# Quantum®

# Video Surveillance Infrastructure Solutions for the Global Airport Industry

## Inspired by One of the World's Top 10 Airports

### AIR TRAVEL NEARLY DOUBLED IN PAST DECADE

Between 2010 and 2019, global passenger air travel nearly doubled to 4.5 billion travelers[1] per year. While COVID has impacted 2020 travel, air travel is expected to quickly rebound in the years to follow, especially as citizens from emerging regions like Asia, Africa, and the Middle East gain the financial means and desire to travel.

While the world's busiest airports handle more than 100 million passengers per year, even modest-sized airports handle hundreds of thousands to millions of passengers per year[2].

### SECURITY IS CRITICAL FOR AIRPORT OPERATIONS

To protect travelers and employees, airports need to have a robust security system, often based on "layers" of security.

Video surveillance systems (VSS) are a key layer of security. VSS act as a deterrent to would-be criminals. Frequently, VSS help security authorities identify persons of interest after an incident. Increasingly, analytics help security authorities identify potential and in-progress incidents, which can range from customer service issues, such as congestion at a security checkpoint to the visual identification of fire before a smoke alarm is able to sense smoke, to unauthorized persons approaching a restricted area. Taken together, many airports find that they now need to access 20% of the video that is recorded—a 400% increase over needs of years past.

Many airports are currently investing in their video surveillance system capabilities. Common upgrades include the addition of cameras ("streams"), replacing analog or low-resolution IP cameras with 4K or 8K cameras, adoption of IP-based central storage, and the implementation of real-time video

1 https://www.statista.com/statistics/564717/airline-industry-passenger-traffic-globally/
2 https://www.internationalairportreview.com/article/32311/top-20-largest-airports-world-passenger-number/

### INDUSTRY SCENARIO

Transportation agency administrators and professionals need to deploy wide-scale video surveillance infrastructure solutions to protect people and property, and improve business operations.

### CHALLENGES

- Meeting the demand for improved safety solutions within a fixed budget.
- Capturing and managing massive amounts of data.
- Increasingly longer retention periods for information assets.
- Need for users to easily retrieve video regardless of where that video is stored.
- Leveraging improved analytics to drive increased business value from data.
- Zero loss of data, including protection against local disasters and technical issues.

### SOLUTION

- Quantum's multi-tier storage solution for video surveillance.

### BENEFITS

- Lower total cost of ownership by preserving existing camera investments and scaling intelligently over time with cost-effective tier storage.
- Capture, retrieve, and analyze large amounts of data.
- Increase retention and allow users to access video files quickly and transparently.
- Take advantage of easy integration and support for analytics applications.

analytics. Depending upon local regulations, some airports have begun to favor long-term retention of video footage instead of auto-erasing it after a set period of time such as 30 days.

The increase in camera count, the substantial improvement in camera resolution, and the retention of video is putting a strain on video surveillance systems storage to an extent never before seen. For example, a 4K image typically requires 400% more storage than an HD image. Retaining video for 180 days instead of 30 days increases storage requirements by another 600%. Even compression algorithms are challenged by airport video, given the high degree of motion within airport video streams.

When airports undertake the planning that is needed to upgrade their video surveillance system storage capabilities, they take into consideration many factors. Some of the more common requirements are:

- Ability to simultaneously stream, record, and view hundreds or thousands of cameras at 4K or 8K resolutions at a full 30 frames per second (fps).
- Zero loss of data, including protection against local disasters and technical issues.
- Ability to easily and rapidly search, retrieve, and share archived video footage.
- Ability to seamlessly add storage capacity as future needs grow due to additional cameras, higher resolutions, and longer retention times.
- Affordability—since storage is typically around 60% of the total cost of a system, minimizing cost while achieving performance objectives is important.

## NEW ARCHITECTURE FOR NEW NEEDS

The traditional approach of leveraging tens to hundreds of network video recorders (NVRs) is not feasible as video surveillance requirements grow. Enterprise-class storage architectures are better suited to meet the demanding requirements.

## OBJECT STORAGE AS THE HUB FOR STORAGE

Object storage has emerged as the leading technology for the world's largest video surveillance systems such as those found in airports, government facilities, and universities, to name but a few.

Object storage creates asset repositories that can hold up to hundreds of petabytes, spreading the data across a large number of disk resources. The data objects can be distributed geographically to provide a self-healing environment that is both more scalable and more resilient than RAID arrays.

