Office of the State Attorney
Fifteenth Judicial Circuit
Palm Beach County, Florida

(www.sa15.state.fl.us.us)

Digital Evidence and Document Standards

Version 3.5
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Purpose: The purpose of these standards is to allow for seamless transfer and viewing of digital evidence between law enforcement agencies and the State Attorney's Office. Standards will allow for a common set of applications that work on all workstations reducing systems support costs. Utilizing the Internet, agencies can enter digital evidence and documents directly into the SAO's case tracking system, STAC.

Environment: Agencies collect the digital evidence and transfer the evidence to STAC using the Digital Evidence System. This system is Internet based for agencies that are not on the County network. The information is transferred using an acceptable level of security (https://) through the County network and firewalls and through the State Attorney's office firewall landing on the SAO secure network and into STAC.

Responsibility: The Law Enforcement Agency is responsible for preparing the digital evidence and converting it to a format that can be read by the SAO. Digital Evidence should be entered into STAC by an authorized Evidence Custodian. Digital Documents can be entered by any agency's authorized staff member.

No Proprietary software – Surveillance software: All digital evidence that requires proprietary applications must be converted to CD or DVD formats as specified in the file format standards. The SAO does not have the resources to do format conversions.

CJNet users - File size is limited to 2MB: We are guests on CJNet and being good visitors we have to be courteous and kind. So as not to interfere with other network users we restricted the file size for network transfers to 2 MB, a manageable size at this time.

CJNet users - Files larger than 2MB: Digital files that are larger than 2MB should be mailed or hand delivered to the office. Please follow the CD/DVD preparation requirements presented later in this document.

Palm Beach County WAN users - File size is limited to 70MB: We are guests on the county network and being good visitors we have to be courteous and kind. So as not to interfere with other network users we restricted the file size for network transfers to 70 MB, a manageable size at this time.

Palm Beach County WAN users - Files larger than 70MB: Digital files that are larger than 70MB should be mailed or hand delivered to the office. Please follow the CD/DVD preparation requirements presented later in this document.

Digital Evidence Validation: The evidence custodian can print the transaction completed screen for their records. STAC maintains a detailed log of all digital evidence transfers including who did the transfer. The original evidence will be handled in a normal procedure.

Documents: In 2009 the guide expanded to include documents to be sent to STAC. All documents must be transferred in .pdf format. Multiple page documents and filing packages should be sent in a consistent order. The order should be coordinated between the SAO division and the agency. If there is a need for a receipt of document transfer, print a copy of the transfer success screen. Details are covered in the STAC web guide and training materials.

File Format standards are Critical: To make the process manageable and to limit the number of desktop applications required to access these files, only the following files will be accepted:

Audio Files	Document Files	Image Files	Video Files
Audio CD **WAV** **MP3**	**PDF**	**BMP** **JPG - JPEG** **GIF**	**DVD Format** **MPG** **AVI**

911 Recordings: *Please only send the recording related specifically to the case.* The SAO software is not designed for fast finding or editing.

CD/DVD Preparation: There are specific steps that need to be done in order for a CD to work.

- Media Quality is important! Based on our research the following media is acceptable.
    - Verbatim DVD+/- R (Made in India, UAE, Singapore or Taiwan)
    - JVC Taiyo DVD +/- R (From authorized dealer)
    - Sony DVD +/- DVD (Made in Taiwan only)
- **Be sure to finalize the CD/DVD.** This will allow us to read the CD/DVD from our software.
- Label the media with:
    - Agency Case Number
    - LAST/First name of the person related to the file.
    - Name the file using the agency case number as the prefix.

SAO Applications: The following Applications are used by the SAO to access digital evidence. By complying to the standards all of the digital evidence will run on the ASA's Desktop and in the court rooms.

- Windows Media Player: For audio and video images. (See References for details.)
- Windows Picture and Fax Viewer: For Images (See References for details.)
- VLC media player: Multi-format player (See References for details.)

PDF File Format:

The Florida Supreme Court specifies that .pdf is the acceptable format for court documents. This format makes it very easy to read and less acceptable to change.

