Peter Enrico's

WLM Performance & Re-evaluating Goals Workshop

A 4-Day Virtual Workshop

An online experience of learning and doing!

Visit www.epstrategies.com for class schedule and pricing.

A Week of Reviewing Your Own Data!

Prior to class we instruct you on what data to bring to class ***from your own systems.*** Then, while in class, you will also be spending a week doing a basic system performance basic Health Check® using the data you supplied. So, if you have not done a basic Health Check® in a while, or have some performance nagging questions, this is a perfect opportunity for combined instruction, time doing analysis, and an opportunity to get input and recommendations from a leading zArchitecture performance expert – Peter Enrico.

You will leave this workshop having done an actual WLM performance analysis! No other z/OS performance seminar, workshop, or z/OS conference offers the level of analysis and value you will gain in this workshop.

This workshop is for you…

- If you want to perform an evaluation of your own WLM Service Definition and goals.
- If you want to ensure your WLM Service Definition is truly correct for your environment.
- If you are an experienced performance analyst but want an in-depth understanding of WLM.
- If you are a novice performance analyst, or new to the field of z/OS, and need to learn about WLM to effectively do your job.
- If you want WLM performance management information and advice.
- If you want to spend a week learning and improving the performance of your own installation.

This workshop is sure to give you a deeper understanding of WLM functions and abilities. *During this WLM workshop, you will analyze your own WLM Service Definition and measurements*. You will learn considerations for when to re-visit and re-evaluate goals over time, and how to better monitor, tune, and control how WLM manages your workloads. Since WLM is more than just understanding service classes and goals, you will also learn about the many other WLM functions that your system could take advantage of for workload balancing and systems management.

Workshop Overview

Understanding the basics of WLM, how WLM works, and how it manages workloads is a big first step towards evaluating your WLM Service Definition and goals. After the basics are covered, the workshop discusses how the z/OS Workload Manager actually works. You will be provided insights into the WLM algorithms and methods used by WLM to solve delays to improve response times and velocities. You will also be made aware of the often-misunderstood methods that WLM uses to manage various workloads such as CICS, IMS, WebSphere, DB2, system started tasks, SAP R/3, ADABAS, IDMS, and more. You will learn about enclaves and application environment and how these constructs are used by WLM and your workloads.
The attendee will learn how to effectively use the WLM controls of service classes and goals, including specific setups and recommendations for each of the many different workloads running on z/OS. You will learn how to interpret WLM related measurements, and you will analyze ***your own*** measurements!

Migrating to goal mode was just the first step. Over time, however, your workloads have changed, or others were added; your systems change; your hardware changes. Such changes should cause you to reevaluate your WLM goals. During this workshop you will learn a variety of methods to revisit and reevaluate your WLM Service Definition and goals. You will learn many specific recommendations targeted towards specific subsystems and workloads.

Class Participation

During this workshop you will analyze your own data and WLM Service Definition. Prior to this workshop, you will be requested to send us a copy of your WLM Service Definition and a set of raw SMF data. We will prepare your data to help ensure your active analysis during the entire week of the workshop. Peter will be available for one-on-one discussions before the workshop, during breaks, and after the workshop.

Performance measurements, analysis, and tuning considerations are discussed throughout. A key strength of this workshop is that Peter does not just teach tuning recommendations, but why each recommendation exists.

Workshop Dates and Location and Prices

This workshop will be held online through Zoom. For dates and prices, please visit www.epstrategies.com for details or email Jamie.Novotny@epstrategies.com.

Instructor: Peter Enrico

Having worked extensively in the MVS performance measurement and tuning area, and with the MVS Workload Manager, Peter Enrico draws from his wealth of experience to help you understand WLM. Past students are always surprised and pleased with the WLM insights that Peter provides in the workshop. Peter is an effective instructor that will give you fresh insight to the MVS Workload Manager, and to the performance management of your workloads. In this workshop, Peter will provide instruction in the manner in which he is known – practical information relevant to your jobs and explained clearly.

Peter Enrico is a recognized expert on WLM, having worked in the MVS Workload Management algorithm design and development teams during his tenure at IBM, and having helped many clients convert to goal mode. He has also helped many more to tune their Service Definitions and exploit new WLM functions.

