

## **z/OS Technical Bootcamp**

### **Course Summary**

#### **Description**

This course provides an intense examination of z/OS for systems programmers. Topics include an introduction to computer systems hardware and an exploration of architecture, system services and functions, storage management mechanisms, and I/O processes. Additional topics include REXX programming, SMP/E processing, an overview of Workload Manager and performance tuning. In the final section a look at system diagnostics and data collection will be examined. It includes a mix of demonstration & hands-on (10) labs."

#### **Topics**

- System Basics
- Programs
- History and Overview of z/OS  
The IPL Process
- System Services and PARMLIB
- Storage Management Mechanisms
- Task Management
- I/O Processing
- Access Methods and Data Bases
- Resource Management
- System Managed Storage
- Introduction to JES2
- Introduction to Unix System Services (USS)
- Introduction to Basic Communication Services
- Introduction to REXX Programming
- SMP/E Installation and Maintenance

#### **Audience**

This course is designed for system programmers, operators, and application programmers that need an understanding of the z/OS environment and the subsystems supported. Workstations will be used to illustrate concepts and provide basic exposure to the elements of the z/OS environment

#### **Prerequisites**

z/OS (MVS) Skill Pack (PT2013) or equivalent experience with TSO/ISPF and JCL processing are required.

#### **Duration**

Ten days

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### **Course Outline**

#### **I. System Basics**

- A. Examine how data is represented in computers, using binary, hexadecimal, and decimal.
- B. Introduction to memory addresses and basic instruction operation
- C. Explore the role of the PSW in machine operations
- D. Introduce basic computer hardware inventory: CPU, Memory, and I/O devices

#### **II. Programs**

- A. Examine basic program structure.
- B. Introduction to Linkage Editor functions
- C. Illustrate connection between data, JCL and programs

#### **III. History and Overview of z/OS**

- A. Evolution of operating systems from MVT/MFT to z/OS.
- B. Examining LPARs and parallel sysplex configurations.

#### **IV. The IPL Process**

- A. Review the IPL process
- B. Steps in systems initialization

#### **V. System Services and PARMLIB**

- A. Interrupts and interrupt handling
- B. PARMLIB definitions related to system functions
- C. System Address spaces

#### **VI. Storage Management Mechanisms**

- A. Real storage management:
- B. Central and expanded storage usage
- C. Virtual storage management:
- D. Paging/Swapping mechanisms
- E. Auxiliary storage management

#### **VII. Task Management**

- A. Review of initiator/terminator functions
- B. Address spaces and task control

#### **VIII. I/O Processing**

- A. Introduction to DASD hardware functions:
  - 1. CKD, ECKD, and FBA devices
  - 2. Parallel Access Volumes (PAV)
  - 3. Volume Affinity
- B. Components of I/O operation:
- C. Introduction to channel command processing
- D. Access method services
- E. Caching mechanisms

#### **IX. Access Methods and Data Bases**

- A. Data set organization and access methods:
  - 1. Sequential access (SAM)
  - 2. Basic Partitioned Access (BPAM)
  - 3. Basic Direct Access (BDAM)
  - 4. VSAM processing (ESDS, KSDS, RRDS)
- B. Introduction to database processing concepts

#### **X. Resource Management**

- A. Examine basic objectives in managing system resources
- B. Explore the process of defining objectives
- C. Discuss the process WLM uses to make decisions and monitoring requirements
- D. Scheduling environments
- E. Intelligent Resource Director

#### **XI. System Managed Storage**

- A. Introduce DFSMS concepts
- B. Review SMS components
  - 1. SMS Control data sets
- C. ISMF Panels and Storage Administration Functions
  - 1. Storage Groups
  - 2. Data Class
  - 3. Management Class
  - 4. Storage Class

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### **Course Outline (cont'd)**

