

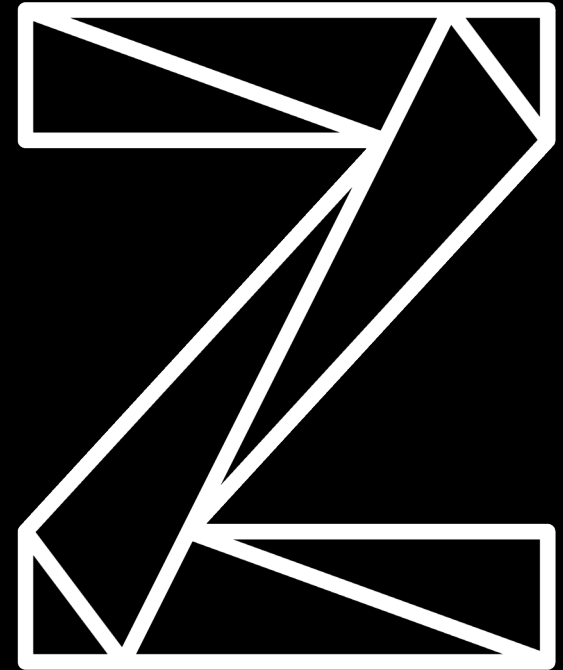
# Application Performance Analyzer for zOS

v14.1 client presentation

**Lamar Woods**

[woodslam@us.ibm.com](mailto:woodslam@us.ibm.com)

Brand Technical Specialist (Certified)  
IBM Devops on Z, Communications/CSI Sector



# Digital Transformation is a key focus for every industry

*Goal: Integrate digital technology into all areas of businesses to deliver value to customers and drive business growth*

**Banking and  
Financial  
Services**



**Government**



**Healthcare**



**Energy &  
Utilities**



**Automotive**



**Retailers**



# The **mainframe** and enterprise assets are at the center of a **digital enterprise**



## **Virtually Limitless Scale**

**1.3 million CICS** transactions are processed every second, every day...**20X** the number of Google searches.



## **Trusted Computing**

The **highest level of security** certification for commercial server and **99.999%** application availability.



## **Enterprise Data Serving**

Over **80%** of all corporate structured data



**Business Critical Applications Serving \$3T** of all daily commerce flows through **COBOL Applications**

# Digital Transformation is driving requirements at unprecedented pace for every industry

The best way to accelerate digital transformation for Z clients is to **"Modernize in place"**

Deliver new compiler features to enable developers to extend business critical applications to support new environments (e.g. web, mobile, cloud)

Enable new programming languages on z/OS

Enterprise COBOL v6.3



Java

Automatic Binary Optimizer v2.1

IBM SDK for Node.js – z/OS v12



Enterprise PL/I v5.3

IBM Open Enterprise Python on z/O



z/OS v2.4 XL C/C++

Go



# The Anatomy of Legacy Mainframe Applications

What the distributed world should know about Mainframe Applications

## Highly Specialized

- Learning curves tend to be significantly longer without modern tooling and processes
- Most mission critical applications are written in COBOL

## Large and Complex

- Hundreds or more programs make up an application and each program is compiled individually
- Execution can be batch or online
- Exceptions are converted to abends with tools available to analyze abends

## Highly Secure Applications and Data

- Access to applications and data is much more locked down
- Mainframe is the most secure enterprise system

