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Identification

Core Residence Metering
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Purpose

Section B0.3.02 describes the method for metering the number of pages of core actually used by a process.

Description

Determining which process is responsible for the presence of a page in core, when many processes may reference the page, is a difficult problem. The strategy chosen to implement this portion of resource-expenditure metering is the best solution yet proposed for metering actual core requirements. It consists in arranging for a system process to place a special directed fault in all page table words for all users (with the obvious exception for pages used to meter page usage, service page faults, etc.) at intervals determined by the system administration. See B0.4.03 for a description of this system process.

The next process to reference such a locked page encounters the page-accounting fault, and enters a fault handler which

1. Obtains the process ID from the Processor Data Block, and thus the AMT entry for the process. (The Active Process Table entry points to an AMT entry for the process's account.)
2. Increases the core-usage meter in the AMT entry by the number of word-seconds for the page. (The size of the page can be determined from the SCU data for the fault, and the length of time is the scan period of the page-locking system process.)
3. Removes the fault for this page.
4. Returns to the interrupted procedure, to complete the access.

When a page is first assigned to a process, Page Control will call accounting to have steps 1 and 2 above performed, as follows:

```
call start_page (size);
```

The core-residence metering scheme has the following properties:

1. When a user first requires a page of core, his meter is increased.
2. The user who uses a page first after a "locking cycle" is the one metered for the page. In the case of many users referencing a page, the metering will approximate, in the long run, some measure of frequency of access.
3. When a page becomes idle but remains in core, no account is metered for its use.