Maximizing the Flexibility of Edge Video Analytics with uCPE

Service provider inq leverages Advantech's edge appliances combined with Enea's uCPE virtualization and management solution for delivery of high performance video analytics services at the customer premises edge

Video surveillance and CCTV have been around for a long time. Monitoring using these tools still tends to be done manually and, due to a lack of resources, most surveillance video is never seen. Even when seen, there is still a risk of human error, leading to low accuracy and missed or misinterpreted events.

Software-based video analytics can improve both the accuracy and effectiveness of video surveillance by combining different methods, such as machine learning and AI, to let the system do the tedious task of monitoring and automatically generate descriptions or metadata of events in videos.

With such increased accuracy and lower operational costs, as well as new areas of use, it is of no surprise that the video analytics market (software and services) is experiencing strong growth, with Allied Market Research giving it a value of $5,816 million in 2020 and projecting it will reach $21,778.0 million by 2021.[1] The services segment is expected to grow at an even faster rate than the software segment, providing ample opportunities for service providers. So how can service providers tap into such an opportunity? What is the optimum way to deploy such a service to ensure quality for the customer and profitability for the provider?

How to Deploy and Optimize Video Analytics as a Service

Process the Video at the Edge

Software-based video analytics makes it possible to move monitoring activities from a centralized location to the customer premises without compromising on quality or generating higher costs. This has 2 major benefits:

The data volumes produced by a single surveillance camera can be huge - several tens of GB a day. This can create a bandwidth issue for many links, including LTE/5G. With multiple cameras in use, even fixed lines can become congested. Processing on premises removes bandwidth problems.

Data privacy and protection means that many enterprises do not want to process any data outside the premises. Surveillance video footage can contain both personal and sensitive data. Video analysis enables this data to remain on-site.
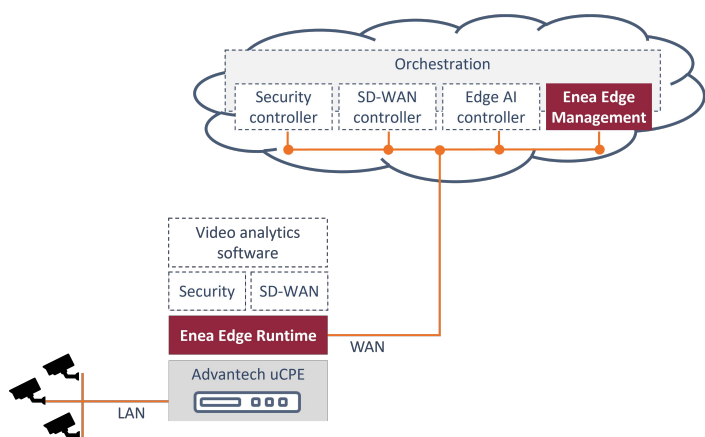
Create Maximum Service Flexibility

Analytics built into camera hardware or vendor-specific appliances comes with a fixed function set limiting how service providers and enterprises can use it or customize its functionality. A video analytics solution that can be used in many different ways and easily adapted to specific situations, , requires a much more flexible platform - one that separates the camera hardware from the analytics software to allow innovation at "software speed". Universal Customer Premises Equipment (uCPE) is ideal for this and also provides a very cost-effective solution.

[1] https://www.alliedmarketresearch.com/video-analytics-market

A uCPE is essentially a white-labeled networking and compute platform for customer premises and edge, capable of hosting any workload. It is managed centrally, through a virtualization and management layer, allowing software updates, application installations or removals on-demand, but with all processing taking place at the edge. Running video analytics software on a uCPE decouples the analytics application from the camera hardware, thereby avoiding any hardware limitations.

Also, if the video analytics application is co-hosted with other virtual networking applications, e.g. a router, SD-WAN solution or firewall, it gains access to the connectivity needed to send metadata to the cloud or a data center. A service provider can use a single uCPE platform to mix and match applications of various kinds and sources, allowing enterprises to choose which vendors they want for their different applications in addition to the video analytics service.

Example of a uCPE from Advantech running video analytics alongside security and SD-WAN services. Enea Edge provides the virtualization and management functions for the onsite applications.

inq: Providing AI-based Video Analytics as a Service

inq, a pan African digital service provider headquartered in Mauritius, offers both networking services based on secure SD-WAN, and smart video analytics as a service. Their video analytics service is mainly focused on three key areas:

- Compliance as a service – detecting compliance and safety issues using AI
- Intelligent perimeter security - automatically monitoring and alerting across locations in real-time
- Retail analytics – AI-based real-time store and customer behavior analytics

The solution is completely software-based and can tap into existing camera systems. The captured video is processed on the uCPE and extracted metadata (selected, specific information) can be sent to centralized or cloud-based systems or it can generate alerts. The solution is controlled and managed through a cloud-based platform, also provided as a service.

Detection capabilities include:

- Motion detection
- Facial recognition & license plate reading
- People counting & dwell time monitoring for retail stores
- Recognizing long lines at checkout and sending alerts
- Compliance as a Service in HSE (health, safety and environment)
- Retail analytics for the customer experience – Shopping malls
- Intelligent security - Office premises
- Behavioral Analytics - Crowd management
- Vehicle VNPR - Number plate recognition

Typical Use Cases for Video Analytics

As the development of video analytics progresses driven by software innovations, new areas of use emerge, providing expanding opportunities for service providers. The following are a few examples of use cases where video analytics is making a difference:

Crime Detection

Video analytics can augment crime investigation and solving capabilities allowing a more proactive approach through the rapid detection of intrusions, theft, transaction discrepancies, loitering, and the presence of suspicious items.