## Performance Impact to Systems of Engagement

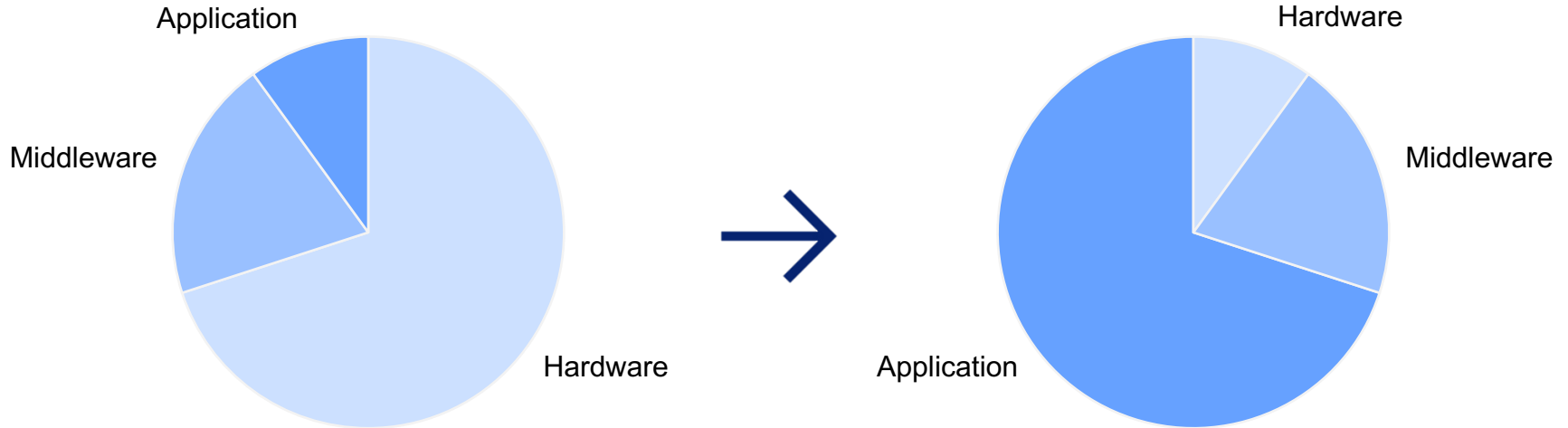
- Decades long applications not written for today's hardware
- Mainframe applications provide back-end support
- Poor performance increases costs

# Application Performance and Z hardware

Performance on modern IBM Z hardware is delivered via a combination of hardware features and compiler support.

To improve performance, you'll need to:

- Recompile
- Optimize
- Refactor...



# Tools Available to Analyze and/or Boost Performance

*Analyze and Boost the performance of your COBOL applications in order to reduce costs and shorten your programs execution time*



*Application Performance Analyzer for z/OS (APA)*




The Automatic Binary Optimizer (ABO)

***Enterprise COBOL  
for z/OS V6.3***

## What is **APA**?

A tool that performs **application performance tuning** for applications running on z/OS systems

 **Application performance tuning** – the process of minimizing the amount of time and system resources (CPU, IO, etc.) that an application uses

