Inter-Office Memorandum

To Wendell Shultz
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From H. C. Lauer

Location Palo Alto

Subject A simplified version of monitors

Organization SDD/SD

XEROX

Filed on: <Lauer>SimpleMonitors.memo

In our discussion on Friday, there seemed to be some confusion over the complexibility and understandability of monitors as opposed to messages. Comparing the two proposals (<Redell>MesaProc.memo and <Lauer>SendMessages.memo) in this respect is like comparing apples and oranges; they are really aimed at two different levels of system. Accordingly, I have sketched very quickly here a stripped-down version of the monitor proposal which is the exact dual of the message system I previously outlined. My serious concern is that this level of system is not adequate to our needs, even now, and that the process working group was quite right to extend their recommendation beyond this basic skeleton. If that is the case, then the same must be done to the message proposal. In any case, neither proposal is ready for implementation without a thorough technical review.

Simple monitors

The following are the salient features of the simple monitor scheme, listed along with their duals from the simple message scheme. It is assumed that each would be implemented in the same medium (i.e., both or neither in microcode) but that the monitors would be embedded into Mesa.

Monitors	**Messages**
Monitored modules	Processes
NEW <module name>	**CreateProcess**
FORK <process name>	**SendMessage**
JOIN	**AwaitReply**
PROCESS declaration plus entry condition variables	**WaitForMessage** plus mask
RETURN	**SendReply**

There are several differences between this list and the monitor proposal, including the following important ones:

condition variables have a simpler character, possibly not as flexible or usable (but this is open to question).

monitored objects are not included, yet these are very important to most of the components of Pilot, especially the communications facilities, memory management, and file support.

- time-outs and aborts on condition variable waits are not provided; the process working group seems to feel strongly about these, though I would scrutinize this carefully in a technical review.

If these facilities are required by our systems and/or applications programmers in order to make monitors useful, then by the duality argument, corresponding facilities are needed in the message system. My proposal would then have to be augmented to include them; this would increase the complexity of the implementation and make the mechanism exactly as difficult to comprehend as the monitor scheme. This is not surprising, since the programs which would be written in the two schemes would be almost identical to each other, anyway.