

Choosing the Right Foundation for Your Video Surveillance: White Paper Discussing the Difference Between HCI and SDA Server/Storage

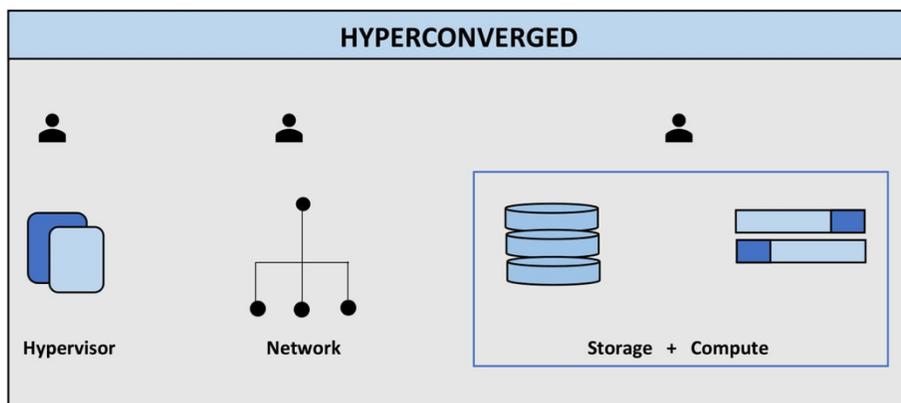
Abstract

An IHS Markit report estimated that there will be more than one billion security cameras deployed globally by 2021. It's no surprise that with more video surveillance, analytics, and big data comes an increased stress and importance of its foundation: servers and storage.

Hyper-converged infrastructure (HCI) is considered a great and innovative technology for IT and traditional network data. However, is it the right architecture that you can trust with enterprise, mission-critical, and forensic video surveillance? In contrast, Rasiliant's surveillance-defined architecture (SDA) recognizes that the management and nature of video data differs greatly from conventional data and was created for this sole purpose. This white paper will define the fundamentals of both HCI and SDA, as well as discuss the differences between IT and Surveillance organizations in order to illustrate why SDA is the obvious choice when it comes to video surveillance.

What is Hyper-Converged Infrastructure?

Hyper-converged infrastructure (HCI) is an IT architecture that integrates the conventionally physical components of storage, computing, and networking into one platform, using software or virtual machines (VM), also known as a hypervisor. In an IT application, this is considered a great improvement compared to its predecessor, converged infrastructure (CI), as it simplified data center complexity by managing it with a single user interface. This architecture is great when organizations are using multiple IT software platforms, with a dynamic number of users, and need to constantly reallocate resources throughout the day/altering schedules. Data applications are typically running for only a few hours, and then resources are reconfigured as more/different applications are ran.



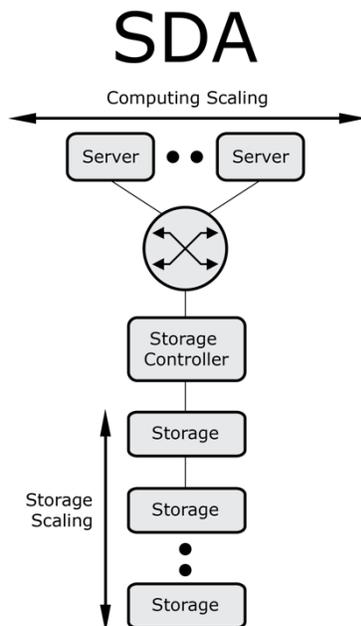
HCI deployments consist of a minimum of three nodes built with computing, memory, and storage to form a cluster. This architecture shares all resources across the cluster; which forces future growth to affect all resources rather than just what is required. This type of setup is difficult to scale in an environment like video surveillance. For example, if a project requires only additional storage, the cluster would require purchasing/adding unneeded computing as well. Because of this nature, HCI scales exponentially rather than independently.

The implementation of HCI architecture requires specialized training to commission and maintain, additional resource overhead, and typically has associated software licensing fees.

What is Surveillance-Defined Architecture?

