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Security Sales & Integration

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Beyond Megapixel: Answering to a Higher Definition

There's more to the number than meets the eye; new capabilities and features bring value-add to customer specs

For systems integrators, it's not enough to peddle megapixels (MP) alone. Sure, the number is important, but ultimately end users want to know the value proposition and how the camera will help solve security, safety or other challenges at the protected premises. Users want to be able to target specific areas with technology that works to resolve issues or address risk-prone settings. They are most often looking for a solution that can be handled as an operating expense (OpEx), versus a large capital expense (CapEx) that may take months or even years to budget for.

The good news is that with the higher resolutions, image quality and clarity afforded by megapixel cameras come a wealth of other benefits and capabilities that translate into a lower total cost of ownership, heightened business intelligence and other valuable services that systems integrators can provide to customers from these surveillance devices.

Evolution in Action

The state of megapixel and HD camera R&D has evolved to higher resolutions, superior imaging and the ability to apply the latest compression codecs for more efficient bandwidth use in transmission and storage as well as cloud computing. Higher definition is of course great, but what it affords in new implementations is what really matters to security integrators and users—and there's no shortage of exciting and trending features systems installers can leverage to target customer's applications.

For systems integrators, whether it's a 2 to 5MP unit like those most commonly deployed today, or maybe the latest 4K camera, it's more than simply selecting the appropriate number of pixels and examining the aspect ratio for image quality and clarity. It's about creating a holistic ecosystem targeted at the specific challenge and vertical market—a unified, integrated, automated solution with design-built cybersecurity that makes use of the inherent advantages of the cloud.

First, a clarification. Resolution and image quality are actually very different. You can have a high resolution product that still results in a poor picture if the end-to-end solution doesn't have the right compression, cabling, monitors, servers, transmission, PC graphics cards, and so on. You might have a 12MP camera, but the image quality at the other end could translate down to a nearly useless 1MP if you haven't properly planned the entire ecosystem from head end down to everything in between.

The benefit of improved resolution technology has had widespread, significant impact on the systems integration channel and while high-quality imagery has become the norm, systems integrators want to

know what value-added features they can provide to differentiate their offerings and bring even greater perceived and real value to the end-user, making them a happier and perhaps stickier client.

It's hard to believe it's been nearly 25 years since the first IP network camera was invented, and now, according to analyst firm IHS Markit, the market for network cameras has surpassed analog, with two-thirds of all cameras sold globally in 2018 network cameras. Since the network camera's creation there's been a steady march to higher megapixels and with it, a host of features have emerged, including extreme low-light functionality, smart wide dynamic range, onboard camera or edge analytics and new compression and bandwidth reduction capabilities.

Technology Benefit and Impact

Megapixel technology provides higher resolution for viewing greater detail, covers an expansive area and helps more fully define objects. These advancements can be effectively deployed with live images, where one high-resolution camera can cover the same visual area of two or three lower resolution cameras. For cameras in applications such as sports stadiums or arenas, surveillance can pick out individuals at greater distances with exceptional clarity. Higher resolutions also come into their own in playback, as there are more pixels in the picture to leverage. For example, when an incident has occurred monitoring operations can zoom into the image to obtain greater detail; the higher the resolution, the greater the detail now possible with digital zoom.

Installations that strive for a combination of high-resolution and high-performance at a competitive price point are making the jump to 4K cameras, which have also dropped in price like other units on the market. The increased amount of pixels per foot with 4K resolution cameras improves image detail substantially in areas such as loading docks, transportation hubs and distribution centers and airport terminals. With additional processing power an important part of the equation, built-in IR illuminators produce clear images at an effective distance in a variety of subpar lighting conditions.

New Efficiencies Equal Value-Add

The latest megapixel cameras now feature premier video intelligence technology that maximizes resources and improves overall performance—just what the customer wants. Low-light performance has improved significantly as cameras have added substantial processing power. Onboard or edge camera analytics distribute the computing load between the camera and the video management system while triggering events to be used for forensic analysis or business data and insights. Low-light detection is enabled by IR illumination, working in conjunction with features such as smart wide dynamic range and true day/night capabilities that provide exceptional video in the most challenging conditions. Consider the all-too-common application in a receptionist area, or retail, where light levels vary drastically and can often disrupt clear and crisp image capture. Cameras can now cope and adjust for internal and external images, offering the correct color and white balance, with some units effectively capturing high quality color video well below 0.1 lux.

Further deploying high-sensitivity, low-noise CMOS progressive image sensors with noise reduction, megapixel cameras can control the threshold and strength of a low pass filter to keep the detail while providing noise filtering. As a result, cameras can view dark scenes while maintaining enough detail to identify key features of objects and people.

The difference in extreme lighting within a scene is known as dynamic range. Wide Dynamic Range (WDR) is a camera feature that balances challenging lighting conditions and improves surveillance images in scenes with varying foreground and background illumination. When WDR is off, the image in the foreground is dark with features hidden by shadows due to the bright backlighting. When WDR is on, the lighting variation is minimized, making the resulting image suitable for surveillance viewing and recording.

Cameras with WDR functionality have special software and hardware that allows them to balance foreground and background lighting for one clear image. This makes them ideal for recording areas like store entrances where the contrast between the sunshine outside and the dim lighting inside can be extremely difficult to capture and record. From a loading dock backlit by the sun, to a hotel lobby with large glass windows, cameras can still capture video surveillance for any security need.

Real Bandwidth Reduction

Systems integrators now have technology available that actually reduces network bandwidth and video storage requirements. Intelligent bitrate control mechanisms adjust the compression configurations during live streaming, minimizing network bandwidth and storage requirements for H.264 and H.265 video streams. This embedded technology continuously monitors and optimizes system streaming parameters to match the level of activity within the camera's field of view, offsetting the added video storage required when streaming at 4K resolution, for example. Users benefit from real-world cost savings by both reducing the load on their network and lowering the amount of storage required.

Customers with scenes that feature times of no movement or areas within the image that remain static stand to gain the most from this technology—the common use case is scenes that feature times of no movement or areas within the image that remain static. For example, a car parking facility or building entrance may have low motion activity for extended periods. These conditions let users dramatically reduce the amount of bandwidth and storage needed while still allowing the customer to record and/or live view a high-quality video stream.

At the Edge Gains Speed

With greater processing power, camera analytics and other 'smarts' are moving to the edge. They can process complex analytics, including motion detection, line crossing, loitering, audio classification and other activities. New technology that enables "trickle storage" has made its way to edge-based video for guaranteed assurance of recording. With this capability, cameras automatically detect network short-term interruptions and start recording video to its on-board SD memory card, followed by a seamless video transfer of the recording to hard drive or VMS once the network connection is reestablished.

Systems integrators will rejoice in knowing that installation efficiency has also been targeted by camera manufacturers. Cameras can include presets that are most often used for certain applications, so technicians can select a default that works perfectly with their specification or vertical market. Manufacturers have also been working on seamless integration, offering easy ways to install and connect cameras, saving valuable time in the field and labor costs.

Since there are so many camera options, how do you ensure you have the right value that your end user customer will be attracted to or need? That's where many of the new and emerging features of high

definition, high-resolution megapixel cameras make their bid. Numbers are great, but think first about what your customer is trying to accomplish and any challenges, and then marry the appropriate megapixel camera to the specification. Become a problem solver, which is easy to do with the wide range of trending features and capabilities now available from megapixel cameras in the security market.