

Solution Brief

AI Machine Vision
Video Safety and Security



Intel® Video AI Box

A solution to scale video analytics at the edge



Meet surging opportunity for intelligent video

The value of the data produced by video systems has skyrocketed as new AI-driven use cases and analytics technologies have emerged. Deep learning networks capable of extracting insights from video data in real time can improve security, safety, and operational efficiency and even reveal new opportunities for revenue. This trend spans a variety of imaging devices, modalities, and environments—from medical imaging in hospitals to frictionless retail experiences and automated situational awareness in remote corners of the world.

To achieve the results that businesses and other organizations want, it's critical that these intelligent video solutions reach a high degree of reliability and resiliency and that they are built on open, standards-based platforms that can scale. They also need to offer simplified paths for customization and deployment to speed time to value.

Intel is helping video solutions developers and operators achieve all this and more with the Intel® Video AI Box. This solution design gives video innovators a scalable architecture purpose-built for video analytics and an open software platform capable of launching next-generation intelligent video systems.

Overcoming barriers at the edge

The deployment and adoption of AI-driven video cases has been held back by the sheer volume of data produced by intelligent video systems. With camera count and resolution quickly rising, it's inefficient to transmit video data from the camera to the cloud for analytics and then back to the edge to put into use. This latency also inhibits near-real-time performance. In addition, AI video use cases have been limited by demanding physical requirements such as tight spaces for installation, highly dispersed distributions, and the need to deploy in harsh environments.

By analyzing video data before it's transmitted to centralized systems—preprocessing it to reduce volume size and for fast ingestion—edge computing can reduce latency and storage demands and improve the performance of video systems. Edge computing solutions for video systems need to be compact and highly adaptable while offering multiple layers of security to protect the device as well as data.



A scalable, flexible solution for video analytics

Built to address these concerns and more, the Intel Video AI Box is a solution platform for the creation of deep learning-based AI appliances capable of performing video preprocessing and enabling near-real-time analytics at the edge. With scalability at the core of their design, Intel Video AI Boxes allow you to bring the level of intelligence you need to exactly where you need it. Each iteration of the platform is designed to easily integrate into new or existing infrastructure, offering businesses a fast path to achieving intelligent video use cases. Devices can even be stacked to add new capabilities or amplify compute power.

Intel Video AI Box modules perform data preprocessing at the edge to extract near-real-time insights and to distinguish between data that needs to be sent to the cloud or stored and data that doesn't. These modules are designed to suit a wide variety of edge deployments with a highly compact form factor that can hide away when space is limited and ruggedized versions capable of delivering reliable performance in industrial facilities or in just about any other environment. By incorporating Intel Video AI Boxes, not only can businesses introduce new capabilities to video systems, but they can make them more resilient and responsive. With more compute power to leverage at the edge, intelligent video systems can handle greater spikes in demand and compensate for outages more effectively.

A selection of performant, efficient compute built for the edge

The diverse capabilities and cost-effective performance of the Intel Video AI Box architecture center on the capabilities of Intel® processors, which offer integrated graphics and exceptional performance for video processing. 12th Gen Intel® Core™ processors deliver built-in deep learning acceleration with the integration of Intel® Deep Learning Boost (Intel® DL Boost), which extends the speed advantage of Intel® Advanced Vector Extensions 512 (Intel® AVX-512) to deep learning workloads. Intel® Celeron® processors deliver a highly efficient performance-to-power ratio, enabling use cases where cooling and power are limited.

These processors also offer integrated graphics acceleration with on-chip Intel® Iris® Xe graphics, which enables them to analyze up to 32 channels at once. Intel processors are also more flexible than other approaches to video analytics, allowing businesses to run different types of workloads on the same module. While some solutions struggle to switch between real-time analytics and other types of content, Intel Video AI Boxes can converge edge workloads to increase efficiency and data availability. These capabilities allow businesses to extract value and insights from camera metadata, integrated sensors, and other sources of data beyond captured video.

Industries and use cases

Intel® Video AI Boxes are being customized by our partners to meet the requirements of a wide variety of use cases and industries.



