

ABSTRACTHIGH PERFORMANCE SYMMETRIC ARBITRATION PROTOCOL
WITH SUPPORT FOR I/O REQUIREMENTS

A system and method for providing a high performance symmetric arbitration protocol that includes support for priority agents. The bus arbitration protocol supports two classes of bus agents: symmetric agents and priority agents. The symmetric agents support fair, distributed arbitration using a round-robin algorithm. Each symmetric agent has a unique Agent ID assigned at reset. The algorithm arranges the symmetric agents in a circular order of priority. Each symmetric agent also maintains a bus ownership state of busy or idle and a Rotating ID that reflects the symmetric agent with the lowest priority in the next arbitration event. On an arbitration event, the symmetric agent with the highest priority becomes the symmetric owner. However, the symmetric owner is not necessarily the overall bus owner (i.e., a priority agent may be the overall bus owner). The symmetric owner is allowed to take ownership of the bus and issue a transaction on the bus provided no other action of higher priority is preventing the use of the bus. A symmetric owner can maintain ownership without re-arbitrating if the transaction is either a bus-locked or a burst access transaction. The priority agent(s) has higher priority than the symmetric owner. Once the priority agent arbitrates for the bus, it prevents the symmetric owner from issuing any new transactions on the bus unless the new transaction is part of an ongoing bus-locked operation.

Figure 1