PDF Conversion:

If an agency does not have a formal internal standard for document printing or conversion to .pdf, we recommend the "CutePDF" product. It is free and easily loaded on to a workstation or computer. It can be downloaded from http://www.cutepdf.com/

Go2PDF enables you to convert instantly any document into PDF format with a simple click. Go2PDF contains a Virtual PDF Printer, which is a high-quality PDF converter and generator with password protection, PDF access control, PDF scaling, PDF version and compatibility control, font embedding options and more. The generated PDF is small yet clear. Go2PDF is Freeware, offering an effective

solution to create PDF documents with ease. Go2PDF itself is only 261KB, very small, easy to use, yet smart and powerful. You may convert Microsoft Word, Excel, PowerPoint, Access documents into PDF formats, convert AutoCAD file into PDF, convert image formats to PDF, convert plain text file to PDF. For more conversion information, please visit our FAQ page, http://www.go2pdf.com/faq.html

There are several other free applications on the Internet that can be used for pdf conversion.

References:

AVI Format: Audio Video Interleave, known by its acronym **AVI**, is a multimedia container format introduced by Microsoft in November 1992 as part of its Video for Windows technology. AVI files can contain both audio and video data in a file container that allows synchronous audio-with-video playback. Like the DVD video format, AVI files support multiple streaming audio and video, although these features are seldom used. Most AVI files also use the file format extensions developed by the Matrox OpenDML group in February 1996. These files are supported by Microsoft, and are unofficially called "AVI 2.0". (Wikipedia 2009)

BMP Format: In computer graphics, a **bitmap** or **pixmap** is a type of memory organization or image file format used to store digital images. The term *bitmap* comes from the computer programming terminology, meaning just a *map of bits*, a spatially mapped array of bits. Now, along with *pixmap*, it commonly refers to the similar concept of a spatially mapped array of pixels. Raster images in general may be referred to as bitmaps or pixmaps, whether synthetic or photographic, in files or memory.

In some contexts, the term bitmap implies one bit per pixel, while pixmap is used for images with multiple bits per pixel.[1][2]

Many graphical user interfaces use bitmaps in their built-in graphics subsystems;[3] for example, the Microsoft Windows and OS/2 platforms' GDI subsystem, where the specific format used is the *Windows and OS/2 bitmap file format*, usually named with the file extension of .BMP (or .DIB for *device-independent bitmap*). Besides BMP, other file formats that store literal bitmaps include InterLeaved Bitmap (ILBM), Portable Bitmap (PBM), X Bitmap (XBM), and Wireless Application Protocol Bitmap (WBMP). Similarly, most other image file formats, such as JPEG, TIFF, PNG, and GIF, also store bitmap images (as opposed to vector graphics), but they are not usually referred to as *bitmaps*, since they use compressed formats internally. (Wikipedia 2009)

CutePDF Writer (Freeware) Create professional quality PDF files from almost any printable document. **FREE** for personal and commercial use! No watermarks! No popup Web advertisements! Now supports 64-bit Windows.

CyberLink PowerDVD is a commercial video player and music player for Microsoft Windows and recently Turbolinux [1]. It enables the viewing of DVD-Video movies on the user's PC. DVD-Video backups stored on hard disk (created using software such as DVD Decrypter) can also be played. The player can also be used to play videos and audio/music files in other formats encoded with different codecs, for instance DivX, XviD, Windows Media Video video and MP3 and AAC audio. Newer versions also support full Blu-Ray and HD DVD playback with menus, with CPRM DRM support. (Wikipedia, 2008)

DVD Format, also known as **Digital Versatile Disc** or **Digital Video Disc**, is an optical disc storage media format, and was founded in 1995. Its main uses are video and data storage. DVDs are of the same dimensions as compact discs (CDs), but store more than six times as much data.

Variations of the term *DVD* often describe the way data is stored on the discs: DVD-ROM (read only memory) has data that can only be read and not written; DVD-R and DVD+R (recordable) can record data only once, and then function as a DVD-ROM; DVD-RW (re-writable), DVD+RW, and DVD-RAM (random access memory) can both record and erase data multiple times. The wavelength used by standard DVD lasers is 650 nm;[4] thus, the light has a red color.

