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.