

DVD

DVD - Digital Video Disc or Digital Versatile Disc

- bigger, faster than traditional CD and can hold video as well as audio and computer data
- DVD aims to encompass home entertainment, computers, and business information with a single digital format, eventually replacing audio CD, videotape, laserdisc, CD-ROM, and perhaps even video game cartridges
- Major formats: DVD-Video (holds video programs and is played in a DVD player hooked up to a TV), DVD-ROM (holds computer data and is read by a DVD-ROM drive hooked up to a computer), and DVD-Audio (hold audio. The technical specifications for DVD-Audio are not yet finalized).
- DVD-Video Advantages:
 1. Over 2 hours of high-quality digital (MPEG-2) video (over 8 on a double-sided, dual-layer disc).
 2. Support for widescreen movies on standard or widescreen TVs (4:3 and 16:9 aspect ratios).
 3. Up to 8 tracks of digital audio (for multiple languages, DVS, etc.), each with as many as 8 channels.
 4. Up to 32 subtitle/karaoke tracks.
 5. Automatic "seamless" branching of video (for multiple story lines or ratings on one disc).
 6. Up to 9 camera angles (different viewpoints can be selected during playback).
 7. Menus and simple interactive features (for games, quizzes, etc.).
 8. Multilingual identifying text for title name, album name, song name, cast, crew, etc.
 9. "Instant" rewind and fast forward, including search to title, chapter, track, and timecode.
 10. Durable (no wear from playing, only from physical damage).
 11. Not susceptible to magnetic fields. Resistant to heat.
 12. Compact size (easy to handle, store, and ship; players can be portable; replication is cheaper).
- Country Codes:
 1. Motion picture studios want to protect their video content from piracy premature release (a movie may come out on video in the U.S. when it's just hitting screens in Europe).
 2. To do this, studios have required that the DVD standard include codes that can be used to prevent playback of certain discs in certain geographical regions. Each player is given a code for the region in which it's sold. The player will refuse to play discs that are not allowed in that region.
 3. This means that discs bought in one country may not play on players bought in another country.
 4. Regional codes are entirely optional for the maker of a disc. Discs without codes will play on any player in any country. It's not an encryption system, it's just one byte of information on the disc that the player checks.
 5. These Country Codes also prevent purchase of a disc in countries that do not enforce international copyrights for piracy and distribution in other countries. Digital media scares content providers (WHY?) because they can make perfect copies so a copy of a copy is still as good as the original which is not true for analog. Other protection mechanisms exist which prevents copies of copies, scrambling of content, etc.
- Dual-layer discs: A dual-layer disc has two layers of data, one of them semi-transparent. Since both layers are readable from the same side, a dual-layer disc can hold almost twice as much as a single-layer disc.
- Double-sided: Discs may also be double sided. Combining Dual-layering and Double-sided quadruples the storage capacity.
- DVD players are able to read CD and CD-ROMs.
- Divx: Divx is a pay-per-viewing-period variation of DVD. Once inserted into a Divx player the DVD disc plays normally (allowing the viewer to pause, rewind, even put in another disc before finishing the first disc) for the next 48 hours, after which the "owner" must pay \$3.25 to unlock it for another 48 hours. A Divx DVD player must be hooked up to a phone line so it can call an 800 number for about 20 seconds during the night once each month to upload billing information. Most Divx discs can be

converted to DivxSilver status by paying an additional fee (usually \$20) to allow unlimited plays on a single account. This approach could be applied to data and video games.

- Divx Advantages:
 1. Viewing can be delayed, unlike rentals.
 2. Discs need not be returned. No late fees.
 3. You can watch the movie again for a small fee. Initial cost of "owning" a disc is reduced.
 4. Discs can be unlocked for unlimited viewing (Divx Silver), an inexpensive way to preview before deciding to purchase.
 5. The disc is new; no damage from previous renters.
 6. The "rental" market is opened up to other retailers, including mail order.
 7. Studios get more control over the use of their content.
 8. You get special offers from studios in your Divx mailbox.
- Recording: There are four recordable versions of DVD-ROM: DVD-R, DVD-RAM, DVD-RW, and DVD+RW. DVD-R can record data once (sequentially only), while DVD-RAM, DVD-RW, and DVD+RW can be rewritten thousands of times. The specs for R and RAM have been adopted. RW and +RW are due out soon. The market will select which format wins.
- DVD Capacity (A CD-ROM hold 650 MB.)
SS/DS -Single/Double Sided. SL/DL - Single/Dual Layered:
 1. DVD-1 (8cm, SS/SL): 1.36 gig (1.4 G), about half an hour
 2. DVD-18 (12cm, DS/DL): 15.90 gig (17 G), over 8 hours
 3. DVD-R (12cm, SS/SL): 3.68 gig (3.95 G) -MAX
 4. DVD-RAM (12cm, DS/SL): 4.80 gig (5.16 G) MAX

(Why so much bigger than CD? 1) smaller pit length (~2.08x), 2) tighter tracks (~2.16x), 3) slightly larger data area (~1.02x), 4) more efficient channel bit modulation (~1.06x), 5) more efficient error correction (~1.32x), 6) less sector overhead (~1.06x). Total increase for a single layer is about 7 times a standard CD-ROM.

- Speed: 1x DVD-ROM drives provide a data transfer rate of 1.321 MB/s. 1x DVD is equivalent to 9x CD. A 5x DVD drive can theoretically transfer data at 55.4 Mbps or 6.4 MB/s.