STA Technical Committee

- STA Technical meeting July 18th – Colorado Springs 01s013r0
  - May 2nd Nashua Minutes 01s008r0 on www.scsita.org/STATech
  - Parallel SCSI roadmap to 2012 - 01s001r2, 2X2Y (twice the performance every 2 years) adopted for Ultra640 to Ultra5120 SCSI.
  - Ultra640 SCSI, Maxtor presentation 01s012r0
  - Ultra640 SCSI Key issues, restrictions and guidelines presentation was developed 01s014r0
  - The next meeting will be in Huntington Beach - Sept 12, 2001.
  - Server and PC ease of use documents, approved May 4th - Rev 1.0 of both documents 00s018r4 and 00s019r4
STA General

• STA
  – Roadmap was approved
  – 20th anniversary May 22nd Fairmont Hotel with IDC
    • Good turn out, excellent show of the history of SCSI and the roadmap chart to Ultra5120 SCSI.
  – The last STA General was in Nashua 4-May-2001 –
    • Booth at Applied Computing coming up May 14-17
  – Revise website went on line in December - Marketing to web based, last year over 100,000 hits
  – Product data base allows non STA member product listings for a fee
  – Several Articles published, RTC, CTR, EDN, IEEE
  – Next STA General meeting – July 19th 1:30PM– Colorado Springs
Planned Steps

- Ultra640 SCSI – SPI-5 - 2003
- First generation Multilevel- SPI-6 – 2005
  - Ultra1280 SCSI (1.2 Gigabyte/second)
- Step in 2007 Ultra2560 SCSI
- Step in 2009 to Ultra5120 SCSI
Requirements for drive performance

Disk drive transfer rates, SCSI requirements 4 disk drives running long block sequential transfers

Proposed naming: Ultra SCSI in Megabytes per second

- Ultra640 SCSI
- Ultra1280 SCSI
- Ultra2560 SCSI
- Ultra5120 SCSI

Marketing Roadmap

• **Ultra640 SCSI – 2003**
  - Extension of the current technology developed for Ultra320
  - Expanders and Bus tuning may be required

• **Ultra1280 SCSI – Approximately 2005**
  - Encoded SCSI – backward compatible with LVD SCSI
  - Multimode transceivers will not be supported.
  - Expanders required for Single ended.

• **Ultra2560 SCSI – Approximately 2007**
  - Second generation encoding.

• **Ultra5120 SCSI – Approximately 2009**
Step Details

- **Ultra640 SCSI**
  - SPI-5, Fast-320 SCSI
  - adjustable - Precomp or AAF
  - No major impedance mismatches
    - Expanders for cable to backplane matching
    - Tuning the termination
  - Expanded domain validation

- **Ultra1280 SCSI**
  - SPI-6, Fast-640 SCSI
  - Encoding with self clocking proposed
  - Multilevel proposed
  - Works on LVD SCSI bus
Step Details

• **Ultra2560 SCSI**
  – SPI-X, Fast-1280
  – Encoding, self clocking - proposed
  – 2\text{nd} generation multilevel proposed
  – Works on the LVD SCSI bus

• **Ultra5120 SCSI**
  – SPI-x, Fast-2560
Summary

- The roadmap for performance is clear.
- The steps are in definition, but the technical community is starting down the roadmap with the new project proposals for SPI-5 and SPI-6.
- SPI-6 involves a new technology approach that will take time to test and develop.
  - We are starting the work now to be ready in 4 years with the technology that will have follow on generations.
  - The long term roadmap to 2012 continues to double performance every 2 years.
Ultra640 SCSI

Key issues proposed
New Restrictions
Develop Guidelines for Ultra640 testing
Key issues

- Reflections as large as signals
- Major impedance mismatch between cables and backplanes.
- Crosstalk to signal ratio marginal on large configurations
- Periodic structure issues (Comb filter effects)
- SE – 5 volt requirement – problem for technology and eliminating will reduce capacitance
- Stub effects
New Restrictions

- Restricting applications
  - Cable assembly defined by Electrical parameters, not an open statement of wire gauge and distance.
    - Applications of unshielded cable – restriction
      - Impedance problems, crosstalk, common noise, sweep attenuation – avoiding periodic structures
    - Expanders for heavily loaded backplanes and long cable applications
- SPI-5 cables marking - Performance differences
- Programmable terminators
  - Reducing the impedance to match the loaded bus impedance for backplanes
New Restrictions

- **LVD only**
  - Drop MSE, there have been three generations for the transition to LVD SCSI
  - Drop SE in SPI-5
  - Series resistors for devices to reduce stub effects

- **Backplane design rules**
  - Reduce the effects of periodic structures
  - Reduce the crosstalk

- **Twisted and flat cable spacing**
  - Reduce the effects of periodic structures
  - Reduction of the impedance change of the flat section
Develop Guidelines for Ultra640 testing

- **Cable to backplane restrictions**
  - **Cable to backplane**
    - Electrical specifications that limit cable connections to backplanes. (Crosstalk)
    - 5 or X slot maximum backplane – electrical specifications on backplanes
  - **Backplanes over 5 or X slots**
    - Restrict to expander
  - **Termination on the backplane matches the impedance**
    - Programmable termination that can be adjusted to the backplane loading.
    - Adjust with switch or I2C bus, out side of the SCSI bus to keep the terminator cost down – 55 to 135 ohm range, adjustable bias current for negation
  - Expanders, SES and SCSI should plan to control
Develop Guidelines for Ultra640 testing

- Reduce stub effects with series resistors on drives
- Backplanes
  - periodic structures at 160 MHz should not be used.
  - Crosstalk
  - Strip line? Tutorial or annex
  - Tutorial on designing backplanes
- SPI-5 cables marking - Performance differences
- White Box profile definitions