



**iVMS-5200 Pro V3.3.2
Technical Manual**

Technical Manual

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Chapter 1 System Introduction

1.1 About This Document

Purpose:

This technical manual mainly introduces the architecture design, functions, operation, configuration and deployment of the iVMS-5200 Professional (hereafter briefed as iVMS-5200 Pro). The iVMS-5200 Pro is a centralized management monitor system which is developed by HIKVISION based on SOA architecture. It features flexibility, scalability, high reliability and powerful functions.

5 CMSs can be managed by a RSM, and each CMS could manage up to 2048 cameras simultaneously with high scalability. Analog, hybrid and network video devices, including third-party IP cameras, can be managed. The system is adaptive to different network environment, and applicable for the building, the factory, community and other scenarios. The system supports many functions, such as: live view, recording, playback, video content analysis, alarm linkage and so on. It is an open systematic architecture with interfaces to integrate with other systems.

Intended Audience:

This document is intended for:

- Sales
- Technical Support Engineers

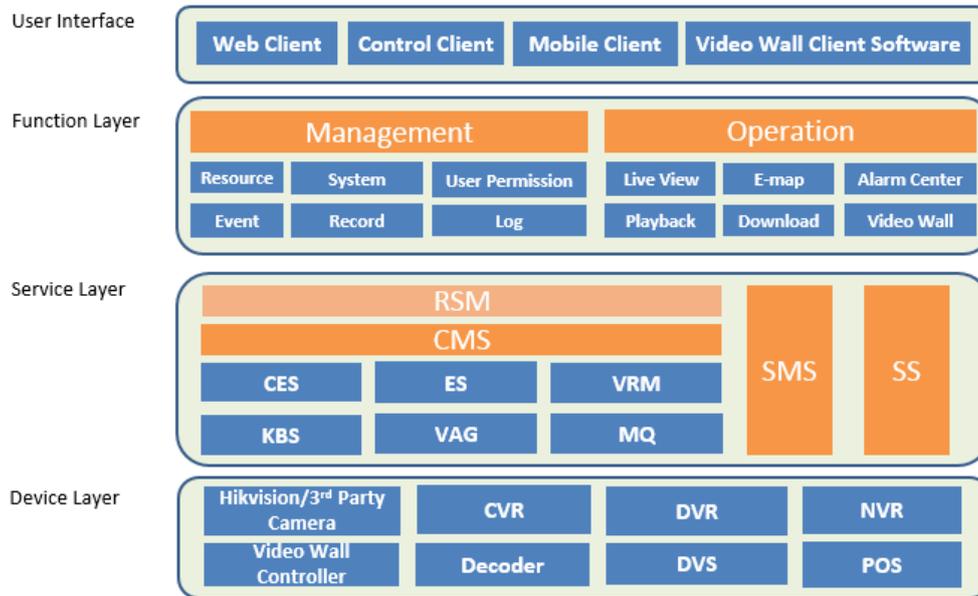
1.2 Terms and Abbreviation

Terms/Abbreviation	Meanings
iVMS	Intelligent Video Management System
CMS	Central Management Server
SMS	Stream Media Server
SS	Storage Server

SMD	Smart Motion Detection
PTZ	Pan/Tilt/Zoom
SOA	Service-Oriented Architecture
VRM	Video Recording Manager
ES	Event Server
EDS	Event Distributed Server
VAG	Video Access Gateway
RSM	Remote Site Management
CES	Cascading Event Server
SAM	System Access Module
KBS	Keyboard Proxy Server

Chapter 2 Architecture

2.1 Software Structure



➤ User Interface

There are application systems to present the specific functions to the end users. Currently, the iVMS-5200 Pro supports Web Client, Control Client, Video Wall Client Software and Mobile Client.

➤ Function Layer

The layer is used for providing the applications built on the unified software framework. Two parts are contained.

1) Management Application

iVMS-5200 Pro V3.3.2 provides resource management, authentication, record management, event management, log and system management, VCA rule settings, domain management and other applications. The Third-party service is also provided for third-party system integration.

2) Operation Application

iVMS-5200 Pro V3.3.2 provides many real-time monitoring functions, such as live view, record storage, video playback, people counting, e-map and Business Intelligence, etc.

