

Video Security and Surveillance Solutions

Smarter infrastructure for video management, analytics, and IoT workloads

With more and more of the world's population moving to urban areas, crime, congestion and other challenges are increasing. Infrastructure managers across small towns, cities, and public venues are required to ensure safety and security, more effectively manage assets, and improve quality of life. Video-centric IoT systems, combining a wide variety of video feeds and real-time IoT data, can provide the foundation for a safer and smarter city.



Video and sensor data have become a strategic asset in generating critical insights to city management and operations. Video surveillance and data collection systems combined with intelligent analytics can provide faster response time for emergency personnel and provide better situational awareness. Video analysis can assist law enforcement in the apprehension of suspects and gather necessary evidence.

<p>Crime Detection and Loss Prevention</p> <p>Analyzing and deriving information from video and sensors</p>	<p>Traffic Management</p> <p>Understanding traffic and pedestrian patterns, routing around congested areas</p>	<p>Smart Buildings</p> <p>Lighting and energy management, building security and access, parking lot management</p>
<p>Public Transportation</p> <p>Vehicle tracking and license plate recognition, security of mass transit</p>	<p>Electronic Signage</p> <p>Providing real-time messages and alerts to citizens for emergency management and situational awareness</p>	<p>Event and Emergency Management</p> <p>Managing venues, routing emergency vehicles, responding during and after disasters and emergencies</p>

Well-designed IoT infrastructure can also leverage video to provide benefits such as traffic management to reduce congestion and recognize pedestrian patterns. This can also apply to building management systems that must provide an environment that keeps occupants safe and buildings operating efficiently. Smart IT infrastructure helps city managers plan around events, or improve response to disasters and emergencies.

As these requirements continue to grow, city managers will need to expand existing IT systems. A scalable solution allows for additional applications to be added such as electronic signage, access controls, crowd and traffic management, or allowing additional cameras and sensors to be added in new venues or more areas where Edge computing might be required.

Manage Traffic

Video analysis of traffic flows can feed into signal timing to optimize travel time for citizens, limit congestion, and reduce pollution.

Save Energy

Combining environmental and personnel usage data with building control systems can help reduce energy consumption.

Optimize Parking

Real-time information of open parking spots can be provided to command center and city visitors, and control ingress-egress in emergencies.

Manage Lighting

Motion and infra-red sensors can monitor movement and presence, reducing energy, and maintaining public safety

Reduce Water Pollution

Monitoring pollution levels at points of interest can detect water quality issues and contaminants early to reduce impact to environment and water supply.

Provide Campus Navigation

Indoor navigation to find places of interest, optimal routes, and emergency exits.

Implementation Challenges

Industries such as transportation, government, health care, gaming, education, manufacturing, and hospitality are adding video surveillance capabilities, but are struggling with how to implement solutions. How to handle the massive size of projects, brownfield integration, and security are all top of mind. Current systems often cannot handle future growth which leaves IT owners choosing between overspending today or delaying upgrades. Scalability is key. They need a partner they can count on to help them scope, implement, and manage such a solution.

Lenovo and Pivot3, along with surveillance industry leaders, deliver an enterprise-class smart city infrastructure that is easy to manage, simple to deploy, and scales as needs grow.

Optimize Fleets

Connected vehicle tracking allows for better management of large fleets reducing costs, optimizing asset usage, and providing prescriptive service as problems arise, and preventing loss.

Air Quality Control

By analyzing air pollution data, traffic and industry can be adjusted to reduce harmful levels in highly polluted areas and citizens can be notified to limit outside activity.

Detect Gas and Water Leaks

Smart meters with embedded sensors can measure consumption and detect leaks.

Detect Crime

Video feed can be analyzed in real time for crime and help authorities find criminals.