The nature of surveillance systems is one of static resource requirements and constant functionality where the calculations for video streams, analytics, Artificial Intelligence, and operator usage are determined from the start. This application is completely different from that of typical data usage for a customer's IT department - where at any given time, resources will need to be adjusted from one software suite that is in high-demand to a different application. This can be thought of as the difference between timeshares and dedicated property.

Surveillance-defined architecture (SDA) distributes resources amongst different chassis as the project requires. As SDA systems need to expand/scale and various new technologies/policies are introduced, it provides a simple and cost-effective process of adding only the resource that



is required to the existing unified infrastructure. Since SDA functions on the bare metal rather than the software layer, it also lowers the overall resource-requirement and can be maintained with less skill specialization. Additionally, there are multiple benefits from separating computing from storage - ranging from a reduction in purchased equipment, smaller footprints, simpler configuration, and more accessible scalability as systems expand.

Traditional hardware created for datacenters is designed to handle a balanced processing load of write-and-read cycles, as users move data and then read that data many times. Whereas surveillance hardware needs to be designed specifically to write video in much higher percentages compared to read capabilities. This is to ensure video data is not lost due to system lag. Continuous data writing to hard drives creates opportunity for disk errors which can lead to corrupted video, reduced

performance, or system crashes. SDA prioritizes writing by caching incoming video and ensuring disk errors are reduced through data alignment and in-line defragmentation.

Fundamentally Different: Surveillance and IT Environments

We now know that HCI is purposed for IT, while SDA is meant for video; but why do the different backgrounds create such difficulty when applying to physical security?

A key differentiator between the two environments is not only data type, but traffic and how they handle such data. Video has a heavy focus and stress on writing to a server's drive. In a practical surveillance setup, a system is typically writing 95% of the time because video is constantly being pushed to the server. Whereas IT and general data normally illustrates a 70% read vs. 30% write environment. A significant percentage of reads impacts performance and can ultimately lead to losing video.

Another significant distinction is how and the order in which IT data is stored or "placed" in a server, contrasting it with what makes sense for video. Since video is linear and chronological in nature, it's most logical to write and store the data in such a manner as well. This way, when it does come time to read and retrieve a clip/incident, it's easily found, quickly traced and logically ordered in case you need to review a significant amount.

However, servers that hail from an IT environment tend to cater to random access. Since its priority and strength is not in writing data and its typical file sizes are relatively small, it randomly places short, 4KB blocks of video in the 'first' available space. Similar to throwing confetti up in the air and letting it fall to the ground. When a server focused on surveillance places video data, it writes in large, linear 64KB blocks. For example, first organizing the confetti by color and then laying the colors down in a sequential order.



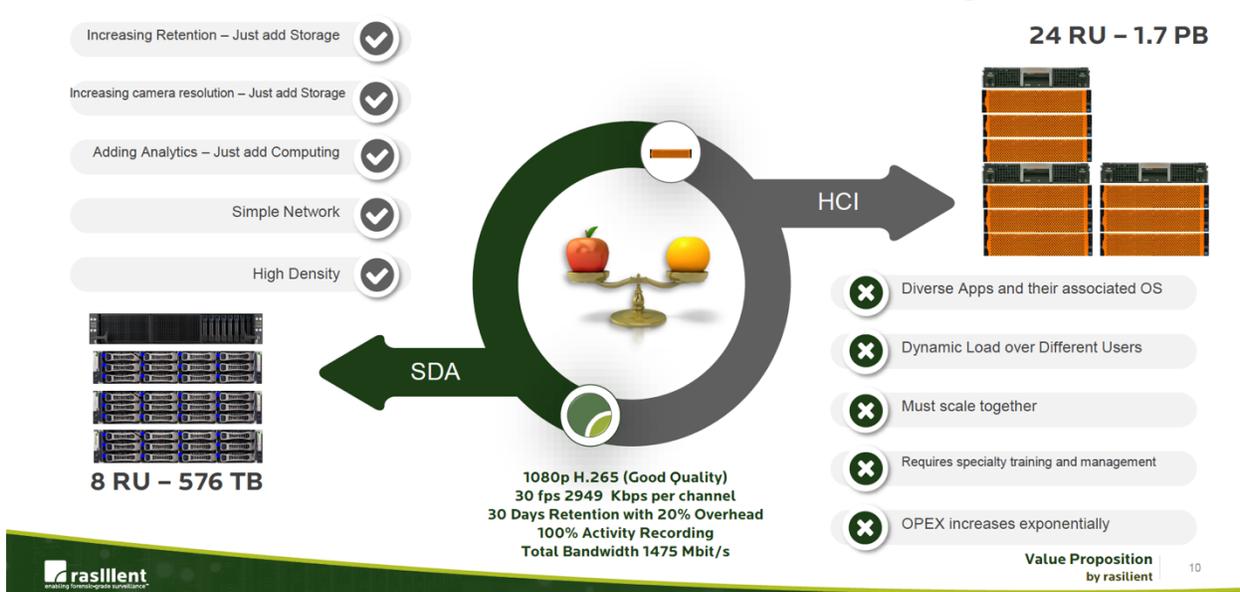
Every time you write randomly, you create an unnecessary loss of bandwidth which then equates to a danger of missing or lost data/video. This way of writing is not only inefficient but potentially ineffective, especially when it comes to video data that is being *collected 24/7*. Consider what could the consequences be if your video surveillance has gaps or missing footage when you need it most?

