Identification

Processor Tag

J. H. Saltzer

Discussion

In a multiprocessor system, even though all processors are nominally identical, there must be a means of identifying processors, for at least the following purposes:

1.   Hardware test and diagnostic.
2.   Tie resolution at interlocks.
3.   Creating unique identifiers.

For identifiers to be most useful for tracing the impact of hardware problems, and communicatable between installations, every processor must have a distinct tag, different from the tags of processors even at other installations.

A unique number, here known as the processor serial number is assigned to each GE-645 processor as it is manufactured and remains assigned to the processor forever. Also, a three-bit tag known as the processor hardware tag and which is readable by program is wired into each 645 processor when it is manufactured: this tag must be different from the tags on other processors at the installation for which the processor is destined. On a 645 computer, the Multics system maintains a table of correspondence between processor hardware tags and processor serial numbers (the processor serial-tag table). This table is different at each Multics installation and must be updated whenever a new processor is obtained.

As described in section BK.0, the overview of processor management, every processor is also assigned a processor index number when it is attached to the system. Processor index numbers represent entries into tables of processor masks and intercommunication data; they range from one to the maximum number of processors ever used by the installation. All system software concerned with processor identification is written using the processor serial number or the processor index, as appropriate. The processor hardware tag is never used for identification purposes except in routines dealing directly with the hardware.

Ideally, the processor hardware tag would be identical to the processor serial number; in such a case the processor serial-tag table would not be needed.