NETAPP E-SERIES AND AXXON ONE INTELLIGENT VMS SOFTWARE

Technical Framework Report

Abstract

This report details the execution and subsequent results obtained from gold-level storage certification of Axxon One Intelligent VMS on the NetApp® E2800 Series product lines. This Technical Framework Report certifies that the E-series storage solution is compatible with Axxon One Intelligent VMS software. The results show that NetApp E-Series is an optimal storage solution that works with Axxon One Intelligent VMS.

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Key Solution Components

Axxon One Intelligent VMS

Axxon One is a limitlessly scalable video management software that combines comprehensive support for 10,000+ IP devices and a streamlined user interface. Axxon One offers unique value through features like smart forensic search in recorded video and customizable video analytics powered by Artificial Intelligence.

NetApp Dynamic Disk Pools (DDP)

NetApp Dynamic Disk Pools (DDP) technology represents a significant advancement in storage system data protection and management. As disk capacities continue to grow without corresponding increases in data transfer rates, traditional RAID rebuild times are getting longer, even up to several days. Slow rebuilds result in much more time with degraded performance and exposure to additional disk failures.

With five issued patents, DDP technology is designed to deliver worry-free storage through effortless management and self-optimization while maintaining predictable performance under any conditions, including recovery from drive failures. With rebuild times that are up to four times faster than previous methods, DDP technology significantly reduces exposure to multiple cascading disk failures, providing excellent data protection.

The following list identifies the key DDP attributes that enable these benefits:

Simplified management:

- Distributed hot spare capacity (known as preservation capacity) eliminates the need for dedicated idle hot spare drives.
- You can add drives to a pool without reconfiguring RAID.
- The protection scheme and stripe size are automatic; you do not need to configure them.

Predictable performance:

- A deterministic algorithm dynamically distributes data, spare capacity, and protect information across a pool of drives.
- If a drive fails, segments are recreated elsewhere, which reduces the magnitude and duration of the performance disruption.
- The large pool of drives reduces hot spots.

Reduced exposure to multiple disk failures:

- Through segment relocation, the system returns to an optimal state faster.
- Through prioritized reconstruction, any stripes that experience multiple drive failures are given the highest priority.

With fully redundant I/O paths, advanced data protection features, and extensive diagnostic capabilities, all E-Series storage systems deliver greater than 99.999% availability and provide data integrity and security. E-Series' modular architecture makes it easy to size and scale the storage environment for capacity and performance based on three variables:

- Number of cameras streaming data to recorders
- Average sustained throughput per camera over a 24-hour period in millions of bits per second (Mbps)
- Retention requirements (days)

Test setup

The test architecture was built in the TD SYNNEX Cyber Range in Tempe, Arizona. The test setup consisted of one NetApp E2812 dual-controller storage array, one SuperMicro Microsoft Windows 2019-based Intel Xeon server running Axxon One Intelligent VMS software, and one Microsoft Windows 2019-based Intel Xeon server running AxxonSoft IP camera simulation software. All the systems were connected through a 10 Gigabit Ethernet (10GbE) switch from Allied Telesis by using the iSCSI protocol, as shown in Figure 1.

Figure 1) Network setup.
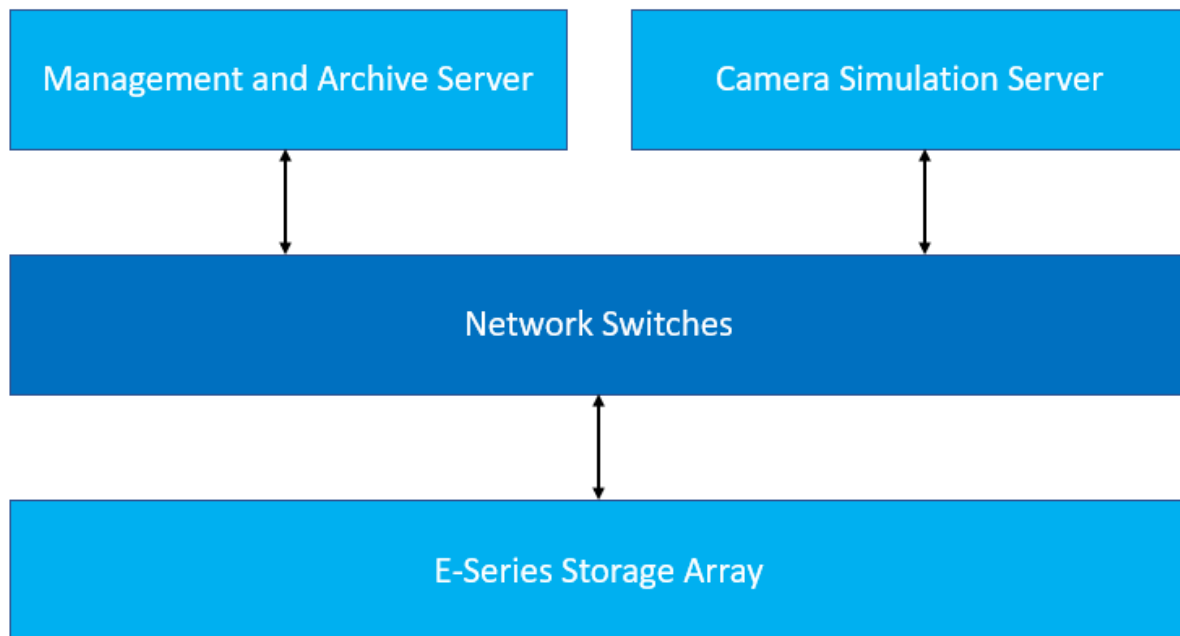
The storage array was configured to provide 1 x 10TB volume that was provisioned from a 22-drive DDP set. The volume was assigned to the Axxon One Intelligent VMS software which was allotted 10TB of space. When drive space was assigned to an archiver, it was designated from Windows drive space (in this case, an E-Series LUN) that had already been allocated. Therefore, even though the LUN was a Windows 10TB volume, the Video Management Software (VMS) was assigned the full capacity.

