

TV evolution: Enhanced picture quality

Context

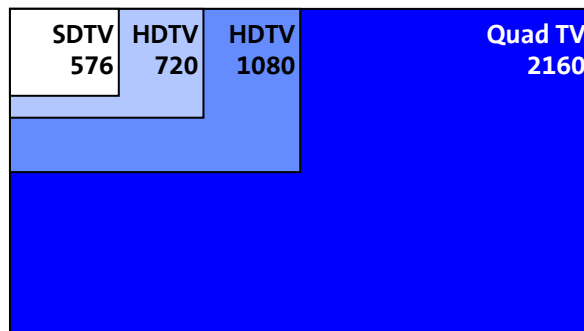
The widespread introduction of HDTV is imminent. Larger bandwidths will enable several TV channels to be received and recorded simultaneously in HD quality. This will also bring multi-channel sound (Dolby Digital 5.1) to the television: a must for the home cinema experience.

Broadband point-to-point connections will support video-on-demand services that allow users to make up their own TV viewing schedules.

Finally, thanks to sufficient bandwidth, high-quality video services can also be offered over the Internet.

Trend in TV formats

The trend in TV formats is towards ever higher resolution, necessitating an increase in transmission bandwidth. The following figure shows the various formats and the number of pixels they support.



Classical format:

SDTV (PAL), 720x576 px (pixels), 10.4 Mpxs

HDTV formats (rollout in progress):

HDTV 720p, 1280x720 px, 46.1 Mpxs

HDTV 1080i, 1920x1080 px, 51.8 Mpxs

Beyond HDTV (under development):

Quad Full HDTV, 3840x2160 px, 207.4 Mpxs (at 25 images per second)

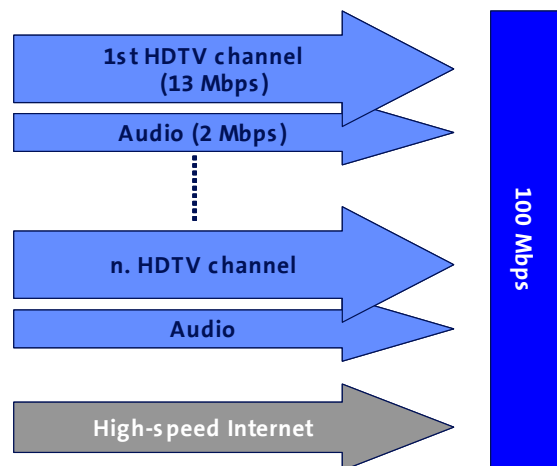
Demand for higher bandwidth

The required transmission bandwidth can be substantially reduced using signal compression.

Current methods enable compression factors typically of 1:20 to 1:100.

HDTV requires at least 10 Mbps per channel, but more realistically 15 Mbps including multi-channel audio (Dolby Digital 5.1). An optical fibre connection provides approx. 100 Mbps, enabling the simultaneous transmission of several HDTV channels so that viewers in different rooms can watch different programmes live or record them.

At the same time videos can be viewed directly from the Internet (streaming), in ever-higher quality.



Outlook

One of the conceivable further developments in TV formats is 3D. Commercial equipment is already available for special applications. The model shown enables 3D viewing without special glasses. Images from eight different camera angles are combined and bent in various directions by a prism in front of the screen, so that the viewer sees different parts of the image with his own two eyes. The bandwidth requirement for this technology increases by a further factor of 8.