CICS V5:
Scalability and availability for a mobile world

Speaker Name and Title

Agenda

- Scalability for a mobile world
- Performance for a mobile world
- Policies
- Scalability Tooling
- Connectivity
- Summary

Driving operational efficiencies - Greater capacity

VERTICAL SCALING

- **Vertical Scaling**
  - Relieve region storage constraints
  - Further virtual storage constraint relief
  - Maximum task limit has been doubled
  - Further threadsafe support to reduce TCB switching and increase workload capacity

*Run more, **more easily***

- **Horizontal Scaling**
  - Instrumentation enhancements – understand how the platform is scaling
  - Standardization and simplification

'right-size' and simplify CICS topologies

HORIZONTAL SCALING

DSW Workload – CPSM Dynamic routing

- **8 CPs - 34 CICS regions**
- **COBOL/VSAM**
- **All transactions routed from 4 TORs to 30 AORs via CPSM**
- **50% of transactions issue FC requests**
- **All TS requests are TS Shared**
- **All FC requests are VSAM RLS**
  - Average of 6 requests per transaction (all transactions)
  - 69% Read, 10% Read for Update, 9% Update,11% Add , 1% Delete

CICS DSW 4 TORs 30 AORs – RLS - 8 CPs

ETR	CICS %	Ms/Tran	LPAR%
2071.61	141.20	0.681	21.05
2842.02	189.11	0.665	27.85
4128.25	270.70	0.655	39.41
5047.36	326.08	0.646	47.24
6493.98	417.16	0.642	60.21

CICS TS 4.2

ETR	CICS %	MS/Tran	LPAR%
2074.87	139.91	0.674	20.87
2846.00	188.55	0.662	27.78
4133.39	269.54	0.652	39.32
5053.15	326.22	0.645	47.33
6501.18	416.92	0.641	60.25

CICS TS 5.1

4.2 Ave CPU/Tran = 0.657ms 5.1 Ave CPU/Tran = 0.654ms

DSW Workload – Static routing

- **16 CPs - 5 CICS regions**
- **COBOL/VSAM**
- **All transactions routed from 2 TORs to 2 AORs**
- **All File requests are Function Shipped to 1 FOR**
- **50% of transactions issue FC requests**
- **All FC requests are VSAM LSR**
  - Average of 6 requests per transaction (all transactions)
  - 69% Read, 10% Read for Update, 9% Update,11% Add , 1% Delete

CICS DSW 2 TORs 2 AORs 1FOR 16 CPs

ETR	CICS %	Ms/Tran	LPAR%
2498.52	75.86	0.304	6.78
2928.69	88.35	0.302	7.79
3543.47	104.08	0.294	9.09
4428.34	129.16	0.292	11.13
5944.91	168.58	0.284	14.34

CICS TS 4.2

ETR	CICS %	MS/Tran	LPAR%
2496.35	77.55	0.311	6.89
2939.62	87.18	0.297	7.65
3532.10	102.29	0.290	8.86
4425.48	126.17	0.285	10.80
5948.50	166.52	0.280	14.07

CICS TS 5.1

4.2 Ave CPU/Tran = 0.295ms 5.1 Ave CPU/Tran = 0.292ms

RTW Workload – Single region

- COBOL/DB2
- 7 transaction types
- 20 Database tables
- Average 200 DB2 calls per transaction
- 54% Select, 1% inset, 1% update, 1%delete,
- 8% open cursor, 27% fetch cursor 8 close cursor

CICS RTW single region

ETR	CICS %	MS/Tran	LPAR%
249.69	53.59	2.146	21.33
361.55	77.65	2.147	30.93
474.66	101.46	2.137	39.85
592.37	125.40	2.116	48.89
730.20	153.82	2.106	59.51

CTS 4.2

ETR	CICS %	MS/Tran	LPAR%
249.98	54.19	2.167	21.63
361.88	78.35	2.165	31.26
474.86	101.42	2.135	39.74
592.74	126.14	2.128	49.20
729.98	155.06	2.124	59.98

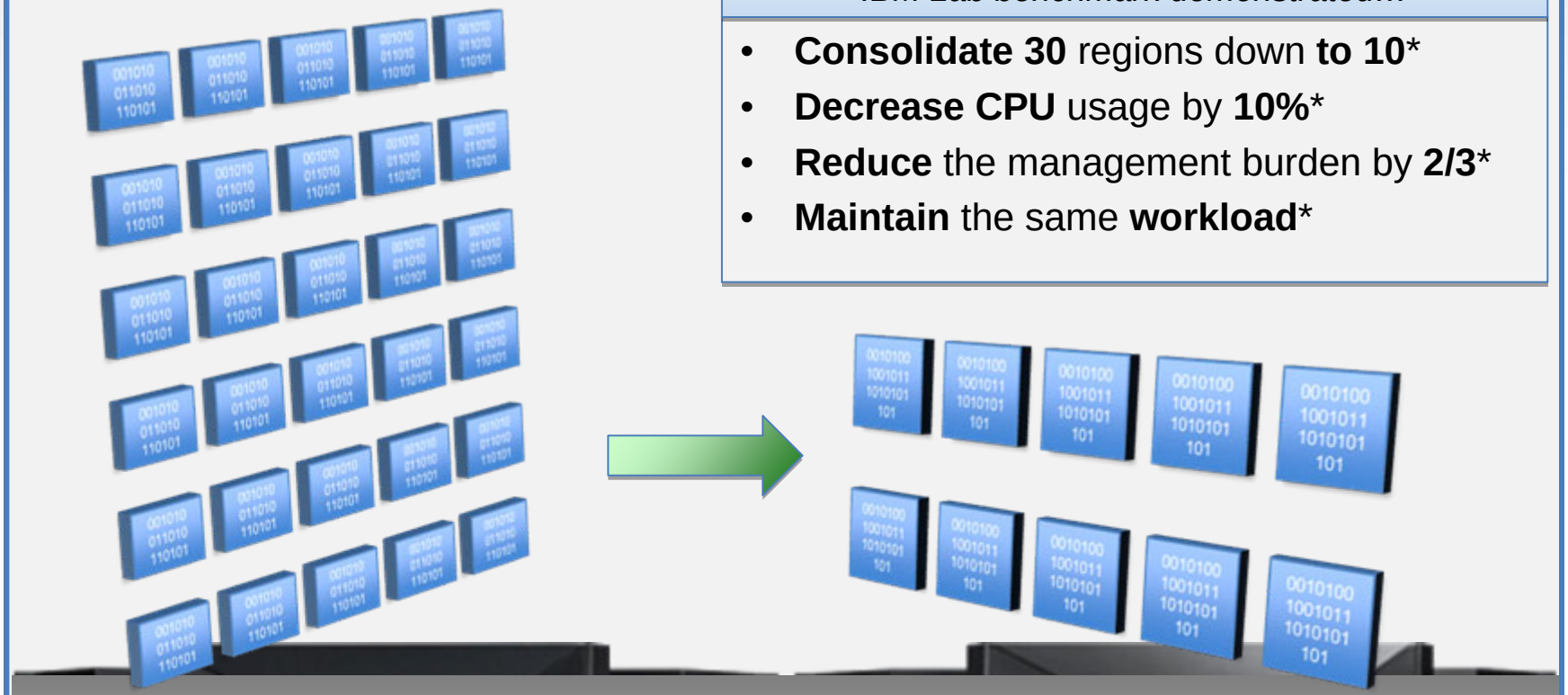
CTS 5.1

4.2 Ave CPU/Tran = 2.130ms 5.1 Ave CPU/Tran = 2.143ms

Greater Capacity – Achieve cost savings through consolidation

IBM Lab benchmark demonstrated…

- **Consolidate 30** regions down **to 10***
- **Decrease CPU** usage by **10%***
- **Reduce** the management burden by **2/3***
- **Maintain** the same **workload***



*Test conducted under lab conditions – For further information contact IBM

CICS Consolidation DSW/RLS workload

ETR	CICS %	LPAR%	MS/Tran	Real frames
4983.60	253.74	19.95	0.640	736961
6385.12	325.48	25.35	0.635	737319
10135.28	510.46	39.24	0.619	738387
13969.74	704.09	53.80	0.616	739682
15898.14	821.69	62.53	0.629	740917

30 AORs

ETR	CICS %	LPAR%	MS/Tran	Real frames
4969.95	232.11	18.09	0.582	342299
6390.11	293.22	22.69	0.568	342460
10137.49	456.27	34.93	0.551	342893
13969.68	620.51	47.22	0.540	343470
15867.72	725.80	55.26	0.557	343775

