



ATTO EDITORIAL GUIDE

ATTO Trademarks

Accelerate™ Partner Program

Access™ Partner Program

ATTO Advanced Data Streaming (ADS™) Technology

ATTO Benchmark Tool™

ATTO CacheAssure Technology™

ATTO Celerity™

ATTO ConfigTool™

ATTO Drive Map Director™

ATTO DriveAssure™ Technology

ATTO DVRAID™

ATTO ExpressNAV™

ATTO Express Power Center™

ATTO ExpressSAS®

ATTO FastFrame™

ATTO FibreBridge®

ATTO FibreConnect™

ATTO intelligent Controller Architecture™

ATTO Latency Scout™

ATTO Multipath Director™

ATTO QuickNAV™

ATTO Smooth Data Optimization™

ATTO Signal Integrity™

ATTO ThunderLink®

ATTO ThunderStream®

ATTO Virtual Device Manager™

ATTO Virtual Drive Response™

ATTO vConfigTool™

ATTO WriteStop™

ATTO XstreamCORE™

ATTO Xtend SAN™

ATTO Product Names

ATTO Celerity™ 81EN

ATTO Celerity™ 82EN

ATTO Celerity™ 84EN

ATTO Celerity™ 161E

ATTO Celerity™ 162E

ATTO Celerity™ 164E

ATTO Express Power Center™

ATTO ExpressSAS® H12F0

ATTO ExpressSAS® H120F

ATTO ExpressSAS® H1280

ATTO ExpressSAS® H1208

ATTO ExpressSAS® H1244

ATTO ExpressSAS® 1248

ATTO ExpressSAS® 1288

ATTO ExpressSAS® H608

ATTO ExpressSAS® H60F

ATTO ExpressSAS® H680

ATTO ExpressSAS® H6F0

ATTO ExpressSAS® R644

ATTO ExpressSAS® R608

ATTO ExpressSAS® R60F

ATTO FastFrame™ NS11

ATTO FastFrame™ NS12
ATTO FastFrame™ NS14
ATTO FastFrame™ NT11
ATTO FastFrame™ NT12
ATTO FastFrame™ NQ11
ATTO FastFrame™ NQ12
ATTO FastFrame™ CS11
ATTO FastFrame™ CS12
ATTO FastFrame™ CS14
ATTO FibreBridge® 6500
ATTO FibreConnect™ 8324
ATTO FibreConnect™ 8316
ATTO FibreConnect™ 8308
ATTO ThunderLink® FC 1082
ATTO ThunderLink® NS1101
ATTO ThunderLink® NT 1102
ATTO ThunderLink® SH 1068
ATTO ThunderLink® FC 2082
ATTO ThunderLink® NT 2102
ATTO ThunderLink® SH 1068
ATTO ThunderLink® FC 2082
ATTO ThunderLink® NT 2102
ATTO ThunderLink® NS 2102
ATTO ThunderLink® FC 2162
ATTO ThunderStream® SC 3808D/E
ATTO XstreamCORE™ 7500
ATTO Xtend SAN™

Industry Terms

bandwidth

byte

cache

cloud (no cap)

compression ratio

data center bridging

data rate

digital asset management

Ethernet (cap)

failover

Fibre Channel (cap)

Fibre Channel Fabric

high availability (no caps)

ingest

iSCSI (lower case i)

OTT (over-the-top)

scale/scalable/scalability

tiered storage

transcoding

virtual device manager

ATTO Terms

ATTO (always all caps)

Adaptive Path Optimization

Data Mover

Disk Benchmark

Power Center Pro

TECH TERMS

big data (not capped)

data center

direct-attached, network-attached

enterprise

fabric

failback

failover

flash

I/O

IOPS

MB / GB (Megabyte / Gigabyte)

Mb / Gb (Megabit / Gigabit)

STANDARD WRITING GUIDE

Ampersands (&) are to be used only when connecting two elements (M&E, Media & Entertainment, Oil & Gas). For all other purposes, use “and” instead.

block-level (no cap)

capitalization: Only capitalize the first word of a headline or subhead and proper nouns

file-level (no cap)

software-defined storage (no caps)

software-defined networking (no caps)

Thunderbolt™ device (not Thunderbolt-enabled device)

ThunderLink® device (no cap)

ThunderStream®

The difference between MB/s, Mb/s, GB/s and Gb/s

\$/Gb or dollars per Gb

Use ™ (Alt+CTL+T) instead of superscript TM

Use ® (Alt+CTL+R) for registered trademark

ABBREVIATIONS

CapEx or CAPEX: capital expenditure

HBA: host bus adapter

HDD: hard-disk drive

LAN: local area network

LUN: logical unit number

NIC: network interface card

OpEx or OPEX: operational expenditure

RAID: redundant array of independent disks

RDMA: remote direct memory access

RoCE: remote direct memory access over converged Ethernet

SAN: storage area network

SAS: serial-attached SCSI

SATA: serial advanced technology attachment

SCSI: small computer system interface

SDD: software design description

SDS: software-defined storage

SMB: small- to medium-sized business

SSD: solid-state drive

TCO: total cost of ownership

M&E Dictionary

24 Frames Per Second

The international frame rate standard used when shooting film. The number of frames that are run through the gate of a camera, or projected, per second.

