2. Definitions and Abbreviations

The following are terms that are used in the Serial Bus discussions.

acknowledge. A link-layer signal returned by a destination node back to a source node at the end of a packet transmission.

acknowledge gap. The period of idle bus between the end of a packet and the start of an acknowledge.

acknowledge packet. A packet made up of a single byte which is sent in response to most primary packets.

application environment. The physical environment of a backplane serial bus. This includes the bus itself, the modules, and the system which contains them. This environment may be a standardized host backplane (eg., a FutureBus+ profile) which describes signal requirements, transceivers, mechanical arrangement of the modules, and temperature range over which operation is guaranteed.

arbitration. The process by which nodes compete for ownership of the bus. The cable environment uses a hierarchical point-to-point algorithm, while the backplane environment uses the bit-seral process of transmitting a arbitration sequence. At the completion of an arbitration contest only one node will be able to transmit a data packet.

arbitration reset gap. The minimum period of idle bus that must occur after a source using the fairness protocol has won an arbitration contest before it can once again compete for bus mastership. This is longer than a normal subaction gap.

arbitration sequence. For the backplane environment, a set of bits transmitted by nodes that wish to transmit packets that is used to determine which will be able to transmit next.

arbitration signal. Bidirectional signal exchanged between nodes during arbitration. One of the PDUs for the Physical Layer (the other is the data bit).

asynchronous packet. A primary packet which contains bus_ID of the destination in the first quadlet, and is sent as the request subaction and/or response subaction of a transaction.

B-PHY. Abbreviation for the Backplane Physical Layer.

base rate. The lowest data rate used by the Serial Bus in a particular environment. In multiple speed environments, all nodes must be able to receive and transmit at the base rate. The base rate for the cable environment is 98.304 Mbit/sec ± 100 ppm. The base rate for the backplane environment is 49.152 Mbit/sec ± 100 ppm.

broadcast_offset_ID. An offset_ID with a value of 1111112.

bus_ID. A 10-bit number uniquely specifying a particular bus within a system of multiple interconnected buses.

byte. Eight bits of data.

C-PHY. Abbreviation for the Cable Physical Layer.

cycle master. The node that generates the periodic cycle start request.

cycle start. A special packet that indicates the start of a cycle.

data bit. The smallest signaling element used by the Physical Layer for transmission of packet data on the medium. One of the PDUs for the Physical Layer (the other is the arbitration signal).

destination. A node which is addressed by a packet. If the destination is individually addressed by a source then it must return an acknowledgment.

doublet. Two bytes of data.

dribble bits. Extra bits added to the end of a packet which allow extra synchronization in implementations.

fairness interval. A group of back-to-back transfers during which each competing source using the fairness protocol gets a single transfer. The delimiters of the fairness interval are arbitration reset gaps.

gap. A period of idle bus.

initial register space. The address space reserved for resources accessible immediately after a reset. This includes the registers defined by the IEEE 1212 CSR Architecture as well as those defined by this specification.

isochronous. The period of idle bus before the start of arbitration for an isochronous subaction.

isochronous channel. A relationship between a talker and one or more listeners, identified by a channel number. One

packet for each channel is sent during each isochronous cycle. Channel numbers are assigned by the channel management function.

isochronous cycle. An operating mode of the bus that begins after a cycle start is sent, and ends when a subaction gap is detected. During an isochronous cycle, only isochronous subactions may occur. An isochronous cycle begins every 125 microseconds, on average.

isochronous gap. The term “isochronous” indicates the essential characteristic of a time-scale or a signal such that the time intervals between consecutive significant instances either have the same duration or durations that are integral multiples of the shortest duration.

isochronous subaction. A complete Link Layer operation (arbitration and isochronous packet) that is sent only during an isochronous cycle.

listener. A node that receives an isochronous subaction for an isochronous channel.

local_bus_ID. A bus_ID with a value of 1111111111_2.