10 AORs

HIS data collected for the last measurement interval

DSW Hardware Instrumentation data extracts for last interval

	30 AORs	10 AORs	Delta
Execution Samples	2487298	2201099	-11%
Instruction First Cycle (IFC)	379000	371470	-2%
Micro Seconds per transaction	628.34	556.43	-11%
Cycles per instruction	6.53	5.90	-10%
MIPS per CP	797	882	+10%
Data cache misses (samples)	744894	608550	-18%
Instruction cache miss includes TLB miss	90483	66626	-26%
% Cycles used by TLB misses	6.82	5.94	-13%
Relative Nest Intensity (RNI)	0.48	0.34	

CICS Consolidation Webservices (GENAPP)

ETR	CICS %	LPAR%	MS/Tran	Real frames
828.31	94.85	37.47	1.145	862739
992.14	114.24	44.94	1.151	873593
1237.67	139.43	54.45	1.126	880690
1633.98	185.24	71.92	1.133	897041
1883.25	233.38	89.69	1.239	959291

30 AORs

ETR	CICS %	LPAR%	MS/Tran	Real frames
827.72	86.42	34.26	1.044	381422
986.51	104.35	41.20	1.057	389384
1231.89	129.67	50.90	1.052	394495
1629.05	166.94	65.07	1.024	399247
1916.36	209.88	81.54	1.095	464827

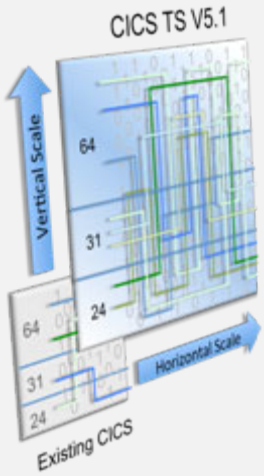
10 AORs

Web Services Hardware Instrumentation data extracts for last interval

	30 AORs	10 AORS	Delta
Execution Samples	3517830	3188565	-9%
Instruction First Cycle (IFC)	589236	590667	+2%
Micro Seconds per transaction	1240	1095	-11%
Cycles per instruction	5.97	5.39	-10%
MIPS per CP	898	1003	+11.6%
Data cache misses (samples)	1145876	932896	
Instruction cache miss includes TLB miss	149468	115015	
% Cycles used by TLB misses	9.95	9.23	
Relative Nest Intensity (RNI)	0.75	0.51	

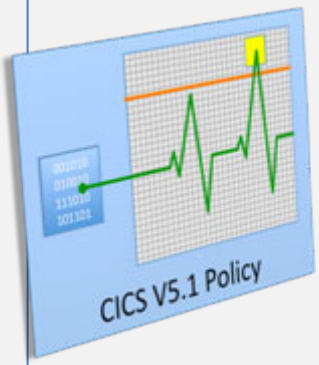
CICS TS 5.1 - Driving Operational Efficiency

Greater Capacity



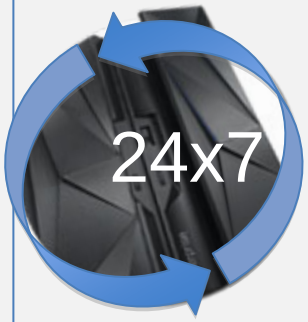
- Doubling the MAXTASK limit to 2,000
- Increased 64-bit and reduced 24-bit storage usage
- Greater parallelism from threadsafe API and SPI
- Greater system parallelism through optimized TCB usage
- Performance improvements from 64-bit Java 7
- Greater access to 64-bit storage from Assembler programs

Managed Operations



- Automated control over critical system resources
- Set data access thresholds on SQL or file access
- Set program loop thresholds on EXEC LINK
- Set storage request thresholds
- Set CPU time thresholds
- Policies can issue messages, abending tasks, or create events

Increased Availability



- Upgrade CICS versions and releases without requiring a z/OS restart
- Modern batch feature pack
- Refresh Secure Sockets Layer (SSL) certificates
- Keep IPIC connections up and running
- Support more IBM GDPS/AA solutions
- Dynamically specify cross-system coupling facility groups
- Better reflect current best practices with updated and simplified defaults

Deeper Insight

- Auditing of SPI commands that alter the system
- Improved auditing of user IDs that make requests over IP
- Extended identity propagation to include started tasks
- Cipher suites used for SSL connections to be stored in the performance records
- Calculate the actual and potential use of specialty processors
- Regular status updates provided while lost locks recovery is taking place

Managed Operations - *Reduce cost and risk through automation*

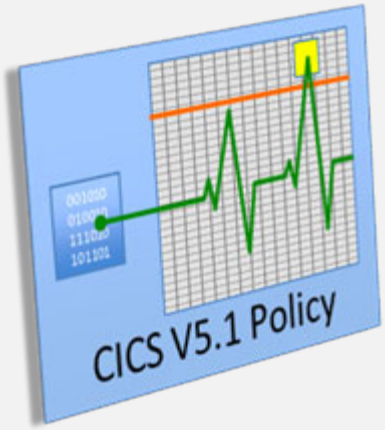
Protect critical systems

- "***Abend* any *task*** running on the Retail Banking region that tries to request any 24-bit storage"
- "***Display message*** if a *task* allocates more than 1MB of storage in this region"
- "**Trigger an *event*** if a shopping-cart browse *task* generates more than 500 SQL requests"

Define a Policy

Manage

- DB2 SQL
- Files
- Storage
- CPU



Threshold breach

Trigger an action

CICS Triggers an action

Abend *Message* *Event*

An XML Policy document defines the threshold and action

The power of Policy applied to Applications and Platforms

Application

Faster & easier deployment of CICS applications & resources

- "*Abend* any *application* running on the Retail Banking region that tries to request any 24-bit storage"

Platform

Faster & easier management of CICS application environment

- "I want to see a *message* if an *application* allocates more than 1MB of storage on this *platform*"

Policy

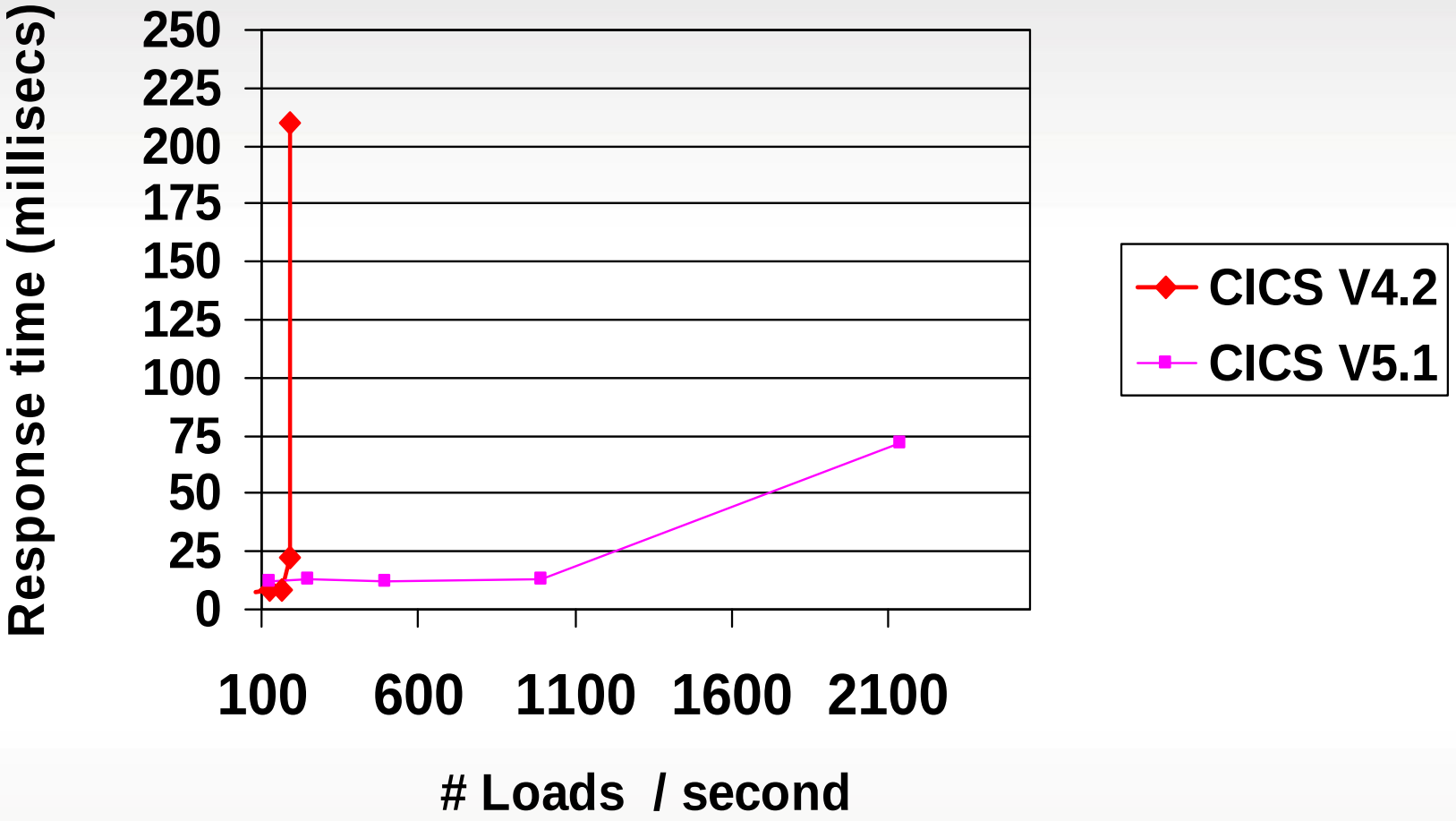
Respond faster to unwanted behaviour

- Dynamically update policies at runtime to manage changing workload characteristics

