

# CISCO

## IT Essentials I

### Chapter 8

# Multimedia





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## Chapter 8 CD-RW and DVD

### **Compact Disk Read Only Memory**

CDROMS are a very popular type of removable media. Initially, they were originally intended for digital audio, but rapidly expanded into the world of personal computer data storage. The success of CD-ROMs can be attributed to their storage capacity, ruggedness, and price. Due to the widespread acceptance of this media format, CD-ROM drives are standard devices on most personal computers.

Depending on the type of reader, writer, and software used to create the CD, they have the ability to store 650 MB / 70 minutes and 700 MB / 80 minutes of information. They are comprised of a layer of polycarbonate plastic, a layer of reflective metal, and a coat of lacquer.

### **Recording CDs with CD-R and CD-RW**

CD recorders, often referred to as CD burners, are becoming standard equipment on personal computers. CD recorders allow users to burn, or write, their own CDs containing music, data, video, or any combination thereof. Users are now able to do all of the following with CD recorders:

- Create their own compilation audio CDs
- Make backup copies of software
- Backup their critical data
- Create Video CDs (VCDs) that can be played in stand-alone DVD players

The inexpensive price of the drive and media coupled with the generous capacity of a CD has made owning a CD recorder very desirable.

### **Compact Disc – Recordable (CD-R)**

CD-R was the first of the two CD recording technologies conceived.

The speed at which a CD-R can burn a CD uses the same numeric convention as CD-ROM drive read speeds. A CD-R drive that can write at 3000 kbps is shown as having a 20x, or 20 times 150 kb, write speed. A drive listed as 24x/40x has a write speed of 24x and a read speed of 40x. One downside of CD-R media is that it cannot be rewritten.

CD-R is known as "Write Once, Read Many" or WORM.

### **Compact Disc – Rewritable (CD-RW)**

Like CD-R drives, CD-RW drives require the use of a special type of disc. The CD-RW disc is compatible with other CD reading drives and the CD-R can be read by a CD-RW drive. This is what allows the rewriting of CDs. Similar to CD-R drives, CD-RW drives are rated by the speed at which they write, rewrite, and read information. A CD-RW drive listed as 24x/12x/40x has a write speed of 24x, a rewrite speed of 12x, and a read speed of 40x.

A CDRW can be written to many times.

Multimedia is a combination of: Text, Sound, Graphics and Video.

### **Digital Versatile Disc**

Digital versatile disc (DVD) is a newer technology that builds upon the strengths of CD-ROMs. DVDs share the same physical size as a CD-ROM, but they can handle a much greater amount of information. DVDs are used for movies, audio, and data. Depending upon the layering and single or double-sided disc, DVDs can store close to 20 times the amount of information as a single CD. DVDs are able to store more information because they do all of the following:

- Provide a greater area for data storage
- Use a higher density recording technique
- Can access multiple layers within the media

Consumer demand for greater amounts of removable storage options has prompted the industry to develop methods of recording DVDs. Currently, there are four different methods of DVD recording. Each of these technologies is vying to be the standard for recordable DVD:

**DVD recordable (DVD-R)** – DVD-R is similar to CD-R technology in that it allows the media to be written one time only. This method is most often used for DVD authoring and is not very practical for consumers due to the price of drives, which is usually U.S. \$2000 or more and media, which can be U.S. \$20 per disc. Even though price is a drawback for this technology, compatibility is not. Most DVD-ROM drives and stand-alone players can read DVD-R discs. DVD-R discs can hold 4.7 GB of data per side.

**DVD-RAM** – Using the RAM technology allows users to write and overwrite discs 100,000 times. DVD-RAM uses phase-change technology similar to CD-RW drives and stores 4.7 GB of information on each side of the disc. DVD-RAM drives are priced below U.S. \$1000 with media costs of U.S. \$15 per disc. Compatibility is an issue with DVD-RAM drives and most of these drives require the use of a cartridge-based disc while recording.

**DVD read/write (DVD-RW)** – The DVD-RW is a technology designed to address compatibility and re-recording issues. Geared more towards general use than authoring, DVD-RW uses a caddyless system and allows users to rewrite information on the media approximately 1000 times. The media is compatible with most DVD-ROM drives and stand-alone players on the market today. The drive uses a sequential recording technology used primarily for streaming media. DVD-RW is capable of writing 4.7 GB of information to each side of a disc.

**DVD+RW** – DVD+RW is the latest DVD recording technology and many major corporations including Hewlett-Packard back it. As with DVD-RW, the technology is both compatible with existing hardware and is easily written to multiple times. The major advantage of DVD+RW is the ability to use a variable bit-rate when encoding certain types of media, such as streaming video. The major industry backing of this format coupled with the affordability of the drive, which is less than U.S. \$600, should find DVD+RW as the standard DVD recording format in the near future. Figure shows a DVD+RW disk.