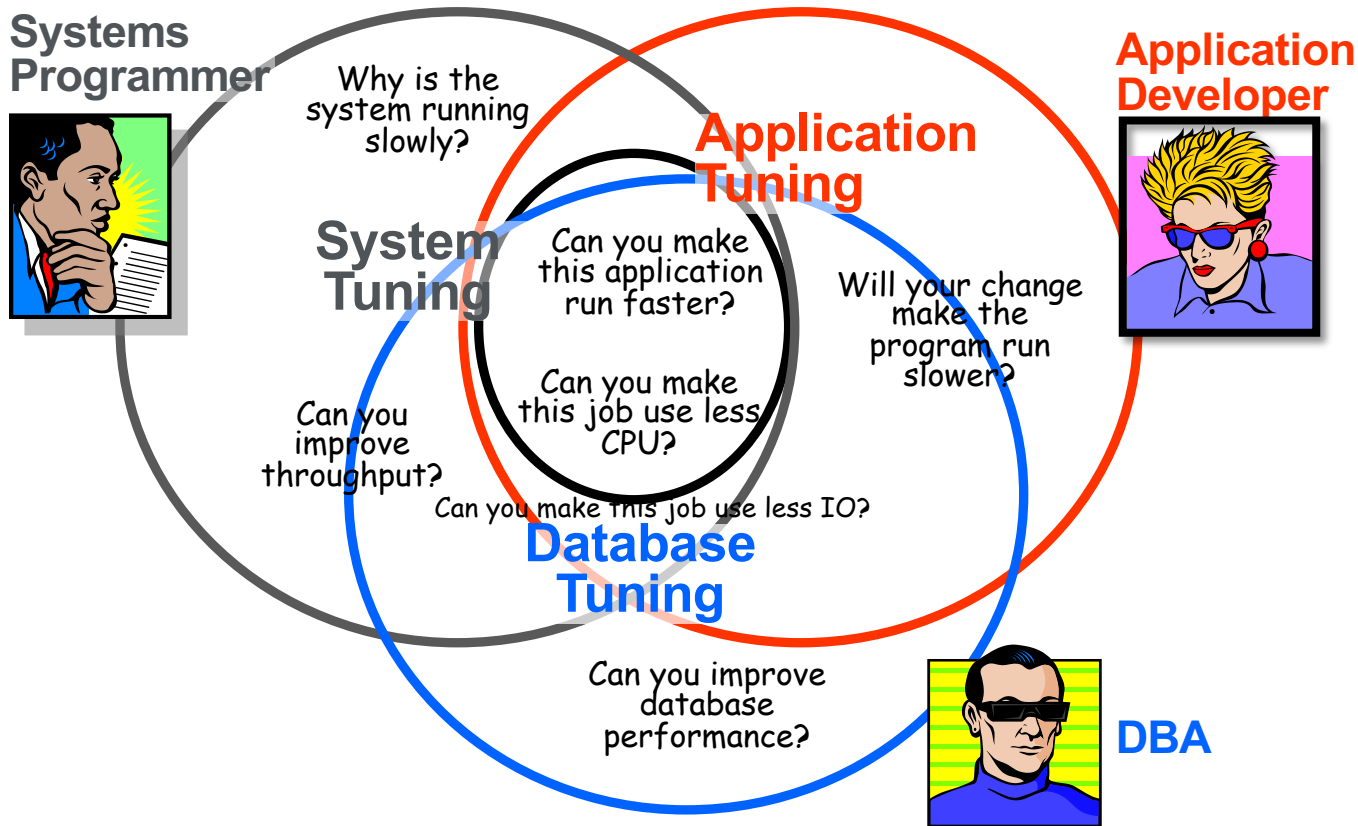
Included in Application Delivery Foundation for z/OS (ADFz) product suite

# Answers the question:

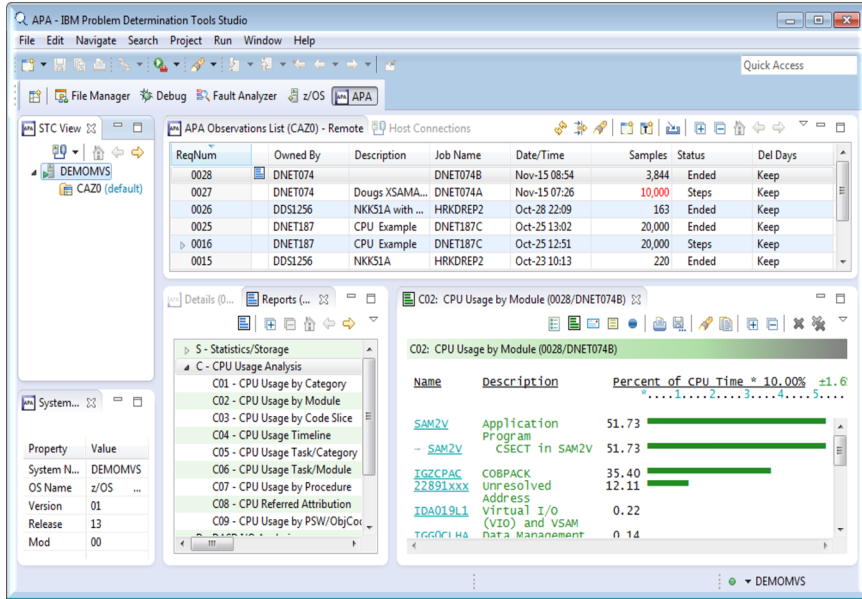
# Where does the application spend its time?



