

White Paper

Video Surveillance
Intel® Xeon® processors



Redefining the video management and analytics landscape

Videonetics maximizes the power of Intel® Xeon® processors to optimize their VMS and AI video analytics solutions, leading to high performance, enhanced efficiency, and low TCO.

Authors

Srivikraman M

VP, Products & Strategic Alliances,
Videonetics Technology Private Limited

Kiran Kumar A

Principal Architect,
Videonetics Technology Private Limited



Executive Summary

The video surveillance landscape is currently undergoing a revolutionary shift, propelled by the rapid advancements in digital technology. With the proliferation of high-definition cameras, the expansion of surveillance networks, and the integration of sophisticated technologies like artificial intelligence (AI) and machine learning, the volume and complexity of video data have reached unprecedented levels.

This paradigm shift has necessitated the adoption of sophisticated video management systems and advanced video analytics capabilities to effectively control, monitor, and leverage this wealth of visual information. As video surveillance becomes more ubiquitous, the sheer volume of data generated by these systems is increasing exponentially. This surge in data, combined with the need for real-time monitoring and analysis, is pushing the limits of traditional surveillance infrastructures and necessitating more advanced and powerful solutions.

Videonetics, a leading video management software provider in India and Asia, collaborated with Intel to optimize their video management system and AI video analytics solution. This white paper explores the impact of 4th Generation Intel® Xeon® Scalable processors in accelerating performance, enhancing efficiency, and lowering TCO for Videonetics' solution. The paper also examines benchmark results from performance testing of multiple channels of streaming and video analytics applications.

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Videonetics and Intel have enjoyed a long and successful partnership, driving innovation and adopting cutting-edge technology to transform the world of security and safety. We are excited about the future and look forward to more groundbreaking advancements together.

Srivikraman M, VP, Products & Strategic Alliances,
Videonetics Technology Private Limited



Videonetics VMS Overview

Videonetics Video Management System (VMS) is a robust and feature-rich platform designed to streamline the management and control of video surveillance systems. At its core, the Videonetics VMS offers a comprehensive set of capabilities to enhance security and operational efficiency. Its main features include live video streaming, viewing archived footage, receiving real-time security alerts, recording capabilities, map-based camera, event viewing, and storage management. The system is highly secure, offering dual-factor authentication, video watermarking, encrypted client-server communication, and a single-sign-on feature for enterprise-wide user management. It also provides role-based authentication and privacy masking for both live and archive views, ensuring sensitive sections of video are protected from unauthorized viewing. Videonetics VMS conforms to ONVIF standards and provides detailed reports on system and camera health.

The system also offers advanced features like collaborative vigilance, enabling operators to share crucial evidence and communicate in chat mode during investigations. The snap search feature allows for quick investigation by viewing snapshots from specific cameras across time intervals. The video cart feature allows for multiple video segments to be exported and downloaded with a message. The VMS also comes with an in-built disaster recovery framework, ensuring 100% system availability.

Built on a flexible and open architecture, Videonetics VMS facilitates seamless integration with third-party security products through a built-in framework. The system also features an open API, enabling integration with other third-party solutions. Over the years, it has been successfully integrated with a variety of third-party products, including perimeter intrusion detection systems, access control systems, IP speakers, integrated command and control centers, and radars.

Another key advantage of Videonetics VMS is that it is integrated with the AI Analytics Application Suite, all accessible through a single, unified interface. This system enables analytics to be performed both at the edge and at central locations, providing comprehensive insights with ease. This in-built analytics capability sets Videonetics apart from its competitors. These analytics cover a broad spectrum, including people, crowd, vehicle, object, traffic, highway, law enforcement, industrial safety and health, urban and municipal areas, facial recognition, women's safety, object tracking, and forensic investigation, making it a versatile and powerful tool for a wide range of surveillance needs.

