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Older hard drive connections

Website Forum Facebook Updates Sitemap Links Link MENU (Hard Drive): 1. Hard Drive 2. Update Hard Drive 3. How hard drive 4. RAID Google Ads www.computerupgradesrepairs.co.uk © Hard drives can be accessed through a number of bus types, including parallel ATA (PATA, also known as IDE or EIDE; SATA ATA as ATA, Serial ATA (SATA), SCSI, Serial-connected SCSI (SAS) and Fibre Channel. The bridge circuit is sometimes used to connect hard drives to buses that cannot communicate natively, such as IEEE 1394, USB, SCSI, and Thunderbolt. Disk interface families Disk drive connections have evolved from simple interfaces that require complex controllers to connect to the computer into high-level interfaces that display a consistent interface to the computer system regardless of the internal technology of the hard disk. The following table lists some common HDD interfaces in chronological order: Acronym or abbreviation: Meaning SMD Storage Module Device Bit serial data interface introduced by cdcstandard interface for many mini-computers in the 1970s and 1980s. ANSI has evolved into scsi (SASI is a compatible part of the first version of SCSI). ST-506ST-412ST-412RLL Bit serial data interface introduced by Seagate Technology in early 1980. Standard interfaces are the most small HDDs of the 1980s and early 1990s. SCSI Small Computer System Interface Word serial interface sponsored by ANSI and introduced in the mid-1980s; Standard interfaces for most corporate HDDs this century; replaced the SAS ESDI Enhanced Small Disk Interface Bit serial data interface sponsored by ANSI and first introduced by Maxtor in the late 1980s. By the mid-1990s, the ST-506 family had a higher data transfer rate, replaced by the SCSI (P)ATA (Parallel) AT Attachment Word serial interface, introduced by Conner Peripherals in the late 1980s, which was later sponsored by ANSI; successor to ST-412/506/ESDI. Standard HDD interface for all but enterprise HDDs until replaced by sata SATA Serial ATA Bit serial interface successor PATA sponsored by ANSI and introduced in 2003.Most common interface of all, but corporate HDDs. SAS Serial Attached SCSI bit serial interface successor to SCSI sponsored by ANSI and introduced in 2004.Now common interface corporate HDDs. SAS Serial Attached SCSI bit serial interface successor to SCSI sponsored by ANSI and introduced in 2004.Now common interface enterprise HDDs. SAS Serial Attached SCSI bit serial interface successor SCSI sponsored by ANSI and introduced in 2004.Now common interface corporate HDD. Most common interface for enterprise HDDs. Most common interface for enterprise HDDs. Most common interface for enterprise Early interfaces Data cable (above) and control cable (below) connecting a control card and an ST-506 HDD. The power cord does not appear. The earliest hard drive (HDD) interfaces were bit-line data interfaces that connected one HDD to a controller with two cables, one for control and the other for data. [a] An additional cable was used for power, initially often connected to an alternating power supply, but later usually directly to a DC power supply. The control control significant functions such as serial/parallel conversion, data isolation and song formatting, and snap to the drive (after formatting) to ensure reliability. Each controller cable can use two or more drives, while a dedicated (and smaller) data cable has served each drive. Examples of early interfaces include: Many early IBM drives, such as IBM 2311,[1] had such interfaces. The SMD interface was popular on minicomputers in the 1970s. ST412, an ST-506 version, was available in mfm or RLL (Run Length Limited) encoding versions. The improved singles interface (ESDI) was an industry standard management interface similar to the ST412, which supported higher data rates between the processor and the disk drive. For bit-line data interfaces, the data frequency, the data encoding schema written to the disk surface, and error detection all affected the design of the supporting control. The encoding schemes used included frequency modulation (FM), modified frequency modulation (MFM) and RLL[2] encoding at frequencies of 0.156 MHz (FM 2311) and 7.5 MHz (RLL ST412) MHz. Thus, every time the internal technology evolved, there was a need for delay, as the controllers were designed or modified to adapt to development; this combined with the cost of controller development led to the introduction of Word serial interfaces. The enhanced singles interface (ESDI) was an attempt to minimize the controller's design time by supporting multiple data rates with a standard data encoding scheme; This is usually matched automatically by the disk drive and the controller; however, most of the time, 15 or 20 megabit ESDI disk drives were not down-compatible (i.e. a 15 or 20 megabit disk drive would not run on a 10 megabit controller). ESDI disk drives typically used jumpers to stop sector sizes per track and (in some cases) by sector size. Word serial interfaces History serial interfaces connect a hard drive to a bus adapter[b] with a cable for combined data/control. (As with all early interfaces above, each drive also has an additional power cord, usually directly from the power supply.) The earliest versions of these interfaces usually received 8-bit parallel data transfer from the drive/drive, but 16-bit versions have become much more common and there are 32-bit versions. The word type of data transfer makes it significantly easier to design a host bus adapter than