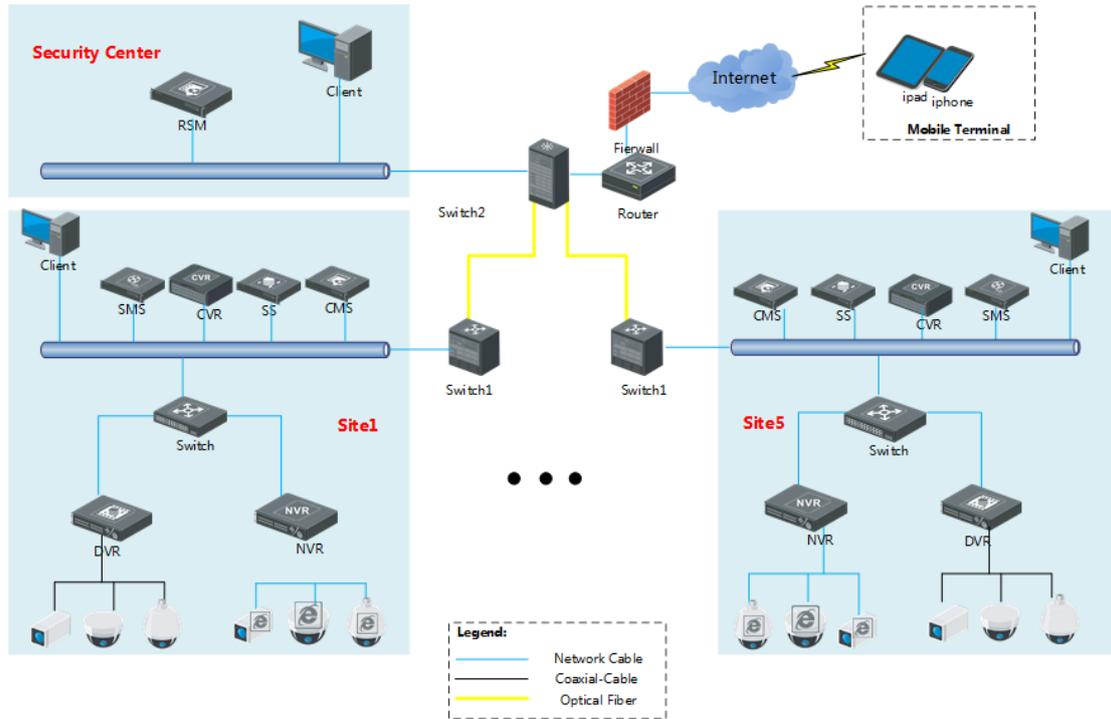
➤ **Service Layer**

The Service layer contains four parts: RSM, CMS, SMS and SS. The Remote Site Management (hereafter simplified as RSM) is the management center of CMSs (Central Management Server) and can view all the video and receive all the alarm information of the managed CMSs. CMS is the core component of the iVMS-5200 Pro, providing the authentication, permission granting, and management service. SMS is mainly responsible for the distribution and forwarding of the live video stream. SS gets video stream via SMS or directly from the encoding devices and extracts its index information and stores recording files and pictures on the storage device, thus to realize the large-scale network storage. RSM is the management center of CMSs and can view all the video and receive all the alarm information of the managed CMSs.

➤ **Device Layer**

This layer contains basic devices, such as network camera, encoding device, decoder, NVR and DVR, which are conveniently managed via unified network interface layer.

2.2 Application Deployment



Chapter 3 System Components

3.1 Components Structure



3.2 Service Manager

The Service Manager shows the running and registering status of all servers, which provides an interface for editing port of the servers.

3.3 Server

3.3.1 Remote Site Management

The Remote Site Management (hereafter simplified as RSM) is the management center of CMSs (Central Management Server) and can view all the video and receive all the alarm information of the managed CMSs.

