



iVMS-5120-V2.0-HikCStor Operation Manual

Hangzhou Hikvision Digital Technology Co., Ltd Wuhan Research and Development Center

<http://www.hikvision.com>

Security Solutions for Customer Focused

Thank you very much for purchasing the products. Please contact us if you have some questions or needs.

This operation manual is applied to **iVMS-5120-V2.0-HikCStor**.

This operation manual may contain technical inaccuracies, some places where product functions don't correspond with operation or print errors. We will update the content according to the product functions and regularly modify and update the product or procedures described in this manual. The updated content will be added to the new version of this manual without further notice.



Attention of Smart Cluster Storage System

- Cannot modify IP address and time of the server if the system deployment is completed.
- Calibrate the time for all the sub-modules when deploying all the sub-systems to reduce the time difference for each module in the system
- When Cluster storage management nodes are configured and work normally, adjust the hardware devices according to the certain order. Make sure to shorten the interruption time for the cluster to provide service, please contact the relevant technical personnel about the specific operation sequence.

Content

1	Overview.....	1
1.1	Introduction of Smart Cluster Storage Product.....	1
1.2	Term Interpretation	2
1.3	Product Function.....	3
1.3.1	Smart Cluster Storage- Video Function	3
1.3.2	Smart Cluster Storage-Picture Function	5
1.3.3	Smart Cluster Storage-File Function.....	6
1.3.4	Smart Cluster Storage-Smart Stream Function	7
1.3.5	Smart Cluster Storage-System Management Function	7
1.3.6	Smart Cluster Storage-Operation and Maintenance Management Function	8
1.4	Smart Cluster Storage System Deployment Structure Diagram	9
1.4.1	Standard Cluster.....	9
2	Standard Cluster System Deployment	11
2.1	Preparation Before Installation	11
2.1.1	Hardware Environment	11
2.1.2	Software Environment	11
2.2	Storage Point Deployment	11
2.2.1	CVSN Internet Configuration	11
2.2.2	CVSN Disk Initialization.....	14
2.2.3	Ordinary Storage CVSN Node Deployment	15
2.3	Management Node Deployment	22
2.3.1	Installation of Management Node Deployment System	22
2.3.2	Installation of Management Node Software	22
2.4	Standard Double Clusters Machine HA Formation	24
2.4.1	Bind Net Port	24
2.4.2	HA Cluster Formation and Initialization.....	24
2.5	Establish Standard Cluster Cluster.....	29
2.5.1	Bind Network Interface.....	29
2.5.2	Establish & Initialize Standard Cluster Cluster	30
2.6	Configure Standard Cluster	33
2.6.1	Configure CVS	33
2.6.2	Create Domain	33
2.6.3	Modify Domain.....	34
2.6.4	Add CVS to Domain.....	34
2.6.5	Create Resource Pool.....	35
2.6.6	Modify Resource Pool	36
2.6.7	Configure CVA	37
2.6.8	Add CVA to Cluster	38
2.6.9	Modify CVA Parameter.....	39
2.6.10	Configure CCU	39
2.6.11	Configure Synchronization Server.....	40
2.6.12	Configure Group IP	41

2.6.13	Resource Pool User Management	42
2.6.14	Manage Bucket	44

1 Overview

1.1 Introduction of Smart Cluster Storage Product

With the large-scale application of high-definition video, security video security system is larger and larger. The data types stored in the system are various and the complexity of the industry application improves constantly. Video data need to be stored in the storage system for a long time and require the accurate invoking at any time, which put forward new requirements on the reliability and performance of the storage system. In the complex system in the future, the data will grow explosively, so it is particularly important to provide fast storage and retrieval technology for massive data. The storage system is becoming the decisive factor in the future development of video security technology.

In the face of the massive storage requirements of EB level growth in recent years, the capacity and performance of the traditional NVR, SAN or NAS will be a bottleneck. However, Cluster storage can break through the bottleneck, but also achieve a linear expansion of performance and capacity, which is a new choice for government and enterprise users of pursuing high performance and availability.

Cluster storage is a new concept which extended and developed based on Cluster Computing which is a system of providing external data storage and service access functions. Through the application of cluster, grid technology or distributed file system, Cluster storage apply storage virtualization technology to store a large number of different types of various network volumes with the application software to work together. So Cluster storage is considered as the Cluster computing system of configuring large capacity storage volume.

Based on the technical and functional characteristics of Cluster storage, Hikvision designs a set of Hikvision smart Cluster storage system which specifically for the storage and management of large capacity video data, meets the special application requirements of video security and

application requirements of file storage. (Hikvision smart Cluster storage called in following sections)

Through the combination of Cluster storage technology, intelligent application in video security and big data technology, Hikvision use the integration of hardware and software design to provide “security”, “intelligent” and “big data” professional storage services with uniform, flexible and safe characteristics.

1.2 Term Interpretation

Name	Meaning
CVMN	Cluster Video Manage Node
CVSN	Cluster Video Storage Node
CVM	Cluster Video Manage
CVS	Cluster Video Storage
CVA	Cluster Video Access
CPM	Cluster Plan Manage
CDT	Cluster Data Transfer
CCU	Cluster Calculate Unit
ASSN	Asynchronous Storage Service Node
ASS	Asynchronous Storage Service
Domain	Composed of multiple storage nodes. The domain can be divided into lots of resource pools
Group	Composed of a number of storage nodes in a domain
IPC	IP Camera
Stand Cluster	Independent CVMN hardware device, installed CVM program and provides external service through the only virtual IP address

1.3 Product Function

1.3.1 Smart Cluster Storage- Video Function

1. Recording Management Function

Function	Function Description
Recording schedule Management	Link the Recording schedule on the platform and synchronize the Recording schedule to each storage node
Recording schedule Execution	Confirm the channel and storage address according to requirements and responsible for the write operation from recording data to lower module
Event recording	Perform recording tasks according to the specific event and the priority is higher than the timing recording

2. Video Storage Function

Function	Function Description
Video Recording	Save the recording data from the front-end device by the system according to the user's plan. The recording type and header are specified by the user and the storage opens the related resources
	Revise recording type dynamically: when acquiring the front-end video data, we can modify recording type according to the alarm type. Collected data after modifying preserves to the system immediately and reflects in the data type
Video Retrieval	Search the recording data by the user through the encoder ID, recording type, time period, locking and label, etc.
Video Playback	Support playback about the recording data according to encoder ID, time period and recording type
	Support the positioning of the playback time about the recording data according to encoder ID and time period
	Support fast and slow forward

	Support positive and reverse playback
	Support I frame playback
	Support to pause playback manually
	Support to stop playback manually
Video Download	Support to download about the recording data according to encoder ID and time period
	Support to resume from the breakpoint
	Support to stop download manually
Video Locking	Support to lock the specified video and the locked data is not covered circularly
	Support the locked video clips will unlock when the locking time expires
	Support to unlock the specified video clips manually
Video Backup	Support the local Cluster storage backup about recording data according to encoder ID and time period
	Support the different Cluster storage backup about recording data according to encoder ID and time period
	Support backup automatically according to the number of redundant copies while recording
Video Annotation	Support to mark according to encoder ID and time period
	Support to search, modify and delete the annotation information of the recording data
Cover Circularly	Support coverage storage of the recording data according to the cycle and capacity
	Support that cover circularly automatically when the remaining capacity of single storage node is insufficient
Video Additional Recording	Support to supplement lost video automatically when the flow and video writing is abnormal
	Support sending down the history stream recording schedule and supplement

	<p>history video from front-end regularly</p> <p>Support supplementing history recording manually by the user</p>
Main stream/Sub Stream Storage	Support to store main stream/sub stream according to the schedule optionally
Frame Extracting Storage	Support frame extracting storage according to recording data regularly(only store I frame)
Frame Extracting Display	Support to extract I frame according to the video recording and position effective information from massive video data accurately

1.3.2 Smart Cluster Storage-Picture Function

Function	Function Description
Picture Writing	<p>Support direct Cluster storage of picture from alarm server and picture server</p> <p>Support direct Cluster storage of picture from capture machine</p>
Picture Retrieval (URL preview)	<p>Support picture preview according to the URL</p> <p>Support a variety of compression methods of picture preview: percentage compression, size compression, width and height compression</p>
Picture Download	<p>Support to download the specified picture according to the URL</p> <p>Support the bath download of the picture according to the number of monitoring points and the time period</p> <p>Support a variety of compression methods of picture download: percentage compression, size compression, width and height compression</p>
Picture Locking	<p>Support to lock the specified picture according to the URL and the locked data is not covered circularly</p> <p>Support the bath locking of the picture according to the number of monitoring points and the time period</p> <p>Support that the locked picture will unlock when the time expires</p>
Picture Cover	<p>Support coverage storage of the picture data according to the cycle and capacity</p> <p>Cover circularly automatically when the remaining capacity of single storage</p>

	node is insufficient
Picture Backup	<p>Support the local Cluster storage backup about picture data according to encoder ID and time period</p> <p>Support the different Cluster storage backup about picture data according to encoder ID and time period</p> <p>Support backup automatically according to the number of redundant copies when writing picture</p>
<p>Search Image by Image</p> <p>(support DS-A720XXR-CVS series)</p>	<p>Support to model and store model for the picture writing</p> <p>Support model analysis according to picture writing and return to the picture URL of the high similarity</p>

1.3.3 Smart Cluster Storage-File Function

Function	Function Description
File Upload	<p>Support to upload files via URL</p> <p>Support the metadata information of the setting files</p> <p>Support multiple copy storage</p> <p>Support copy loss and automatic supplement</p> <p>Support multi-step download for big object and resuming from break point</p>
File Permission Control	Support of file setting and modifying permissions. The supported permission: read and write, only read or privately
File Version Number Management	Support to manage the version number of the file and store multiple versions of the file according to the setting
File Copy	The existed file can be copied by the user and metadata information and the permissions of the file can be set again
File Retrieval	File data can be searched via file key

File Download	Support file download via URL
	Support to resume from break point
File Delete	Support to delete file via file key
File Expires Automatically	The expired file will be deleted by the system in the bucket automatically according to the setting bucket period by the user

1.3.4 Smart Cluster Storage-Smart Stream Function

Function	Function Description
Smart Stream Storage	Support to store smart stream of the stripped video separately when recording video
	Support to store smart stream and the corresponding video data according to the different periods
smart stream retrieval	Support to search the smart stream data according to the number of monitoring points and time period, etc.
smart stream download	Support to download the smart stream data according to the number of monitoring points and time period
	Support to resume from break point
	Support to download rapidly
smart retrieval	Smart event retrieval

1.3.5 Smart Cluster Storage-System Management Function

Function	Function Description
Cluster Management	Cluster mode is used by file index and has no single fault, which ensures the safety of the index data
	Fast index management is used by the cluster and position rapidly according to

	the user's various query conditions (the number of the monitoring points, video type, time period, etc.)
Load Balance Management	The virtual IP technology is used by the cluster and provides a unified entrance IP form externally. The access to the cluster shares via varieties of algorithms which reduce the access pressure of a single node
	Monitor the pressure of the real-time back-end storage node and a single storage node can be migrated to other storage nodes when the pressure is too large, which achieves the balance between the entire cluster load
Virtualization Management	Support unified management for the storage devices, regard virtualization as resource pool and manage the virtual resource which is divided into blocks
Automatic Simplification Management	Distribute storage space dynamically and adjust and distribute storage resource space in the system to improve the utilization of the system storage space
Distributed Storage Management	Through the specific algorithm front-end data will be distributed to each storage node, thereby reducing the pressure on the large number of playback for a single storage node
Hybrid Storage Management	(Video/picture/file/smart stream hybrid storage)
Online Extension	(Hard disk expansion)
	(Disk array expansion)
	(Server extension)
Storage Space Management	Support to distribute recording space for the camera randomly and the distributed space can be adjusted flexibly. Support to record file when the camera resumes recording
Permission Management	Multi-level user management. Bind the user and resource pool and limit the user's permission
	The abstract authentication and encryption mechanisms are used by interactive protocols to ensure the security of the network interactive protocols

1.3.6 Smart Cluster Storage-Operation and Maintenance Management

Function

Function	Function Description
System Information Acquisition	Support system information: version, CPU, memory, network card, disk, etc.
System Fault Alarm	Support system fault(CPU, memory beyond the threshold) and Cluster storage program exception, notify alarm to the operation and maintenance platform automatically
Storage Device Alarm	Support that the device fault and device offline will be notified to the operation and maintenance platform automatically

1.4 Smart Cluster Storage System Deployment Structure Diagram

1.4.1 Standard Cluster

Hikvision standard Cluster solution adopts the 'all' cluster program of the management server and storage equipment, management server is mainly responsible for the management of software and hardware resource, business scheduling and distribution, storage node is mainly responsible for data reading and writing. The architecture design can meet the needs of massive data storage and concurrent process of large and medium-sized projects, which provide high performance, high stability and high scalable storage services with video, picture, document and other types of data to the users.