# Who does performance tuning?



# Application Performance Analyzer



Developer for z Systems  
Enterprise Edition

Fault Analyzer for z/OS

Application  
Delivery  
Foundation for  
z Systems

File Manager for z/OS

Application  
Performance  
Analyzer for z/OS

- Improve **response time** and minimize **resource consumption**
- CICS, IMS, DB2, MQ
- COBOL, PLI, ASM, JAVA

- Automatic job monitoring
- Reports help to identify bottlenecks
- **Eclipse** or 3270 UI

Built on IBM Explorer for z/OS Aqua

# IBM Application Performance Analyzer for zOS



## Key Capabilities

- Non-intrusive collection of performance and statistical data
- Pinpoint and fix bottlenecks easily
- Report and track historical changes over time
- Support application development, enhancements and debugging

## Benefits

- System and resource application usage no longer hidden
- Takes minutes what would take an entire team days
- Identify and correct issues quickly, so enterprises can maintain CI/CD timelines
- Early-career users can easily improve transaction response times and batch throughput
- PDF and .XML reports can be shared with event monitoring tools, IT managers, executives, and across the enterprise

**IBM Application Performance Analyzer for z/OS** is trusted by DevOps and Agile teams to continuously improve mainframe application performance across the entire software development lifecycle.

Quick and efficient identification of application performance issues allow enterprises to:

- avoid technical debt accumulation
- reduce MSU consumption
- delay costly/unnecessary hardware upgrades
- exceed customer sat and SLAs.

## Leader in Java® insights

IBM Application Performance Analyzer for z/OS can help supplement mainframe DevOps, Agile, and hybrid cloud modernization initiatives.

Detailed Java insights have long been a strength of this powerful performance analysis tool. And in our recent version we've enhanced Java reporting with Simultaneous Multi-threading (SMT) metrics for deeper understanding into your Java and zIIP-eligible workloads.

## Enhanced user experience

IBM Application Performance Analyzer for z/OS is the only Eclipse-based Graphical User Interface that integrates seamlessly with the IBM Application Delivery Foundation for z/OS experience.

While other GUIs may claim integration with IBM tools, the actual user experience will always be lackluster.

## Day one support

IBM Application Performance Analyzer for z/OS offers Day One support for z/OS, popular mainframe language and compilers, subsystems, and middleware.



# Features of **APA**



*Provides formatted analysis reports with info regarding:*

- CPU Usage
- WAIT Time
- Db2
- CICS
- IMS Calls
- DASD Usage
- HFS Usage
- MQ
- Storage
- Java
- ...and more



*Runs in its own address space and does not increase resource usage*



*Supports COBOL, PL/I, C/C++, Java, Assembler*



*User can view and print analysis reports*

## Why use **APA**?

*APA is a solution to help ensure CI/CD Pipelines, Devops and Agile Teams deliver value fast and efficiently*