Integration of Intel® Xeon® Processors

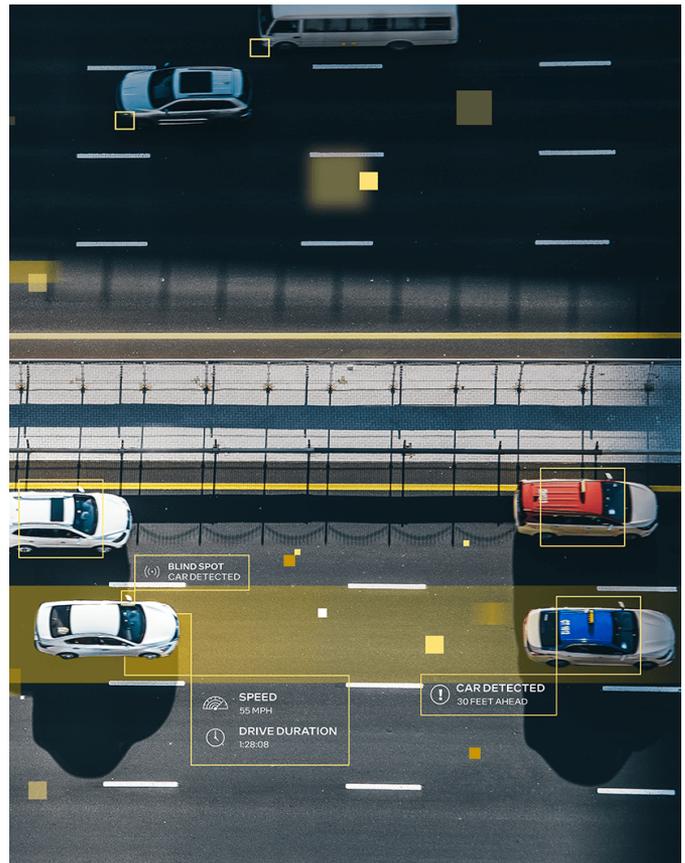
Videonetics maximizes Intel hardware to enhance the performance and efficiency of their video management system, leveraging the performance, efficiency, and scalability of Intel® Xeon® processors.

At the edge, Videonetics predominantly utilizes Intel® Core™ i7 (and above) processors to power its video analytics capabilities. These multi-core processors provide exceptional performance and efficiency, allowing

Videonetics' solutions to run advanced analytics directly on the edge devices without the need for dedicated, high-end processing servers. The ability to perform analytics at the edge is a crucial advantage, as it reduces the bandwidth and latency requirements for transmitting video data to a centralized location. By processing the video data locally, Videonetics' solutions can quickly detect and respond to events, enhancing the overall responsiveness and effectiveness of the video surveillance system.

For centralized locations, Videonetics leverages 4th Generation Intel® Xeon® Silver and Gold processors, which are designed to deliver high performance, scalability, and reliability. These processors are capable of handling large-scale analytics and data processing tasks that require substantial computational resources. 4th Generation Intel® Xeon® Scalable processors provide the necessary horsepower to support multiple analytics workloads simultaneously, ensuring that the system can manage large volumes of video data from multiple sources with ease. This is particularly important in environments where rapid analysis of high-resolution video streams is required.

Intel® Xeon® processors also provide an excellent balance between performance and energy consumption, making them ideal for applications where power availability may be limited, or energy costs are a concern. This efficiency extends the operational life of edge devices, especially in harsh and demanding environments where reliability and durability are paramount. Intel® processors are built to withstand the rigors of such conditions, ensuring that Videonetics' systems remain operational and effective even in the most challenging settings.



Benchmarking Videonetics VMS with Intel® Xeon® Processors

Videonetics has rigorously benchmarked its Video Management System (VMS) and video analytics applications using 4th Generation Intel® Xeon® Scalable processors compared to the previous generation, ensuring that the platform can handle the demanding requirements of modern surveillance and security systems. The benchmarking process was comprehensive, focusing on the key VMS functionalities such as live streaming, recording, and archive management across multiple channels simultaneously streaming to the VMS server. This thorough testing process was essential to validate the system’s capability to manage high volumes of video data while maintaining performance, reliability, and efficiency.

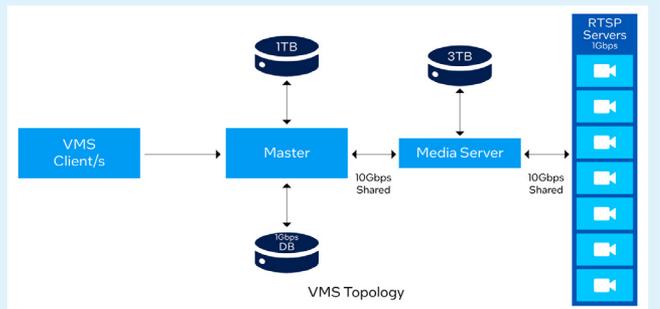
In addition to the VMS performance evaluation, Videonetics also benchmarked its video analytics applications, such as Intrusion Detection, Fire Detection, and Attribute Search. These critical analytics capabilities were thoroughly tested to ensure their reliability and efficiency in real-world deployments.

The benchmarking process was conducted across three different topologies, allowing Videonetics to assess the performance and scalability of its solutions in diverse deployment scenarios.