Hikvision standard Cluster program is mainly applied to the large and medium-sized projects, the point of the front-end is more than 1000, storage device is more than eight or projects which have high security storage and data analysis requirements

The architecture of the standard Cluster system is as follows:

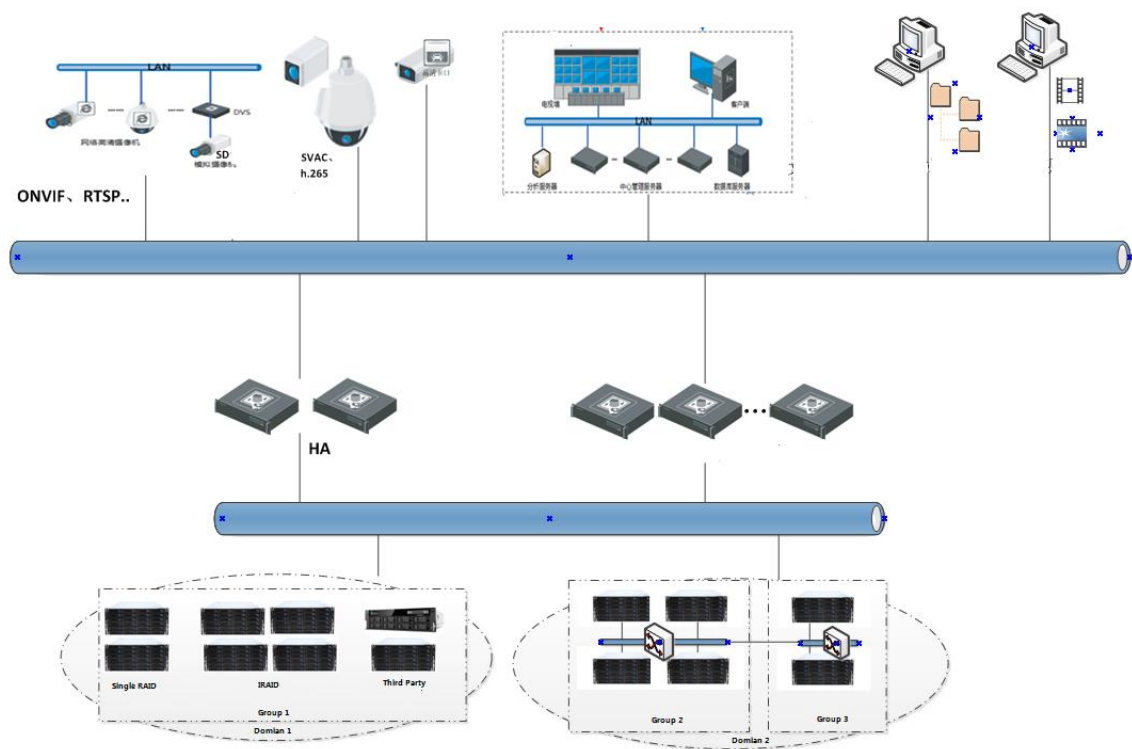


Fig.1.4.1-1 The architecture of the standard Cluster system

2 Standard Cluster System Deployment

2.1 Preparation Before Installation

2.1.1 Hardware Environment

Device Name	Configuration
CVMN	Processor: Configuration≥ dual six-core processors, Dominant Frequency 2.0GHz; RAM: Configuration≥32GB DDR3; HDD: Configuration≥4 hot plug hard disks with 300GB 10K 2.5 ‘SAS’; Support more than 6 hard disks inserted; Internet: Provide≥ two gigabit Ethernet interface; Power Supply: Efficient hot plug redundant power supplies (1+1);
CVSN	Processor: Configuration≥i3/i7/E5-2620; RAM: Configuration≥16GB DDR3; HDD: Configuration≥16/24/36/48/60/72 disk bit hot-swappable hard disk; Internet: Provide≥ two gigabit Ethernet interface; Power Supply: Efficient hot plug redundant power supplies (1+1);

2.1.2 Software Environment

Device Name	Software
CVMN	Linux CentOS 7-64bit
CVSN	Linux Suse 10-64bit (save CVS 1.0.1 system)

2.2 Storage Point Deployment

2.2.1 CVSN Internet Configuration

Prepare a new ordinary storage server or a double control storage server of Hikvision. Insert SATADOM card of the

latest version CVS1.0.1 into SATA slot. Pay attention to put the SATADOM card in front of SATA slot, otherwise, the system will go wrong.

1. Modify IP address of the storage server. The method is as follows:

- 1) Using a gigabit network cable to connect the network port of the notebook computer with the management network port on the storage server. Set the notebook computer IP address same with port management network, for example: 10.254.254.100.
- 2) Make sure the network connection is normal (You can use the Ping 10.254.254.254 to test on laptop.). Open the browser of your laptop and type <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.). Enter to confirm then it will appear the front page of system, as shown in figure 2.2.1-1. There is the serial number of system equipment below the login interface.

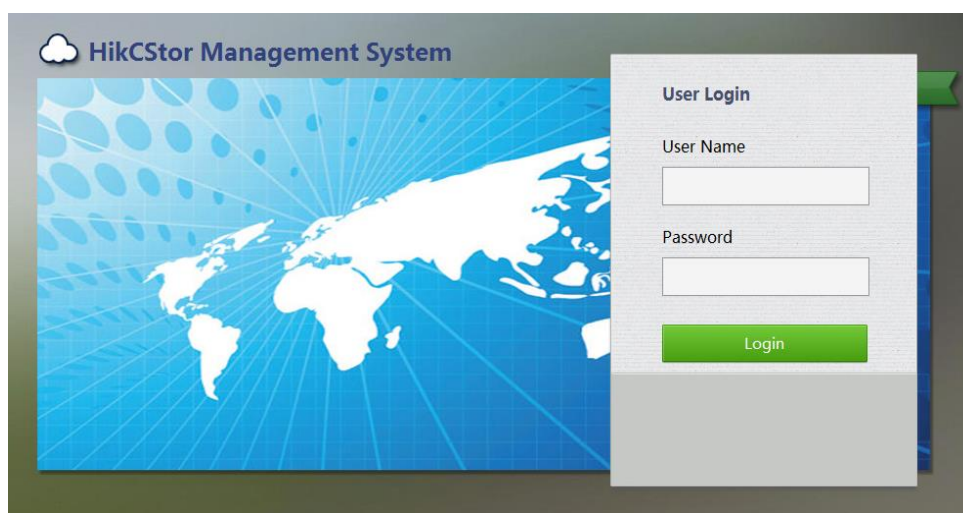


Figure 2.2.1-1 Storage Management System

- 3) Enter the user name and password and go to the storage server management interface.
- 4) Go to the 'System - > Network Management' interface to modify data network port interface IP address of storage server. Suppose you want to modify the network interface IP to 10.192.77.30 of 1. You can check the network interface needing modification in the figure 2.2.1-2 and click 'Modify'. Then you can modify following information in the 'Modify Network Port Information' interface popped up:
 - IP Address of New Network Port
 - Subnet Mask
 - Gateway
 - Giant frame size: Choose bigger than 1500 bytes of the frame to improve the transmission performance. Using giant frame transmission needs the support of routers and other network equipment.

Home Page

Cluster

Virtualizing

Storage

Access

System

Log

Help

Network Management

Configuration Management

Web User Management

Bind Network Interfaces

+ Set Network

		Network Interface Name	IP Address	Subnet Mask	Gateway	MAC	Status	Speed (Mbps)	Network Interface Type
1		veth0	10.254.254.254	255.255.255.0	0.0.0.0	68-05-ca-40-ad-f5	No Connection	0	Management Network Interface

Release Binding

+ Set Network

		Binding Name	IP Address	Subnet Mask	Gateway	Network Interface Name	MAC	Status	Speed (Mbps)
1		bond1	10.18.147.4	255.255.255.0	10.18.147.254	eth0 eth1	0c:c4:7a:b1:69:6c 0c:c4:7a:b1:69:6d	Connected No Connection	1000 0

Figure 2.2.1-2 Set Network Interface IP

After modify storage server IP, you can type <https://xx.xx.xx.xx:2004>(xx.xx.xx.xx is the storage server IP.) on browser in the machines of same network segment to join Storage Management System.

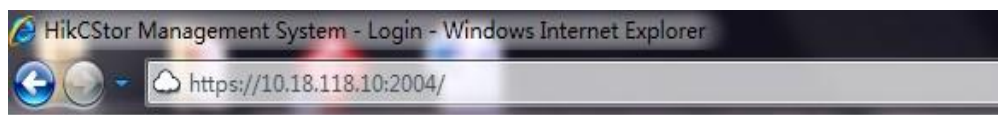


Figure 2.2.1-3 Access IP in Storage Management System

If you need to bind network interface, refer to the following information:

Log on <https://storageIP:2004>. Go to 'System -> Network Management'. Check the network interface needed to bind. For example, check bond1 and bond2 and click 'Bind Network Interfaces'. Make sure the current network speed is '1000MB/s' and binding model is 'Virtualization'. If not, you should click 'Modify' as shown in figure 2.2.1-4.

Note: You need to restart the machine after modify the 'network speed' and 'binding model'.

- Maintenance
- Storage**
- System
- Network
- Alarm
- Time
- Tool
- Log System
- Use Help
- Logout

Create Network Interface [Total: 2]

<input type="checkbox"/>	Network Interface	IP Address	Subnet Mask	MAC Address	Jumbo Frame	Status	Connection Status	Speed
<input type="checkbox"/>	Management NIC	10.254.254.254	255.255.255.0	68:05:CA:53:DC:51	1500 Byte	Enabled	Disconnect	Unknown

[Create NIC Bonding](#) [Modify](#)

System NIC Bonding Info (Total: 1)

<input type="checkbox"/>	System NIC Bonding Info:	IP Address	Subnet Mask	Jumbo Frame	Status	Network Interface	Connection Status	Speed	MAC Address
<input type="checkbox"/>	Bind NIC1	10.41.8.167	255.255.255.0	1500 Byte	Enabled	Data NIC1 Data NIC2	Connect Connect	100Mb/s 100Mb/s	ac:1f:6b:20:0a:12 ac:1f:6b:20:0a:13

[Delete](#) [Modify](#)

[Add Route](#)

Custom Route

[MAC&IP Bonding](#)

MAC&IP Bonding Information

Preferred DNS Server: None [Modify](#)

Alternative DNS Server: None [Delete](#)

Default Gateway: 10.41.8.254

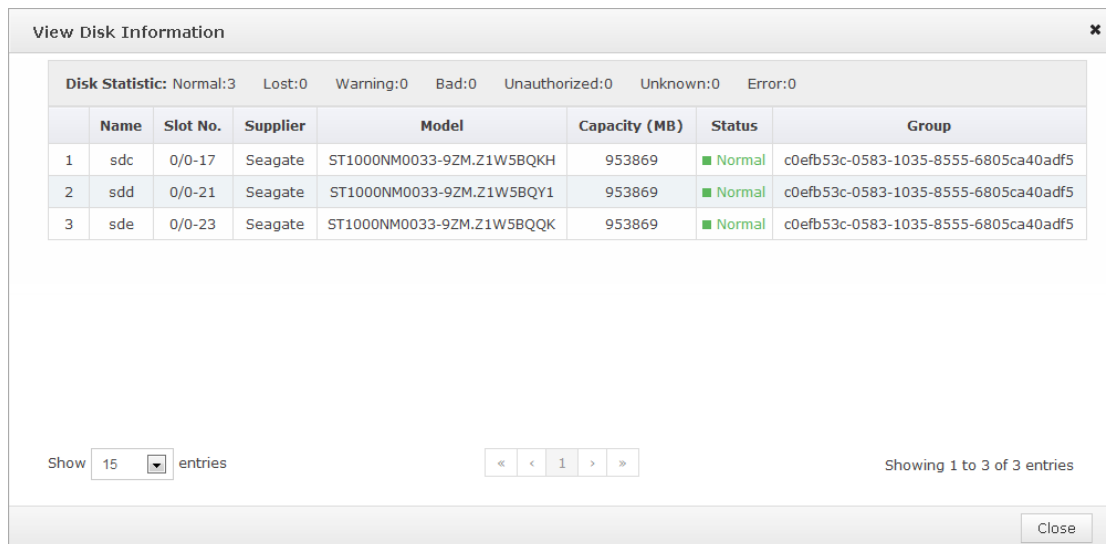
NIC Bonding Mode: Virtualization [Modify](#)

Network Speed: 1000 Mb/s [Modify](#)

Figure 2.2.1-4

2.2.2 CVS Disk Initialization

After inserting hard disk into storage machine, go to the ‘Storage -> CVS’ interface in a HikCStor Management System. Click ‘View Disk Information’ and you will see the disk information as shown in figure 2.2.2-1.



View Disk Information

Disk Statistic: Normal:3 Lost:0 Warning:0 Bad:0 Unauthorized:0 Unknown:0 Error:0

	Name	Slot No.	Supplier	Model	Capacity (MB)	Status	Group
1	sdc	0/0-17	Seagate	ST1000NM0033-9ZM.Z1W5BQKH	953869	Normal	c0efb53c-0583-1035-8555-6805ca40adf5
2	sdd	0/0-21	Seagate	ST1000NM0033-9ZM.Z1W5BQY1	953869	Normal	c0efb53c-0583-1035-8555-6805ca40adf5
3	sde	0/0-23	Seagate	ST1000NM0033-9ZM.Z1W5BQQK	953869	Normal	c0efb53c-0583-1035-8555-6805ca40adf5

Show 15 entries Showing 1 to 3 of 3 entries Close

Figure 2.2.2-1 View Disk Information

For the first time to join the disk storage systems, it will show ‘Unauthorized’ if there is no storage disk testing standards for certification. It should pass the disk test before using as shown in figure 2.2.2-2.



Storage -> HDD Management

HDD Status Rescan Sleep Status

HDD Information (Total: 6)

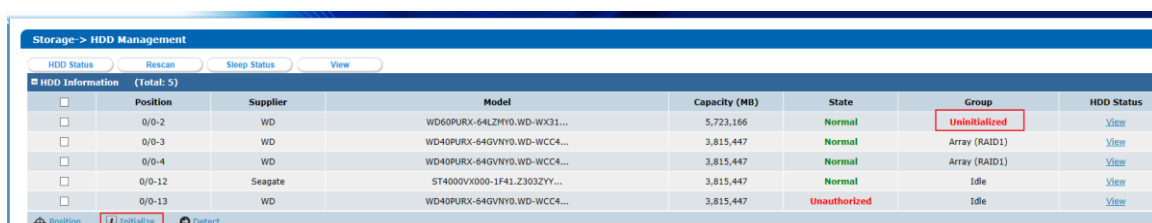
	Position	Supplier	Model	Capacity (MB)	State	Group	HDD Status
<input type="checkbox"/>	0/0-1	WD	WD60PURX-64LZHY0.WD-WX31...	5,723,166	Normal	Idle	View
<input type="checkbox"/>	0/0-2	WD	WD60PURX-64LZHY0.WD-WX31...	5,723,166	Normal	Idle	View
<input type="checkbox"/>	0/0-3	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Normal	Idle	View
<input type="checkbox"/>	0/0-4	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Normal	Idle	View
<input type="checkbox"/>	0/0-12	Seagate	ST4000VX000-1F41.Z303ZY...	3,815,447	Normal	Idle	View
<input type="checkbox"/>	0/0-13	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Unauthorized	Idle	View

Position Initialize Detect

Figure 2.2.2-2

Check the disk of ‘Unauthorized’, click ‘Detection’ and then click ‘start’ in the pop-up window. The disk status will appear ‘normal’ after the test successes.

The ‘Group’ will show ‘Uninitialized’ if the inserted disk is used before like figure 2.2.2-3.



Storage -> HDD Management

HDD Status Rescan Sleep Status View

HDD Information (Total: 5)

	Position	Supplier	Model	Capacity (MB)	State	Group	HDD Status
<input type="checkbox"/>	0/0-2	WD	WD60PURX-64LZHY0.WD-WX31...	5,723,166	Normal	Uninitialized	View
<input type="checkbox"/>	0/0-3	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Normal	Array (RAID1)	View
<input type="checkbox"/>	0/0-4	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Normal	Array (RAID1)	View
<input type="checkbox"/>	0/0-12	Seagate	ST4000VX000-1F41.Z303ZY...	3,815,447	Normal	Idle	View
<input type="checkbox"/>	0/0-13	WD	WD40PURX-64GVNY0.WD-WCC4...	3,815,447	Unauthorized	Idle	View

Position Initialize Detect

Figure 2.2.2-3

Check the column of 'Uninitialized' and click the 'Initialized' to empty the disk data.

