



# UltraIO for Video Surveillance & Digital Content Analytics



The threat of sophisticated criminal and terrorist activities is increasing across the world which leads to an increasing demand for video surveillance systems in both commercial and residential establishments. For a safer community, many modern cities globally are transitioning to a 'smart' approach, leveraging information and communication technologies. Video surveillance – from satellite, street, and traffic cameras that improve operational efficiency to stoplight cameras that ensure civilian safety – has emerged as a critical element of increasing public safety and efficiency.

Video surveillance is no longer used simply for security purposes. Now video analytics has widespread uses. Video streams are being measured in real-time to find deeper insights that can be in the form of patterns, anomalies, motion detection, behavior, events, and more. The information collected helps businesses improve their bottom line through increased sales, time savings, reduction in losses, and a boost in productivity.

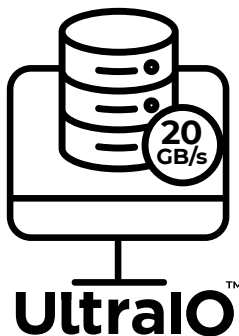
## Challenges

As the demand and use cases for video surveillance grows, so does the amount of data generated each day that needs to be stored. IDC estimates that by 2025 data from IoT cameras and other devices will be 79+ zettabytes<sup>1</sup>. With the number of cameras in use quickly multiplying, current infrastructure is not able to keep up with the video ingestion streams and rates needed. Additionally, increasing video retention times and enhanced camera resolution contribute to the challenges organizations encounter requiring more capacity, efficient storage, and fast access to the video content while staying within tightening budgets.

## Why an UltraIO storage system?

Nyriad's UltraIO storage system leverages a software-defined combined CPU and GPU processor architecture providing accelerated performance and extreme parity making it a perfect solution for video surveillance use cases. The Nyriad UltraIO System can ingest video streams from as many as 90,000 cameras simultaneously.

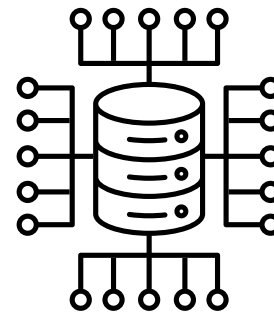
### PERFORMANCE



**20 GB/s** in a single UltraIO System.

Quickly ingest, and playback video content for faster incident response or analytics processing with up to 20 GB/s read/write capabilities.

### RESILIENCE

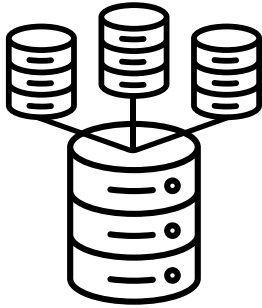


Up to **20 drives** of dynamic parity

Provides the highest resiliency and secures your data while delivering high bandwidth needed for zero frame loss.

<sup>(1)</sup> IDC, Worldwide Global DataSphere IOT Device and Data Forecast, 2019-2023

## EFFICIENCY



Up to **92%** overall efficiency with  
~ **215 TB** per rack unit of usable capacity

More usable capacity in less footprint, reduces costs  
while addressing growing capacity needs.

## TOTAL COST OF OWNERSHIP



Ultra low **\$/TB**. Lower power/cooling.  
Simple to Operate. Reduced Business **Risk**

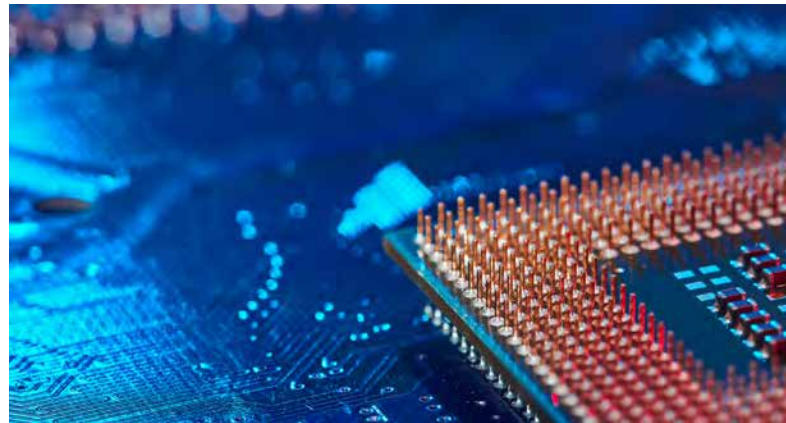
Low TCO and cost effective storage empowers  
organizations to effectively consolidate active  
archive for extended video retention.

A single Nyriad UltraIO system delivers high performance and lower Total Cost of Ownership without the complication and expense of a two-tier storage array. The Nyriad UltraIO system delivers an extraordinary combination of simplicity, performance, resilience, and efficiency.

# NYRIAD®

## Simultaneous Camera Ingest

The Nyriad UltraIO storage system's high ingest rate enables it to ingest the video streams from an astonishing number of cameras concurrently as exemplified in the following chart.



