

AXIS Camera Station in a virtual environment

Introduction

AXIS Camera Station server may run on virtualized Windows® machines. Axis performs testing and verification on VMware®. However, you, as a system administrator, are fully responsible for the hardware selection and configuration of the virtual machine to make it suitable for your intended purpose.

This document aims to help system integrators and IT departments to dimension virtual machines to run AXIS Camera Station server in a virtual environment. It describes: Considerations and limitations when you set up AXIS Camera Station in a virtual environment. Performance test environments and test results compared to a native environment

Considerations and limitations

The benefits of using virtualization are many. It is more flexible to expand your system, easier to update the hardware, set up test environments and manage in general, etc.

However, virtualization is often used to optimize the utilization of hardware resources for services that are only used occasionally and when demands change. The same cannot be applied to video recording servers since they record continuously from cameras. This puts a constant load on CPU, memory, network as well as storage system.

We strongly recommend you use sufficient reserved hardware resources CPU, memory, network adaptor and storage for each virtual machine. Sharing resources between virtual machines is not tested nor supported by Axis. Additionally, you need to make sure that there is enough network and disk bandwidth resources to handle the number of cameras in the system.

From the test results presented below, you can see that using virtualization does add a performance cost so the requirements for reserved hardware resources that are used in a virtual environment must be above our general hardware guidelines.

<https://www.axis.com/products/axis-camera-station/hardware-guidelines>

Axis support

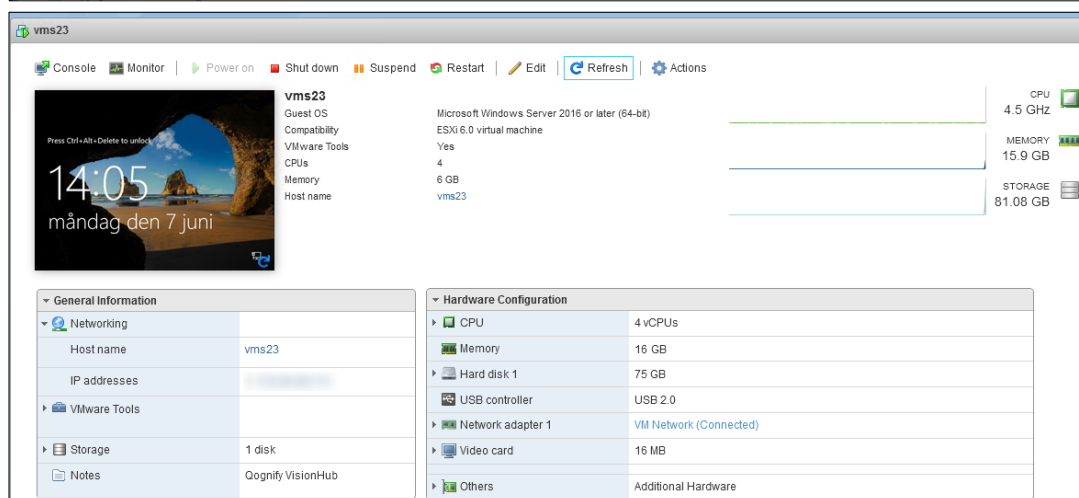
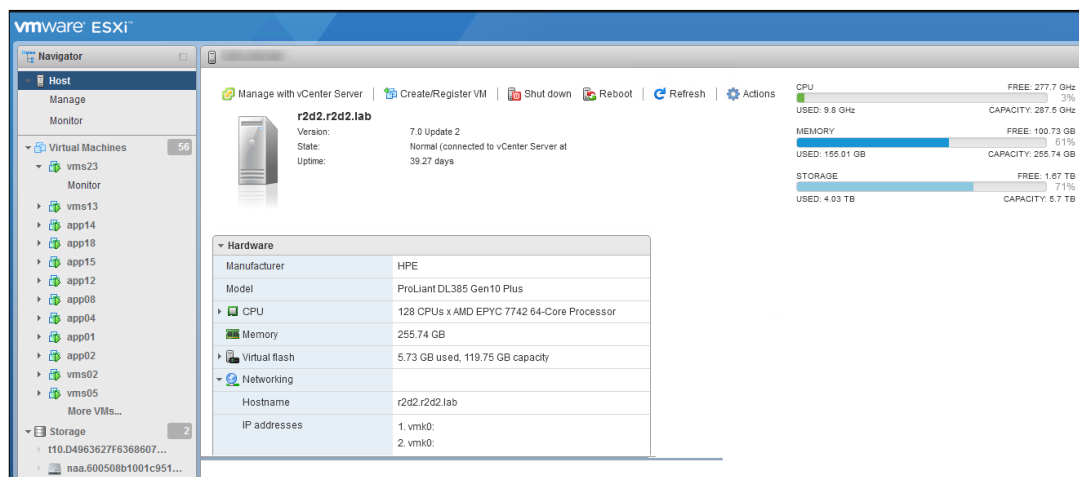
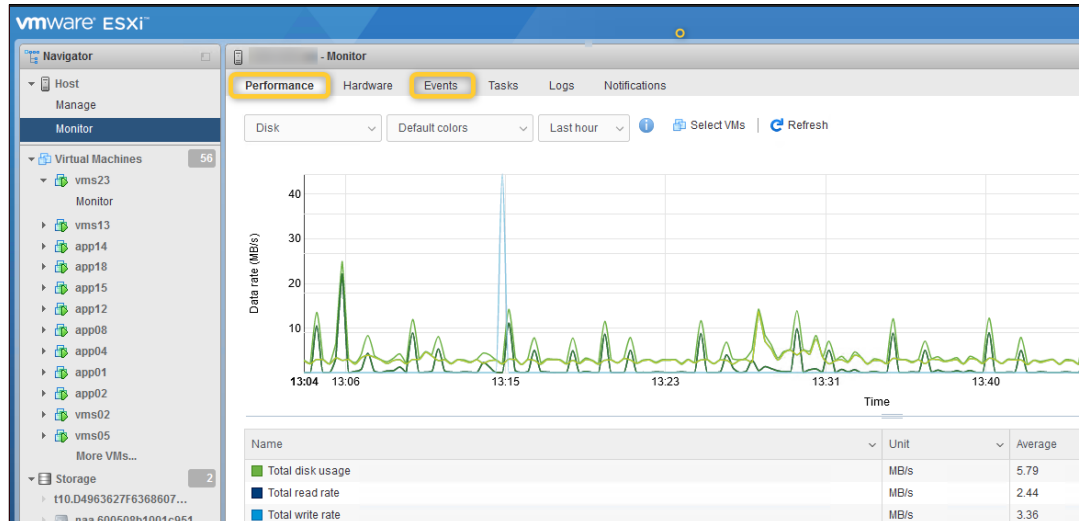
Running AXIS Camera Station system in a virtual environment puts more responsibility on you as an administrator and is difficult for Axis to support and help with troubleshooting. Axis supports AXIS Camera Station, not the virtual machine environment nor the operating system.

