

# **Cover sheet added after SPI-4 meeting on Jan 15, 2002**

- **The following slides contain detail about why Compaq voted no on the latest SPI-4 letter ballot**
- **Most of the objections noted were resolved in the January 15, 2002 SPI-4 working group to a point where Compaq is now willing to change its vote to yes (assuming that the agreed changes are retained in the final document)**
- **As the general objections are of considerable importance to SPI-4 and other future standards, this presentation serves as documentation of the issues**

# **Background behind Compaq's vote against SPI-4**

- **Compaq has voted no on the latest T10 letter ballot to forward SPI-4 to INCITS for further processing**
- **This presentation provides some background for this position**
- **Although some significant technical issues have been resolved others still remain in the document after the proposed comments resolution process**
- **Compaq presently has no basis for changing its vote to yes**

# **Background behind Compaq's vote against SPI-4**

- **The worrbersome issues all involve wording that states or implies that certain configuration properties (notably physical length of segments and spacing of features) are guaranteed if the requirements in the document are met**
- **The process of determining whether a specific segment configuration delivers the required signals to the receivers under all allowed conditions is much more complex than following the requirements in SPI-4**

# **Background behind Compaq's vote against SPI-4**

- **SPI-4 is a specification that cannot be validated by testing of physical parts (very different from protocol)**
- **If testing reveals that certain configurations fail then the SPI-4 specification is faulty - testing is very useful!**
- **However, if testing reveals that certain configurations work it does NOT validate the configuration in general (because worst case components and conditions are simply not available or not known and for other reasons noted later)**
- **Validation of specific configurations should be done using modeling and system design processes that vary all segment properties over their allowed ranges (well beyond the state of the art captured in SPI-4)**

# **Background behind Compaq's vote against SPI-4**

- **Some specific reasons why physical configuration parameters are not guaranteed by SPI-4**
  - **The acceptable length of an interconnect assembly is affected by many features including: the properties of the conductor used, the construction of the cable or backplane, the routing, the properties of the connectors, the specific loading on each connector (see next slide), the spacing of the loads, the noise environment, and especially the properties of the drivers, receivers, and terminators used**
  - **There are no specifications on interconnect assemblies (cables, backplanes etc) that can be directly translated into length or device spacing using only the information in SPI-4**

# **Background behind Compaq's vote against SPI-4**

- **There are no specifications on the electrical performance of connectors - notably cross talk**
- **There are no specifications on the insertion loss of interconnect assemblies - the insertion loss specifications that do exist apply only to a single specific frequency and to the unconnectorized uniform bulk cable - suckout limits are not specified**
- **There is no definition of the loading conditions on connectors (14 different basic loading conditions may exist for any connector - see latest PIP document)**

# **Background behind Compaq's vote against SPI-4**

- **The requirements on the driver and receiver are different between precomp and non-precomp -- no distinction is made in any length parameter in the present document between the type of driver used**
- **It is implied that interconnect types may be mixed in the same segment without penalty**
- **Recommendations are made for segment design parameters that are contrary to present knowledge - e.g. recommendation of using evenly spaced loads which is known to exacerbate suckout**

# **Background behind Compaq's vote against SPI-4**

- **There is no definition of the “worst case” driver signals for either precomp or non precomp -- this makes compliance testing for specific segment configurations problematic**
- **It is implied that interoperability should be expected at points within the segment where no device exists**



# **Background behind Compaq's vote against SPI-4**

- **The list could go on, however Compaq is not suggesting that any of the length or other physical configuration information be removed from the document since it does set some level of expectation concerning what one might expect to get from a good, constrained, system design (involving much more than contained in SPI-4)**
- **Compaq's objection would be removed if the wording were changed as suggested in our letter ballot comments that defines almost all length and spacing numbers as reasonable targets that could result from good system design rather than as guaranteed properties**
- **The document as it now stands lacks technical credibility in the areas noted**