HP Education Services

HP OpenVMS v8.3 Internals for System Managers (u3729sb.01)

This course provides a general overview of system mechanisms such as interrupt priority level, spinlocks, CPU context, and access modes. It is designed to examine the components, structures, and mechanisms of the OpenVMS operating system on Integrity Server and Alpha platforms. It is intended for students without significant programming backgrounds, who want a better understanding of how OpenVMS works. The 5-day course is 50% percent lecture and 50% percent hands-on labs.

Audience

- HP OpenVMS system managers and application programmers.

Prerequisites

- Advanced system management skills
- A general understanding of operating system concepts
- An understanding of binary and hexadecimal numerical representation

Course Objective

The class uses the System Dump Analyzer on a live system to examine the data structures that form the operating system. The dynamics of the operating system will be explored through changes to data structures visible through SDA.

The focus is on the three major subsystems of OpenVMS:

- Process and scheduling
- Memory Management
- I/O

Benefits to You

Upon completion of this course, you should be able to:

- Use the System Dump Analyzer (SDA) to examine data structures and system data cells.
- Describe process and supporting process-related data structures
- Describe the data structures that constitute a process and examine them using SDA
- Describe the processing and roles of interrupts and exceptions
- Describe the roles of the following synchronization techniques: ASTs, timers, and locks
- Discuss the dynamics and data structures associated with image activation
- Discuss the metrics ssociated with paging
- Describe the working set algorithms under OpenVMS
- Size process working sets
- Interpret paging metrics
- Set working set adjustment related SYSGEN parameters
- Analyze the layout of an image file
- Track page file usage
- Describe the layout and functions of data structures within the I/O database
- Describe the OpenVMS scheduling mechanism and change system parameters that affect scheduling
- Explain the reasons for processes entering and leaving wait states
- Analyze process and system stalls caused by process resource wait states

Why education services from HP?

- Focus on job-specific skills
- Hands-on practice
- Experienced and best-in-the-field HP instructors
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Course Title: HP OpenVMS v8.3 Internals for System Managers

HP Product Number: u3729sb.01

Category/Subcategory: OpenVMS

Course Length: 5 days

Level: Intermediate

Delivery Language: English

To Order: To review course schedules and to register for a course, visit www.hp.com/learn/unix and select your country from the drop down menu, or, contact your HP sales representative or HP authorized channel partner.

Detailed Course Outline

Internals Concepts

- OpenVMS Access Modes
- Data Representation
- Data Structures
- Stacks
- Asynchronous Events and Context
- Synchronization
- Interrupts and Exceptions
- Spinlocks
- OpenVMS Symbolic Naming Conventions
- Learning Check
- Hexidecimal and Binary Representation of Data

Introduction to SDA

- SDA Requirements and Uses
- Command Summary
- CLUE

OpenVMS Processes

- Process Concepts
- The Process and Kernel Threads
- Process Data Structures Overview
- Job Information Block (JIB)
- Process Header (PHD)
- Kernel Threads
- PCB Vector Table

OpenVMS Scheduling

- Thread States
- Event Flag Wait Queue
- Computable Queues (also COMO)
- Hardware Context
- SMP Support for Scheduling
- Boosting Software Priority
- Report System Event (RSE)
- Quantum End Activities
- Wait State Activities
- PIXSCAN and DORMANTWAIT

Mechanisms and Synchronization

- Timer Queue Entries
- Distributed Locking Mechanism
- Dynamic Resource Remastering
- Pre-v8.3 Dynamic Resource Mastering
- v8.3 Lock Manager Changes
- Deadlock Detection in a Cluster
- Sub-Second Deadlock Wait
- Resolving Lock Resource Contention
- Dedicated CPU Lock Manager
- Dedicated CPU Lock Manager Interaction
- AST Concepts

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