

QPC Analysis on Axis Video Recorder Server

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Introduction

We often build multi-purpose servers for clients where Axis Camera Station is one of the purposes of the server. The biggest cost with an Axis Camera Station video management server is the disk capacity. Video recordings take a lot of disk. It is not uncommon for a 40 – 50 camera system to require 9 – 14 TB or more of disk. Even if you are using ZipStream, H264, and rules that only record what you need, the reality is that you have video surveillance to end up with usable video. So that means you must have good cameras that record in high enough quality, with adequate FPS, and record frequently enough. Motion detection-based recording is not appropriate in all scenarios. Some cameras are required to record constantly throughout the day for a specified schedule. With usable video being the goal, organizations are getting 5 MP, 8 MP, and 4K video cameras. These consume more disk storage of course.

We originally wanted to use SSD hard drives in a server that was a multi-purpose server where one of the VMs running on the server was for ACS. A 1.9 TB MLC SSD hard drive is about \$1900 each. If you run this through a RAID calculator even for RAID 50, you end up with about 50% of the cost of the server being due to the hard drives. This turned out to be around \$27,000. The client asked if there was possibly a cheaper option of using an ACS appliance for the ACS component of the solution, and then buying a smaller Dell PowerEdge server for the other server load needs.

I investigated this in depth.

Initially, it looked like there might be some cost savings because you can get a sizeable ACS appliance for around \$15,000. However, I was able to create a PowerEdge server specification that serviced SEVEN server workloads for \$19623 + \$3168 for the ACS licenses. These would be permanent, transferrable ACS licenses as well. Our server design would allocate 63 TB of disk to the ACS VMS virtual machine. That puts it directly on par with the S1148 64TB ACS appliance, but our server spec included more proc, RAM, better OS, and RAID 50 instead of the RAID5 on the S1148. The hard drives we selected were NLSas 7.2k, and the total server warranty period was 7 years.

Baseline analysis

I got the live specs on two different current S11xx ACS appliances (video recorder servers) from Axis. On both of them, the BIOS as well as other updates were missing and listed as critical on Dell's websites. It would appear that people who buy these appliances were not treating them as a PowerEdge server. Critical updates were missing as a result. You can surmise that other proper maintenance was not being done.

Even the new model of ACS video management server available as of November 2018 maxes out at 8 GB of RAM. That is not even remotely enough for ACS as an app. And you need additional free RAM to run V-Locity or Diskeeper in order to maintain disk performance over time. Maintaining disk performance over time is critical to a process that is a data thrashing heavy application because it is constantly writing to the database, and it's running on meager 7.2k RPM hard drives.

We have been managing ACS VMS servers since 2000, and adequate RAM plus disk optimization software is required in order to get viable performance out of the servers.

Operating system concern

The largest ACS appliances come with Windows 10 IoT enterprise OS.

The system is specifically listed as not usable for local viewing of the video per Axis documentation. This is probably due to the lack of RAM. But this lack of RAM is also going to adversely affect things like normal system maintenance that will just take too long causing labor fees to be much higher. ACS version upgrades, system backups, and operations inside of Axis Device Manager are intensive processes. All of which are absolutely necessary functions to have adequate resources to perform.

When designing a system, one must be keenly aware of the impact of inadequate performance on causing higher labor fees over the life of the system. Those soft costs can easily add up over the life of the system to greatly outweigh the cost of more expensive, but more capable hardware.

Per Microsoft documentation, the specs on Windows 10 IoT Enterprise OS state that it is only rated for running a single app.

My interpretation of that is that we cannot actually run the full complement of necessary apps such as:

- Acronis to back it up
- V-LOCITY to maintain performance
- a security agent
- a monitoring agent
- Dell OMSA in order to know what is going on with the hardware
- Dell Server Update to install hardware updates

Monitoring

In fact, we know that Dell Server Update and OMSA won't run on Windows 10 because those apps will only run on a server OS per their specification. So how is it possible to have any monitoring capabilities of the hardware without OMSA? It is not possible to do so with any level of automation. Someone would have to connect to the iDrac to see that data, and only if that even works with an iDrac that is not an Enterprise model.

Without proper monitoring, a failed hard drive, CPU over temperature, or any other failure or warning would go unnoticed.

An appropriate solution is to use Windows Server operating system, have OMSA installed, and then use a Kaseya monitoring agent. Kaseya when properly programmed, will pick up appropriate events logged into the Windows Event Logs by OMSA and email notify the appropriate humans.

Windows 10 has other major failures as an operating system for this task because it is not capable of link aggregation. This means that the system has no network pathway resiliency/redundancy, and probably inadequate throughput to accommodate the feeds from 48 cameras.

