

Problem Analysis and Performance Tuning for CICS

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Agenda

1. Challenges facing CICS Customers across the Organization
 - Complex Code
 - Skills Shortage
 - Where do we start and what is the focus
2. Detect, Verify (analyze) and Solve Method (DVS)
3. IBM OMEGAMON for CICS (OM CICS)
4. CICS Performance Analyzer (CICS PA)
5. Rocket C\Prof
6. Summary

Challenges Across the Organization

Application Developer



"I have to keep up with application changes as we expand our markets worldwide and adopt more users."

CICS Sysprog



"It is challenging to address performance issues with application workloads that always seem to be changing."

"I need to get my business results fast and accurate. What's going on?"

LOB Manager



"I'm getting too many performance alerts. Need to be able to pinpoint the ones that are most important."

IT Manager



"Performance problems seem to appear without warning and deep technical skills are hard to find."

QA Manager



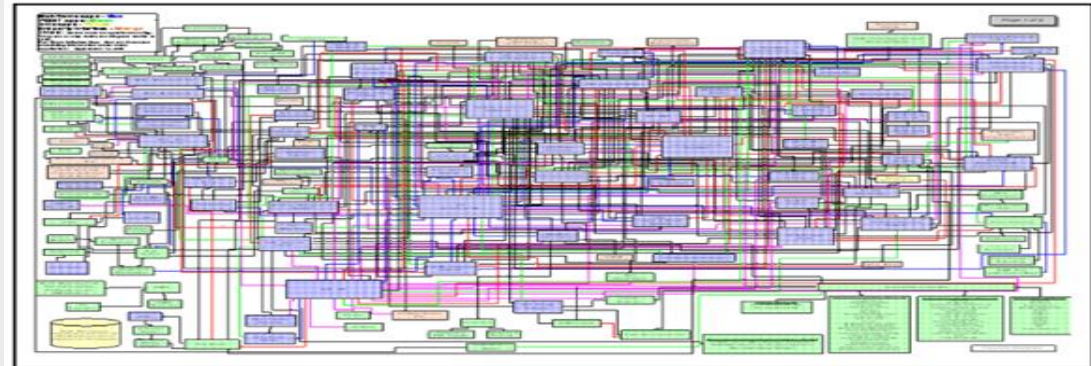
"We can't test for changing workloads in today's digital economy since we don't have enough resources."

CICS applications can be complex systems built on decades of continuous & incremental development

Change?

Fix Problems?

Optimize?

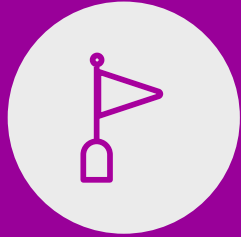


Modernize?

API enable?

Re-use?

CICS Problem Analysis / Performance and Tuning



Where do I start?

The Problem determination manual was renamed to "Troubleshooting CICS" as of CICS v5.4

Online version:

<https://www.ibm.com/docs/en/cics-ts/5.6?topic=troubleshooting>

PDF Download:

https://www.ibm.com/docs/en/SSG_MCP_5.6.0/pdf/troubleshooting-guide_pdf.pdf



System Problems

Affecting individual users or entire system?

- System Outage
- Waits, Loops and Hangs
- Poor Performance possibly due to poor application design



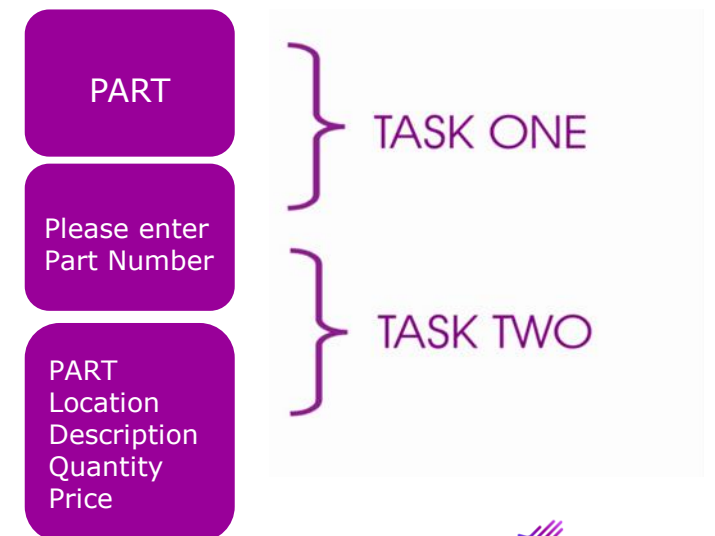
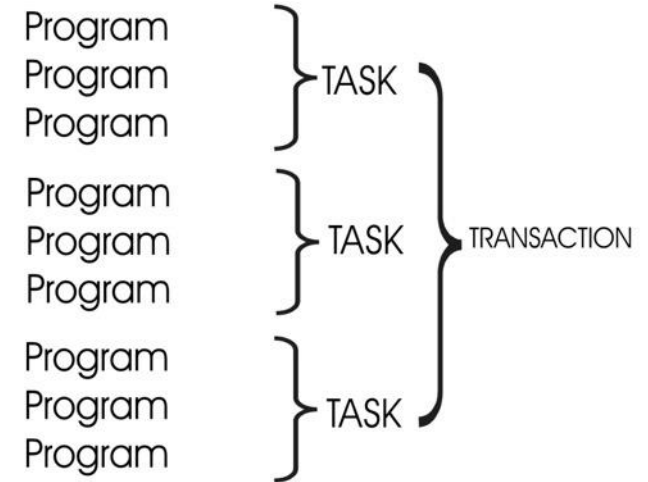
Application issues

Causing overall system problems or isolated to application?

- Transaction Abends
- Deadly Embrace
- Applications suspended for excessive amounts of time
- Response times erratic or degrading over time or after change implementation

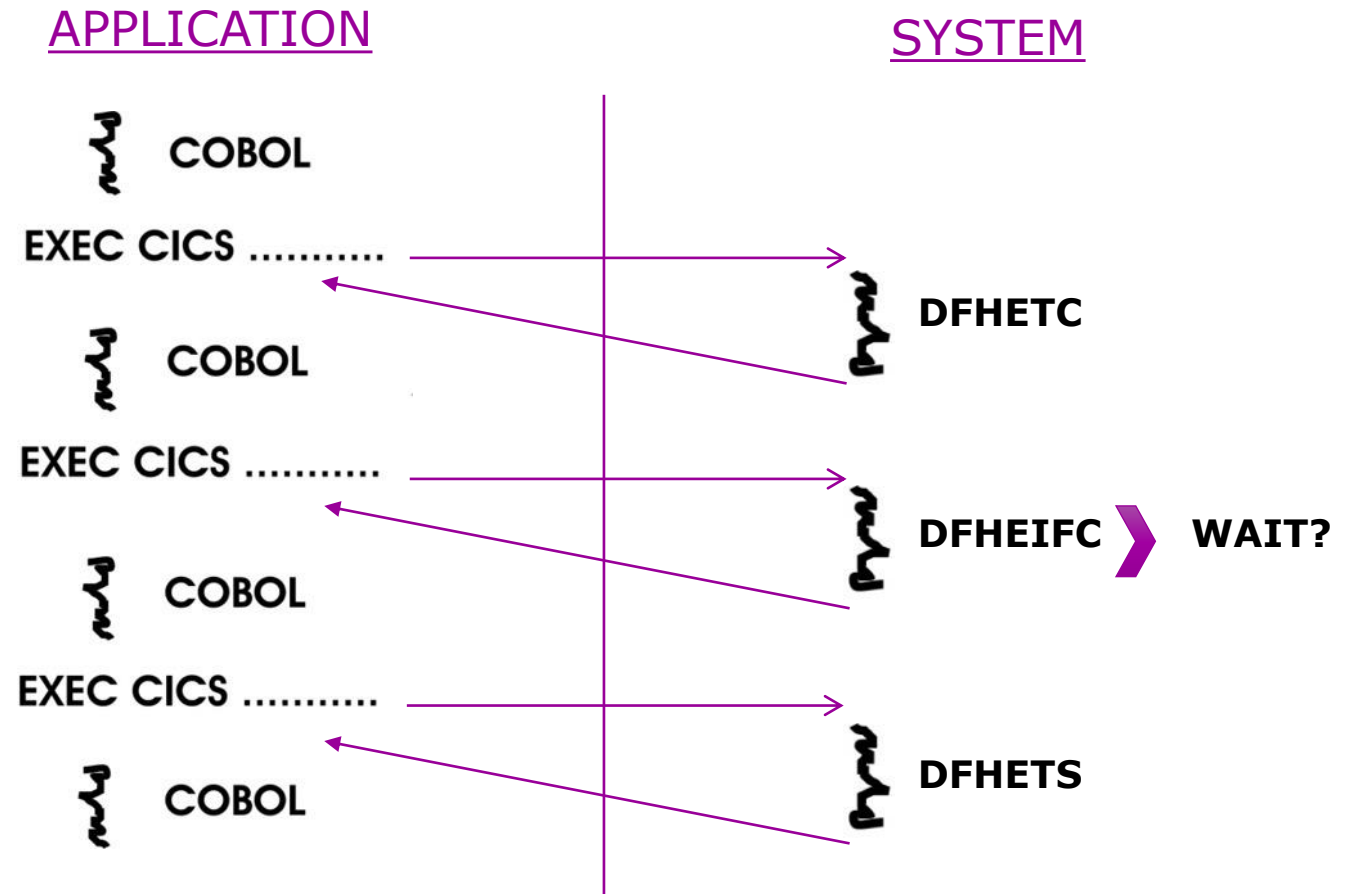
CICS Tasks and Programs

- A task is an instance of a transaction started by a user.
- When a user types in data and presses Enter or a Function key, CICS begins a Task and loads the necessary programs.
- Tasks run concurrently. Therefore, a user can run multiple instances of the same transaction simultaneously.
- CICS multitasks giving fast response times.
- CICS runs each task, briefly giving CPU to each one.