PROGRAM LOAD

- When running on an open TCB and a CICS program load is requested there is no longer a TCB switch to the RO TCB
  - EXEC CICS LINK, LOAD, XCTL, …
- CICS RO TCB will still be used for …
  - CICS program LOADs when NOT running on an Open TCB
  - DFHRPL and LIBRARY Dataset Management
- Updated Loader global statistics
  - New statistics on RO TCB program load requests
  - load time recorded by module
- Benefits …
  - Reduced contention for the single CICS RO TCB
  - Reduced pathlength – RO TCB switch eliminated
  - Significantly increased potential CICS program LOAD capacity

Physical Program Loads V4.2 vs V5.1



CICS Performance Analyzer for z/OS

What is CICS PA?

- A Comprehensive Performance Reporting and Analysis tool for CICS
- Provides ongoing system management and measurement reports on all aspects of CICS application performance

How does it work?

- Uses SMF data as input
- Easy to use interface for report generation (over 240 supplied report forms)
- Performance and Statistical analysis
- Graphical performance analysis via the explorer

What's its value?

- Analyze CICS Application performance
- Improve CICS resource usage
- Evaluate the effects of CICS system tuning efforts
- Improve transaction response time
- Provide ongoing system management and measurement reports
- Increase availability of resources
- Increase the productivity of system and application programmers
- Provide awareness of usage trends

Why this tool is important to CICS customers

- Reduce both time/resource required to analyze off-line performance data (usually massive) for tuning and capacity planning purposes.
- Enables deep-dive CICS performance analysis and understanding of usage trends
- Aids capacity planning and tuning
- Helps quickly identify and eliminate trends leading to online performance problems

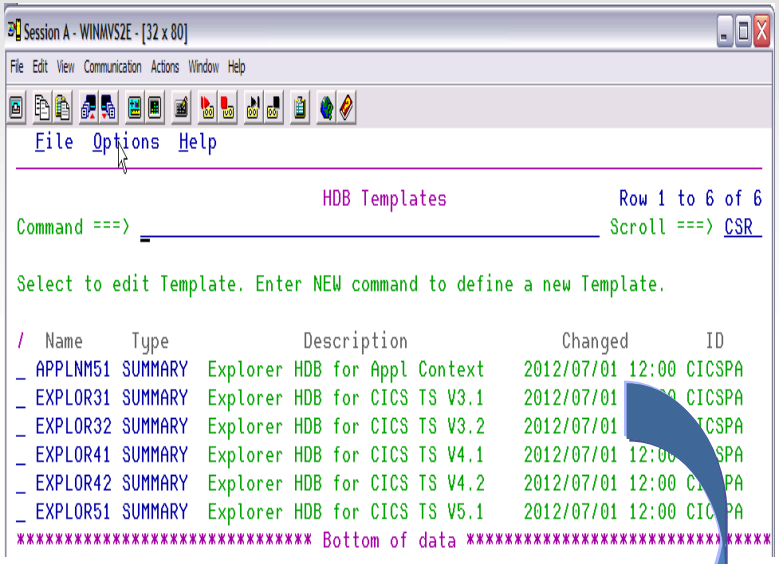
PERFORMANCE

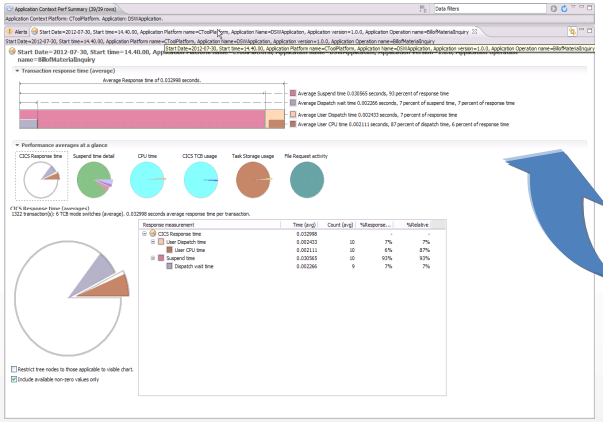
Platform and Application Performance insight

Scenario

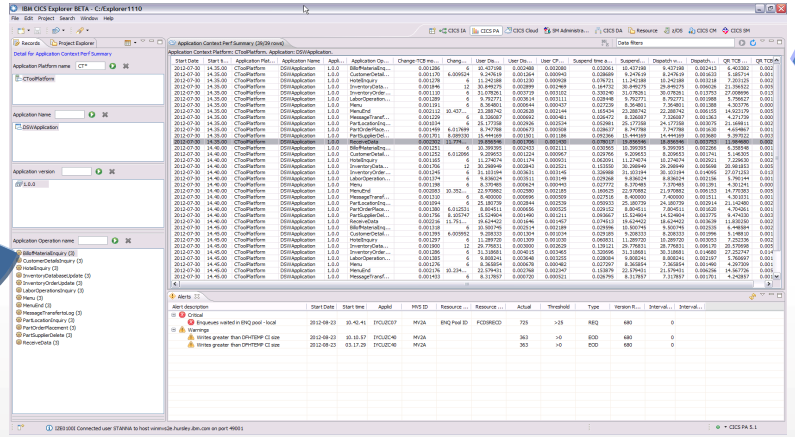
- Summarize CICS performance data at application and transaction level
- Drill down into details such as CPU, Response time, Storage and TCB usage
- Data filtering to analyze specific transactions and operations
- Statistics alerts
- Simplify analysis of large volumes of data
- Identify performance bottlenecks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

Summarize and export application and transaction data to DB2





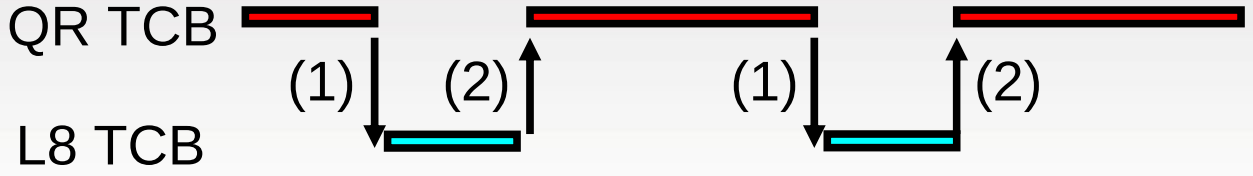
Drilldown to transaction or operation



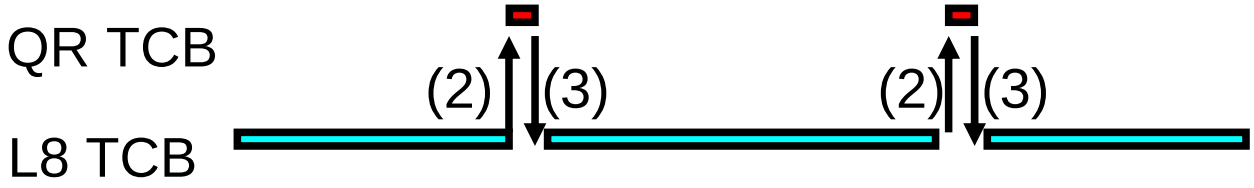
Detailed performance and statistics analysis with data filtering