2.2.3 Ordinary Storage CVSN Node Deployment

Based on the series equipment of Hikvision including DS-A71024R-CVS, DS-A71048R-CVS, DS-72024R-CVS, DS-72048R-CVS, this chapter will introduce CVSN node deployment for steps.

1. CVSN Software Installation

You should read 'CVSN Module Update Instruction' in <iall-readme.txt> carefully before install CVSN update patch. You can refer to the figure 2.2.3-1:



Figure 2.2.3-1

Go to <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.) to join 'System - > Network Management' interface. Click 'Upload BIOS' button.

Check the operation logs to make sure the upgrade package installation completed after the page appears 'Upload BIOS Successfully' (as shown below).

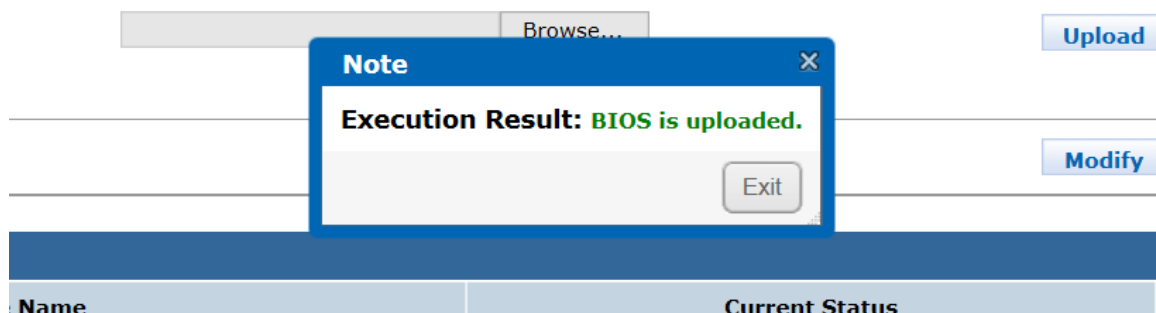


Figure 2.2.3-2 Upload BIOS Successfully

You should complete installing steps and restarting operation strictly referring to 'CVSN Module Update Instruction' in <iall-readme.txt>.

2. CVSN System Format

You need to initialize the storage server in the cluster and add it to the management cluster when use it first time. Only in this way management cluster can manage and use its storage resource.

The method of initializing Storage Server is as followed:

Go to <https://xx.xx.xx.xx:5119> (xx.xx.xx.xx is the storage server IP.) to join 'Storage -> Storage Volume' interface. Click 'Format' button as followed:

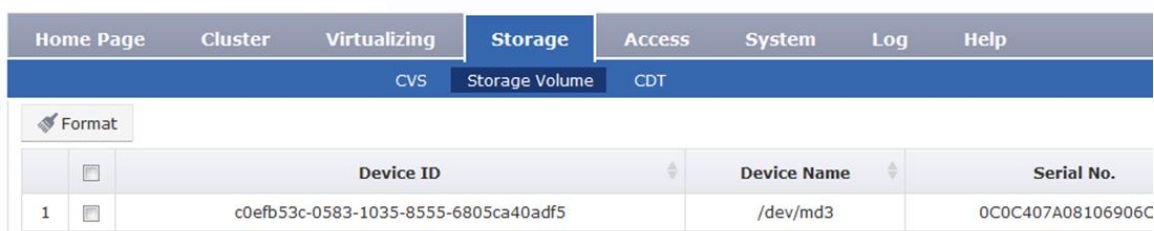
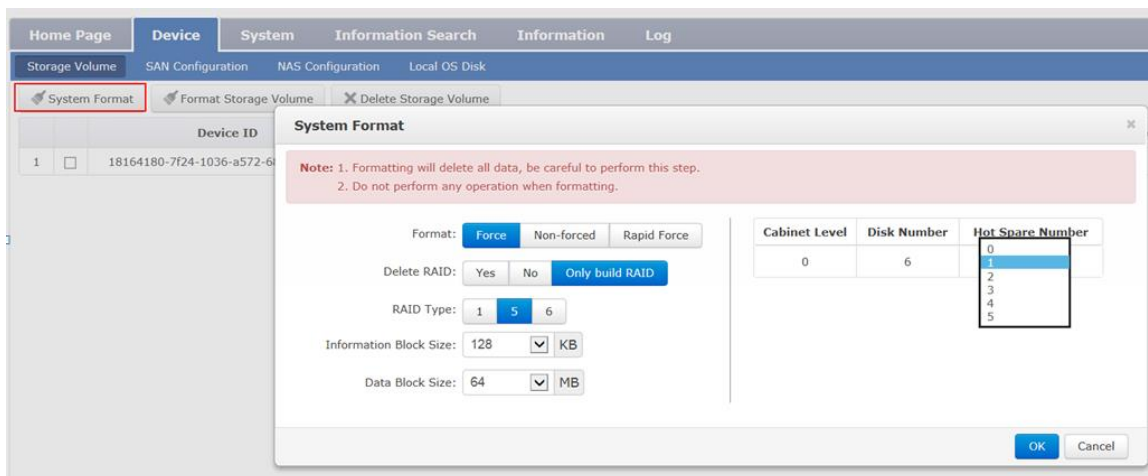


Figure 2.2.3-3 Format

Choose 'Yes' in 'Force Format' box. Choose 'Only RAID' in 'Delete RAID' box. Choose 'RAID5' or 'RAID6' in 'RAID Type' box. Choose the number of hot standby tray and click 'Yes' to complete as shown in figure 2.2.3-4.



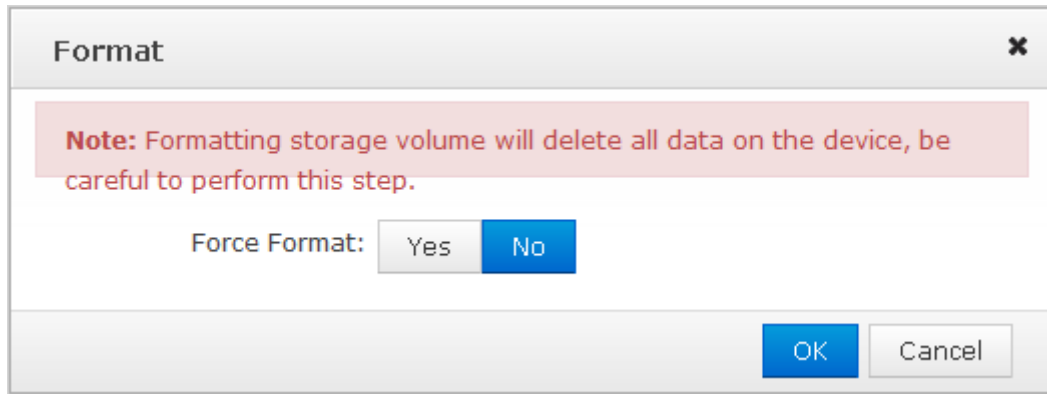
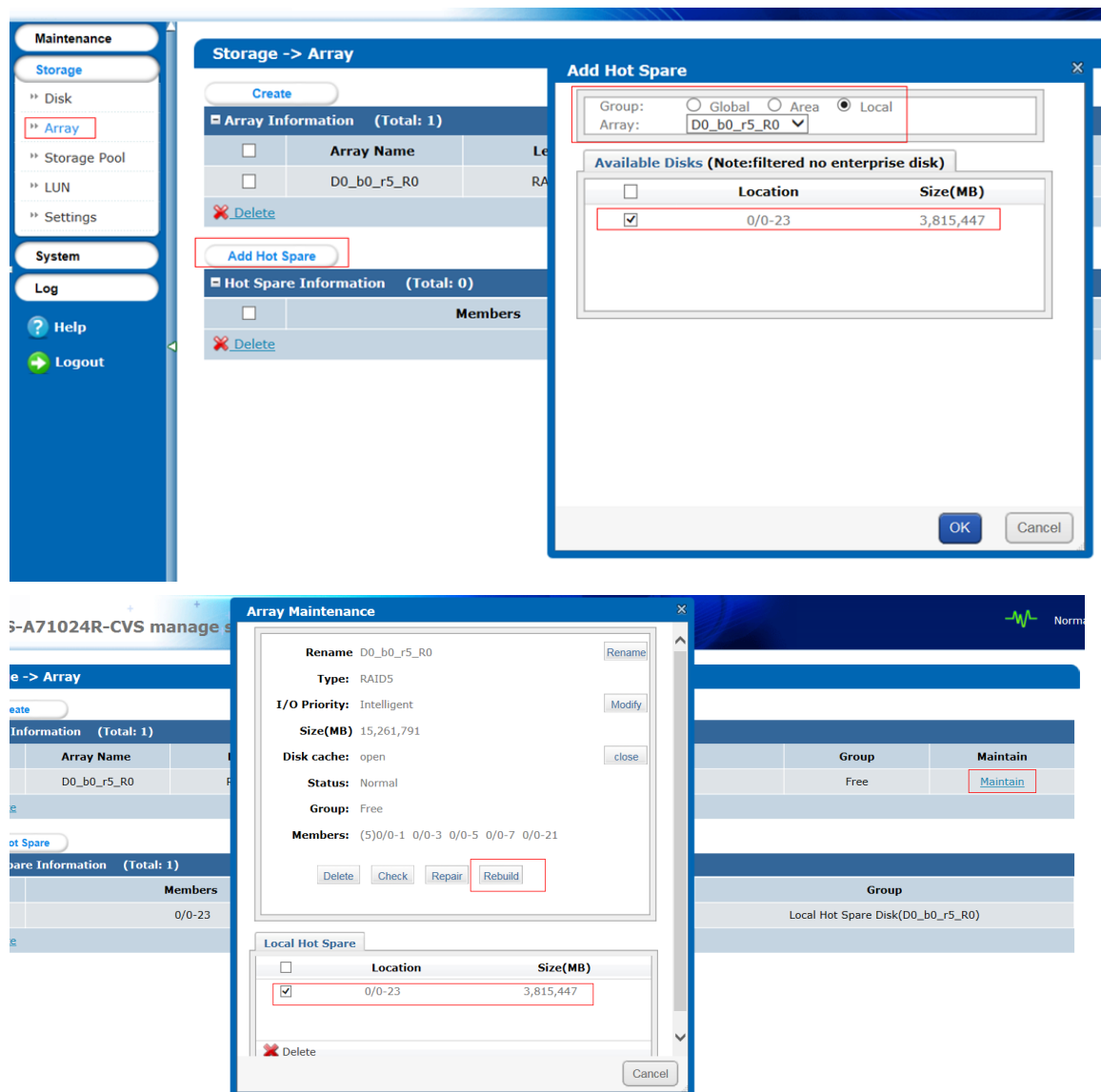


Figure 2.2.3-4 System Formatting Options

The array will be created successfully soon.

If there is some bad disk, you need to replace this HDD, and add a new HDD as hot spare in <https://ip:2004>, then this array will rebuild automatically, if not you can rebuild manually.



There may be 'OFF' in 'CVS Sever State' of 'Configuration Management' as shown in Figure 2.2.3-6. (It is normal protected operation.).

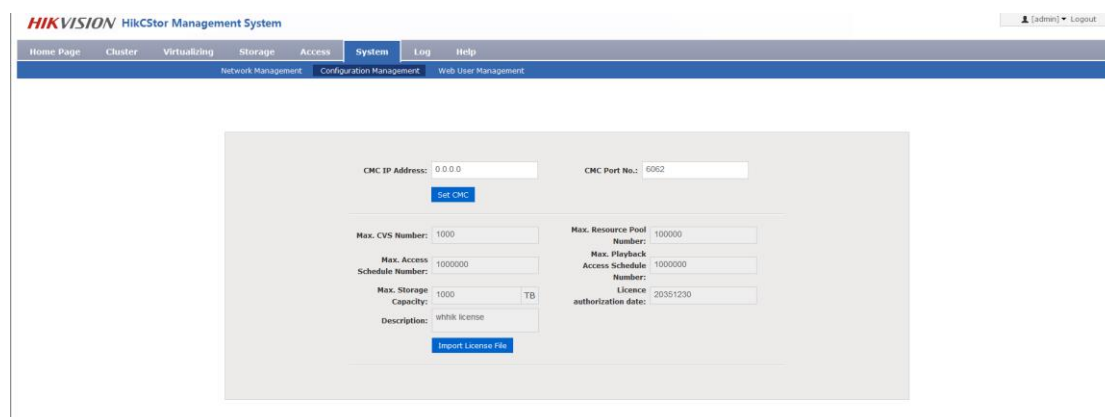


Figure 2.2.3-6.

It is better to synchronize at night or on weekends after build Raid because this step needs several hours. Click 'Force format' and go to <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.) to join 'Storage - > Array Management' interface. Click 'Maintain' to make sure the synchronous speed setting of 'Set Management' is 'High' and modify the array attribute to 'Protection Priority' as shown in figure 2.2.3-7.

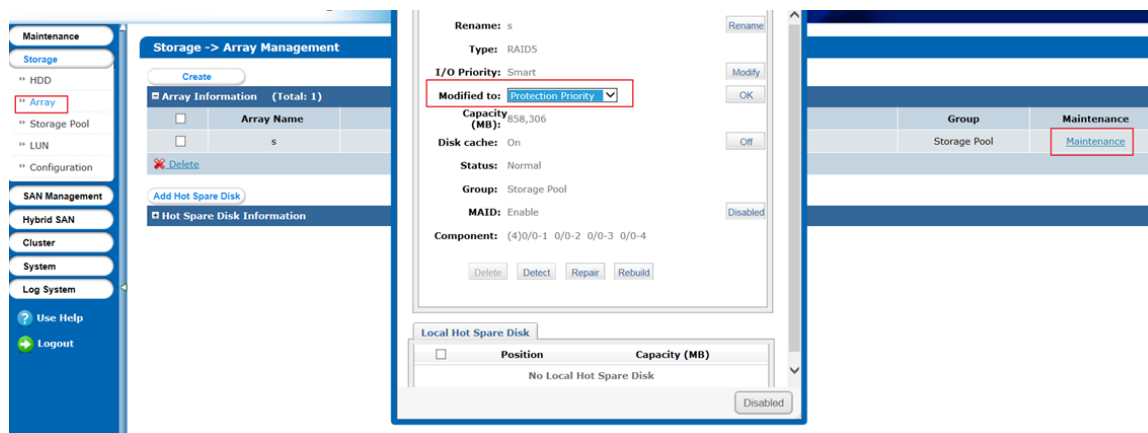


Figure 2.2.3-7

After array synchronization is completed, you can check it in 'Log - > Operation Log' as shown in figure 2.2.3-8.

