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**HIKVISION ENTERPRISE
NETWORK STORAGE
HYBRID SAN PRODUCTS**

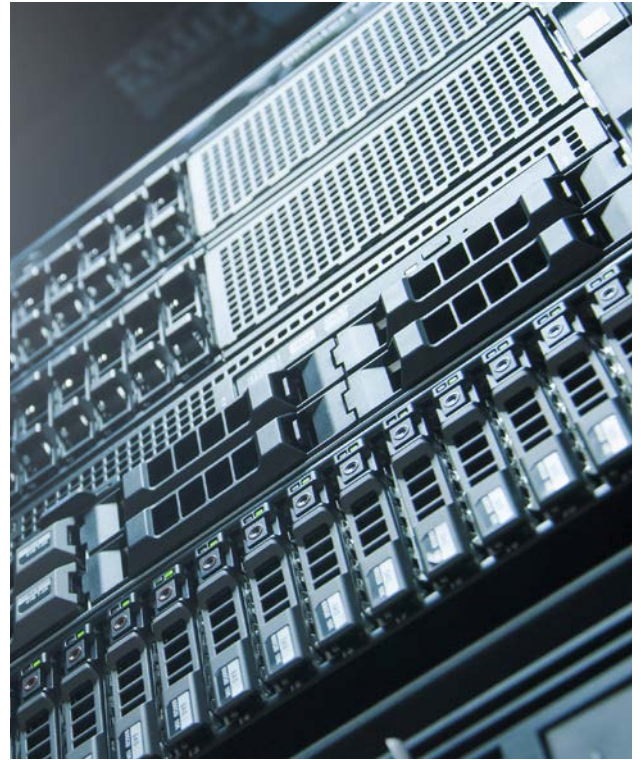
OVERVIEW

For over a decade, Hikvision's industry-leading R&D department has provided state-of-the-art, application-specific storage products, building a reputation for superior data security and sustainability for our customers.

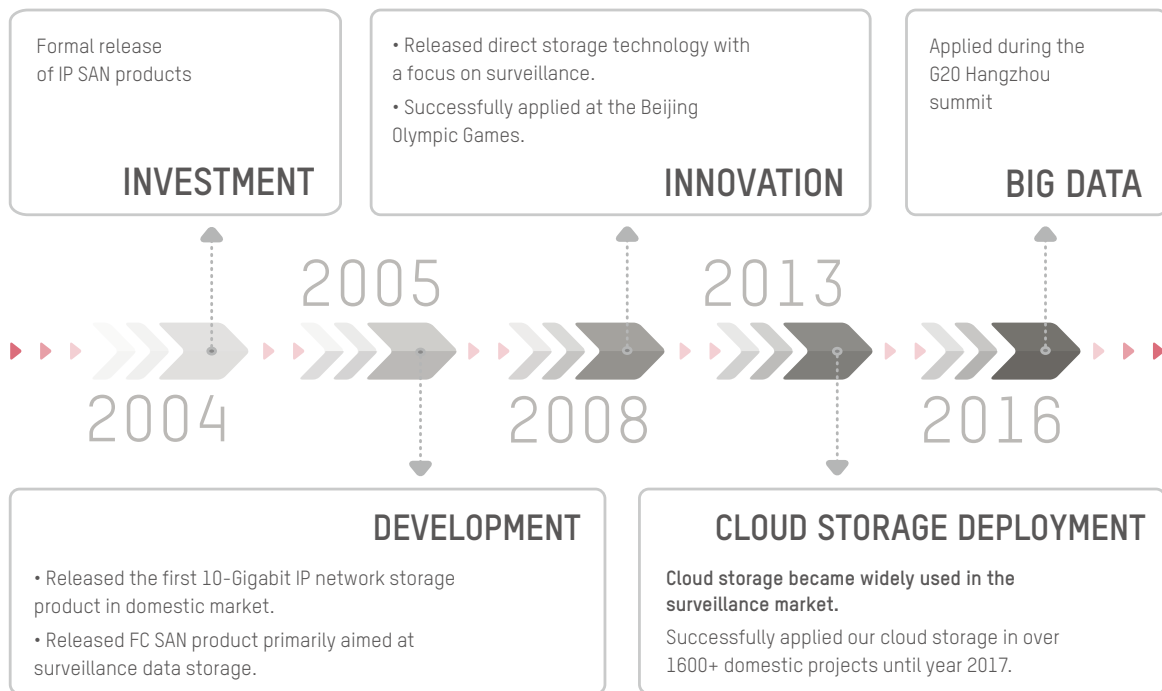
With years of technological savvy, Hikvision has established an extensive and highly-developed line of storage products, combining high data density, modularized design, video management, data safety, and device management technology. Together, these characteristics create the most advanced and flexible storage solutions available. Hikvision's IP SAN and FC SAN support, and its patented direct video streaming technology, provide customers with autonomous control, stability, and efficiency.

