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An internet protocol (IP) camera is a digital video camera that sends and receives data over a network or the Internet. Unlike traditional analog cameras, IP cameras offer higher resolution and advanced features like remote access and motion detection. They connect directly to your network, allowing you to monitor your business in real-time from any device with an internet connection. This makes them a popular choice for modern security solutions, providing flexibility and ease of use for business owners.Types of IP camerasFixed IP cameras: Stationary cameras that provide a consistent field of view.PTZ (pan-tilt-zoom) IP cameras: Cameras that can pan, tilt, and zoom to cover a wide area.Dome IP cameras: Cameras encased in a dome, often used for discrete monitoring and protection against tampering.Bullet IP cameras: Long, cylindrical cameras typically used for outdoor security.Wireless IP cameras: Cameras that connect to the network wirelessly, offering flexible installation options.Infrared (IR) IP cameras: Cameras equipped with IR LEDs for night vision capabilities.360-degree IP cameras: Cameras that provide a full panoramic view, reducing blind spots.Box IP cameras: Versatile cameras often used with different lenses for various applications. IP cameras are crucial for enhancing security due to their high-resolution video and advanced features like motion detection, which help identify and respond to threats quickly. Remote monitoring allows business owners to access live feeds from anywhere, ensuring constant oversight even when they are off-site. These cameras are also cost-effective; features like Power over Ethernet (PoE) reduce the need for multiple cables and infrastructure. Additionally, IP cameras offer easy scalability, enabling businesses to expand their security coverage as needed.Flexible storage options, including local and cloud storage, provide versatile solutions for data management and retrieval. IP cameras can also improve productivity by allowing employers to monitor employee activity, optimize operations, and ensure adherence to company policies. Finally, high-quality video recordings from IP cameras serve as valuable evidence in legal and insurance cases, helping to resolve disputes and claims efficiently. An IP camera (Internet Protocol camera) is a digital security camera that sends and receives video footage over a network. Unlike traditional CCTV cameras, which rely on analog signals and local recording devices, IP cameras stream footage digitally using an internet connection. With the rise of smart technology, home and business security systems have evolved significantly. IP cameras have become the go-to solution for homeowners and businesses looking for reliable, high-resolution surveillance. They offer remote access, real-time monitoring, and smart integrations, making them a versatile alternative to analog CCTV systems. Key Takeaways: IP cameras use an internet connection to transmit and store video footage. They provide higher resolution compared to traditional CCTV systems. Remote access allows users to monitor footage from anywhere. These cameras integrate with smart home systems, cloud storage, and AI-powered analytics. No need for extensive wiring, reducing installation complexity. They are commonly used in home security systems, businesses, and public surveillance. IP cameras rely on digital technology to capture, process, compress, and transmit video data over a network. Here’s how the process works step by step: Every IP camera has a lens and image sensor that captures light and converts it into electrical signals. An analog-to-digital converter processes these signals and converts them into digital video data. Since raw video files are large, video compression (such as H.264, H.265) reduces file size and bandwidth usage. The compressed video data is packaged into data packets and sent over a network using the camera’s unique IP address. Video footage can be stored on: Network Video Recorder (NVR): A dedicated device for storing IP camera recordings. Cloud Storage: Secure off-site storage for remote access. Local SD Card: Some IP cameras come with onboard storage. Users can access live or recorded footage using a mobile app, web browser, or security software. IP cameras provide HD (1080p), 4K, and even 16MP resolution, offering clearer and more detailed footage. Unlike traditional CCTV, IP cameras allow real-time monitoring from anywhere using a smartphone, tablet, or PC. Many IP cameras come with motion detection, facial recognition, and AI-powered alerts, reducing false alarms. Wireless IP Cameras: Connect to Wi-Fi for easy installation. PoE Cameras: Use a single Ethernet cable for both power and data transmission, reducing clutter. With built-in microphones and speakers, IP cameras allow users to communicate remotely. Advanced night vision ensures 24/7 surveillance. Businesses and homeowners can expand their security system by adding multiple IP cameras to a single network. Designed for outdoor use Long-range focus for monitoring specific areas Weatherproof housing Ideal for indoor & outdoor use 360-degree coverage with wide-angle lenses More discreet and vandal-resistant Remote-controlled movement for a broader field of view Optical zoom for detailed surveillance Best for large areas like parking lots Easy to install with no wired connection required Ideal for renters or temporary setups Ultra-wide-angle view with 360-degree coverage Ideal for retail stores and office spaces Before purchasing an IP camera, consider these factors: FactorDescriptionResolutionChoose 1080p, 2K, or 4K for clarity.Field of ViewWider angles cover more area.Storage OptionsCloud storage, NVR, or SD card support.Power SourcePoE for wired reliability, battery/Wi-Fi for convenience.IntegrationWorks with Alexa, Google Assistant, or security systems.Weatherproof RatingIP65+ for outdoor use.Night VisionInfrared (IR) or color night vision for low-light performance. Yes. IP cameras provide higher resolution, remote access, and smart features, whereas CCTV cameras require more wiring and a local recording system. Yes. While internet access is needed for remote viewing, IP cameras can still function on a local network without an active connection. To prevent hacking, always: Use strong passwords Enable encryption Keep firmware updated Disable remote access when not needed Yes. Most IP cameras integrate with Amazon