All-Flash Array

A data storage system that contains multiple flash memory drives in place of spinning hard disk drives, allowing for much faster data transfer rates and more efficient use of data center resources.

Aspect Ratio

Describes the proportional relationship between the width and height of an image. The most common aspect ratios used in film are 1.85:1 and 2.39:1. The two most common video aspect ratios are 4:3 and 16:9, which is the universal aspect ratio for high-definition television.

Bandwidth

The total amount of data that can be transferred at one time between CPU and storage. Generally, bandwidth refers to large block data transfers and is measured in MB/sec. For instance, the total bandwidth available on any given UltraSCSI bus is 40 MB/sec. Actual transfer rates are somewhat less than this.

Byte

One of the basic units for measuring digital information, especially relevant to understanding storage capacity on computer disks. 8 bits comprise a byte. Roughly 1000 bytes equals one kilobyte. 1000 kilobytes is one megabyte or meg. 1000 megabytes is a gigabyte. Byte uses a capital "B" (MB = MegaByte) in abbreviations whereas a bit is represented by a lower case "b" (Mb = Megabit).

Cache

Same technology as cache memory used in servers. Storage cache usually resides on RAID controllers and boosts performance because the CPU doesn't have to wait for a disk head to spin. Data can be written to and read directly from cache.

CGI (Computer-Generated Imagery)

Refers to animating digital elements or creating 3D computer graphics that will eventually be composited into a scene to give the illusion as if the elements were a part of the original scene.

CODECs (Compressor / Decompressor)

Software that enables your devices (Camera, Editor, Player) to perform video encoding and/or decoding. Codecs are used to compress raw footage to make it easier to manage since compressed footage requires less storage space and less throughput to stream.

Color Grading / Color Correction

The process of altering or enhancing the color of an image, usually done in what's called a Digital Intermediate suite. This is one of the final creative processes of post-production, where the filmmaker is able to create the specific look of the finished film. Color correction is usually done using raw, uncompressed footage. This requires very high bandwidth and is a good use case for ATTO products.

Color Space

Refers to an abstract mathematical model that describes the way colors are represented to the human eye based on various defined color models. HDTV uses the Rec.709 color space. Digital Cinema uses the P3 color space.

Compositing

The process of combining visual elements from separate sources into single images, usually done through the method of green-screen, and most recently using "virtual sets" that are replaced by computer graphics programs.

Compression Ratio

The ratio between the video's original size and its compressed size. This allows us scale to the video down to a manageable size for the final product. Compression is a tradeoff between storage capacity / storage bandwidth needs and image quality (detail and color).

Dailies

Processed or shot footage that the director reviews to see the results of the previous day's shooting.

Data Rate

An attribute assigned to a media file by a compression utility. It is a measure of the amount of digital information transmitted in a given unit of time—usually a second. Thus, a video could be encoded to play back at a rate of 500 kb/s.

Digital Asset Management

(Also known as Media Asset Management.) How you take in, handle and distribute media assets in digital form.

Digital Intermediate

Creating a digital intermediate (DI) refers to the digitizing of motion picture data and manipulating the color and other image characteristics in one of the final stages of finishing the film in post-production. The process uses digital tools to color grade, and ultimately the DI will be used to create the digital master.

DNxHD (Digital Nonlinear Extensible High Definition)

A lossy high-definition video post-production codec engineered for multi-generation compositing with reduced storage and bandwidth requirements. It is an implementation of SMPTE VC-3 standard. The DNxHD codec was developed by Avid Technology.

Edit Decision List (EDL)

Used in the post-production process of film and video editing. Contains an ordered list of reel and timecode data representing where each video clip can be obtained in order to conform the final cut.

Failover

The automatic substitution of a functionally equivalent system component for a failed one. The term failover is most often applied to intelligent controllers connected to the same storage devices and host computers. If one of the controllers fails, failover occurs and the survivor takes over its I/O load.

Fibre Channel Fabric

A Fibre Channel fabric is created by a set of interconnected HBAs, bridges, storage devices and switch(es). Note that a SAN installation often contains multiple fabrics for redundancy.

Gamma

A measurement of the level of midtones in an image.