With an acute understanding of video storage requirements, Hikvision launched Hybrid SAN products, revolutionizing video storage. By virtue of its unique direct video streaming technology, Hikvision's solutions need no recording servers. Directing streaming and video storage in Hybrid SAN not only enhances efficiency but also guarantees enterprise-level video data security.

Supporting lab-tested and field-proven IP SAN technology, Hikvision Hybrid SAN products are compatible with leading VMS like Milestone, Axxon, and ISS. Hikvision Hybrid SAN products provide you a truly flexible enterprise video storage solution.



HIKVISION STORAGE PRODUCTS R&D HISTORY



HIKVISION STORAGE PRODUCTS MARKETING MILESTONE

<p>No.1</p>	<p>No.1</p>	<p>150PB</p>
<p>World's No. 1 SAN storage in video surveillance, 2016 (according to IHS Markit)</p>	<ul style="list-style-type: none"> • First to develop direct video streaming technology • First to develop direct picture streaming technology • First to develop video+picture direct streaming technology • First to release CCTV cloud storage solution 	<p>150 PB in a single, very large Safe City project deployment</p>

KEY FEATURES

HYBRID SAN – DUAL STORAGE MODE SOLUTION



IP SAN

Supports standard iSCSI
Supports 3rd-party VMS systems – Milestone, Axxon, ISS, and more



HYBRID SAN

Supports ONVIF/RTSP
Supports direct streaming from 3rd-party cameras




DIRECT STREAMING

Hikvision Hybrid SAN products can work perfectly in IP SAN mode with your existing system. They can also work in direct streaming mode for new installation with no need of a recording server, providing a cost-effective and flexible solution.

COST-EFFECTIVE ENTERPRISE STORAGE SOLUTION

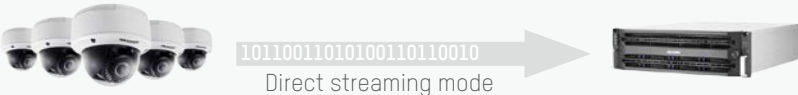
IP SAN SOLUTION



Recording servers

VS

HYBRID SAN SOLUTION



Direct streaming mode

The direct streaming mode of Hikvision's Hybrid SAN solution reduces your expenditures on recording servers, but also improves efficiency of search and write operations with a simplified process, making applications flexible and budget-friendly.

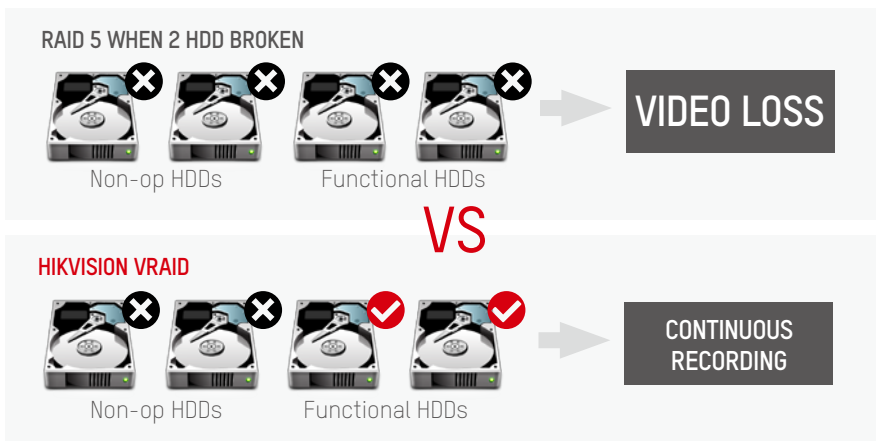
QUICK VIDEO SEARCH AND RETRIEVAL



Conventional file retrieval path with IP SAN:
File system\Sub-file system\File\Location
File retrieval with Hikvision direct streaming:

- Specify camera by assigned number
- Select related data volume
- Set the offset (start and end time of the video segment)

VRAID (RAID 5+) – SUPERB RECORDING CONTINUITY

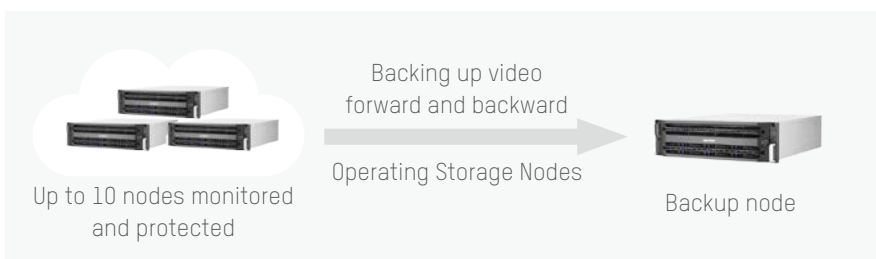


RAID Class	RAID 5	Hikvision VRAID
With 2 Failed HDDs:		
Data Integrity	NO	NO
Continuous Recording	NO	YES
With more than 2 Failed HDDs:		
Usable Footage in Functional HDDs	NO	YES
Continuous Recording	NO	YES

- VRAID continues to function even when two or more hard drives fail; video recording remains uninterrupted.
- Data stored on functioning hard drives can still be played back.

