

To: T10 00-404r0  
From: PIP ad hoc via Bill Ham, Compaq  
Subject: Interoperability points and approach to concatenated constructions (part of PIP report)  
Date: November 02, 2000

## **1. Introduction**

This document is largely an extract from the PIP minutes from several months ago. Its intention is to bring attention to the issues described to a broader set of the T10 membership.

The definitions and issues describe the expectations of most users yet are significantly different from the way SCSI signal requirements are specified today (even in the latest draft versions of the standards).

There are implications to the requirements for SCSI signal specification in general and to the importance of simple expanders in particular when one truly desires to have interoperability at some points in a SCSI domain.

### **1.1 Approach to concatenated constructions**

Concatenated constructions are those where passive interconnect assemblies are connected together with a separable connector. Examples include connecting a flat cable assembly to round cable assembly, connecting a cable to a backplane, and connecting a round cable assembly to another round cable assembly.

The PIP group identified two basic kinds of configuration relating to concatenated constructions.

#### **1.1.1 Configuration 1**

In configuration 1 the SCSI passive interconnect performance is considered where the bus segment interconnect consists of a single media type and construction on both sides of the connector. For example, a round to round connection is a configuration 1. Although configuration 1 has the complication of a connector and connector transition regions in the "middle" of the segment it is the simplest form of a multidrop-like construction and is important to consider.

Configuration 1 kinds do not include two dissimilar (e.g. round to flat) cable assemblies connected together in series. Similarly, a backplane connected directly to a round shielded cable would NOT be considered a configuration 1.

### **1.1.2 Configuration 2**

Four configuration 2 examples are described below:

- where a short cable assembly is used between the HBA and the bulkhead in a PC-like packaging
- where a short cable assembly is used between the disk drive and the backplane
- where an HBA is used between the external bulkhead and both internal and external cables
- where an external cable is attached directly to a backplane

Each of these cases has the property that the performance at the segment may be significantly affected by the details of the passive interconnect on BOTH sides of the connector. This complicates specifying the performance requirements at the connector between the two because of interactions on both sides.

Because these are important practical applications, some approach is needed in the PIP work. This subject is left for further consideration by the modeling group and in future PIP efforts. Pending definition of a viable strategy for these configuration 2 cases work in PIP will be focused on the configuration 1 cases.

## **2. Interoperability points**

### **2.1 Definition**

Definition: interoperability points are physical points in the system where separable connectors exist and where it is required that the components on either side of the connector may be supplied from different compliant vendors. (or simply where one expects the SCSI domain components to come apart and be interchangeable amongst different suppliers)

### **2.2 Description of interoperability points**

Following is a list where interoperability might be expected in a SCSI segment. A "Y" following the position designation means that this point is presently considered an interoperability point for PIP purposes.

Similarly, a "N" following the position designation means that the point is NOT presently considered an interoperability point for PIP purposes.

[Note that PIP purposes are not different from those of active devices in the sense that the signals into and out of the passive interconnect need to be specified so that the interconnect itself may be specified as a separate interoperable component.]

Figure 1 shows a diagram of many common points in a SCSI system that may be candidates for interoperability points.

