Solution Brief

Edge AI
Intel® Core™ Processors, Intel® Xeon® Processors, Intel® Distribution of OpenVINO™ Toolkit

Unlocking the potential of AI-powered edge computing and intelligent analytics

Shenzhen Genew Intelligent Technology Co.,Ltd collaborates with Intel to drive the AI Fusion Analytic Insight Engine solution that enables enhanced real-time data processing and decision-making across sectors such as smart cities, transportation, manufacturing, and smart buildings.

> "The collaboration with Intel enables us to leverage their technologies to offer a seamless and high-performance solution, driving the efficiency and scalability needed for intelligent infrastructure."
>
> **Xianghua Liu**
> Co-Founder and CTO at Shenzhen Genew Intelligent Technology

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The landscape of modern infrastructure, encompassing smart cities, intelligent transportation systems, and smart factories, is undergoing a profound transformation driven by the proliferation of sensors and the increasing demand for real-time data processing and AI-powered analytics. However, organizations face significant hurdles in realizing the full potential of this data due to fragmented sensor integration, inefficient data processing pipelines, high bandwidth costs associated with cloud-centric architectures, limited edge computing capabilities, and challenges in scaling AI-driven applications across diverse domains.

To address these challenges, **Shenzhen Genew Intelligent Technology Co.,Ltd** (aka Shenzhen Rontex Technology Co.,Ltd), an Intel® Partner Alliance Gold partner and Intel® Industry Solution Builder member, collaborated with Intel to drive the AI Fusion Analytic Insight Engine solution. This solution enables real-time data ingestion, structured video and sensor data analysis, and intelligent decision-making directly at the network edge.

The Challenge: Addressing Critical Pain Points in Intelligent Infrastructure

Modern smart environments are characterized by a vast network of interconnected sensors and devices generating massive amounts of real-time data. However, several key challenges hinder the effective utilization of this data for intelligent decision-making.

A significant challenge lies in connecting and managing a diverse array of sensor types from various manufacturers, each often employing different communication protocols and data formats. This lack of interoperability creates data silos and complicates the development of unified analytics platforms. Furthermore, traditional centralized systems struggle to cope with the sheer volume and velocity of real-time video and sensor data generated by modern infrastructure.

Transmitting raw data to central servers for processing leads to significant delays, making it challenging to implement real-time applications that require immediate insights and actions. The continuous transmission of raw, unstructured data, particularly high-resolution video streams, to remote cloud servers results in substantial bandwidth consumption and escalating operational expenses, a cost burden that can be a major deterrent for large-scale deployments with numerous data sources.

Moreover, many existing surveillance and monitoring solutions lack the necessary processing power at the edge to perform sophisticated AI inference and analytics locally. This reliance on cloud-based AI limits the responsiveness of applications and introduces latency, which is critical in time-sensitive scenarios like traffic management and emergency response. Finally, as smart cities, transportation networks, and factories evolve, there is a growing need to expand and adapt to new AI-driven applications. Traditional systems often lack architectural flexibility to easily integrate new sensors, deploy advanced AI models, and scale their processing capabilities to meet these evolving demands. These challenges collectively underscore the need for a paradigm shift towards distributed, edge-centric AI solutions that can overcome the limitations of traditional centralized architectures.

Driving Innovation with the AI Fusion Analytic Insight Engine Solution

The AI Fusion Analytic Insight Engine solution is specifically designed to address these challenges by bringing powerful AI capabilities closer to the data source. This edge-first approach enables real-time data processing, reduces bandwidth consumption, enhances system responsiveness, and provides a scalable foundation for future AI-driven applications.

The core of the solution comprises tightly integrated components: the Genew Intelligent MEC (Multi-access Edge Computing unit), an intelligent gateway acting as the frontline data processing hub; the Edge Fusion AI Server, designed for deployments requiring higher AI computing power at the edge; and the AI Training & Inference Server, a high-performance server typically deployed in a data center or regional hub for large-scale AI model training and complex inference tasks. By seamlessly orchestrating these components, the AI Fusion Analytic Insight Engine solution provides a comprehensive and scalable solution for building intelligent infrastructure across various industries.