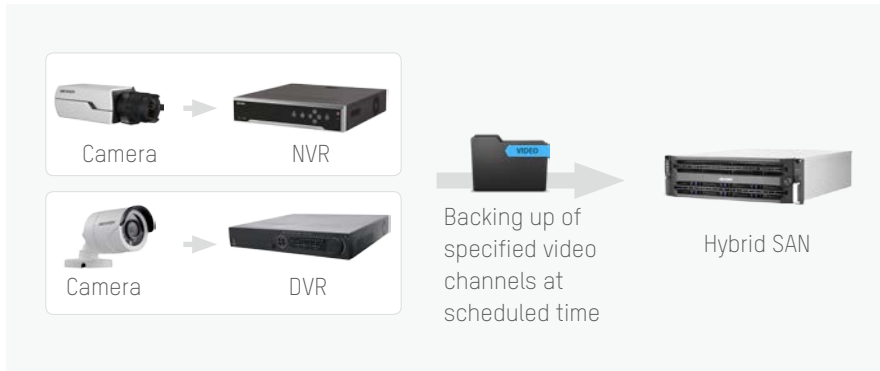
*Note: VRAID is only used with single-controller Hybrid SAN products DS-A81016S and DS-A80624S.

EXCELLENT N+1 FAILOVER FOR CONTINUED OPERABILITY



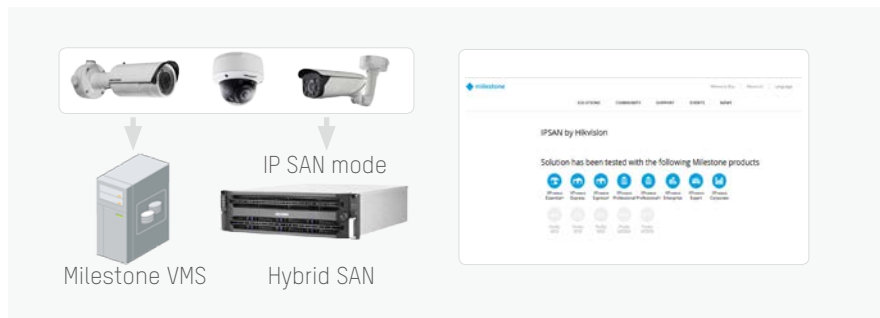
- One Hybrid SAN backup node can take over workloads from multiple failed host nodes.
- When a failed host node goes back to normal, the backup node will transfer the workloads back.

SCHEDULED BACK UP FROM DVRS AND NVRs



HD video can be stored locally in an NVR or DVR using a LAN. When the network is available, the NVR or DVR transfers video back to Hybrid SAN based on pre-configured rules. This creates an effective video backup solution under restricted data-transmission conditions as, for example, when bandwidth is limited.

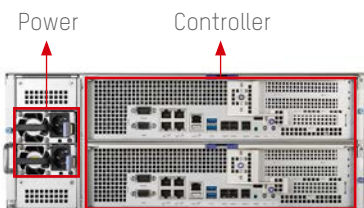
PROVEN COMPATIBILITY WITH LEADING VMSS



- Standard iSCSI protocol support
- Lab-tested and field-proven compatibility with Milestone, ISS, Axxon, and others

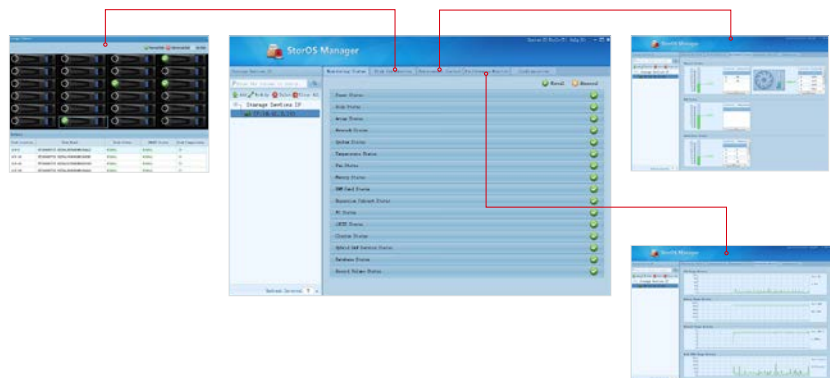
HIGH RELIABILITY HARDWARE DESIGN

- Modularized hardware design – Easy to install and maintain
- Hot swapping of HDDs and controllers without traffic interruption ensures system availability