CICS TS V5.1 Threadsafe enhancements

CICS TS V4.1 Threadsafe CICSAPI



CICS TS V4.2 Threadsafe Required



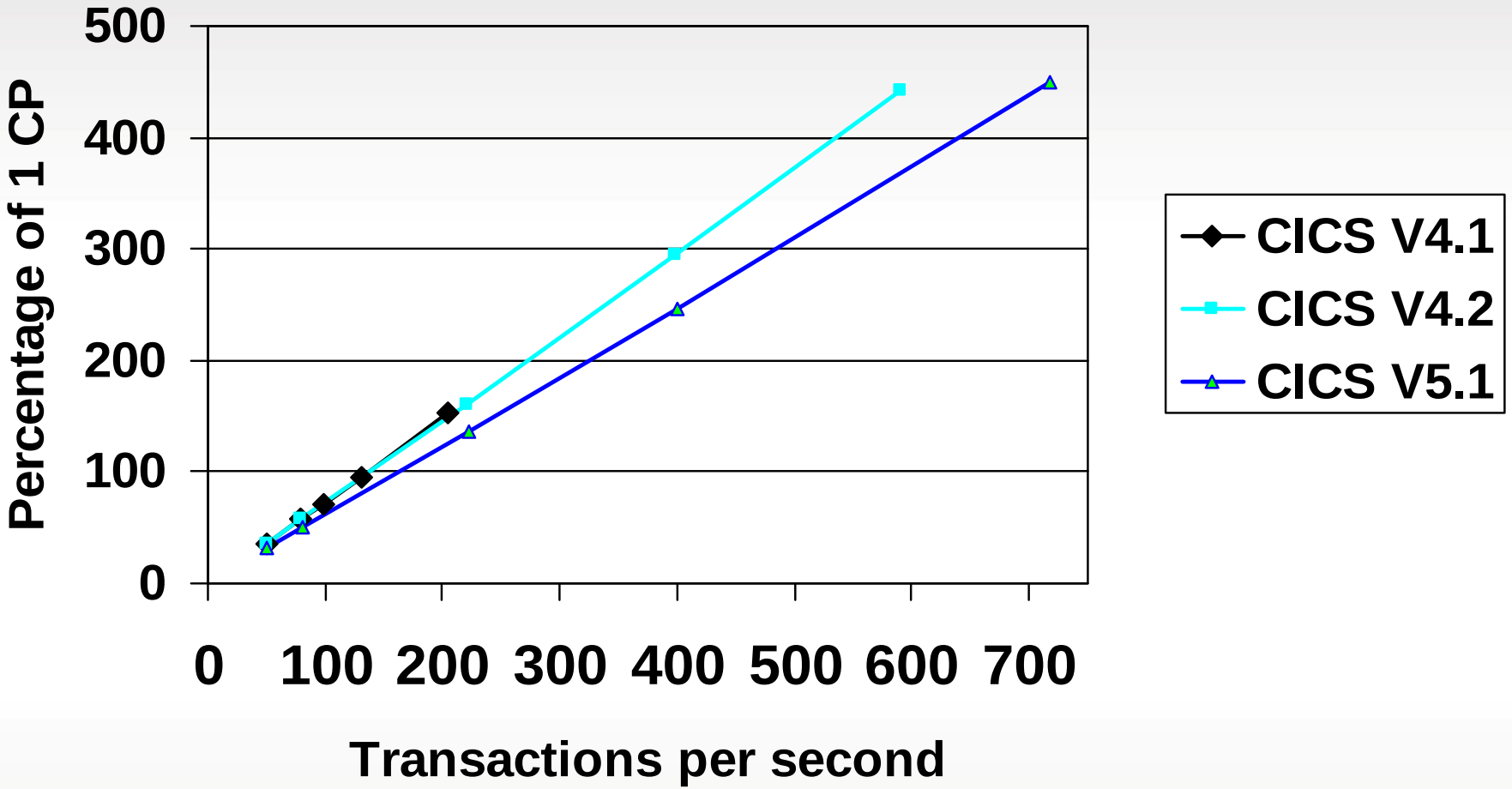
CICS TS V5.1 Threadsafe Required

(1) Changemode due to DB2 call

(2) Changemode due to TD Write

(3) Changemode back to L8 due to Required option

Transient data mixed with DB2

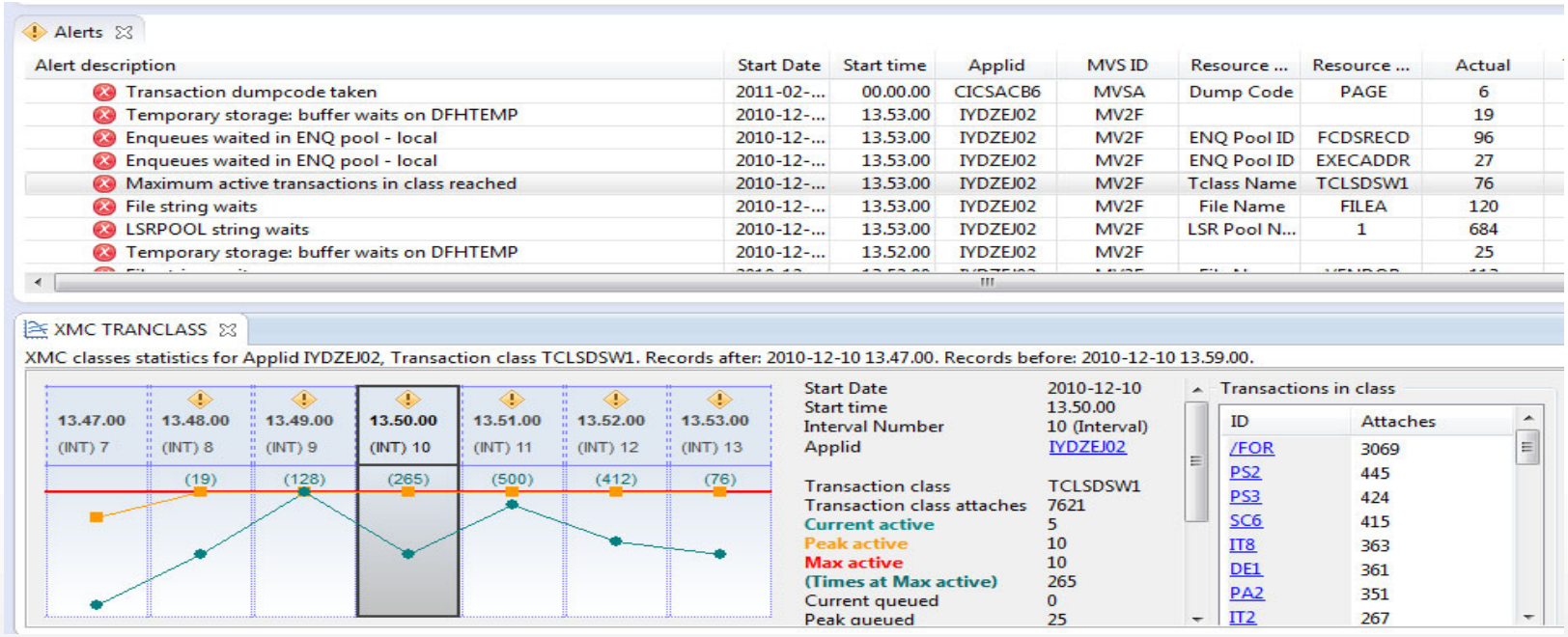


CICS PA - Alerts

Statistics Alert Reporting is a capability enabling the definition of conditions, in terms of CICS TS or CICS TG statistics field values, which will generate alerts.

Alerts can be used to assist users in highlighting potential tuning opportunities or identify trends that may lead to poor CICS performance or even unnecessary CICS system outages

Alerts enable users to more easily identify the specific CICS regions, the time of day and the type of CICS resources that may require further specific in-depth performance analysis thereby allowing preventative tuning action to be taken



CICS Performance Analyzer for z/OS V5.1

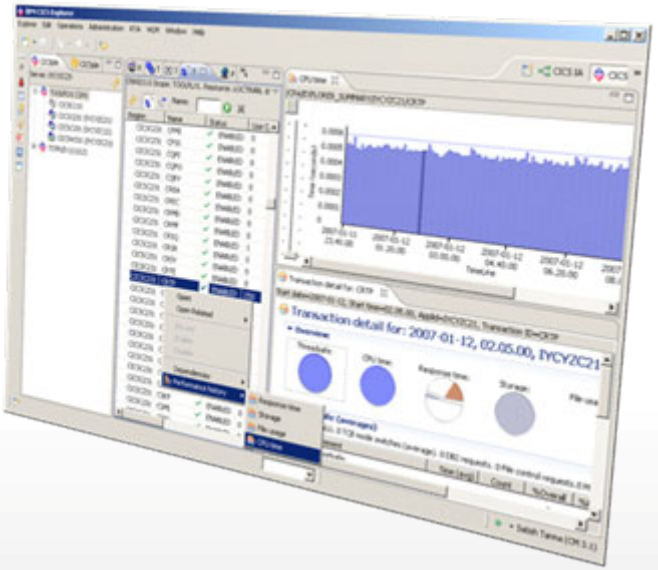
Performance insight

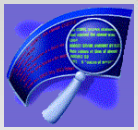
What's new in CICS PA V5.1…

- CICS TS V5.1 – support for new metrics
- Application, Platform, and Policy
- Plug-in enhancements:
  - Application centric view
  - Customizable sheet views
  - Suspend time reporting
  - Easy navigation to key reports and alerts
- SMF logstream support
- Batch statistics reporting for CICS TG
- Improved management of PA data loaded to DB2
- CPU totals on MQ reports
- SMF data processing performance improvements

CICS PA enables you to…

- Comprehensive Performance Reporting and Analysis for CICS including DB2, WebSphere MQ, and MVS System Logger
- Understand trends and develop capacity plans
- View statistics and create statistical alerts





Application Performance Analyzer for z/OS

What is APA?

