

T10/08-188r0

SAS 2.0 to SAS 1.1 inter-op
electrical questions?

EMC

Reference: IBM add in Comment reads:

- IBM comment number 4
- Page=171 Subtype=Text Author=Ted Vojnovich
- Comment=
- Section 5: Lots of good math there. However, I am concerned about the
- following scenario: Somebody has a SAS 1.1 device (disk for example) and
- uses a SAS 2.0 cable (I understand that SAS supports up to 10M while SAS
- 1.1 supports 5M). If the distance limit for SAS 2.0 is longer than SAS
- 1.1, how does the system behave (I would think SAS 1.1 transceiver would
- have a hard time working with a cable that is farther in distance). I may
- be off base here (have not watched the analog side that closely) but would
- think there needs some way to help the admin trouble shoot this
- (connector/cable color matching, some impedance sensing, etc). Should
- that not be specified in the std?

Current spec wording:

5.3.3.3.3 TxRx connection characteristics for 6 Gbps

- A TxRx connection supporting 6 Gbps may not support 1.5 Gbps and 3 Gbps and may not support SATA.
- SAS 6 Gbps transceiver devices incorporate enhanced features to allow them to operate over TxRx connections with higher loss than TxRx connections compliant with previous versions of this standard, TxRx connections defined in this standard for 1.5 Gbps and 3 Gbps (see 5.3.3.3.2), and TxRx connections supporting SATA.

What does all this INFER at the connector level?

- A SAS connector designed for 6G SAS, needs to also meet 3G SAS, but the standards are NOT the same!
 - Example impedance has a tolerance at SAS1.1 but no tolerance at 6G, which do you use? Its possible to meet the S-parameters at SAS 2.0 with a different impedance than what's specified in SAS1.1
 - Can we add a statement saying specifically that “Connectors designed to work at 6G automatically are compliant at 3G/1.5G.”

What does all this INFER at the Cable (TX RX connection) level?

- A cable that was designed to run at 6G SAS 10Meter, will be impossible to work at SAS 1.1 3G speeds.
 - Nothing in the spec says you should keep the DFE on at 3G, when you are a SAS 2.0 device, it infers you might want to keep it on, BUT actually its just the opposite for power reasons, most would want to turn it off, and either method meets the spec(s) at 3G, but doesn't actually work.
 - So how do you know you have a SAS 2.0 TXRX connection? We would need an EEPROM in the cable perhaps?
 - What happens when you have a bad 10M cable that doesn't reliably connect at 6G SAS 2.0? Bad lane? Flaky wire or ground? What do we back track to?