REAL TIME OPERATING SYSTEM PROGRAMMING-I: μC/OS-II and VxWorks

Lesson-13:

VxWorks functions for Pipe device

1. Functions for Pipe device

Pipe Functions in VxWorks

- A pipe is a device with stream of messages managed by a pipe driver (like a device driver) *pipedrv*.
- [This is analogous to the named pipe in UNIX.]
- A VxWorks pipe feature is to also implement the client server architecture between a set of tasks

Pipe Functions

- pipeDevCreate ( ); /* Creates a pipe device*/
- select ( ); /*a task waits for several kinds of messages, from pipes, for sockets and serial I/Os*/

Pipe Open and close

- open ("/pipe/*pipeUserInfo*", *rdwrFlag*, mode);
  - Remember that after opening a pipe, when we finish using it, we must use the following function:
- STATUS close ( );

Options in Pipe

- flag specified as O_RDWR permits read and write both,
- flag O_RDONLY permits the read only option, and
- flag O_WRONLY permits the write only option.

Pipe Device creation

STATUS = pipeDevCreate ("/pipe/name", *max_msgs*, *max_length*);
/* create a named pipe with maximum number of *max_msgs* messages in maximum pipe length *max_length* bytes. A task blocks if message is not available and pipe is empty, when task attempts to read a pipe */

Descriptor for the Pipe or Socket or File Device

- Device driver uses a *file descriptor* can be used for a pipe or socket or serial device or file or other type of device.
- Let a file descriptor fd = *n*; There is an array of bits in which the n^{th} bit corresponds to fd = n.

FD_SET Descriptors as well as a set of functions

- struct FD_SET

a C' structure. This structure *fd_set* has a set of file descriptors as well as a set of functions.

- FD_SET (*n, &fdSet*)

/* n^{th} bit sets*/

- FD_SET (*m*, &fdSet)

/* m^{th} bit sets*/

FD functions

• FD_CLR (*n*, &*fdSet*) will make n^{th} bit = clear.

• FD_ZERO *(&fdSet*) makes all bits of array = 0.

• FD_ISSET (n, &fdSet) returns true if n^{th} bit in the array is set and false if reset.

•Refer to Example 9.26 for understanding use of pipe and file descriptor functions.

Summary

We learnt

- pipes are the devices that can be opened and closed like a file.
- Pipes are virtual IO devices that store the messages as FIFO.

End of Lesson 13 on VxWorks functions for Pipe device