

Dirac is a general-purpose video codec. It is aimed at a wide range of applications, offering efficient coding at resolutions from QCIF (180 × 144) to HDTV (1920 × 1080). It uses wavelets, motion compensation and arithmetic coding and offers facilities for both interlaced and progressive scan sources.

The philosophy behind the Dirac codec is 'keep it simple'. This is an ambitious aim since video codecs, particularly those with state of the art performance, tend to be fearsomely complex. However, the BBC would like to collaborate with the Open Source community, academics and others to produce an open codec. It is therefore important for us to keep the principles and design as simple as possible and to provide copious documentation.

A lot remains to be done to convert our promising algorithm and experimental implementation into a practical useable code. This includes optimisation so that it can decode in real time. Algorithmic enhancements are needed to improve the compression performance still further. The resulting codec needs to be integrated with other parts of a compression system, such as players, and interfaced using standard IO formats. We welcome help and support in creating an open and freely available compression system based on this technology.

How is Dirac different from MPEG-2/4, Windows Media 9, Real9/10, Theora etc?

Dirac is, of course, open source and intended to be free to use. It uses some newer techniques than MPEG-2, which is now more than a decade old. It therefore achieves state of the art performance and we intended to develop it further. We are targeting a wide range of applications including broadcasters requirements such as for desktop programme production. It is therefore suitable for higher quality applications in addition to internet streaming.

What is the license?

Dirac is released under the open source Mozilla Public License 1.1. The license states that it can be relicensed under the GPL or LGPL license; so Dirac can be incorporated in GPL or LGPL licensed software.

Are there any patent issues?

The Mozilla license has been chosen to address patent licensing issues. The intention is that it should be possible to use Dirac without paying license fees. It has been designed to avoid patent infringement. However, we can never guarantee that we don't infringe third party patents. If such patents come to light we will endeavour to code round them.

How fast is encode/decode?

At present Dirac is only an alpha release. Part of the code has been optimised, leading to a 250 times increase in speed. Hence it is not meaningful to compare performance until further optimisation takes place. The algorithm is probably simpler than comparable state of the art algorithms and it should be possible to make it run quickly. The intention is to achieve real time decode at standard definition (e.g. 720 × 576 pixels 25 frames/s). At present decode approaches real time for CIF pictures (360 × 288) at 12 frames/s.

What wrapper(s) will you use? Will it stream over the internet.

We intend to use MXF as a wrapper for both uncompressed input and compressed output. MXF is designed for streaming. We intend to investigate streaming over the internet.

Do any players support it?

There is some support in Mplayer for the MXF wrapper. Our aim is to support its use in a variety of players hopefully including VLC Media Player, Xine, Windows Media Player, Quicktime.