Alexa, Google Assistant, Apple HomeKit, and security systems. It depends on resolution and compression: 1080p (H.264): ~1-2 Mbps 4K (H.265): ~5-15 Mbps Motion-triggered recording reduces bandwidth usage. IP cameras have revolutionized the security industry by offering high-quality video, remote access, and smart integrations. Whether you’re protecting your home, business, or property, IP cameras provide a flexible and scalable solution. Investing in an IP camera system ensures peace of mind, enhanced safety, and effortless monitoring—all at your fingertips. Explore different IP camera options, compare features, and choose the best model that fits your needs. A smart, connected security system starts with the right IP camera. If you’re looking for IP camera installation in Atlanta, Alpharetta, and nearby Georgia areas, contact Callaway Security today! Internet Protocol cameras, also called IP cameras or network security cameras, provide digital video surveillance by sending and receiving footage over the internet or local area network (LAN). Like their name suggests, IP cameras connect to a network through WiFi or a Power over Ethernet (PoE) cable. They’re often used with network video recorders (NVRs) and sometimes digital video recorders (DVRs, making them a common solution for enterprise video surveillance.Jump to each section to learn more:• Where are IP Cameras Used?• What are the Types of IP Cameras?• What are Must-Have Features of IP Cameras?• What are Extra Features of IP Camera Systems?• What to Consider When Buying an IP CameraIP cameras are commonly used in:Retail StoresBusiness OfficesGovernment BuildingsIndustrial SitesBanksMilitary FacilitiesTraffic IntersectionsTypes of IP Cameras:PTZ IP Camera: Pan-tilt-zoom (PTZ) cameras can adjust their field of view and angle via a remote operator, allowing users to track events with greater control. They can cover potentially large areas and are commonly used to monitor public outdoor spaces.Fixed IP Camera: Fixed IP cameras operate in a static position and provide a single view within the camera’s field of vision, continuously surveilling subjects within a predetermined frame. Fixed cameras are widely used both outdoors and indoors, typically in retail stores and business offices. Compared to PTZ cameras, they require less bandwidth to support.PoE or PoE+ IP Camera: PoE IP cameras use an Ethernet cable (usually Cat 5 or 6) to supply both electrical power and data simultaneously. This eliminates the need to run two cables for power and data separately, thus reducing the amount of hardware required. With fewer parts to deal with, PoE systems tend to be easier to install and cost less to maintain compared to traditional systems. The difference between PoE and PoE+ is the amount of electricity each one transmits to power their systems. Standard PoE systems power most IP cameras and transmit up to 15 watts of electricity. PoE+ systems transmit up to 30 watts and are usually used in more high-power cameras with their own heating and cooling mechanisms.Wireless IP Camera: Wireless IP cameras connect to a WiFi router to send video data. The footage is then transferred to cloud storage or the camera’s local built-in storage. Wireless IP cameras can be a good solution for small homes, but a wired camera system is less susceptible to interference and recommended for larger areas.Must-Have Features of IP Cameras:Cloud and Built-In Storage: Storage space is a huge consideration when surveying IP cameras. By law, many companies are required to retain security footage for a specific amount of time depending on their industry and local mandates. Most surveillance systems will transmit video data onto cloud storage, a Solid-State Drive (SSD), or a Hard Disk Drive (HDD). Advanced solutions store footage locally on an SSD or HDD while also backing it up in the cloud; these “hybrid cloud” security systems are considered safer and more reliable than systems that rely on just one type of video storage.PoE Capabilities: IP cameras that can be powered over a PoE connection eliminate the risk and cost of running electrical wire. Compared to purely wireless cameras, PoE IP cameras tend to have more stable data transmission and less likely to encounter interference from nearby devices. You can use either STP or UTP cables for the connection.Video Data Encryption: How secure an IP camera is depends on its level of data encryption and network security. Encryption is a way to conceal information by scrambling data so that only authorized parties can decode it. Since IP cameras are often targeted in IoT breaches, utilizing modern security standards is key to prevent hackers from lifting company information and even disabling whole systems. There are two states of encryption, at rest and in transit.At Rest Encryption: Data encrypted “at rest” means data is protected while on the camera. RSA and AES are two examples of Public Key Infrastructure (PKI) encryption standards, which ensure that anyone who accesses video data won’t be able to extract it from onboard storage.In Transit Encryption: Data encrypted “in transit” means data is protected while it’s traveling over the network, or being transferred from local to cloud storage. Secure systems encrypt data in transit using HTTPS/SSL over Port 443, and only make outbound connections to dedicated cloud services.Instant Video Sharing: One capability of modern IP surveillance systems is not only remote access, but the ability to share video clips through SMS texts, emails, or live links. This decreases the amount of time it takes to alert authorities when incidents occur and immediate action is required.Video Quality: IP cameras are generally known to provide higher video quality compared to analog cameras traditionally used in CCTV systems. Because they transmit digital signals, they are able to capture greater detail. This makes it possible for many IP security systems to incorporate advanced video analytics like facial recognition and matching into their software.Edge-Based Video Analytics: Modern surveillance systems incorporate artificial intelligence (AI) and edge-based analytics to detect people and objects in the camera’s field of view. Software with deep learning capabilities can use facial and vehicle matching to alert users of incidents in real-time and speed up investigations. These advanced surveillance systems also allow users to define restricted areas within the camera’s view and be