- An application performance measurement tool designed to appeal to a wide audience.

What's its value?

- Does not require application recompile
- Significantly reduce the time required to identify CICS application resource consumption
- Benchmark comparisons to quickly locate variations in measurements
- Pro-active and Re-active analysis – integration with IBM Omegamon-type products

How does it enhance the CICS environment?

- Allows measurements of multiple CICS Address Spaces
- Measurement can be "triggered" – i.e. Batch starting a CICS Transaction
- Multiple levels of CICS measurements – general, timing statistics, transaction counts, etc.
- Monitor specific transaction(s) or terminal ID's

Why is this tool important?

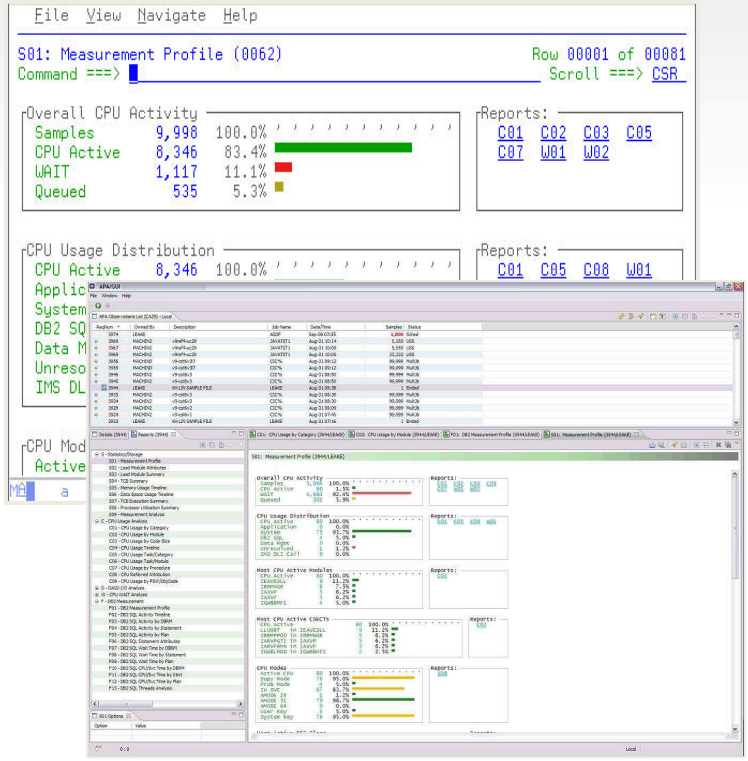
- All inclusive Language support
- All inclusive Environment support
- Set invocation Thresholds
- Detailed reports with drill down from high-level all the way to program source code
- No application impact in any environment – runs as fast / slow as the system allows
- Reduce the amount of time to identify application resource consumption

Problem Determination

Pinpoint enterprise application bottlenecks

IBM Application Performance Analyzer for zOS

- **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)
- Aids application design, development and maintenance cycles
- Measures and reports on how system resources are used by applications running in virtually any z/OS address space including CICS
- Proven 3270-based interface and free graphical user interface



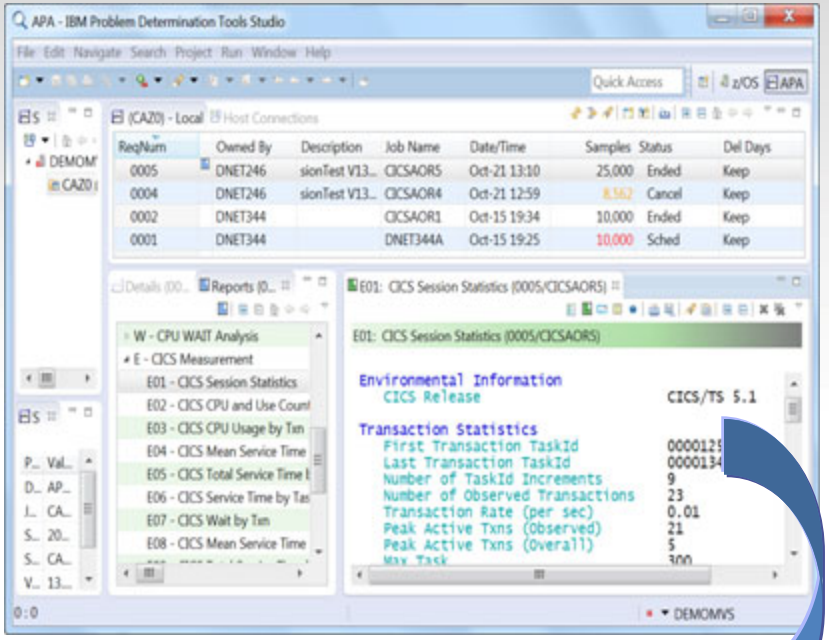
Monitor and optimize performance at the application level

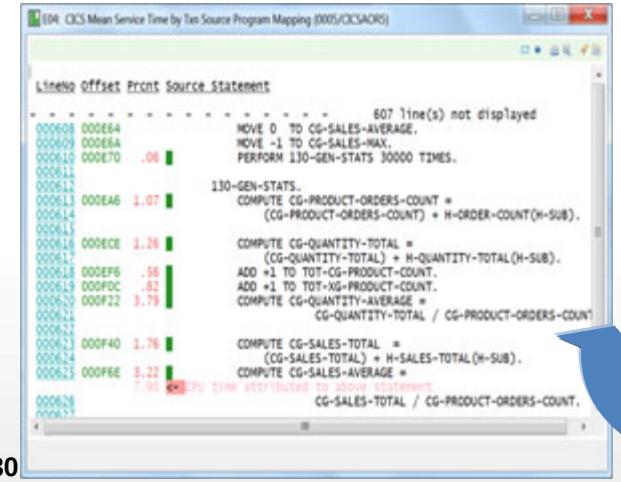
Capture CICS Session Statistics and Transaction Measurement Data

APA for zOS CICS Scenario

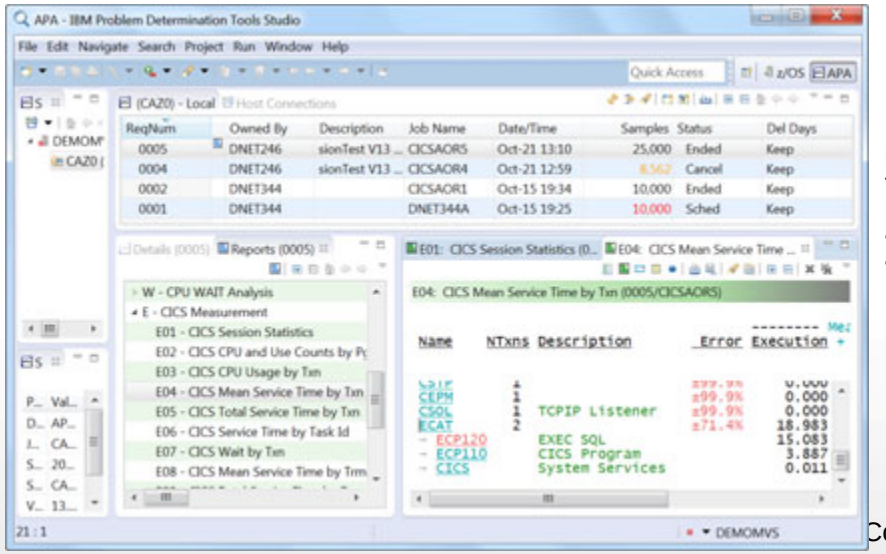
- Session statistics summarizes CICS performance activities occurring in the region
- Gather detail information about transactions running in the CICS region
- Drill down to specific application source statements causing performance impacts
- Monitors specific transactions using wildcard prefixes or terminal ID's
- Pinpoint performance bottlenecks impacting transaction response times

Summarize how much CICS related activity occurred in the region during an Observation Session.





