

Chapter 11

Real Time Operating System

Lesson 02

Real Time Operating System (RTOS)

Real Time Operating System (RTOS)

- A program

- to enable scheduling and to enable time-constrained and controlled resources access to a task at an instance,
- to control resources sharing with real time constraints,

Real Time Operating System (RTOS)

- A program

- to control signals, tokens and messages between the tasks and
- to provide interfaces between the application software and hardware

RTOS

- A background program that controls the execution of number of application subtasks and task states
- Facilitates communication between the subtasks

RTOS

- RTOS is an operating system that allows flexible scheduling of the system resources to several tasks

RTOS

- An RTOS enables system design by division of a system into multiple tasks

Task States

- One of the following states at any given instance —ready, deleted, running, timeout, waiting for a specific period, and waiting till some signal or message before some specific or undefined period
- RTOS controls a task state in real time constrained system

Task States

- Ready means gets a signal for which it is waiting or gets a message for which it is waiting or time out when its waiting-period is over

System clock

- Generates timeouts and interrupts at the periodic preset intervals
- Interrupts RTOS periodically to transfer program control from user mode to supervisory mode
- Functions as basic clock of the system
- Example- System Timer RTX166 in RTOS RTX51

Scheduling

Round-robin Scheduling

Example- RTX 51
Tiny, RTX-51 full

Each task given
resources access
cyclically

Preemptive Scheduling

High priority task
preempts
(blocks) lower
priority

Example- RTX 51
full, μ COS-II,
VxWorks

Summary

We learnt

- RTOS— is an OS that controls the execution of number of real time constrained application subtasks and control the task states
- Facilitates communication between the subtasks
- RTOS enables scheduling and to enable time-constrained and controlled resources access to a task at an instance

We learnt

- Controls resources sharing with real time constraints
- Priorities can be assigned to the use tasks to met the real time constraints
- Preemptive Priority based scheduling

End of Lesson 02 on
Real Time Operating System