Surveon
Complete Megapixel Solutions

AN_NVR5316 SAS Expansion Feature

Application Notes

Version <1.0>

Surveon
Complete Megapixel Solutions
Technical Support Team

Preface

In Surveillance, recording is a vital part when designing a project, since evidences will need to be kept for further investigations. In analogue system design, even the maximum resolution won't make a huge difference on the storage design, for the D1 resolution is quite small. However, IP Surveillance is going to a new generation that IP cameras can provide mega pixels resolution to deliver clear image quality and high FPS with motions in details. Also, more and more projects are demanding for more, for example, the high FPS requirement in casino projects. About the storage design, we all have to think more.

For a larger storage size, the number of HDD and HDD's capacity should all be considered. With different interfaces and purposes, multiple HDDs, NVR with swappable HDD, and external storage space such as iSCSI, NAS as well as SAS expansion are various options for users to choose from.

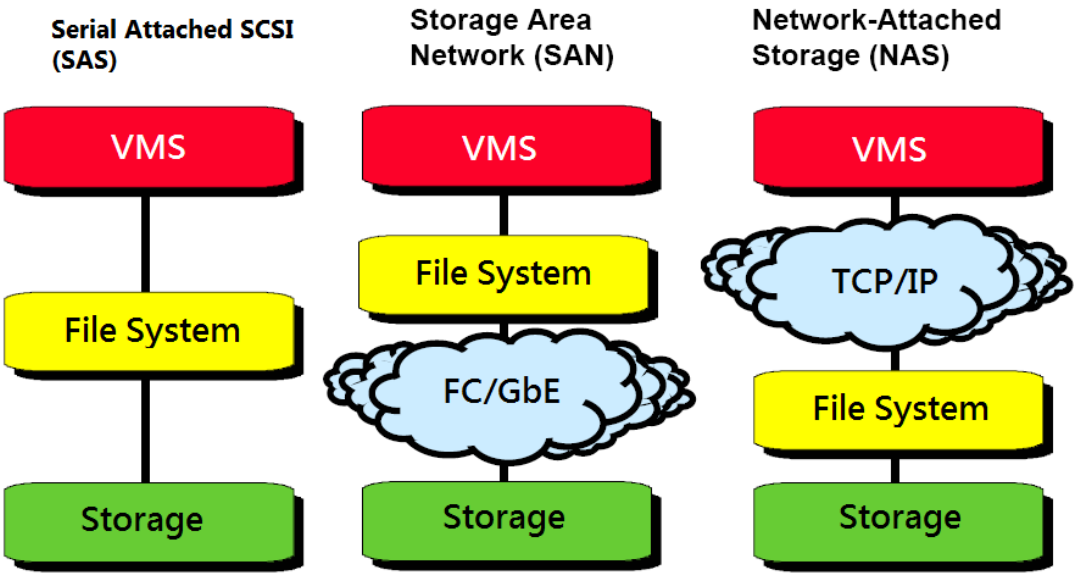
In this application note, Surveon will present the new feature, SAS expansion, in FW3.1.0.A03 of NVR5316 and explain the differences among other interfaces.

The agenda is as below:

1. What is SAS? Comparing with iSCSI and NAS.
2. SAS Scenario
3. Conclusion

1. What is SAS? Comparing with iSCSI and NAS.

Before we discuss SAS, let's see the structures of each interface below.
SAS is directly connected to provide point to point data transmission.
SAN can connect to FC or GbE and to storage space to manage data.
NAS uses TCP/IP to access.



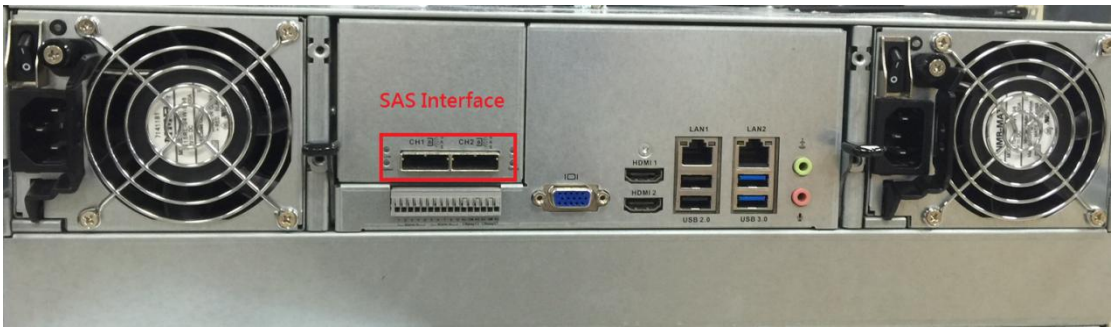
NAS is Network Attached Storage with the File system which can provide service in the TCP/IP platform. It is a well-known solution to provide a storage service in the network. Normally, it uses SAMBA protocol which can provide different OS to access, however, I/O limitation is a major issue when applying for a project with a huge number of recordings.

iSCSI is Internet Small Computer System Interface which can provide SCSI protocol to transfer data via TCP/IP protocol. In addition, some people call IP-SAN and most applications use iSCSI card to accomplish a Network interface to provide IP convenience and increase I/O bandwidth.

SAS is Serial Attached SCSI which provides point to point to transfer data to external storages. In theory, the SAS v3 can support a maximum of 12Gbit/s and it needs to deploy a SAS cable as an exclusive high way to send data. This picture shows how a SAS cable looks like.