GPU (Graphics Processing Unit)

A specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display.

HD (High Definition)

HD comes in three different formats, all in widescreen 16:9 aspect ratio. The first (720p) features 720 x 1280 pixel resolution with progressive scanning. The second high definition format (1080i) features greater resolution (1080 x 1920 pixels), but with interlaced scanning.

The third (1080p) is currently the ultimate high definition format, with 1080 x 1920 pixel resolution and progressive scanning.

Ingest

Used for digitizing video. Can be done via decks, film scans (Cine), hard drives, solid state disks (ex. P2 media, XDCAM, RED One), satellite feeds, capture cards and breakout boxes.

I/O

Refers to data that is being sent from a CPU to any type of storage device or peripheral.

IOPS

Input/Output operations per second.

IPTV (Internet Protocol TV)

A system where a digital television service is delivered using Internet Protocol over a network infrastructure, which may include delivery by a broadband connection. Content, instead of being delivered through traditional broadcast and cable formats, is received by the viewer through the technologies used for computer networks. IPTV is typically supplied by a service provider using a closed network infrastructure. This closed network approach is in competition with the delivery of TV content over the public Internet, called Internet Television.

iSCSI

Short for Internet Small Computer System Interface, an IP-based standard for linking data storage devices over a network and transferring data by carrying SCSI commands over IP networks. iSCSI supports an Ethernet interface at the physical layer, which allows systems supporting iSCSI interfaces to connect directly to standard Ethernet switches and/or IP routers.

iSCSI initiator

Software or hardware that enables a host computer to send data to an external iSCSI-based storage array through an Ethernet network adapter over a Transmission Control Protocol (TCP)-based Internet Protocol (IP) network. The iSCSI initiator originates the input/output (I/O) command sequence to facilitate data transmission to the storage device, which is also known as an iSCSI target.

JBOD

Just a Bunch of Disks. Refers to drives that reside in their own enclosure external to the server, but contain no RAID intelligence. JBOD drives are dependent on the server for RAID functionality.

Linear Tape File System (LTFS)

Refers to both the format of data recorded on magnetic tape media and the implementation of specific software that uses this data format to provide a file system interface to data stored on magnetic tape. The Linear Tape File System format is a self-describing tape format developed by IBM to address tape archive requirements. The LTFS Format specification, which was adopted by the LTO Technology Provider Companies, defines the organization of data and metadata on tape - files stored in hierarchical directory structure. Data tapes written in the LTFS Format can be used independently of any external database or storage system allowing direct access to file content data and file metadata. This format makes it possible to implement software that presents a standard file system view of the data stored in the tape media. This file system view makes accessing files stored on the LTFS formatted media similar to accessing files stored on other forms of storage media such as disk or removable flash drives.

LUN (Logical Unit Number)

A logical representation of physical storage. Users can determine whether a LUN is a disk drive, a number of disk drives, or a partition on a disk drive, depending on RAID configuration.

Mirroring

A form of storage array in which two or more identical copies of data are maintained on separate media. Also known as RAID 1, disk shadowing, real-time copy and t1 copy.

Motion Capture

The process of filming an actor wearing special sensors in an artificial environment that will be used later during CGI and VFX.

Multipathing

Also called SAN multipathing or I/O multipathing, it is the establishment of multiple physical routes between a server and the storage device that supports it. In storage networking, the physical path between a server and the storage device that supports it can sometimes fail. When there's only one physical path between the two devices, there is a single point of failure (SPoF), which can be a problem if a cable breaks or someone accidentally unplugs the wrong cable. Because SAN multipathing establishes multiple routes between the hardware, however, if someone accidentally unplugged the wrong cable and one path failed, I/O would simply be routed through another path.

In addition to being a useful failover tool, multipathing can assist with load balancing by spreading I/O across multiple paths to reduce latency.

Material Exchange Format (MXF)

An object-based file format that wraps video, audio, and other bitstreams ("essences"), optimized for content interchange or archiving by creators and/or distributors, and intended for implementation in devices ranging from cameras and video recorders to computer systems. In effect, the format bundles the essences and what amounts to an "edit decision list" (data used by audio-visual content editing systems) in an unambiguous way that is essence-agnostic and metadata-aware.

Network-Attached Storage (NAS)

An IP-based file-sharing device attached to a local area network. NAS serves a mix of clients and servers over an IP network. A NAS device uses its own operating system and integrated hardware and software components to meet a variety of file service needs.

Network File System (NFS)

A protocol that allows a user on a client computer to access files over a network in a manner similar to how they would access local storage. Benefits include cutting the need for users to have separate home directories on every network machine and lowering disk space on local workstations. NFS, like many other protocols, builds on the Open Network Computing Remote Procedure Call (ONC RPC) system.