DVD-Video and DVD-Audio discs refer to properly formatted and structured video and audio content, respectively. Other types of DVDs, including those with video content, may be referred to as DVD Data discs. (Wikipedia 2009)

DVD Media Quality: Not all media is good. Buying a good disc is not a simple matter of using a name brand disc, or paying for the most expensive disc on the shelf. With the continued influx of cheaply-made Chinese, Malaysian, Korean, and Hong Kong media (not to mention a few 'bulk-quality" Taiwanese companies), about half or more of all media is inferior quality. Bad discs are a complete waste of time and money.

While some cheap meda my work for you, it's a gamble that often loses. Try to use 1st class media, maybe 2nd class if the situation must budget tightly. Do yourself big favor and just outright avoid rd class media if at all possible. (http://www.digitalfaq.com/reviews/dvd-media.htm)

GIF Format: The **Graphics Interchange Format** (**GIF**) is a bitmap image format that was introduced by CompuServe in 1987 and has since come into widespread usage on the World Wide Web due to its wide support and portability.

The format supports up to 8 bits per pixel, allowing a single image to reference a palette of up to 256 distinct colors chosen from the 24-bit RGB color space. It also supports animations and allows a separate palette of 256 colors for each frame. The color limitation makes the GIF format unsuitable for reproducing color photographs and other images with continuous color, but it is well-suited for simpler images such as graphics or logos with solid areas of color. (Wikipedia 2009)

https: (Hypertext Transfer Protocol over Secure Socket Layer) is a URI scheme used to indicate a secure HTTP connection. It is syntactically identical to the http:// scheme normally used for accessing resources using HTTP. Using an https: URL indicates that HTTP is to be used, but with a different default TCP port (443) and an additional encryption/authentication layer between the HTTP and TCP. This system was designed by Netscape Communications Corporation to provide authentication and encrypted communication and is widely used on the World Wide Web for security-sensitive communication such as payment transactions and corporate logons. (Wikipedia, 2008)

Internet: The **Internet** is a worldwide, publicly accessible series of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). It is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked web pages and other resources of the World Wide Web (WWW). (Wikipedia, 2008)

JPG – JPEG Format: In computing, **JPEG** (pronounced /ˈdʒeɪpɛg/, *JAY-peg*) is a commonly used method of compression for photographic images. The degree of compression can be adjusted, allowing a

selectable tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality.

JPEG compression is used in a number of image file formats. JPEG/Exif is the most common image format used by digital cameras and other photographic image capture devices; along with JPEG/JFIF, it is the most common format for storing and transmitting photographic images on the World Wide Web. These format variations are often not distinguished, and are simply called JPEG.

The MIME media type for JPEG is *image/jpeg* (defined in RFC 1341).

MPEG Format: Short for ***M**oving **P**icture **E**xperts **G**roup*, and pronounced m-peg, is a working group of the ISO. The term also refers to the family of digital video compression standards and file formats developed by the group. MPEG generally produces better-quality video than competing formats, such as Video for Windows, Indeo and QuickTime. MPEG files previously on PCs needed hardware decoders (codecs) for MPEG processing. Today, however, PCs can use software-only codecs including products from RealNetworks, QuickTime or Windows Media Player.

MPEG algorithms compress data to form small bits that can be easily transmitted and then decompressed. MPEG achieves its high compression rate by storing only the changes from one frame to another, instead of each entire frame. The video information is then encoded using a technique called ***D**iscrete **C**osine **T**ransform* (DCT). MPEG uses a type of lossy compression, since some data is removed. But the diminishment of data is generally imperceptible to the human eye.

