

# Performance Management for

- Capacity Planners
- Performance Analysts
- System Programmers

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## **1 General Remarks**

The modules are divided in content with obligation to work through and optional content. The content with obligation to work through is relevant to examinations, that means, that the corresponding knowledge must be present in tests, examinations and for practical exercises.

The optional content can be worked on voluntary. Of course we have highly experienced experts for answering questions und for helping with practical exercises.

The learning effort will be 8-10 hours a week on average. Taking into account a four month module that will be approximately 130 hours for the module "Performance Management".

These includes:

- face to face workshops approx. 15 hours
- virtual classrooms approx. 20 hours
- e-learning approx. 55 hours
- exercises and labs approx. 40 hours

Labs are conducted on a System z Mainframe. Current version is z/OS 1.13.

## **2 International reknown Experts**

We integrate international experts as teachers. Examples are Fabio Massimo Ottaviani from EPV Italy and Anthony Mungal from EMC USA (that's one reason why this module is completely in English).

## **3 Content**

In the following the module parts are described in detail. The number in brackets in the headline is the estimated time needed to work through the content.

### **3.1 Kick-off Workshop (approx. 6 h)**

#### **Face-to-face Workshop**

The goal of this workshop is building the foundation for a successful collaboration during the learning sequence of the module.

The workshop takes place in Augsburg, because at the IT Akademie we have all the infrastructure available that is needed to experience the e-learning tools locally and get accustomed to them. Afterwards, all these tools work also remote.

**Duration**      **1 Day**

**Date**            **TBA**

**Location**      **IT Akademie, Augsburg**

#### **Objectives**

The following goals will be reached by this workshop

- Attendees and key people and teachers from EMA get to know each other.
- Attendees learn about the e-learning tools which are used during the e-learning sequences, especially the Virtual Classroom software, which is used very intensively.
- Attendees get a first glance over the content of the module.

#### **Outline**

##### **Introduction**

Round of introductions  
Module introduction

##### **Learning Efficiency**

Learning and neurobiology  
Efficient Learning

##### **E-learning & Blended Learning**

Impact of e-Learning  
Advantages of blended learning  
Integration of Web 2.0  
Overview of e-learning tools

##### **Learning Platform Moodle**

Overview and configuration

##### **Das Virtual Classroom**

Virtual vs. Physical classrooms

##### **Technical Introduction**

Performance Analysis and Capacity Planning  
Introduction and Definitions  
Service Levels and SLAs  
What to measure  
How to measure

##### **Mainframe Monitoring**

RMF & SMS  
Other Tools

### 3.2 Performance Management Introduction (approx. 30 h)

#### Objectives

The students know about the different disciplines in the area of performance management of enterprise systems, especially the IBM Mainframe. The concept of capacity planning will be discussed and how capacity planning relates to workload processing.

#### Outline

##### Capacity Planning

Capacity Planning Definition & Concepts  
Continuous availability & Capacity Planning  
Balancing Resources  
Capacity Planning Tools

##### Monitoring Overview

Event Tracing vs. Sampling  
System Management Facility (SMF)  
Resource Measurement Facility (RMF)  
Other Tools

##### Performance Management

Performance Analysis Introduction  
Service Level Agreements (SLAs)

##### Performance Metrics

CPU and I/O Performance Metrics  
Response Time and Throughput  
Anatomy of Transactions  
Internal Throughput Rate (ITR)  
Large System Performance Reference (LSPR)  
Formulas and Laws in Performance Mgmt.  
SRM Constants

### 3.3 Workload Manager (WLM) Introduction (approx. 20 h)

#### Objectives

The students know about the working concepts of the WLM. They are able to implement a basic configuration in compliance with the needs of their own installation.

#### Outline

##### WLM Basics

Why WLM?  
What **are** Workloads?  
Workload Mgmt. vs. Resource Mgmt.  
WLM Components  
How WLM works  
WLM Functions

##### WLM Configuration

WLM Datasets  
ISPF Dialog

##### Setting Goals

Using Service Classes  
Defining Service Goals  
Workload Considerations  
USS and WLM

##### Enterprise Workload Manager

Basics  
ARM instrumented Middleware  
EWLM Control Center

##### Implementation and Workload Classification

Service Policy  
Service Classes  
Classification Rules  
Response Time Goals  
Velocity  
Discretionary  
Performance Index (PI)  
WLM Commands

### **3.4 Monitoring (approx. 10 h)**

#### **Objectives**

The students know about the different monitoring tools available from IBM and other vendors. They are able to select the appropriate tools that fit their needs.

#### **Outline**

##### **Monitoring**

Basics of Monitoring  
Event Tracing vs. Sampling

##### **Tracing**

Traces in z/OS  
Generalized Trace Facility (GTF)

##### **System Measurement Facility**

SMF Basics  
SMF Records  
SMF Configuration  
Dataset Recording vs. Logger Recording  
Customizing SMF  
SMF Dump Utility (IFASMFDP)  
Dumping selective SMF Records

##### **Resource Measurement Facility**

RMF Basics  
RMF Monitor I, II and III  
RMF Parmlib Members  
RMF System Commands

##### **Other Tools**

Tools from other Vendors

### **3.5 Using RMF (approx. 30 h)**

#### **Objectives**

The students know how to use the different RMF monitors and how to interpret displays and listings to optimize performance in their own environment.

#### **Outline**

##### **Monitoring with RMF**

RMF Monitor I, II and III  
RMF Monitor III Contention Analysis  
RMF Post Processor  
RMF Spreadsheet Reporter

##### **RMF Report Analysis**

Interactive Analysis with Monitor III  
Selected Monitor III Displays  
Snapshot Reporting with Monitor II  
Post Processing Reporting  
Selected Post Processing Reports

##### **RMF Setup & Configuration**

Setting up RMF  
RMF Parmlib Members  
RMF System Commands  
Starting and Controlling Monitor Sessions



### **3.6 Workload Manager Advanced Topics (approx. 15 h)**

#### **Objectives**

The students know how to use the advanced features of WLM.

#### **Outline**

##### **Resource Capping**

Resource Groups  
Capping Mechanisms  
Guaranteeing a minimum Service

##### **WLM in a Sysplex Environment**

Parallel Sysplex measurement  
Coupling Facility and structure measurement  
HiperDispatch

##### **Internal Resource Director (IRD)**

Functions  
LPAR CPU Management  
Channel Subsystem Priority Queueing

##### **Server Address Space Management**

DB2 for Stored Procedures  
IWEB

##### **WLM Managed Initiators**

Parmlib Definition for JES2 and JES3  
Adjust Service Class Goals

##### **Other Topics**

Enclave Management  
Resource Affinity Scheduling  
Parallel Access Volume (PAV)  
zIIPs, zAAPs and CPs

### **3.7 Closing Workshop (approx. 6 h)**

#### **Face-to-Face Workshop**

This is the finishing workshop for this module.

**Dauer**            **1 Day**

**Datum**           **TBA**

**Ort**                **TBD**

#### **Objectives**

Wrap up the issues of Performance Management in a complex mainframe environment.

#### **Outline**

##### **Performance Management Review**

Capacity Planning  
Performance Analysis

##### **Q & A**

Questions / answers / discussion

##### **Workload Manager (WLM)**

WLM wrap up

##### **Closing Remarks**

Feedback

##### **Monitoring**

Monitoring with RMF and SMF  
Monitoring with other tools