Retail

- Touchless shopping
- Personalized experiences
- Loss prevention



Healthcare

- Remote patient monitoring
- Medical imaging analysis
- Threat detection



Industrial

- QA automation
- Machine vision for robotics
- Predictive maintenance



Smart City

- Automated security
- Fire detection
- Traffic analysis

Open software architecture and framework

Bringing compute to the edge is only part of the benefit of working with the Intel Video AI Box for video analytics. The complexities of distributed camera systems can overwhelm their value. That's why each Intel Video AI Box module is built on an open software framework that makes it easy to integrate your applications for performing analytics or other workloads. This flexible software environment means that end users and solution developers have more options for what to run. It can also

help end users and operators avoid the vendor lock-in that can occur with closed, proprietary architectures.

The Intel® Distribution of OpenVINO™ toolkit is at the core of the software environment. It provides a set of tools for video inference and deep learning. Working with the Intel Video AI Box also provides a unified environment for developers, allowing you to write code once and deploy it anywhere.

Open software architecture and framework

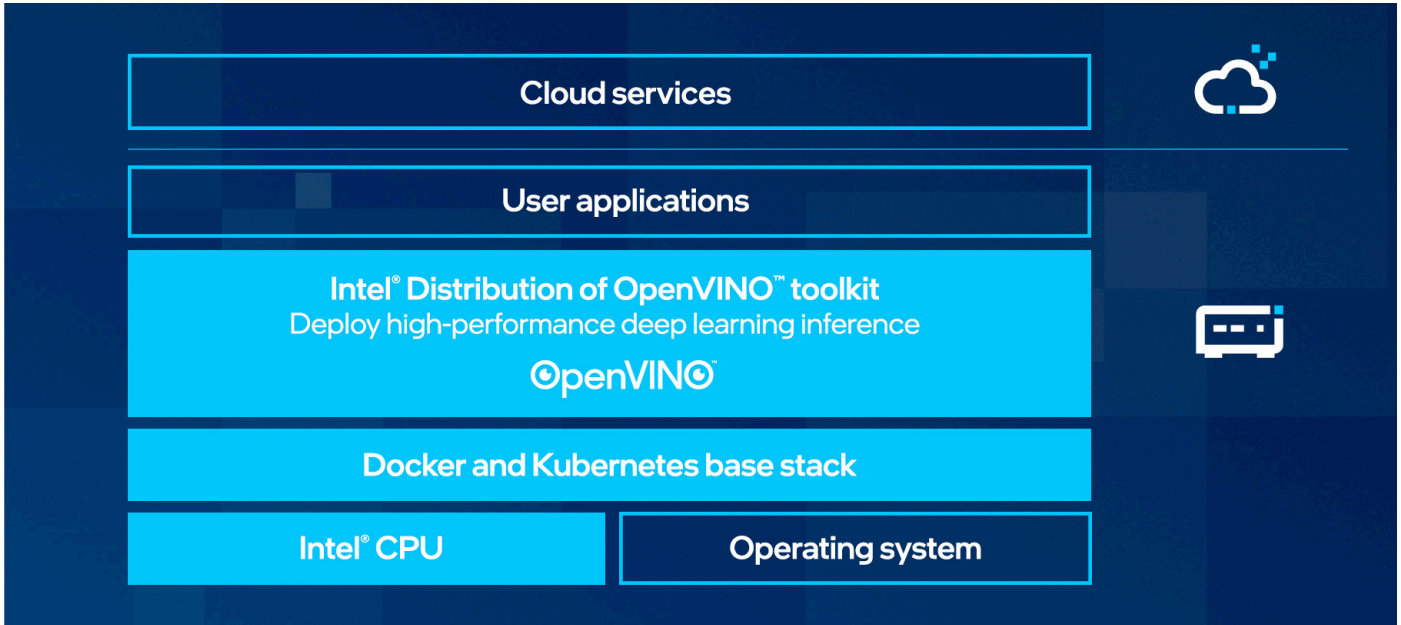
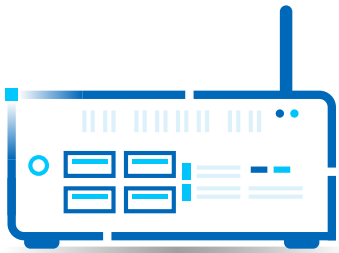


Figure 1: Intel® Video AI Box offers an open yet mature software stack.

The right features for scalable video analytics

Bringing intelligence to the edge requires having choices that allow you to effectively customize solutions. The Intel Video AI Box solution architecture comprises a selection of trusted, industry-standard components for connectivity, storage, memory, and enclosure and options for wired and wireless networking.