Home Page		Cluster	Virtualizing	Storage	Access	System	Log	Help
					Operation Log	Log Download	Property Settings	
Year: 2016		Search		Log Download				
	Log Time	Operator	IP Address					
1	2016-09-09 09:25:46	admin	10.18.133.18	System: Switching language succeeded.				
2	2016-09-09 09:24:38	admin	10.18.133.18	System: Switching language succeeded.				
3	2016-09-09 09:24:28	admin	10.18.133.18	Login succeeded.				
4	2016-09-09 09:17:54	admin	10.18.135.111	System: Switching language succeeded.				
5	2016-09-09 09:09:12	admin	10.18.135.111	Login succeeded.				
6	2016-09-08 21:37:12	admin	10.18.134.26	Login succeeded.				
7	2016-09-08 20:25:41	admin	10.18.135.111	System: Switching language succeeded.				
8	2016-09-08 20:12:41	admin	10.18.135.111	Login succeeded.				
9	2016-09-08 19:53:07	admin	10.18.135.111	System: Switching language succeeded.				
10	2016-09-08 19:53:03	admin	10.18.135.111	Login succeeded.				
11	2016-09-08 19:31:13	admin	10.18.135.111	System: Switching language succeeded.				
12	2016-09-08 19:02:06	admin	10.18.135.111	System: Switching language succeeded.				
13	2016-09-08 19:01:55	admin	10.18.135.111	System: Switching language succeeded.				
14	2016-09-08 18:51:44	admin	10.18.135.111	System: Switching language succeeded.				
15	2016-09-08 18:51:04	admin	10.18.135.111	System: Switching language succeeded.				

Figure 2.2.3-8 Array Synchronization Completed

Check RAID and disk status of each CVS node, to see if the disk has been kicked out. Set the synchronous speed to 'Medium' as shown in figure 2.2.3-9.

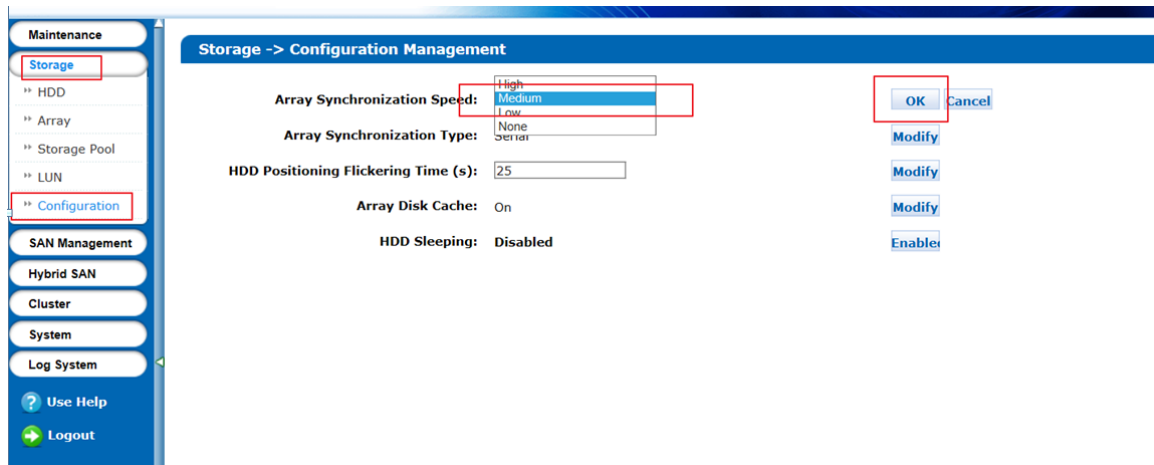


Figure 2.2.3-9

Set the array attribute to the default 'Smart' as shown in figure 2.2.3-10.

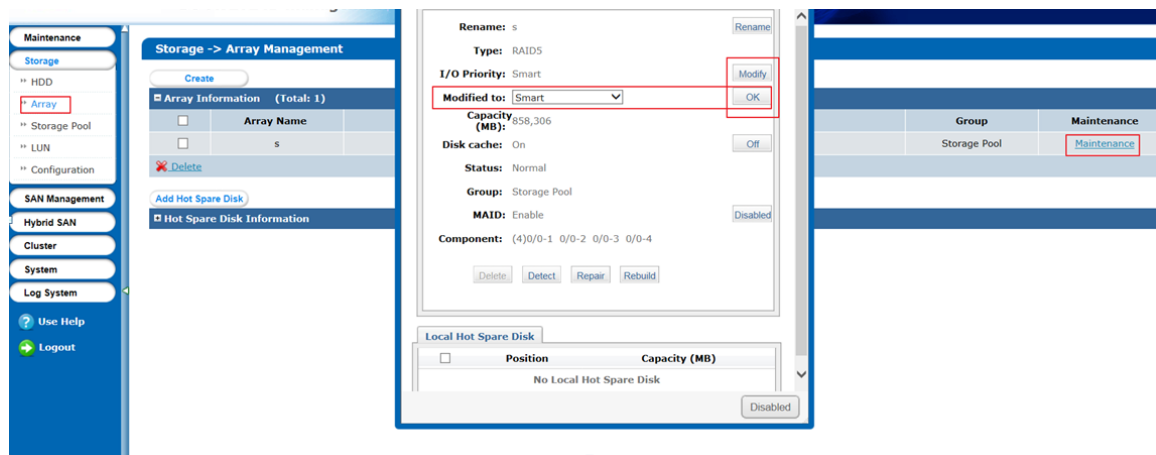


Figure 2.2.3-10

Check whether the array detection is closed in 2004 page after the package upgrade. If not, you must delete the array detection strategies in ‘Maintenance - > Common Maintenance’ page.

Do not need to shut down disk detection strategy as it has less effect on system performance.

Click the ‘Restart’ to restart the storage server in ‘Maintenance - > System Monitoring’, after RAID synchronization is completed.

Then go to <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.) to join ‘Storage - > Storage Volume’ interface. Click ‘Format’ at each storage volume and wait until it completed, as shown in figure 2.2.3-11.

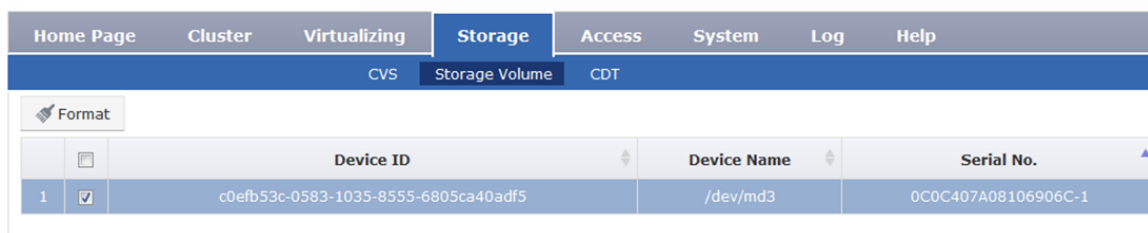


Figure 2.2.3-11 Block Device Format

3. CVA Installation

CVA is Cluster storage access software. You should install the CVA when needing a distributed video program for active video requirements except the image project.

Installation steps are as follows:

Go to <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.) to join ‘System - > Management Tool’ interface. Choose storos-xxxxxxxxxxx-B-iVMS-5120-V2.x.x-Sx-CVA-915.bin to upgrade and view the Operation Log making sure it completed. Now you can run the CVA without restarting the server.

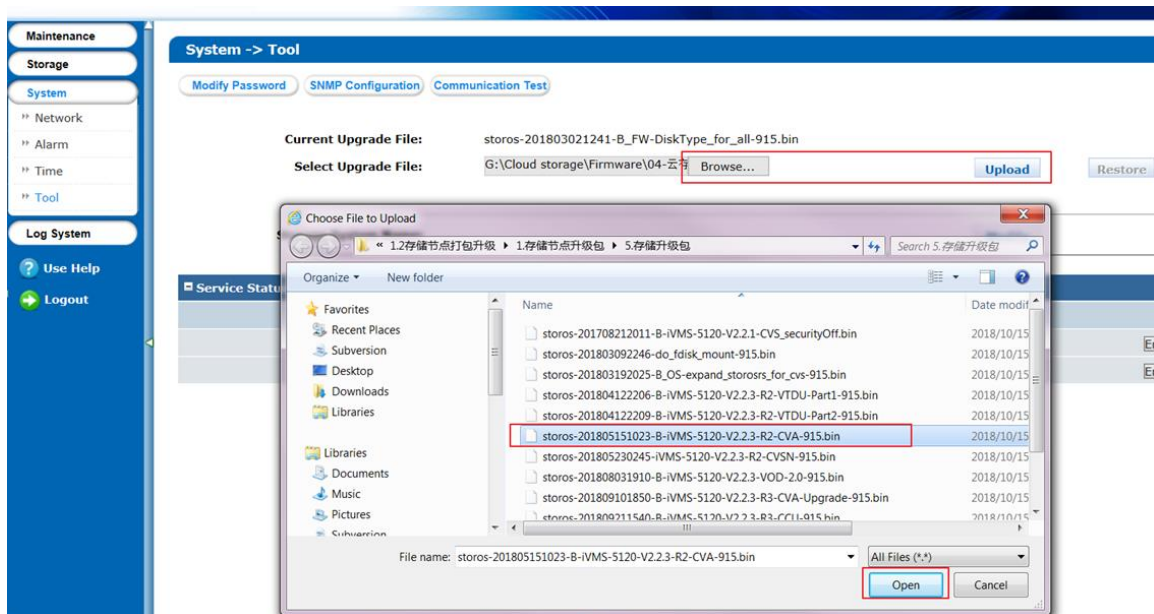


Figure 2.2.3-12

4. CCU Installation

CCU is Cluster storage calculate software. You should install the CVA when need the function of searching pictures by pictures or intelligent retrieval.

Installation steps are as follows:

Go to <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx is the storage server IP.) to join 'System -> Management Tool' interface. Choose storos-xxxxxxxxxxxx-B-iVMS-5120-V2.x.x-Sx-CCU-915.bin to upgrade and view the Operation Log making sure it completed. Then you can run the CCU without restarting the server.

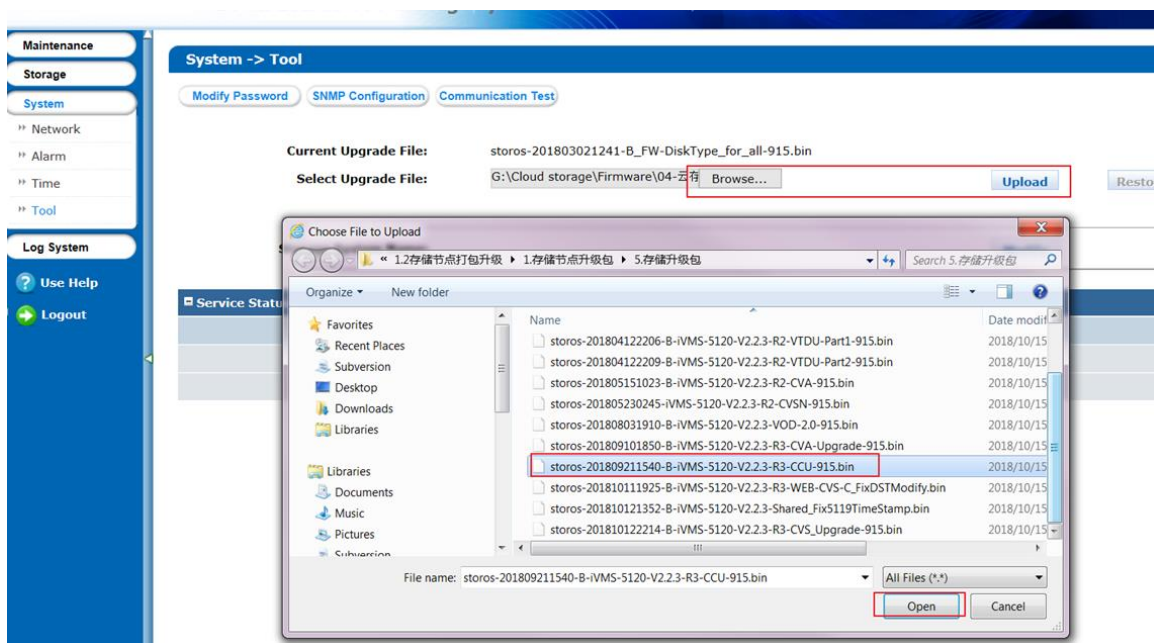


Figure 2.2.3-13

2.3 Management Node Deployment

2.3.1 Installation of Management Node Deployment System

Running CVMN node application server needs to install CentOS7 operation system. The specific method of installation and configuration is in 'Enclosure 1: CentOS7 operating system installation manual'.

2.3.2 Installation of Management Node Software

Standard Cluster is made up off two kinds of hardware configurations including management node CVMN and storage node CVSN. Standard Cluster need to deploy centos7.0 system on the management node first. Then install corresponding software.

1. Prepare a server to install CentOS7.
2. Copy all installation files under 'install_all \ cvmn_all' to any contents on the server.
3. Installation steps are as follows:
 - 1) Modify all installation script permissions copied to make it perform the permission (chmod 755 *).
 - 2) Perform installation script(./install.sh). Complete the installation according to the steps in installation script.

```
[root@ha845 cvmn_all]# ./install.sh
*****
*                               ivms-5120 install                               *
*****
*      please enter your choise:(1-4)      *
*      (1) one click Install Cluster all component *
*      (2) one click Install HA all component  *
*      (3) optional install component         *
*      (4) exit menu                          *
*****
please input 1-4 number:
```

Figure 2.3.2-1 Installation Steps

Installation script instruction:

- a) There are two methods of CVM installation: (1) Distributed cluster installation(2n+1 devices); (2) HA cluster installation(2 devices); (3) Installation for custom.
- b) The character of host name is limited to [a-z],[A-Z],[0-9] and '-' and its length should be 3-15 characters.
Note: The host name of standard Cluster platform management node should be different.
- c) One-Click setup.
 - If you select one-click setup of corresponding mode, the system will automatically perform one-click unload before installing script.
 - Now you can start to install after upload is complete. First it will prompt you change the host name or not. You can choose yes or no according to individual demand. If enter yes, the next step is enter new host name.

```

[root@ha845 cvmn_all]# ./install.sh

*****
*                               *
*               ivMS-5120 install *
*                               *
*****
*           please enter your choice:(1-4) *
*           (1) one click Install Cluster all component *
*           (2) one click Install HA all component *
*           (3) optional install component *
*           (4) exit menu *
*****
please input 1-4 number:2
uninstall success.
will install ha...
stop service
Do you want change your hostname?
Please input (yes/no): yes
Please input your new hostname : vmnode1
Local hostname change successfully, new hostname: vmnode1

install cluster program will start, please wait a moment.