module. The smallest unit of physical management; i.e., a replaceable device.

natural priority. The order of packet transmission of a node given that all nodes start arbitration at the same instant using the same priority level. For the cable environment, the closer a node is to the root, the higher is its natural priority. For the backplane environment, the priority level and node_offset are concatenated to give its natural priority.

node. An addressable device attached to the bus with at least the minimum set of control registers. Changing the control registers on one node does not affect the state of control registers on another node.

node_ID. This is a unique 16-bit number, which distinguishes the node from other nodes in the system. The 10 most significant bits of node_ID are the same for all nodes on the same bus; this is the bus_ID. The six least-significant bits of node_ID are unique for each node on the same bus; this is called the offset_ID.

non return to zero (NRZ). A technique in which a polarity level high represents a logical “1” (one) and a polarity level low represents a logical level “0” (zero).

octlet. Eight bytes of data.

offset_ID. The least-significant 6 bits of the node_ID. Special transactions are used to guarantee that these numbers are unique for all nodes on the local bus.

packet. The PDU for the Link Layer. A serial stream of clocked data bits.

path. The concatenation of all the physical links between the Link Layers of two nodes.

payload. The portion of a primary packet that contains data defined by an application layer.

PHY. Abbreviation for the Physical Layer.

physical connection. The full-duplex physical layer association between directly connected nodes. In the case of the Cable Physical Layer, this is a pair of physical links running in opposite directions.

physical_ID. A six-bit number used as the initial offset_ID after a bus reset.

physical link. In the Cable Physical Layer, the simplex path from the transmit function of one node’s port to the receive function of a directly connected node’s port.

port. A Physical Layer entity in a node that connects to either a cable or backplane and provides one end of a physical connection with another node.

primary packet. A packet made up of whole quadlets which contains a transaction code in the first quadlet. Any non-acknowledge packet.

Protocol data Unit (PDU). Information delivered as a unit between peer entities that may contain control information, address information and data.

quadlet. Four bytes of data.

reaction time. The maximum period after the end of a packet transmission before:

1) an explicitly addressed destination must send its acknowledge, or
2) a node with an active isochronous channel must start its arbitration.

request. A subaction sent by a node (the requester) with a transaction code and optional data to another node (the responder).

response. A subaction sent by a node (the responder) that sends a response code and optional data back to a requester.

SBM. Abbreviation for the Serial Bus Management Layer.

services. A set of functions provided by one protocol layer entity for use by a higher layer or by management entities.

service primitive. A specific service provided by a particular protocol layer entity.

source. A node which initiates a bus transfer.

speed code. The code used to indicate various bit rates for Serial Bus: S25 indicates 24.576 MBit/sec for TTL backplanes; S50 indicates 49.152 MBit/sec for BTL and ECL backplanes; S100 indicates 98.304 MBit/sec base rate for cable; S200 and S400 indicate 196.608 Mbit/sec and 393.216 Mbit/sec for the cable.

split-response transaction. A transaction where the responder releases control of the bus after sending the acknowledge and then some time later starts arbitrating for the bus so it can start the response subaction. Other subactions may take place on the bus between the request and response subactions for the transaction.

starting delimiter. The first code group transmitted in a packet. This contains the speed encoding for the packet.

subaction gap. The period of idle bus between subactions. There is no gap between the request and response subaction of a concatenated split transaction.

subaction. A complete Link Layer operation: arbitration, packet transmission and acknowledgment. The arbitration may be missing when a node already controls the bus, and the acknowledge is not present for subactions with broadcast addresses or for isochronous subactions.

talker. A node that sends an isochronous subaction for an isochronous channel.

transaction. A request and the corresponding response. The response may be null for transactions with broadcast destination addresses. The PDU for the Transaction Layer.

unified transaction. A transaction where the request and response subactions are directly concatenated without a gap between the acknowledge of the request and the response packet.

unit architecture. The specification document describing the format and function of the unit’s software-visible resources.