3.3.2 Central Management Server

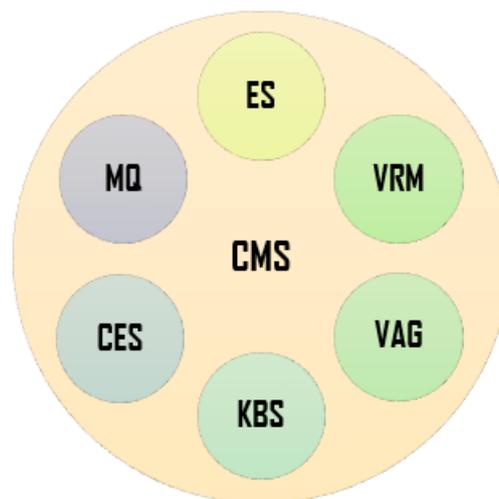
The Central Management Server (hereafter simplified as CMS) is the core component of the iVMS-5200 Pro, providing the authentication, permission granting, and management service. CMS authenticates the access of the client, manages the user, role, permission, monitor devices. The CMS also provides the interface for third-party system integration. The installation package

has two modes: normal and hot backup. The end-user needs to input the IP address and port of CMS with normal installation mode, while there is no need to install Server Manager with hot backup installation mode. The causes of “Registering” of servers can be shown on Server Manager.

Server Performance and Parameters:

- 1) Up to 2048 cameras connectable.
- 2) Up to 1024 encoding devices connectable.
- 3) The number of Alarm inputs plus Alarm outputs is up to 2048.
- 4) Up to 64 roles.
- 5) No limit on the users.
- 6) Up to 100 Clients (Web Client/Control Client/Mobile Client/Video Wall Client Software) can be visited concurrently.
- 7) 1024 e-maps manageable.
- 8) Support Virtual Machine. Both VMware (ESXi™ 6.x) and Hyper-V (with Windows Server 2012 R2) are supported.

The CMS contains the following service modules:



Database Server Module

Database Server module provides services as the data query, database management, database user management, information writing, history data storage, and daily data maintenance and

backup and so on. The backup of database can be done manually and end-users can choose configuration URL. The database supports PostgreSQL (V9.2.10).

Video Recording Manager

Video Recording Manager is mainly responsible for the configuration of the camera recording schedule and the search of record files. And VRM provides the unified management of the storage of the device (e.g., network camera), supports PB-scale data storage and provides query result with sub-second response time.

Video Access Gateway

The Video Access Gateway manages all the Hikvision devices' access to the system, and checks those devices' running status.

Event Server

The Event Server manages and handles various alarm events, distributes and uploads the alarm information. The linkage actions include the Control Client linkage (triggering pop-up image of camera, audible warning), PTZ action, recording, email notification, and alarm output linkage. Moreover, alarm log management is also available. It also checks the device and user status in the system.

Event server also monitors the running status of the system, including devices and servers, and displays it in the diagram.

Cascading Event Server

CES (Cascading Event Server) relays alarm information to all sites and logs on Control Client with RSM user.

Keyboard Proxy Server

KBS (Keyboard Proxy Server) provides communication function between the iVMS-5200 Pro and Hikvision IP keyboard, so that the Video Wall, PTZ can be managed by keyboard.

Message Queue

MQ (Message Queue) is used for inter-process communication.

3.3.3 Stream Media Server (Optional)

Stream Media Server (SMS) is mainly responsible for the distribution and forwarding of the live video stream, and concurrently 300 channels D1@2mbps can be forwarded. The stream from third-party devices can also be forwarded by SDK or RTP/RSTP protocol. The SMS utilizes the bandwidth in a reasonable way, in that it can save the bandwidth when there are many users getting the same video stream via the SMS. SMS helps transcode platform's HD stream to the standard definition stream which is used for live view in the mobile client.

Note: *The SMS is a must for Mobile Client, and third-party camera access. There is no limit to the number of SMS.*

3.3.4 Storage Server (Optional)

The Storage Server gets video stream via Stream Media Server or directly from the encoding devices, and extracts its index information and stores the record files, pictures on the storage device, thus to realize the large-scale network storage. The platform supports 32 Storage Server. The storage media supports the local HDD or network storage, and HDD space expansion is provided. The storage space can be managed via the remote configuration of the Storage Server at physical view of Web Manager.

