

RTOS (VxWorks) programming

Synopsis & Objective of Course

An RTOS is a class of operating systems intended for real time-applications (an application that guarantees both correctness of result and the added constraint of meeting a deadline). RTOS forms the back bone of higher end embedded devices. VxWorks is a widely-used real-time operating system for embedded software and process control applications. VxWorks has been ported to a number of platforms and now runs on practically any modern CPU that is used in the embedded market. The key features of the current OS are Multitasking kernel with preemptive and round-robin scheduling and fast interrupt response

Target Audience

Programmers and engineers who wish to gain a sound understanding of embedded designing on a RTOS platform, specifically VxWorks

Prerequisites

Attendees should have a basic knowledge of OS & programming.
An elementary knowledge of the C/C++ programming language is essential.

Delivery

The initial concepts of RTOS will be theoretically explained by the Trainer with real life analogies. Then the trainer will implement & demonstrate the versatile features of VxWorks followed by hands-on exercises.

Certain development projects will be given as assignments (under complete guidance) to master a trainee in implementation oriented designing.

Duration : 5 days

Course Contents

Day	Topic	Sub topics
Day 1	Introduction	Real Time Systems Multi tasking & Concurrency Build & Load of an application Interrupts
	Software Architectures	Round – Robin Round – Robin with Interrupts Function – Queue – Scheduling Architecture Real – Time Operating System Architecture Selecting an Architecture
	RTOS services	Tasks and Tasks States Tasks and Data Semaphores and Shared Data Message Queues, Mailboxes, and Pipes Timer Functions & Events Memory Management Interrupt Routines in an RTOS Environment

	VxWorks	Introduction
	Getting Started	Components of Tornado Hardware / Software Configuration Booting Starting Tornado WDB Agent
Day 2	Projects	Projects Overview Configuration Integrated Simulator Cross Development and Downloadable Projects Build Specifications
	CrossWind	Overview Basics of Shell Starting A Debugging Session Basic Debugging System-Level Debugging
	Real-Time Multitasking	Introduction Task Basics Task Control Error Status System Tasks Summary
	WindView 2.0	Introduction Configuring WindView Events
	Task Management	Creation μ C/OS-II's task, Delete a task, Check the size of a task's stack, Change a task's priority, suspend and resume a task, Get information about a task. Exercises based on tasks using TORNADO

Day 3	Intertask Communication	Introduction Shared Memory Message Queues Pipes
	Semaphores	Overview Binary Semaphores and Synchronization Mutual Exclusion
Day 4	Memory	Typical Memory Layout Target Server Memory Pool System Memory Pool Allocating/Releasing Memory Debugging Options Examining Memory Fine Tuning Generic Partition Manager Creating a Memory Partition Managing Memory Partitions
	Exceptions, Interrupts, and Timers	Exception Handling and Signals Interrupt Service Routines Timer
Day 5	I/O and File System	Introduction Character I/O Block I/O
	Socket Programming	Introduction Protocols BSD Sockets Programming

Trainers' Profile

Corporate Trainer(s) with more than 6 years of experience in embedded development & corporate training in CMM level5 companies.

Scheduled & On-site Training

Apart from in-house training programs, comprehensive training can be also provided as per the requirement & will be optimally customized as per the client's needs.

For training calendar, availability of seats & other details please mail us at training@sigmasolutions.co.in