```

Figure 2.3.2-2 Modify Host Name

- Then cluster, CVM, CPM, WED and SNMP will perform installation automatically. Please wait patiently for its completion. You can see the prompt information.
- d) Custom Installation
- Perform installation script(./install.sh). Choose '3' and go to custom installation shown below:

```

[root@ha845 cvmn_all]# ./install.sh

*****
*                               *
*               ivMS-5120 install *
*                               *
*****
*           please enter your choice:(1-4) *
*           (1) one click Install Cluster all component *
*           (2) one click Install HA all component *
*           (3) optional install component *
*           (4) exit menu *
*****
please input 1-4 number:3

*****
*                               *
*       ivMS-5120 optional install menu *
*                               *
*****
*           please enter your choice:(1-6) *
*           (1) Install cluster *
*           (2) Install cvm *
*           (3) Install cpm *
*           (4) Install web *
*           (5) Install snmp *
*           (6) exit menu *
*****
please input 1-6 number:

```

Figure 2.3.2-3 Custom Installation

- Options 1-5 are respectively the installation software packages of management node CVMN. Do not need to install the item (5) of SNMP packets if no operational projects.

It will prompt you to select installation cluster mode or HA mode when installing (1) cluster. Then you will be prompted whether to change the host name. You can choose according to yourself.

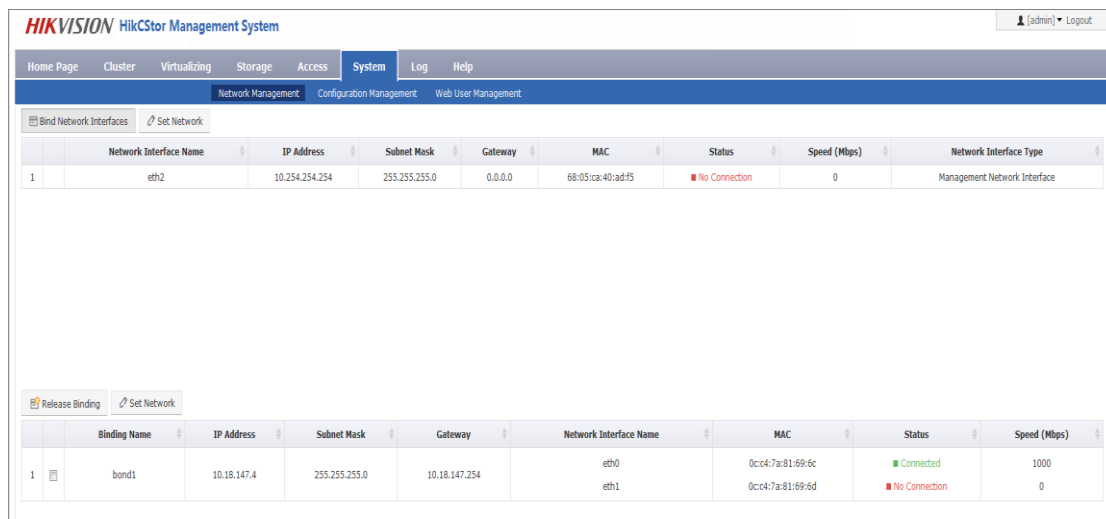
Complete the installation according to the 2 ~ 5 steps.
Note: Each management node need to install the software.

2.4 Standard Double Clusters Machine HA Formation

For the convenience of description, we will use CVM1 and CVM2 on behalf of the formation of HA cluster of 2 CVMN servers.

2.4.1 Bind Net Port

Go respectively into the CVMN-WEB pages of CVM1 the CVM2 and enter <https://xx.xx.xx.xx:5120> (xx.xx.xx.xx is the storage server IP.) to join ‘System - > Network Management’ interface, as shown in figure 2.4.1-1.



The screenshot shows the HIKVISION HikCStor Management System web interface. The top navigation bar includes 'Home Page', 'Cluster', 'Virtualizing', 'Storage', 'Access', 'System' (selected), 'Log', and 'Help'. Below this, there are sub-tabs for 'Network Management', 'Configuration Management', and 'Web User Management'. The main content area is titled 'Bind Network Interfaces' and 'Set Network'. It contains two tables. The first table, 'Bind Network Interfaces', has columns for 'Network Interface Name', 'IP Address', 'Subnet Mask', 'Gateway', 'MAC', 'Status', 'Speed (Mbps)', and 'Network Interface Type'. It shows one entry for 'eth2' with IP 10.254.254.254, Subnet Mask 255.255.255.0, Gateway 0.0.0.0, MAC 68:05:ca:40:ad:f5, Status 'No Connection', Speed 0, and Network Interface Type 'Management Network Interface'. The second table, 'Release Binding', has columns for 'Binding Name', 'IP Address', 'Subnet Mask', 'Gateway', 'Network Interface Name', 'MAC', 'Status', and 'Speed (Mbps)'. It shows two entries: 'bond1' with IP 10.18.147.4, Subnet Mask 255.255.255.0, Gateway 10.18.147.254, Network Interface Name 'eth0' (MAC 0c:c4:7a:81:69:6c, Status 'Connected', Speed 1000) and 'eth1' (MAC 0c:c4:7a:81:69:6d, Status 'No Connection', Speed 0).

	Network Interface Name	IP Address	Subnet Mask	Gateway	MAC	Status	Speed (Mbps)	Network Interface Type
1	eth2	10.254.254.254	255.255.255.0	0.0.0.0	68:05:ca:40:ad:f5	No Connection	0	Management Network Interface

	Binding Name	IP Address	Subnet Mask	Gateway	Network Interface Name	MAC	Status	Speed (Mbps)
1	bond1	10.18.147.4	255.255.255.0	10.18.147.254	eth0	0c:c4:7a:81:69:6c	Connected	1000
					eth1	0c:c4:7a:81:69:6d	No Connection	0

Figure 2.4.1-1 Net Port Binding

Do not need to bind network port if the device has only two data ports. Now you should set the eth1 as the heartbeat after cluster initialization. The information of Heartbeat configuration is in ‘3.4.3HA cluster heartbeat configuration’. Set the eth2 as the heartbeat and bind eth0 and eth1 if device has three or more than three data ports.

2.4.2 HA Cluster Formation and Initialization

The steps of HA cluster formation for two CVMN servers are as follows:

1. Install the corresponding software for each server, with reference to the 3.3 management node (CVMN) deployment. Note: Select HA mode for installation.
2. Choose one of the 2 servers, such as CVM1. Go to the CVMN-WEB page of CVM1. Enter <https://xx.xx.xx.xx:5120> (xx.xx.xx.xx is the storage server IP.).

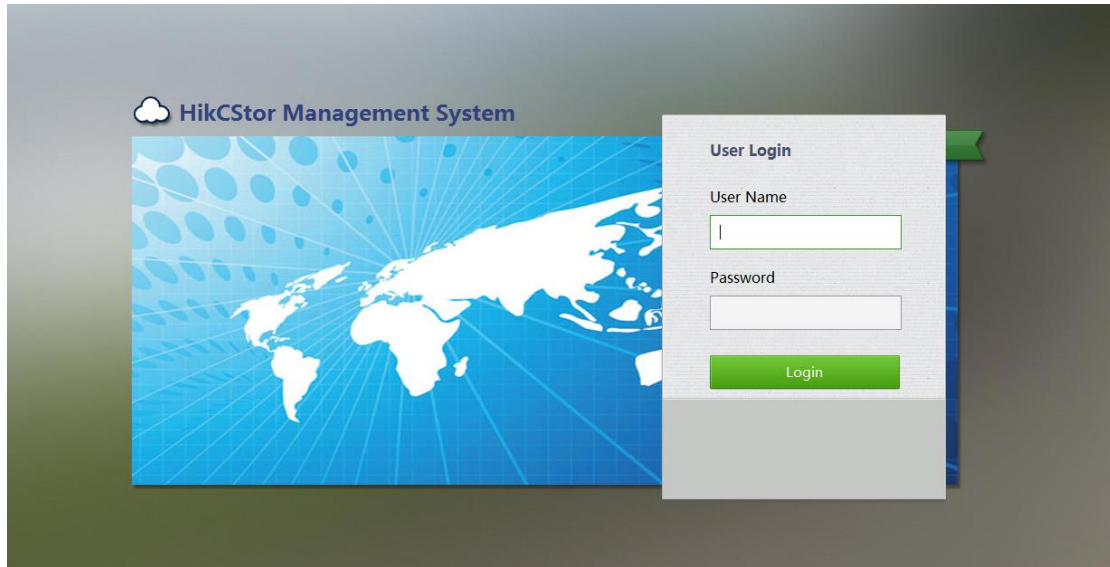


Figure 2.4.1-1 CVMN-WEB Login Screen

3. Go to the welcome interface after login. Home page shows the current cluster profile. The initial state of the cluster system is shown as 'no set-up'.

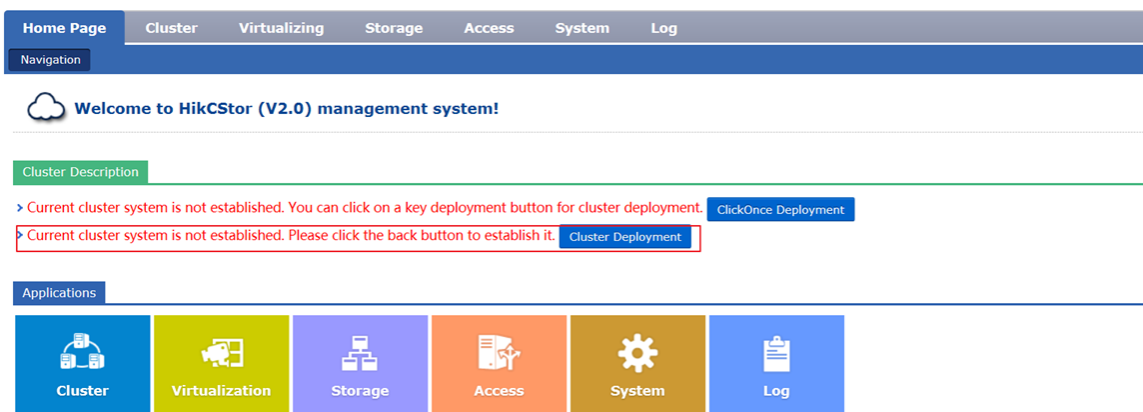


Figure 2.4.1-2

Click 'Cluster Deployment' in the page and it will pop up a mode selection window such as the figure 3.4.1-3. Select the deployment mode in accordance with the actual situation (in this case, select 'Standard Cluster Deployment'). Then enter '**Standard Cluster Deployment** – Mode Selection' to join configuration guide page.

Click the button 'Standard Cluster Deployment' in the page and it will pop up a mode selection window such as the figure 3.4.1-4. Select the formation mode in accordance with the actual situation (in this case, select 'HA Mode'). Then enter '**Standard Cluster Deployment –HA Mode**' to join configuration guide page.

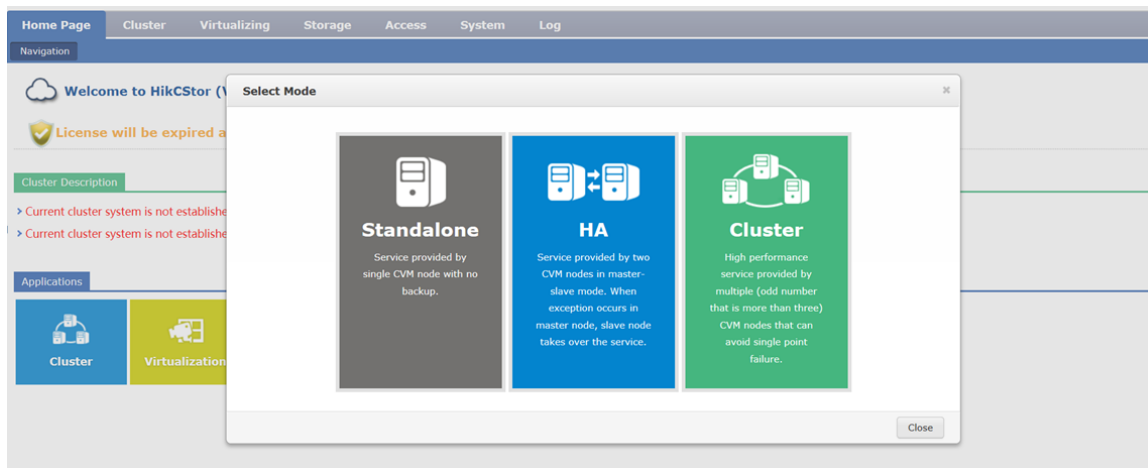


Figure 2.4.1-4

4. First step of cluster configuration: Select Node. Enter the IP of CVM2 in the text box of 'Please enter the node IP'. Click 'Detection and Add' to join the CVM2 management node into the cluster.

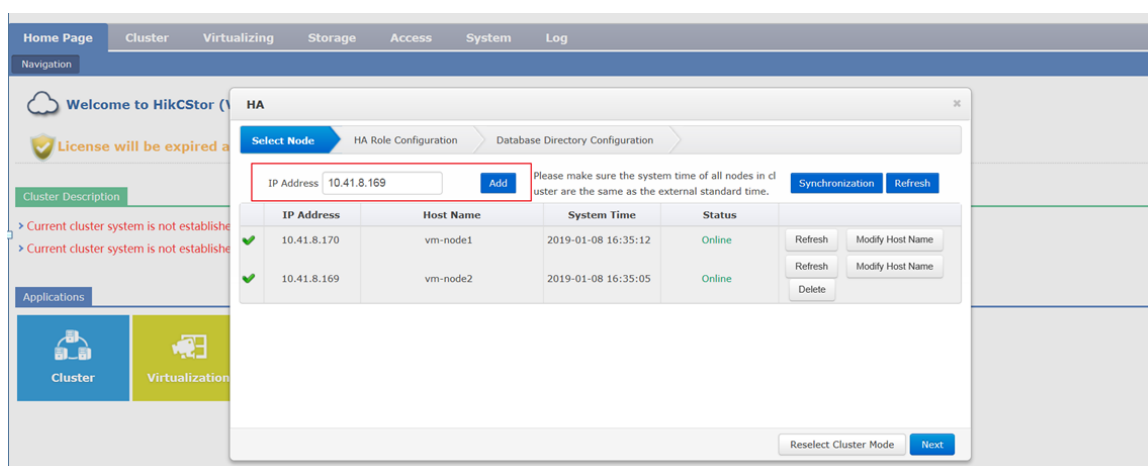


Figure 2.4.1-5

Perform the time calibration first after the node addition to ensure that the time of the cluster server is consistent with the external standard time. Click the 'Time Calibration' to adjust the machine time, and then click 'OK' to complete the calibration.