Topology 1: 4th Generation Intel® Xeon® Gold Processors

Master Server, Database Module: Intel® Xeon® Gold 6454S @2.2 GHz, 6 Cores & 24GB DDR5

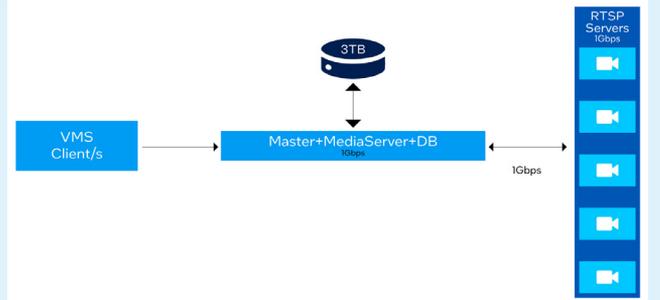
Media Server Module: Intel® Xeon® Gold 6454S @2.2 GHz, 4 Cores & 8GB DDR5



Topology 2: 4th Generation Intel® Xeon® Silver Processors with Master & Media Server in One Box

Master (VMS) Server, Media & Database: Intel® Xeon® Silver 4410Y @2.0 GHz, 4 Physical Cores & 16GB RAM

Video Analytics Server: Intel® Xeon® Silver 4410Y @2.0 GHz, 12 Physical Cores & 48 RAM

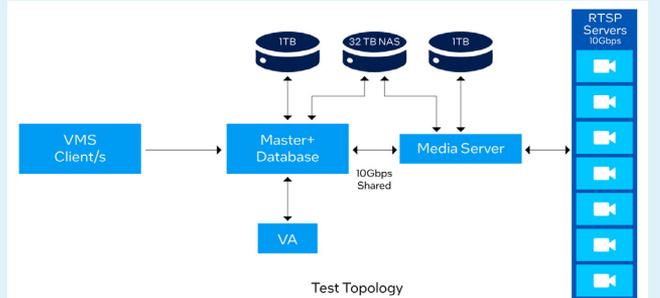


Topology 3: 4th Generation Intel® Xeon® Silver Processors with Master & Media Server in Separate Box

Master (VMS) Server, Media & Database: Intel® Xeon® Silver 4410Y @2.0 GHz, 4 Physical Cores & 16GB RAM

Media Server: Intel® Xeon® Silver 4410Y @2.0 GHz, 4 Physical Cores & 16GB RAM

Video Analytics Server: Intel® Xeon® Silver 4410Y @2.0 GHz, 12 Physical Cores & 48 RAM



High-impact Results

Videonetics’ innovative architecture, coupled with the power of 4th Generation Intel® Xeon® Scalable processors, has enabled exceptional performance and scalability. By optimizing resource utilization, Videonetics has achieved a higher number of channels per core compared to industry standards.