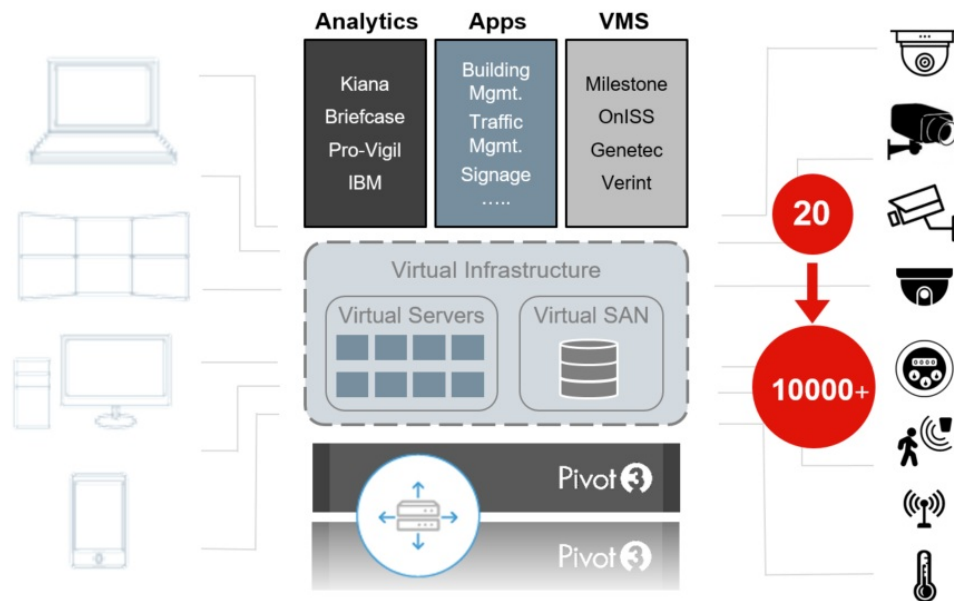
Smart Energy Management

Tracking and management of energy peak-time consumption in residential and industrial facilities can ensure grid reliability.

Public Transport

Live video streams, live bus tracking, and enabling WiFi services enhances citizen and visitor experience, while using public transport.

Lenovo Pivot3 Smarter City Solution Architecture



<p>Advanced Analytics</p> <p>Facial recognition, vehicle tracking and recognition, threat and crime detection, traffic monitoring, infrastructure monitoring, and predictive maintenance.</p>	<p>Built-In Failover</p> <p>Virtual servers restart with no user intervention during failures, and all previously recorded video remains accessible. No need for redundant software, licensing or hardware. Capture of video does not stop during failure.</p>	<p>Scalable</p> <p>Easily scale storage, compute, and bandwidth without disruption as requirements expand and change. Extremely high ingest rate to support very large number of sensors and cameras.</p>
<p>Video Management System</p> <p>Industry-leading VMS software aggregates, stores, and organizes video to view both live and recorded video.</p>	<p>Software Defined Storage</p> <p>Resources can be aggregated together into a single shared storage pool, fully accessible by all cameras and IoT applications. Resources in the pool back up each other.</p>	<p>Advanced Fault Tolerance</p> <p>Patented erasure coding protects data better than aging RAID technology, withstanding simultaneous failure of five disks or an appliance, and reducing storage requirements exponentially.</p>
<p style="text-align: center;">Virtualized Client Access</p> <p style="text-align: center;">Secure, fully functional client access from any device reduces the need for costly graphics-enabled workstations.</p>		

Purpose-Built Solution for Demanding Video Applications

Together, Lenovo and Pivot3 provide a solution that allows IT administrators to consolidate streaming data management (including video), access controls, and IoT applications on a single solution, eliminating the need for separate systems. This provides higher levels of resiliency and fault tolerance, and lowers management and solution costs for the entire application suite.

Lenovo and Pivot3 leverage a broad partner ecosystem to deliver enterprise-class video surveillance infrastructure and IoT integration in an easy-to-manage, simple-to-deploy, scale-out solution. Lenovo and Pivot3's optimized solutions serve major customers in demanding video environments including transportation, government, health care, gaming, education, manufacturing and hospitality.

Primary Benefits

Reduces Risks and Liabilities	Improves Response and Situational Awareness	Simplifies Management	Lowers Total Cost of Ownership	Scales On Demand
Patented erasure coding eliminates system downtime, protects against data loss liabilities, and reduces storage costs.	Accesses video and integrated systems on any device, including mobile.	Multiple petabytes can be easily managed by a single, non-IT specialist.	Dense, highly resilient platform delivers industry-leading efficiency and cost/TB.	Scale storage, compute, and bandwidth as needed without disruption.

Customer Success

In a recent case study in Bogotá, Colombia, the solution provided the following multiple benefits to city operators and government:

- Improved effectiveness by allowing operators at all control centers to view citywide video data
- Reduced risk and liabilities by eliminating data loss and downtime
- Enabled future expansion of camera and sensor counts through a scalable solution
- Reduced power and cooling needs using a high-density solution that fit into limited floor space
- Reduced response times by properly routing emergency response vehicles

For More Information

To learn more about Video Security and Surveillance Solutions, contact your Lenovo representative or Business Partner.

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