Note: *The storage server must be installed on 64-bit OS.*

Server Performance and Parameters:

- 1) The capacity of one disk in Storage Server should be no more than 8TB.
- 2) The total capacity of single Storage Server should be no more than 80TB.
- 3) Storage Server supports NTFS disk file system.
- 4) iPSAN can be mounted as a local disk in SS via iSCSI protocol and managed by Storage Server.
- 5) Up to 32 Servers (SS/CVR) can be supported for storage.
- 6) Record files and pictures overwriting.
- 7) Storage efficiency of 10 pictures per second.

- 8) Up to 64 channels D1 @2Mbps can be stored concurrently for local disk, and up to 128 channels D1 @2Mbps can be stored concurrently for IP-SAN.
- 9) High-speed download of record files for multiple cameras at the same time.
- 10) Download by time or by alarm search.
- 11) Storage exception report.

3.4 Client

3.4.1 Web Client

iVMS-5200 Pro Web Client is a web browser based interface for system configuration, such as resource management, recording schedule configuration, event configuration, logical alarm and user management.

3.4.2 Control Client

You can view the live video, playback record files, handle the alarm, download the video file, search the system log, open the local pictures and check the server status, etc. The working status of all server modules and devices can also be monitored. It also supports BI (Business Intelligence) Report, POS information overlay and POS playback.

3.4.3 Video Wall Client Software

Video Wall Client Software is used to control the video wall. You can create scene, configure the roaming windows, merge windows, configure cycle decoding, customize background picture and logo, configure scene switching, playback record files or show alarm images on video wall.

3.4.4 Mobile Client

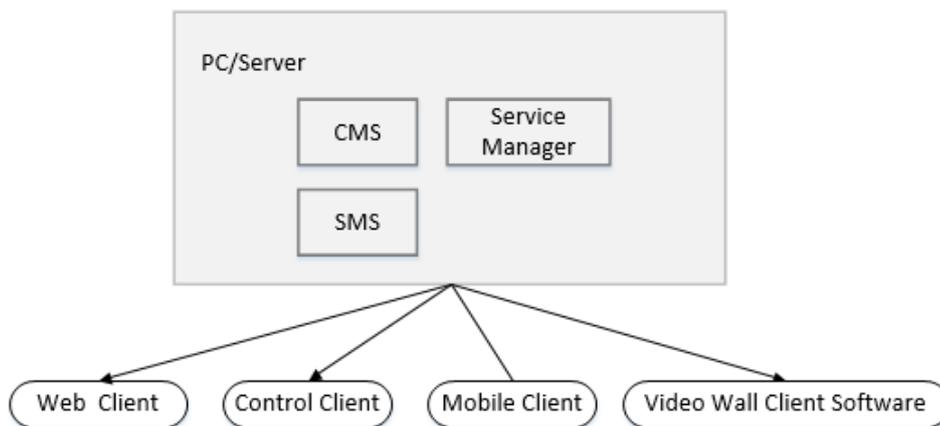
The Mobile Client (iVMS-5200 Mobile Client) can be installed on your mobile phone or PAD to get the live view, do PTZ control, and playback conveniently. It can also upload the live video

captured by the camera of your cell phone to the Control Client. And the operating system can be iOS and Android. The SMS should be enabled for the camera before you can live view the camera via Mobile Client.

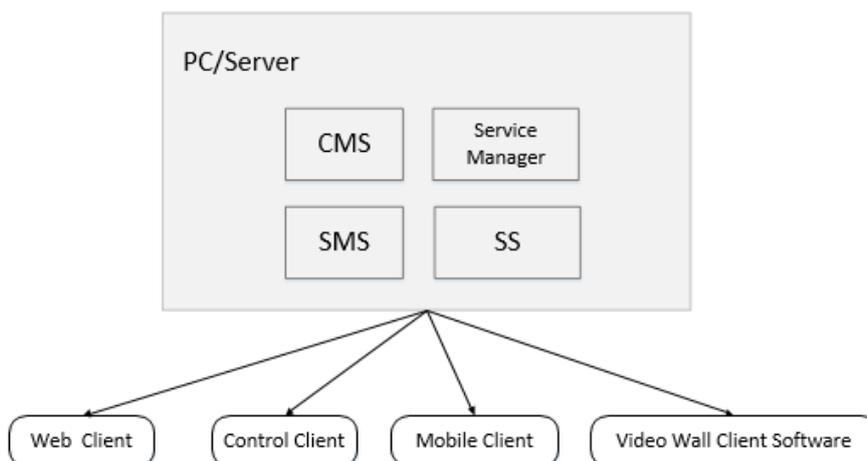
Chapter 4 iVMS-5200 Pro Typical Installation Deployment

