

SATA

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SATA Stands for "Serial AT Attachment", and is the current leading standard for harddrives and optical media, having succeeded the (Parallel) ATA interface. Practically all SATA drives can be used using either AHCI or ATA

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Introduction

SATA is a bus interface for communicating with mass storage devices (such as disk drives, optical drives, etc). The composition is mostly identical to PATA, where one controller connects to several devices using SATA cables. SATA wiring is also one-on-one instead of allowing more than one device to be connected to a single cable. When SATA was introduced, almost all host controllers were configured to masquerade as an PATA controller, needing no change from the existing disk drivers. The majority of SATA controllers also support AHCI, which offers connecting more devices than PATA allows, and significant other advantages over the legacy protocol.

Computers that are currently shipped often are AHCI only, and backwards compatibility mode, if present, has to be manually enabled from the BIOS - a change that often comes with the cost of making the installed OSes unbootable.

The actual SATA specification is split into three distinct protocol 'layers'.

- Physical Layer - Information relating to the physical connectors, etc. Not especially relevant here.
- Link Layer
- Transport Layer

At the time of writing, there were three supposedly definitive, conflicting standards for SATA. It may be best to wait for the industry to shake out a little more completely, before trying to write SATA drivers.

If you want to try anyway, then get the ATA7, and ATA8 technical docs from www.t13.org. Then maybe try paying \$25 to get the technical specs from www.sata-io.org. Hopefully, the discrepancies between the standards aren't too bad.

Detection and Initialization

Send a standard IDENTIFY command to the drive (0xEC). The drive should respond with an error in the ERR bit of the Status Register, and a pair of "signature bytes". On the Primary ATA bus, you get the signature bytes by reading IO ports 0x1F4 and 0x1F5, and you should see values of 0x3C and 0xC3.

See Also

AHCI

External Links

- The Serial ATA International Organization (<http://www.sata-io.org/>)
- <http://www.ata-atapi.com> -- Public Domain C driver sourcecode, including SATA, Busmastering DMA, ATAPI -- not perfect, but good.

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