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Identification

Process Interrupt Handler
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Purpose

The Process Interrupt Handler is called by the Interrupt Interceptor when one of the three process interrupts (time-out, pre-empt, or quit) occurs. Its task is to force the process currently running on the interrupted processor to block or re-schedule itself.

Interrupts

For each processor attached to the system there is one (and only one) system controller which transmits process interrupts to that processor. One unique interrupt cell is assigned for each of the three process interrupts (BC.1.04).

Process interrupts may be generated only in the following ways:

The pre-empt interrupt may be generated by the scheduler (BJ.4.00) to interrupt a running low priority process in order to get a higher priority process into the running state more quickly.

The time-out interrupt is always generated when a timer runout fault occurs on a processor. This causes the running process to re-schedule itself because it has used up an allotted amount of processor time. This mechanism forces processes to share the available processors with other ready processes.

The quit interrupt may be generated by the quit entry in the Traffic Controller in order to force a running process to stop execution by calling block.

Interrupt Handling

The Interrupt Interceptor calls the Process Interrupt Handler as follows:

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call proc_int$pre_empt;
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where proc_int$pre_empt is the pre-empt interrupt handler.

call proc_int$time_out;

where proc_int$time_out is the time-out interrupt handler.

call proc_int$quit;

where proc_int$quit is the quit interrupt handler.

Pre-empt Interrupt Handler Actions

The following actions are taken by the Pre-empt Interrupt Handler when called by the Interrupt Interceptor.

1. If the drain switch is on no action is taken; the procedure simply returns to the caller. (The drain switch being on indicates that the process is in the process of being taken out of the running state. See BJ.6.)

2. If the drain switch is off the procedure calls restart and then returns to the caller.

Time-out Interrupt Handler Actions

The following actions are taken by the Time-out Interrupt Handler when called by the Interrupt Interceptor.

1. If the drain switch is on no action is taken; the procedure simply returns to the caller. (The drain switch being on indicates that the process is in the process of being taken out of the running state. See BJ.6.)

2. If the drain switch is off the procedure calls restart and then returns to the caller.

Quit Interrupt Handler Actions

The following actions are taken by the Quit Interrupt Handler when called by the Interrupt Interceptor.

1. If the drain switch is on, the procedure calls quit for itself and then returns to the caller. (The drain switch being on indicates that the process is in the process of being taken out of the running state.

The reason quit is called is in order to remove this process from the ready list in case it was switched from running to ready immediately prior to draining the interrupt. See BJ.6.)

2. If the drain switch is off the procedure calls block and then returns to the caller.