Contact Peter: Peter.Enrico@epstrategies.com

This workshop is constantly being updated with the latest IBM announcements and the latest performance tuning and management techniques.

For More Information…

For more information on this or other workshops, including prices, please contact:

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Please do not hesitate to call if you would like more information or details on this workshop.

In-house instruction

All workshops are available for private instruction for groups of 5 or more interested students. Please contact us for more information.

Workshop Outline

The following is a high-level outline for this workshop. Since the workshop is constantly being updated, actual workshop content and flow may vary slightly from this outline. **Remember, throughout the class you will be actively analyzing your own WLM Service Definition and SMF measurement data.**

Part I: Introduction and Review of the WLM Concepts and Controls

Don't think of this overview of WLM concepts and controls as being the same material you've been hearing from IBM, and others, for the past number of years. This overview is designed not just to level set with the basics, but also to provide you with additional information not detailed in the WLM manuals or commonly known.

- Service Definitions, Service Policies, Workloads, Service classes, and Service Class Periods
- Goals – Response Time goals, Discretionary goals, Velocity goals, System goals
- Report classes – heterogeneous and homogeneous
- Classification rules
- Resource Groups
- Special protections for critical workloads
- Miscellaneous topics

Part II: Understanding How Workload Manager Works

A big step towards evaluating your WLM Service Definition and goals is gaining an understanding of how WLM works. This section of the workshop does this to allow you to better evaluate and tune your WLM Service Definition and goals.

- Workload Manager algorithm basics, or – 'How WLM works'
  - Basic terminology and concepts
    - Performance Index
    - Delays and Using indicators
    - Receivers, Donors, and Resources
    - Receiver value and Net Value
    - Plots and histories
  - Policy Adjustment and Resource Adjustment
  - Introduction to resources that WLM can manage
  - Introduction to WLM algorithms
  - Basics of WLM algorithms to solve MPL delays, CPU delays, Storage delays, I/O delays, etc.
- WLM Management of workloads
  - Understanding enclaves and application environments
  - Understanding the 5 major address space types and how each is uniquely managed by WLM
  - Understanding the 4 major transaction types and how each is uniquely managed by WLM
  - Information in this section is the foundation of goal recommendations and evaluation techniques for the different workloads (i.e. CICS, IMS, TSO, STC, Batch, WebSphere, DB2, etc.)

Part III: Evaluating WLM Performance Measurements

A correct understanding of WLM related measurements is needed to properly evaluate WLM goals and controls. However, many WLM measurements are not as straightforward as one might expect. This section of the workshop will explain the important WLM measurements, clear up common misunderstandings, and provide many new insights to measurements used to evaluate workload performance and goals.

- Understanding WLM related performance measurements
  - How to answer the basic performance monitoring questions when monitoring your workloads.
  - Understanding Address Space and Enclave oriented measurements
  - Understanding CICS and IMS transaction measurements
- Examining the SMF 98 and 99 transient granular performance measurements

Part IV: Revisiting Workload Manager Goals Over Time

This section discusses how to revisit goals over time. The techniques discussed in this section are continuously evolving and being developed. When possible, specific techniques are taught. Otherwise, high-level general concepts are discussed.

- Introduction to revisiting goals over time
- Considerations when to revisit and re-evaluate goals (and 'how' when possible)
  - Improperly set goals
  - Goals regularly being missed
  - Planning for environmental changes
  - Exploitation of new WLM functions
  - Adapting to changes to WLM and the system
  - Improperly tuned system
  - Business priorities and objectives change
  - When exploitation of non-WLM functions influence performance

Part V: Effective Use of WLM Controls

Since not all workloads are the same, each workload type has specific WLM setup recommendations. This section of the workshop details key recommendations specific to each workload type and to your WLM setup in general.

- Effective Use of Workload Manager controls
  - General recommendations, tricks, and using miscellaneous controls
  - Approach to revisiting your WLM Service Definition settings and goals
- WLM Management of traditional workloads
  - TSO, UNIX System Services, system address spaces and started tasks, UNIX System Services
- WLM Management of CICS and IMS workloads
  - Understanding WLM CICS and IMS server management
  - Managing based on transaction goals versus region goals
- WLM Management of DB2 workloads
  - Includes DB2, DDF, Store Procedures
- WLM Management of Batch Workloads
  - Includes a discussion on WLM batch initiator management and Scheduling Environments