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## Chapter 8 Displays

Many displays use Cathode Ray Tube (CRT) technology, which is similar to that used in most television sets. The CRT technology requires a certain distance from the beam projection device to the screen in order to function

Dots, or basic elements of a video image, comprise what is displayed on a monitor. These dots are also known as **pixels**. The three primary colours that are used for a computer display are **red, green and blue**.

### The size of the screen

On desktop computers, the display screen width relative to height, known as the aspect ratio, is generally standardized at 4 to 3 (4:3). Screen sizes are measured diagonally from one corner to the opposite corner. They are measured in either millimeters or inches. Common desktop screen sizes are 15, 17, and 19 inches. Notebook screen sizes are somewhat smaller.



### Colour capability

Today, most desktop displays provide colour. Older notebook computers and smaller desktop computers sometimes have a less expensive monochrome display. The video displays can usually operate in one of several display modes. These modes determine how many bits are used to describe colour and how many colours can be displayed.

Bit-Depth	Number of Colours
1	2 (monochrome)
8	256 (VGA)
24	16,777,216

### Sharpness and viewability

The absolute physical limitation on the potential image sharpness of a screen image is the dot pitch. The shape of this beam can be round or a vertical, slot-shaped rectangle depending on the display technology. Displays typically come with a dot pitch of .28 millimetres (mm) or smaller. This dot pitch is the diagonal distance between phosphor dots of the same colour. The smaller the dot pitch, the greater the potential image sharpness.

The actual sharpness of any particular display image is measured in dots-per-inch (dpi). The dpi is determined by a combination of the screen resolution, which is how many pixels are projected on the screen horizontally and vertically, and the physical screen size.



This is the connection used by most computer displays



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## Chapter 8 Video / Sound

### Video Cards

Newer Pentium systems include an advanced Accelerated Graphics Port (AGP) interface specifically designed for video cards. The AGP interface is a variation of the PCI bus design that has been modified to handle the larger data throughput associated with three-dimensional graphics. The AGP standard provides for a direct channel between the AGP graphic controller and the computer system main memory. This removes the video data traffic from the PCI buses.

When upgrading a video card in a PC system replace the drivers with basic windows drivers before removing the old card and adding the new video card.

Device manager can be used to remove or disable an old video adapter driver.

The video BIOS is responsible for determining how an image is to be displayed. The video BIOS provides the set of video functions that can be used by the software programs to access the video hardware. The video BIOS allows software to interface with the video chipset in much the same way as the system BIOS does for the motherboard chipset.

### Sound Cards

Audio is an integral component of the multimedia experience and is a standard feature on personal computers. Educational and recreational software use sound effects to heighten the experience. Musicians use computer audio capabilities to create songs. Visually impaired users can have the computer voice information to them. The applications for computer audio are endless, but for a PC to have audio capabilities it requires the use of a sound card.

Most sound cards use IRQ 5.

Sounds cards can be either PCI cards, USB devices or built into the system motherboard.

#### **Common Audio file types:**

WAV — Uncompressed audio file — Usually around 10 MB of disk space per minute of audio.

MP3 — Compressed audio file — Three or four minute song less than four MB of disk space.

WMA — Compressed audio streaming for windows media player.

RA — Compressed audio streaming for windows REAL Player.

MIDI—Musical Instrument Digital Interface

### MPEG

JPEG provides enough compression to allow single frame digitized images (still images) to fit on disk drives, full motion pictures require much greater compression. The MPEG format was created to provide compression ratios up to 200:1 with high quality video and audio. MPEG removes redundant picture information from individual scenes. However, instead of simply removing redundant information from within a single frame, the MPEG compression scheme removes redundant information from consecutive scenes. In addition, the MPEG methodology compresses only key objects within a frame every 15th frame. Between these key frames, only the information that changes from frame-to-frame is recorded. **MPEG 1** video specification supports CD-quality sound. **MPEG 2** video specification supports CD-quality surround sound.

### Video Capture

A Video Capture Card is used to convert a TV output into a digital format.

SVideo is the type of output signal that is generated from a VCR or camcorder when connecting to a video capture card.

### USB

USB allows for the hot swappable connection of many external peripherals.

## **Digital Cameras**

Light is recorded electronically by a semiconductor device. Some very high resolution digital cameras can provide as good if not better results than film cameras.

The most common file formats are TIFF and JPEG.

CCD is image sensor technology which is used by most high-end digital cameras.

### **Types of removable media used with digital cameras:**

Memory Stick  
PCMCIA hard disk cards  
writeable CD

### **Digital video camera formats**

MiniDV  
Digital8  
DVD

Digital video cameras have a higher resolution than analogue video cameras.