Drilldown to application source statements causing the CICS performance issue



Detailed transactional performance and statistics analysis

Application Performance Analyzer for z/OS V13.1

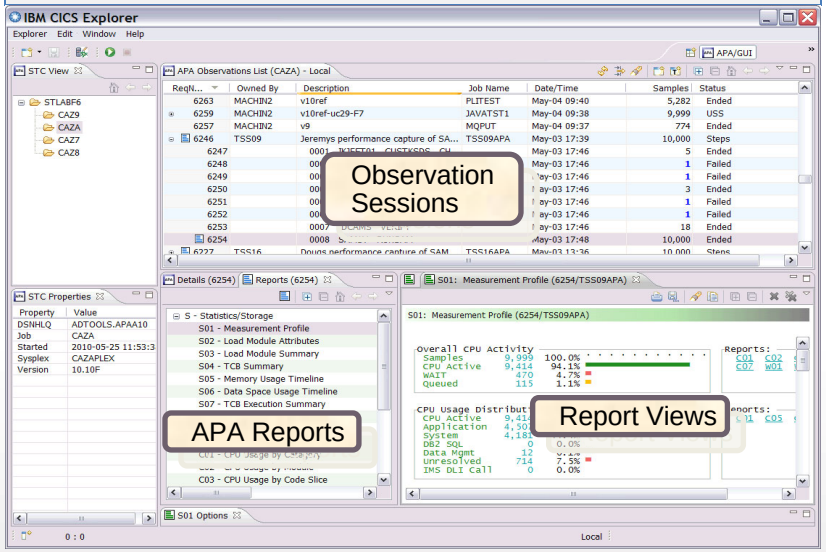
Performance insight

What's new in Application Performance Analyzer V13.1…

- Filtering criteria for CICS information
  - CICS Timing Statistics
  - CICS Detailed Counts
- Identification of Remote file in DASD EXCP summary reports
- Websphere reports identify CICS distributed program link calls initiated from servant regions
- Support of CICS/TS V5.1

Application Performance Analyzer enables you to…

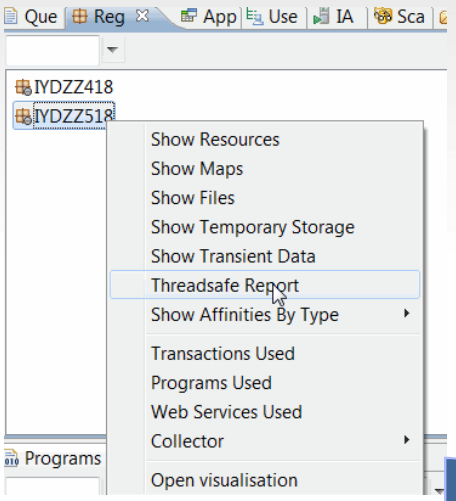
- Monitor CICS Region(s), named Transactions, up to 16 Transaction Groups , or Terminal IDs
- Analyze separate and integrated reports for CICS and other sub-system activity (DB2, IMS, Adabas, MQ, etc)
- Map to Application Source Code
- Integrate into the CICS Explorer via plug-in



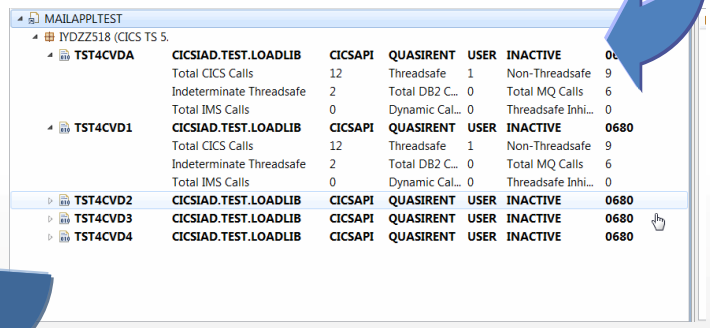
Drive a threadsafe report from the CICS Interdependency Analyzer plug-in

Benefits
• Understand threadsafe issues by program • Run the report against the latest level of CICS

Run threadsafe report by region



View Summary



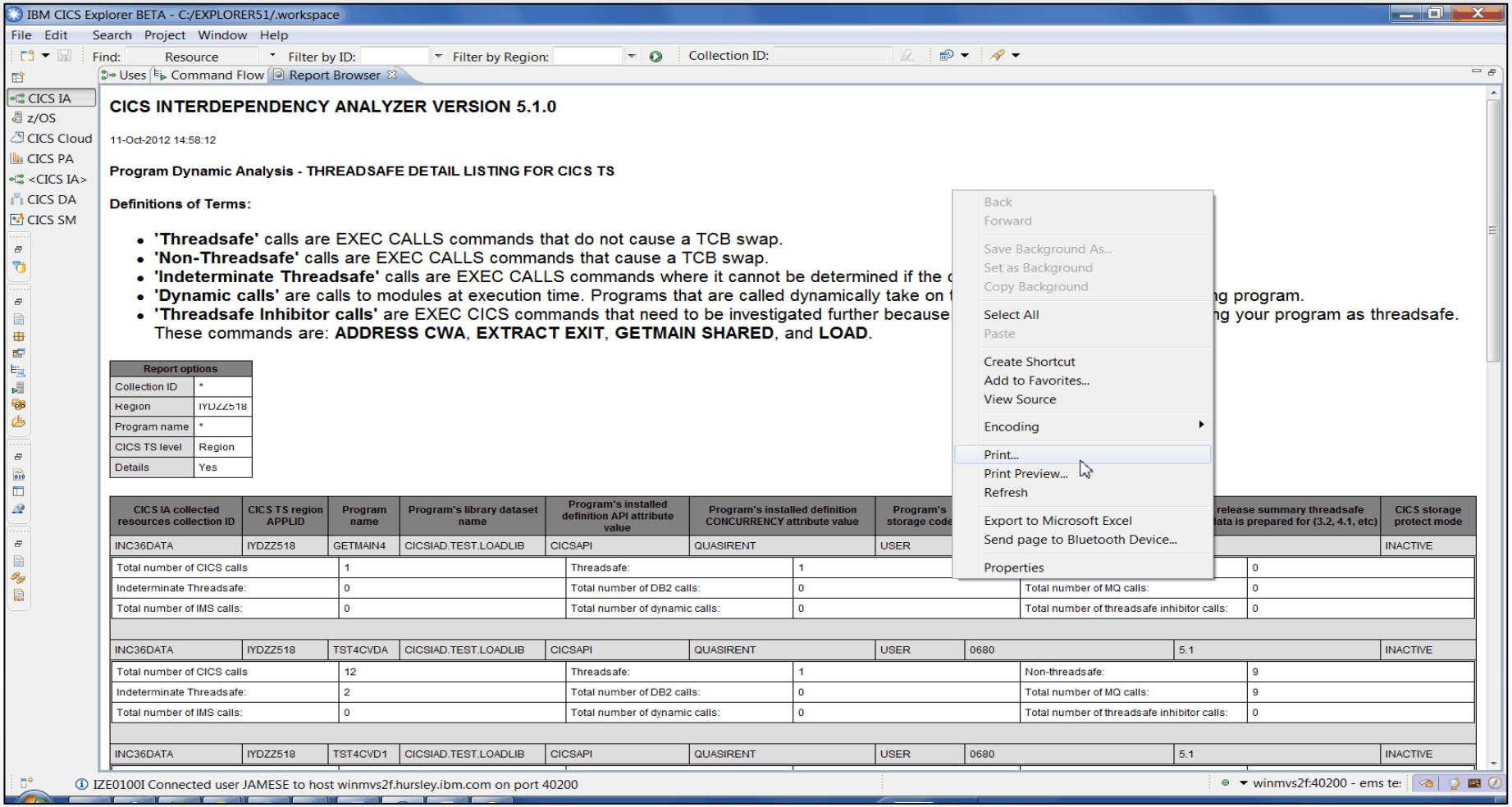
View detail by program

Save as HTML report

Comma...	Function	Type	Object	Offset	Use cou...	Threadsafe	Inhibitor
MQ	CLOSE	QUEUE	CSQ4SAMP.MAILMGRJAM...	000063...	2	Y	
CICS	IGNORE	CONDITION		000049...	2	Y	N
MQ	INQUIRE	QUEUE	CSQ4SAMP.MAILMGRJAM...	000065...	7	Y	
CICS	LINK	PROGRAM	TST4CVD2	00005A...	2	I	N
CICS	LINK	PROGRAM	TST4CVD4	00005B...	1	I	N
MQ	OPEN	QUEUE	CSQ4SAMP.MAILMGRJAM...	000062...	2	Y	
CICS	RECEIVE	MAP	CSQ4VD0	00004E...	2	N	N
CICS	RECEIVE	MAP	CSQ4VD1	00005C...	5	N	N
CICS	RECEIVE	MAPSET	CSQ4VDM	00004E...	2	N	N
CICS	RECEIVE	MAPSET	CSQ4VDM	00005C...	5	N	N
CICS	SEND	MAP	CSQ4VD0	00004E...	2	N	N
CICS	SEND	MAP	CSQ4VD1	00005B...	5	N	N
CICS	SEND	MAPSET	CSQ4VDM	00004E...	2	N	N
CICS	SEND	MAPSET	CSQ4VDM	00005B...	5	N	N
CICS	SEND	TEXT	SEND TEXT	00004D...	2	N	N

CICS IA: Threadsafe report in the plug-in.

