

To: Distribution
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Subject: Separately Pricing DPS8 Hardcore

INTRODUCTION

There is a marketing requirement for providing the increased performance capabilities of the DPS8/70M CPU as a Priced Separately Product (PSP) in Multics release MR9.0. This requirement is in line with marketing's desire to receive an ever increasing amount of revenue from the sale of software.

This MTB describes the method used to implement this requirement in the DPS8 hardcore supervisor.

IMPLEMENTATION

The DPS8 processor is really just a redesigned/repackaged and performance improved L68 processor. Aside from expanded history regs, associative memory and 8K cache, there are few, if any, incompatible instructional changes in the DPS8 decor. There is also a marketing requirement that DPS8 and L68 processors coexist in a mixed configuration. The changes to Multics hardcore were designed with coexistence built in, therefore the same hardcore tape will run on either; An unmixed L68 system, an unmixed DPS8 system or a mixed DPS8 and L68 system.

Since there are no well defined software incompatibilities, the hardcore PSP requirement could not be implemented as simply a software release/packaging and distribution constraint. There is however, one well defined means of determining processor type identity. The information returned from the execution of an RSW (2) privileged instruction contains a cpu type identifier in bits 4 and 5. (This field is not used by the L68 cpu, therefore it is presented as "00"b.) For a DPS8 cpu the bit configuration of bits 4 and 5 is a "01"b.

Whenever a processor is activated, either during the act of system initialization, cpu reconfiguration or cpu testing (with ISOLTS), the module `validate_cpu_card` is called. In addition to validating cpu type and `model_info` on the cpu card image against deducible information from RSW (2) data, `validate_cpu_card` will

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use the numerical value of the `cpu_type` as an index into an external `cpu_type` bit array located in a new hardcore segment, `hc_psp`. If the bit that corresponds to the `cpu_type` is not set, a `syserr` message with a code of 1 (crash the system) is output stating that the DPS8 software must be purchased.

The `hc_psp` external hardcore segment is a Multics object segment coded in the CDS language. Currently the `cpu_type` bit array (with dimensions (0:3)) is the only externally accessible variable. The intent is that the source of this segment be controlled (and modified) by the Multics software Packaging/Distribution function and not be distributed with software releases. For sites that have not purchased DPS8 software, only element 0 of the `hc_psp$cpu_type` will be initialized to a "1"b. (All other bits in the array are set to "0"b.) For sites that purchase DPS8 software, elements 0 and 1 of the `hc_psp$cpu_type` array will be initialized to a state of "1"b.