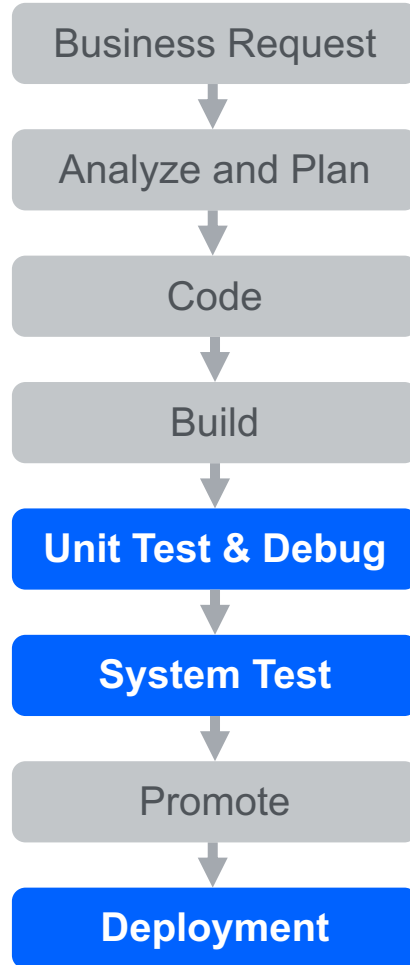
Reduce CPU Consumption in applications



Maximize Utilization of Existing Hardware



Reduce operational and maintenance costs



# When to use **APA**?

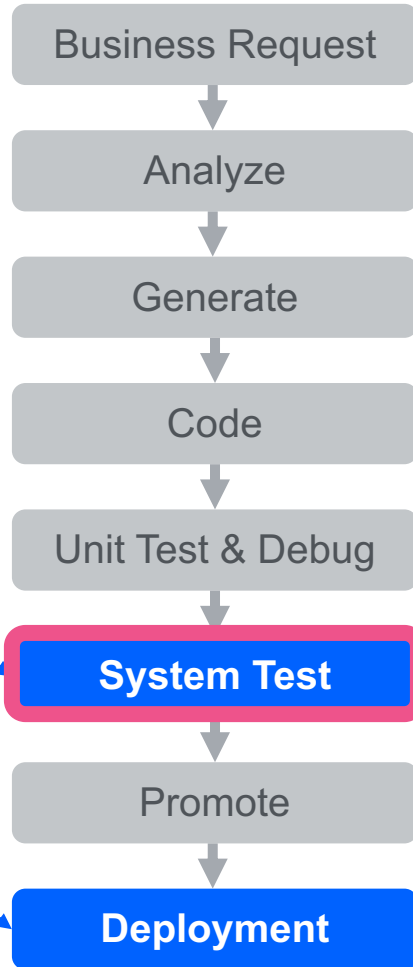
*In the **Development Cycle** visualized to the right, APA helps developers in the two areas highlighted.*



Prevent problems in new & modified applications



Resolve production performance problems



# When to use **APA**?

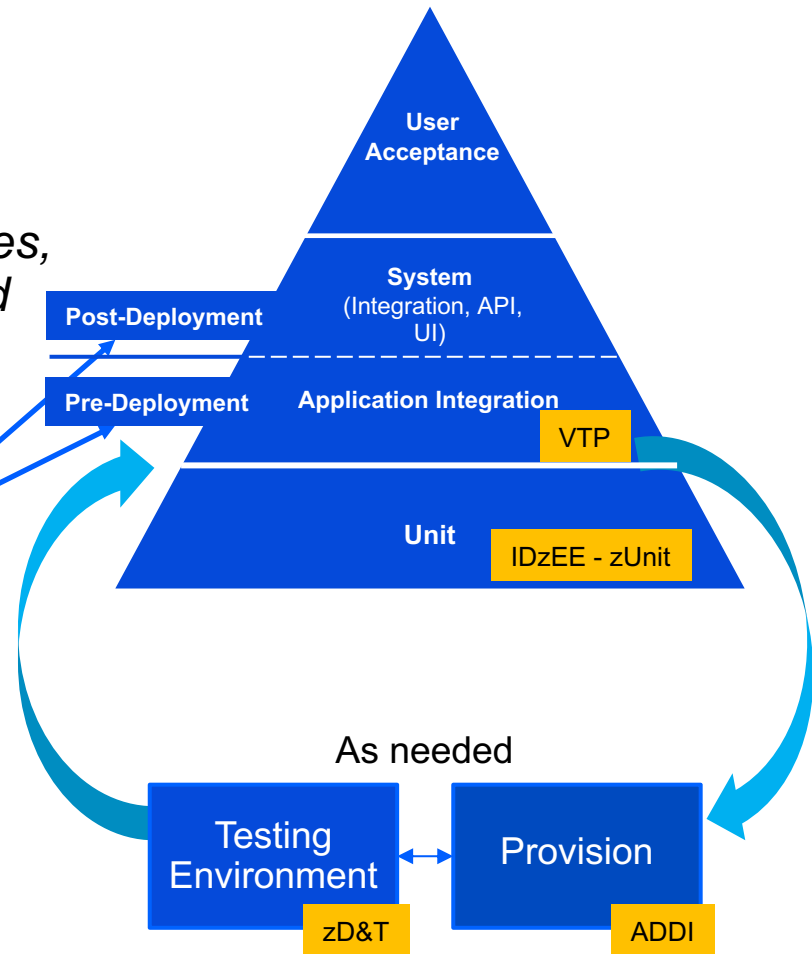
*APA is a solution to help ensure CI/CD Pipelines, Devops and Agile Teams deliver value fast and efficiently*