Open Report and print



CICS VSAM Transparency for z/OS V2.1

Modernize your CICS and batch VSAM data

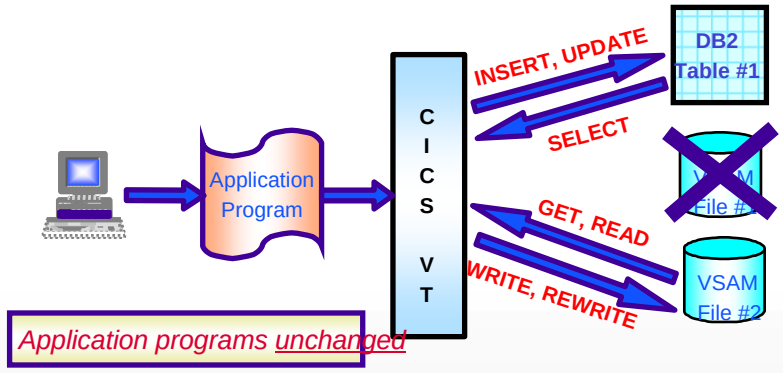
What's new in CICS VT V2.1…

- Auto-generate customized data migration JCL
- Enhanced IDCAMS REPRO support
- New migration tracking report
- Improved diagnostic facilities
- Support for CICS® Transaction Server V5.1 and DB2® 10
- Other functional enhancements
  - Long column name support
  - HLL support for user exits
  - RRS support in batch
  - Read-only DDM
  - Dynamic DST update
- New plug-in for CICS Explorer

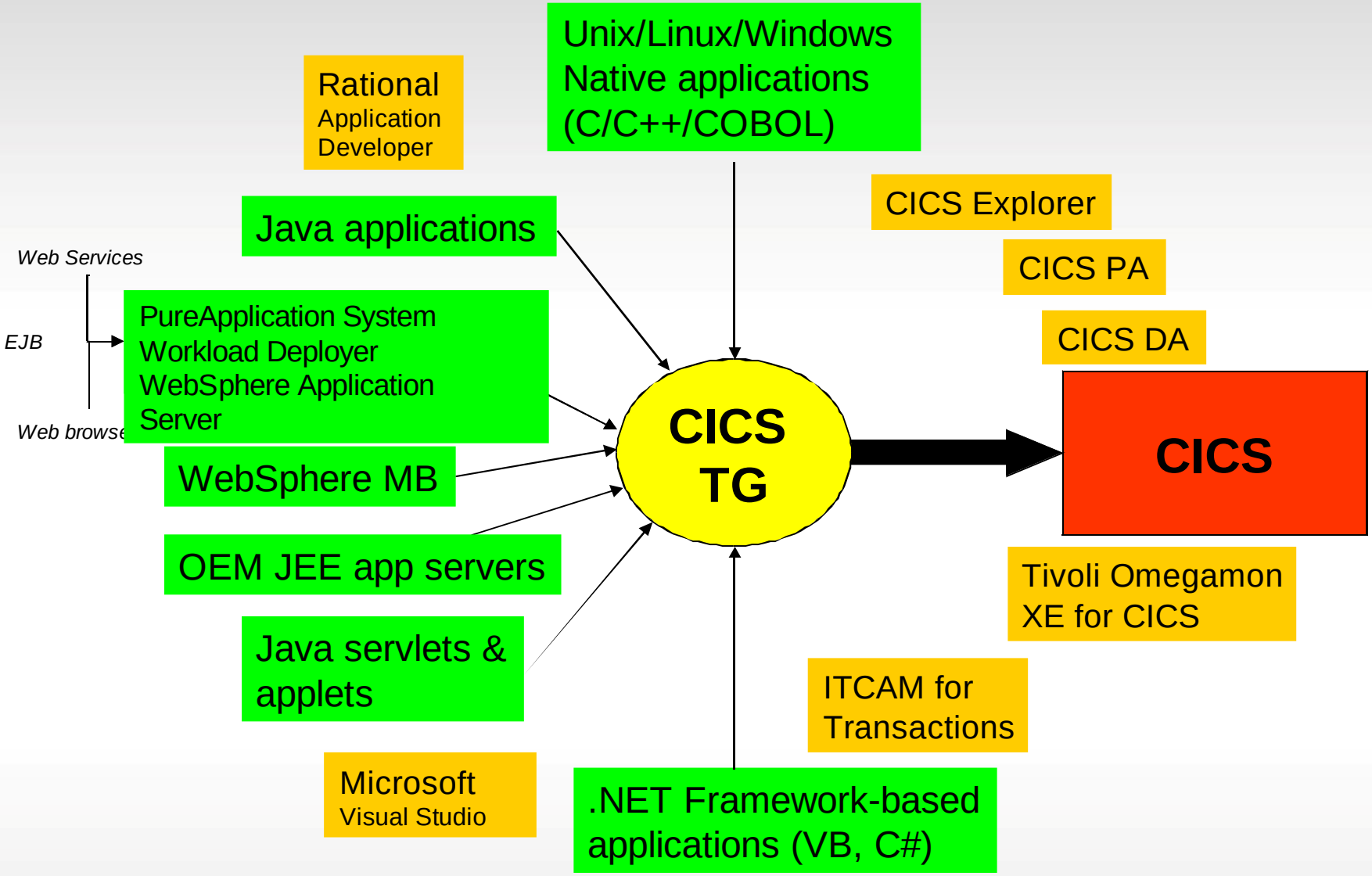
CICS VT enables you to…

- Migrate VSAM files to DB2 without changing application programs
- Maintain single copy of the data
- CICS and batch programs access data in DB2 under the control of CICS VT
- Access migrated DB2 data natively using SQL

After CICS VT



What is the CICS Transaction Gateway?



Product positioning

CICS TS for VSE
TxSeries
CICS TS for i

CICS TS
for z/OS

DE+MP support
AIX
Windows
Linux (z/p/x)
Oracle Solaris
HP-UX

**CICS TG
for z/OS**

*Licensed
by VU*

Enterprise
1000s

.NET | C/C++
Java | JEE

**CICS TG for
Multiplatforms**

100s

*Licensed
by PVU*

.NET | C/C++
Java | JEE

**CICS TG
Desktop Edition**

DE DE DE

*Licensed
by AU*

.NET | Java | C/C++

CICS Transaction Gateway V9.0

Extended scalability, application interoperability, and flexible secure topologies

Increased capacity
Reduced complexity

- 64-bit z/OS Gateway
- Richer dynamic routing & filtering
- IPIC connection level timeout
- IPIC capacity for 2-tier

Flexible deployment

- Asynchronous ECI V2
- 64-bit C/C++ applications
- PureApplication System
- Java 7 JEE 6 WAS V8.5
- RHEL (Intel) compatible
- .NET 4

CICS TS V5.1

CICS PA V5.1
CICS DA V5.1
CICS Explorer

More security options

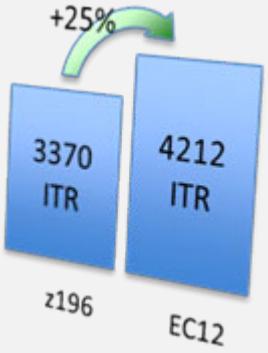
- 3-tier secure connectivity
- Improved identity assertion
- Security standards compliance
- Secure IPIC with DSS

Deeper insight

- Enhanced request monitoring
- WAS-CICS Transaction tracking
- Historical statistics on all platforms

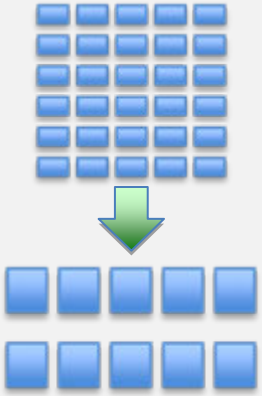
CICS TS V5.1 : Performance

CICS on EC12



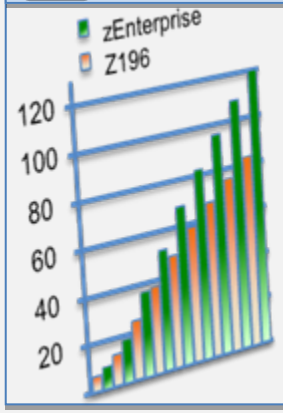
- Upgrade from z196 to EC12 and benefit **from 25% increase in throughput**
- **No additional tuning** required

CICS Consolidation



- **Consolidate 30** regions down **to 10***
- **Decrease CPU** usage by **10%***
- **Reduce** management burden by **2/3***
- **Maintain** the same **workload***