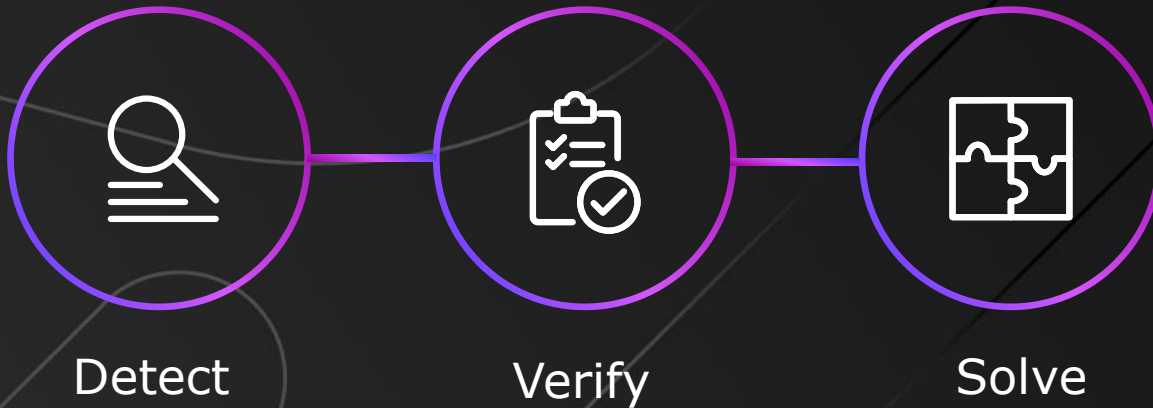


EXEC Interface

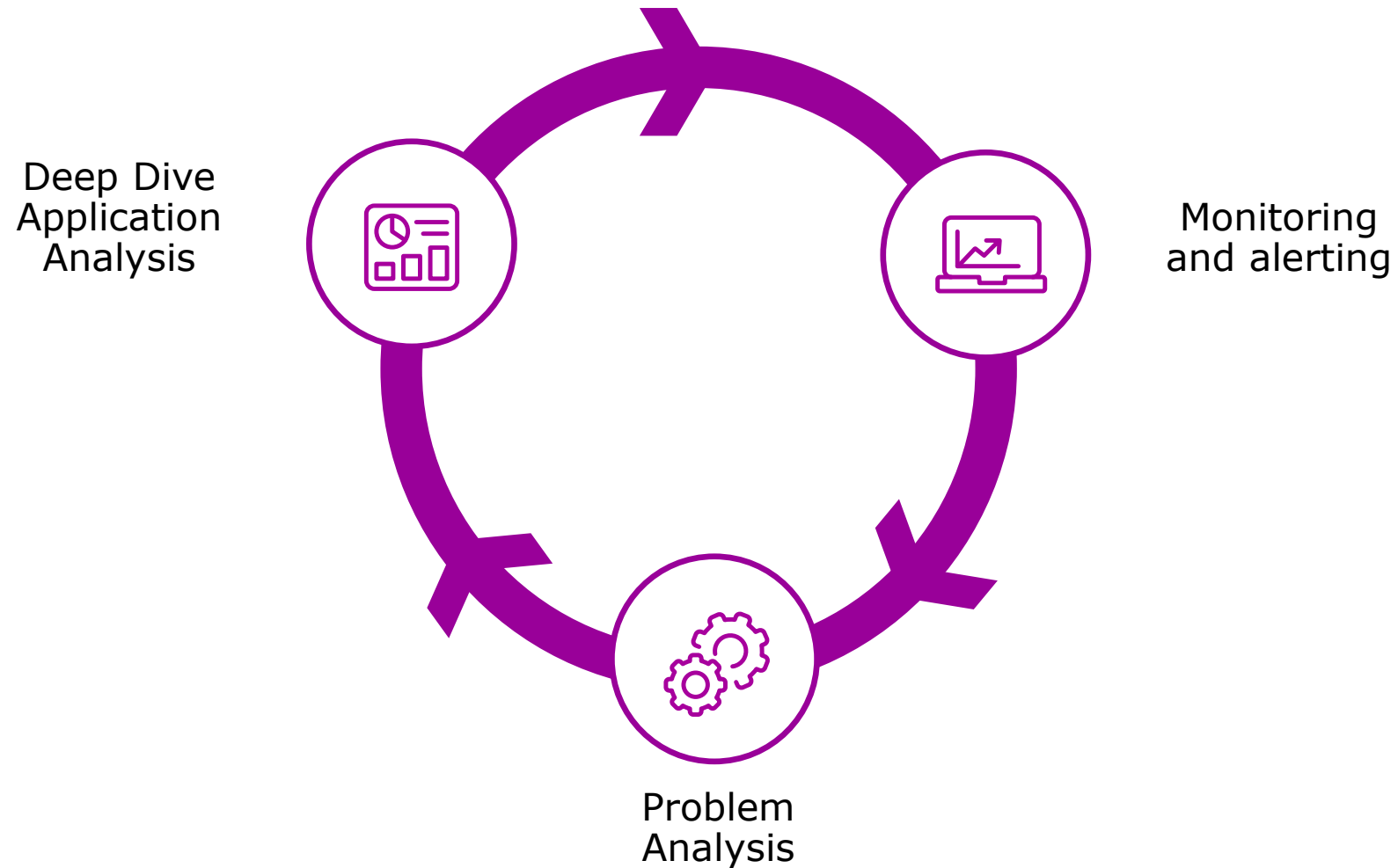
- CICS programs look like batch with the insertion of Execute CICS commands.
- The CICS commands are used to request Services.
- CICS commands must be translated into COBOL prior or during program compilation.



Methodology for Solving Problems



CICS Performance / Problem Analysis Tasks



Detect, Verify (Analyze) and Solve



Detect – Requires some form of system monitoring.

IBM OMEGAMON for CICS on z/OS allows users to:

- Avoid/delay costly slow downs and outages by monitoring key CICS resources and workloads and be alerted of any issues.
- Reduce time-to-resolution of problems by quickly pinpointing and isolating problems.
- Maximize overall efficiency by leveraging integration of z/OS platform information with other OMEGAMONs for a total picture of your multi-functional core business workloads.



Access to historical data limited

Detect, **Verify (Analyze)** and Solve



Verify – Requires a tool that can review long term data.

IBM CICS Performance Analyzer (PA) for z/OS

- powerful offline reporting tool to help you develop, tune, and manage your CICS systems.
- CICS PA addresses the needs of everyone involved in CICS performance analysis, system tuning, and planning capacity.
- Includes those who architect, develop, deploy, and manage complex mainframe CICS applications.



Access to forensic application data limited

Detect, Verify (Analyze) and **Solve**



Solve – Requires a tool that can forensically analyze application flow.

Rocket C\Prof

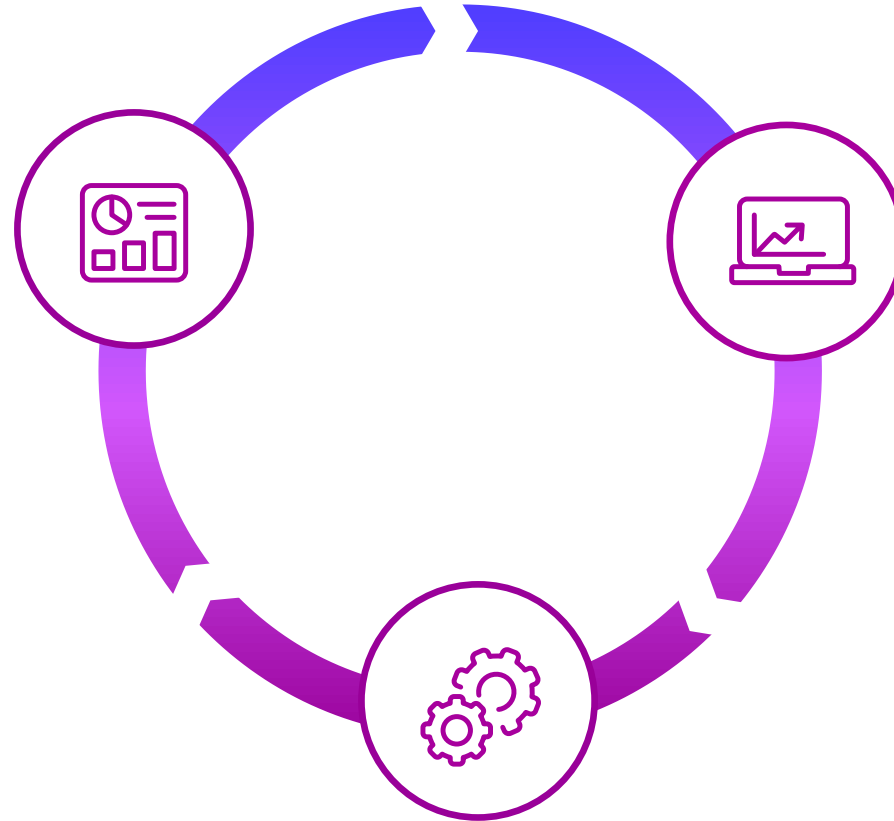
- Reproducing a problem and identifying solutions with existing tools can be tedious, time consuming, and expensive.
- Rocket C\Prof helps organizations get more business and operational value from IBM CICS internal trace data while it protects your IBM z/OS mainframe environment.
- Rocket C\Prof provides the added details you need to diagnose problems in your CICS applications faster—with minimal impact on your business-critical applications.



Access to data for deep dive application analysis

CICS Performance / Problem Analysis Tasks

Solve
Rocket C\Prof



Detect
IBM Z OMEGAMON
for CICS

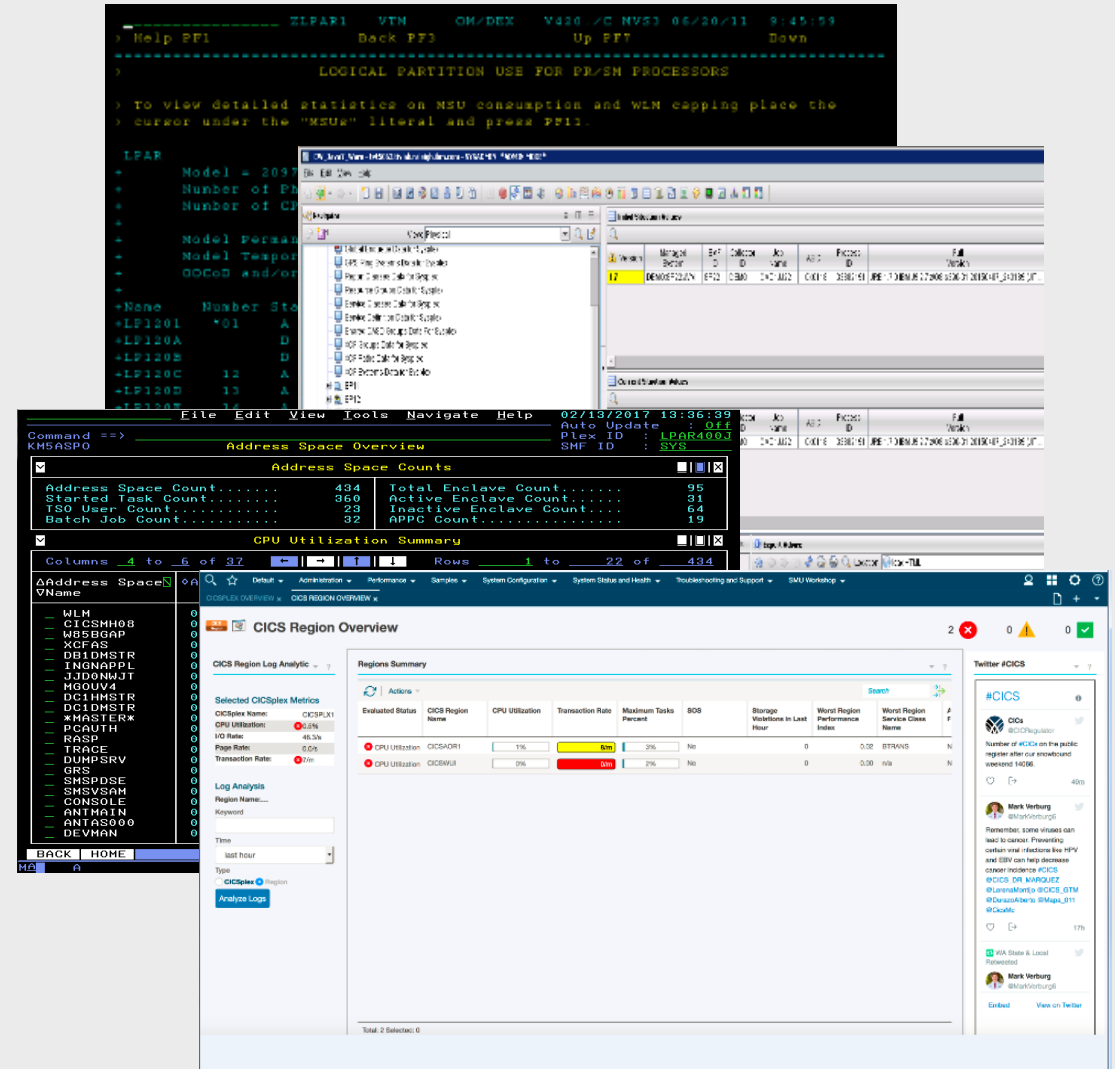
Verify
IBM CICS
Performance Analyzer

IBM OMEGAMON for CICS

CICS Performance and Problem Management Tools (Detect)

IBM Z OMEGAMON for CICS Overview

- OMEGAMON for CICS has been around since early 1980s:
 - We still call it the "Classic" UI, but it has evolved continuously since then.
- Some of the updates added over the years:
 - CICSplex wide data viewing and summarization
 - Real-time and Historical Data Collection and Reporting
 - Application Trace Facility
 - Bottleneck Analysis
 - Resource Limiting
 - Proactive Alerting
 - Task History collection
 - New CICS metrics and statistics
 - CICS TG support
 - Updated User Interfaces
 - Integration with other OMEGAMONS and other tooling
- Commitment has been to deliver Day One support for latest levels of CICS (including supporting open beta clients)
- **Latest level (V5.6) released in June 2022**



New Features to Date in V5.6.0

FixPack 3, December 22, 2023

- **New Resource Types for Resource Limiting**

Three new Resource Types are available for Resource Limiting. These give you new options for which transactions you want to include and exclude from Resource Limiting:

- **RUNTIME:** This is for held tasks due to MXT or Class maximum, where you do not wish to include the time held in the resource limit. The task will be allowed to run for the time specified.
- **CPUGP:** This limits the task time on a general processor. It excludes time where the task was using CPU on a specialty processor.
- **CPUQR:** This is the time spent on the QR TCB. It excludes time on a specialty processor or an Open TCB. With only one QR TCB, it can be important that tasks not spend too much time occupying it.

- **CICSplex transaction rate displayable per second or per minute**

- **CICS API Requester application monitoring via zCEE**

- **New values for task displays provides the CPU on General Purpose, specialty, and CPU eligible for specialty**

- **FIND for Temporary Storage models**

New Features to Date in V5.6.0

FixPack 2, February 2023

- **Background Tasks:** The ability to designate the background and do not need to appear in the workspaces used for routine monitoring.
- **CP/SM CICS System Groups:** OMEGAMON will now import any CP/SM CICS system groups which are configured.
- **TRUE Monitoring:** You can now monitor activity generated by Task Related User Exits.
- **FINDing the TCP/IP Service Port:** You can now search across a CICSplex or group of regions for Port used by a region's TCP/IP service.

FixPack 1, October 2022

- **Correlating CICS tasks and Db2 threads:** The CICS Task History Detail panel now lets you correlate CICS task history with Db2 thread history. You can navigate directly between the CICS Task History Detail panel and the Db2 Thread History Detail panel in IBM OMEGAMON for Db2 Performance Expert.
- **The FIND command:** Updated to support Logo ID, BUNDLES TS / TD Queues and Ports, also added wildcard support.

New Features to Date in V5.6.0

June 2022

- **Program Tracking Support:** Ability to track program usage by transaction and region.