Nonlinear Editing

Nonlinear distinguishes editing operation from the "linear" methods used with tape. Nonlinear refers to not having to edit material in the sequence of the final program and does not involve copying to make edits. It allows any part of the program to be accessed and modified without having to recopy the material that is already edited. Nonlinear editing is also nondestructive, as it uses hard disks to play this material in the random access order the editor has selected rather than playing a linear videotape.

Offline Edit

During post production, an offline edit is the process of cutting a project at a lower resolution in order to save money and time.

Online Edit

Once an offline edit is completed, using an EDL, the sequence is then reassembled using high-resolution media for the final output.

OTT (Over-The-Top)

Refers to the delivery of audiovisual content streamed over the Internet without the involvement of an Internet service provider (ISP) in the control or distribution of the content. The ISP is neither responsible for, nor is able to control, the viewing abilities, copyrights, and/or other redistribution of the content, which arrives from a third party and is delivered to an end-user's device. The ISP is only in the role of transporting IP packets. It's often referred to as "over-the-top" because these services ride on top of the service you already get. OTT services don't require any business or technology affiliations with the entity that controls or maintains the infrastructure through which the content is delivered to end-users.

Pro Res/ Quicktime

Apple's post-production format offering uncompressed HD quality at SD file sizes. Typically used when working with non-native camera formats; or to preserve maximum quality for composites and demanding color grading work. Pro Res is an intermediate codec, primarily used for video editing and not end-user viewing. It retains higher quality than end-user codecs while still requiring smaller storage systems as compared to uncompressed video.

Progressive

Frame-scanning technology that processes each frame as one complete image, as opposed to two separate fields as with interlacing.

Redundant Array of Independent Disks (RAID)

A disk array in which part of the physical storage capacity is used to store redundant information about user data stored on the remainder of the storage capacity. The redundant information enables regeneration of user data in the event that one of the array's member disks or the access path to it fails.

RAID Controllers

RAID controllers are I/O devices that control the layout and format of the data. A RAID controller places data across multiple media or device type according to the RAID group specified.

Render

The act of processing and transcoding data.

SAN (Storage Area Network)

A SAN is a configuration of computer and storage systems that incorporate dedicated Fibre Channel connectivity between the computer systems and storage. A SAN bypasses traditional network bottlenecks and supports direct high-speed data transfer between the servers and storage devices. SAN storage may consist of solid state drives, hard-disk drives, RAID Controllers and tape storage devices that are connected through switches and bridges to multiple servers.

Serial-attached SCSI (SAS)

A method used in accessing computer peripheral devices that employs a serial (one bit at a time) means of digital data transfer over thin cables. The method is specified in the American National Standard Institute (ANSI) standard called Serial-attached SCSI (Small Computer System Interface), also known as ANSI/INCITS 376-2003. In the business enterprise, serial-attached SCSI is especially of interest for access to mass storage devices, particularly external hard drives and magnetic tape drives.

Scale/Scalable/Scalability

In computer systems, to grow or support growth in such a way that all capabilities of the system remain in constant ratio to each other. For example, a storage subsystem where data transfer capacity increases by the addition of buses as its storage capacity increases by the addition of disks is said to be scalable.

Server (Video)

A storage system that provides audio and video storage for a network of clients. Aside from those used for video on demand (VOD), video servers are applied in three areas of television operation: transmission, post production and news. Compared to general purpose file servers, video servers must handle far more data, files are larger and must be continuously delivered.

Tape Backup

In computers, tape backup is the ability to periodically copy the contents of all or a designated amount of data from its usual storage device to a tape cartridge device so that, in the event of a hard disk crash or comparable failure, the data will not be lost. Tape backup can be done manually or, with appropriate software, be programmed to happen automatically. Tape backup systems exist for needs ranging from backing up the hard disk on a personal computer to backing up large amounts of storage for archiving and disaster recovery purposes in a large enterprise as part of a storage area network (SAN), usually combining a hardware and software

package. For enterprise tape backup, Linear Tape-Open (LTO) is an industry open standard from Hewlett-Packard, IBM, and Seagate.

Telecine

The process of scanning film in real-time and outputting to a tape-based or digital format.

Tiered Storage

A lifecycle solution where your most critical and often-used data is kept most easily accessible, your aged and less critical information gets moved to secondary storage systems, and eventually ends up in longer-term archive systems – all to achieve a balance of protection, performance and cost.

Transcoding

A process that changes the video or audio features of a file, such as the resolution or bit rate, by changing portions of the audio/visual content but not by reconstructing the content (as would be in encoding). Compressed-domain transcoding also maintains the format of the file.

Ultra High Definition

A successor to the HDTV format with up to 16 times the pixel resolution (8K).