notified if meaningful activity is detected during a certain time of day.Steady State Streaming: IP cameras that operate in “steady state” consume significantly less bandwidth, making them more scalable and less costly for enterprises and large organizations. In steady state, cameras send a constant stream of encrypted thumbnails and related metadata to the cloud once every 20 seconds. A steady state IP camera operates at about 20 kbps, which is roughly 1/100 of a traditional cloud camera that streams at 1-2 mbps. Given the low bandwidth footprint, over 100 steady state cameras can share the same network connection and consume the same bandwidth as one traditional cloud camera.Considerations when Choosing the Best IP Camera:What’s the scope of the area being surveilled? (Distance? Scope?)How much internet bandwidth is needed to support the camera?How will footage be stored, and how much space will you need?Is data encryption up to modern security standards? (RSA vs. AES? At rest vs. in transit?)Where is it being placed? (Indoor? Outdoor?)Does it utilize encrypted transmission? (SSL/TLS?)How to Choose the Best Security CamerasWhether you’re upgrading an existing surveillance system or starting from scratch, choosing the best security camera system is critical to ensuring the safety and security of your property. While traditional security cameras offer simplicity and reliability, cloud-based IP solutions provide advanced features, scalability, and remote access. Verkada’s hybrid-cloud security cameras combine the best of both worlds, delivering a secure, scalable, and easy-to-use solution for modern surveillance needs.Why Verkada’s Modern IP Systems:- User-friendly interface: Ultra intuitive, easy to use platform that offer a streamlined and accessible way to monitor video footage without technical expertise required - Integrated hardware and software: Verkada’s products are integrated with a single cloud-based software platform.- No DVR or NVR required: Verkada’s cloud-based systems eliminates the need for DVRs and NVRs, which are susceptible to cyber threats. - Advanced AI search & people analytics: Powerful edge-based processing and state-of-the-art large language and vision models enable face detection, pinpoint a person of interest, and filter results based on clothing color, apparent gender, and/or actions - Scalable solutions: Whether you want 1 or 1,000 security cameras, alarms, intercoms, and more, large-scale deployments are easy to manage with minimal technical expertise required - No maintenance costs: Verkada’s software updates are automatic and free, ensuring the products you invest in today only get better with time, with no upgrades necessary. - Privacy-sensitive: Verkada’s mission is to protect people and property while still respecting privacy. - Remote access and management: Easy remote access from any web browser or Verkada’s free mobile app and secure video sharing - Hybrid cloud storage: Built-in storage on every camera, as well as automatic cloud backups for up to 365 days - 24/7 Support: Fast, efficient, and free technical support 24 hours a day, 7 days a week - Warranty: Most Verkada cameras offer a 10-year warranty and of course, free product updates over the air.Get a Custom Walkthrough of Verkada’s Security CamerasDiscover how Verkada’s fully integrated, cloud security cameras can transform your security strategy in the most simple, scalable, and secure way. See how Verkada’s cameras work to see our advanced features in action and learn how we can help you protect what matters most. Or you can get a Free 30-day Trial - no credit card required. IP cameras, also known as IP network and Internet Protocol cameras, are digital video cameras that communicate video data over the internet or local area network (LAN). Each camera has its own IP address and requires nothing more than a network connection to transfer video data between external systems. Unlike analog cameras, Internet Protocol cameras can process and encode video data natively using built-in processors. Diverse range of IP cameras to meet every needAI analytics for improved securitySecure encryption to protect your dataIntegrates with your existing systems IP cameras communicate live video footage to external recording and monitoring devices over the internet. Depending on the business’s needs, footage can be transferred over a hardwired network connection (Ethernet/USB cables) or communicated wirelessly via a secure Wi-Fi or cellular network, offering great flexibility in terms of installation and design.Network optionsBusiness and property owners who decide to develop IP camera systems can choose from a few network options that dictate how captured footage is communicated between devices. In some cases, multiple options can be combined to ensure reliable coverage over key areas.Wired networks: Ethernet cables physically connect IP cameras to video storage and viewing devices. Wired networks provide fast transmission speeds and secure transfers, with a low risk of signal interference or interception from outside sources.Wireless networks: Captured footage is sent to storage and viewing devices over a wireless Wi-Fi network, meaning IP cameras can be placed in areas where installing cables is not possible. However, Wi-Fi communications can be prone to interference.Cellular networks: Video data is communicated over a cellular network, enabling video security systems to be developed in areas without internet access or suitable wiring infrastructure. Cell networks are convenient but upload and download speeds can be inconsistent depending on the installation location.What is an IP camera system?IP camera systems are combinations of video recording, storage and monitoring devices that rely on an internet connection to communicate data. A typical IP camera system will contain four main components used to capture, transmit, store and view video footage, including: Internet Protocol cameras: Internet Protocol cameras can be installed in key areas to capture live footage of unfolding events.Communication network: Depending on the business’s needs, IP cameras may communicate data over Ethernet cables, a Wi-Fi network or a cellular network.Network Video Recorders (NVR): As IP cameras can process video data internally, they don’t need to be connected to external processing devices. Instead, they can be linked directly to an NVR that acts as a mass storage device for processed video data.Video management