



1394b is Better with a PCI-Express Host

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Outline

- Increased bandwidth
 - More efficient performance
 - Easier, smaller board layout
 - Enhanced power management
 - Improved error immunity/Reliability, Availability, Serviceability (RAS)
 - Support for future enhancements
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- Microsoft Win7 survey shows 91% of the 1394 hosts are PCI!

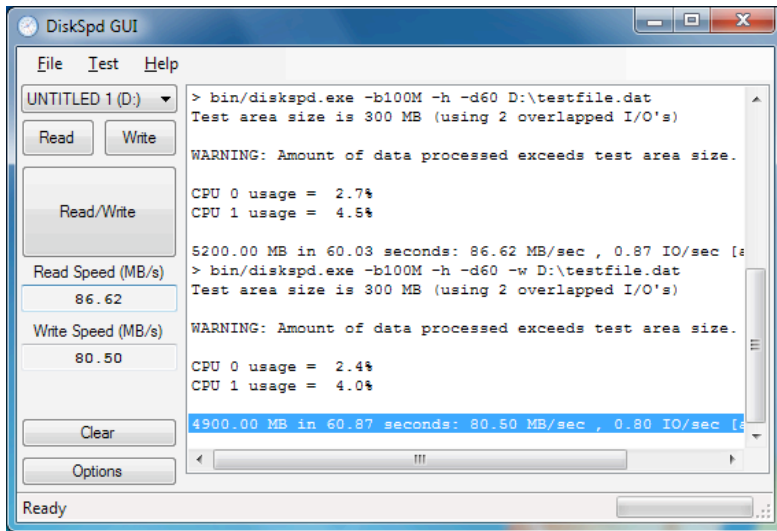
Increased Bandwidth, 2.5 to 8x More!

- Conventional 64-bit PCI supports 1 Gig/second
- Allows many devices on same bus segment
- Bus can be quickly saturated, or filled up
- This means streaming video performance, for example, can be 'compromised'
- PCI-Express generation 1 supports 2.5 Gig/second
 - Generation 2 is 5Gig/second
 - Generation 3 is 8Gig/second
- Allows one device per root port
- No "shared" bandwidth

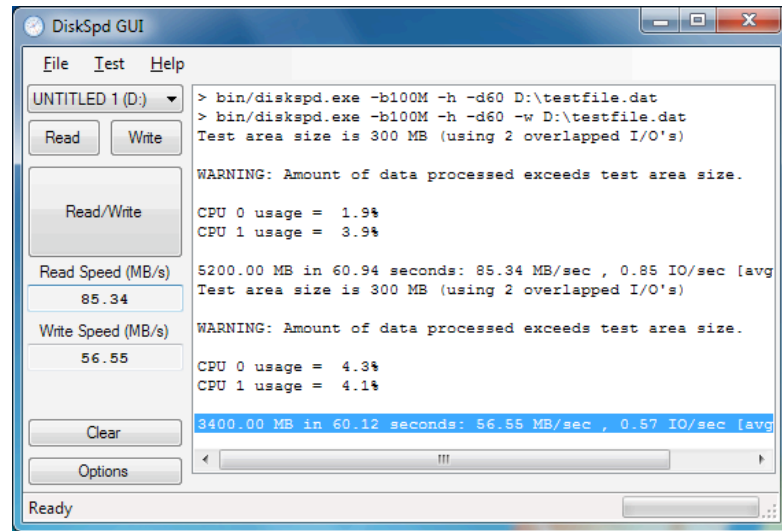
More Efficient Performance

- Conventional PCI Bus arbitration and transaction termination
- Constant bus re-try efforts increase 'overhead'
- Bandwidth becomes limited by competition for bus ownership
- Can lead to 'live lock'
- PCI-Express Uses split transaction protocol
- No more battling over ownership
- All wait states are gone
- Supports 'credit-based flow control'
- Traffic congestion is removed

Bandwidth & Performance, 30% higher with PCI-E



PCI-Express



PCI

Easier, Smaller board design

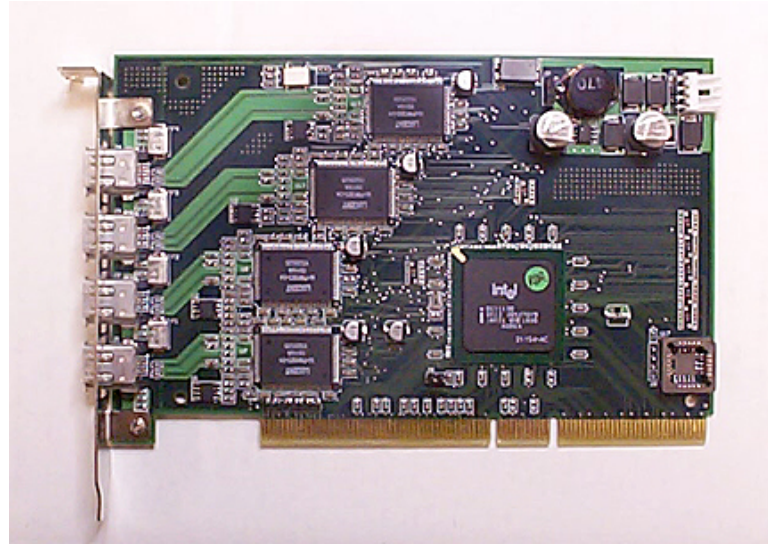
- PCI-Express is a serial bus, PCI is a parallel bus
 - No requirement for 32-bit or 64-bit wide buses
- Smaller 1394 host controller packages
- Easier board placement and easier 1394 signal routing
- Simplifies system board design
- Enables a lower cost implementation

- Or, Enables multiple controllers on one PCI-Express board

Quad 1394 Host Size Comparison, 1/2 the size!



PCI-Express



PCI

Enhanced power management

- PCI-Express includes PCI's software controlled "static" power states
- PCI-Express adds "Active State Power Management" (ASPM) which enables additional power savings in normal "dynamic" operation
- For mobile platforms, PCI-Express offers hot swap Express Card support
 - Replaces the Card bus slot and eliminates the discrete Card bus controller
 - Enables hot plugging of 1394 host adapters!
- PCI-Express Gen 2 adds power optimization by signal level margining
- PCI-Express Gen 3 adds dynamic equalization which optimizes power efficiency and signal integrity

Improved error handling (RAS)

- PCI-Express requires standard on-chip hardware for error detection, correction and reporting
- PCI-Express includes multi-level error reporting capabilities:
 - On-chip PCI-Express hardware handles correctable errors on the fly
 - On-chip PCI-Express hardware notifies software of non-correctable errors that are non-fatal and correctable in software
 - On-chip PCI-Express hardware notifies software of non-correctable fatal errors
- The spec standardizes error reporting which eliminates the need additional device drivers
- By comparison, PCI could only detect parity errors

Support for future enhancements

- PCI-Express supports Virtualization, not currently used
- PCI-Express supports 64-bit OHCI, not currently used
- More operating sys support for multiple 1394 controllers
- Optimized Buffer Fill/Flush (OBFF)
- Latency Tolerance Reporting (LTR)



Thank you for attending!