

(b) NUMA-Q

FIGURE 8.42 Expanded directory state diagrams for the case study multiprocessors of this chapter

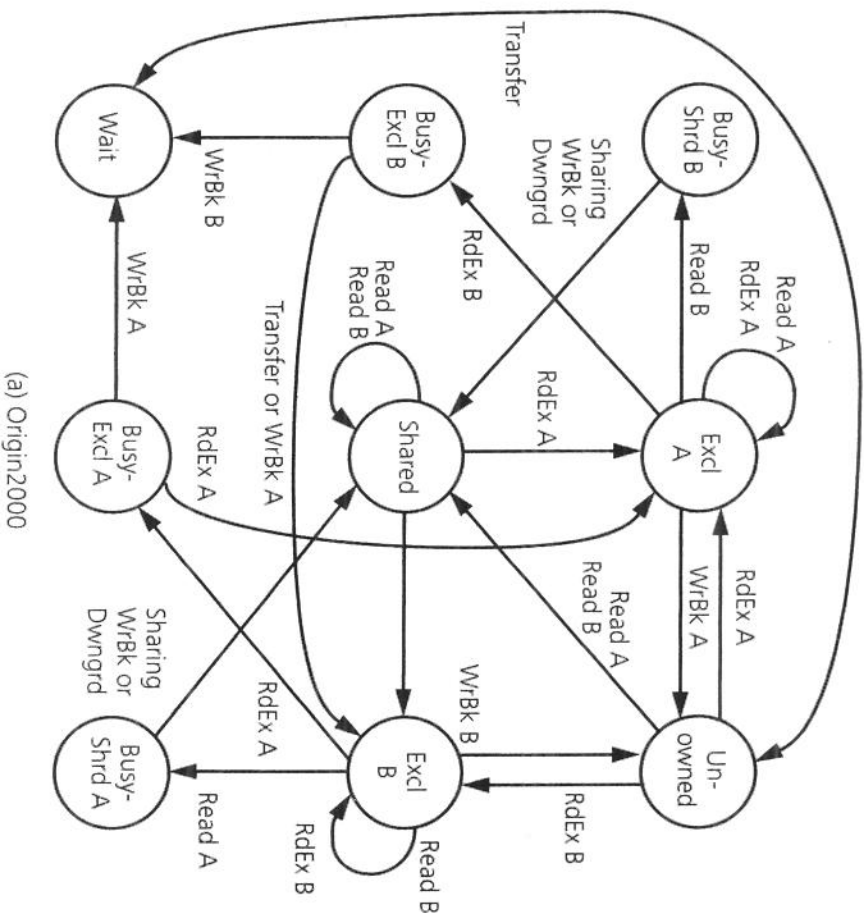
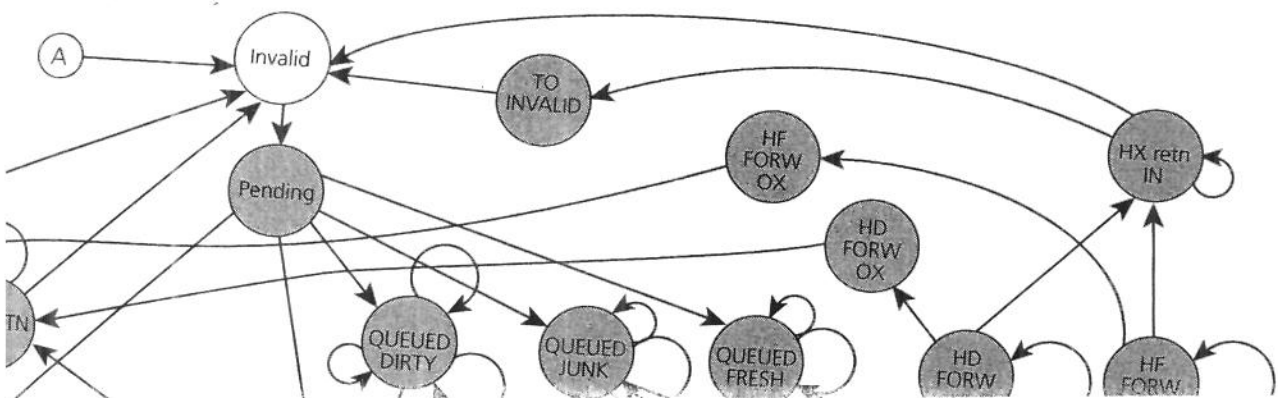