### VIDEO CAMERA BANDWIDTH\*

| FPS | RESOLUTION          | CODEC | # OF CAMERAS |
|-----|---------------------|-------|--------------|
| 15  | 720P (1280X720)     | H.264 | 42000        |
| 30  | 720P (1280X720)     | H.264 | 21000        |
| 15  | Full HD (1920X1080) | H.264 | 21000        |
| 30  | Full HD (1920X1080) | H.264 | 10500        |
| 15  | 4K (3840X2160)      | H.264 | 5000         |
| 30  | 4K (3840X2160)      | H.264 | 2500         |
| 15  | 720P (1280X720)     | H.265 | 90000        |
| 30  | 720P (1280X720)     | H.265 | 45000        |
| 15  | Full HD (1920X1080) | H.265 | 45000        |
| 30  | Full HD (1920X1080) | H.265 | 22500        |
| 15  | 4K (3840X2160)      | H.265 | 11000        |
| 30  | 4K (3840X2160)      | H.265 | 5500         |

\*Bandwidth calculations and bit rate used are the aggregate of video surveillance camera manufacturers' best practices including Arxys, Canon, Panasonic, and Promise. Protocol was iSCSI. The number of cameras was calculated using the smallest Nyriad UltraIO configuration, H1012.

## Retention by Resolution and FPS

The chart below shows average days of video retention on one Nyriad UltraIO system for 1000 cameras using each the H.264 and H.265 codecs and at varying resolution and frames per second.



| 1,000 Cameras<br>H.264: Recording 15 FPS |       |                  | Surveillance Storage Capacity* |       |     |     |
|--|-------|------------------|--------------------------------|-------|-----|-----|
| Res.                                     |       | # Days Retention | 800TB                          | 1.5PB | 2PB | 3PB |
| Res.                                     | 720P  | }                | 36                             | 68    | 90  | 135 |
|  | 1080P |                  | 23                             | 43    | 58  | 87  |
|  | 4K    |                  | 4                              | 7     | 10  | 15  |

| 1,000 Cameras<br>H.264: Recording 30 FPS |       |                  | Surveillance Storage Capacity* |       |     |     |
|--|-------|------------------|--------------------------------|-------|-----|-----|
| Res.                                     |       | # Days Retention | 800TB                          | 1.5PB | 2PB | 3PB |
| Res.                                     | 720P  | }                | 20                             | 38    | 51  | 77  |
|  | 1080P |                  | 13                             | 24    | 32  | 49  |
|  | 4K    |                  | 2                              | 4     | 5   | 8   |

| 1,000 Cameras<br>H.265: Recording 15 FPS |       |                  | Surveillance Storage Capacity* |       |     |     |
|--|-------|------------------|--------------------------------|-------|-----|-----|
| Res.                                     |       | # Days Retention | 800TB                          | 1.5PB | 2PB | 3PB |
| Res.                                     | 720P  | }                | 72                             | 136   | 182 | 270 |
|  | 1080P |                  | 46                             | 87    | 116 | 175 |
|  | 4K    |                  | 8                              | 15    | 19  | 30  |

| 1,000 Cameras<br>H.265: Recording 30 FPS |       |                  | Surveillance Storage Capacity* |       |     |     |
|--|-------|------------------|--------------------------------|-------|-----|-----|
| Res.                                     |       | # Days Retention | 800TB                          | 1.5PB | 2PB | 3PB |
| Res.                                     | 720P  | }                | 40                             | 75    | 100 | 152 |
|  | 1080P |                  | 25                             | 48    | 64  | 97  |
|  | 4K    |                  | 4                              | 8     | 10  | 16  |

\* Capacity of each resolution is based on an average, and capacity calculations assume all cameras record 100%, not motion-only. Calculations were average of surveillance storage calculators from Arxys, Canon, Panasonic, and Promise.



## Summary

As the performance, number of cameras, and capacity requirements grow for Video Surveillance and Digital Content Analytics, Nyriad's UltraIO storage system more than meets the demands that are required by the industry. The Nyriad UltraIO system provides the read/write performance needed for video ingest and playback from as many as 90,000 cameras concurrently as well as the processing of analytic insights without disrupting live capture. Combining this performance with the Nyriad UltraIO system's resilience safeguards against frame loss, providing peace of mind that the video files are available and easily accessible when needed. Using a single highly efficient and cost effective Nyriad UltraIO system instead of a complex and expensive two-tier system saves organizations both time and money, improving their bottom line.



## About Nyriad

Nyriad, Inc. is the developer of the Nyriad UltraIO™ storage system, an all-new system that combines the processing speed of GPUs and advanced algorithms to deliver remarkable performance, resiliency, and efficiency. The ground-breaking design enables Nyriad's UltraIO systems to support block storage media and block, file, and object data types in a single system for maximum flexibility. Nyriad's UltraIO systems run on industry-standard hardware, use the high capacity, extremely efficient storage media, and simplify storage management to achieve low total cost of ownership. Headquartered in Austin, Texas, Nyriad empowers businesses to grow and adapt their storage to stay competitive in a data-driven world. For more information, visit us on the web at [www.nyriad.io](http://www.nyriad.io)

