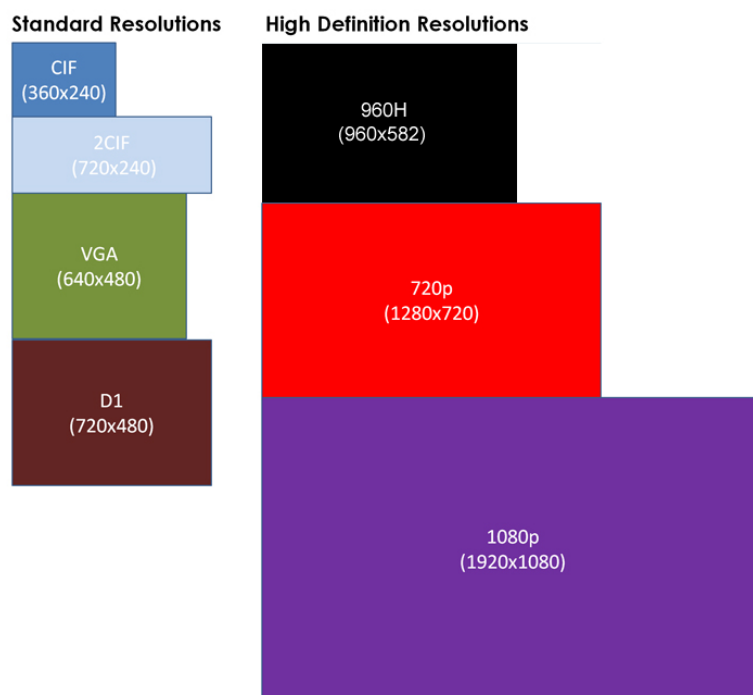


IP CCTV and the other Two Options

There is a lot of conflicting information about the relative benefits of IP CCTV over other CCTV technologies. As always there are pros and cons and this paper tries to unpack these for you.

When asked to specify a solution to a client that has an existing CCTV system installed, many integrators' standard answer is: "You have to go IP..." While the benefits and value of an IP system cannot be denied, adopting a rip-and-replace attitude in every installation may not be the optimal solution. If a client has good quality legacy coax cable installed, replacing this with Cat5/6 can often overinflate the price.

Resolution of the image is a major difference amongst the technologies. Most analogue installations over the last few years use D1 or VGA cameras but there are still some CIF cameras in service from 20th century installations. The different resolutions are shown below:



Analogue systems cover CIF to 960H resolutions and work on coax or CAT5/6 cable with Baluns. Long cable runs cause a reduction in high frequency response (lack of sharpness) and an increase in video noise (lines and other picture distortions). This degradation cannot be removed so extremely long cable runs (over 300m) are difficult to achieve without losing clarity.

IP systems cover VGA to 1080p+ resolutions and work on CAT5/6 network cable. The bit rate required on the network for one 1080p camera (using H264 encoding) is between 2 and 5 Megabits per second so 10-20 IP cameras are possible on one 100 Mbps network cable. It is possible to send this video data around the world without losing any clarity.

HD-SDI systems cover 720p and 1080p resolutions and work on good quality coax. But transmission over great distances is more difficult than with IP systems because they require 150 to 1,500 Mbps data bandwidth on the cable. Latency is lowest with HD-SDI because there is no encoding to reduce bandwidth and storage requirements (useful for counting items on a production line and reacting quickly to a change in image).

Benefits of HD-SDI

- Works with existing good quality legacy coax cabling.
- Delivers close to zero latency as the live video has not been encoded.
- Less complex in design than IP based systems, especially to the integrator that lacks knowledge or confidence in implementing an IP solution.
- Traditional surveillance systems can upgrade to this new technology by just replacing analogue cameras and DVRs with HD-SDI cameras and HD-DVRs. However, the bandwidth of HD-SDI signal is far beyond the analogue video signal.

Considerations for HD-SDI

Due to the large volume of data, the solution requires fairly large storage requirements. The technology is also more expensive than traditional analogue/960H CCTV, especially as both recorder and cameras need to be replaced. The benefit is mostly due to being able to use existing cabling and the quality of video gained from upgrading.

In the event where no existing coax cabling infrastructure is present, opting for a new IP-based infrastructure or even utilising the existing IP infrastructure (currently being used for computers and IP telephones) might prove to be a more viable, future proof and scalable option.

Currently, no intelligence or video analytics can be added to the HD-SDI cameras and edge storage on SD cards is not an option. Today's CCTV HD-SDI standards only allow for 1080p resolution, whereas some IP cameras can support resolutions in excess of 14 megapixels.

What is 960H?

In recent years, the maximum resolution obtainable from an analogue CCTV camera was D1 (720X480). Recent advances in signal processing technology have enhanced horizontal resolution across the board. 960H increases the resolution to 960X582. The benefits of this technology are not realised without an equally capable surveillance video recording device.

Benefits of 960H

- In an existing coax infrastructure, no additional work is needed. It might also be that your client has been installing D1 cameras recently, but not gaining any benefit from the higher quality.
- Cheap upgrade path for moderate picture improvement.
- Less complex than IP and HD-SDI based systems.

Considerations for 960H

You will need to upgrade your DVR recording device to use 960H, however, this is the only capital layout, and any analogue camera – all brands – from CIF all the way up to 960H will be supported. You will also require more hard disk storage to accommodate for the larger image size, but this is minor compared to the HD-SDI solution. Although 960H will give you a better image quality over a standard analogue system, the image quality is still superior on an IP or HD-SDI based system.

In short, these alternatives are merely to get higher definition video outside the feature rich IP realm. Price, application and growth, bundled with features and flexibility will ultimately determine the solution for your proposal.