4.1 Single-Server Deployment

4.1.1 Single-Server Deployment (Minimum)

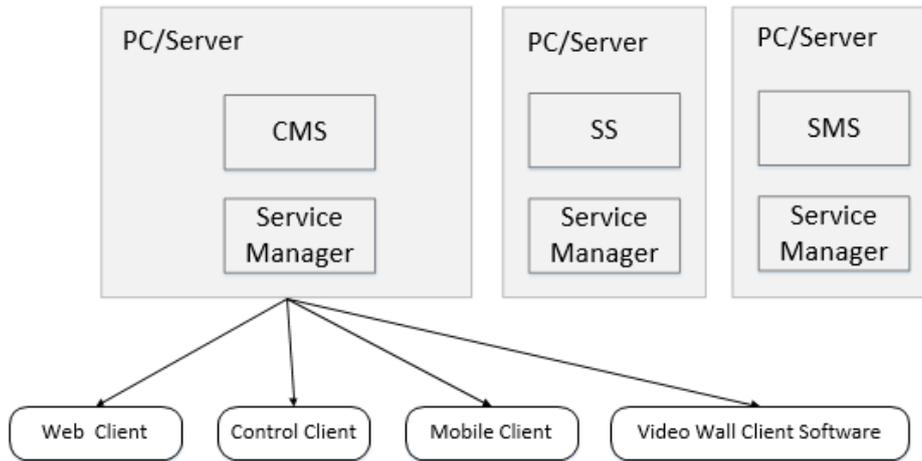


4.1.2 Single-Server Deployment (Complete)



Note: The difference between **Minimum** and **Complete** is that SS is deployed in the PC/Server.

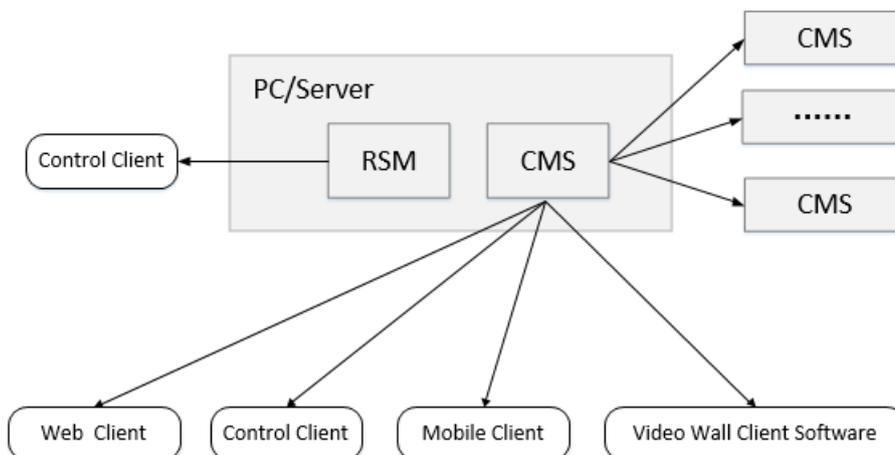
4.2 Distributed Deployment



Note: The difference between **Single** and **Distributed** is that SS and SMS are deployed in different PCs/servers with CMS.

