REPORT

Memory Access

Schemes: \*\*To pair processors and memory modules at the beginning of a memory

cycle, any non-starving assignment scheme is acceptable. As an example,

consider a priority scheme such processors are granted access to memory modules

in their natural index order (processors with lower index are granted access

first.) In the figure below, this is equivalent to scanning the processing

elements from left to right and grant, in that order, memory access to those

processors for which the requested memory module is free. In the example of the

figure below, \*P\*~3 ~and \*P\*~5 ~will have to wait to

another cycle to gain access to their requested modules. It is clear that this

scheme suffers from starvation, some processors may never gain access to

requested memory modules.

To fix the problem and avoid

starvation, processors can be re-labeled at the beginning of a memory cycle

such that the first “waiting” processor is re-labeled with index 0 and the

remaining processors are cyclicly relabeled in the natural order. The relabeling

can be done dynamically while scanning, or a circular ordered data structure

can be kept with a dynamic pointer to the first processor to be considered



