



# **Qsan 10GbE iSCSI SAN Enables 1000+ Channel HD IP Cameras Application**

**P600Q series**

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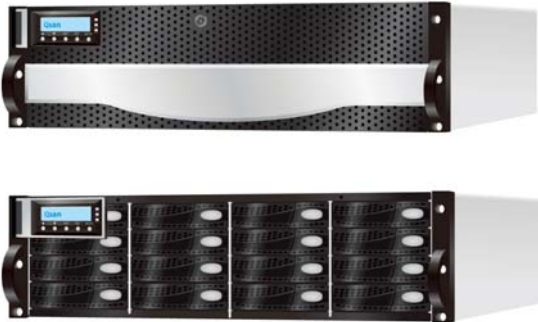
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## Qsan 10GbE iSCSI array enables 1000+ channel IP camera solution



According to IMS research report, digital security and surveillance systems are rapidly replacing older analog CCTV equipments. IP cameras are mainstream and the most common choice for new professional projects. Both IP camera and NVR (Network Video Recorder) categories have a 30%+ CAGR in 2011. As the deployment scale goes up and more content analysis functions add to the system, what kind of storage system can handle the workload? What storage architecture is up for the challenge?

### Background

Qsan was invited by embedded system giant Intel® to conduct Intel Smart Surveillance Solution (ISS) project along with leading surveillance company – Nuuo. The goal is to provide a total solution that supports over 1000 high definition IP cameras recording and live view at the same time. The systems involved including NVR and iSCSI SAN storage are using existing Intel 2<sup>nd</sup> generation Core processor, Xeon C5500/3500 processor and Intel 10Gb Ethernet controller chip. With more and more demands on large scale megapixel IP camera deployment, this highly-integrated solution demonstrates what the future surveillance architecture may look like and proves that iSCSI SAN is the ideal storage system for IP camera surveillance applications.

“NUUO, Qsan, and Intel have worked together to design an IP DSS architecture solution that is ready to meet the challenges of today’s enterprise IP DSS systems, with scalability for the future.”

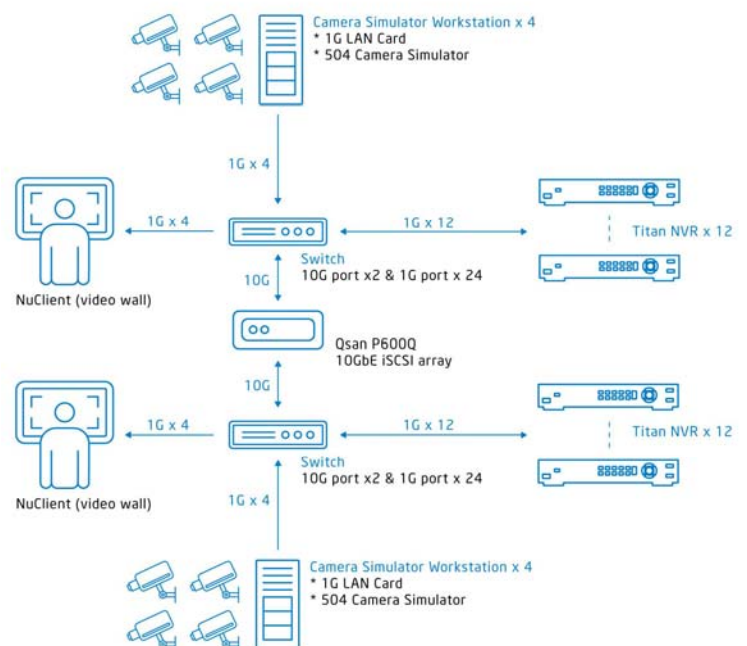
-- David Tuhay  
General Manager, Intel® Corporation

### Challenge

There are eight IP camera simulator workstations that are used to generate 1000+ channels video streaming input to the NVRs. 24 Nuuo Titan NVRs are deployed with 42 channel support in each NVR. Qsan P600Q-D316 dual controller 10Gb iSCSI array is used to handle all read/write requests from Titan NVRs. The storage network is constructed by 2 Dell PowerConnect 5524P switches. Please refer to figure 1 for more details.

So, exactly how much data needs to be stored and accessed when it comes to 1000+ HD IP cameras? For a 1080p high definition IP camera, it generates about 5Mbps with 30 frames/sec throughput (according to H.264 coding protocol). Each Titan NVR is set to process 42 channels of 1080p real-time video stream. An overall of 1008 channels of HD video streaming data coming down to Qsan P600Q, which is a staggering 5Gbps of randomly write access data. So, what kind of storage system is up for the job?