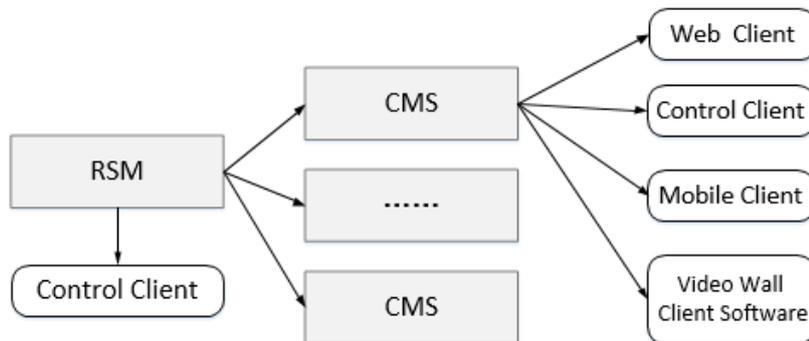
4.3 Federation Deployment

4.3.1 Federation Deployment (Single-Server)



Note: RSM and CMS are deployed in the same PC/Server, and up to 5 CMSs can be managed by RSM.

4.3.2 Federation Deployment (Distributed)

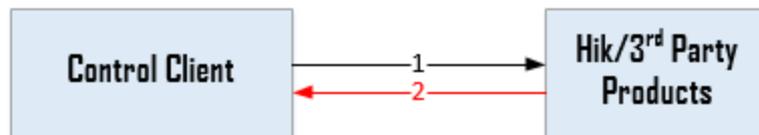


Note: The main difference between Single and Distributed is that RSM and CMS are deployed in different PCs/Servers. RSM client can manage up to 5 CMSs and receive alarms of managed sites.

Chapter 5 iVMS-5200 Pro Signaling Flow

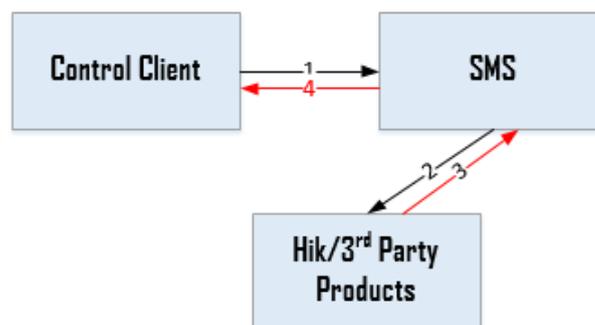
5.1 Live View

5.1.1 Live View via direct connection



- 1) Step 1: Control Client gets stream of the device via SDK according to the related information, such as camera information and transmission information.
- 2) Step 2: The device sends stream data to Control Client, and Control Client plays the live video.

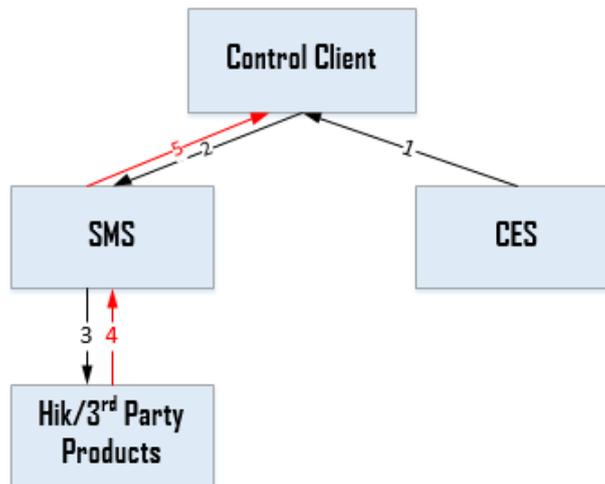
5.1.2 Live View via SMS



- 1) Step 1: Control Client calls the SMS interface to get stream from SMS via URL which is combined with SMS information, camera information and transmission information.
- 2) Step 2: SMS gets stream from the device through ONVIF protocol according to the device address, port No., camera No., stream type and other information involved in the URL.
- 3) Step 3: The device sends the stream data to SMS.

- Step 4: SMS encapsulates the stream data and forwards it to Control Client for live viewing.