The major MPEG standards include the following;

- **MPEG-1**: The most common implementations of the MPEG-1 standard provide a video resolution of 352-by-240 at 30 frames per second (fps). This produces video quality slightly below the quality of conventional VCR videos.
- **MPEG-2**: Offers resolutions of 720x480 and 1280x720 at 60 fps, with full CD-quality audio. This is sufficient for all the major TV standards, including NTSC, and even HDTV. MPEG-2 is used by DVD-ROMs. MPEG-2 can compress a 2 hour video into a few gigabytes. While decompressing an MPEG-2 data stream requires only modest computing power, encoding video in MPEG-2 format requires significantly more processing power.
- **MPEG-3**: Was designed for HDTV but was abandoned in place of using MPEG-2 for HDTV.
- **MPEG-4**: A graphics and video compression algorithm standard that is based on MPEG-1 and MPEG-2 and Apple QuickTime technology. Wavelet-based MPEG-4 files are smaller than JPEG or QuickTime files, so they are designed to transmit video and images over a narrower bandwidth and can mix video with text, graphics and 2-D and 3-D animation layers. MPEG-4 was standardized in October 1998 in the ISO/IEC document 14496. *See MPEG-4*.
- **MPEG-7:** Formally called the *Multimedia Content Description Interface*, MPEG-7 provides a tool set for completely describing multimedia content. MPEG-7 is designed to be generic and not targeted to a specific application.
- **MPEG-21:** Includes a *Rights Expression Language* (REL) and a Rights Data Dictionary. Unlike other MPEG standards that describe compression coding methods, MPEG-21 describes a standard that defines the description of content and also processes for accessing, searching, storing and protecting the copyrights of content. *See MPEG-21*. (Wikipedia, 2009)

Portable Document Format (**PDF**) is the file format created by Adobe Systems in 1993 for document exchange. PDF is a fixed-layout format used for representing two-dimensional documents in a manner independent of the application software, hardware, and operating system.[1] Each PDF file encapsulates a complete description of a 2-D document (and, with Acrobat 3-D, embedded 3-D documents) that includes the text, fonts, images, and 2-D vector graphics that compose the documents.

PDF is an open standard, and recently took a major step towards becoming the ISO 32000.[2][3]

1) What's the difference between Searchable PDF and PDF Normal?

PDF Normal - also referred to as Formatted Text & Graphics - is the usual PDF output produced from a text processing or authoring environment, such as MS Word, Quark, and FrameMaker. It contains the full text of the page with appropriate coding to define fonts, and font sizes, and so on.

Searchable PDF is usually produced from scanned documents. It consists of an image of the page, with the text portions of the image converted to text for search purposes and stored in a "text layer." This layer is generated through an Optical Character Recognition (OCR) process. While the image layer will be accurate, the accuracy of the text in the text layer will vary depending on the OCR and cleanup process that was used.

Searching is done by querying the text layer for matching text patterns. If the text is found, the image corresponding to the found text is displayed, and the materials can be read in context. Searchable PDF is created in two steps: (1) obtaining a page image (for example, by scanning a page), and (2) creating the text layer via OCR.

This PDF format is better than Searchable PDF for several reasons:

- File sizes are smaller
- Legibility of text is better on screen and on printouts, especially at high zoom
- Textual accuracy is very high

When PDF Normal is available, that's the way to go. But when starting with images, Searchable PDF is a much less expensive process.

For a more extensive treatment of this topic see the multi-part white paper - "Adobe PDF Conversion: How, for Whom, and When?" by Data Conversion Laboratory's Lazar Weisz:

Overview of PDF formats
PDF Image Only
PDF Searchable Image
PDF Normal

(Data Conversation Laboratory 2009)

TIFF - Tag Image File Format is a common format for exchanging raster (bitmapped) images between application programs. Usually identified with the ".tiff" or ".tif" filename extension, the format was developed in 1986 by an industry committee chaired by the Aldus Corporation (now part of Adobe). Microsoft and Hewlett-Packard were also on the committee. One of the more common image formats, TIFFs are common in desktop publishing, faxing, and medical imaging applications.

History

The phrases "Tagged Image File Format" and "Tag Image File Format" were used as the subtitle to some early versions of the TIFF specification; the 1992 specification, TIFF 6.0, does not use either subtitle phrase, but is simply "TIFF".

