Problem Analysis and Performance Tuning for CICS

Ezriel Gross - Principal Solutions Advisor

egross@rocketsoftware.com

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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

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Challenges across the Organization

Application Developer

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

LOB Manager

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

IT Manager

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

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

CICS Sysprog

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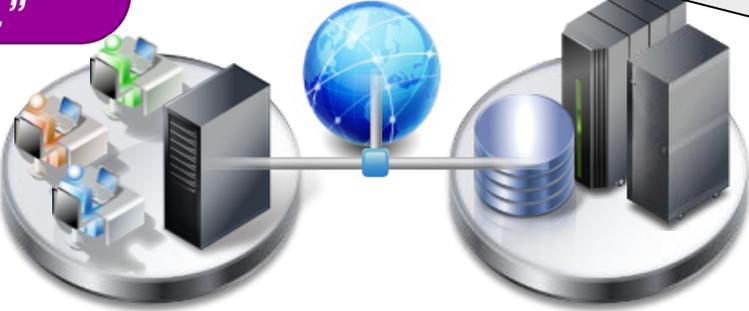
QA Manager

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

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

Change?

Fix problems?

Optimize?
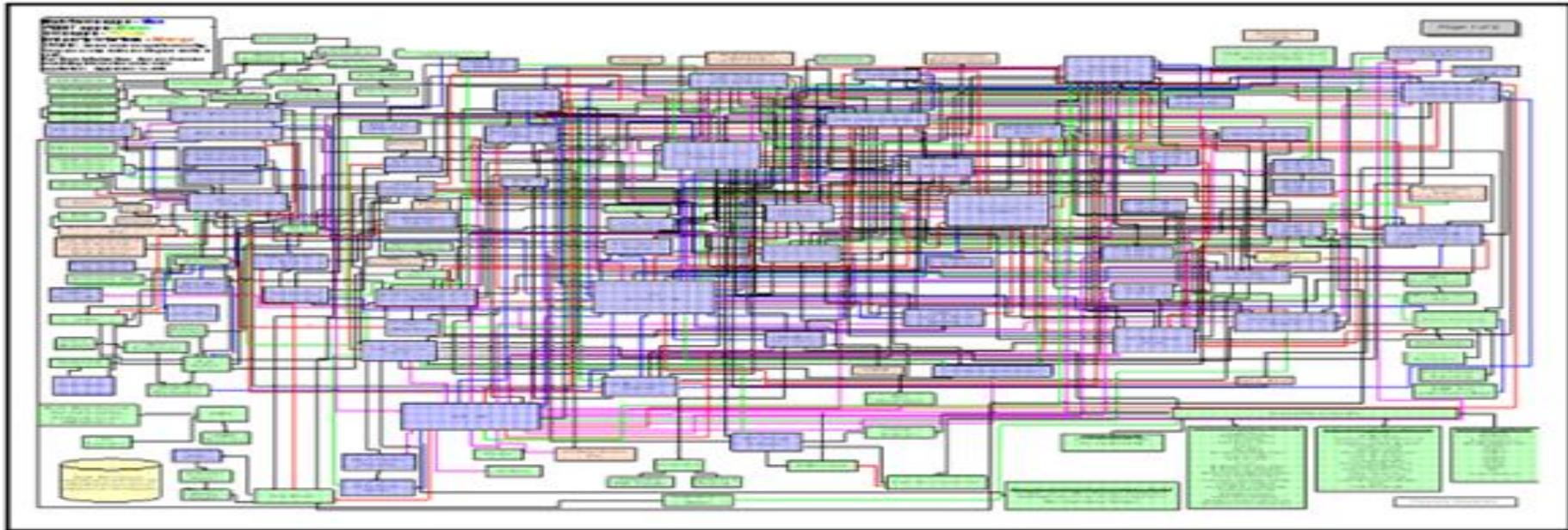
Modernize?

API Enable?

Re-use?

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CICS Problem Analysis / Performance and Tuning

- Where do I start?
  - The Problem determination manual was renamed to "Troubleshooting CICS" as of CICS v5.4
  - On-line version: https://www.ibm.com/docs/en/cics-ts/5.6?topic=troubleshooting
  - PDF Download: https://www.ibm.com/docs/en/SSGMCP_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

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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.
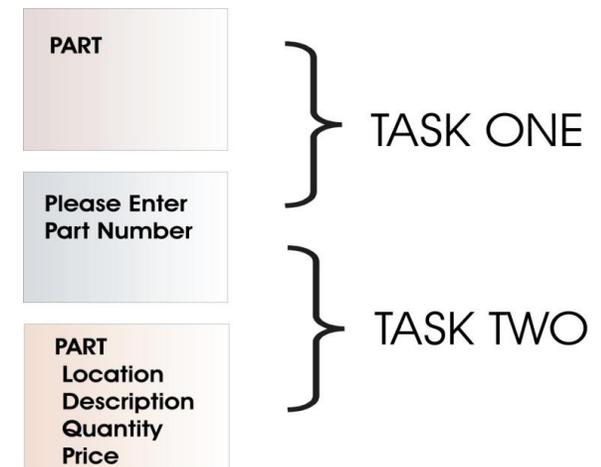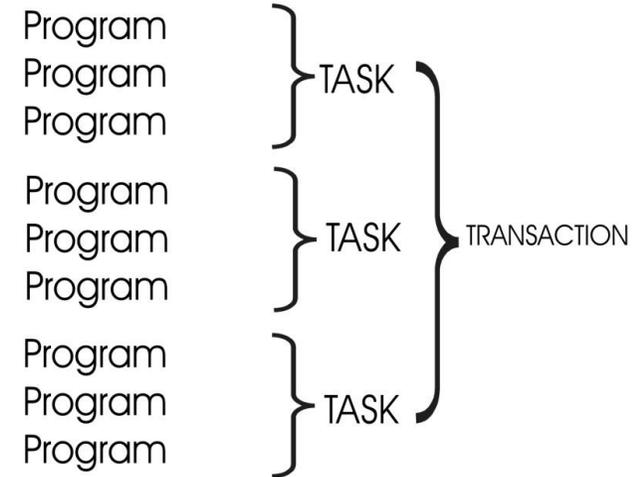
EXEC interface

- 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.