Why SDA is the preferred choice when dealing with video

We've laid the groundwork, now it's time to get to the highlights. Simply put, SDA is better for video-based data because:

- It is designed *for* video surveillance
- It is the only architecture that boasts **100% video capture – tested & proven**
- Improves reliability, performance, scalability, accessibility and affordability
- Removes costly licensing and unnecessary layer of software configuration
- Distributed and tailored approach creates a smaller footprint and lower total cost of ownership (TCO)
- Server Attached Storage (SAS) is uncomplicated, quick to deploy, reliable and inexpensive
- Certified with all the top VMS/analytic software platforms and open integration for others

SDA versus HCI 500 Cam Value Comparison



Rasilient’s SDA is an enterprise-grade solution platform that supports the most mission-critical applications. With patented storage options like BusyPlot, VAN, ZM, HyperCache, NFDMeter visibility and associated best practices, the solution allows large deployments to grow gracefully for years to come. CISOs, CEOs, IT and security managers alike can rest easy, knowing their video is in the best hands.

Video surveillance runs 24 hours a day, 7 days a week. That’s why businesses and individuals invest in it. Why use a server/storage architecture that was created for dynamic change for

something that doesn't change its resource load? When it comes to the foundation of your physical security efforts, using a technology that excels in the application is pivotal.

Conclusion

The last 25 years have come with incredible innovations and developments in physical security and video surveillance – except servers. While this technology has been optimized and improved in regard to the IT industry, a majority of the surveillance industry is still using server and storage technologies that are not optimized for the cumbersome tasks and duties a video system requires. HCI, albeit great for the data center, falls short in a heavy-writing environment like video. SDA was not only created for video surveillance; it boasts an impressive reputation with 100% video capture and retention.

HCI typically requires 3-4 times as many resources as SDA - spanning from cost and hardware, to required personnel and expertise. This is due to many key differences between the two technologies, including:

- HCI exceedingly increases operational cost by typically requiring three times the hardware of SDA, which only increases as growth occurs.
- HCI scales horizontally and exponentially, with computing and storage together. SDA scales independently, focusing only on what's required and proven calculations.
- HCI was created to enable data center efficiency while catering to many changing application requirements. SDA was created and optimized specifically for the constant and reliable loadbearing of video surveillance.
- HCI's virtualization creates complex deployment and system maintenance, as well as limiting technology growth by utilizing aggregated resources and diverse apps. The dedicated operating system of SDA simplifies both installation and management.

IT-based architecture, like HCI, is handling an ever-increasing amount of data in our modern world. It will continue to innovate and improve in order to meet the general network, storage and infrastructure needs of data centers and businesses everywhere. But when an operation invests in and depends on video surveillance for everything from safety and security, legal liabilities, process optimization, quality assurance, business insight, preventative measures and more – would you prefer to use an architecture that *might* get the job done, or that you can **rely on no matter what** the situation?

If you would like to learn more about SDA and Rasiliant's offerings, visit us at www.rasilient.com or contact us directly: sales@rasilient.com | +1-888-902-8981