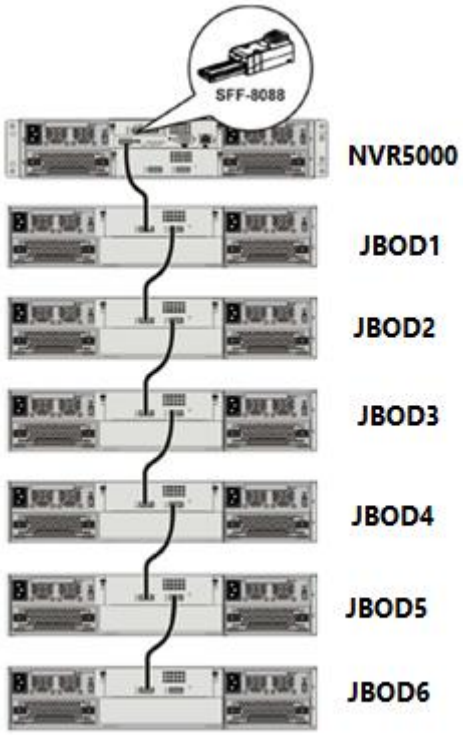
SAS cable

This is the back of NVR5316, with an indication of the SAS interface.



Not only providing point to point high speed transmission, SAS also provides an expansion interface to connect more enclosures to increase storage space.
This picture shows the wiring of JBOD.

The expansion is with other JBODs.

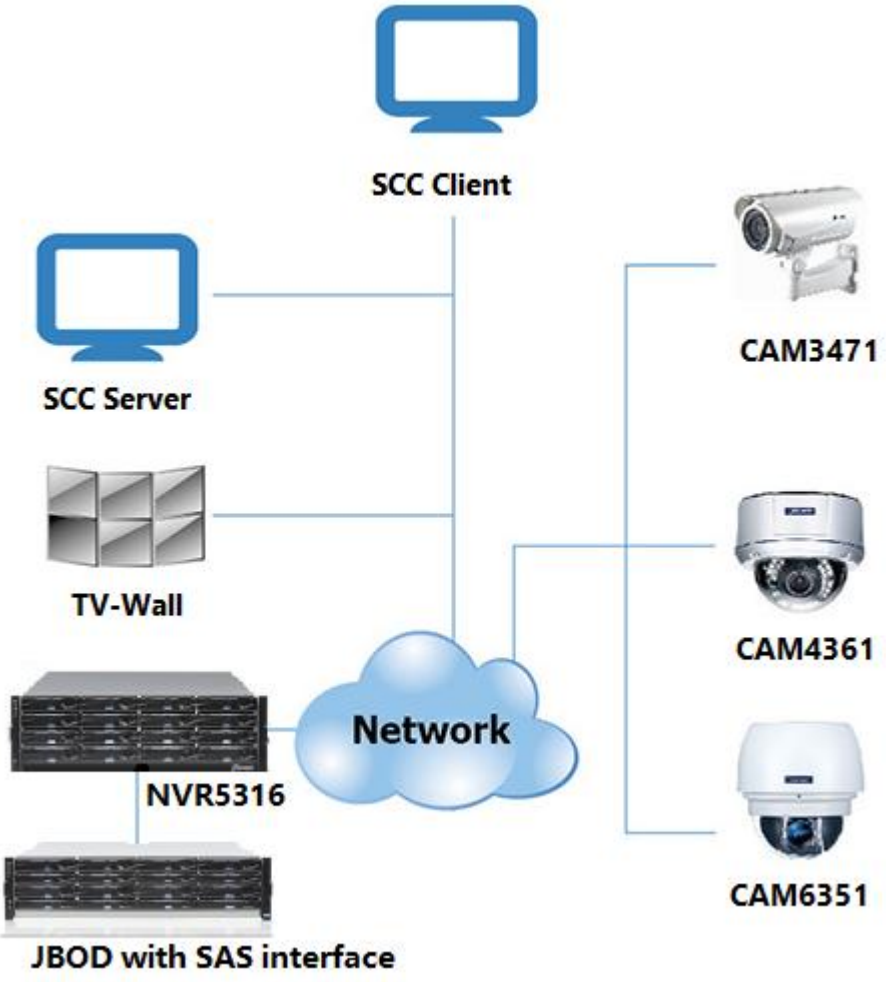


This table shows the comparisons of NAS, iSCSI and SAS.

	NAS	iSCSI	SAS
Platform	TCP/IP	TCP/IP	SCSI
Transfer Medium	Ethernet cable	Ethernet cable	SAS cable
Max. Bandwidth	1Gbps	10Gbps	12G bps
Major cons	Limited I/O speed	Device need to support iSCSI	Limited cable length
Major pros	File share with all OS platform	Ethernet interface	Special line for file transmission
Expandable	No	Yes	Yes

2. SAS Scenario:

This diagram shows the basic hierarchy of surveillance system. It contains remote viewing (CMS client), Central Monitor Server (TV-Wall) and storage.



Various benefits can be foreseen when using Surveon products. For instance, with JB2016, the NVR5316 has SAS interfaces to arrange video files to avoid over consumed bandwidth affecting the network quality. And SAS is extendable to up to 12 enclosures for further use. Surveon cameras with a SD card can record when the network is disconnected to provide a non-stop recording operation. SCC (Surveon Control Center) is Central Management System, centralizing all live view and providing TV-Wall solutions. In addition, SCC server can offer account management for administrators to have access controls from other accounts more easily.

3. Conclusion:

Surveon will release SAS expansion feature in NVR5316 from FW 3.1.0.A03 providing fast and reliable transmission solutions and versatile designs for data storage. Besides easy to initialize and install, the simple network can avoid traffic interferences, creating a pure environment for storing and retrieving. Moreover, Surveon NVR is compatible with Infortrend RAID solutions, performing a comprehensive data protection to secure recordings and maintain data integrity.

Reference

1. Figure1, http://www.surveon.com/solution/solution_city-surveillance.asp