Base IBM Z OMEGAMON for CICS 5.6.0

- **Resource limiting** resolution for CPU has been increased, to allow transaction limits to be set in millisecond increments. This lets you take action much sooner, to prevent tasks from impacting the region.
- **Finding resources within a group of regions** is now much more intuitive. The new FIND command menu provides a drop-down list of resources to search for, together with related help for each resource type. FIND is now extended to CICS temporary storage and transient data queues.
- **New CICS policy statistics** are available. For customers using policies within CICS to take actions on applications, IBM Z OMEGAMON for CICS will now show statistics relating to the use of those policies.
- **CICS Transaction Gateway Memory statistics** are now available. This allows users to monitor their CICS Transaction Gateway Daemon for problems related to memory usage.

Checking Overall System Health

Drill down to see the system is operating as expected

CICSplex Summary Screen

File Edit View Tools Navigate Help 12/21/2022 15:46:54

Command ==> KCPSTART Enterprise CICSplex Summary Auto Update : Off
CICSplex :
Region :

All Active CICSplexes

Columns 2 to 12 of 19 Rows 1 to 5 of 5

ΔCICSplex Name	ΔNumber of Regions	ΔTransaction Rate	ΔCPU Utilization	Any SOS Regions	SOS Region	ΔWorst Performance Index	Worst Service Class Name	ΔEnqueue Waits	ΔCurrent Buffer Waits	ΔCurrent String Waits	ΔI/O Rate
CCVPLEXH	4	1/m	0.0%	No	n/a	0.00%	n/a	0	0	0	0/s
FUWPLEX	8	0/m	0.1%	No	n/a	0.00%	n/a	0	0	0	*/s
RS01	2	0/m	0.0%	No	n/a	0.00%	n/a	0	0	0	0/s
RS02	2	11/m	0.0%	No	n/a	0.00%	n/a	0	0	0	0/s
WUIPLEX	1	0/m	0.1%	No	n/a	0.00%	n/a	0	0	0	*/s

File Edit View Tools Navigate Help 12/21/2022 15:48:17

Command ==> KCPSTART Enterprise CICSplex Summary Auto Update : Off
CICSplex :
Region :

All Active CICSplexes

Columns 10 to 19 of 19 Rows 1 to 5 of 5

ΔCICSplex Name	ΔCurrent Buffer Waits	ΔCurrent String Waits	ΔI/O Rate	ΔPage Rate	ΔStorage Violations in Last Hour	Total AIDs	Total ICES	ΔHighest MAXT Percent	Highest MAXT Region	All VTAM ACBs Open
CCVPLEXH	0	0	0.0/s	0.0/s	0	0	23	10%	CCVDEMO	Yes
FUWPLEX	0	0	37.2/s	0.0/s	0	0	43	2%	FUFWDR	Yes
RS01	0	0	0.0/s	0.0/s	0	0	9	1%	CICS00	Yes
RS02	0	0	0.0/s	0.0/s	0	0	10	19%	CCVCMAS	Yes
WUIPLEX	0	0	35.3/s	0.0/s	0	0	6	1%	FUWUUI	Yes

CICSplex Regions Summary Screen

S3 - Omegamon RS02 - Rocket BlueZone Mainframe Display

File Edit Session Options Transfer View Script Help

File Edit View Tools Navigate Help 05/18/2023 12:04:03

Command KCPRGNS ==> CICSplex Regions Summary

Auto Update : Off
CICSplex : FUWPLEX
Region : FUWPLEX

Regions Summary for FUWPLEX

Columns 2 to 11 of 36 Rows 1 to 8 of 8

ΔCICS Region φName	ΔCPU φUtilization	ΔTransaction φRate	ΔMaximum Tasks φPercent	Highest Pct Class MaxT	Total Queued Transactions	SOS	ΔStg. Violations φlast hour	ΔWorst φPerf. Index	Worst Region Service Class Name	+Any Cur WS Faul
- FUWFWAR	0.8%	1475/m	1%	0%	0	No	0	0.01%	LTRANS	No
- FUWFWA1	1.4%	1466/m	1%	0%	0	No	0	0.01%	LTRANS	No
- FUWFWDR	1.5%	784/m	2%	0%	0	No	0	0.00%	n/a	No
- FUWFWFR	0.8%	1583/m	0%	0%	0	No	0	0.00%	n/a	No
- FUWFWF2J	0.0%	0/m	0%	0%	0	No	0	0.00%	n/a	No
- FUWFWIR	0.4%	890/m	0%	0%	0	No	0	0.00%	n/a	No
- FUWFWTR	1.3%	2944/m	0%	0%	0	No	0	0.27%	CTTRANS	No
- FUWTCIC	0.0%	0/m	0%	0%	0	No	0	0.00%	n/a	No

BACK | Hub RS01DEMO:TEMS on platform RS01(z/OS)

MB 03C S02TCP07 03/014

S3/C 137.134.4.55 S02TCP07 NUM 00:00:203 03.014

Region Overview Screen

File Edit View Tools Navigate Help 12/14/2022 15:05:32

Command ==> KCPRGN0 CICS Region Overview Auto Update : Off
CICSplex : CTREG5
Region : CTC156GA

CICS Region [z/OS Address Space] [Data Sources]

CTC156GA Overview

System ID.....	RSC1	CICS Region Name.....	CTC156GA
Worst Region Service Class Name.....	CTRANS	Region's Worst Perf. Index.....	0.50%
CPU Utilization.....	7.1%	CICS TOD Updated.....	Yes
Transaction Rate.....	173307m	Maximum Tasks Percent.....	2%
Queued Remote Requests.....	0	SOS.....	No
Stg. Violations last hour.....	0	ATDs.....	0
ICLS.....	3	CICS TOD Clock.....	15:05:32
Any Current WS Faults.....	No	Any Current WS Timeouts.....	No
CICS Version.....	7.3.0		

Highest CPU Tasks

Columns 2 to 14 of 19 Rows 1 to 4 of 4

Transaction ID	ΔCPU %	ΔElapsed Time	Task State	Wait Type	Resource Type	Resource Name	Exceeds MAXR Threshold	ΔTask Number	First Program ID	Terminal ID	User ID	Status	+PSB Name
OSRV	0.002702s	52m 03s	Suspend	TaskCnt1	USERWAIT	SRVWORK	No	00044	KOCOME00	n/a	CICSUSER	Active	n/a
OSEC	0.001700s	52m 03s	Suspend	TaskCnt1	USERWAIT	SR2WORK	No	00045	KOCOME00	n/a	CICSUSER	Active	n/a
SSP3	0.000372s	.002209s	Running	CPU	IN_DB2	L800M	No	83506	LGTESTP3	S209	CICSUSER	Active	n/a
SSC1	0.000161s	.022309s	Running	CPU	IN_DB2	L800E	No	83500	LGTESTC1	S204	CICSUSER	Active	n/a

Storage Areas

Columns 2 to 10 of 10 Rows 1 to 3 of 3

Area	SOS	Percent Used	Storage Limit	Storage in Use	Storage Available	Storage Allocated	Region Size	zOS Storage Free	Largest Contiguous Available
DSA	No	20%	5.0M	1.0M	4.0M	1.5M	8.9M	3.1M	3.1M
EDSA	No	26%	200.0M	51.0M	149.0M	59.0M	1.5G	1.2G	1.2G
GDSA	No	0%	10.0G	18.0M	9.9G	1023.0M	10.0G	n/a	n/a

Connections

Columns 2 to 10 of 11 Rows 1 to 1 of 1

Connection Type	Allocation Rate	Allocate Percentage	Allocation Count	Total Number of Connections	Total Send Sessions in Use	Maximum Send Sessions in Use	Percent of Maximum Send Sessions in Use	Total Receive Sessions in Use	+Maximum R Sessions
MRO	0	0	0	0	0	n/a	n/a	0	n/a
ISC	0	0	0	0	0	n/a	n/a	0	n/a
IPCONN	0	0	0	0	0	0	0	0	0

Analyzing Individual Transactions

Use Task History as Transactions run to quick to catch normally

Task History Detail Screen - Tabs

File Edit View Tools Navigate Help 12/21/2022 15:52:05

Command ==> KCPTASHE Task History Detail

Display : HISTORY
CICSplex : FUWPLEX
Region : FUWFWAR

Details Statistics Storage Timings I/O Programs Related

Task History Detail for Task Number 00781

Transaction ID.....	DATA	CPU Time.....	.000359s
Response Time.....	.000396s	Task Number.....	00781
End Time.....	13:17:23	Start Time.....	13:17:23
User ID.....	CICDFLT	Program ID.....	DATAPGM
Storage HWM.....	53616	File Requests.....	0
Terminal ID.....	TR1	Terminal I/O.....	No
ABEND Code.....		Trace active.....	No
End Date.....	12/21/22	Start Date.....	12/21/22
Asynchronous Status.....	No	Original Start time.....	13:17:23

File Edit View Tools Navigate Help 12/21/2022 15:53:47

Command ==> KCPTASHL Task History Detail

Display : HISTORY
CICSplex : FUWPLEX
Region : FUWFWAR

Details Statistics Storage Timings I/O Programs Related

Tasks with same unit of work

CICS Region Name	Transaction ID	CPU Time	Overall Elapsed Time MS	Total Wait Time	Dispatch Time	Task Number	Task Status
FUWFWTR	DATA	.000448s	.002562s	0.001s	0.000s	01678	Done
FUWFWIR	CSMI	.000358s	.000797s	0.000s	0.000s	00751	Done
FUWFWFR	CSMI	.000199s	.000716s	0.000s	0.000s	00743	Done
FUWFWAR	CSMI	.000097s	.000685s	0.000s	0.000s	00778	Done

File Edit View Tools Navigate Help 12/21/2022 15:55:29

Command ==> KCPTASHP Task History Detail

Display : HISTORY
CICSplex : FUWPLEX
Region : FUWFWAR

Details Statistics Storage Timings I/O Programs Related

Transaction Program Details

Program Name	Invoked Count	ΔCPU Time	ΔElapsed Time	ΔDispatch Time	ΔCPU Time on QR TCB	ΔNumber of EXEC calls	ΔNumber of Abends	ΔNumber of Mode Switches
DATAPGM	1	.000169s	.000959s	.000209s	.000065s	10	0	7

Program Tracking Feature - New

- Program Tracking is a new feature which allows users to see all the programs that have run for a task.
- For a program to be tracked it must be either invoked by CICS as a result of an EXEC CICS command or application TRUE request or be called directly and issue an EXEC CICS call.
- Only determined if it is a new program via the call if the EXEC CICS request is issued from a different load module.
- This feature is enabled by default. It can be controlled dynamically via the TOM.
- Worst case less than 0.25% based upon the 1ms per transaction.

Task Program Details

- OMEGAMON CICS provides details on each CICS defined program that has been used by a task.
- This is available via the OMEGAMON CICS Active Task and Task History displays.

File Edit View Tools Navigate Help 02/04/2022 13:27:24

Command ==> KCPTASHP

Display : HISTORY
CICSplex : SB3
Region : CICD5503

Task History Detail

Details Statistics Storage Timings Programs Related

Transaction Program Details

Columns 2 to 9 of 9 Rows 1 to 6 of 6

ΔProgram ▽Name	ΔInvoked ▽Count	ΔCPU ▽Time	ΔElapsed ▽Time	ΔDispatch ▽Time	ΔCPU Time ▽on QR TCB	ΔNumber of ▽EXEC calls	ΔNumber ▽of Abends	ΔNumber of ▽Mode Switches
- DPLLSTRT	1	.000033s	.000066s	.000063s	.000033s	3	0	0
- DPLLINKA	3	.000221s	.000381s	.000372s	.000221s	12	0	0
- DPLLINKB	1	.000054s	2.19312s	.000054s	.000054s	6	0	0
- DPLLINKC	2	.000274s	4.19449s	.000299s	.000274s	18	0	0
- DPLLINKD	1	.000086s	2.09694s	.000089s	.000086s	7	0	0
- DPLXCTLA	1	.000175s	2.09709s	.000221s	.000175s	7	0	0

Task Program Details

- Locating tasks which used a specific program.
- Task History filters allow you to specify as program name. In which case only tasks which have used the program will be returned. The wildcard * character is supported.

```
File Edit View Tools Navigate Help 05/18/2023 12:32:09
Command ==> KCPTAHFN
Task History Filters
Display : HISTORY
Plex ID : FUWPLEX
Sys ID :

Records to scan 10000
Response time GE _____ CPU time . . .GE _____
Storage HWM . GE _____ File . . . .GE _____ +
DL/I . . . .GE _____ + DB2 . . . .GE _____
ADABAS . . . .GE _____ + DATACOM . . .GE _____ +
IDMS . . . .GE _____ + SUPRA . . . .GE _____ +
MQ . . . .GE _____ + USREVNT1 . . .GE _____ +

Between 12:31:06 on 05/18/2023 and 12:32:06 on 05/18/2023

Inclusion Criteria Exclusion Criteria
Tran ID . . . EQ _____ + Tran ID . . . EQ _____ +
Terminal ID EQ _____ + Terminal ID EQ _____ +
User ID . . . EQ _____ + User ID . . . EQ _____ +
Abend code EQ _____
Program . . . EQ DATABUS_

Only Transaction and Terminal filters are case sensitive
Clear All Filters OK
```