Prevent problems in new & modified applications



Resolve production performance problems





# How Does **APA** Work?

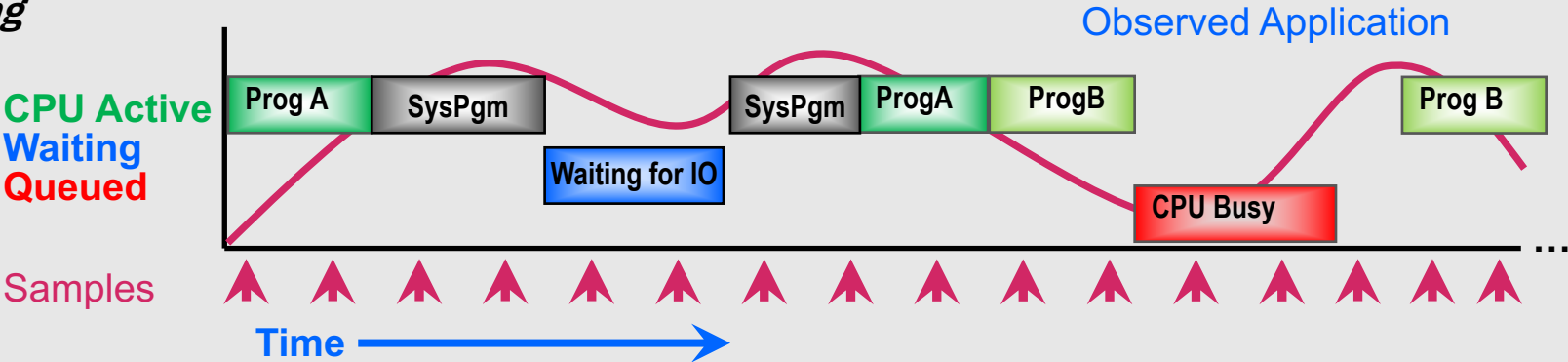


Collects detailed performance information by **sampling**



Processes the information and writes reports based on it

## *Sampling*



# First, request an Observation Session



Use the online interface to request a session

Observation Requests can be entered for the following:



**New Observation**

**Schedule New Measurement**

Job Information Options Multi Steps Active Jobs Subsystems Schedule Sched Options

System ALL

Job Name/Pattern TSS14A Get Active Jobs

Inactive

Step Specification

Step Number 1 Specify step number, program, step name or step name + proc step name. Use 'Multi Steps' tab to specify more than one step

Program Name

Step Name

Proc Step Name

Description Measure SAM1, SAM2 and SAM3 performance

Number of Samples 10000 Measure to step end

Duration (min:sec) 1:00 Delay by (secs)

Notify TSO User Retain file for (days) 10

USS observations Max. 25

Submit Cancel Preview

- Job that is already running
- Job that is not running yet
- Multiple Jobs simultaneously
- Batch Job Threshold Criteria met
- Future Observation Requests
- CICS Regions and transactions
- IMS Regions and transactions
- DB2 Stored Procedures and User Defined functions
- ...and more

# Once complete, download reports for analysis



Right click the observation to download reports

## Sample S01 Report



APA Observations List (CAZE) - Remote

ReqNum	Owned By	Description	Job Name	Date/Time	Samples	Status	Del Days
00105	TSS14		PROD05	Oct-10-2016 09:29	10,000	REPEAT	Keep
00104	TSS14		TSS14S2	Oct-10-2016 09:29	1,000	Ended	89
00103	TSS14		TSS14S1	Oct-10-2016 09:29	1,000	Ended	89
00099	TSS14			-10-2016 08:43	976	Ended	89
00098	TSS14			-10-2016 08:43	1,000	Ended	89
00088	TSS14			-10-2016 07:48	10,000	Steps	89
00087	TSS14			-10-2016 07:16	322	Ended	89
00086	TSS14	Me	Trigger	-10-2016 07:05	10,000	Steps	9
00085	TSS14	Me	Modify	-10-2016 06:54	10,000	Steps	9
00084	VNDBKN2	TES		-07-2016 12:38	30,000	Ended	86