If you want to modify the host name of the CVMN machine, click the button in this page, enter 'new host name' in the pop-up window (shown in Figure 3.4.1-6). Click 'OK' to complete the modification. Note: Each host should have different name.

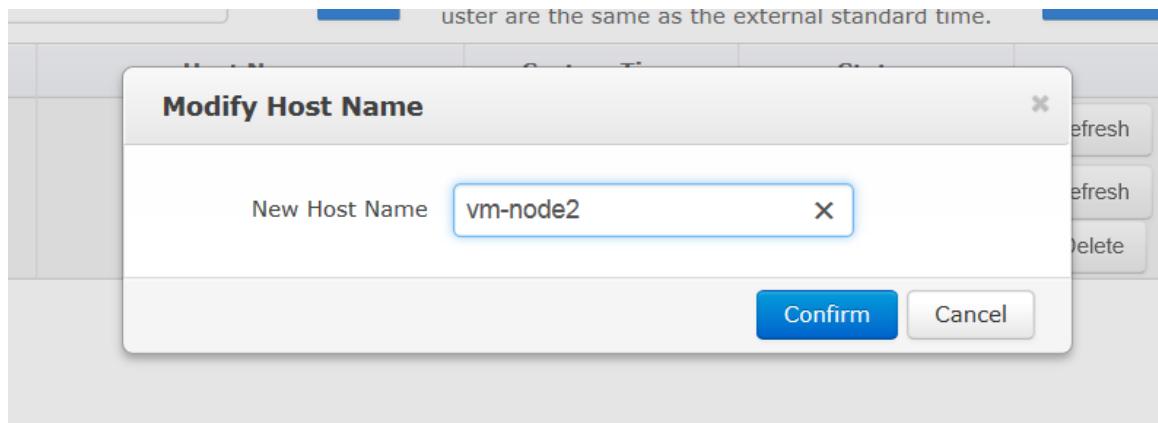


Figure 2.4.1-6

Click 'Next Step' to jump to the next step of cluster configuration after modification.

5. Second step of cluster configuration: HA role configuration. The HA cluster need a virtual IP as the only interface for external service (Virtual IP must be segment and not using. You can test it if available through the button 'Test'). Enter a custom HA cluster ID in 'Cluster ID' text box and specify the role of HA (by default). Then click 'next' .

IP Address	Host Name	HA Role	
		Master	Slave
10.41.8.170	vm-node1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.41.8.169	vm-node2	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 2.4.1-7

6. Third step of cluster configuration: Database directory configuration. This section is mainly to configure the data index directory and data directory. You the better create different disks if you need to configure a number of data directories.

The screenshot shows a window titled "HA" with a close button in the top right corner. Below the title bar is a navigation bar with three tabs: "Select Node", "HA Role Configuration", and "Database Directory Configuration". The "Database Directory Configuration" tab is active and highlighted with a blue arrow. Below the navigation bar, there is a green text message: "This is the HDD mount directory. To configure multiple data directories, you are recommended to set HDD mount directories as different HDDs." Below this message, there are two input fields: "Data Index Directory" with the value "/mnt/cvm/disk1/name" and "Data Directory" with the value "/mnt/cvm/disk2/data". To the right of the "Data Directory" input field is a blue button labeled "Add more...". At the bottom of the window, there are three buttons: "Reselect Cluster Mode", "Previous", and "Establish Cluster".

Figure 2.4.1-8

- Now you have completed all the preparations for the work of cluster formation. You can click the 'Last Step' if you want to go back again. Click 'Return to Select Cluster Mode' to reselect and install the cluster mode if you want to modify the formation of cluster mode. Otherwise, click 'Set up the Cluster' and it will pop up a confirmation box as shown in figure 2.4.1-9.

The screenshot shows a "Confirm" dialog box with a close button in the top right corner. The dialog box has a light blue background and contains the text: "After establishing the cluster, all options cannot be edited. Continue?". At the bottom right of the dialog box, there are two buttons: "Yes" and "No".

Figure 2.4.1-9

- Choose 'yes' to start cluster formation and it will automatically initialize and wait for the completion of the initialization.

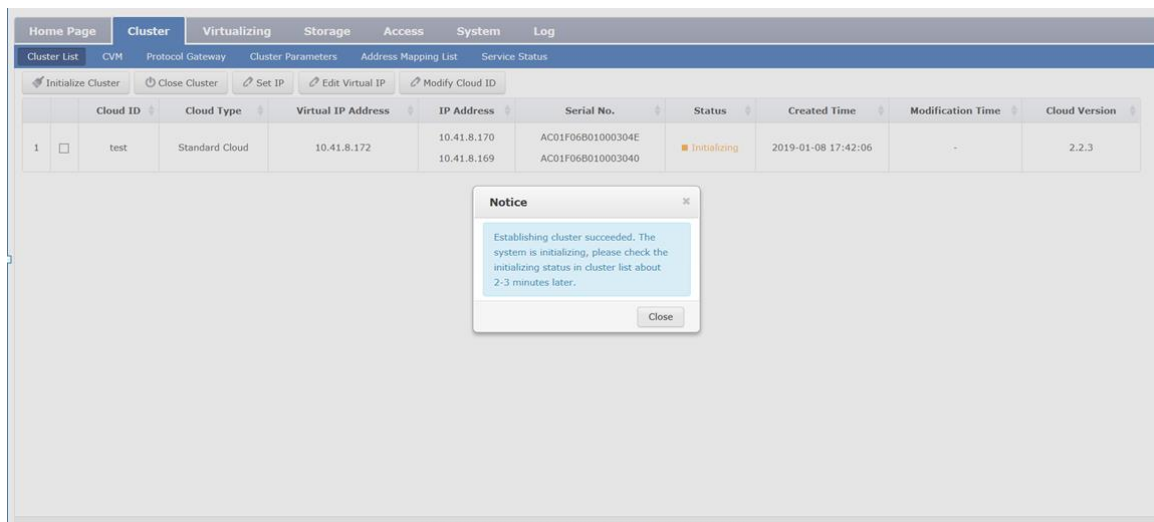


Figure 2.4.1-10

The cluster state is displayed as ‘being initialized’ in the initialization process. Wait for 2-3 minutes. Refresh the page manually. If the cluster state shows ‘initialized’, it has been initialized successfully.

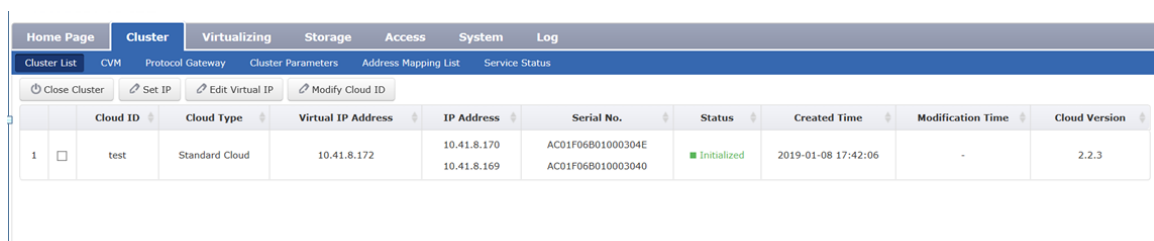


Figure 2.4.1-11

2.5 Establish Standard Cluster Cluster

To achieve a clear description, the CVMN servers below for establishing cluster are hereinafter referred to as CVM1, CVM2 and CVM2 respectively.

2.5.1 Bind Network Interface

Go to CVMN-WEB page of CVM1 and CVM2 respectively by visiting [http:// xx.xx.xx.xx:5120](http://xx.xx.xx.xx:5120) (xx.xx.xx.xx refers to the management server IP)-->Login-->System-->Network Management-->Tick **eth0 and eth1**-->Click **Bind Network Interfaces**. Please see Figure 2.5.1-1

Home Page Cluster Virtualizing Storage Access System Log Help								
Network Management Configuration Management Web User Management								
Bind Network Interfaces		Set Network						
	Network Interface Name	IP Address	Subnet Mask	Gateway	MAC	Status	Speed (Mbps)	Network Interface Type
1	eth2	10.254.254.254	255.255.255.0	0.0.0.0	68:05:ca:40:ad:f5	No Connection	0	Management Network Interface
Release Binding		Set Network						
	Binding Name	IP Address	Subnet Mask	Gateway	Network Interface Name	MAC	Status	Speed (Mbps)
1	bond1	10.18.147.4	255.255.255.0	10.18.147.254	eth0	0c:c4:7a:81:69:6c	Connected	1000
					eth1	0c:c4:7a:81:69:6d	No Connection	0

Figure 2.5.1-1 Bind Network Interface

2.5.2 Establish & Initialize Standard Cluster Cluster

Steps of cluster establishment on CVM1, CVM2 and CVM3 are as below:

1. Install the software on each server. *Note:* please select cluster mode when installing. Please refer to Section 2.3-CVMN Deployment.
2. Select one server from CVM1, CVM2 and CVM3 optionally. Taking CVM1 for an example, go to CVMN-WEB page of CVM1 by visiting [http:// xx.xx.xx.xx:5120](http://xx.xx.xx.xx:5120) (xx.xx.xx.xx refers to the management server IP).

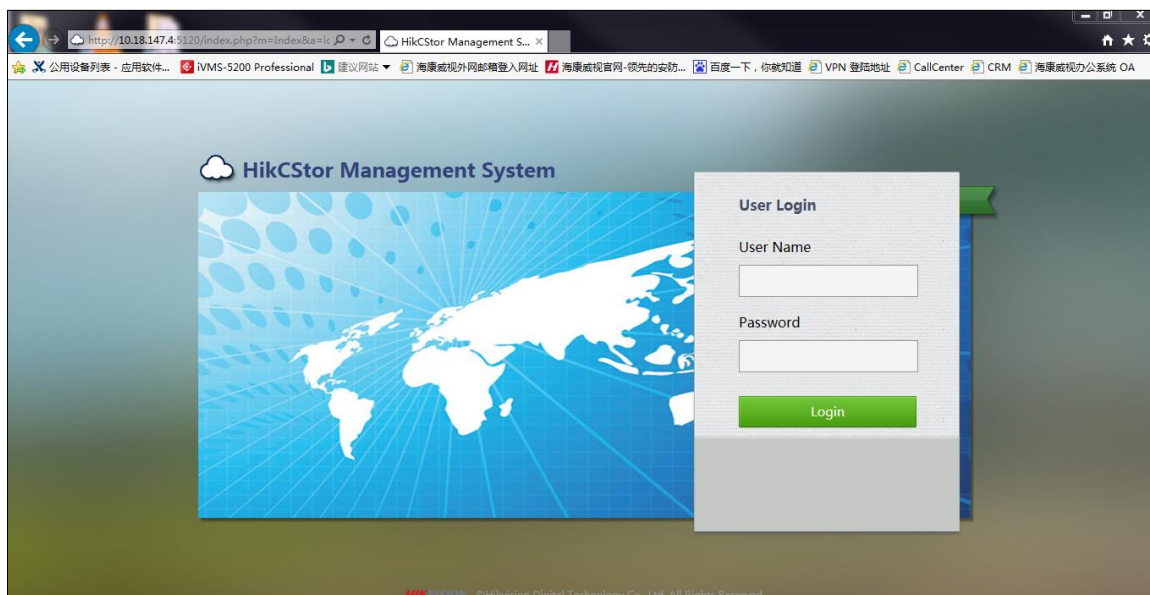


Figure 2.5.2-1 CVMN-WEB Login Interface

3. After login, homepage is displayed which contains a cluster description. The original state indicates cluster system unestablished.

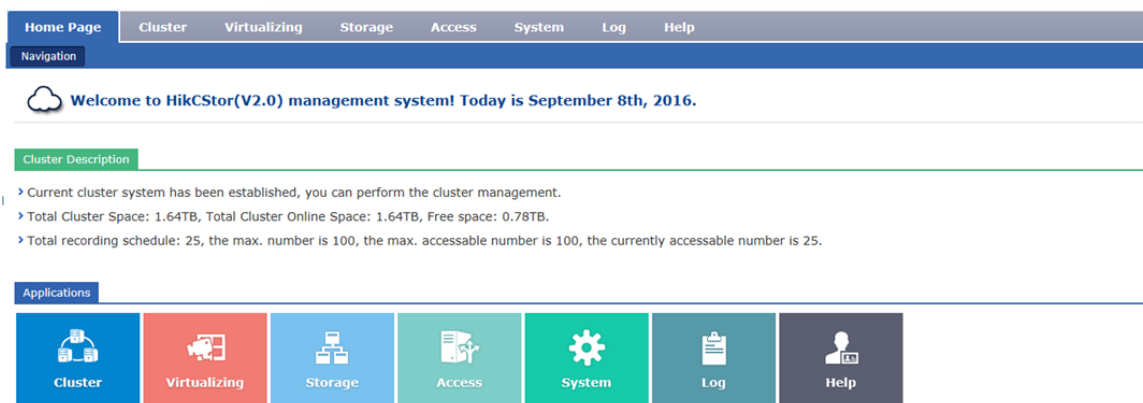


Figure 2.5.2-2 Cluster Description

Click Deploy Cluster-->Select one Cluster type in the pop-up window (For example, Standard Cluster Deployment is selected in this text)-->Select one deployment approach optionally (For example, Cluster is selected in this text).

4. Step 1 for cluster establishment: node selection.

Input CVM2 IP address in “Please Input Node IP” box-->Click Detect & Add to add CVM2 to the cluster. Likewise, add CVM3 to the cluster.

Having completed adding CVMN to the cluster, please execute time synchronization operation to ensure server time and standard time consistent. Click Synchronization to adjust server time. Then click OK to finish the operation.

To modify host name of CVMN, if needed, click Modify Host Name-->Input new host name in pop-up window-->Click OK to finish modification. *Note:* host name of each CVMN must be unique.

Click Next to enter load balancing configuration page.

5. Step 2 for cluster establishment: load balancing configuration.

CVMN cluster requires a virtual IP to serve as the only port for external service (The virtual IP must be available in the same network segment with CVMN)-->Click Check to see whether the IP is available-->Assign roles for load balancing (Keep default value)-->Click Next.

6. Step 3 for cluster establishment: database role configuration.

Configure the database role as follows:

- Cluster ID: input the cluster ID
- Maximum Database Cache: RAM allocated to the database. If the physical memory of the server is less than 32G, it is suggested to input 1024; if the physical memory is no less than 32G, it is suggested to input 4096.
- Check distributed database role (Keep default value)

Having completed the configuration above, please click Next.