Program Aggregation – Region Level

File Edit View Tools Navigate Help 02/04/2022 14:01:47

Command ==> KCPPRGS

Auto Update : Off
CICSplex : SB3
Region : CICD5501

Program Summary

Installed Used

Programs which have been used on CICD5501

Columns 2 to 10 of 15

Rows 13 to 18 of 18

ΔProgram vName	ΔInvoked vCount	ΔTransaction vCount	ΔCPU vTime	ΔAverage vCPU Time	ΔElapsed vTime	ΔAverage vElapsed Time	ΔDispatch vTime	ΔAverage vDispatch Time	ΔCPU Time v on QR TCB
- DPLLINKB	2	2	.000112s	.000056s	4.30868s	2.15434s	.000112s	.000056s	.000112s
- DPLLINKC	4	2	.000540s	.000135s	8.38270s	2.09567s	.000749s	.000187s	.000540s
- DPLLINKD	2	2	.000175s	.000088s	4.18710s	2.09355s	.000177s	.000089s	.000175s
- DPLLSTRT	2	2	.000339s	.000170s	.005112s	.002556s	.005102s	.002551s	.000074s
- DPLXCTLA	2	2	.000329s	.000165s	4.18599s	2.09299s	.000525s	.000263s	.000329s
- MICKSTRS	12003	12003	.251720s	.000021s	20m 34s	.102881s	.703362s	.000059s	.251720s

File Edit View Tools Navigate Help 02/04/2022 14:01:11

Command ==> KCPPRGS

Auto Update : Off
CICSplex : SB3
Region : CICD5501

Program Summary

Installed Used

Programs which have been used on CICD5501

Columns 9 to 15 of 15

Rows 13 to 18 of 18

ΔProgram vName	ΔAverage vDispatch Time	ΔCPU Time v on QR TCB	ΔAverage CPU Time v on QR TCB	ΔNumber of vEXEC Calls	ΔAverage vEXEC Calls	ΔNumber v of Abends	ΔNumber of vMode Switches
- DPLLINKB	.000056s	.000112s	.000056s	12	6	0	0
- DPLLINKC	.000187s	.000540s	.000135s	36	9	0	0
- DPLLINKD	.000089s	.000175s	.000088s	14	7	0	0
- DPLLSTRT	.002551s	.000074s	.000037s	6	3	0	2
- DPLXCTLA	.000263s	.000329s	.000165s	14	7	0	0
- MICKSTRS	.000059s	.251720s	.000021s	84264	7	52	0

Program Aggregation – Region Level

The program aggregation data displayed with program details.

```
File Edit View Tools Navigate Help 02/04/2022 14:06:13
Auto Update : Off
Command ==> KCPPRGD Program Details CICSplex : SB3
Region : CICD5501

Program statistics for MICKSTRS in CICD5501
Program Status..... Enabled Length..... 4104
Current Use Count..... 1 Current Copies..... 1
Total Use Count..... 12205 Total Load Count..... 1
Statistics Use Count..... 12205 Deletes by Compression.... 0
Statistics Refreshes..... 0 Statistics Last Reset..... 00:00:00
Load Status..... Loaded Program Location..... ESDSA
Load Point..... 39B0F000 Entry Point..... B9B0F000
Loaded From..... Library Library Name..... CMDEVTST

RPL Dataset Name
TDCICST.CMDEVTST.LOAD

Program Usage Data for CICD5501
Invoked Count..... 12204 Transaction Count..... 12204
CPU Time..... .253797s Average CPU Time..... .000021s
Elapsed Time..... 20m 34s Average Elapsed Time..... .101187s
Dispatch Time..... .705536s Average Dispatch Time..... .000058s
CPU Time on QR TCB..... .253797s Average CPU Time on QR TCB .000021s
Number of Mode Switches... 0 Number of Abends..... 53
Number of EXEC Calls..... 85471 Average EXEC Calls..... 7

Program definition for MICKSTRS in CICD5501
Defined Language..... Not Defi Deduced Language..... Assemble
Data Location..... Any Quasiree
Execution Key..... User Program Attribute..... Reusable
Definition Type..... Grplist CEDF Allowed..... Yes
Amode..... 31 Rmode..... Any
API status..... CICS API EXECUTIONSET..... FullAPI
Remote Program ID..... n/a Remote System ID..... n/a

Resource Signature Data for MICKSTRS in CICD5501
BACK HOME Hub CSD3:CMS on platform SB3(z/OS) MORE
```

Task History Collection - Timespan

- OMEGAMON can detect, and in some cases remediate problems
- However, permanently solving problems require further analysis
- Task History data in OMEGAMON is only kept for a short period of time
- Some problems require analyzing data collected over several months...

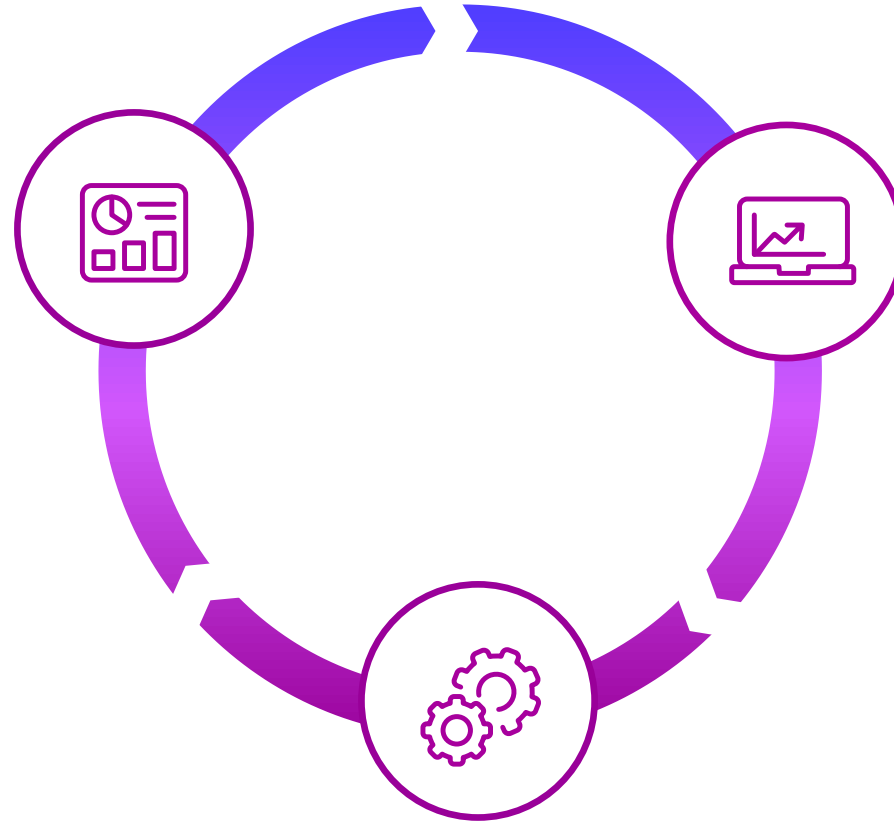
```
File Edit View Tools Navigate Help 12/21/2022 16:01:39
Command ==>
KCPONDV CICS Task History Status
Auto Update : Off
CICSplex : FUWPLEX
Region : FUFWAR

Task History Status Active

Task History DataSpace Status
Data Store Type..... DataSpac Start Date..... 12/16/22
Data Store Size..... 956K Start Time..... 17:55:35
Data Store Records..... 240 Display Requests..... 33
Transaction Recs Received..... 478 Data Store Wraparound..... 1
Cross Memory Posts..... 2 Reserved Size..... 25%
Date of Oldest Transaction..... 12/19/22 Date of Most Recent Trans..... 12/21/22
Time of Oldest Transaction..... 06:43:28 Time of Most Recent Trans..... 15:54:36
TimeSpan..... 2d 09h
```

CICS Performance / Problem Analysis Tasks

Solve
Rocket C\Prof



Detect
IBM Z OMEGAMON
for CICS

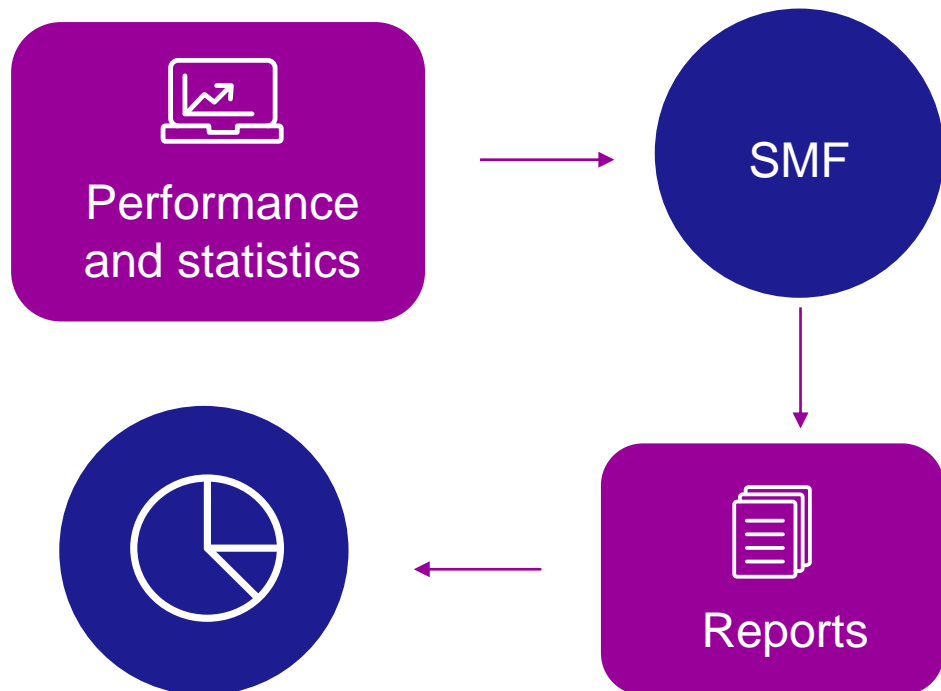
Verify
IBM CICS
Performance Analyzer

IBM CICS Performance Analyzer – CICS PA

CICS Performance and Problem Management Tools (Verify)

What is IBM CICS Performance Analyzer?

- 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 250 supplied report forms)
- Performance and statistical analysis

CICS Monitoring Facility (CMF)

Sources of data for CICS Performance Analyzer

SMF 110
CICS
monitoring
facility

110
CICS TS
statistics

88
System
logger:
CICS
journalling

101
Db2
accounting

116
MQ
accounting

112
OMEGAMON
XE for CICS

111
CICS TG
statistics

- CMF collects data about all transactions in CICS
- Records are written to SMF for later offline processing
- CMF collects 4 classes of data: exception, identity, performance, and transaction resource
- CMF can produce a large volume of data, so CICS compresses the data by default
- To exclude monitoring data fields, use a monitoring control table (MCT)
- To process output, use CICS PA or CICS-supplied sample program DFH\$MOLS

CMF Data Types – Performance and Exception

Performance class

- Provides detailed transaction information
- Processor and elapsed time
- Time spent waiting for I/O
- One record per transaction

Exception class

- Information about resource shortages encountered
- Queuing for file strings
- Wait for temporary storage buffers
- Highlights problems in CICS system operation
- Identifies system constraints that affect performance
- One exception record written for each condition that occurs

CICS Statistics

Sources of data for CICS Performance Analyzer

SMF 110
CICS
monitoring
facility

110
CICS TS
statistics

88
System
logger:
CICS
journalling

101
Db2
accounting

116
MQ
accounting

112
OMEGAMON
XE for CICS

111
CICS TG
statistics

- Statistics domain collects a variety of data and writes it to the SMF data set
- Provides information about resources and domains
- Counts and wait times for resource requests
- Processor and storage use
- Some statistics counters can be reset when records are cut
- Interval recording can be set on/off using STATRCD (SIT)
- Records can be processed by DFHSTUP, DFHOSTAT or CICS PA

When Does CICS Collect Statistics

Interval statistics

- At intervals set, default every hour
- Requires STATRCD=ON in SIT
- Can be turned on using SET command (CEMT SET STATISTICS)