Java 7 on EC12



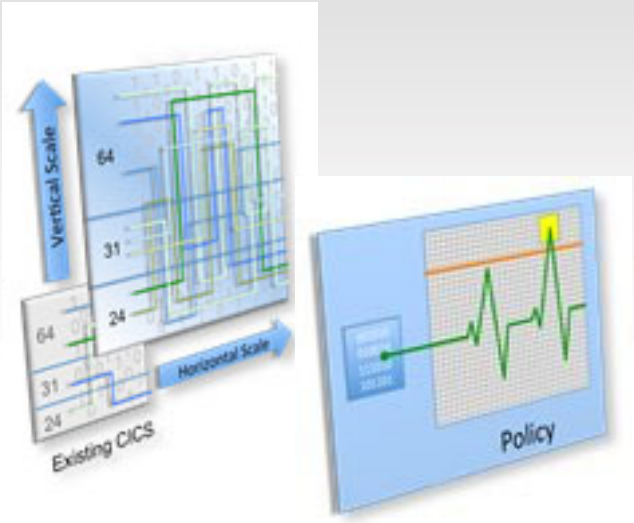
zEnterprise EC12 offers a **~45% improvement over z196** running the Java Multi-Threaded Benchmark

AXIS 2 Web Service Invocation

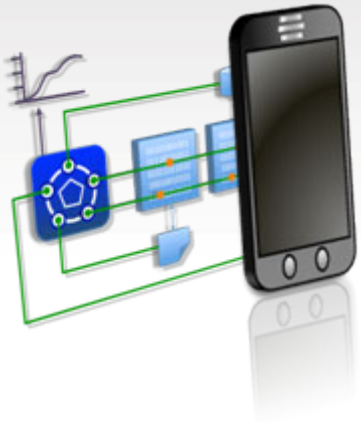
Updated AXIS 2 runtime shows **30% - 60% performance improvement** in Web Service invocations **over CICS V4.2 at GA**

***Test conducted under lab conditions – For further information contact IBM**

Try it now



CICS Transaction Server V5.2
Open Beta



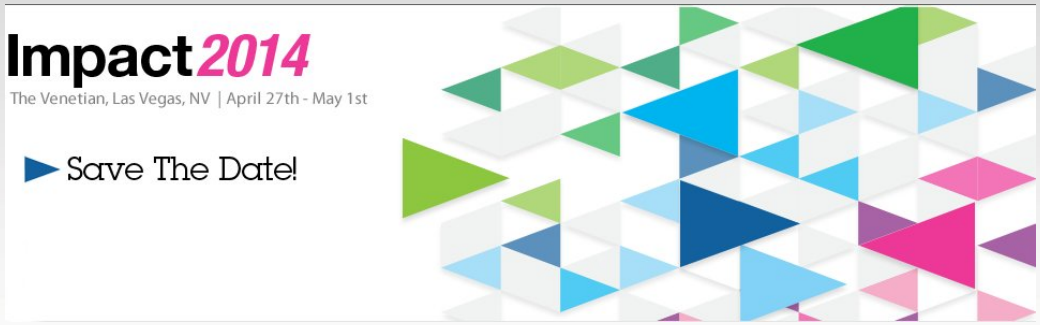
CICS TS V5.2

Open Beta

Available now!

Delivers more dynamic, flexible CICS application deployment.
Faster and more reliable CICS platform deployment.
Policy-based management of CICS applications and platforms.
Better vertical and horizontal scaling
    64-bit addressing, thread safe, and higher maximum CICS tasks.
More exploitation of industry standards,
    XML, Java, and TCP/IP.
Includes more core transaction processing capability
    email notifications, identity propagation, API, and enhanced events.
More comprehensive monitoring and statistics to improve operational metrics.

Find out more



Register for Impact 2014 today
-30 CICS related sessions
- 2 Labs
-Meet CICS Technical specialists
-Hear about the latest CICS V5.1 Portfolio release
-http://www-01.ibm.com/software/websphere/events/impact/registration.html

CICS Smart Seminars

Arrange a customized CICS agenda at your location and hear about the CICS topics you want to hear about. Contact your local IBM representative or send an Email to cicssem@uk.ibm.com

CICS Developer Trial

- V5.2 Available in 2014
- No charge trial, fixed expiry date
- Does not start SVC period
- For non-production environments
- Available through IBM ShopzSeries
- PID 5655-Y30

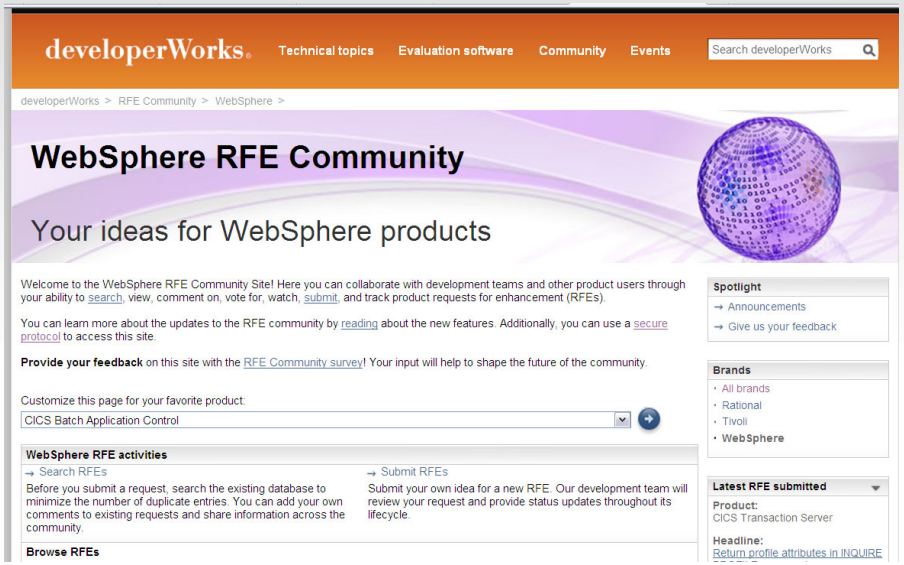
Based on CICS TS V5.1

- (with restrictions)
  - Performance
  - Capacity
  - License

http://www-03.ibm.com/software/products/en/cics-ts-devtrial

Raising new requirements with RFE

- **You can now raise and track requirements using the new IBM RFE system for**
  - CICS Transaction Server
  - CICS Explorer
  - TXSeries
  - WXTR
  - IBM CICS Tools
  - CICS Transaction Gateway
  - PD Tools



- **All previous FITS requirements have been processed, and either be transferred to RFE or closed and returned**
- **All brands https://www.ibm.com/developerworks/rfe/ - select Brand: WebSphere**
- **WebSphere only https://www.ibm.com/developerworks/rfe/?BRAND_ID=181**
- **Select Product Family: Transaction Processing - for CICS Transaction Server, TXSeries, and WXTR**
- **Select Product Family: Enterprise Tooling - for the CICS Tools, CICS Transaction Gateway, and PD Tools**
- **Raise CICS Explorer base requirements against the Explorer component of CICS TS.**
- **Raise plug-in requirements against the Explorer component of related product.**

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CICS Explorer Forum
ibm.com/developerworks/forums/forum.jspa?forumID=1475&start=0

CICS-L list Forum
listserv.uga.edu/archives/cics-l.html

Key documents

- **Analyst papers**
  - Lustratus Research - New project platform section for CICS Users ftp://public.dhe.ibm.com/software/htp/cics/pdf/Lustratus_Research_Paper_New_project_platform_selection_for_CICS_users.pdf
  - Branham Group: IBM CICS Tools: Unrealized Productivity Gains and True Cost Savings ftp://public.dhe.ibm.com/software/htp/cics/tools/IBM_CICS_Tools_Whitepaper_2009.pdf
  - Software Strategies: IBM z/OS Problem Determination Tool Suite Leads Again https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=swg-rszswg
- **IBM Redbooks**
  - **CICS Transaction Server from Start to Finish**, SG24-7952-00
  - **Implementing IBM CICS JSON Web Services for Mobile Applications**, SG24-8161-00
  - **Smarter Banking with CICS Transaction Server**, SG24-7815-00
  - **Implementing Event Processing with CICS,** SG24-7792
  - **CICS and SOA: Architecture and Integration**, SG24-5466-06
  - **Implementation of Popular Business Solutions with CICS Tools**, REDP-4824-00
  - **Threadsafe considerations for CICS**, SG24-6351-04
  - **Architects guide to CICS on System z**, SG24-8067-00
  - **IBM CICS and the JVM server: Developing and Deploying Java Applications**, SG24-8038

Summary

CICS V5 addresses the challenges faced by enterprises of delivering operational efficiency and service agility

Achieved through introducing: cloud support and modernization along with enhancements to the base

Doing more for less with CICS V5

- delivering results more quickly

- for a sound long-term investment