system (VMS): Live IP camera footage and files stored on NVRs are sent to an on-site VMS for security staff to review. Cloud-based VMSs may also be utilized to enable staff to view feeds remotely on smart devices and computers. As with any other type of security camera, there are numerous types of IP cameras, each with its own features, capabilities and potential use cases. Before you invest in IP cameras, understanding the different IP camera types and their uniqueness should be assessed. Below are some popular types of IP cameras utilized in modern video security systems.Bullet IP camerasBullet IP cameras capture high-quality footage at long-range distances but they usually have a narrow field-of-view. These types of cameras are best used to cover outdoor and open areas like building perimeters, access roads and long hallways. As bullet cameras are often installed outdoors, they usually have weather-resistant casings and feature night vision capabilities.Dome IP camerasDome IP cameras have wide-angle lenses to capture clear footage of expansive areas like warehouses, offices and parking lots. This IP camera type has a protective dome-shaped enclosure that helps prevent the lens from being damaged by individuals or the weather. However, this enclosure can become dirty in outdoor or industrial areas, so regular cleaning is necessary.Fisheye IP camerasFisheye, or 360-degree, Internet Protocol cameras capture panoramic images of target areas, making them a great choice for observing activity over factory floors, retail spaces and restaurants. While 360-degree IP cameras enable businesses to cover larger areas with less hardware, image quality can suffer, meaning IP cameras may not be ideal for high-risk locations where image clarity is crucial.Turret IP camerasTurret Internet Protocol cameras have a built-in ball-and-socket joint that enables operators to adjust the device’s viewing angle as required. This unique ability makes turret cameras a great choice for areas where layouts often change, like shop floors and stock rooms. However, staff should be aware that the camera’s moving parts can be susceptible to wear and tear.PTZ IP camerasPan-Tilt-Zoom (PTZ) IP cameras feature motorized joints that enable operators to adjust viewing angles remotely. Objects of interest can be followed through an environment to support security staff in responding to unfolding events. Similarly to turret cameras, the moving parts inside PTZ camera models require continuous maintenance to mitigate damage. Modern Internet Protocol cameras have various key features and capabilities to support business owners and organizations in developing reliable video security solutions. Below are a few key features and add-ons that stakeholders should consider when designing IP camera systems.Cloud and internal storage Many businesses are legally required to retain security footage for a set amount of time, so it’s important to ensure your proposed IP camera systems have ample storage space. Most IP cameras have some internal storage, but external hard drive storage should also be utilized, alongside cloud storage solutions to allow for automated video data backups.Power-over-Ethernet (PoE)PoE IP cameras receive power and transmit data over a single Ethernet cable, making for an easier and more reliable installation compared to analog or standard IP alternatives. Consider choosing PoE for cameras, as it produces a more stable connection than comparable Wi-Fi cameras which are also less prone to interference and signal loss issues. Remote management toolsOne of the major benefits of IP cameras is their ability to transmit footage over the internet, enabling businesses to view, edit and analyze security data from any location. Look for IP cameras with remote management tools, or open API configurations, as this will support security staff in creating and optimizing bespoke cloud-based video security solutions.Video analyticsAI video analytics help stakeholders develop automated responses to common security threats with algorithms that intelligently analyze target areas for signs of suspicious activity. Threats like people carrying contraband items, crowds forming in unusual areas and movement outside normal business hours can all be detected and addressed using AI analytics or AI security cameras.Data encryption softwareThe most prominent disadvantage of IP cameras is their vulnerability to cyber threats as data sent over the internet can be vulnerable to hacking attempts. Businesses can improve their cybersecurity posture by encrypting their data transfers. Therefore, prospective buyers should look for camera systems featuring at-rest and in-transit data encryption tools. Developing an effective video security solution for any organization requires stakeholders to review the unique needs of their facilities. While IP cameras can provide several advantages not matched by comparable analog cameras, they’re not always the best option.AdvantagesInstallation flexibility: Unlike analog cameras, IP cameras are not restricted to use only in areas with wiring infrastructure. This means they can be installed in different locations, with wired and wireless models in the same network.Ease of integration: IP cameras, especially those with open API configurations, can be easily integrated into wider security and building management systems, allowing for automated processes between video security, access control, alarm and sensor systems.Image quality: IP cameras capture and process digital footage internally, therefore they can produce high-quality and high-resolution images. Captured footage can also be adjusted using digital zoom tools that don’t impact image quality like optical zoom.Instant data sharing: If IP cameras are connected to a cloud management system, stakeholders can develop remote alerts and instant data sharing functions. If cameras detect suspicious activity, video footage can be sent to staff via SMS or email.Simple scalability: Extra cameras and security devices can be easily connected to IP installations by adding a new network or wireless connection. In an analog system, new coaxial/power cables would need to be wired throughout the property.DisadvantagesBandwidth demand: IP camera systems require a significant amount of bandwidth to function effectively, averaging around 1 – 2 Mbps for a 1080p 6 – 10fps device.Cybersecurity risks: As IP cameras send data over the internet, malicious actors can intercept