NOTE: The VMS was allowed to allocate as much or as little space as necessary from the physical volume.

Test procedure

The scalability certification consisted of meeting the following desired performance requirements:

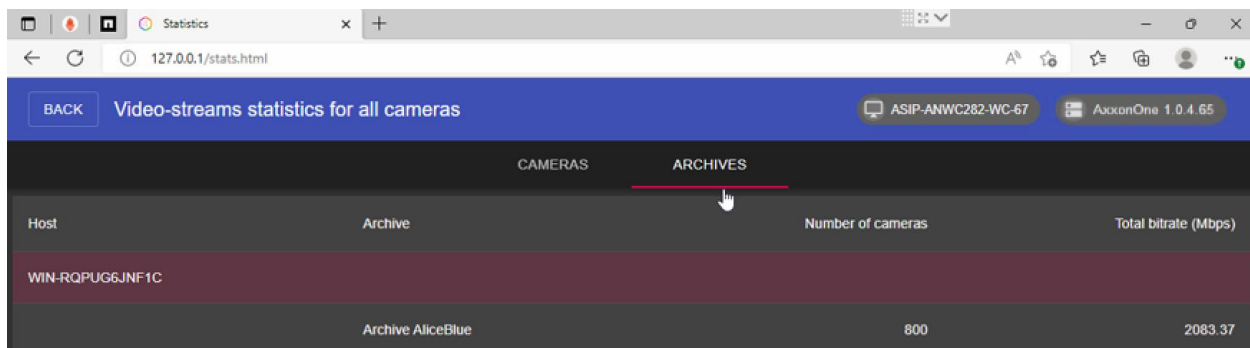- 1100 cameras streaming 2.2Mbps each (with 500k substream)

For each test case, the video archiver ran until the allotted storage space (10TB) was full. The archiver continued to run for an additional 24 hours, both writing to and deleting from the storage array. The VMS deleted the data per the prescribed retention period. If the allotted drive space filled up before the specified retention, it was overwritten.

Test results

All performance data was collected by using Windows Performance Monitor and Prometheus. Axxon One Intelligent VMS software was also used to collect and archive event logs during the testing process. The event logs for this certification effort showed no major issues and virtually no Real Time Streaming Protocol (RTSP) packet loss.

10TB DDP Pool consisting of 22 7.2K HDDs running 800 cameras yielded the following results:

- 60% CPU host utilization

- 43% E2812 controller utilization

- Disk write bandwidth: 233.62 MiB per second

- Archive Bitrate: 2083.37 Mbps

- Disk IOPS: 1.31k IOPS

Configuration details

The test setup included the following components:

- Management and Archive server:
    - Third Generation Intel Xeon Processor Gold 6338N, 2.2GHz, 32 cores
    - 512GB RAM
    - Microsoft Windows Server 2019 Standard

- Camera Simulation server:
    - Intel Xeon Processor E5-2699 v3, 2.3GHz 18 cores x 2
    - 128GB RAM
    - Microsoft Windows Server 2019 Standard

- NetApp E2812 storage array:
    - NetApp SANtricity® management software 11.70.2
    - NetApp DDP technology
    - 22 x NL-SAS 7.2K RPM hard drives

- 10GbE Allied Telesis network switches

Conclusion

The performance statistics and event logs analysis indicate that the NetApp E2800 product lines are prime candidates to work with Axxon One Intelligent VMS software. The E-Series storage system easily met all the storage requirements to attain AxxonSoft's solution certification for scalable intelligent video surveillance solutions.

Where to find additional information

To learn more about the information that is described in this document, review the following documents:

E-Series and SANtricity 11 Documentation Center https://docs.netapp.com/ess-11/index.jsp

E-Series and SANtricity Documentation Resources page https://www.netapp.com/us/documentation/eseries-santricity.aspx

WP-7240: NetApp E-Series Storage for Video Surveillance—The Advantages of Simple, Reliable Block Storage in Video Surveillance Environmentshttp://www.netapp.com/us/media/wp-7240.pdf

TR-4825: NetApp E-Series for Video Surveillance Best Practice Guide https://www.netapp.com/us/media/tr-4825.pdf

TR-4652: SANtricity OS Dynamic Disk Pools—Feature Description and Best Practices https://www.netapp.com/pdf.html?item=/media/12421-tr4652.pdf

Axxon One Video Management Software General Info https://www.axxonsoft.com/products/video-management-software

Axxon One VMS Documentation Resources Page https://docs.axxonsoft.com/confluence/display/ASdoc/Documentation

Axxon One VMS Specifications https://www.axxonsoft.com/products/video-management-software/axxon-one-specifications

Version history Version	Date	Document version history
Version 1.0	July 2022	Initial release.