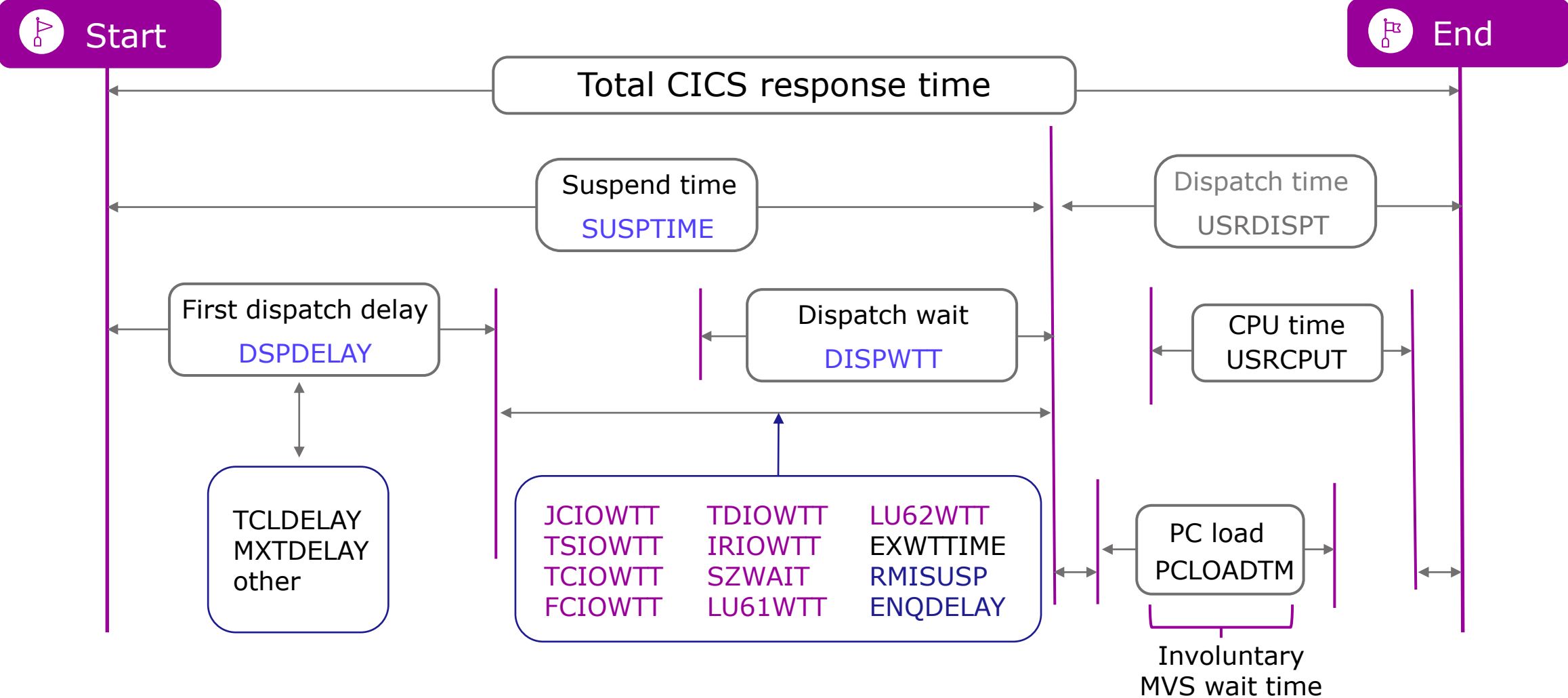
End-of-day statistics

- When CICS shuts down either normal or immediate
- At midnight (by default) in 24/7 operations

Requested statistics

- EXEC CICS Perform statistics record
- EXEC CICS Set statistics RECORDNOW
- CEMT Perform statistics
- Can be issued with any combination of resources

Response Time Structure of CICS Transaction



Response Time

Response time consists of two elements:

1. **Suspend time:** the time a task is not executing (waiting)
2. **Dispatch time:** the time that CICS thinks the task is executing. This time is further divided into:
 - A. **CPU time:** the time the task is executing on CPU
 - B. **Wait time:** the time the CPU has been taken away from the task without the knowledge of CICS

CPU to dispatch ratio:

- Ratio = (CPU time/dispatch time) * 100
- Objective is 80% or higher

Suspend Time Breakdown

Suspend time=
First dispatch time +
I/O wait time +
Other wait time +
Unaccounted wait time

First dispatch delay included
TRANSCCLASS delay and MXT delay

Total I/O wait time =

(terminal I/O wait time +
Temporary storage wait time +
Shared temporary storage I/O wait time +
Transient data I/O wait time +
Journal (MVS Logger) I/O wait time +
File I/O wait time +
RLS file I/O wait time +
Coupling Facility Data Table (CFTD) I/O wait time +
Inbound socket I/O wait time +
Inter-region (MRO) I/O wait time +
LU 6.1 I/O wait time +
LU 6.2 I/O wait time +
FEPI I/O wait time)

Total other wait time =

(CICS OTE TCBS delay time +
CICS change - TCB mode delay time +
TCB mismatch wait time +
ENQ delay time
IC/WAIT interval control delay time +
Lock Manager (LM) delay time +
RMI suspend time +
BTS delay +
JVM suspend +
Request receiver wait time +
Request processor wait time +
CFDT server sync point wait time +
MVS storage constraint wait time +
Dispatchable waits wait time)

Why Analyze SMF Data?

- Analyze CICS application performance
- Improve CICS resource usage
- Evaluate the effects of CICS 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 is it important?

- Reduce time and resource required to analyze offline performance data
- Enables deep-dive CICS performance analysis and understanding of usage trends
- Aids capacity planning and tuning
- Help quickly identify trends, anticipate and prevent online performance problems



Benefits of Using CICS PA

- **Ease of use**
 - No additional setup or customization required
 - Familiar CICS terms and concepts
- **ISPF dialog to build, maintain, and submit reports**
 - Tailor your reports easily using report forms
 - Extensive online help available, and field descriptions
- **Trend and capacity planning**
- **Statistics reporting capability**
 - Comprehensive reporting and analysis of CICS statistics data
 - Alert processing to highlight potential tuning opportunities
- **Transaction profiling**
 - Compares transaction performance between two time periods

Performance Summary Screen

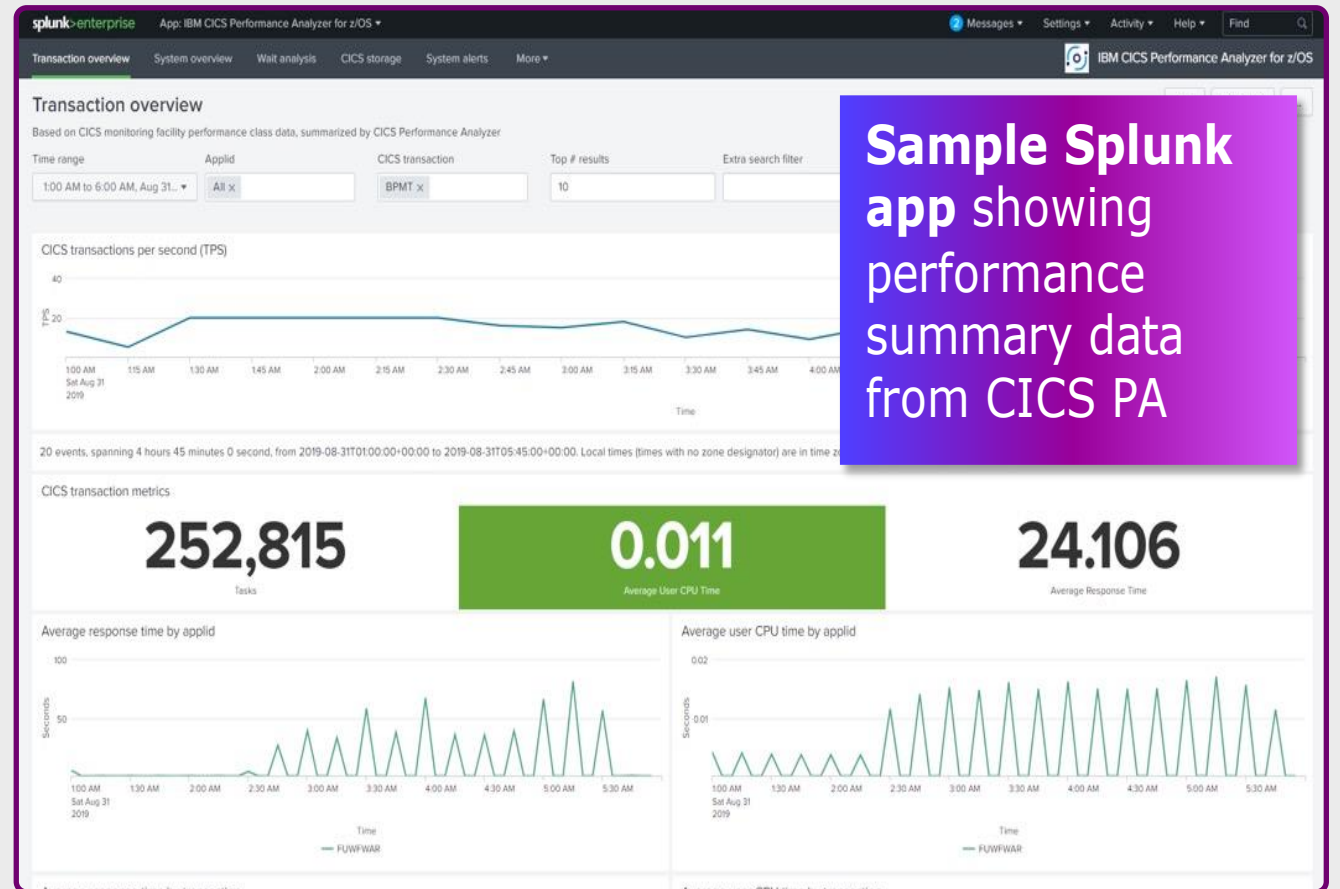
V5R4M0		CICS Performance Analyzer Performance Summary													
0SUM0001		Printed at 15:29:36 12/06/2018										Data from 00:17:50 11/23/2017 to 23:59:49 11/23/2017		Page 1	
Tran	WEBDESC	#Tasks	Avg Response Time	Max Response Time	Avg Dispatch Time	Avg User Time	Avg CPU Suspend Time	Max Suspend Time	Avg DispWait Time	Avg FC Wait Time	Avg FCAMRq Count	Avg IR Wait Time	Avg SC24UHW Count	Avg SC31UHW Count	
DSA2	wachinformation	876	.0261	1.2575	.0094	.0067	.0167	1.2470	.0040	.0000	43	.0000	0	8873477	
DSA2	wactualdisbursements	130	.0339	.2196	.0196	.0137	.0142	.1928	.0047	.0000	200	.0000	0	9228932	
DSA2	waddhistory	44309	.0272	6.2085	.0080	.0061	.0192	6.2001	.0032	.0000	29	.0000	0	8526714	
DSA2	wadverseactionhierarchy	5	.0392	.0435	.0303	.0096	.0090	.0164	.0036	.0000	63	.0000	0	8919520	
DSA2	wbankersnote	9200	.0326	3.0703	.0147	.0118	.0179	3.0548	.0039	.0000	57	.0000	0	8547006	
DSA2	wcchupdate	37083	.0334	5.2381	.0103	.0074	.0231	5.2260	.0040	.0000	58	.0000	0	8918366	
DSA2	wchecklist	4823	.3627	4.6495	.1993	.1375	.1635	4.4762	.0351	.0000	2494	.0000	0	9230632	
DSA2	wclosingsmethodrecommend	37	.1910	.3687	.1514	.0965	.0396	.1822	.0196	.0000	1846	.0000	0	9131641	
DSA2	wclosingsupport	3632	.0916	2.3611	.0337	.0236	.0580	2.3270	.0077	.0000	370	.0000	0	9130782	
DSA2	wcommunication	27439	.3698	4.5413	.2227	.1542	.1472	4.3050	.0388	.0000	2753	.0000	0	9249514	
DSA2	wcontactupdate	5477	.0346	3.1524	.0129	.0093	.0218	3.1350	.0043	.0000	85	.0000	0	8951858	
DSA2	wcontractfinancial	8179	.3128	3.7768	.1864	.1274	.1265	3.5585	.0316	.0000	2391	.0000	0	9306619	
DSA2	wcontractissuenotificat	1959	.0325	1.0548	.0143	.0104	.0182	1.0395	.0034	.0000	98	.0000	0	9078754	
DSA2	wcosignaturestatement	62	.0244	.0969	.0119	.0078	.0125	.0862	.0045	.0000	52	.0000	0	9078769	
DSA2	wcreditbureaureports	13790	.1867	6.1528	.1401	.0946	.0466	6.1404	.0207	.0000	1707	.0000	0	9082305	
DSA2	wcreditreversal	2	.0367	.0433	.0283	.0092	.0084	.0106	.0011	.0000	35	.0000	0	8591656	
DSA2	wdecision	31634	.3303	6.9502	.1807	.1226	.1495	6.6450	.0312	.0000	2217	.0000	0	9142872	
DSA2	wdisbursementdetails	2943	.0356	6.0530	.0174	.0134	.0182	6.0456	.0049	.0000	210	.0000	0	9216289	
DSA2	wdisclosures	853	.1028	3.1773	.0193	.0132	.0835	3.1549	.0062	.0000	172	.0000	0	8951865	
DSA2	wdiscountmaintutility	650	.0573	2.1343	.0215	.0151	.0357	2.1096	.0049	.0000	183	.0000	0	9092450	
DSA2	wemploymentandincome	2015	.3116	4.4824	.2051	.1430	.1064	4.2515	.0314	.0000	2398	.0000	0	9244769	
DSA2	wexceptions	22007	.2874	6.6658	.1744	.1177	.1130	6.4709	.0292	.0000	2152	.0000	0	9139205	
DSA2	wextcontact	1	.0299	.0299	.0297	.0133	.0002	.0002	.0001	.0000	62	.0000	0	8658976	
DSA2	wfinancial	1763	.3131	2.3143	.1818	.1252	.1313	2.1094	.0327	.0000	2510	.0000	0	9227588	