signals if cybersecurity provisions are not in place.System complexity: IP camera systems need multiple accessories to work optimally, including transmitters and connectors, which can be complex to set up. Subscription costs: To safely and reliably operate IP camera systems, subscriptions for the internet, cloud storage, operating software, and cybersecurity are typically required. The versatility and flexibility of IP camera systems make it easy to create custom networks for a wide range of applications. Commercial business owners, factory operators and even healthcare professionals can combine different types of IP cameras, network infrastructure and monitoring solutions to develop reliable video security systems tailored to unique requirements.Retail and hospitalityIn retail stores and hospitality facilities, like hotels and restaurants, IP cameras can capture continuous footage of high-risk areas like stock rooms, lobbies, shop floors and cash-counting areas, with options for managers and security officers to view live feeds remotely 24⁄7. Video analytics tools may also be used in retail camera systems to autonomously detect suspicious activity, like shoplifting or violent behavior, with instant alerts sent to operators warning of unfolding events, leading to faster incident response times.Commercial offices Commercial IP cameras can be deployed in rented offices to provide reliable coverage of key areas to help protect employees and observe activity after hours. Wired IP cameras can also be a good choice for offices, as business owners can easily scale systems with business needs, adding new cameras, security integrations and management solutions as the organization grows.Healthcare facilitiesThe cloud-based capabilities of IP cameras are well-suited to healthcare applications, as staff can remotely check in on vulnerable patients at any time. Healthcare camera systems can also be enhanced with video analytics tools used to autonomously identify contraband items and dangerous activities, with security integrations allowing for automated threat responses.Industrial environmentsDifferent types of IP cameras can be combined to help ensure reliable coverage of industrial facilities, factories and construction sites, with managers able to add and remove devices as required. These industrial IP cameras enable security teams and managers to observe worker safety, productivity and the delivery of shipments and orders. Wi-Fi and cellular networks can be useful in these settings, as often it’s not possible or logical to install physical wiring infrastructure in factories and temporary sites.Government buildingsIP camera systems with powerful encryption tools are used in government buildings to provide the benefits of security coverage while mitigating the risk of cyber threats. The ability to closely observe government facilities 24⁄7 is central to protecting confidential data and important personnel, with high-quality footage ensured via digital IP cameras. Alongside ensuring your IP cameras have the features and capabilities required to function optimally, security staff need to ensure IP camera systems are installed and configured appropriately. Here are some key considerations for developing reliable IP camera solutions.Bandwidth requirementsIP cameras require significant bandwidth to work effectively and bandwidth demand will rise with every camera added. Businesses must make sure data plans can support the addition of IP cameras and network solutions without impacting the functionality of existing systems. For reference, the following equation can be used to estimate IP camera bandwidth demand.Number of cameras x bit rate of cameras = required bandwidth (Mbps)Camera placements Attention must be paid to where cameras are installed to ensure good coverage and prevent tampering. Think about which types of IP cameras will be best suited to different areas, like dome cameras in expansive spaces and bullet cameras for perimeters, and try to install hardware out-of-reach to the public but in locations that can be accessed by maintenance staff. Network security Access to IP camera operating software and management systems must be secured behind monitored access controls, with multi-factor authentication and zero-trust policies in place to help deter unauthorized access. These provisions should be deployed in cooperation with cybersecurity solutions like endpoint detection and response, encryption and firewall tools.File sharing featuresThe ability for IP camera feeds to be viewed remotely 24⁄7 via cloud VMSs is a major benefit, but this feature can be further enhanced. Look for IP surveillance camera systems with customizable file-sharing functions. This will help improve incident responses, with video clips sent via SMS or email to security staff when suspicious activity is detected.Integration possibilitiesIntegrating IP cameras with wider security technology and building management systems can help security staff develop greater situational awareness for enhanced security and improve operational efficiency through automated responses. For example, suspicious access attempts may trigger IP cameras to flag footage and alert operators, while suspicious events spotted by video analytics tools may cause on-site alarms and access control locks to engage automatically. Physical security consistently ranks as a top priority for businesses and property owners of all sizes. By developing proactive solutions designed to help teams identify, address and deter criminality, leaders demonstrate a commitment to the safety of their employees and assets. Next to access control readers and on-site alarms, video security cameras are usually a critical aspect of a modern security system. However, organizations operating older or outdated CCTV solutions may not be as well-protected as they could be. With support from cloud-based management tools and smart physical security solutions and integrations, using Internet Protocol (IP) surveillance cameras can help leaders better address a wide variety of common threats. For business and property owners wishing to learn more about different types of IP cameras, configurations and use cases, this guide outlines all you need to know. Internet protocol cameras, also known as IP cameras, are a special style of digital security camera designed to send and receive footage over a secure network or internet connection. They are standalone security devices with