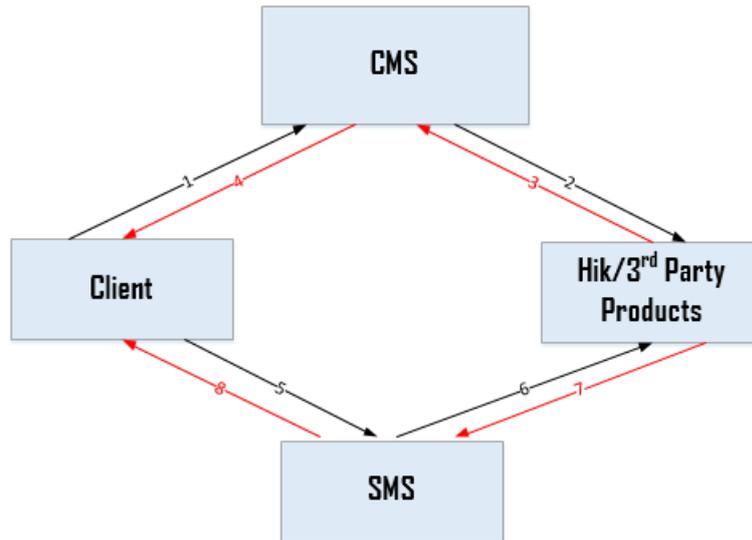
5.1.3 Alarm Linkage to Live View on Client with RSM User



- Step 1: CES sends alarm information of all sites to Client with RSM user.
- Step 2: The Client with RSM user chooses the right IP address to visit SMS based on the network information.
- Step 3: SMS gets stream from the device.
- Step 4: The device sends stream back to SMS.
- Step 5: SMS relays the stream to Client.

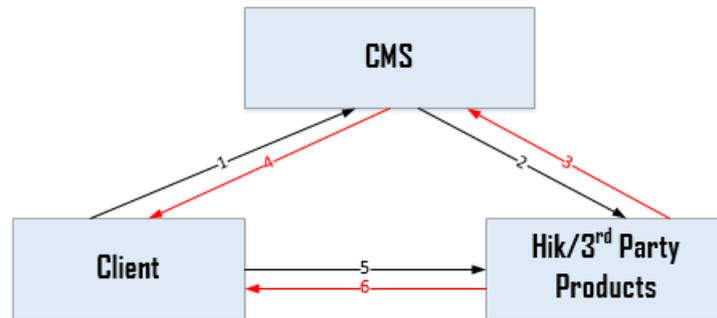
5.2 Playback

5.2.1 Storage on Device (Configured With SMS)



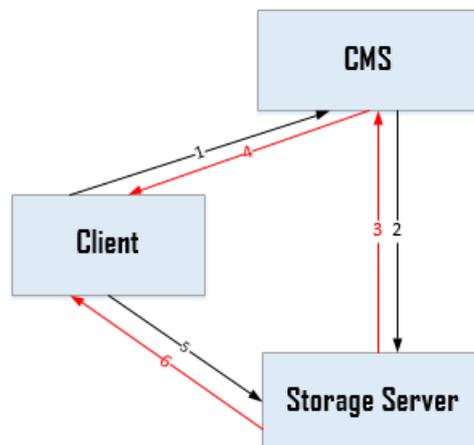
- 1) Step 1: The Client sends the camera No., time duration, recording type and other query conditions to CMS.
- 2) Step 2: If the query type is evaluated as the recording on device, the CMS will login the device and call the device SDK for searching the record files.
- 3) Step 3: The device sends the query results back to CMS.
- 4) Step 4: CMS returns the query results to the Client, and the Client will display the result on its interface.
- 5) Step 5: The Client gets stream from SMS according to the URL of the searched record files.
- 6) Step 6: SMS calls the device SDK to get stream from the device according to the URL and other information.
- 7) Step 7: The device sends the stream to SMS.
- 8) Step 8: SMS forwards the stream to the Client.