Visualize the Data Using an Analytics Engine

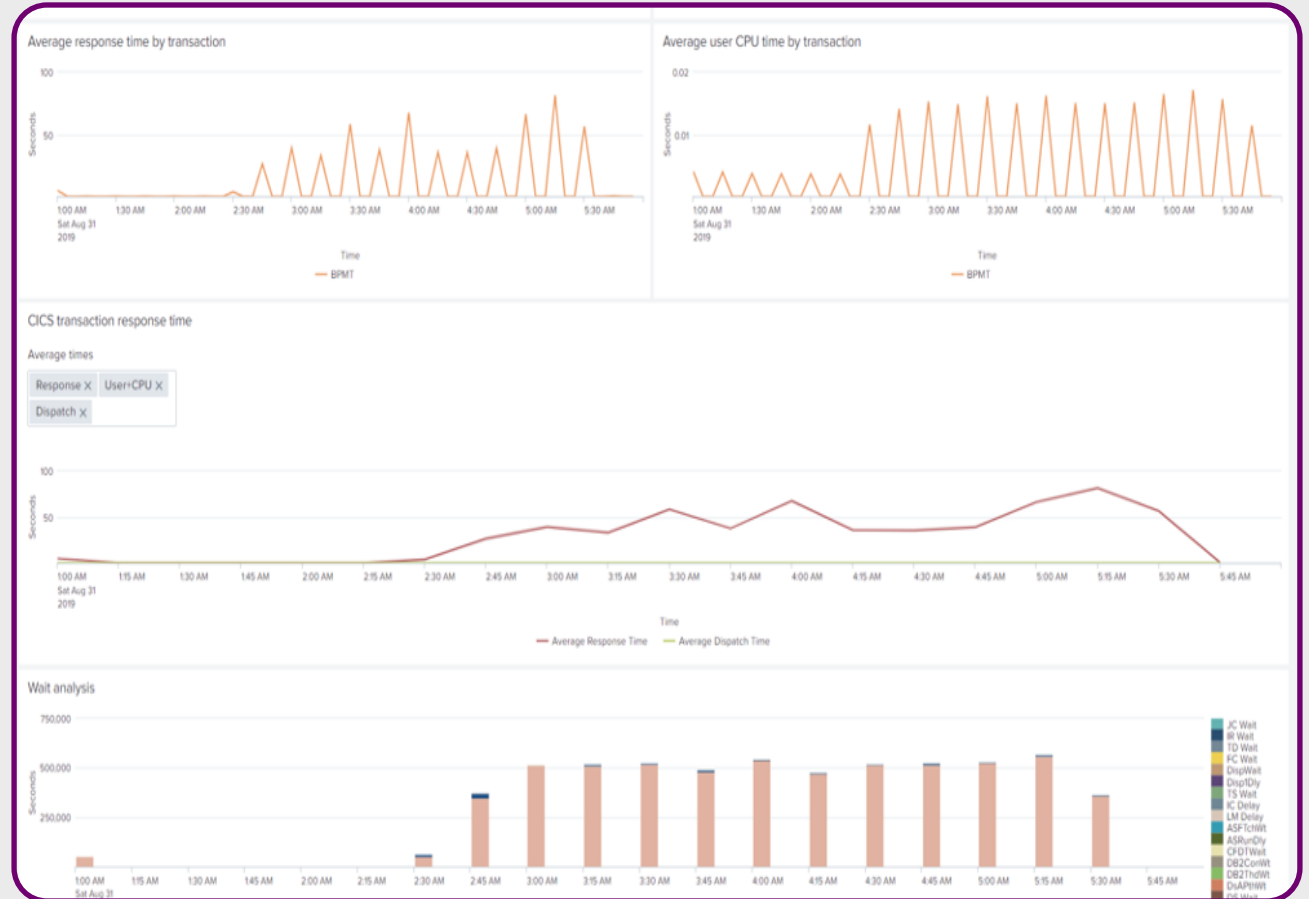
SupportPac CA10 provides sample JSON Lines data output

<https://www.ibm.com/support/pages/ca10-cics-performance-analyzer-zos-output-json-lines>

Visualization with Splunk or Elastic Dashboards

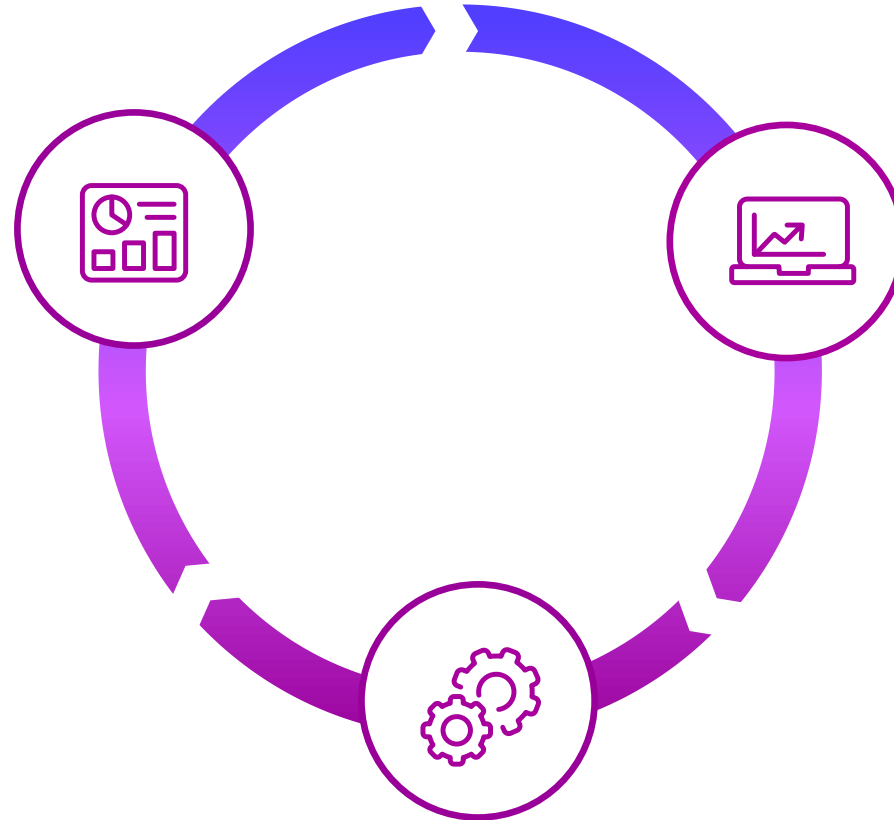


Visualization with Splunk or Elastic Dashboards



CICS Performance / Problem Analysis Tasks

Solve
Rocket C\Prof



Detect
IBM Z OMEGAMON
for CICS

Verify
IBM CICS
Performance Analyzer

Rocket C\Prof

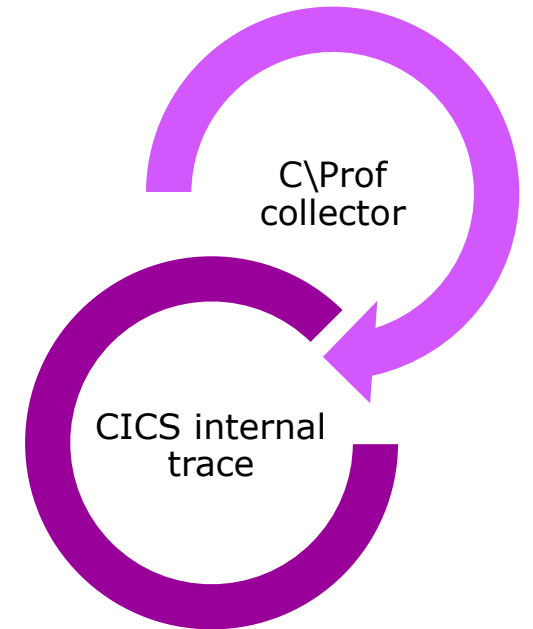
CICS Performance and Problem Management Tools (Solve)

What is C\PROF?

- A completely new approach to trace capture
- Uses significantly less CPU than traditional tools
- Does not require changes to CICS
- With C\Prof, the CICS trace becomes:
 - Inexpensive to capture
 - Simple to interpret
- C\Prof ***unlocks*** the hidden value of the trace
 - Low CPU usage means you can run it in production
 - Ideal for permanent use in development environments

How Does it Work?

- **Collector runs in separate MVS address space**
 - Peeks inside CICS to look at CICS internal trace
 - **CICS is unaware that this is happening**
- **The CICS internal trace is collecting all the time**
 - C\Prof writes the trace to special profiling or auxiliary trace data sets
 - Level of detail is only limited to what is stored in the trace
 - Collect all the time, in a short burst, or take a quick snapshot
- **Collect one region or multiple with same collector**
 - Use C\Prof to filter and sort transactions, view application events, dive into the trace events themselves
 - **Supports regions using MRO**
 - Collect using the C\Prof server, or generate JCL to submit ad hoc batch collection requests



Highlights: C\Prof

- Simple to get started (< 30 minutes)
- Transaction data supplied in near-real time
- Single Point of Control (SPOC) via the C\Prof **Region List**
- An “application” view of your trace events:
 - Collect event data from the CICS internal trace
 - Find your transaction
 - Drill down to application events, performance information, transaction breakdown by program, trace event “deep dive”
- Adjustable trace levels
 - Add additional trace points for more detail
- All the features of the CICS auxiliary trace but much more

Multiple Trace Capture Modes

Record

- Record the contents of the CICS internal trace
- *Two modes:*
 - **Record for Profiling – our premiere feature**
 - Application perspective of the trace
 - Stored in C\Prof archive data sets
 - View transaction list, application events, program calls, trace events...
 - **Record to Auxiliary Trace Data Sets**
 - Output similar to the CICS auxiliary trace facility but with a lot less overhead and more recording options

Snapshot

- Take a point-in-time snapshot of the CICS internal trace
 - Captures a **copy** of what is currently there
- *Effect?*
 - Snap looks **backward** to see what recently occurred in CICS
- Works even if the collector was not running at the time
- Combine with automation products for automated problem capture

C\Prof Translates This ...

```
• AP 1790 TFXM ENTRY - FUNCTION(INIT_XM_CLIENT) CLIENT_REQUEST_BLOCK(2708F570 , 02A00000)
•
• TASK-01629 KE_NUM-0286 TCB-C/QR /008F63C8 RET-A47683E0 TIME-00:25:52.3404031650 INTERVAL-00.0000020239 =0000058
• 1-0000 00480000 000000B3 00000000 00000000 BFC00000 00000000 01000100 2708F570 *.....{.....5.*
• 0020 02A00000 00000000 00000000 00020000 00000000 00000000 DBC862DE C5240D60 *.....H..E.-*
• 0040 00000000 00000000 *.....*
• 2-0000 C3D7F3F6 91F20006 2732D040 2732D040 00000000 0001629C *CP36j2....} ..} ..... *
```

```
• XM 1001 XMIQ ENTRY - FUNCTION(SET_TRANSACTION) FACILITY_TYPE(TERMINAL) FACILITY_TOKEN(2708F570)
•
• TASK-01629 KE_NUM-0286 TCB-C/QR /008F63C8 RET-A5A68922 TIME-00:25:52.3404045825 INTERVAL-00.0000014174 =0000059
• 1-0000 01380000 000000A1 00000000 00000000 B1000000 00080000 03A85530 26EEF160 *.....y....1-*
• 0020 2702E0E8 1790E0D8 26EEDFE0 00000048 2708F570 00000018 00000000 15672700 *..Y..\Q...\.....5.....*
• 0040 15000000 00000000 273C96CD 00000000 00000000 2474E310 00000000 2474E460 *.....o.....T.....U-*
• 0060 00000000 2474E572 00000000 2474E310 00000000 2474E89C 00000000 2474EC10 *.....V.....T.....Y.....*
• 0080 C9E401D9 24A0B250 F0F3F8C8 24AFED40 000002D0 C6F4E2C1 00000000 2474EFC2 *IU.R...&038H... ..}F4SA.....B*
• 00A0 00000000 2474EB84 00000000 2474EF40 0000001E 2708F570 0000001E 8C97459B *.....d.....5.....p..*
• 00C0 00000000 00000000 00000000 00000000 00000000 26EEF430 00000000 00000000 *.....4.....*
• 00E0 00000000 00000000 00000000 E3E2F8F0 F0F74040 00000000 00000000 00009508 *.....TS8007 .....n.*
• 0100 00000000 00009508 00000000 00009508 00000000 00000000 00000000 024D47D6 *.....n.....n.....(O*
• 0120 00000000 024D47D6 00000000 00000000 00000000 00000000 *.....(O.....*
```

```
• XM 1002 XMIQ EXIT - FUNCTION(SET_TRANSACTION) RESPONSE(OK)
•
• TASK-01629 KE_NUM-0286 TCB-C/QR /008F63C8 RET-A5A68922 TIME-00:25:52.3404064179 INTERVAL-00.0000018354 =0000060
• 1-0000 01380000 000000A1 00000000 00000000 B1000000 00080000 03A80130 26EEF160 *.....y....1-*
• 0020 2702E0E8 1790E0D8 26EEDFE0 00000048 2708F570 00000018 00000000 15672700 *..Y..\Q...\.....5.....*
• 0040 15000000 00000000 273C96CD 00000000 00000000 2474E310 00000000 2474E460 *.....o.....T.....U-*
• 0060 00000000 2474E572 00000000 2474E310 00000000 2474E89C 00000000 2474EC10 *.....V.....T.....Y.....*
• 0080 C9E401D9 24A0B250 F0F3F8C8 24AFED40 000002D0 C6F4E2C1 00000000 2474EFC2 *IU.R...&038H... ..}F4SA.....B*
• 00A0 00000000 2474EB84 00000000 2474EF40 0000001E 2708F570 0000001E 8C97459B *.....d.....5.....p..*
• 00C0 00000000 00000000 00000000 00000000 00000000 26EEF430 00000000 00000000 *.....4.....*
• 00E0 00000000 00000000 00000000 E3E2F8F0 F0F74040 00000000 00000000 00009508 *.....TS8007 .....n.*
• 0100 00000000 00009508 00000000 00009508 00000000 00000000 00000000 024D47D6 *.....n.....n.....(O*
• 0120 00000000 024D47D6 00000000 00000000 00000000 00000000 *.....(O.....*
```