Compliance Monitoring

In environments that are complex and present risks, video analytics can be used for compliance monitoring to make sure that workers respect security rules, are wearing correct protective gear, do not enter dangerous or prohibited zones and respect attendance times.

Industrial and Manufacturing

The accuracy of video analytics and the rapid processing of images can also help to streamline industrial processes and flows, increasing productivity. Leakage detection, object counting, object tracking, quality control, and danger detection are common applications in industrial environments.

Retail analytics

In retail, and especially store environments, video analytics can be used as a marketing and sales research tool to improve customer flows, measure experience, and understand behavior better. For example, it can be used to measure waiting times in queues, detect customer emotions, count customers, and provide demographic data.

Smart Cities

Video surveillance is a crucial building block for smart cities, but the amount of data produced, even in a small city, can be so massive that a high level of automation is required to analyze it. This is especially true for actions that need to be taken in real-time, based on provided input. Smart city applications include traffic monitoring, license plate recognition, crowd monitoring, fire and disaster detection, and public safety.

The video analytics solution has identified a person.

A major benefit of inq's solution is that it is completely based on software and agnostic to camera hardware, making it possible to use any IP camera. Even existing cameras can be connected to the solution, leveraging investments and installations.

Because the analytics software is decoupled from the camera hardware, it is easy to modify and enhance services. Detection algorithms can be customized to fit any use, new or existing, and fine-tuned to provide the highest possible accuracy using inq's control and machine learning platforms. Camera system training is part of the offering, providing the end user with a system adapted to their unique needs while still being delivered as a service.

Flexibility in uCPE

inq saw a possibility to cross-sell their networking and video analytics services, using the secure connectivity provided by their SD-WAN solutions to remotely control the analytics solution and relay processed data back.

The company needed a flexible platform that could host both networking and video analytics applications at the customer premises edge and turned to uCPE. The right uCPE would offer the flexibility, performance, and management features needed to address both technical and business needs.

In the end, inq chose an Advantech white-box edge appliance in combination with Enea Edge virtualization and management platform. When installed at the customer premises, inq can easily on-board and provision any application requested by the end user (including the enterprise's own applications) and make changes and updates remotely and on-demand. This provides an excellent upsell opportunity, as inq can instantly install and run additional services for any existing uCPE-based customer.

inq: A Closer Look

Advantech Edge Appliances

Advantech commercial-off-the-shelf edge appliances for uCPE, SD-WAN and SASE provide a solid and open foundation for service providers and enterprises allowing them to accelerate network transformation through agile and secure, cloud-native network solutions. The scalable white boxes integrate the latest Intel computing and networking technologies, from Intel Atom

Advantech FWA-5070

to Intel Xeon scalable processors. They are already widely deployed, running popular networking and security software from industry leading ecosystem partners. They have been carefully designed to minimize costly downtime, on-site interventions and service interruptions, and are supported by Advantech's global service network.

Advantech appliances can scale to all needs including secure connectivity for small and medium enterprise branches to large campuses and headquarters. They adapt to multiple configurations and price points, with optional networking modules that allow a highly flexible WAN connectivity choice of hybrid 5G, 4G/LTE, Wi-Fi 6, Wi-Fi 5, xDSL & SFP+. Rugged models supporting a wide operating temperature range (-20 to 70 °C) and surge protection allow Advantech to extend appliance use to environments such as smart cities and smart grids. In addition, server-class configurations that can integrate AI acceleration enable new uCPE use cases including intelligent retail and surveillance.

Enea Edge

Enea Edge is a uCPE operating system and management solution purpose-built to host virtual networking, security, and edge applications like video analytics on white-box uCPE. The universal design of Enea Edge allows it to support any application from any vendor, including an enterprise's own applications, thereby freeing service providers and enterprises from vendor lock-in. This open approach enables service providers to grow their business by extending their offering with new functionalities.

Enea Edge consists of three elements:

- Enea Edge Runtime: white-box operating system providing virtual machines and container runtimes
- Enea Edge Management: platform and application/VNF lifecycle management
- Enea Edge Automation: framework for automating deployment and operation of large-scale networks

Enea Edge Runtime can be deployed on any Advantech white-box hardware (uCPE) at the customer premises or service provider edge. It is optimized to combine high networking and compute performance with a small platform footprint, thereby enabling cost effective use of available hardware resources.

Enea Edge Management and Enea Edge Automation are deployed in a data center or cloud environment. Access is either through a web-based GUI or an API for integration with 3rd party tools. The management and automation solutions are tested on large-scale networks comprising thousands of units to ensure scalability for growing business.

Conclusion

Video analytics represents a huge opportunity for service providers especially when deployed on uCPE in combination with other services. inq is an excellent example of how to build a successful offering, making surveillance systems more useful by adding smart video analytics to IP cameras. By reducing the workload on security and management staff, it helps enterprises capture the full value of video surveillance with intelligence and adapts to any use case.

For service providers looking for a reliable, proven uCPE solution, Advantech's white-box appliance with Enea Edge is an ideal combination.

Questions?

For more information on uCPE and service virtualization at the edge, please visit: **www.enea.com/ucpe**

Or contact Enea at **www.enea.com/contact-us** to book a one-to-one discussion on how you can optimize your services and expand your business through uCPE and Enea Edge.

For more information about Advantech Edge Appliances, please visit: **www2.advantech.com/nc/spotlight/ucpe**

For more information about inq, please visit: **www.inq.inc**

About Enea

Enea is one of the world's leading specialists in software for telecommunications and cybersecurity. The company's cloud-native products are used to enable and protect services for mobile subscribers, enterprise customers, and the Internet of Things. More than 3 billion people rely on Enea technologies in their daily lives.

Enea is headquartered in Stockholm, Sweden, and is listed on Nasdaq Stockholm.

ENEA