APPLICATION

SYSTEM

COBOL

EXEC CICS ....

DFHETC

COBOL

EXEC CICS ....

DFHEIFC   WAIT?

COBOL

EXEC CICS ....

DFHETS

COBOL

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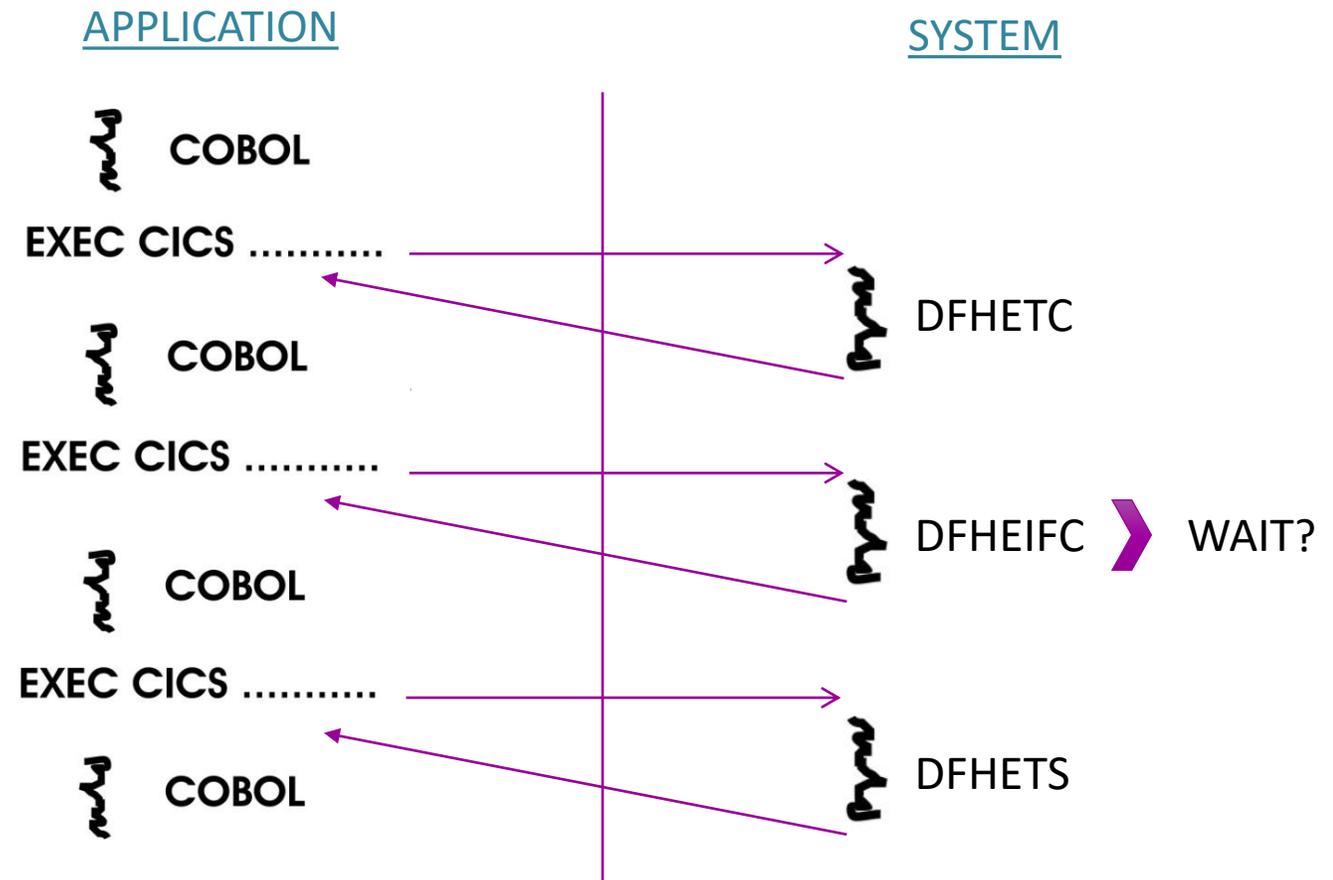
Methodology for Solving Problems

DETECT → VERIFY → SOLVE

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CICS Performance / Problem Analysis Tasks

Deep Dive Application Analysis

Monitoring and alerting

Problem Analysis

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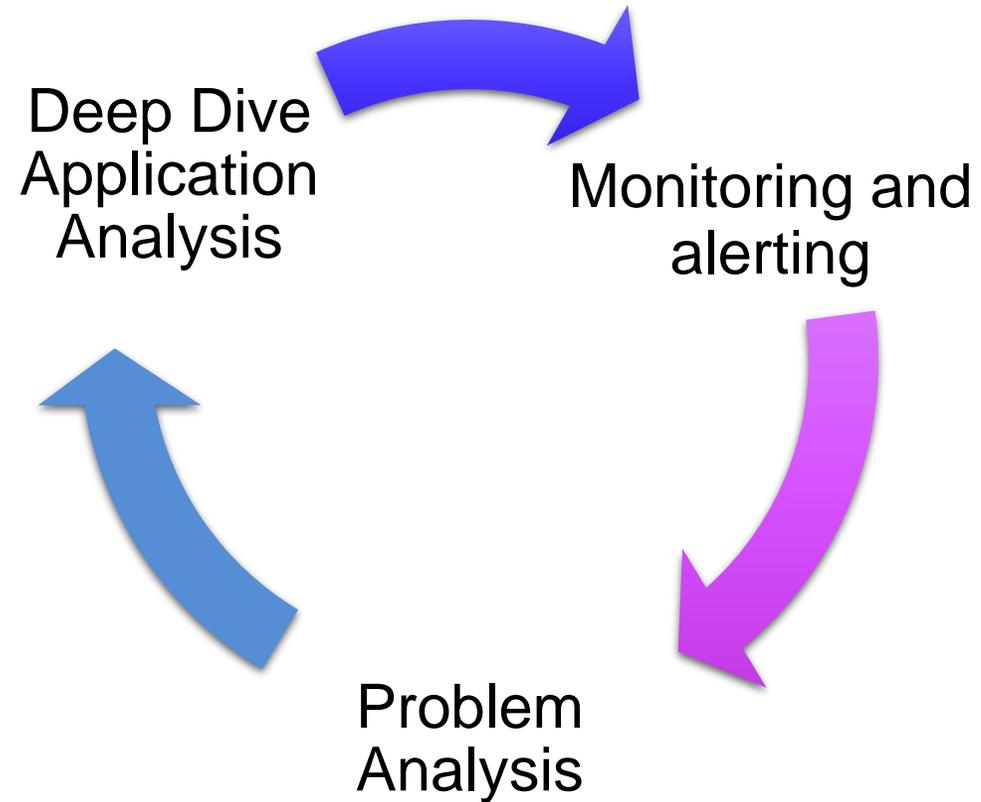
Detect, Verify (Analyze) and Solve