Into a Consolidated Form Like This

```

File  Menu  Edit  Form  Help
C:\Prof Application Events                               Row 1 of 84 More: >
Command ===>                                           Scroll ===> PAGE

Tran: BPMT  Start: 2023-05-11 13:43:29.397222 Response: 0.400859 Task: 819

/  Relative APPLID  Task Program  Elapsed Call  Resource EIBRESP TCB  STMT # Offset Command
---
+0.000000 FUWFWTR 819 ATTACH TASK
+0.000114 FUWFWTR 819 GETMAIN OK QR SYSEIB GETMAIN SET(X'28E0E008')
+0.000280 FUWFWAR 12871 ATTACH TASK
+0.000501 FUWFWAR 12871 MBKPSTD1 GETMAIN OK QR SYSEIB GETMAIN SET(X'26A5C008')
+0.000529 FUWFWAR 12871 MBKPSTD1 START PROGRAM MBKPSTD1 QR START_PROGRAM PROGRAM(MBK
+0.000600 FUWFWAR 12871 MBKPSTD1 GETMAIN OK QR 00000481 SYSEIB GETMAIN SET(X'2850C8D8')
+0.000609 FUWFWAR 12871 MBKPSTD1 LINK MBKPCOM1 OK QR 000066 +0014E2 LINK PROGRAM('MBKPCOM1')
+0.000628 FUWFWAR 12871 MBKPCOM1 GETMAIN OK QR 00000481 SYSEIB GETMAIN SET(X'285166B8')
+0.000632 FUWFWAR 12871 MBKPCOM1 GETMAIN OK QR 00128 +001604 GETMAIN SET(X'28517BF8')
+0.000635 FUWFWAR 12871 MBKPCOM1 GETMAIN OK QR 00134 +001696 GETMAIN SET(X'28517C78')
+0.000637 FUWFWAR 12871 MBKPCOM1 GETMAIN OK QR 00137 +001718 GETMAIN SET(X'28517C98')
+0.000639 FUWFWAR 12871 MBKPCOM1 GETMAIN OK QR 00215 +001B3C GETMAIN SET(X'28517CC8')
+0.000641 FUWFWAR 12871 MBKPCOM1 MONITOR OK QR 00221 +001C04 MONITOR POINT(2) DATA(
+0.000645 FUWFWAR 12871 MBKPCOM1 MONITOR OK QR 00227 +001CC2 MONITOR POINT(1) DATA(
+0.000647 FUWFWAR 12871 MBKPCOM1 FREEMAIN OK QR 00233 +001D38 FREEMAIN DATAPOINTER(X'28
+0.000653 FUWFWAR 12871 MBKPCOM1 LINK MBKPSEQ1 OK QR 00191 +001954 LINK PROGRAM('MBKPSEQ1')
+0.001055 FUWFWFR 379 ATTACH TASK
+0.001204 FUWFWFR 379 DFHMIRS GETMAIN OK QR SYSEIB GETMAIN SET(X'2A90E008')
+0.001237 FUWFWFR 379 DFHMIRS START PROGRAM DFHMIRS QR START_PROGRAM PROGRAM(DFH
+0.001248 FUWFWFR 379 DFHMIRS LINK MBKPSEQ1 OK QR +0020B0 LINK PROGRAM('MBKPSEQ1')
+0.001303 FUWFWFR 379 MBKPSEQ1 READQ TD MBK1 OK QR 00054 +001356 READQ TD QUEUE('MBK1') IN
+0.001317 FUWFWFR 379 MBKPSEQ1 WRITEQ TD MBK1 OK QR 00070 +00142E WRITEQ TD QUEUE('MBK1') F
+0.001322 FUWFWFR 379 MBKPSEQ1 WRITEQ TS MINIBANK OK QR 00082 +0014D4 WRITEQ TS QUEUE('MINIBANK
+0.001343 FUWFWFR 379 MBKPSEQ1 READQ TS MINIBANK OK QR 00090 +001588 READQ TS QUEUE('MINIBANK'
+0.001347 FUWFWFR 379 MBKPSEQ1 DELETEQ TS MINIBANK OK QR 00099 +001602 DELETEQ TS QUEUE('MINIBANK'
+0.001350 FUWFWFR 379 MBKPSEQ1 RETURN OK QR 00107 +001674 LINK PROGRAM('MBKPSEQ1')
+0.001506 FUWFWAR 12871 MBKPCOM1 LINK MBKPDEB1 OK QR 00300 +002280 LINK PROGRAM('MBKPDEB1')
+0.001519 FUWFWAR 12871 MBKPDEB1 GETMAIN OK QR 00000481 SYSEIB GETMAIN SET(X'28520898')
+0.001525 FUWFWAR 12871 MBKPDEB1 READ MBKACCT1 OK QR> 00078 +0014D6 READ FILE('MBKACCT1') INT
+0.001717 FUWFWAR 12871 MBKPDEB1 REWRITE MBKACCT1 OK QR> 00106 +0016C6 REWRITE FILE('MBKACCT1')
+0.002481 FUWFWAR 12871 MBKPDEB1 RETURN OK QR 00135 +0017B2 RETURN COBOLII STMT_#(013
+0.002496 FUWFWAR 12871 MBKPDEB1 FREEMAIN OK QR 00000404 SYSEIB LINK PROGRAM('MBKPDEB1')
+0.002512 FUWFWAR 12871 MBKPCOM1 LINK DFHDYP OK QR 00312 +0023D6 LINK PROGRAM('MBKPPMT1')
+0.002541 FUWFWAR 12871 DFHDYP RETURN OK QR +00022E RETURN ASM
+0.002659 FUWTCIC 12906 ATTACH TASK
+0.002789 FUWTCIC 12906 GETMAIN OK QR SYSEIB GETMAIN SET(X'28FAE008')
+0.002840 FUWTCIC 12906 LINK MBKPPMT1 OK QR LINK PROGRAM('MBKPPMT1')
+0.002946 FUWTCIC 12906 MBKPPMT1 GETMAIN OK QR 00000481 SYSEIB GETMAIN SET(X'2A60E248')
+0.002971 FUWTCIC 12906 MBKPPMT1 ADDRESS OK QR 00000247 SYSEIB ADDRESS SYSEIB ASM STMT_#
+0.002975 FUWTCIC 12906 MBKPPMT1 LOAD CSQCOPEN OK QR 00000285 SYSEIB LOAD PROGRAM('CSQCOPEN')
+0.003020 FUWTCIC 12906 CSQCOPEN MQOPEN 0 L8+QR +0002BC APPLICATION-REQUEST MQOPE
+0.003246 FUWTCIC 12906 MBKPPMT1 ADDRESS OK QR 00000247 SYSEIB ADDRESS SYSEIB ASM STMT_#
+0.003252 FUWTCIC 12906 MBKPPMT1 LOAD CSQCPUT OK QR 00000285 SYSEIB LOAD PROGRAM('CSQCPUT') S
+0.003272 FUWTCIC 12906 CSQCPUT MQPUT 0 L8+QR +000460 APPLICATION-REQUEST MQPUT
+0.003372 FUWTCIC 12906 MBKPPMT1 ADDRESS OK QR 00000247 SYSEIB ADDRESS SYSEIB ASM STMT_#
  
```

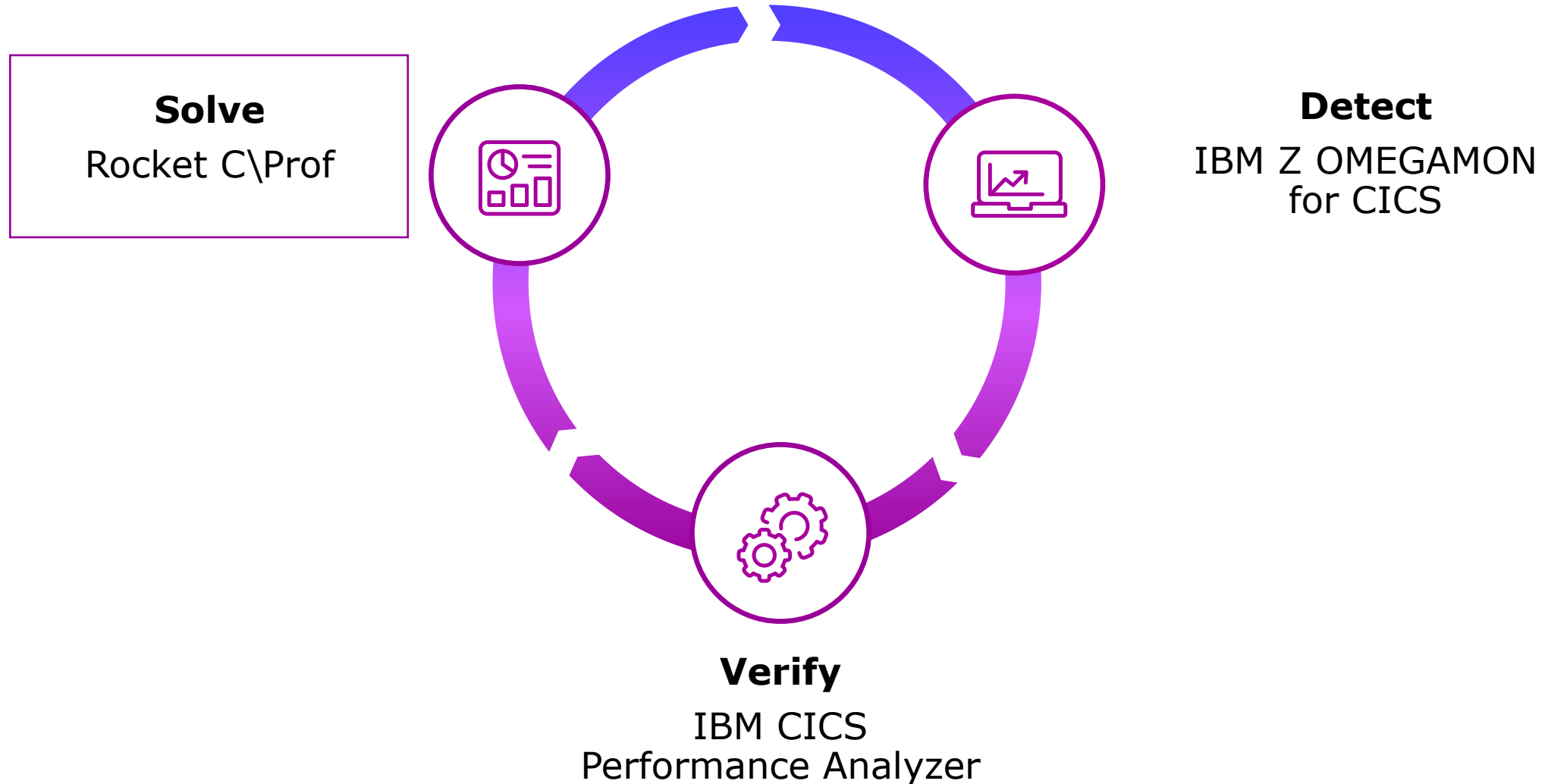
Or This...