TIFF was originally created as an attempt to get desktop scanner vendors of the mid-1980s to agree on a common scanned image file format, rather than have each company promote its own proprietary format.

In the beginning, TIFF was only a binary image format (only two possible values for each pixel), since that was all that desktop scanners could handle. As scanners became more powerful, and as desktop computer disk space became more plentiful, TIFF grew to accommodate grayscale images, then color images. Today, TIFF is a popular format for high color-depth images, along with JPEG and PNG. Adobe Systems, which acquired the PageMaker publishing program from Aldus, controls the TIFF specification as of 2009.

The first version of the TIFF specification was published by Aldus Corporation in the fall of 1986 after two major earlier draft releases. It can be labeled as Revision 3.0. It was published after a series of meetings with various scanner manufacturers and software developers. In April 1987 Revision 4.0 was released and it contained mostly minor enhancements. In October 1988 Revision 5.0 was released and it added support for palette color images and LZW compression.[5]

Flexible options

TIFF is a flexible, adaptable file format for handling images and data within a single file, by including the header tags (size, definition, image-data arrangement, applied image compression) defining the image's geometry. For example, a TIFF file can be a container holding compressed (lossy) JPEG and (lossless) PackBits compressed images. A TIFF file also can include a vector-based Clipping path (outlines, croppings, image frames). The ability to store image data in a lossless format makes a TIFF file a useful image archive, because, unlike standard JPEG files, a TIFF file using lossless compression (or none) may be edited and re-saved without losing image quality. Of course this is not the case when using the TIFF as a container holding compressed JPEG. Other TIFF options are layers and pages.

TIFF offers the option of using LZW compression, a lossless data-compression technique for reducing a file's size. Until 2004, use of this option was limited because the LZW technique was under several patents. However, these patents have expired.

When TIFF was introduced, its extensibility provoked compatibility problems. Every TIFF reader was required to read *BaselineTIFF*, but Baseline TIFF did not include JPEG or LZW compressions (see above). Baseline TIFF *does* include PackBits compression, a form of run-length encoding. Many TIFF readers supported tags additional to those in Baseline TIFF, but not every reader supported every extension. As a consequence, TIFF became the lowest common denominator image format, with most TIFF images containing uncompressed 32-bit CMYK or 24-bit RGB images.

Every TIFF begins with a 2-byte indicator of byte order: "II" for little endian and "MM" for big endian byte ordering. The next 2 bytes represent the number 42, selected because this is the binary pattern 101010 and "for its deep philosophical significance".[6] The 42-reading depends upon the byte order indicated by the 2-byte indicator. All words, double words, etc., in the TIFF file are read based per the indicated byte order. The TIFF 6.0 specification says that compliant TIFF readers *must* support both byte orders (II and MM), however, TIFF writers may choose the byte order convenient for their image.[7] This gave rise to the image-processing community's joke that TIFF is an acronym for *Thousands of Incompatible File Formats*.[8]

A classic TIFF file format uses 32-bit offsets and, as such, file size is limited to 4 GiB (4,294,967,296 bytes). BigTIFF is a TIFF variant file format, which can contain more than 4GiB of data by using 64-bit offsets.[9] Support for BigTIFF file formats among applications is limited since the file format specification was recently implemented (2007) in LibTIFF version 4.0, which is currently in beta development.

In document imaging

The TIFF format is the standard in document imaging and document management systems using CCITT Group IV 2D compression, which supports black-and-white (bitonal, monochrome) images. In high-volume storage scanning, documents are scanned in black and white (not in color or in grayscale) to

conserve storage capacity. An average A4 scanning produces 30 kBs of data at 200 ppi (pixels per inch of resolution) and 50 kB of data at 300 ppi; 300 ppi is more common than 200 ppi.

The TIFF format can save multi-page documents to a single TIFF file rather than a series of files for each scanned page. Multi-page support and 2D compression of bitonal images led to the TIFF's becoming the standard storage format for facsimiles, especially on Fax Servers. (Wikipedia 2009)

VLC media player is an open source, free software media player and multimedia framework written by the VideoLAN project.

