Identification

Slave mode parity masking
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Discussion

The 645 processor instruction LDI (load indicator register) allows a slave mode procedure to load, among other indicators, the memory parity error mask. When this mask is on, memory parity errors are ignored.

Since the Multics supervisor must attempt to detect errors whenever possible, to avoid making mistakes with system-wide repercussions, the parity mask should always be off when executing within the supervisor. Therefore it is necessary, on each entry to the supervisor, to store the indicator register, turn off the parity mask bit in the stored copy, and reload the indicator register from the now-modified copy. This operation is most easily done by the Fault Interceptor and Interrupt Interceptor modules, since all entrances to the supervisor are funneled through these two modules. Note that some parity errors in the fault or Interrupt Interceptor itself, its linkage section, or the Processor Data Segment (used to temporarily store the indicator register as well as other machine conditions) may not be detected since they can occur before the parity indicator can be reloaded. The sequence of instructions to reload the indicator register adds approximately 16 microseconds to the time required to process every interrupt and fault.

An appropriate hardware modification to eliminate the need for constant reloading of the parity mask indicator is to make the parity mask indicator unaffected by an LDI instruction executed in slave mode. Since there are a few special cases where a maintenance or dump program needs to mask memory parity faults, the LDI instruction in master mode should still be capable of setting the parity mask indicator.