Identification

Process Interrupt Handler
H. Frick

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:

        call proc_int$pre_empt;

        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.