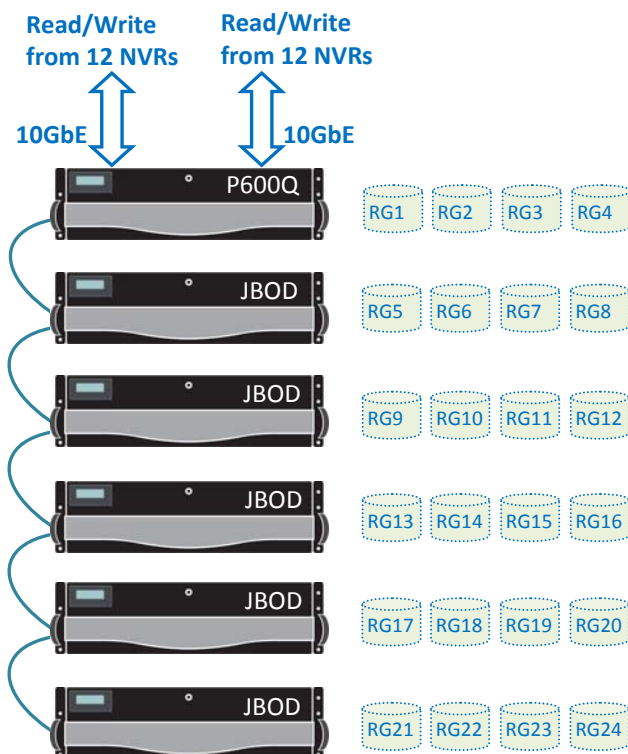
From head to toe, there are several technical challenges we need to overcome. For example, what is the overall network throughput required? What is the processing power on NVR to store and playback video streaming data at real time? What kind of storage system can handle this amount and type of data? How to tackle the stability issue to maintain 24/7 up time? Qsan, Nuuo and Intel® formed an experienced team to solve all the problems. That’s why we call this an integrated solution!



## Solution

The estimated throughput goes beyond what current 1Gb iSCSI storage system can offer on the market. We recommend using 10Gb Ethernet as the storage network to consolidate all data traffic. We deploy one Qsan P600Q-D316 dual controller 10Gb iSCSI array (form factor 3U16) with five Qsan J300Q JBOD cascaded. A total of 96 Seagate SATA hard drives (Constellation ES 2TB) are installed. In order to handle the 24-7 heavy duty workload, enterprise class SATA drive or SAS drive are highly recommended. The trick of organizing these 96 hard drives to satisfy the throughput coming from 24 NVR systems is that each NVR has its dedicated RAID group with fewer HDDs instead of creating a gigantic RAID group with all 96 drives. Therefore, 24 RAID groups are created evenly from these 96 drives using RAID 5 with 4 drives in each RAID group. Only one volume in each RAID group is created and assigned to each NVR.

P600Q iSCSI array can support up to 128 hosts at the same time. 24 NVR systems are not even half of its capacity. There is still plenty room for growth. Processing power is boosted by hardware XOR engine and Intel® I/OAT of Xeon processor and Qsan iSCSI offload technology. The average CPU utilization rate is about 52 percent. To achieve a higher level of data protection, P600Q 10Gb iSCSI system comes with dual controller function that supports fault tolerance, failover, failback, and load balancing.



Under 1000+ ch recording environment, the storage must be stable and high performance. After DSS program test, Qsan does provide an excellent storage solution for the big scale surveillance projects.

-- C.S. Huang  
CTO of Nuuo Inc.

## Benefits

This integrated solution is ideal for deploying large scale surveillance at public transportation systems such as airport, seaport or large facilities like public center, museum, hospital, shopping mall and casino. It has the following advantages.

### Scalability :

This integrated solution can easily handle a deployment scale of less than 1000 HD IP cameras. If more IP cameras are required, you can simply expand the scale by adding additional Titan NVR systems and Qsan JBOD systems. The solution can grow as your business grows to keep your total cost of ownership at minimum and your ROI and utilization rate at maximum.

### Easy management :

Both Titan NVR system and Qsan iSCSI storage array support remote management tools to relieve the burden of IT administrators. Intel® Active Management Technology (AMT) is used to monitor each NVR's hardware and software status. Qsan P600Q can be managed through web UI at a remote site or through a centralized management tool –QCentral, which allows you to manage multiple Qsan iSCSI storage arrays using one single user interface at the same time. When the deployment scale gets bigger and you have multiple Qsan storage arrays, QCentral really comes in handy.