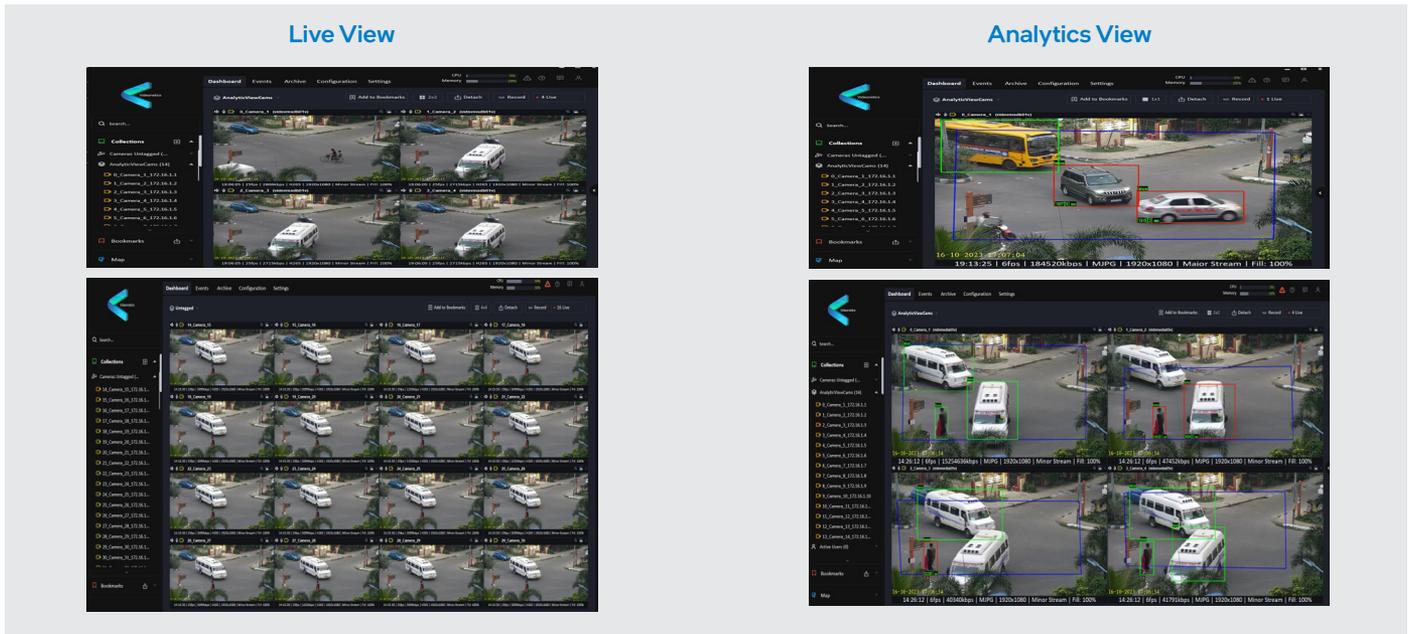
Up to
1.6x
Improvement

4th Gen Intel® Xeon® Gold 6454S processor vs 4th Gen Intel® Xeon® Silver 4410Y processor¹

Up to
1.2x
Improvement

4th Gen Intel® Xeon® 4410Y processor vs 3rd Gen Intel® Xeon® processor¹

The integration of AI-based analytics running on Intel® Xeon® processors has further enhanced the solution’s efficiency and cost-effectiveness. By eliminating the need for dedicated GPUs, Videonetics has reduced hardware costs and simplified deployment. This intelligent combination of hardware and software has resulted in a powerful and versatile video surveillance platform that can handle demanding workloads while maintaining a competitive TCO.



Customer Success Story

Videonetics’ VMS and Video Analytics Deployed on Intel® Xeon® processors for Comprehensive Surveillance and Public Safety

In a large-scale Safe City project, Videonetics’ VMS and Video Analytics were deployed using Intel® processors to monitor the city and ensure the safety of the public. Over 2,000 cameras were installed for round-the-clock surveillance across the city.

The Videonetics solution, powered by Intel® processors, offers a range of advanced analytics to enhance security and public safety in the city. Here are the key analytics deployed in the project:

Gesture Recognition:

This unique analytics feature allows members of the public in emergency situations to look up at the camera and wave for help. The event is immediately sent to the control room, and administrators can review and arrange emergency support, particularly beneficial for women’s safety.

Men Proximity to Women:

When a group of women is surrounded by men, the system generates an alert to the control room, enabling administrators to take necessary precautionary measures to ensure the safety of women, especially in remote areas and during off-peak hours.

People Fighting:

When the system detects a group of people involved in a fight, it generates an event to the control room, alerting the administrators to take control of the situation and ensure public safety.

Unconsciousness Alert:

If a person is found in an unconscious state in a public area, the system generates an event to the control room, allowing administrators to provide necessary assistance to the person in need.

Crowd Detection:

The system detects crowds and alerts the authorities to sensitize and monitor the situation, helping to avoid untoward incidents and maintain public safety.

Unattended Object:

The system can detect unattended objects, which pose a safety threat, and generate an event to the control room to notify the relevant authorities.

Camera Tampering:

The system can detect when a camera has been tampered with or covered by miscreants, generating an alert to the control room with images of the persons involved, enabling the authorities to identify and apprehend the criminals.

The deployment of Videonetics' VMS and Analytics solution, based on 4th Generation Intel® Xeon® Scalable processors, has significantly enhanced the city's safety and security. The comprehensive surveillance, real-time analytics, and timely alerts have provided the authorities with valuable insights and the ability to take proactive measures to ensure the well-being of the public.

Conclusion

The integration of Videonetics' VMS and Video Analytics with Intel® Xeon® processors offers a high-performing, efficient, and cost-effective solution. By delivering high performance and efficiency, coupled with a low Total Cost of Ownership (TCO), it represents an impactful solution for modern security needs. With the ideal combination of Videonetics' expertise and the processing power of 4th Generation Intel® Xeon® Scalable processors, this optimized solution provides customers with a highly efficient, cost-effective, and scalable platform for addressing a wide range of security and surveillance challenges in the real world.

About Videonetics

Videonetics has been ranked the number one video management software provider in India and among the top 5 in Asia (IHS/Informa Tech Research). Videonetics is committed to driving innovation and making the world a safer, smarter, and happier place. Videonetics Unified Video Computing Platform, with a rich suite of products covering video management software with video analytics, traffic management software, VSaaS, and facial recognition systems powered by indigenously developed artificial intelligence and convolutional neural network-based deep learning framework, provides operational efficiency, data-driven insights, situational awareness, and actionable intelligence. At the same time, the Videonetics neoteric approach is key to creating products and solutions that are integrated yet modular, ONVIF compliant, OS and hardware agnostic, cloud-ready, scalable, and interoperable.



¹Internal benchmarking results from tests conducted by Videonetics and Intel.

Performance varies by use, configuration and other factors. Learn more at <https://intel.com/benchmarks>

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates.

No product or component can be absolutely secure.

Your costs and results may vary.

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