Client: Genetec

Title: Professional Security Installer

Date: May Issue, 2015

Raising the resolution

CCTV seems to be all about the resolution these days so here are some tips on upgrading to high-resolution surveillance and fitting the right technology for your customers

With the ability to monitor larger areas and view greater detail using higher resolution cameras, many organisations are turning their attention to newly available multi-megapixel cameras to secure open spaces.

4k cameras provide up to four times the resolution of 1080p high definition security cameras, however organisations must first ensure they have the appropriate infrastructure resources to support these new cameras. While companies desire the increased coverage available with these new devices, they may require additional bandwidth, processing power and storage to support the adoption of the technology.

This has more organisations asking their installers: How can we incorporate higher resolution surveillance cameras, while keeping costs to a minimum? According to Erick Ceresato of Genetec there are a few ways in which installers can help their clients deploy high resolution cameras more efficiently. Here are Eric's suggestions:

Minimise network impact - Although security departments will maximise the benefit of ultra-high resolution cameras by displaying a single camera within a monitor, operators often need to view multiple cameras on a display, dedicating only a small area for each stream. By taking advantage of multi-streaming capabilities, a video management software (VMS) can automatically switch between high and low resolution streams based on the size of the video tiles being viewed by an operator. This can greatly reduce bandwidth and workstation requirements in instances where there is no need to display a full megapixel stream, such as when an operator is monitoring multiple cameras on a monitor or when certain cameras are displayed in small tiles.

GPU-accelerated video decoding - With the increasing availability and use of new ultra-HD and multi-megapixel cameras, it may also be necessary to upgrade existing workstations to cope with the demands of decoding higher resolution video. A VMS that relies solely on central processing units (CPU) will use a significant amount of processing power to decode only a few cameras, thereby inhibiting the ability of the operator to view additional cameras or run concurrent operations.

GPU-accelerated video decoding makes deploying next-generation cameras in a system far more practical and affordable. By leveraging a workstation's graphics cards and embedded graphical processing units (GPU) to decode video, operators can display more cameras, at higher resolutions and frame rates, while also providing them with greater speed and fluidity when playing-back and reviewing video. With affordable, off-the-shelf video cards, organisations can minimise their need to purchase new workstations, as they deploy higher resolution cameras within their system, and keep CPU available for other operations.

Optimising server utilisation - By implementing a high-performance computing (HPC) environment, customers can optimise the use of their existing infrastructure resources, helping them reduce the expense of purchasing new equipment. The selection of a VMS that can provide a scalable architecture can allow organisations to reduce the number of recording servers that are needed within their system, as well as help minimise the costs of operating and maintaining their surveillance infrastructure.

Staying on top of surveillance - With the growing adoption of higher resolution cameras, organisations must take into account how implementing these devices will impact the resources of their surveillance system. Selecting a VMS with capabilities that help optimise the use of bandwidth and hardware can significantly minimise costs. It also ensures that an organisation's network maintains reliability in order to support other applications that are critical to their business operations.

Moving on up

Of course there are a number of ways to upgrade the resolution of a CCTV system depending on the starting point. There is no need for example to →

With the growing adoption of higher resolution cameras, organisations must take into account how implementing these devices will impact the resources of their surveillance system

Client: Genetec

Title: Professional Security Installer

Date: May Issue, 2015

(from previous page)

think that the only road to HD from analogue is IP. Whilst it is fair to say that most of the manufacturers' R&D is in the networked surveillance side of things these days there are various ways to use parts of your analogue infrastructure to gain higher resolutions. The most obvious method is to upgrade the camera as this is where the initial image is captured and if you do not have a camera capable of giving you a good resolution image then no matter what technology your customer has in the background they will not be able to look at data that is not there– real life is not like CSI!

This year we have seen a rapid rise in the number of manufacturers launching 4K cameras, which only last year seemed a little excessive in a market that largely still operates at 720p or 1080p. And, as is the way of technology, the 4K cameras have already been left behind by the launch of 5K, 6K and now from Avigilon a 7K camera. The launch of this unit is covered elsewhere in this edition (on page 26), but it is fair to say that even Avigilon would not expect anyone to buy their 7K cameras and try to fit them straight into to a system running a much lower res analogue unit. As we've pointed out already the infrastructure must be in place to be able to support the demands of these super high resolution cameras.

In the interest of fairness it should be pointed out that not all of your clients are going to need to upgrade to 4K or 7K, it all depends on the application and what information they want to take from the scene. A higher resolution camera will gather more data so if business intelligence or analytics is of importance to them then the higher resolutions offered by 4K will be desirable but not always vital. And just to be sure the images are useful, re-check that the lighting and positioning will suit what may be a wider view from the higher res camera. It is also worth noting that despite the claims of some manufactures as to the bandwidth requirements of their units there are usually sacrifices to be made in order to lower the strain on the network from a high resolution camera. In some cases, while the way in which the image is broken down into tiles to allow lower res images to be saved for saving on the bandwidth certainly does help, the framerate of the cameras is reduced, in some cases to 4fps. If that suits the application then that is fine, but for ANPR analytics for example, this may not always be practicable.

The path to higher resolutions does not have to go through IP territory or involve ripping out cabling

Improving options

As already mentioned, the path to higher resolutions does not have to go through IP territory or involve ripping out cabling. IP is likely the best choice in a new build, but if you have a customer that is currently running low res analogue technology there is no barrier to them increasing their resolutions and a number of ways to do this without breaking the bank. Technologies such HD-SDI have shown that camera upgrades can be made while keeping the Coax cabling in place and not getting IT managers involved in the installation. Some changes will need to be made such as upgrading the monitors (your customers will need to have monitors of at least 720p) and possibly the recording device (HD-SDI does not work with analogue DVRs) in order for the full benefits of the upgrade to be experienced. Based around broadcast systems, HD-SDI can be achieved in full or using hybrid installations and signal repeaters may be required depending on the cable runs. Fans of HD-SDI point to additional benefits such as near zero latency and uncompressed images as reasons to remain on Coax cabling.

There is also the option of using switches/adaptors to run IP cameras over Coax cabling and these can add PoE to the system. Many network camera manufacturers have a range of switches to allow their cameras to be used on existing cabling as (cynics would say) they recognise that by only selling units that required Cat5 to be installed could limit camera sales as the installation costs would spiral.

Clearly the best route to higher resolutions is not as straightforward as just buying the highest resolution cameras. There are a number of questions that you need to ask your customers before suggesting the system for the job. You need to consider:

- *Why do they want to upgrade?*
- *What do they want to do with the data?*
- *What is currently installed?*
- *What is the budget?*

Choosing the most suitable system will depend on combining the answers to those four questions to meet their requirements.

Camera resolutions will only improve in the future. Consider, now that we have seen the launch of a 7K camera how many R&D departments must right now be working on 8K, 9K and beyond? Whether we actually need such high resolutions for most applications is up for debate, but what is sure is that anyone who has tried to identify anyone or anything from a grainy image will have wished they had a better system installed. The image limitations of a 4K camera are much less than those of a 1080p unit, but upgrades always cost more money so getting it right is essential.