An AXIS Camera Station system report includes Windows logs, DxDiag, ipconfig information and AXIS Camera Station developer logs. But unfortunately, it does not give the full picture of the system, as there is no information on how many virtual machines that are running per host and how the hardware resources are allocated or reserved.

When troubleshooting AXIS Camera Station issues in virtual environment, the following information should be provided to Axis Technical Support:

- Host configuration
- Screenshot of the current status for CPU, network and disks
- Information of any errors in the event logs

Also include what resources that has been reserved for the virtual machine. Example below from VMware® 7.0.2:



Performance test

Hardware environments	Host	Reserved for VM
Operating system	VMware® ESXi 7.0 U2	Microsoft® Windows® 10 IoT Enterprise 1909
Total VM(s) used on host	1	
Storage hard drive(s) 7.2K RPM SATA 6Gbps 512e	8 x 8 TB	24 TB
Platform	Dell EMC OEM R540	
BIOS version	2.9.3	
ACS version		5.36.292
CPU	1x Intel® Xeon® Silver 4208, 8 cores, 16 threads	16 vCPUs
CPU base frequency	2.1 GHz	
CPU turbo support	Yes – 2.49 GHz achieved	
RAM	2 x 8 GB	15 GB
Network adapter	2x Ethernet 1 Gb/s	2x Ethernet 1 Gb/s
RAID controller	Dell PERC H730P	
Recording storage RAID		RAID 5 configuration
Recording storage volume		18 TiB (RAID 5 losses included)
Number of video channels		68
Recording method		30 % motion detection and 70 % continuous recording
Recording profile		High profile
Total average recording bitrate		660 Mbit/s

When testing in native environment the same hardware as the host was used, with operating system Microsoft® Windows® 10 IoT Enterprise 1909. The test result is available in the test result table.

Test scenarios	
Test 1	Recording only. No client.
Test 2	Recording + Five clients with live view: <ol style="list-style-type: none"> 1. 4 cameras in split view, streaming 1080p, 30 FPS 2. 9 cameras in split view, streaming 720p, 30 FPS 3. 9 cameras in split view, streaming 1080p, 30 FPS 4. 4 cameras in split view, streaming 1080p, 30 FPS 5. Single client PC with 3 monitors displaying <ol style="list-style-type: none"> a. 9 cameras in split view, streaming 720p, 30 FPS b. 9 cameras in split view, streaming 1080p, 30 FPS c. 4 cameras in split view, streaming 1080p, 30 FPS
Test 3	Recording + Four clients with live view and one with playback: <ol style="list-style-type: none"> 1. 4 cameras in split view, streaming 1080p, 30 FPS 2. 9 cameras in split view, streaming 720p, 30 FPS 3. 9 cameras in split view, streaming 1080p, 30 FPS 4. 4 cameras in split view, streaming 1080p, 30 FPS 5. Playback/scrubbing of 9 cameras in split view, streaming 1080p, 30 FPS

The results show that processor and memory usage in a virtual environment is higher than in a native environment.

Test result				
Test	CPU usage (Native)	CPU usage (Virtual)	Memory usage (Native)	Memory usage (Virtual)
Test 1	8%	14%	5.5 GB	7.3 GB
Test 2	13%	20%	5.6 GB	7.4 GB
Test 3	26%	36%	6.0 GB	7.5 GB