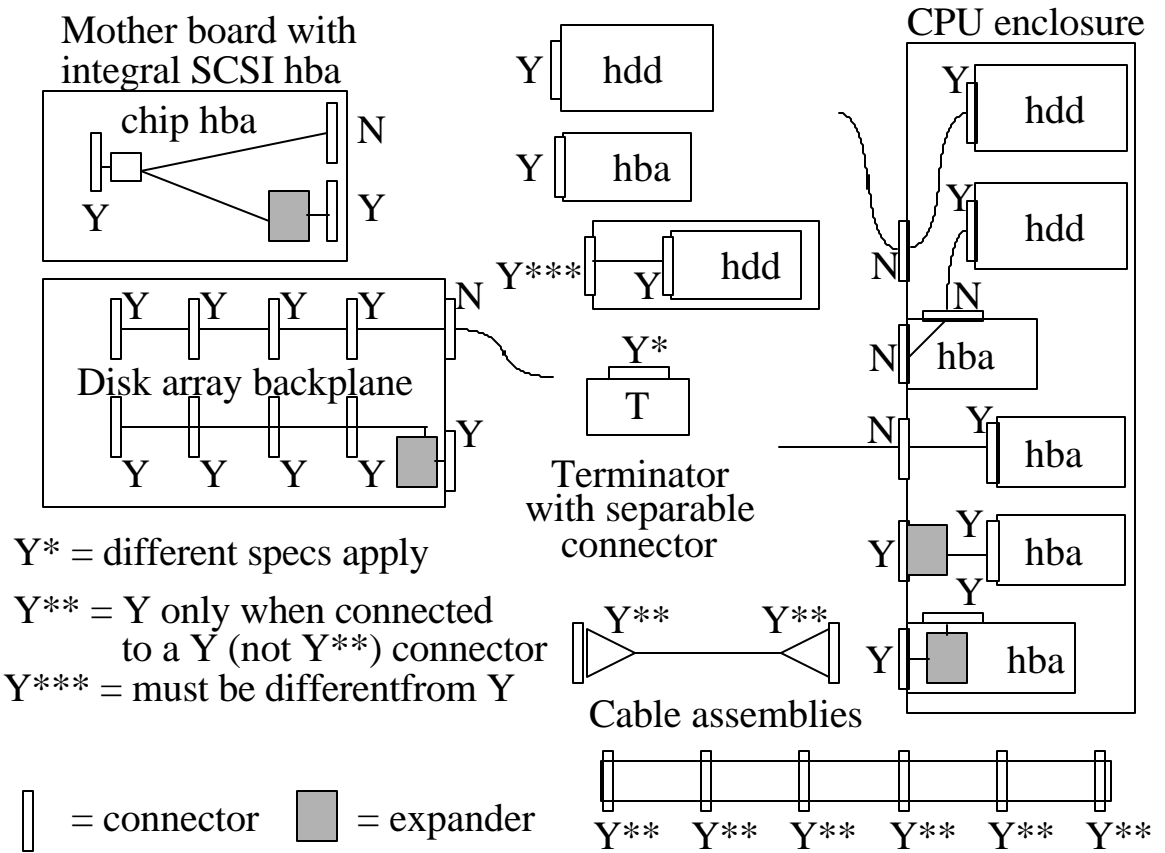


Figure 1 - Examples of interoperability points

Following is the list:

Disk drive connector mounted directly on the disk drive (Y)

HBA connector external connector (Y)

HBA internal SCSI connector to internal cables (Y)

HBA internal SCSI connector to the mother board (uncommon construction where the SCSI path from the HBA chip on the HBA board to the motherboard is through a non-SCSI connector)(N)

Motherboard SCSI connector where the mother board contains the HBA (in an ASIC) on board (Y)

Backplane connectors:

Any connector that directly accepts a disk drive or other SCSI device (Y)

Any connector that directly connects to an external cable assembly through an expander on the backplane (Y)

Any connector on an external cable assembly that connects to an external connector of an HBA (Y)

Any connector on an external cable assembly that connects to an external connector of a disk drive array containing an expander immediately behind the external connector (Y)

Any connector on an internal cable that directly connects to a disk drive or other SCSI device. (Y)

Question: should the external connector to a disk drive array that does not contain an expander be considered an interoperability point? The group agreed that this should NOT be an interoperability point (largely because the media type changes between the cable and the backplane) until proven otherwise in the SSM group or new specifications are developed. (N)

The external connector to a box that has external cable assembly attached and an internal cable assembly attached internally to the same connector. (N)

Note: this means that one may NOT have a cable to cable connection at the bulkhead if interoperability is required.

Question: should separable connectors that belong to terminators be considered interoperability points? The group agreed that these connectors should be included in the interoperability suite. It was noted that a different set of signal requirements apply at terminator connectors (Y)