

Basic DVD Structure

If you intend on ripping DVD's it helps if we have some idea of what we are actually ripping. When you rip a whole DVD to your hard drive you will see something like the picture below:

Name	Size	Type	Modified
Video_ts.bup	20KB	BUP File	06/04/00 23:12
Vts_01_0.bup	78KB	BUP File	06/04/00 23:02
Vts_02_0.bup	30KB	BUP File	06/04/00 23:02
Vts_03_0.bup	36KB	BUP File	06/04/00 23:02
Vts_04_0.bup	18KB	BUP File	06/04/00 23:02
Video_ts.ifo	20KB	IFO File	06/04/00 23:12
Vts_01_0.ifo	78KB	IFO File	06/04/00 23:01
Vts_02_0.ifo	30KB	IFO File	06/04/00 23:02
Vts_03_0.ifo	36KB	IFO File	06/04/00 23:02
Vts_04_0.ifo	18KB	IFO File	06/04/00 23:02
Video_ts.vob	1,768KB	VOB File	06/04/00 23:12
Vts_01_0.vob	134,536KB	VOB File	06/04/00 23:00
Vts_01_1.vob	1,048,574KB	VOB File	05/04/00 18:49
Vts_01_2.vob	1,048,574KB	VOB File	05/04/00 18:49
Vts_01_3.vob	1,048,574KB	VOB File	05/04/00 18:49
Vts_01_4.vob	11,034KB	VOB File	05/04/00 18:49
Vts_01_5.vob	1,048,574KB	VOB File	05/04/00 18:49
Vts_01_6.vob	1,048,574KB	VOB File	05/04/00 18:49
Vts_01_7.vob	674,284KB	VOB File	05/04/00 18:49
Vts_02_0.vob	0KB	VOB File	06/04/00 23:00
Vts_02_1.vob	863,166KB	VOB File	05/04/00 18:49
Vts_03_0.vob	0KB	VOB File	06/04/00 23:00
Vts_03_1.vob	49,744KB	VOB File	06/04/00 23:02
Vts_04_0.vob	0KB	VOB File	06/04/00 23:00
Vts_04_1.vob	14,200KB	VOB File	06/04/00 23:03

I guess you are wondering what all these files are there for, huh. Well to summarize:

vts_01_1.vob Video Transport Stream (VOB = Video Objects)

vts_01_0.ifo Navigational information (IFO = Information)

vts_01_0.bup Navigational info backup (BUP = BackUP)

video_ts.ifo Secondary navigational information

video_ts.bup Secondary Navigational information backup

For the most part the only files we are concerned about are the **IFO** and **VOB** files. The rest are needed more by a DVD player for error correction and seeking requirements.

When I refer to a "title" in my articles I mean a feature of a DVD. For example, DVD's usually contain the main movie. That is the 1st "title". Then they will have the main

trailer, 2nd "title". Then they may also have the short trailer 3rd "title". Then they will have the specials (if any) such as the making of the movie 4th "title". Finally, they will have a small movie clip used for the options and selection menus 5th title. Even still picture menus are made into a slideshow movie so there is rarely any additional files. If you do find additional files they are probably meant to be installed on a PC, like in the Matrix DVD which has an interactive presentation on it.

Vob Files

DVD Vob files contain lots of things bundled together. Imagine each Vob as a box containing various items. The two most important items inside it are the Mpeg-2 video and the Ac3 (or Mp2 / PCM) audio streams. A Vob file can contain many audio tracks at the same time. One can be English, another French, German etc., then you can have alternate music scores and director comments and so on all as separate tracks. A Vob file can also contain subtitles which are usually in the form of transparent pictures that are displayed over the top of the played DVD like a slideshow.

If you play a Vob file back it will usually play everything together i.e. you will hear both the French, German, English and the Directors comments all going at once! This is because they are Multiplexed as one single file. This basically means every file is chopped up into thin slices and stacked together like a pack of cards.

Vob files may also contain repeated sequences. It may have one second of one scene in English, then one second *of the same scene* but in German, and then French and so on. If you were to play it back you wouldn't be able to watch it as a whole movie. This is a big waste of space, but on small movies and cartoons it is still done. Other movies have different playbacks for people of different ages. This means the whole movie is all there but extra scenes are spliced into the movie for people who are older. This method is also popular for cut movies that give the option to play both the cut and uncut versions. In this case you will get both scenes played one after each other. Then we have multiangle movies where you will get the movie played for so long from one camera view, and then the same scene played again from another angle. This is done so the viewer can choose which view to watch as they watch the movie.

It is obvious from the above picture that the largest VOB files on the DVD will be the main movie, the next largest files will be the special features, the next largest files will be the trailers and finally the smallest files the menus. But almost all DVD's will have VOB files that are split into 1 GB files each. So a single movie will usually be built of 2-7 or more 1 GB VOBs. The trailers will just be a single VOB or sometimes just stuck on the end of the movie. And any special features may be built out of one or more Vobs. These Vobs are not separate chapters but are all part of a single title. This can be likened to a book, you will have many pages to a book but only one book. In the same way there are many Vobs to a DVD movie, but there is no pause between them they are played, they are read as one single file.

Every movie or title on your DVD has its own special name. For example, the main movie in the picture above is called:

Vts_01

All Vob files that are part of that title will be numbered in order like this:

Vts_01_01

Vts_01_02

Vts_01_03

Vts_01_04

Vts_01_05

Vts_01_06

Vts_01_07

So you will know that Vts_02_xx is not part of the same title or feature as Vts_01_xx.

IFO Files

As you can see from the previous descriptions of the Vob files, it would be impossible to play most Vob files back in a DVD player without some sort of guidance. If you did, you may get many languages playing at once. All subtitles appearing on screen and repeated scenes all over the place. Then when it reached the end of the first 1 GB Vob file it would stop because it wouldn't know what to play next!

Luckily few DVD's are quite this complex. But nevertheless, they do need information on how they should be played back. And this information is contained in the IFO files. Each IFO file contains a "play list" which tells the DVD player exactly what scenes to show, what subtitles to display and what audio track to use for each selection we make.

Again, each IFO file has its own special name which is always the same as that of the DVD. So going back to our example: the main movie on this DVD is called:

Vts_01

So the IFO file that describes how to play that movie is also called:

Vts_01

If we wanted Flask Mpeg to read this movie like a DVD player would we would open it in DVD mode and choose:

Vts_01_01.ifo

Then Flask would know that it is supposed to play back the Vobs

Vts_01_01

Vts_01_02

Vts_01_03

Vts_01_04

Vts_01_05

Vts_01_06

Vts_01_07

If you opened:

Vts_02_1.ifo

You would probably end up with the special features of the DVD and opening:

Vts_03_1.ifo

Would give you a movie trailer

Well, that's about all you need to know about the structure of a DVD. Hopefully this will help you with your decoding of them to DivX.