the HDD controller of the precursor. Ctl-I (Controller Interface)[3] is an 8-bit serial interface introduced by IBM for mainframe hard drives that began in 1972 with 3333. [4] The 3333 was the first unit to have an eight-type 3330 hard drive it included a CTL-I controller and two 3330 disk drives. Then, the first drive drive a CTL-I controller) marked it as an IBM A-unit in a series of drives. [5] Drives within the A-unit and all other drives in the string had similar interfaces to the above early interfaces. A-units related to IBM directors or integrated attachments. Small Computer System Interface (SCSI), originally known as SASI for Shugart Associates System Interface, is an early (about 1978) industry standard interface specifically deployed to minimize system integration efforts. [6] SCSI disks have become standard on servers and workstations. Commodore Amiga and Apple Macintosh installed a SCSI drive in the mid-1990s, by which time most models were transferred to ATA (and later SATA) family discs. It was only in 2005 that SCSI disk capacity was left behind ATA disk technology, although the highest-performing disks are still only available in SCSI, SAS, and Fibre Channel channels. Data cable domain limits allow external SCSI devices. Originally, SCSI data cables used single-ended (common mode) data transmission, but the server class's SCSI could use differential transmission, either low voltage difference (LVD) or high voltage difference (HVD). (The low and high voltages of differential SCSI are in line with SCSI standards and do not correspond to the low voltage and high voltage voltages used in general electrical engineering environments, as they apply, for example, to statutory electrical codes; both LVD and HVD use low voltage signals (3.3 V and 5 V respectively) in general terminology.) Multiple parallel ATA hard drives with parallel ATA drives, originally ide, will be standardized under the name AT Attachment (ATA), with the alias P-ATA or PATA retroactively en-retroactively added when introducing the new version of Serial ATA. The original name (cir about 1986) reflected the integration of the controller and the hard disk. (This integration was not new here after it happened a few years earlier on SCSI drives.) Moving the HDD controller from the adapter card to the disk drive has helped standardize the host/controller interface, reduce the programming complexity of the host device driver, and reduce system cost and complexity. The 40-pin IDE/ATA connection transmits 16 bits of data on the data cable at a time. The data cable was originally 40-driver, but later has higher speed requirements for data transmission and hard drives led to ultra DMA mode, called UDMA. Gradually faster versions of this standard eventually added the requirement for an 80-conductor version of the same cable, where half of the wires provide the grounding needed for better high-speed signal quality by reducing cross-talk. The interface for the 80-driver has only 39 needles, the missing needle is key to incorrect insertion of the connector into an incompatible socket, which is a common cause of damage to the disc and controller. Bit serial interfaces Modern bit serial interfaces are connected to the drive to the interface adapter of a host bus (now on a computer that is usually integrated into the south bridge) with a data/control cable. Each drive also has an additional power cord that usually leads directly to the power supply. THE DEC's Standard Disk Interconnect (SDI) was an early example of a modern bit-line interface. Fibre Channel (FC) is the successor to the parallel SCSI interface in the corporate market. It's a serial protocol. On disk drives, you typically use fibre channel arbitrated loop (FC-AL) connection topology. FC has a much wider range of usage than mere disk interfaces, and this is the cornerstone of storage area networks (SANs). Other protocols have recently been developed for this area, such as iSCSI and ATA over Ethernet. Disturbingly, drives usually use copper twisted pair cables for fibre channel, not fiber optics. Traditionally, the latter are reserved for larger devices, such as servers or disk array controllers. An mSATA SSD is a 2.5-inch SATA drive at the top of Serial ATA (SATA). The SATA data cable has a data pair for differential transfer of data to the device, and a pair for differential reception from the device, as well as the EIA-422. This requires the transmission of data in sequence. A similar differential warning system is used in RS485, LocalTalk, USB, FireWire and differential SCSI systems. Serial attached to SCSI (SAS) is a next-generation serial communication protocol for devices designed to allow much higher speed data transfer and are compatible with SATA. SAS uses mechanically identical data and power connectors for standard 3.5-inch SATA1/SATA2 HDDs, and many server-oriented SAS RAID controllers can handle SATA hard drives. SAS uses serial communication instead of the parallel method in traditional SCSI devices, but still uses SCSI commands. Notes ^ Some HDDs were parallel data transfer devices, e.g. IBM 2305 ^ Today are typically integrated, but separate boards or boxes of early embodiment References ^ IBM 2311 Field Engineering Theory of Operation, October 1967, 3. September 1987 ^ Via New Attachment Strategy IBM meant to thwart PCMs ^ IBM 3990 Storage Control Reference: GLOSSARY, GA32-0099-06, © Copyright IBM Corp. 1988, 1994 ^ Intelligent systems interface facilitates peripheral integration H. Meyer & J. 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