concurrent

Technical Education Services
Course Specification

Course Number: N9400

Course Title: PowerHAWK 900-Series System Maintenance

Course Duration: 5 Days

Purpose:

Concurrent Computer Corporation's PowerHAWK 900-Series family of real-time computer systems offer powerful, symmetric multiprocessing systems designed for the demanding processing and I/O requirements of the simulation, data acquisition, industrial control and other applications where performance is critical to success. The PowerHAWK 700-Series hardware and Concurrent's PowerMAX OS Operating System software combine to provide high-performance multiprocessing using Commercial-Off-The-Shelf (COTS) single-board computers. I/O capabilities include integral SCSI, Ethernet and Serial ports, a PCI Mezzanine Card (PMC) port and the industry standard VME64 I/O bus. These capabilities provide the customer with the flexibility and ease of integration of a wide variety of application specific interface controllers.

In order to perform timely and effective corrective maintenance, system engineers require an understanding of the PowerHAWK 900-Series system architecture. This course is designed to provide the necessary instruction required for Line Replaceable Unit (LRU) corrective maintenance of any PowerHAWK 900-Series system configuration. Major course topics include system architecture, physical description, a detailed console command set description and in-depth functional overviews of all major system components. Removal and replacement procedures for all major hardware components are presented, and the PowerHAWK diagnostic products are described in detail. Disaster recovery is presented to teach proper system backup and restore methods. System upgrades are also discussed..

Intended Audience:

The PowerHAWK 900-Series System Maintenance course is designed for those support personnel who are responsible for the Operation, Administration and Maintenance of PowerHAWK 900-Series systems. This includes Customer Support personnel and Customer Engineers responsible for the corrective maintenance to the LRU level of these systems.

Course Objectives:

Upon successful completion of this course students are able to:

- Perform various system operational procedures, including system power-up and initialization, boot procedures for PowerMAX OS, and both standalone and online diagnostic execution.
- Utilize STAR and ASTRix commands to execute Single Board Computer (SBC) self-tests and properly configure the system for auto-boot.
- Utilize Console Processor commands to perform system initialization, booting, and initial fault analysis.
- Boot PowerMAX OS into both single and multi-user modes of operation, and describe the sequence of events which lead to the establishment of each mode.
- Define the physical design of the PowerHAWK 900-Series systems, including the hardware configuration of the SBCs, the VMEBus chassis, and the required system cabling.
- Identify all primary system modules used in the PowerHAWK 900-Series and provide brief functional descriptions of each.
- Perform a complete system backup, then restore that backup onto a replacment master disk drive.
- Execute both offline and system-level diagnostics to both verify proper system operation and perform fault isolation.
- Perform corrective maintenance to the LRU level on the PowerHAWK 900-Series computer system.

Prerequisites:

- UNIX System Capability - Students need to understand and be able to use basic UNIX system commands such as those taught in a UNIX introductory course.
- A working knowledge of the **vi** editor is assumed

Course Topic Outline:

I. System Architecture..... (8 Hours)

A. PowerHAWK 900-Series System Architecture

B. Single Board Computer (SBC) Functional Overview

C. VME64Bus Functional Description

D. PowerMAX OS Software Overview

II. Physical Description ..... (2 Hours)

- A. Single Board Computer Indicators and Configurable settings
- B. VMEBus Chassis Overview and Requirements

III. Offline Interface ..... (6 Hours)

- A. Offline Operational Mode Descriptions
- B. STAR commands and configuration
- C. ASTRix commands and configuration
- D. Console Processor commands and configuration

IV. System Booting and Initialization ..... (8 Hours)

- A. System Operational Modes
- B. System Powerup and Initialization
- C. PowerMAX OS Boot Sequence
- D. PowerMAX OS Kernel Initialization
- E. PowerMAX OS Single User mode Initialization
- F. PowerMAX OS Multi User mode Initialization

V. System Backup and Restore ..... (8 Hours)

- A. System Disk Drive Configuration and Initialization
- B. PowerMAX OS System Backup procedures
- C. PowerMAX OS System Restore procedures

VI. Basic Network Configuration ..... (2 Hours)

- A. PowerMAX OS Local Area Network Interface Configuration
- B. PowerMAX OS Network Troubleshooting

VIII. PowerHAWK System Troubleshooting ..... (6 Hours)

- A. Performance Monitoring
- B. Offline Diagnostic Execution
- C. PowerMAX OS Online Diagnostics
- D. PowerMAX OS Basic Crash Analysis

Laboratory Exercises:

Students practice system operational procedures, component removal and replacement, and basic troubleshooting on dedicated PowerHAWK 900-Series training systems. All laboratory sessions are designed to assist the student in developing logical troubleshooting techniques.