The solution incorporates several key features and innovative technologies that differentiate it from traditional solutions. It achieves multi-sensor fusion by seamlessly connecting diverse sensors, ensuring interoperability across various protocols. For edge AI inference, the solution utilizes the robust processing power of Intel® Core™ processors and the parallel processing capabilities of Intel® Arc™ GPU for real-time video analytics, significantly reducing the reliance on cloud computing. The implementation of hybrid AI processing leverages the Intel® Distribution of OpenVINO™ toolkit to optimize AI workloads, intelligently distributing inference tasks between the edge and the server to enhance overall efficiency.

Breaking Down the Solution

The **MEC (Edge Intelligent Gateway)** acts as an intelligent platform deployed close to the data source at the network edge. This multi-access edge computing unit integrates core capabilities encompassing network connectivity, substantial computing power, ample storage, and application hosting functionalities. Based on advanced deep learning technology, it delivers high-performance edge AI services that seamlessly collaborate with the cloud platform.

This effectively addresses the critical needs of the IoT industry, providing agile connectivity, real-time AI inference, efficient data optimization, and robust security and privacy measures. This intelligent gateway is equipped with a versatile array of ports, including RS485, DI/DO, AI interfaces, and various wireless module options, facilitating seamless integration with a wide spectrum of sensors and devices.

Powered by the robust performance of Intel® Core™ processors featuring integrated Intel® Iris® Xe graphics, this edge unit possesses significant processing power for real-time AI inference, capable of simultaneously decoding and performing AI inference on 12 to 36 video streams. Its high device connectivity enables it to interface with over 80+ mainstream sensors, including cameras, radars, Wi-Fi devices, and numerous others, allowing for flexible and highly scalable deployments across diverse smart city and industrial applications.

Edge Intelligent Gateway Devices

The Fusion AI Server is an intelligent platform designed to deliver high-performance AI services, featuring powerful model training and inference capabilities. This server seamlessly integrates software components, robust hardware infrastructure, and advanced AI algorithms, providing a ready-to-use intelligent visual deep learning solution that combines both training and inference functionalities.

This comprehensive AI Server effectively fulfills the diverse needs of AI applications, encompassing data collection from edge devices, efficient model retraining based on collected data, high-speed real-time inference, intelligent alarm management triggered by AI insights, and automated work order allocation for streamlined development, operation, and maintenance workflows. It is ideally suited to address the AI requirements of various sectors, including smart transportation, emergency response systems, intelligent park management, and the modernization of traditional camera systems, enabling intelligent visual models to fully realize their potential across a wide range of industries.

Fusion AI Servers are built upon the foundation of Intel® Xeon® Scalable processors and can be equipped with 2 to 4 Intel® Arc™ discrete graphics cards as needed to meet specific performance requirements. This powerful server supports a comprehensive AI workflow, streamlining AI development and deployment. Optimized for multiple industries, it is ideal for smart transportation, emergency response, parks, and camera upgrades, enabling intelligent AI-driven decision-making. Its scalable and ready-to-use nature integrates software, hardware, and algorithms into a plug-and-play deep learning solution for seamless AI deployment. Capable of handling 60-120 simultaneous video streams, it is perfectly suited for large-scale AI-powered video analytics, leveraging Intel® Distribution of OpenVINO™ toolkit to optimize AI inference, ensuring high efficiency and low latency.

Fusion AI Server

Enabling High-impact Benefits

The adoption of the AI Fusion Analytic Insight Engine offers numerous benefits. It delivers enhanced operational efficiency through real-time AI-driven analytics, reduced bandwidth costs by processing data at the edge, improved responsiveness and lower latency for critical applications, increased scalability and flexibility to adapt to evolving needs, enhanced reliability and resilience through distributed processing, stronger data security and privacy with localized data handling. It enables future-proof infrastructure for adopting advanced AI applications.

The solution supports deployment across multiple hardware device types, offering flexibility to meet diverse application needs. The Rontex Technology MEC edge device provides real-time AI inference directly at the source of the data. The Edge Inference Server caters to higher AI computing demands in roadside or industrial deployments. The Fusion AI Server supports large-scale AI model training and inference for centralized analytics and complex processing. This flexible deployment strategy ensures optimized AI performance for a wide range of applications, from immediate real-time edge processing to high-performance cloud-based AI workflows.

The solution also offers exceptional scalability and adaptability, supporting up to 120 simultaneous video streams, enabling a wide array of AI-powered applications such as traffic monitoring, predictive maintenance, and industrial automation. Furthermore, by processing raw data at the edge before transmitting structured insights to the cloud, the AI Fusion Analytic Insight Engine provides a cost-effective and low-latency solution, significantly reducing bandwidth costs and enabling near real-time decision-making.