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

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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

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

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

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- 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 Management Tools

Solve
Rocket C\Prof

Detect
IBM Z OMEGAMON
for CICS

Verify
IBM CICS
Performance
Analyzer

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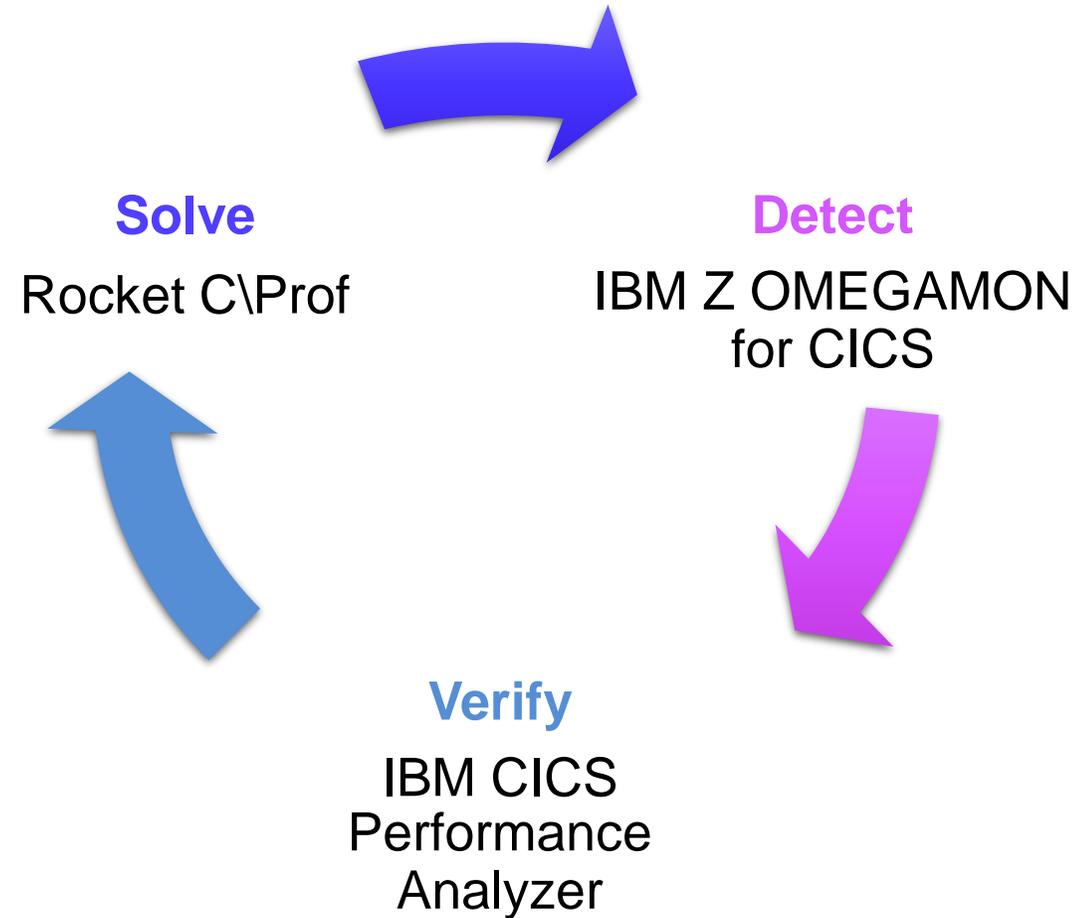
IBM OMEGAMON for CICS

CICS Performance and Problem Management Tools (Detect)

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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**