7. Step 3 for cluster establishment: database directory configuration

In this step, configure database index directory, database log directory and data directory. If more than one data directory needs to be configured, it is suggested to allocate them to different disk. It is recommended to keep default value here.

8. Till now, all configurations for cluster establishment have been finished.

To change values configured at the previous step, please click Back; to change cluster approach, please click Back to Cluster Approach Selection; to finish cluster establishing configuration, please click Establish Cluster.

9. When the cluster is established, it will be initialized automatically.

During the initializing process, the cluster status indicates “initializing”. Two or three minutes later, refresh the page. The status indicates “initialized” which means the cluster has been initialized and is ready to perform its service.

Home Page		Cluster	Virtualizing	Storage	Access	System	Log	Help		
Cluster List		CVM	Cluster Parameters		Address Mapping List					
<div>+ Expand Cluster</div>										
		Cloud ID	Cloud Type	Virtual IP Address	IP Address	Serial No.	Status	Created Time	Modification Time	Cloud Version
1	<input type="checkbox"/>	S200-Test	Micro Video Cloud	-	10.18.147.4	0C0C407A08106906C	<div><div></div> Initialized</div>	2016-07-15 12:57:55	2016-08-03 16:10:18	2.1.0

Figure 2.5.2-3 Cluster Initialized

2.6 Configure Standard Cluster

When a standard Cluster cluster is established, it can be used after customized configuration.

2.6.1 Configure CVS

Go to CVSN-WEB page by visiting <http://xx.xx.xx.xx:5119> (xx.xx.xx.xx refers to CVS IP address)-->Login-->System-->Configuration Management-->Check whether CVS status indicates ON-->Input the cluster virtual IP in CVM IP box-->Click Set CVS Parameters.

After completing the configuration above, CVS service will reboot automatically. Please wait until the reboot is completed.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Storage-->CVS-->Check the CVS information.

2.6.2 Create Domain

When establishing a Standard Cluster, domain is not created by default. Users are allowed to create independent domains optionally. When a domain has been created, users can add one or more CVS to it. The space of a domain depends on that of all CVS added to it: more than one resource pool can be created in a domain; the minimum domain includes only one CVS.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Domain Management--> Click Create Domain-->Input domain name and description-->Click OK to finish creating domain. Please see Figure 2.6.2-1.

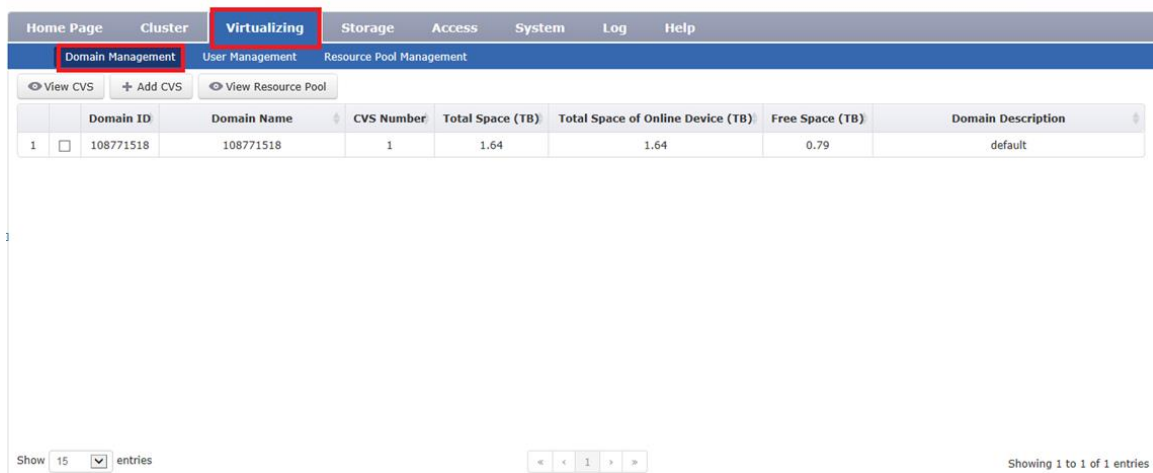


Figure 2.6.2-1 Create Domain

2.6.3 Modify Domain

To modify a domain that has been created, if needed, administrator is allowed to manually modify its information. If not needed, please skip this section.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Domain Management-->Tick the domain-->Click Modify Domain-->Input new domain name and description in the pop-up window. *Note:* as domain ID is automatically created by the system, it can't be modified manually.

2.6.4 Add CVS to Domain

Each domain contains one or more CVS which can't be added to other domains. CVS is available for cluster use only when it has been added to a domain.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Domain Management-->Tick the domain to which the CVS is to be added-->Click Add CVS-->Tick the CVS to be added-->Click OK. Please see Figure 2.6.4-1.

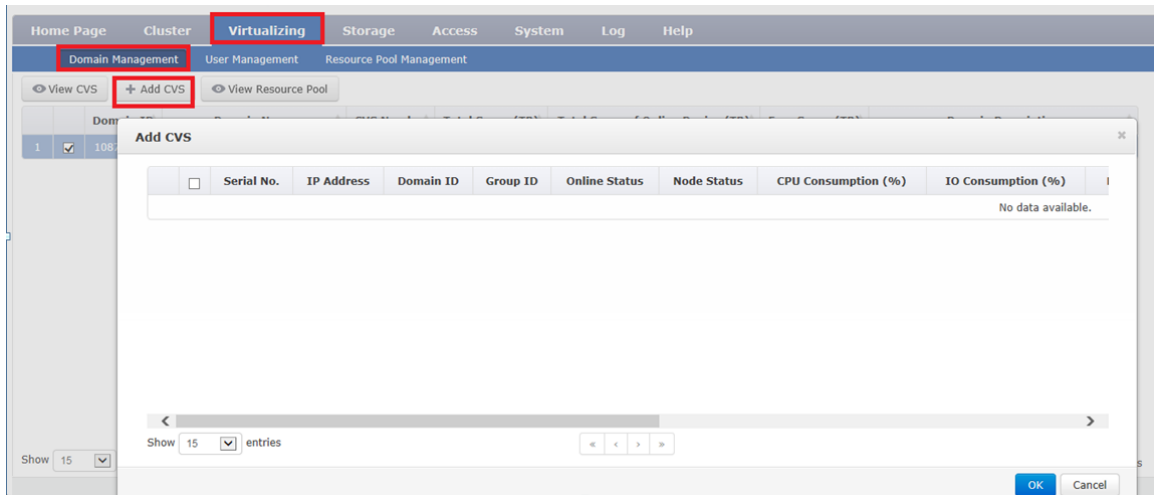


Figure 2.6.4-1 Add CVS

2.6.5 Create Resource Pool

HikCstor Management System achieves centralized management of all CVS in the cluster by integrating them in one or more virtual resource pools. Administrator is allowed to create resource pools optionally in a domain. When creating a resource pool, administrator needs to allocate certain storage capacity to it. Specific steps are as below:

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Resource Pool Management-->Create Resource Pool. Please see Figure 2.6.5-1

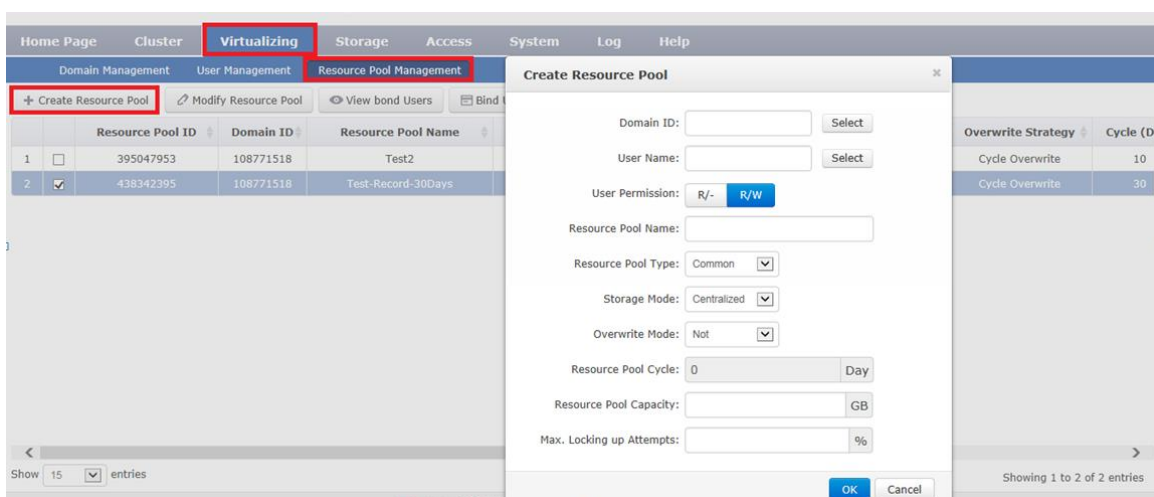


Figure 2.6.5-1 Create Resource Pool

In the pop-up window, configure the following items:

- Domain ID: select one domain in which the resource pool is to be created.

-
- User Name: Select a bond user. If a resource pool is bonded to a user, the user will have its read-and-write permission; if not bonded to any user, only default user of the system has its read-and-write permission.
 - Resource Pool Name: name the resource pool optionally, supporting a combination of number, letter, strikethrough and underline, which can't begin with "--".
 - Resource Pool Type: Common (for video, SureStream and picture storage)/Video (for video and SureStream storage)/Picture (for picture storage only).
 - Storage Mode: Centralized/Dispersed.
 - Overwrite Mode: Not (not overwriting)/Capacity (starting overwriting from the earliest time point when the resource pool capacity is fully occupied)/Cycle (deleting overdue data when the resource pool completes its preset cycle)
 - Resource Pool Cycle: overwriting resource pool after every other preset cycle. Input number optionally. Unit: day.
 - Resource Pool Capacity: capacity of a resource pool. Unit: GB.
 - Max. Locking up Attempts: maximum space for locking up in a resource pool.
 - Transcoding Type: Not/Frame (transcoding frame for storage automatically at the end of a cycle). When Frame is selected as transcoding type, original data cycle needs to be set as well. In this way, the resource pool will store original data within the cycle only, while data before the cycle will be transcoded for storage.

Having finished the above configuration, please click OK and a new resource pool is created.

2.6.6 Modify Resource Pool

To modify a resource pool that has been created, if needed, administrator is allowed to manually modify its information. If not needed, please skip this section.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Resource Pool Management-->Tick the resource pool-->Click

Modify Resource Pool-->modify the information in the pop-up window. Please see Figure 2.6.6-1.

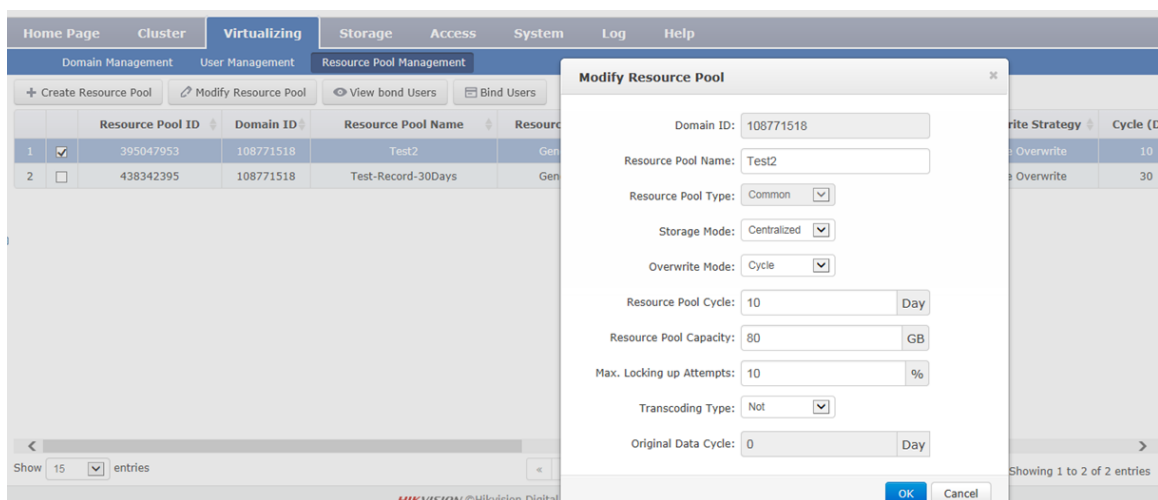


Figure 2.6.6-1 Modify Resource Pool

- Domain ID: not support modifying.
- Resource Pool Name: support inputting a new name.
- Resource Pool Type: not support modifying.
- Storage Mode: support changing the storage mode to Centralized or Dispersed.
- Overwrite Mode: support changing the overwrite mode to Not, Capacity or Cycle.
- Resource Pool Cycle: support modifying the cycle duration. Unit: day.
- Resource Pool Capacity: support expanding or shrinking capacity.
- Max. Locking up Attempts: support modifying space for locking up data.
- For the resource pool in which Cycle is selected as overwrite mode, transcoding type and original data cycle can be modified; for other resource pools in which Not or Capacity is selected as overwrite mode, transcoding type can't be selected or modified.

Note: shrinking resource pool capacity may leads to overwriting history data earlier than the preset date.

2.6.7 Configure CVA

For picture project in which CVA software is not installed, this section can be skipped.

For video project in which CVA software is installed, the following configuration needs to be done.

Go to CVSN-WEB page by visiting <http://xx.xx.xx.xx:5119> (xx.xx.xx.xx refers to CVS IP address)-->Login-->Access-->Configuration Management-->Input the cluster virtual IP in CVM IP and CPM IP boxes-->Click Set CVA Parameter-->Pop up configuration succeeded hint

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Access-->CVA-->Check Cluster Status.

2.6.8 Add CVA to Cluster

For picture project in which CVA software is not installed, this section can be skipped.

