An American National Standard

# IEEE Standard for a Simple 32-Bit Backplane Bus: NuBus

1. General

1.1 Scope. This standard describes a computer backplane bus optimized for 32-bit transfers, multiprocessor operations, and simplicity. In brief, this is a synchronous (10 MHz), multiplexed, multimaster bus that provides a strictly fair arbitration mechanism. The only bus transfers are read and write (and block transfer versions of each of these) to a single 32-bit address space. Geographic slot addressing and nondaisy-chain arbitration scheme make system configuration simpler by eliminating switches and jumpers. This minimalist approach results in a conceptually straightforward bus with a small pin count (51 active signal lines). Figure 1 shows the major elements of a typical NuBus system.

1.2 Objective. The objectives of this bus are:
- Optimized for 32-bit transfers
- System architecture independence
- Multiprocessor support
- Ease of system integration
- Sparsity of mechanism

These objectives result in a bus that is optimized for 32 bits, but simple enough for low-cost applications, such as 32-bit personal computers.

1.3 Purpose. This standard is intended to describe and specify the logical, electrical, and physical interface standard for circuit boards that allow them to connect to and communicate over a backplane. It also specifies the backplane environment that must be provided to these boards. This standard is oriented to designers of bus interface logic, designers of backplane environments, and those evaluating buses. In keeping with the minimalist philosophy of the bus, the standard has taken a similar approach. Section 2 provides an introduction to the bus, Section 3 is the "minimalist" core of the specification, and Appendix A
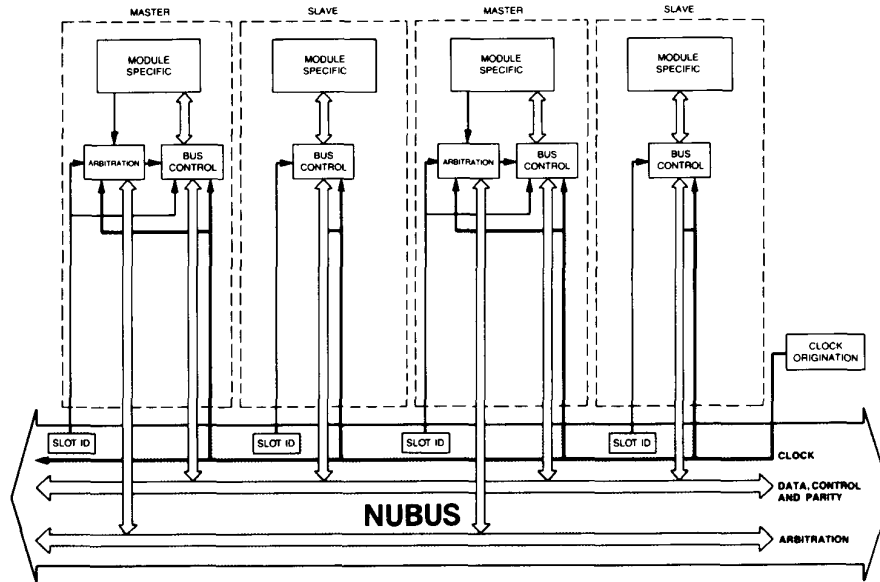
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Fig 1
Simplified NuBus Diagram

describes implications and capabilities that follow from the rules presented in Section 3.

Not specified by this standard are:

- Physical Environment—This includes topics such as how a backplane attaches to a rack, provisions for system cooling, resistance to vibration, etc.
- System Architecture—This is a low-level specification. Any system architectures (such as message passing protocols) are not within the scope of this standard.

1.4 Definitions
1.4.1 General

backplane. A circuit board with one or more bus connectors that provides signals for communication between bus modules, and provides certain resources to the connected modules.