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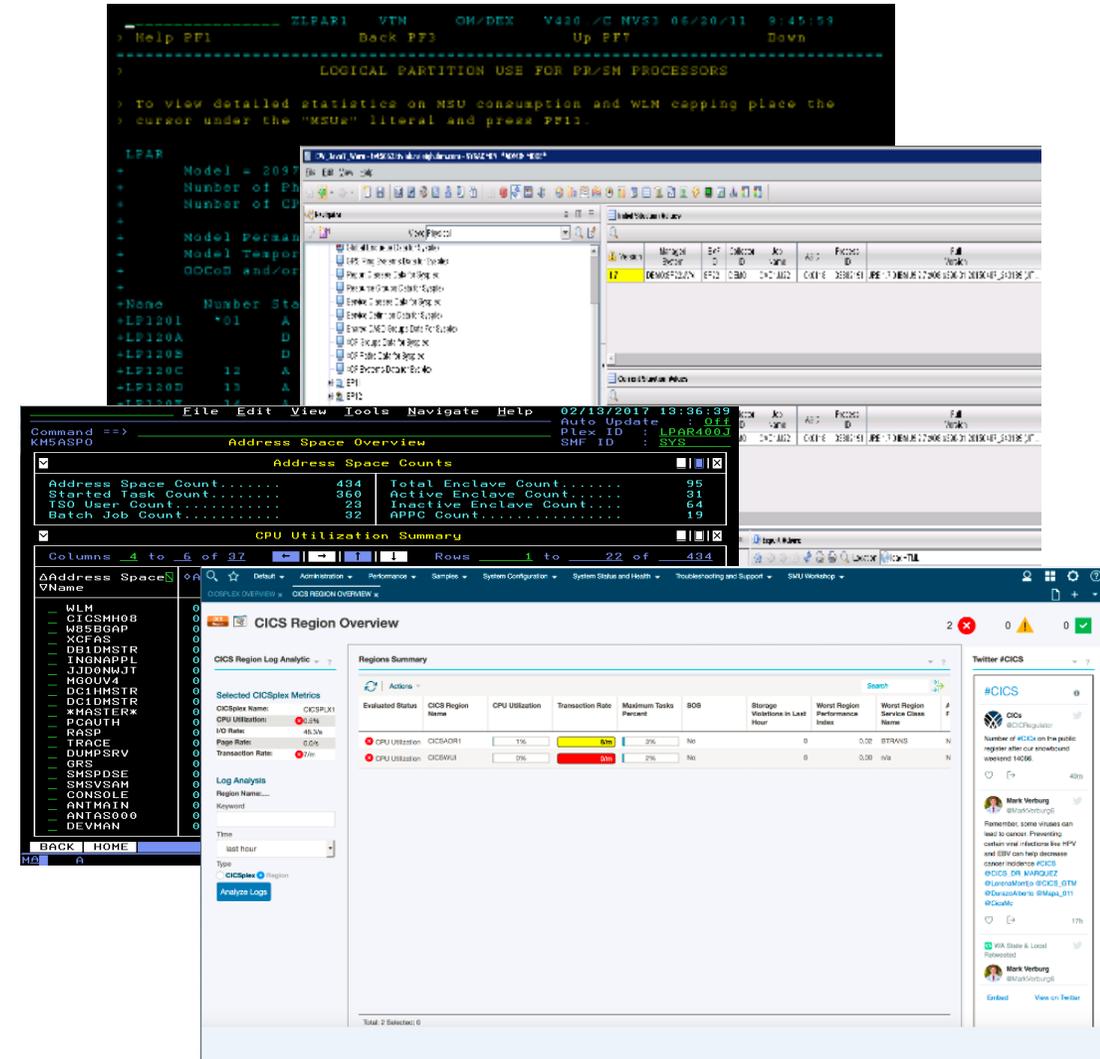
New Features to date in V5.6.0

- 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.

- 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.

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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.

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Checking Overall System Health

Drill down to see the system is operating as expected

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# CICSplex Summary Screen

CICSplex Regions Summary Screen

Region Overview Screen

Analyzing Individual Transactions

Use Task History as Transactions run to quick to catch normally

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Task History Detail Screen - tabs

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.

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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.

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.

Program Aggregation – Region Level

Program Aggregation – Region Level

The program aggregation data displayed with program details.

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…

CICS Performance Management Tools

Solve

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Detect

IBM Z OMEGAMON
for CICS

Verify

IBM CICS
Performance
Analyzer

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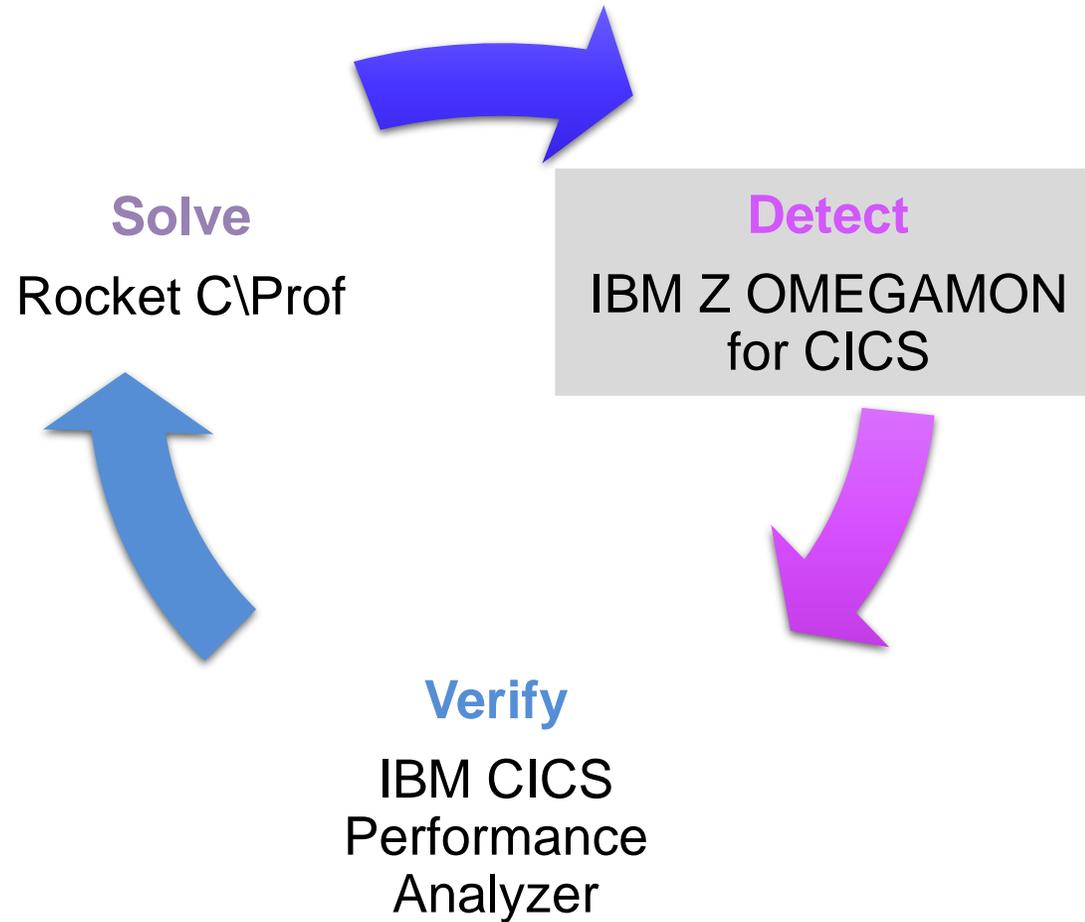
IBM CICS Performance Analyzer – CICS PA