FIGURE 8.42 Expanded directory state diagrams for the case study multiprocessors of this chapter. The state diagram for the SGI Origin2000 in (a) is quite simplified; it shows the busy states at the directory but leaves out I/O operations, the poisoned state, and several race conditions. To show the use of busy states, accesses from two nodes A and B are shown. For example, a state labeled "Excl A" means that the directory thinks the block is in exclusive state in node A, and an arc labeled "RdEx B" indicates a read-exclusive operation from node B. The transfer operation and the wait state are used to handle write backs, as described in the text. The state diagram for the Sequent NUMA-Q in (b) is much more complete, though it also excludes a few corner cases. The state diagram in this diagram and several of the state labels are not explained; the purpose of this diagram is not to convey the complete protocol but simply to show that full-blown state transition diagrams can become quite complex in real systems.



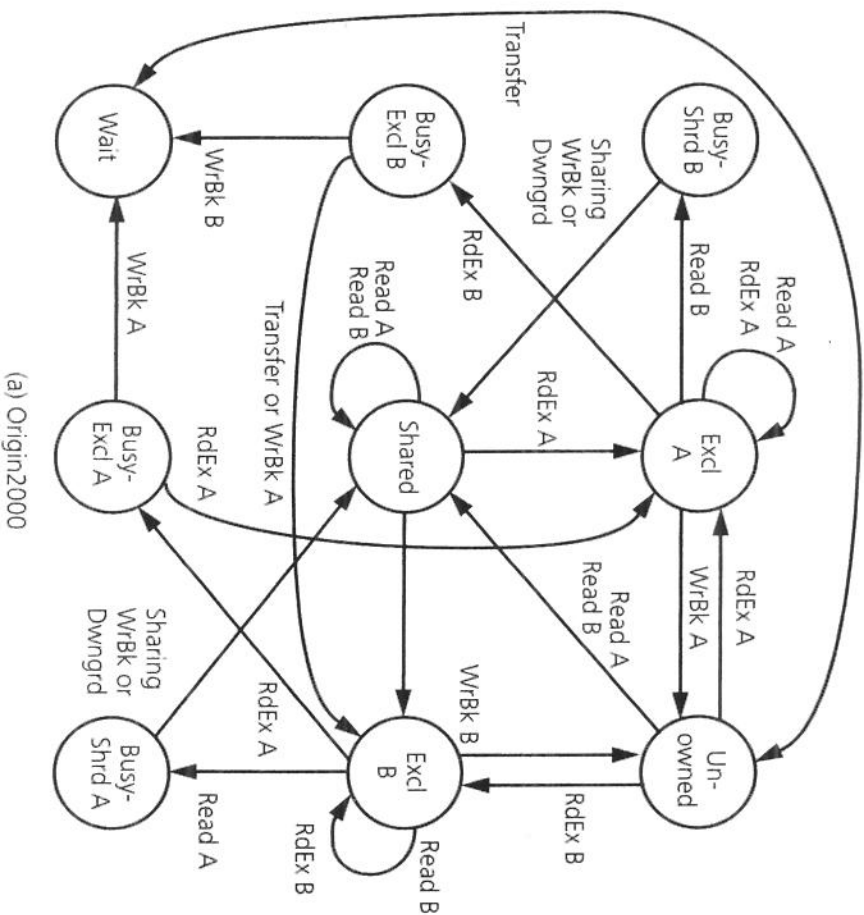


FIGURE 8.42 Expanded directory state diagrams for the case study multiprocessors of this chapter. The state diagram for the SGI Origin2000 in (a) is quite simplified: it shows the busy states at the directory but leaves out I/O operations, the poisoned state, and several race conditions. To show the use of busy states, accesses from two nodes A and B are shown. For example, a state labeled "Excl A" means that the directory thinks the block is in exclusive state in node A, and an arc labeled "RdEx B" indicates a read-exclusive operation from node B. The transfer operation and the wait state are used to handle write backs, as described in the text. The state diagram for the Sequent NUMA-Q in (b) is much more complete, though it also excludes a few corner cases. The state diagrams in this diagram and several of the state labels are not explained; the purpose of this diagram is not to convey the complete protocol but simply to show that full-blown state transition diagrams can become quite complex in real systems.