Intel® Video AI Box Solution Highlights

- Support for 11th and 12th Gen Intel® Core™ processors
- Support for efficient Intel® Celeron® processors
- Up to 64 GB of memory
- Up to 32 channels of video analysis and processing¹
- Ingest up to 48 channels for TGL and up to 58 channels for ADL
- Support for up to four 4K displays
- Two SATA ports for fast storage
- SSD or M.2 Storage Extensible Module
- Docking feature to quickly add capabilities/compute
- Connectivity options include Wi-Fi, 5G, 1 Gb, and 2.5 Gb Ethernet ports
- Up to 10 PCIe 4.0 lanes and support for PCIe 5.0

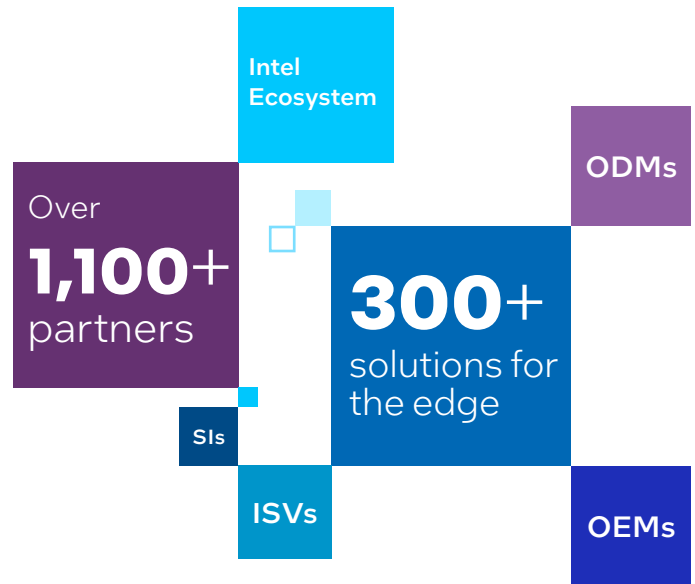
Enhanced security and resiliency at the hardware level

As video systems become more distributed and the vision and data they produce become more valuable, device security and management take on a new priority. Protecting data in transit and at rest while also hardening the device itself from potential attacks and exploits are critical concerns. Intel® Trusted Execution Technology (Intel® TXT) provides hardware-based mechanisms that help protect against software-based attacks, helping to enhance trust in the application's execution environment.

The ability to quickly recover from a software fault or other interruption in service is also critical to creating resilient intelligent video infrastructure. Intel® Active Management Technology (Intel® AMT), available on processors built on the Intel vPro® platform, gives system operators seamless remote access to devices outside the firewall, even if the OS is not booting. With Intel AMT, you can reboot a device, push updates, repair drivers, and remedy a wide range of issues without needing physical access.

A growing ecosystem of support and innovation

Getting value in the long and short term from smart video systems requires a thriving ecosystem to support ongoing innovation and to provide solutions capable of expediting the development process. Intel has spent years cultivating a vibrant community of computer vision innovators. Our ecosystem has over 1,100 partners who have contributed more than 300 solutions for the edge alone. By partnering with Intel, you can find the help you need to overcome hurdles and realize your vision.



Conclusion

The flexibility, cost efficiency, and simplicity of the Intel Video AI Box solution are allowing businesses not only to create the smart video systems that will lead the industry for years to come, but to transform legacy network video recorder (NVR) systems into ultralow-latency, real-time systems capable of cutting-edge AI use cases. Rather than replacing valuable existing infrastructure, the Intel Video AI Box allows businesses to use what they have more effectively.

The opportunity to create powerful intelligent video systems has never been greater. Intel and its ecosystem make it easy to get going with preintegrated, use case-specific modules that are ready to go. Setting up a proof of concept with the Intel Video AI Box for a transformative use case like touchless shopping is easier than it's ever been.

Contact your Intel rep to talk about your vision and challenges, and we can help you take advantage of the Intel Video AI Box to get to where you want to be sooner.

Contact your Intel representative for more information

Browse solutions built with the Intel Video AI Box [Intel® Solutions Marketplace >](#)

Explore software offerings for Intel Video AI Box [Resources and downloads >](#)



1. Analytics performance is workload dependent.

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