CICS Performance and Problem Management Tools (Verify)

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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

performance and statistics → SMF → reports →
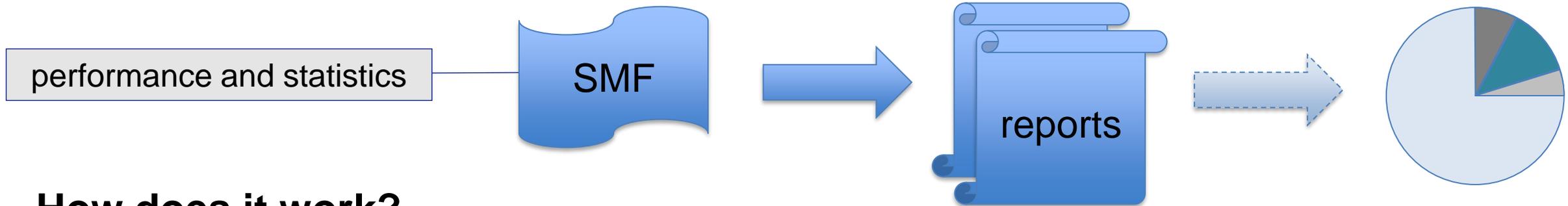
How does it work?

- Uses SMF data as input

- Easy to use interface for report generation (over 250 supplied report forms)

- Performance and statistical analysis

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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				
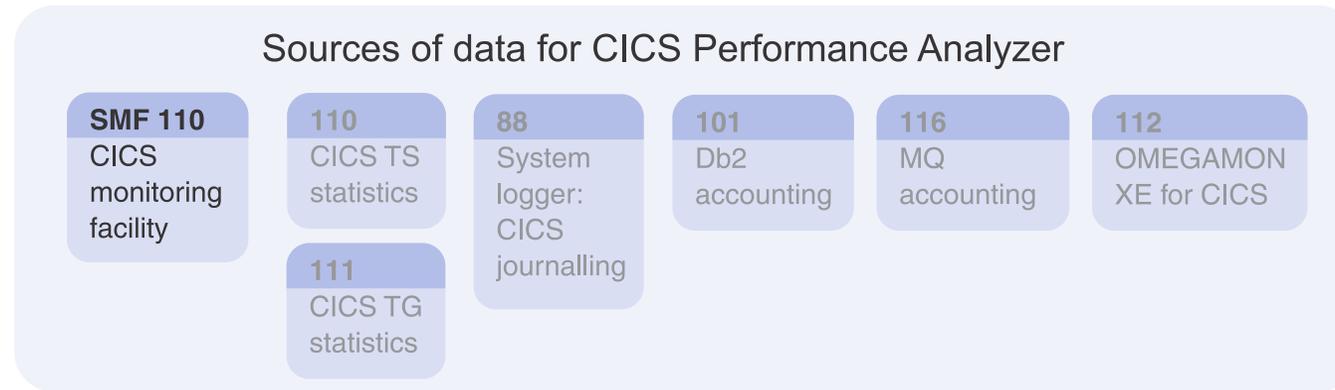
- CMF collects data about all transactions in CICS

- 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

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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

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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				
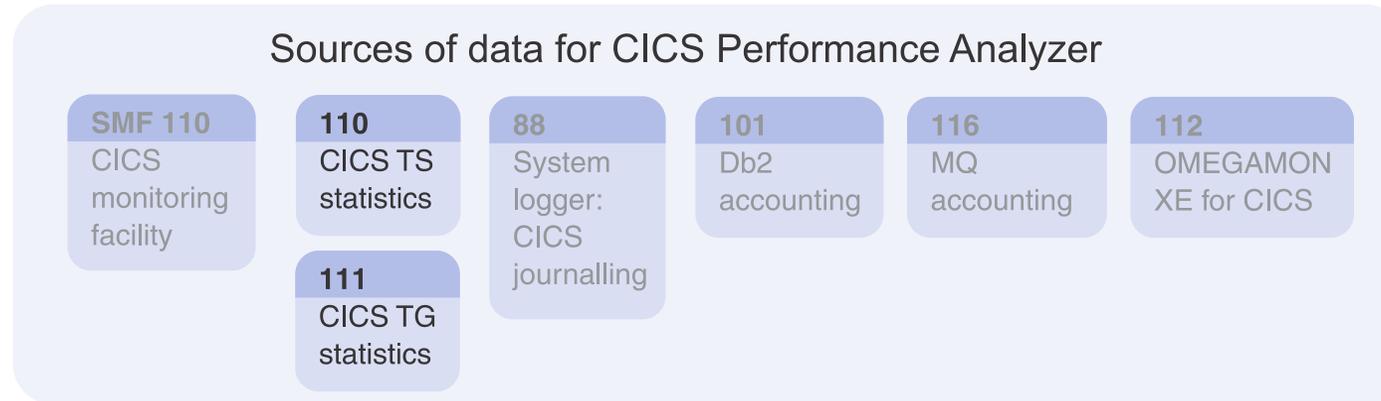
- Statistics domain collects a variety of data and writes it to the SMF data set

- 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, DFH0STAT or CICS PA

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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

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Response time structure of CICS transaction