VLC is a portable multimedia player, encoder, and streamer supporting many audio and video codecs and file formats as well as DVDs, VCDs, and various streaming protocols. It is able to stream over networks and to transcode multimedia files and save them into various formats. VLC used to stand for VideoLAN Client, but that meaning is now deprecated.[3][4]

It is one of the most platform-independent players available, with versions for Microsoft Windows, Mac OS X, Linux, BeOS, Syllable, BSD, MorphOS, Solaris and Sharp Zaurus, and is widely used with over 110 million downloads for version 0.8.6.[5]

The default distribution of VLC includes a large number of free decoding and encoding libraries; on the Windows platform, this greatly reduces the need for finding/calibrating proprietary plugins. Many of VLC's codecs are provided by the libavcodec library from the FFmpeg project, but it uses mainly its own muxer and demuxers. It also gained distinction as the first player to support playback of encrypted DVDs on Linux by using the libdvdcss DVD decryption library.

WAV File Format: WAV (or **WAVE**), short for Waveform audio format, also known as **Audio for Windows**,[2] is a Microsoft and IBM audio file format standard for storing an audio bitstream on PCs. It is an application of the RIFF bitstream format method for storing data in “chunks”, and thus is also close to the 8SVX and the AIFF format used on Amiga and Macintosh computers, respectively. It is the main format used on Windows systems for raw and typically uncompressed audio. The usual bitstream encoding is the Pulse Code Modulation (PCM) format. (Wikipedia 2009)

Windows Media Player (**WMP**) is a digital media player and media library application developed by Microsoft that is used for playing audio, video and viewing images on personal computers running the Microsoft Windows operating system, as well as on Pocket PC and Windows Mobile-based devices. Editions of Windows Media Player were also released for Mac OS, Mac OS X and Solaris but development of these has since been discontinued.

In addition to being a media player, Windows Media Player includes the ability to rip music from and copy music to compact discs, build Audio CDs in recordable discs.

Windows Media Player replaced an earlier piece of software simply called Media Player, adding features beyond simple video or audio playback.

The default file formats are Windows Media Video (WMV), Windows Media Audio (WMA), and Advanced Systems Format (ASF), and supports its own XML based playlist format called Windows Playlist (WPL). The first generation Zune software (but not the current second generation software) which actually is a modified version of Windows Media Player, additionally supports AAC (Advanced Audio Coding) audio, MPEG-4 and H.264 video formats out-of-the-box.

The player is also able to utilize a digital rights management service in the form of Windows Media DRM. (Wikipedia, 2008)

Windows Picture and Fax Viewer is an image viewer. It is a part of the Windows XP and Windows Server 2003 operating systems. It is capable of viewing JPG, BMP, PNG, GIF, WMF, EMF and TIFF format files.

This program superseded part of the functions of Imaging for Windows (aka Windows Imaging) in Windows 95 / NT 4.0 / 98 / 2000. It is a stripped-down version of the SoftTech's PictureViewer image viewer program. (Wikipedia, 2008)

WWW: The **World Wide Web** is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view Web pages that may contain text, images, videos, and other multimedia and navigate between them using hyperlinks. Using concepts from earlier hypertext systems, English physicist Tim Berners-Lee, now the Director of the World Wide Web Consortium, wrote a proposal in March 1989 for what would eventually become the World Wide Web.[1] He was later joined by Belgian computer scientist Robert Cailliau while both were working at CERN in Geneva, Switzerland. In 1990, they proposed using "HyperText [...] to link and access information of various kinds as a web of nodes in which the user can browse at will",[2] and released that web in December.[3]

Connected by the existing Internet, other websites were created, around the world, adding international standards for domain names and the HTML. Since then, Berners-Lee has played an active role in guiding the development of Web standards (such as the markup languages in which Web pages are composed), and in recent years has advocated his vision of a Semantic Web. The World Wide Web enabled the spread of information over the Internet through an easy-to-use and flexible format. It thus played an important role in popularizing use of the Internet.[4] Although the two terms are sometimes conflated in popular use, *World Wide Web* is not synonymous with *Internet*.[5] The Web is an application built on top of the Internet.

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