AN EASY-TO-MAINTAIN SOLUTION

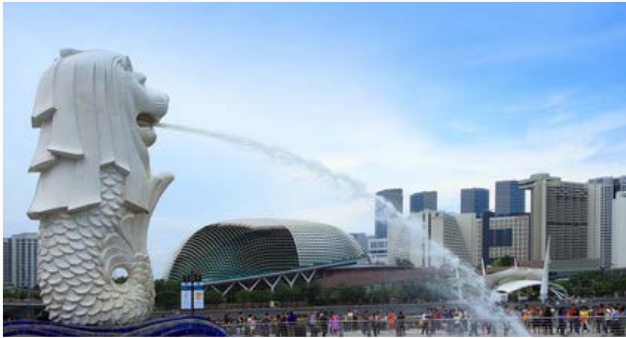
Free maintenance software monitors status of HDDs, CPUs, power units, and fans in real-time.



PRODUCT SHOWCASE

Model Name	DS-A81016S	DS-A80624S	DS-AT1000S/192	DS-A82024D
Product Image				
Controller	Single	Single	Single	Dual
Form Factor	3U, 16 HDDs	4U, 24 HDDs	4U, 24 HDDs	4U, 24 HDDs
Capacity	IP SAN 180-ch	IP SAN 180-ch	IP SAN 180-ch	IP SAN 256-ch
D1 (2 Mbps) Recording + Playback	Direct streaming 320-ch	Direct streaming 320-ch	Direct streaming 320-ch	Direct streaming 448-ch
RAID Levels	0, 1, 3, 5, 6, 10, 50, VRAID, JBOD, Hot-Spare	0, 1, 3, 5, 6, 10, 50, VRAID, JBOD, Hot-Spare	0, 1, 3, 5, 6, 10, 50, VRAID, JBOD, Hot-Spare	0, 1, 3, 5, 6, 10, 50, JBOD, Hot-Spare
Drive Support	1 TB, 2 TB, 3 TB, 4 TB, 6 TB, 8 TB SATA	1 TB, 2 TB, 3 TB, 4 TB, 6 TB, 8 TB SATA	1 TB, 2 TB, 3 TB, 4 TB, 6 TB, 8 TB SATA	1 TB, 2 TB, 3 TB, 4 TB, 6 TB, 8 TB SAS
Memory	4 GB by default (max. 32 GB)	4 GB by default (max. 32 GB)	4 GB by default (max. 32 GB)	8 GB per controller (expandable to 32 GB)
Processor	64-bit multi-core processor	64-bit multi-core processor	64-bit multi-core processor	64-bit multi-core processor
SAS Extension Interface	Support	Support	-	Support
Ethernet Interface	4 x 100/1000 Mbps RJ-45 interfaces (one for management)	4 x 100/1000 Mbps RJ-45 interfaces (one for management)	4 x 100/1000 Mbps RJ-45 interfaces (one for management)	<ul style="list-style-type: none"> • 5 x 100/1000 Mbps RJ-45 interfaces per controller (one for management) • Additional 4 x 1000 Mbps RJ-45 interfaces or 2 x 10000 Mbps RJ-45 interfaces or 4 x 8 GB FC interfaces can be added per controller
Management Method	Web	Web	Web	Web
Operating Environment	Humidity: 5% to 90% (non-condensing)	Humidity: 5% to 90% (non-condensing)	Humidity: 5% to 90% (non-condensing)	Humidity: 5% to 90% (non-condensing)
	Temperature: 5°C to 40°C	Temperature: 5°C to 40°C	Temperature: 5°C to 40°C	Temperature: 5°C to 40°C

REFERENCE CASES



SINGAPORE TELECOM PROJECT

Requirements and Challenges

Limited rack space and network bandwidth

Hikvision Solution Benefits

Hybrid SAN provides scheduled backup to retain video from DVR or NVR at night



THAILAND BANKING PROJECT

Requirements and Challenges

Hundreds of cameras in a multi-layered application

Hikvision Solution Benefits

Hybrid SAN provides graded management and centralized storage in each grade



QATAR RESIDENTIAL PROJECT

Requirements and Challenges

120-day video storage with stable operation

Hikvision Solution Benefits

High-density, space-saving 72-Bay/8U storage and N+1 failover for enhanced system security



U.S. PHARMACY PROJECT

Requirements and Challenges

Four years of dual-layer storage as required by law

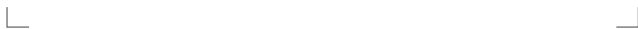
Hikvision Solution Benefits

Dual controller with JBOD for extended storage



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