#### **XII. Introduction to JES2**

- A. Introduction to JES2 Concepts
  - 1. Introduction to JES2 Checkpoint and Spool operations
  - 2. Examine JES2 job execution phases
  - 3. JES2 and Workload Manager (WLM)
  - 4. JES2 system configuration options (including Poly-JES)
- B. JES2 Initialization
  - 1. JES2 start-up options
  - 2. JES2 procedure and specification requirements
  - 3. Dynamic allocation of PROCLIB and PARMLIB specifications
  - 4. Introduction to JES2 initialization statements
- C. Controlling JES2 Processes
  - 1. JES2 device assignments
  - 2. Internal reader facility
  - 3. Job selection criteria and job initiation
  - 4. Member affinity and initiator management
  - 5. Output management
  - 6. Print/Punch phase and output routine
- D. Spool Volumes and Operation
  - 1. Spool volume allocation
  - 2. Spool management
  - 3. Spool Offload Facility
- E. JES2 Checkpoint Processing
  - 1. Checkpoint sizing and placement
  - 2. Checkpoint configuration considerations
  - 3. Checkpoint reconfiguration dialogues
  - 4. Recovering from Multi-Access Spool (MAS) failures
  - 5. JES2 Checkpoint and coupling facility
- F. Remote JES2 Configurations: RJE/NJE
- G. Network Job Entry (NJE) definitions
- H. Networking considerations and topology
- I. Remote Job Entry (RJE) definitions

#### **XIII. Introduction to Unix System Services (USS)**

- A. USS File systems
- B. USS Setup, commands, and definitions

#### **XIV. Introduction to Basic Communication Services**

- A. Basic networking and configurations
- B. VTAM/SNA overview and function
  - 1. Examine terminology associated with SNA networks
  - 2. Review VTAM/SNA networking concepts and configurations
  - 3. VTAM JCL and data sets
  - 4. VTAM initialization parameters (ATCSTR00 and ATCCONxx)
  - 5. Terminal definitions, USSMODE, LOGON mode
- C. TCP/IP overview and function
  - 1. Examine terminology associated with TCP/IP networks
  - 2. Review TCP/IP networking concepts and packet delivery
  - 3. Examine architecture and standards
  - 4. Review TCP/IP protocols
  - 5. Describe various TCP/IP applications and their uses

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### **Course Outline (cont'd)**

#### **XV. Introduction to REXX Programming**

- A. REXX Overview
  - 1. Basic language structure
  - 2. Clauses
  - 3. Literals
- B. Running REXX programs
  - 1. ALTLIB
- C. REXX Procedures
  - 1. PARSE
  - 2. Data Stack
  - 3. Operators
  - 4. DO Loops
  - 5. Built-in functions
  - 6. External functions
  - 7. Routines
  - 8. ADDRESS host environments

#### **XVI. SMP/E Installation and Maintenance**

- A. SMP/E Overview and Methodology
  - 1. SMP/E data sets and their role in maintaining system information
  - 2. Introduction to SMP/E dialogues
  - 3. Introduction to the SMP/E zones; Global, Target, and Distribution
  - 4. Establishing the SMP/E environment and its definitions
- B. SYSMODS
  - 1. Introduction to SYSMOD types; PTF, APAR, FUNCTION, and USERMODS
  - 2. Review HOLDDATA
  - 3. Examine MCS statements and how utility functions are performed within SMP/E
  - 4. RECEIVE, APPLY, and ACCEPT processing
  - 5. Examine the SMP/E process for introducing change into the z/OS environment
  - 6. RECEIVE processing
  - 7. APPLY CHECK and APPLY processing
  - 8. ACCEPT CHECK and ACCEPT processing
- C. RESTORE and REJECT processing
  - 1. Examine SMP/E process for restoring and removing changes from z/OS
  - 2. RESTORE CHECK and RESTORE processing
  - 3. REJECT processing
- D. Managing SYSMODS
  - 1. CLEANUP processing to remove extraneous data from zones
  - 2. REPORT processing commands for reviewing SYSMOD status
- E. Controlling SMP/E data sets
  - 1. UCLIN processing to modify data elements within zones
  - 2. ZONE processing commands
  - 3. BUILD MCS command for migrating SMP/E managed elements to other systems
- F. SMP/E Reporting
  - 1. SMP/E logging functions to trace activity

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2. SMP/E LIST command to report on managed elements
3. SMP/E Report functions