Total CICS response time

Start   End

Suspend time
SUSPTIME

Dispatch time
USRDISPT

First dispatch delay
DSPDELAY

Dispatch wait
DISPWTT

CPU time
USRCPUT

TCLDELAY
MXTDELAY
other

JCIOWTT   TDIOWTT   LU62WTT
TSIOWTT   IRIOWTT   EXWTTIME
TCIOWTT   SZWAIT   RMISUSP
FCIOWTT   LU61WTT   ENQDELAY

PC load
PCLOADTM

Involuntary
MVS wait time

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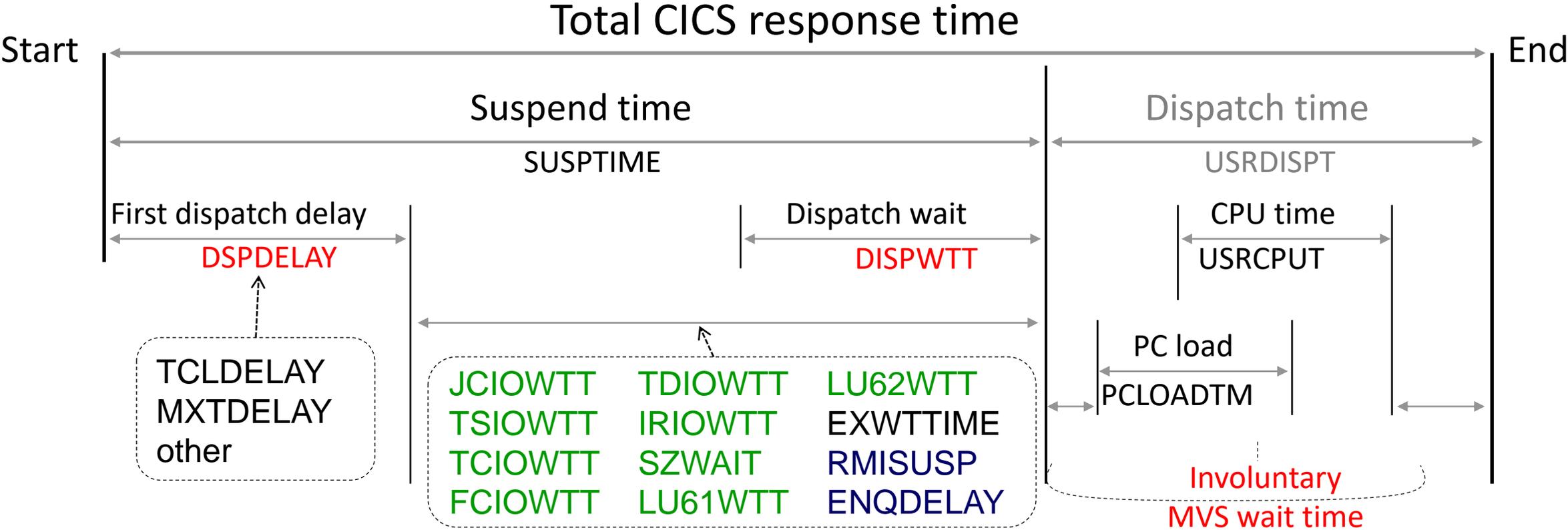
Response time

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

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Suspend time breakdown

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

First dispatch delay includes
TRANCLASS delay and MXT delay

Total I/O wait time =
 (terminal I/O wait time +
 temporary storage I/O 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 (CFDT) I/O wait time +
 inbound socket I/O wait time +
 outbound 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 +
 RRMS/MVS in-doubt wait time +
 3270 bridge partner wait time +
 CFDT server sync point wait time +
 MVS storage constraint wait time +
 dispatchable waits wait time)

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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

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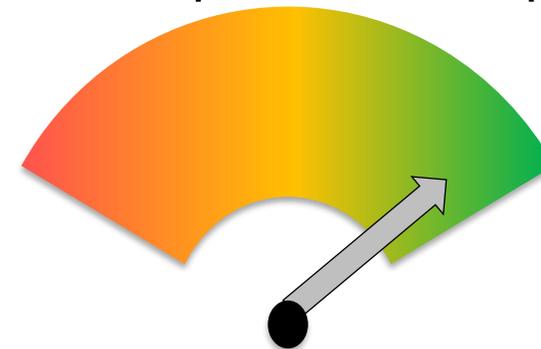
Benefits of using CICS PA

- 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

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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 CPU Time	Avg Suspend Time	Max Suspend Time	Avg DispWait Time	Avg FC Wait Time	Avg FCAMRq Count	Avg IR Wait Time	Avg SC24UHW Count	Avg SC31UHWM 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	wclosingmethodrecommend	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

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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