Maximizing the Intel Advantage

Intel's portfolio of hardware and software solutions provides the robust foundation needed to deploy advanced AI-driven systems across smart cities and industrial environments.

Intel® Core™ processors power the Genew Intelligent MEC, facilitating real-time AI inference, video processing, and data management at the edge. Intel® Core™ processors minimize latency and ensuring rapid decision-making for applications such as traffic flow optimization and public safety monitoring. To enhance AI performance within the Fusion AI Servers and Edge Inference Servers, the solution incorporates the high-powered graphics capabilities of Intel® Arc™ GPU. These GPUs are specifically designed for parallel processing, making them ideal for handling the numerous video streams inherent in video analytics applications. By enabling AI-optimized workloads, Intel® Arc™ GPUs significantly accelerate the processing of visual data, leading to faster and more insightful analytics. This combination of CPU and GPU power ensures seamless handling of data-intensive tasks while maintaining energy efficiency.

To further optimize AI workloads, the solution utilizes the Intel® Distribution of OpenVINO™ toolkit, which enhances model efficiency and accelerates inference on Intel hardware. This optimization ensures fast, reliable performance across a variety of devices, from edge nodes

to AI servers, significantly improving real-time applications such as predictive maintenance, video analytics, and smart infrastructure management. By leveraging Intel® Distribution of OpenVINO™ toolkit, the solution enables seamless AI deployment with minimal latency, driving smarter decision-making and operational efficiency.

For enterprise-scale AI operations, Intel® Xeon® Scalable processors power Fusion AI Servers, providing the computational strength required for AI training, model inference, and complex dataset management. Intel® Xeon® processors enable large-scale, high-performance applications, ensuring AI-driven solutions can scale efficiently while delivering the processing capabilities required for deep learning, natural language processing, and industrial automation. Additionally, the solution integrates Intel® FlexRAN™ for high-performance 5G networks, leveraging Intel® Xeon® Scalable processors and Intel® eASIC™ acceleration to enhance network efficiency, low-latency data processing, and real-time AI applications. This flexible infrastructure supports seamless edge computing, improving network performance in smart city deployments, industrial automation, and connected infrastructure.

Creating Real-world Impact: Use Cases

The AI Fusion Analytic Insight Engine solution is revolutionizing industries by delivering AI-driven intelligence that enhances efficiency, automation, and decision-making. Its ability to analyze vast amounts of data in real-time makes it a powerful tool for optimizing operations across multiple sectors, from industrial maintenance to urban infrastructure and security. By combining AI analytics with edge computing and high-speed connectivity, this technology enables smarter, more responsive systems that improve safety, efficiency, and reliability.

In **machine condition monitoring,** AI-powered predictive maintenance transforms industrial asset management. By continuously analyzing sensor data, it detects early signs of equipment failure, allowing for proactive maintenance that prevents costly breakdowns and extends equipment lifespan. This minimizes unplanned downtime and reduces maintenance costs, ensuring optimal performance in industries such as manufacturing, energy, and transportation, where operational reliability is critical.

Traffic management is another area where AI-driven insights make a significant impact. In **smart traffic systems**, real-time AI-powered monitoring dynamically adjusts signal control, reducing congestion and improving road safety. By analyzing traffic patterns, the system can optimize vehicle flow, decrease travel time, and enhance emergency response efficiency. This intelligent approach to traffic management helps cities improve urban mobility while reducing carbon emissions associated with idling vehicles.

