THE FUTURE OF VIDEO EXTENSION

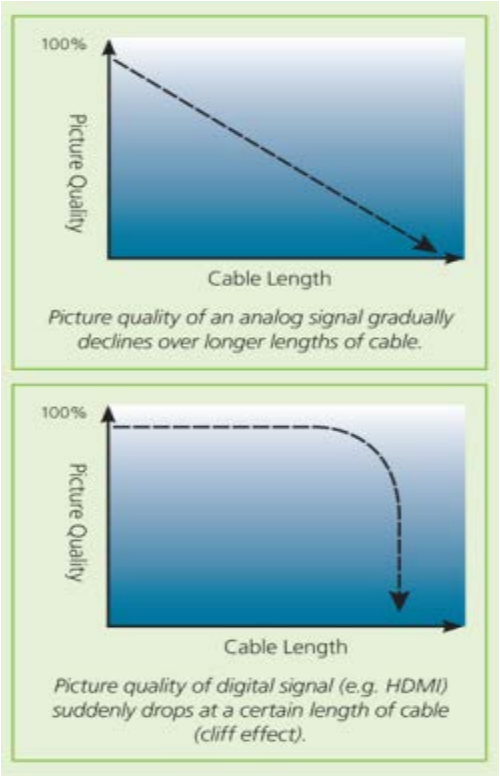
Analog versus Digital Video

Analog video (VGA)

An analog signal is continuously variable. Composite video, Component video, RGBHV, and VGA are types of analog video signals, with VGA being the most common video format used with PCs –at least until recently.

An analog video signal can be run over long lengths of native VGA cable as long as the diameter and shielding of the cable is good enough. However, regardless of the cable quality, signal attenuation increases with video frequency and cable length. This means that after 30 to 50 feet, the image quality will start to degrade. This leads to color skew and smeared-looking text.

To solve for signal degradation in VGA applications, use an extender that compensates for signal loss. A good extender has separate adjustments for high and low frequencies; HF loss is usually greater than LF loss.



Digital video

While analog video signals travel in a sine-like wave form, digital signals travel in a square-like waveform. A digital signal is broken into a binary format where the audio or video data is represented by a series of 1s and 0s. Like analog signals, digital video also suffers from loss, but as long as the cable is of sufficient quality and within the maximum supported distance, the signals don't suffer from blurring or color skew. HDMI and DVI (explained below) are examples of typical digital video interfaces.

However, what you will get when the maximum supported cable length is exceeded is the "cliff" effect, where the digital signal drops off and you completely lose the picture. To overcome distance limitations, you need to use extenders or repeaters.

DVI and HDMI Interfaces

Digital video interface (DVI)

DVI is the standard digital interface for PCs.

The DVI standard is based on transition-minimized differential signaling (TMDS). DVI comes in two formats: single-link and dual-link. Single-link DVI has a maximum frequency. A single-link interface can transmit a resolution of 1920 x 1200 vs. 2560 x 1600 for dual link.
The most common DVI connections are:

- DVI-D: A digital-only connector for use between a digital video source and monitors. DVI-D eliminates the analog pins.
- DVI-I (integrated): Supports both digital and analog RGB connections. It can transmit either a digital-to-digital signal or an analog-to-analog signal. It is used on products instead of separate analog and digital connectors.

High-definition multimedia interface (HDMI)

HDMI is the standard digital interface for HDTV. IT was the first digital interface to combine uncompressed HD video, up to eight channels of uncompressed digital audio, and intelligent format and command data in a single cable. It is now the de facto standard for consumer electronics and HD video, although it is beginning to face competition from the newer DisplayPort (DP) interface. In addition, HDMI also uses TMDS signaling, like DVI, and is backward compatible.

HDMI offers an easy, standardized way to set up AV equipment over one cable. Use it to connect equipment such as digital signage players, set-top boxes, and AV receivers with HD TVs and video projectors. If the HDMI equipment supports higher-resolution HDMI standards, you can also connect 3D displays.

HDMI also supports multiple audio formats from standard stereo to multichannel surround sound. In addition, the interface provides two-way communications between the video source and HDTV, enabling simple, remote, point-and-click configurations.
It also supports high-bandwidth digital content protection (HDCP), which prevents distribution and copying of digital audio and video content sent over HDMI cable. If you have a device between the source and the display that supports HDMI but not HDCP, your transmission won't work if the content is copyright protected.

HDMI is backward compatible with DVI equipment because, like DVI, it uses TMDS signaling. A DVI-to-HDMI adapter can be used without a loss of video quality to enable the connection. Because DVI only supports video signals, not audio, the DVI device simply ignores the extra audio data. However, dual link is not common in HDMI. DVI displays usually also are not able to display HDCP protected and/or component encoded (YCbCr) HDMI signals.

Source : https://bboxblog.wordpress.com/2013/11/11/the-future-of-video-extension/