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Visualization with Splunk or Elastic Dashboards
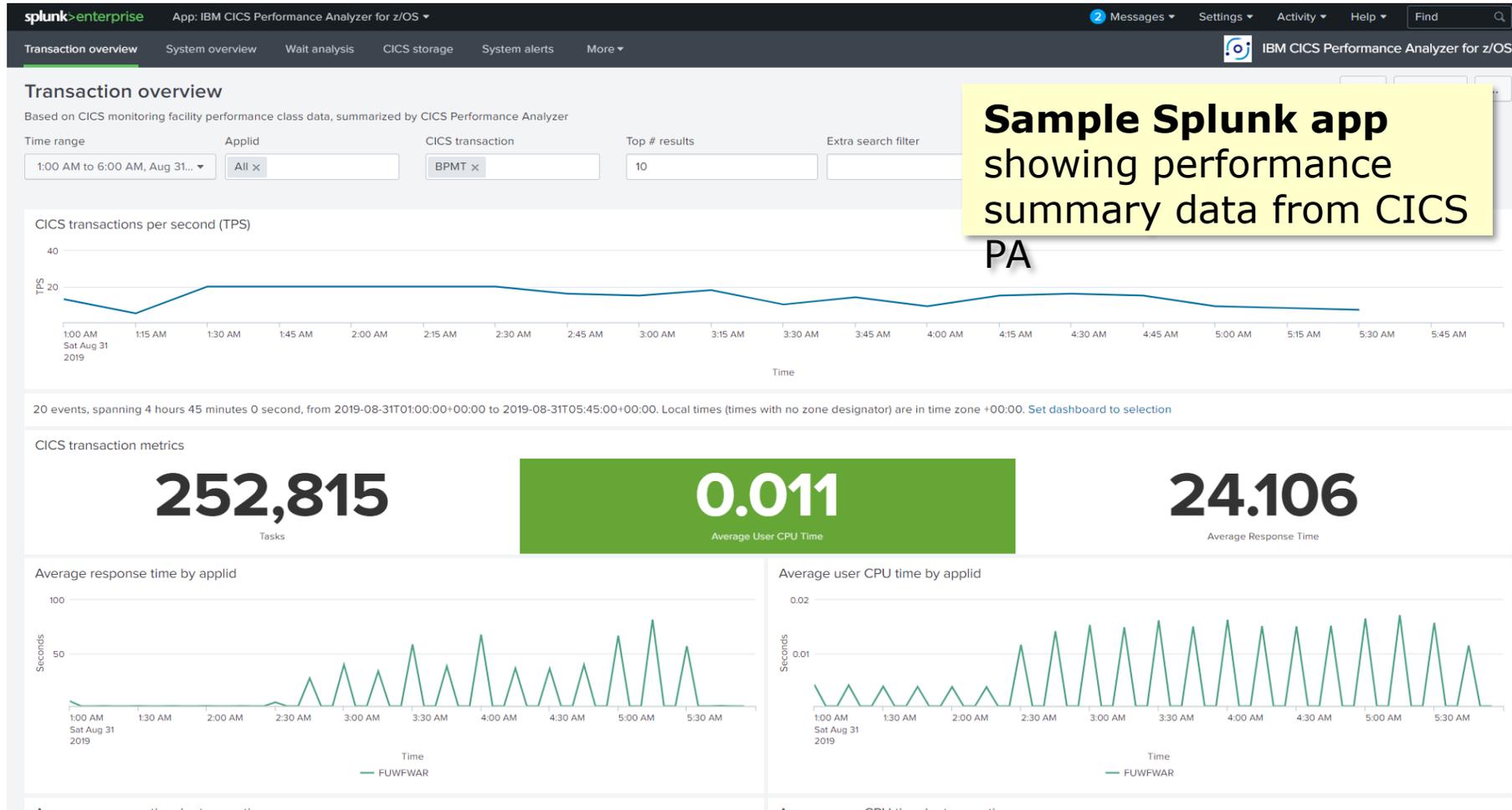
Sample Splunk app showing performance summary data from CICS PA

Sample Splunk app

Visualization with Splunk or Elastic Dashboards

CICS Performance Management Tools

Solve

Rocket C\Prof

Detect

IBM Z OMEGAMON
for CICS

Verify

IBM CICS
Performance
Analyzer

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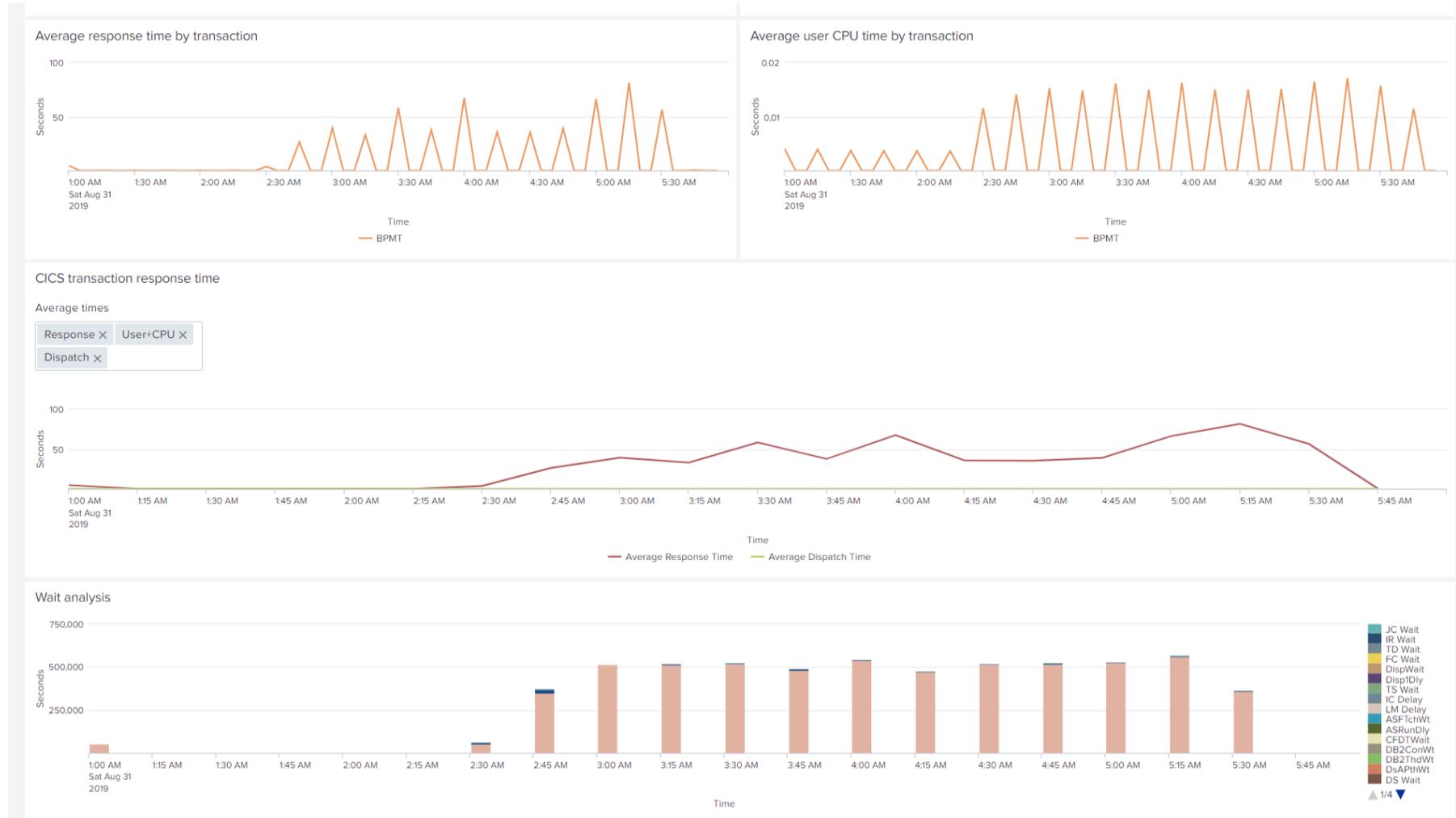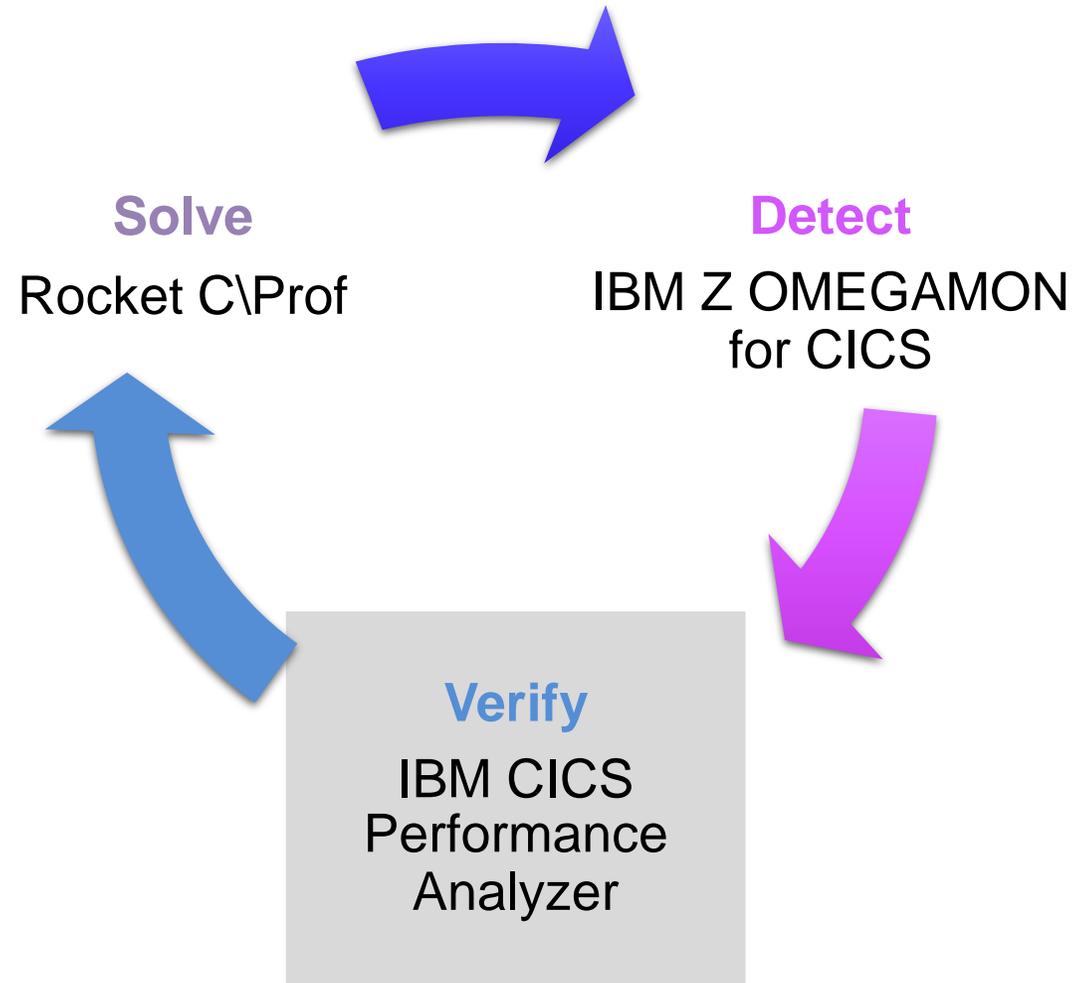
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CICS Performance and Problem Management Tools (Solve)