For video project, CVA needs to join the CVMN management cluster before receiving recording schedule from the cluster.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Access-->CVA-->Check all CVA under the management of current cluster. In this page, you can check Serial No., IP Address, Name, Node Status, Cluster Status, CPU Consumption, Memory Consumption, Network (in/out), Maximum Live View Connection Number, Current Live View Connection Number, Maximum Playback Connection Number, Current Playback Connection Number, etc. Maximum Connection Number refers to maximum number of monitoring spot that VA can manage; Current Connection Number refers to current number of monitoring spot that VA manages.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Access-->CVA-->Tick the VA node-->Click Join Cluster-->Input connection number optionally-->Click OK. Likewise, configure other VA nodes. Please see Figure 2.6.8-1

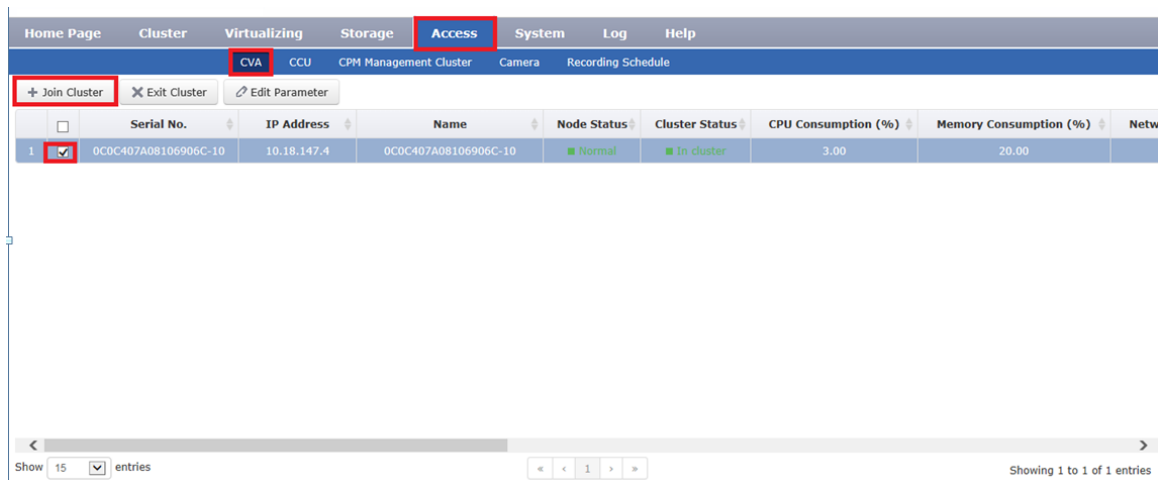


Figure 2.6.8-1 Add CVA to Cluster

2.6.9 Modify CVA Parameter

To modify a CVA that has joined to cluster, if needed, administrator is allowed to manually modify its parameters. If not needed, please skip this section.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Access-->CVA-->Tick the node to be modified-->Click Edit Parameter-->Modify Node Name, Maximum Live View Connection Number and Maximum Playback Connection Number in the pop-up window. Please see Figure2.6.9-1.

The 'Edit Parameter' dialog box is shown with the following fields:

- Node Name: 0C0C407A08106906C-10
- Max. Live View Connection Number: 100
- Max. Playback Connection Number: 100

At the bottom right, there are 'OK' and 'Cancel' buttons.

Figure2.6.9-1 Edit Parameter

2.6.10 Configure CCU

For the project without requirement of searching picture by picture or intelligent retrieval function,

CCU software is not installed. This section can be skipped.

For the project in which CCU software is installed, the following configuration needs to be done.

Go to CVSN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to CVS IP address)-->Login-->Access-->Configuration Management-->Input the cluster virtual IP in CPM IP box-->Click Set CCU Parameter-->Pop up configuration succeeded hint

Having finished the configuration above, go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Access-->CCU-->Check CCU status.

CCU is available for use when it has been added to the cluster. No further configuration needs to be done.

2.6.11 Configure Synchronization Server

For project of active video storage, synchronization server must be configured on HikCStor Management System.

For project of passive video or picture storage, synchronization server does not have to be configured on HikCStor Management System.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Cluster-->Cluster Parameters-->Input synchronization server IP and configure synchronization interval (in general case, keep the default value:1440)-->Click Set Cluster Parameters--> Pop up configuration succeeded hint. Please see Figure 2.6.11-1.

Figure 2.6.11-1 Set Cluster Parameters

Go to each CVS management system by visiting <https://xx.xx.xx.xx:2004> (xx.xx.xx.xx refers to CVS IP address)-->Login—Log-->Operation Log-->Check log detail. **“Synchronization Server: xx.xx.xx.xx Succeeded”** indicates synchronization has succeeded.

2.6.12 Configure Group IP

CVS that has been added to a domain can be grouped optionally; while CVS that has not been added to any domain is divided into one group by default. Group is linked to CVS only, without any linkage to resource pool. When allocating resources, groups are viewable for users. The purpose of grouping is to avoid series flow among switches while recording.

For users who have the requirements of grouping CVS, please follow the configuration steps in this section. For users who don’t have such requirements, please skip this section.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Group Management-->Download Template--> Input information in the template by following the format: Group ID-CVS IP. For example, CVS are divided into three groups in Figure 2.6.12-1.

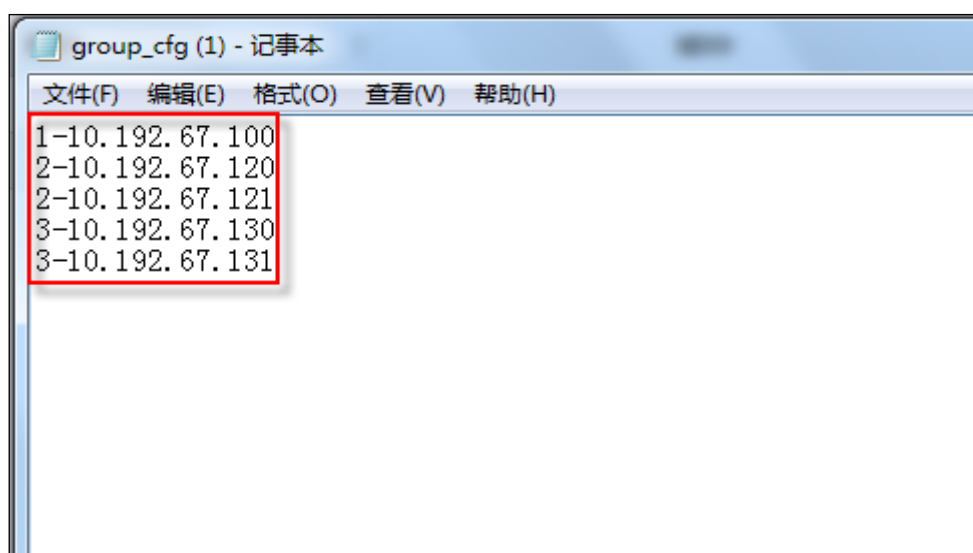


Figure 2.6.12-1 Group Template

Click Virtualizing-->Group Management-->Click Configure Group ID-->Tick the domain in which group ID needs to be configured-->Click OK-->Click Browse in the pop-up window-->Select the group template you have configured-->Click OK.

Having completed grouping, group IP list will be displayed. Click Storage-->CVS-->Check group ID of the CVS.

2.6.13 Resource Pool User Management

HikCStor Management System has only one user with super administrator permission by default that has read-and-write permission for all resource pools. When connecting with professional platform, default user is available for use. For any particular requirements, if needed, the System also provides resource pool user management function which can create particular user to connect with the platform.

More than one user can be created. Every user must bind one or more resource pools; every resource pool can be bonded by more than one users. The relationship between user and resource pool is many-to-many. When a user has bounded a resource pool, the user has its read-and-write permission.

For the case where professional platform is only connected with the default user, this section can be skipped.

For the case where particular resource pool user needs to be created, please follow the configuration steps below.

1. Create User

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->User Management-->Click Create User-->Input user information optionally in the pop-up window. Please see Figure 2.6.13-1

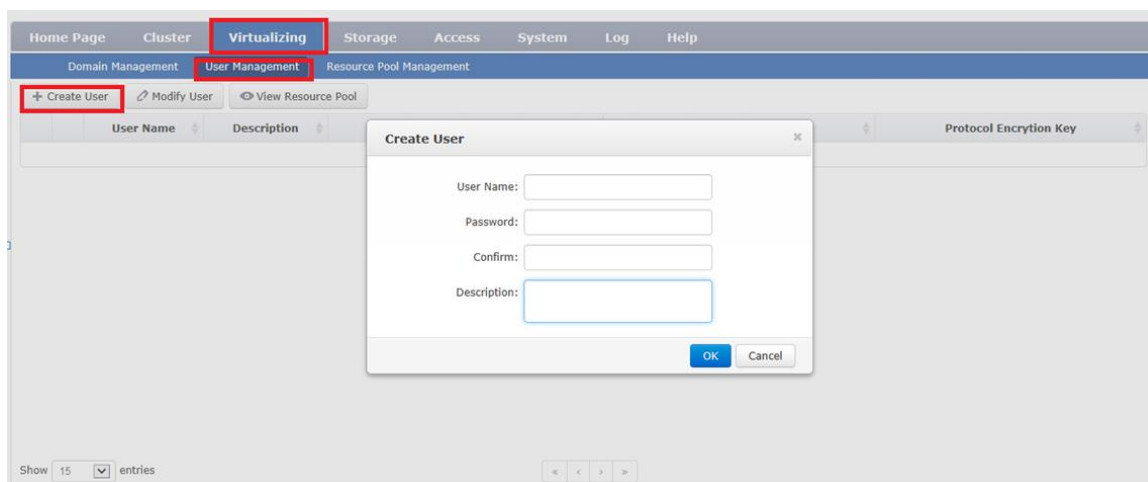


Figure 2.6.13-1 Create User

Configure the following items in the pop-up window.

- User Name: can't be same with other user names. Number, letter, strikethrough and underline are supported.
- Password: for login the system.
- Security Question & Answer/Description

Having completed the configuration, click Ok. A new user will be created.

2. Modify User

For the user that has been created, administrator is allowed to modify its information manually.

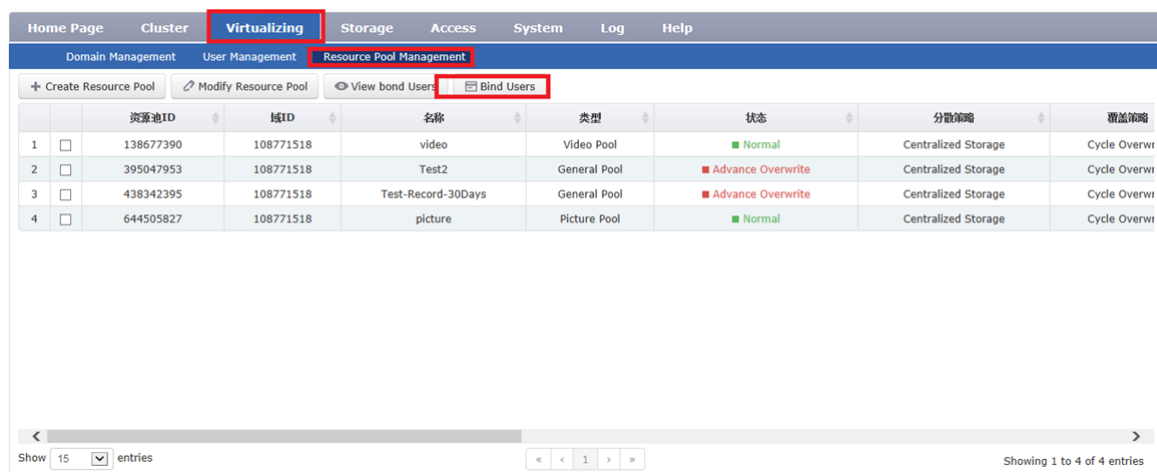
Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP

address)-->Login-->Virtualizing-->User Management-->Tick the user to be modified-->Click Modify User-->Modify the description in the pop-up window.

3. Bind User to Resource Pool

When a user has been created, bind it to resource pool optionally. In this way, the user will have read-and-write permission of the resource pool. Specific operation steps are as below.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Resource Pool Management-->Click Bind Users-->Select user(s) to be bonded-->Click OK. Please see Figure 2.6.13-2



The screenshot shows the CVMN-WEB interface. The top navigation bar includes 'Home Page', 'Cluster', 'Virtualizing' (highlighted with a red box), 'Storage', 'Access', 'System', 'Log', and 'Help'. Below this, the 'Resource Pool Management' section is active, with 'Bind Users' (highlighted with a red box) selected. The main area displays a table of resource pools with columns: 资源池ID, 域ID, 名称, 类型, 状态, 分散策略, and 覆盖策略. The table contains four entries. At the bottom, there is a pagination bar showing 'Showing 1 to 4 of 4 entries'.

	资源池ID	域ID	名称	类型	状态	分散策略	覆盖策略
1	138677390	108771518	video	Video Pool	Normal	Centralized Storage	Cycle Overw
2	395047953	108771518	Test2	General Pool	Advance Overwrite	Centralized Storage	Cycle Overw
3	438342395	108771518	Test-Record-30Days	General Pool	Advance Overwrite	Centralized Storage	Cycle Overw
4	644505827	108771518	picture	Picture Pool	Normal	Centralized Storage	Cycle Overw

Figure 2.6.13-2 Bind Users

2.6.14 Manage Bucket

Bucket needs to be created before storing the Object file. For the project without the requirement of file storage, this section can be skipped. For the project with such a requirement, please follow the configuration steps as below.

As Bucket is created to store Object file, users are allowed to create one or more buckets optionally. Every Bucket name must be unique in the System. Every user can have up to 10 buckets by default. If more buckets per user are required, please ask Hikvision Technical Support Engineers to modify configuration. One bucket can't nest another bucket.

As any Bucket operation is centralized, it's not suggested to create or delete bucket frequently.

Bucket name must be encoded by utf-8 and follow the rules below.

- 1) A combination of small letter, number and underline
- 2) Start with number or small letter
- 3) No less than 3 bytes and no more than 64 bytes
- 4) Bucket cannot begin with the word HikCStor (HikCStor may be an internal sign for Hikvision Cluster Storage)

HikCStor currently supports the following permissions:

- 1) Read-and-write: all users
- 2) Read Only: Bucket owner has read-and-write permission, while other users can only have read permission.
- 3) Private: only Bucket owner has read-and-write permission.

1. Create Bucket

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Bucket Management-->Click Create Bucket-->Input information optionally in the pop-up window.

Parameter description:

Bucket Name: unique in HikCStor Management System

User Name: Select one resource pool user to make it the owner of the bucket.

Bucket Storage Cycle: "-1" indicates Object files in the bucket never expire. A round number is allowed to input. Unit: day. The storage cycle begins to count when the object is stored in the System. When reaching the end of the cycle, the System will automatically delete overdue Object in the bucket.

Storage Location: must keep default value LOCAL-1

2. Query Bucket Information

When a Bucket has been created, you can check bucket information of the user you query. Bucket information includes: Bucket Name, Capacity, Remaining Capacity, Storage Location, Permission, Cycle, and Create Time.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Bucket Management-->Input user name-->Click Query to check bucket information owned by the user.

3. Modify Bucket

HikCStor Management System supports modifying Buck permission, storage cycle and capacity.

Go to CVMN-WEB page by visiting <http://xx.xx.xx.xx:5120> (xx.xx.xx.xx refers to Cluster Virtual IP address)-->Login-->Virtualizing-->Bucket Management-->Click Modify Bucket-->Modify certain items in the pop-up window-->Click OK to finish modification.