their own unique IP addresses. When connected to a local network, footage can be sent from installed IP cameras to a wide range of internet-connected viewing devices, enabling teams to view security feeds remotely. One of the main advantages of IP cameras is that they don’t require a local recording device like traditional analog CCTV systems. Instead, these cameras can be connected to a local network, just like a computer or a smartphone, with data processed internally to be viewed in real-time. What you’ll receive: Best practices for utilizing commercial security cameras Expert tips for choosing the right surveillance systemOur complete checklist to audit your video security strategy IP security cameras capture images in the same way as traditional analog CCTV cameras. However, captured footage is processed and sent to relevant storage and viewing devices in a very different way. Analog cameras must be connected to a recording device using coaxial cables to transmit footage; IP cameras can perform this function wirelessly over the Internet. Stakeholders may choose to physically connect IP cameras to a centralized video recorder using Ethernet cables or USB connections, though this is not always required. In addition, internet protocol cameras can process video and audio data internally without the need for external processing hardware, a requirement for analog CCTV solutions. These distinctions imbue IP cameras with a few features not often found in analog systems: Remote viewing - Verified admins can view live footage from any secure smart device, enabling security professionals to provide 24⁄7 incident responses. Two-way audio - Stakeholders can send and receive audio data directly through IP camera systems; this same functionality is commonly seen in video doorbell devices. Less cabling - IP cameras can be powered via Ethernet cables using a technology known as Power over Ethernet (PoE), meaning less cabling is required for installation. High-res images - IP cameras often record footage at a much higher resolution than analog cameras, with many models able to capture 4K or even 8K definition footage. The term internet protocol camera can be used to define any type of digital security camera designed to send and receive data over the Internet. However, there are numerous different types of IP camera systems available to suit a range of commercial and home security needs. Fixed IP surveillance cameras Fixed IP cameras are designed to continuously monitor high-risk areas from a fixed vantage point, meaning considerations must be made regarding the model of cameras installed. For example, bullet IP cameras can produce high-quality footage at a long range, though with a narrow field of view. At the same time, dome IP cameras can cover open areas at the cost of long-range functionality. The main benefit of a fixed installation is that less bandwidth will be required to operate the system on a permanent basis. Fixed IP cameras can be effective in both indoor and outdoor installations and are commonly found in locations like retail stores, offices and rental units. Pan Tilt Zoom (PTZ) IP cameras PTZ internet protocol cameras offer greater functionality than fixed solutions, with security teams able to adjust each unit’s field of view in real-time. From a remote position, an operator can pan, tilt or zoom in and out of live images to monitor suspicious events as they unfold, though this added functionality contributes to a more bandwidth-intensive installation. PoE IP cameras PoE internet protocol cameras are designed to both receive power and transmit data over a single Ethernet cable. Traditional analog CCTV solutions require two separate cables to be installed, one for power and one for data transmission. This means PoE camera systems are usually far easier to install and simpler to maintain due to a reduction in required system hardware. Wireless IP cameras Wireless IP cameras can be connected to a private WiFi network to send video data over a large distance. Footage may be automatically sent to a cloud-storage system or saved in an internal storage device, enabling teams to continuously capture and retain security footage. Wireless and cloud-based camera solutions can be of benefit in situations where installing Ethernet cables is deemed too difficult or resource-intensive. However, data transmitted over a wireless network can be more susceptible to interference and cyber-attacks. This means wireless IP cameras are not usually recommended for high-security applications that lack intensive encryption capabilities. Receive instant alerts of potential threatsExpand your camera system with scalable softwareChoose from cloud-native or on-premise optionsCentrally manage your sites from anywhere IP surveillance systems enable stakeholders to view live security footage from anywhere in the world, helping business and building owners provide 24⁄7 protection to people, property and valuable assets. In addition, their ability to transmit data using only a network connection means installations can be freely adjusted, adapted and moved as needs change. With different types of hardware available to suit indoor and outdoor applications, and many high-quality IP security cameras able to be integrated into wider security systems, these devices provide a great deal of flexibility to stakeholders. When considering the development of an IP camera installation, leaders and security staff should focus on the following primary benefits they bring to the table. Efficient cloud storage As IP cameras typically record footage continuously, effective installations will require a lot of storage space. Businesses may also be required to store surveillance footage for a specific period of time to meet legal and regulatory requirements. Secure cloud-based storage solutions featuring built-in encryption tools will ensure footage is kept in a safe environment for as long as required, with admins able to access saved footage remotely at any time. It’s also wise to backup saved footage in a physical storage device, like a solid-state or hard disk drive, as this will mitigate the risk of files being lost or corrupted. Strong data encryption Video data encryption solutions ensure files sent between IP cameras, monitoring stations and storage devices remain unreadable to unauthorized external sources. Look for systems with both “at-rest” and “in-transit” encryption capabilities. This will ensure all data