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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:
  - o Inexpensive to capture
  - o Simple to interpret

- C\Prof **unlocks** the hidden value of the trace
  - o Low CPU usage means you can run it in production
  - o Ideal for permanent use in development environments

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How does it work?

- **Collector runs in separate MVS address space**
  - Peeks inside CICS to look at CICS internal trace
  - <mark>CICS is unaware that this is happening</mark>

- **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
  - <mark>Supports regions using MRO</mark>
  - Collect using the C\Prof server, or generate JCL to submit ad hoc batch collection requests

C\Prof collector

CICS internal trace

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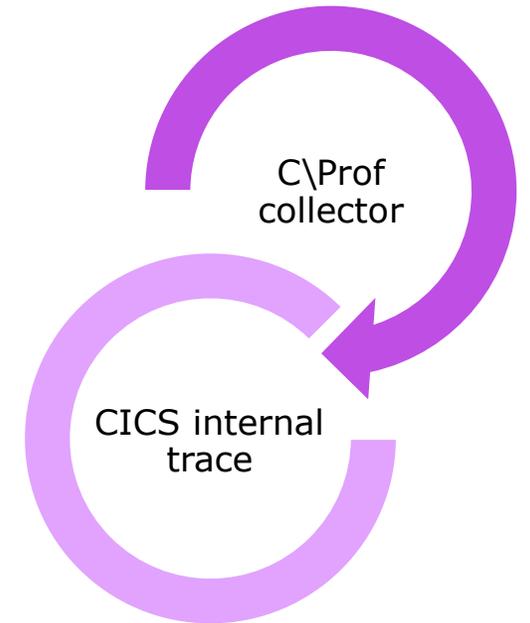
Highlights: C\Prof

- 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
  - <mark>Drill down to application events, performance information, transaction breakdown by program, trace event "deep dive"</mark>

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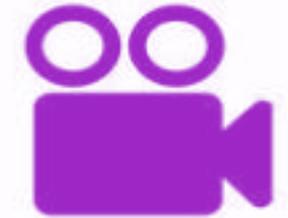
- **Snap (snapshot)**
  - Take a point-in-time snapshot of the CICS internal trace
    - Captures a **copy** of what is currently there
  - *Effect?*
    - Snap looks **backward** to see what recently occurred in CICS
  - Works even if the collector was not running at the time
  - Combine with automation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

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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...............   *

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