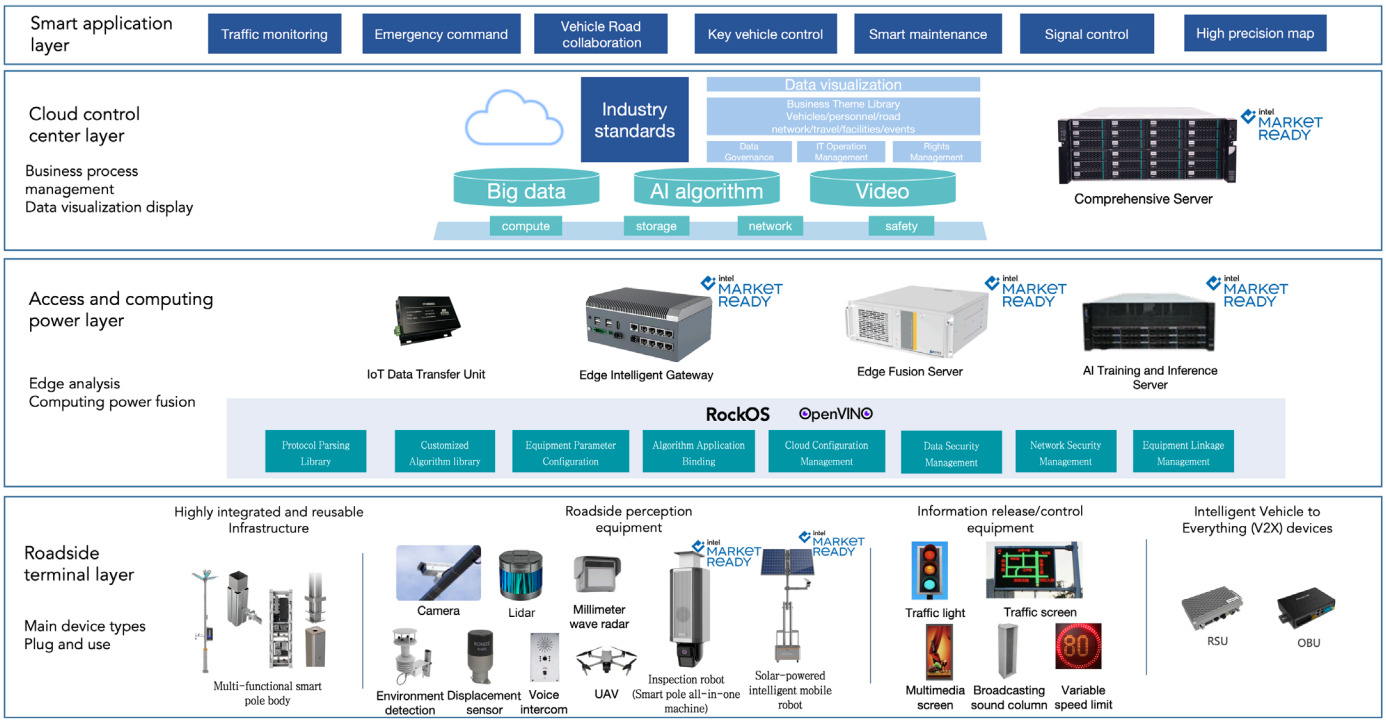

Figure 1: Example of solution architecture for smart traffic systems.

Security and surveillance benefit immensely from AI-enhanced analytics. In **smart security camera upgrades**, AI-driven video analytics provide real-time anomaly detection, improving threat identification and operational awareness. The technology can differentiate between normal and suspicious activities, reducing false alarms and enabling quicker, more accurate responses to security incidents. These enhancements are crucial in public safety, retail, and critical infrastructure protection, where proactive threat detection is essential.

Industrial automation and worker safety are also transformed by AI. In **factory control optimization and autonomy**, intelligent automation improves production efficiency by streamlining workflows and minimizing human intervention. AI-driven robotics and process optimization reduce errors, enhance product quality, and maximize output, leading to cost savings and higher productivity.

Similarly, in **smart construction sites**, AI-powered safety monitoring detects hazards in real time, ensuring worker safety and compliance with regulations. By using AI to analyze site conditions, potential risks can be mitigated before incidents occur, creating a safer work environment.

The combination of 5G private networks and AI edge computing unlocks new possibilities for real-time data processing, intelligent automation, and enhanced decision-making. High-speed, low-latency connectivity ensures that AI-powered insights can be acted upon instantly, reducing dependency on cloud infrastructure while maintaining security and efficiency. This fusion of AI and connectivity enables next-generation applications in industries that require real-time responsiveness, from autonomous vehicles to industrial IoT and smart cities. By leveraging these capabilities, businesses can build more resilient, agile, and intelligent operations, shaping the future of digital transformation.