stored on IP cameras and data sent between security systems remains protected from outside threats. Instant sharing Choosing IP camera systems with instant sharing functionality enables teams to send video clips of suspicious events to relevant stakeholders instantly via SMS texts or email. Utilizing this feature can dramatically improve response times and enhance on-site security visibility. Cost-effective PoE functionality Prioritizing PoE IP cameras will reduce the initial cost of the installation as less cabling will be required to get the system operational. PoE cameras also offer some of the flexibility associated with wireless cameras while providing stable data transmissions comparable to traditional wired solutions, essentially offering the best of both worlds to property owners. While IP cameras provide multiple benefits to business and property owners, including the ability to send and receive data over the internet, there are some disadvantages to consider: Cybersecurity risks - IP cameras, especially those connected to third-party servers, can be vulnerable to cyberattacks. Make sure to choose hardware and software made by reputable manufacturers and regularly review/update active cybersecurity solutions. High bandwidth requirements - IP cameras require far more bandwidth than traditional analog camera systems. Calculations must be made prior to installation to ensure businesses can afford and provide ample bandwidth to meet surveillance needs. Complex operation - IP surveillance systems usually require a number of additional accessories to perform optimally, including connectors, recorders and transmitters. It can be hard to set up and optimize these devices properly without prior experience. For business and property owners considering the deployment of IP cameras, it’s important to consider the requirements of a finished system prior to selecting appropriate hardware. Before exploring the key features of an ideal internet protocol camera solution, stakeholders must ask themselves the following questions regarding proposed business camera installations: How will footage be stored? - Consider whether cloud-based, physical or a mix of the two storage solutions will be most appropriate for administrators and security staff.Which areas need to be monitored? - Consider whether bullet or dome cameras should be used in certain areas, as well as the benefits of PTZ or wireless IP cameras.How much bandwidth is available? - Check how much bandwidth is being used by essential systems and how much could be dedicated to a new IP camera installation.Will cameras be indoors or outdoors? - Outdoor cameras will need some form of built-in weather protection, while indoor cameras may require anti-vandalism features.Will the proposed systems comply with industry standards? - Data privacy rules and regulations must be considered to make sure recorded footage is handled appropriately. For instance, federal buildings in Australia must use non-Chinese camera systems to comply with regulations.With the above considerations taken into account, business and property owners should look for IP surveillance camera systems equipped with the following key features and capabilities.1. Storage considerationsMost modern IP camera systems will automatically store recorded footage in a linked cloud storage environment, though it may be beneficial to store backup footage on a physical hard disk drive or solid-state drive. Business owners should also consider industry-specific rules about data storage, including how long footage can be stored and how it should be removed.It’s also important to consider the quality and resolution of recorded footage, as HD, 4K and 8K quality footage will take up much more storage space than standard definition images. If multiple high-quality cameras are needed, look for systems with upwards of 26TB of storage.2. Encryption capabilitiesAs IP cameras are designed to transmit data over the Internet, unprotected systems may be at risk from cyber-attacks. Using end-to-end encryption tools ensures all transferred data is unreadable without a preapproved key, preventing hackers from intercepting viewable data.There are two types of encryption business owners should look out for when choosing ideal IP cameras. “At rest” encryption is used to protect data stored on the camera itself, while “in transit” encryption ensures data remains protected as it’s sent between the camera and any linked storage solutions. Both styles of encryption should be present in a secure installation.3. PoE vs wireless benefitsAll internet protocol cameras will need to be connected to a power supply, though teams will need to consider whether electrical or Ethernet cables will be most appropriate. If possible, Ethernet cables used for power and data transmission should be prioritized, as these PoE solutions are less prone to interference and more likely to provide stable data transmissions.Wireless IP cameras powered by electrical cables may be appropriate in situations where a physical Ethernet connection is deemed too costly or difficult to install. However, as wireless data transfers are typically less secure, encryption tools must be considered a top priority.4. Data sharing and remote accessMost IP camera solutions can be viewed remotely via a cloud-based management platform, but truly effective systems will also feature additional data-sharing features. Look for systems that enable teams to share footage via texts and emails for fast responses, and send automated alerts to admins if cameras detect suspicious events.5. Video analytics integrationsIP surveillance camera systems can be optimized via integrations with smart video analytics software. These programs can autonomously detect suspicious events like persons carrying contraband items or crowds forming in unusual locations and instantly alert authorized admins for enhanced incident responses. Video security solutions are a key component of any effective business security system, but outdated analog CCTV installations may no longer provide adequate protection. By using modern IP cameras with remote-access functionality, businesses can better identify and address security concerns around the clock to protect their assets from common threats. Provided teams choose appropriate types of IP cameras, consider the pros and cons of PoE vs wireless installations and ensure chosen systems feature suitable storage and encryption capabilities, IP