Rocket C:\Prof > Transactions in region FUWFTR in group DEMO > Events in BPMT

Tran: BPMT Start: 2023-05-11 13:43:29.397221 Response: 0.400859 Task: 819

Relative Time	APPLID	Program	Elapsed Time	Call	Resource	EIBRESP	TCB	STMT#	OFFSET	Command
0.000114	FUWFTR		0.000114	ATTACH TASK		OK	QR			ATTACH/OK TRANSACTION_TOKEN(27452700 , 0000019C) TRANNUM(0000019C)
0.000200	FUWFTR		0.000200	GETHAIN		OK	QR	SYSE2B		GETHAIN SET('X'28E0E000') FLENGTH(8176) INITIMG('X'00') NOSUSPEND CICS(DDATAKEY EXECUTABLE SYSEIB ASH
0.000501	FUWFTR	HBKPSD1	0.000501	ATTACH TASK		OK	QR			ATTACH/OK TRANSACTION_TOKEN(264CA700 , 0012871C) TRANNUM(0012871C)
0.000529	FUWFTR	HBKPSD1	0.000529	GETHAIN		OK	QR	SYSE2B		GETHAIN SET('X'2648C000') FLENGTH(8176) INITIMG('X'00') NOSUSPEND CICS(DDATAKEY SYSEIB ASH
0.000600	FUWFTR	HBKPSD1	0.000600	START PROGRAM	HBKPSD1	OK	QR			START_PROGRAM PROGRAM(HBKPSD1) CEDF_STATUS(CEDF) EXECUTION_SET(FULLAPI) ENVIRONMENT_TYPE(EXEC) SYNCONRETURN(NO) LANGUAGE_BLOCK(267FCF54) COPIAREA(00000000 , 00000000) LINK_LEVEL(1) SYSEIB_REQU...
0.000609	FUWFTR	HBKPSD1	0.000609	GETHAIN		OK	QR	00000481	SYSE2B	GETHAIN SET('X'2858C8D0') FLENGTH(4520) EXECUTABLE SYSEIB ASH STHT_#(00000481)
0.000626	FUWFTR	HBKPCOH1	0.000626	LINK	HBKPCOH1	OK	QR	00066	+0014E2	LINK PROGRAM('HBKPCOH1') COPIAREA('BPHT 1234567890 0000000000000100(0000000000000100(PA') LENGTH(282) COBOLII STHT_#(00066)
0.000632	FUWFTR	HBKPCOH1	0.000632	GETHAIN		OK	QR	00000481	SYSE2B	GETHAIN SET('X'285166B8') FLENGTH(5424) EXECUTABLE SYSEIB ASH STHT_#(00000481)
0.000635	FUWFTR	HBKPCOH1	0.000635	GETHAIN		OK	QR	00128	+001604	GETHAIN SET('X'28517BF8') FLENGTH(100) INITIMG('X'40') COBOLII STHT_#(00128)
0.000637	FUWFTR	HBKPCOH1	0.000637	GETHAIN		OK	QR	00134	+001606	GETHAIN SET('X'28517C78') FLENGTH(16) INITIMG('X'40') COBOLII STHT_#(00134)
0.000639	FUWFTR	HBKPCOH1	0.000639	GETHAIN		OK	QR	00137	+001718	GETHAIN SET('X'28517C98') FLENGTH(24) INITIMG('X'40') COBOLII STHT_#(00137)
0.000641	FUWFTR	HBKPCOH1	0.000641	GETHAIN		OK	QR	00215	+00183C	GETHAIN SET('X'28517CC8') FLENGTH(8) INITIMG('X'40') COBOLII STHT_#(00215)
0.000644	FUWFTR	HBKPCOH1	0.000644	HORIZOR		OK	QR	00221	+001C04	MONITOR POINT(2) DATA1('..SM') DATA2('...') ENTRYNAME('DFHAPPL') COBOLII STHT_#(00221)
0.000645	FUWFTR	HBKPCOH1	0.000645	HORIZOR		OK	QR	00227	+001C22	MONITOR POINT(1) DATA1('..SM') DATA2('...') ENTRYNAME('DFHAPPL') COBOLII STHT_#(00227)
0.000647	FUWFTR	HBKPCOH1	0.000647	FREEMAIN		OK	QR	00233	+001D38	FREEMAIN DATAPOINTER('X'28517CC8') COBOLII STHT_#(00233)
0.000653	FUWFTR	HBKPCOH1	0.000653	LINK	HBKPCOH1	OK	QR	00191	+001954	LINK PROGRAM('HBKPCOH1') COPIAREA('00000000') LENGTH(7) COBOLII STHT_#(00191)
0.001055	FUWFTR		0.001055	ATTACH TASK		OK	QR			ATTACH/OK TRANSACTION_TOKEN(280B1700 , 000379C) TRANNUM(000379C)
0.001204	FUWFTR	DFHPIRS	0.001204	GETHAIN		OK	QR	SYSE2B		GETHAIN SET('X'240E0000') FLENGTH(8176) INITIMG('X'00') NOSUSPEND CICS(DDATAKEY EXECUTABLE SYSEIB ASH
0.001237	FUWFTR	DFHPIRS	0.001237	START PROGRAM	DFHPIRS	OK	QR			START_PROGRAM PROGRAM(DFHPIRS) CEDF_STATUS(CEDF) EXECUTION_SET(FULLAPI) ENVIRONMENT_TYPE(EXEC) SYNCONRETURN(NO) LANGUAGE_BLOCK(29187D40) COPIAREA(00000000 , 00000000) LINK_LEVEL(1) SYSEIB_REQU...
0.001248	FUWFTR	DFHPIRS	0.001248	LINK	HBKPCOH1	OK	QR	+002000		LINK PROGRAM('HBKPCOH1') COPIAREA('00000000') LENGTH(7) ASH
0.001303	FUWFTR	HBKPCOH1	0.001303	READQ TD	HBK1	OK	QR	00054	+001356	READQ TD QUEUE('HBK1') INTO('00000006') LENGTH(7) NOSUSPEND COBOLII STHT_#(00054)
0.001317	FUWFTR	HBKPCOH1	0.001317	WRITEQ TD	HBK1	OK	QR	00070	+00142E	WRITEQ TD QUEUE('HBK1') FROM('00000007') LENGTH(7) COBOLII STHT_#(00070)
0.001322	FUWFTR	HBKPCOH1	0.001322	WRITEQ TS	HINIBANK	OK	QR	00082	+001404	WRITEQ TS QUEUE('HINIBANK') FROM('00000007') LENGTH(7) AUXILIARY COBOLII STHT_#(00082)
0.001343	FUWFTR	HBKPCOH1	0.001343	READQ TS	HINIBANK	OK	QR	00090	+001588	READQ TS QUEUE('HINIBANK') INTO('00000007') LENGTH(7) ITEM(1) COBOLII STHT_#(00090)
0.001347	FUWFTR	HBKPCOH1	0.001347	DELETEQ TS	HINIBANK	OK	QR	00099	+001602	DELETEQ TS QUEUE('HINIBANK') COBOLII STHT_#(00099)
0.001350	FUWFTR	HBKPCOH1	0.001350	RETURN		OK	QR	00107	+001674	LINK PROGRAM('HBKPCOH1') COPIAREA('00000007') LENGTH(7) COBOLII STHT_#(00107)
0.001506	FUWFTR	HBKPCOH1	0.001506	LINK	HBKPCOH1	OK	QR	00300	+002280	LINK PROGRAM('HBKPCOH1') COPIAREA(' 1234567890 0000000000000100(PAYMENT TEST ...') LENGTH(241) COBOLII STHT_#(00300)
0.001519	FUWFTR	HBKPCOH1	0.001519	GETHAIN		OK	QR	00000481	SYSE2B	GETHAIN SET('X'28520000') FLENGTH(4304) EXECUTABLE SYSEIB ASH STHT_#(00000481)
0.001525	FUWFTR	HBKPCOH1	0.001525	READ	HBKACCT1	OK	QR	00078	+00140E	READ FILE('HBKACCT1') INTO('1234567890 0999999876210000(') LENGTH(207) RIDFLO('1234567890') KEYLENGTH(20) EQUAL UPDATE COBOLII STHT_#(00078)
0.001717	FUWFTR	HBKPCOH1	0.001717	REWRITE	HBKACCT1	OK	QR	00106	+0016C6	REWRITE FILE('HBKACCT1') FROM('1234567890 0999999876210700(') LENGTH(207) COBOLII STHT_#(00106)
0.002481	FUWFTR	HBKPCOH1	0.002481	RETURN		OK	QR	00135	+001782	RETURN COBOLII STHT_#(00135)
0.002496	FUWFTR	HBKPCOH1	0.002496	FREEMAIN		OK	QR	00000404	SYSE2B	LINK PROGRAM('HBKPCOH1') COPIAREA(' 1234567890 0000000000000100(PAYMENT TEST ...') LENGTH(241) COBOLII STHT_#(00300)
0.002512	FUWFTR	HBKPCOH1	0.002512	LINK	DFHPIRS	OK	QR	00312	+00230E	LINK PROGRAM('HBKPCOH1') COPIAREA(' 1234567890 0000000000000100(PAYMENT TEST ...') LENGTH(241) SYSD('TCIC') COBOLII STHT_#(00312)
0.002541	FUWFTR	DFHPIRS	0.002541	RETURN		OK	QR	+00021E		RETURN ASH
0.002659	FUWFTR		0.002659	ATTACH TASK		OK	QR			ATTACH/OK TRANSACTION_TOKEN(28F59400 , 0012906C) TRANNUM(0012906C)
0.002789	FUWFTR		0.002789	GETHAIN		OK	QR	SYSE2B		GETHAIN SET('X'28FAB000') FLENGTH(8176) INITIMG('X'00') NOSUSPEND CICS(DDATAKEY SYSEIB ASH
0.002840	FUWFTR		0.002840	LINK	HBKPCOH1	OK	QR			LINK PROGRAM('HBKPCOH1') COPIAREA(' 1234567890 0000000000000100(PAYMENT TEST ...') LENGTH(241) ASH
0.002846	FUWFTR	HBKPCOH1	0.002846	GETHAIN		OK	QR	00000481	SYSE2B	GETHAIN SET('X'240E2400') FLENGTH(8000) EXECUTABLE SYSEIB ASH STHT_#(00000481)
0.002971	FUWFTR	HBKPCOH1	0.002971	ADDRESS		OK	QR	00000247	SYSE2B	ADDRESS SYSEIB ASH STHT_#(00000247)
0.002975	FUWFTR	HBKPCOH1	0.002975	LOAD	CSQCOPEN	OK	QR	00000285	SYSE2B	LOAD PROGRAM('CSQCOPEN') SET('X'24EFC000') FLENGTH(3600) ENTRY('X'AAEFC000') SYSEIB ASH STHT_#(00000285)
0.003020	FUWFTR	CSQCOPEN	0.003020	HQOPEN		0	LB+QR		+00029C	APPLICATION-REQUEST HQOPEN - HQCC(00000000) HQRC(00000000)
0.003246	FUWFTR	HBKPCOH1	0.003246	ADDRESS		OK	QR	00000247	SYSE2B	ADDRESS SYSEIB ASH STHT_#(00000247)
0.003252	FUWFTR	HBKPCOH1	0.003252	LOAD	CSQCPUT	OK	QR	00000285	SYSE2B	LOAD PROGRAM('CSQCPUT') SET('X'29EFC000') FLENGTH(3600) ENTRY('X'AAEFC000') SYSEIB ASH STHT_#(00000285)
0.003272	FUWFTR	CSQCPUT	0.003272	HQPUT		0	LB+QR		+000460	APPLICATION-REQUEST HQPUT - HQCC(00000000) HQRC(00000000)
0.003372	FUWFTR	HBKPCOH1	0.003372	ADDRESS		OK	QR	00000247	SYSE2B	ADDRESS SYSEIB ASH STHT_#(00000247)
0.003374	FUWFTR	HBKPCOH1	0.003374	LOAD	CSQCGET	OK	QR	00000285	SYSE2B	LOAD PROGRAM('CSQCGET') SET('X'24EFD000') FLENGTH(3600) ENTRY('X'AAEFD000') SYSEIB ASH STHT_#(00000285)
0.003394	FUWFTR	CSQCGET	0.003394	HQGET		2	LB+QR		+000304	APPLICATION-REQUEST HQGET - HQCC(00000002) HQRC(000007F5)
0.003448	FUWFTR	HBKPCOH1	0.003448	GETHAIN		OK	QR	00000481	SYSE2B	GETHAIN SET('X'24621B38') FLENGTH(8000) EXECUTABLE SYSEIB ASH STHT_#(00000481)
0.003453	FUWFTR	HBKPCOH1	0.003453	WRITEQ TD	CESE	OK	QR	00000412	SYSE2B	WRITEQ TD QUEUE('CESE') FROM(' RRI BPH 20230511134329 HQGET #a1ed * CC : 00000000 * RC : 00000207 *') LENGTH(105) SYSEIB ASH STHT_#(00000412)
0.003478	FUWFTR	HBKPCOH1	0.003478	ADDRESS		OK	QR	00000247	SYSE2B	ADDRESS SYSEIB ASH STHT_#(00000247)
0.003480	FUWFTR	HBKPCOH1	0.003480	LOAD	CSQCCLDS	OK	QR	00000285	SYSE2B	LOAD PROGRAM('CSQCCLDS') SET('X'24EFD000') FLENGTH(3600) ENTRY('X'AAEFD000') SYSEIB ASH STHT_#(00000285)
0.003489	FUWFTR	CSQCCLDS	0.003489	HQCLOSE		0	LB+QR		+000348	APPLICATION-REQUEST HQCLOSE - HQCC(00000000) HQRC(00000000)
0.003504	FUWFTR	HBKPCOH1	0.003504	RETURN		OK	QR	00199	+0002E0	RETURN COBOLII STHT_#(00199)

CICS Performance / Problem Analysis Tasks



Summary

Questions?

Thank you!

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