I concede that it would be possible to purchase a 10 GbE SFP+ NIC for the ACS appliance after initial purchase, and thereby provide a 10 GbE connection into it. This method would provide overkill amounts of bandwidth with no redundancy/resiliency benefit. And you would have to have an open SFP+ port on a switch to plug it into. A lot of SMBs still don't have 10 GbE SFP+ ports on their network equipment.

Note that any add-on parts are not covered under the original system warranty. If you buy a Dell server through a Dell PowerEdge certified partner and add Dell certified parts later through the proper process, then those parts can be covered under the original server hardware warranty. The process of ordering this equipment properly should be handled by your Dell partner.

Hardware analysis

By looking up the actual physical hardware configuration based upon the service tags that I was provided, the systems do not include additional necessary components.

- iDrac enterprise
 - sliding rack rail kit with cable management arm
- The ACS appliance OEM units I looked up that had actually shipped from Dell did not include that in their spec, but when I contacted Axis support, they claimed that rails with cable management arm were included.

Hard drives

The hard drives used in the spec for the ACS appliance are 7200RPM SATA hot-plug. I'm not sure if you realize this, but straight up plain SATA drives have a 1 yr warranty on them regardless of what your server warranty is with Dell.

If you want hard drives covered under the full server warranty for the 5 – 7 yr period, you have to get SAS drives. They can be SATA, but they also must be SAS. These are usually referred to as NLSas or near-line SAS.

I did not see the SAS specification in the hardware specs of the system configs for the two service tags provided by Axis for me to review. I think that is another way they are getting the price down without the disclosure that the hard drives are not covered under warranty for more than a year. The SATA vs SAS drive warranty coverage has been Dell's policy for at least 10 years now. It's nothing new.

I'm also very disappointed by the cache on the Perc controller in the server. They basically picked the cheapest RAID controller that could handle the quantity of drives required. For something that is disk write intensive, it would make more sense to use a larger cache Perc and configure it for optimization with a write buffer.

Dell server support access

I contacted Axis support about this and confirmed that we would have to work through issues exclusively with Axis support. Not being able to talk directly to Dell server engineer support concerns me. We must have the ability to provide Dell server engineering support a Support Assist report and get direct feedback on whether or not there are updates for the PSUs and HDD because these items are specifically not delivered through the update catalog for many servers. Dell informed PowerEdge certified partners that these updates were removed by Dell because people were blowing up their servers by incorrectly installing PSU updates and some hard drive firmware updates.

If the server hardware is to be properly maintained, we must have direct ability to talk to Dell server engineering support. However, if you buy an ACS appliance instead of a real PowerEdge server, you may be denied support from Dell server support since the support is supposed to be being provided by Axis.

Warranty concerns

The longest warranty you can buy is a 3-year warranty with the potential to add-on two more years at a later date. We standardly only recommend servers with a 7 year manufacturer warranty, and therefore an expected 7 year lifecycle. This goes back to the soft costs (labor costs) really being the most expensive portion of an implementation. So why would an organization do a migration and change an appliance every 3 -5 years when they could have done that migration only once every 7 years?

You could not get a viable 7-year lifecycle out of an ACS appliance because of its lack of warranty duration.

ACS licenses

The ACS licenses that come with the ACS appliance are not transferrable. They go away with the appliance because they are bundled with the appliance.

If you get a real server, the ACS licenses that are purchased are permanent and transferrable.

I would also be concerned about unexpected OS changes due to new Windows 10 builds like what is happening with Windows 10 Build 1809. Microsoft does not expect you to be running critical server workloads on a workstation operating system, so any Windows 10 installation is deemed non-critical. Windows Server does not do major operating system version replacements and build upgrades. This means you have more stability.

Future migration

Another factor is migration in the future. I know that with ACS app on a server, we can do a full configuration migration from old server to new server including the licenses.

This is not the case with these appliances in that the licenses are not transferrable because they are tied to the hardware purchase as a “bundle”. I suppose if you continued on with a strategy of just buying a new ACS appliance every 3 – 5 years, you would continue to have the included ACS licenses. And yes it is possible still with the ACS appliance to migrate the configuration of the ACS app.

Final assessment

Therefore, my official verdict is that buying the appliance is not worth it. You would be better off to have a Dell PowerEdge server designed and built by a competent, certified partner like QPC.

The ACS appliance is not an option because it lacks extremely critical features that cannot be spackled over.

- OS does not allow OMSA to be installed = zero hardware monitoring ability
- 1 GbE NIC cannot be LAG due to OS limitations
- No access to Dell server support directly for end user IT manager

- Device does not have enough RAM with only 8GB of RAM to be able to function properly. Other ACS servers with 40 – 50 cams are known to need 24 – 32 GB RAM to perform properly.