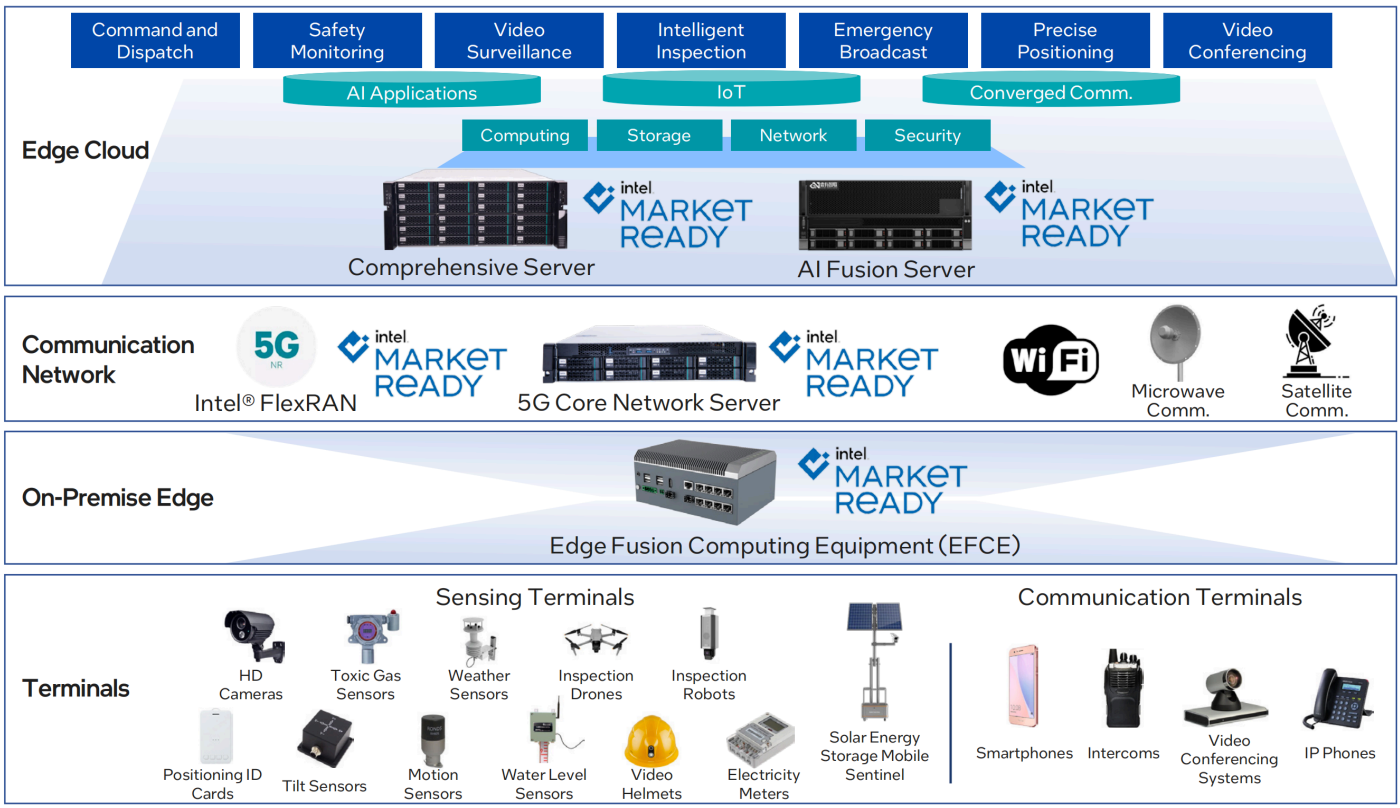

Figure 2: Example of solution architecture for smart construction sites.

Conclusion

The AI Fusion Analytic Insight Engine solution delivers a significant advancement in the development of intelligent infrastructure. By seamlessly integrating edge computing, advanced AI analytics, and the robust performance of Intel technologies, this solution effectively addresses the critical challenges faced by smart cities, transportation systems, and smart factories. Its ability to deliver real-time insights, reduce operational costs, enhance safety, and provide a scalable foundation for future innovation positions it as a vital tool for organizations seeking to build truly intelligent and responsive infrastructure for the modern era.

About Rontex Technology

Shenzhen Genew Intelligent Technology Co.,Ltd（aka Shenzhen Rontex Technology Co.,Ltd) dedicates its value proposition into IoT industries, featuring Internet of Things communication, and artificial intelligence technologies as its core. Through a worldwide network of distributors, Genew Intelligent disseminates its products and services in comprehensive solutions with a hope to connect physical and digital worlds together to elevate AIoT intelligence to the next level.

Learn More

Rontex Technology Homepage

Rontex Technology Fusion AI Server

Rontex Technology Multi-access edge computing unit (MEC)

Intel® Core™ Processor

Intel® Xeon® Scalable Processors

Intel® Arc™ Graphics

Intel® Industry Solution Builders

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