surveillance camera systems can help organizations strengthen their security. Should your organisation switch from traditional CCTV to IP cameras? There are compelling reasons to adopt this comparatively new form of technology – and not all of them relate to straightforward surveillance. This article introduces you to IP Camera technology, taking you from basics like what an IP camera system is, to the ways in which you can put this technology to work for you. Let’s get started. What is an IP Camera? IP stands for Internet Protocol and IP cameras record footage digitally, sending information via the internet. Instead of using an in-house storage device, the files transmitted from IP camera systems are stored in the cloud. Apart from recording video, some IP cameras can also record audio. In its simplest form, an IP camera consists of a lens that captures images and an image sensor that converts images into a signal. Keeping you secure, a good IP camera system should encode signals, convert them into a compressed format, and transmit them – usually to secure cloud storage. But there’s more to IP cameras than just their digital nature. The rise of AI has seen them undertaking increasingly sophisticated surveillance activities that include evaluation of the nature of activities and the identification of individual people. What is the Difference Between an IP Camera and CCTV? There are multiple differences between IP cameras and traditional CCTV, and they illustrate some of the advantages of switching to IP cameras. Muddying the waters somewhat, some manufacturers refer to IP CCTV – possibly in the hopes of helping customers to understand IP cameras better. However, as Security Magazine observes, CCTV is an outdated technology that has little in common with IP camera surveillance. For the purposes of this comparison, we contrast traditional analogue closed circuit TV systems with IP cameras. Video Quality and Resolution To begin with, IP camera video quality and resolution are far better while at the same time allowing for a wider field of vision if required. Thanks to crisp, high resolution images, you stand a better chance of recognising important elements in the footage. For example, you can zoom in to recognise faces or read car licence plates more clearly. If you’ve ever examined regular CCTV footage, you’ll know that zooming in doesn’t reveal more detail – an important difference between IP cameras and CCTV. As an interesting footnote, the capabilities of IP cameras have led to suggestions that they be used by researchers to monitor scientific experiments remotely. Power Over Ethernet (PoE) and Wireless IP cameras have a lower requirement for wiring since they can be powered and transmit data via a PoE cable. You can even go completely wireless – a distinct advantage in areas where wiring up a camera would be difficult or unsightly. The reduced need for cabling makes IP cameras unobtrusive and much easier to install and allows systems to be scaled up with ease. Even the most advanced CCTV cameras require at least one cable, and older ones may need two, or even three cables per camera. Data Transmission Range Analogue CCTV cameras can transmit video via cable for distances as great as 1.5km – however, the image clarity is affected by distance and changes in format. Because IP cameras use IP networks, they can be accessed from any distance and retain full image clarity. Security and Reliability Analogue cameras are less secure than digital cameras. Physical interception of feeds is possible, and devices storing video can be damaged or stolen. IP cameras encrypt their data before sending it and, since they store recorded information in the cloud, data security is enhanced. On the surface, IP cameras may seem less reliable because network outages can occur. However, backup and alert systems can be used, minimising downtime. Cost If we only consider the cost of the camera, then IP cameras will be more expensive. However, they could even turn out to be more cost effective depending on your circumstances and what they achieve for you. For example, lower installation costs and greater scalability will be advantages – and data storage costs don’t include the cost of additional equipment. Besides this, time-saving ease of access for those required to view footage and the ability to do so remotely may also represent a significant cost saving. Finally, the goals you might achieve if you were to switch to IP cameras must be offset against cost. For example, using a “smart” IP camera that produces high-quality video could be better able to help you with issues such as shrinkage, compliance, work systems analysis, and quality control. What is an IP Camera Used For? Extra Functionality Traditional CCTV cameras are for surveillance only. But IP cameras can have onboard processors that offer extra features. For example, they can detect motion, compare it to a database of commonly performed motions, and send out messages if something seems out of the ordinary. Facial recognition is also possible, allowing cameras to be integrated with security systems and used as access control tools. Operating a large building complex or suite of offices? IP cameras can recognise empty rooms and turn off the lights and HVAC system, saving electricity costs. IP cameras can also be used for supervising delicate or dangerous processes remotely, allowing managers to monitor processes more effectively and improving workplace productivity and safety. For example, responsible persons may be notified when an employee enters a hazardous area and can even determine whether they are authorised to do so. What are the Benefits of IP Cameras? In comparing IP cameras to analogue CCTV, we’ve touched on the benefits of IP Cameras. We can sum them up as follows: Better video quality and resolution Ease of installation and fewer wiring requirements Easier expansion of the camera network Remote access to video Improved data security Additional functionality, for example, access control automated pan and zoom, building management, and other AI features Enhanced ability to monitor and improve workplace safety and processes Potential for compatibility with existing reporting, analysis, and workflow solutions Of course, IP camera systems can benefit businesses in different ways. An expert analysis of your security and access control requirements will help you to identify how IP cameras might benefit you in context. Examples of