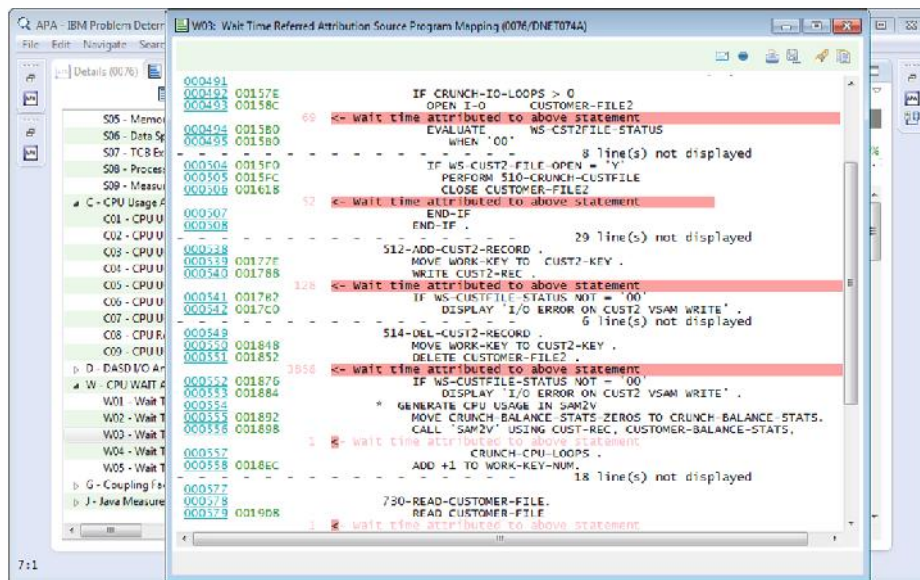
- Comprehensive Performance Reporting
- Transaction tracking and action profiling reports
- Trending and capacity planning with historical database
- Faster problem resolution
- Evaluation and tuning of CICS system efficiency to improve system performance



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.

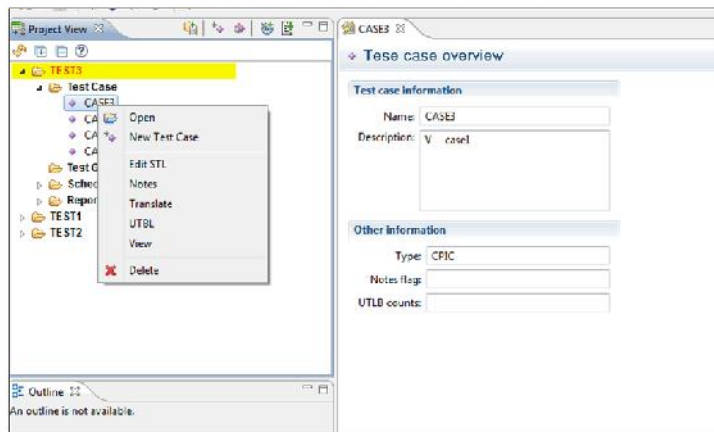


Monitor and optimize performance at the application level

Step 3

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

- **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.

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 sub-systems 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



CICS TS Value Unit Edition — For new Java workload and service enablement

Responding to customer demand for an alternative pricing structure

CICS One-time-charge

Alternative pricing model for new applications using a one-time-charge price metric*

zNALC pricing

*Reduced price for the z/OS operating system on LPARs that run a qualified application**

TS V5.1 avoiding SVC

CICS TS VUE is a separately licensed program and does not initiate Single Version Charging

CICS TS V5 VUE (OTC)

New Java workloads*

Java based CICS Service Enablement*

zNALC LPAR (discounted z/OS)

CICS TS V5, V4 or V3 (MLC)

Existing CICS COBOL, PL1, C/C++, ASM applications running core business logic

Regular LPAR (full-price z/OS)

DPL

* zNALC approval is required for each application

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