Object storage brings several unique capabilities that other storage architectures cannot match, including:

- Zero data loss due to volume, technical errors, or local disasters.
- Ability to expand, nearly infinitely, as future requirements dictate.
- Performance (ingest and playback capabilities).
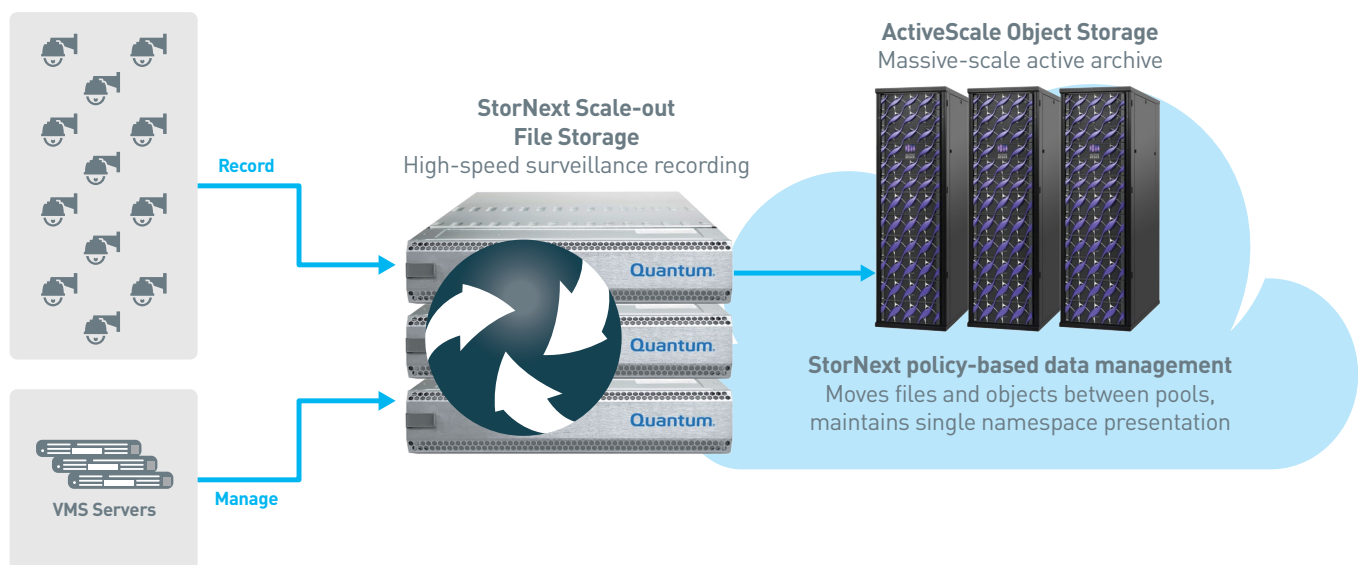- Affordability.

## AIRPORT USE CASE

One of the world's top ten busiest airports, serving tens of millions of passengers per year, initiated a project to upgrade their video surveillance capabilities.

This airport had a mix of analog and low-resolution IP cameras. The security management team wanted to upgrade all cameras to be IP based and 4K quality. Most importantly, they had zero tolerance for data loss owing to performance (i.e., the ability to record thousands of simultaneous 4K camera streams), hardware or software issues, or local (physical) incidents.

The airport security team worked with video surveillance industry experts to analyze various technologies, vendors, and products. Once their analysis was complete, their choice of solutions was an easy one to make.



*Critical Infrastructure at a Major International Airport*

## QUANTUM STORNEXT SCALE-OUT FILE STORAGE AND ACTIVESCALE OBJECT STORAGE

The airport implemented one of the major video management system (VMS) applications to direct 6,000 simultaneous 4K video streams to "land" on primary disk before it was temporarily cached on Quantum StorNext® high-performance shared storage appliances.

StorNext is relied upon by customers who work on a number of interesting use cases ranging from satellite images to Hollywood movies to bioresearch. While each use case is unique, all share the common need for high-performance ingest of video with zero downtime.

Once the 6,000 video streams were temporarily cached on StorNext appliances, the StorNext file system moved the video streams to the 30 PB Quantum ActiveScale™ object storage system.

ActiveScale is one of the top object scale storage systems in use in the world. Like Xcellis®, a StorNext appliance, ActiveScale customers depend upon it for a diverse range of use cases such as oil exploration and on-premise cloud-like services. Its erasure code foundation guarantees data durability as high as 99.99999999999999999% ("nineteen nines").

ActiveScale's built-in geospread capabilities (the saving of data as objects that are "spread" among different hardware systems, even different locations) ensured that if a rack of data went offline, no data loss or downtime would be incurred.

Once the video surveillance was stored on ActiveScale, it was accessible by analytics applications that track trends such as foot traffic and facial recognition.

Since the initial phase of the project, the airport has twice added to their ActiveScale capacity in 15 PB increments. This "capacity on demand" approach helped the airport minimize upfront expenditures.

Looking to the future, the airport will continue to add capacity to their ActiveScale object storage. New buildings will be built as the airport expands. As those buildings come online, geospreading will be easy to implement in order to add an additional layer of protection. If, for instance, one data center was taken offline due to a fire or other cataclysmic event, the other data centers with ActiveScale would continue to function without any data loss.

In the meantime, 6,000 channels record 4K video 24 hours per day, 7 days per week, 365 days per year with zero downtime. While passengers may not be aware of the forethought that has gone into their safety, it is a compliment to the airport and the security team that make safety their mission.

**Quantum.**

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