Details (00103) Reports (00103)

General

Request Number	00103
Request Description	No Descripti
Request Status	Ended
Owner Id	TSS14
Time of Request	Monday Oct
Session Start Time	Monday Oct
Session End Time	Monday Oct 10 2016 09:29:23.78

S01: Measurement Profile (CAZE/00150/TSS14S1)

Overall CPU Activity

Samples	10,000	100.0%
CPU Active	6,002	60.0%
WAIT	3,983	39.8%
Queued	15	0.1%

Reports: C01 C02 C03 C05 C07 W01 W02

CPU Usage Distribution

CPU Active	6,002	100.0%
Application	2,315	38.5%
System	2,720	45.3%
DB2 SQL	0	0.0%
Data Mgmt	54	0.8%
Unresolved	913	15.2%
IMS DLI Call	0	0.0%

Reports: C01 C05 C08 W01

Most CPU Active Modules

CPU Active	6,002	100.0%
IGZCPAC	2,702	45.0%
SAM2V	2,314	38.5%
IDA019L1	29	0.4%
ICYSTOR	15	0.2%
ICYRDNR	9	0.1%

# APA Live Demo



## **Scenario:**

Batch job LWOODS2A is running too long



## **Approach:**

### **Use APA to determine:**

Where does the application spend its time?

### **Interface To Use:**

Eclipse-Based GUI in IBM Developer for zOS

# Your takeaway with **APA**

*Application performance shouldn't be an afterthought. Neglecting this key component can result in expensive rewrites, unnecessary upgrades of hardware capacity, poor customer experiences, and erosion of market share and revenue.*



*Shows which program statement cause the most system resource usage, CPU time, and wait time*



*Uses little resources/ no overhead*



*Works with other z/OS resources – CICS, IMS, Db2, MQ, DASD, ABO etc.*



*Detailed analysis with specific program statements to improve*

# Try IBM Application Performance Analyzer for z/OS today

## New! IBM Application Performance Analyzer for z/OS® Trial

*Free to try!*

Quickly identify and act upon areas of low performance, high CPU consumption, low response time and low throughput in your most critical z/OS applications.

### Learn how to:

Create, initiate, and analyze performance observations for a Java and COBOL batch program.

Exploit source-program mapping and then modify source code statements in a Java and COBOL program.

Create and review a Variance Report to compare the performance of an original and modified program.

# Performance starts now...

## Helpful resources

- Take a deep dive and learn more about [IBM Application Performance Analyzer for z/OS](#)
- Access APA Documentation Library [here](#)
- Test drive our IBM Z solutions at no charge and with no installation [today](#)
- Learn more about the IBM Application Delivery Foundation for z/OS family [here](#)

## Join the conversation

Join the IBM Application Performance Analyzer for z/OS topic group on the new [IBM Z and LinuxONE Community](#).

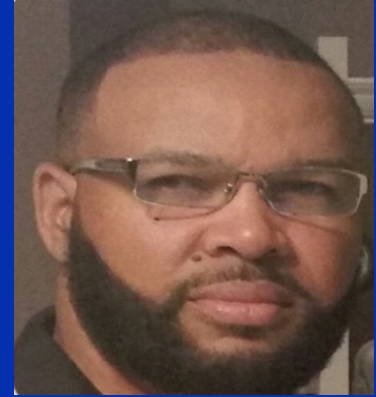
Ask yourself: How critical is application performance in your mainframe computing environment today in meeting the needs of your enterprise?



***Thank  
You***



***Contact  
Information***



**Lamar Woods**

*Client Technical Professional, DevOps on z  
Communications/CSI Sector*

Email:

[woodslam@us.ibm.com](mailto:woodslam@us.ibm.com)

+1-513-469-1469



**IBM**