5.2.2 Storage on Device (Without SMS)



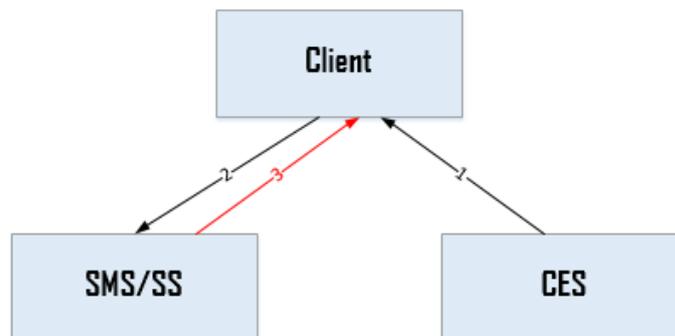
- 1) Step 1: The Client sends the camera No., time duration, recording type and other query conditions to CMS.
- 2) Step 2: If the query type is evaluated as the recording on device, the CMS will login the device and call the device SDK for searching the record files.
- 3) Step 3: The device sends query results back to CMS.
- 4) Step 4: CMS sends query results back to the Client, and the Client will display the result on its interface.
- 5) Step 5: The Client calls the device SDK to get stream from the device according to the URL and other information.
- 6) Step 6: The device sends the stream to the Client.

5.2.3 Storage on Storage Server



- 1) Step 1: The Client sends the camera No., time duration, recording type and other query conditions to CMS.
- 2) Step 2: If the query type is evaluated as the recording on Storage Server, the CMS will log into the Storage Server and search the record files.
- 3) Step 3: Storage Server gives the query results back to CMS.
- 4) Step 4: CMS sends query results back to the Client, and the Client will display the result on its interface.
- 5) Step 5: The Client gets stream from Storage Server according to the URL of the searched record files.
- 6) Step 6: Storage Server sends stream to the Client.

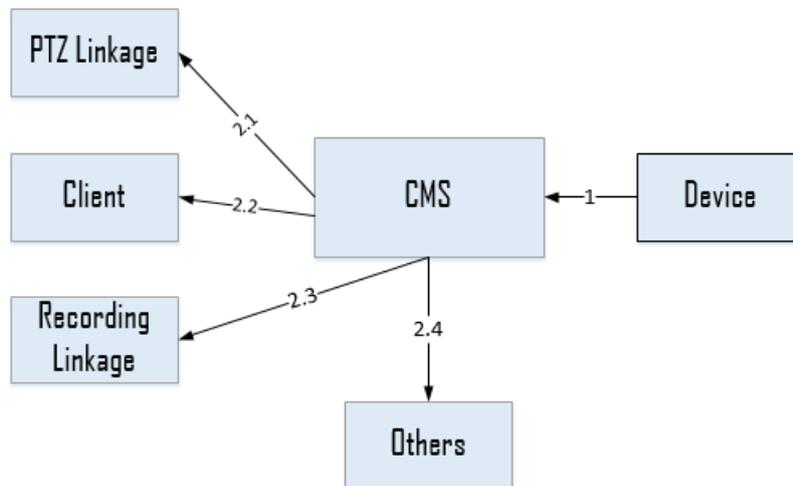
5.2.4 Alarm Linkage to Playback on Client with RSM user



- 1) Step 1: CES sends alarm information of all sites to Client with RSM user.
- 2) Step 2: The Client with RSM user packages playback URL based on alarm information and gets stream from SMS (Storage media is device) or SS/CVR.
- 3) Step 3: SMS/SS sends back playback video to Client with RSM user.

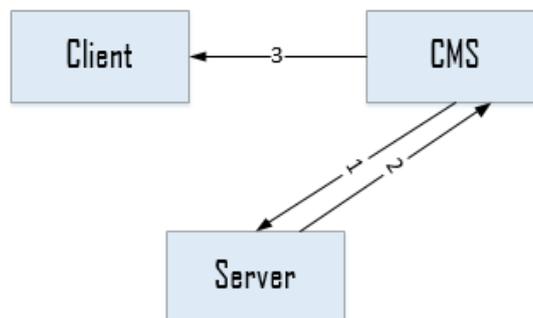
5.3 Alarm Management

5.3.1 Device Alarm



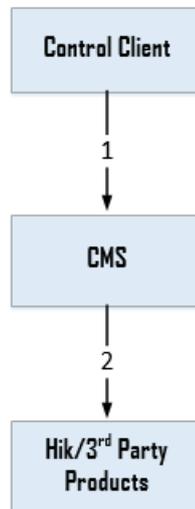
- 1) Step 1: The device sends alarm information to CMS.
- 2) Step 2: CMS sends alarm information to Control Client as configured and trigger the alarm linkage.

5.3.2 Server Alarm



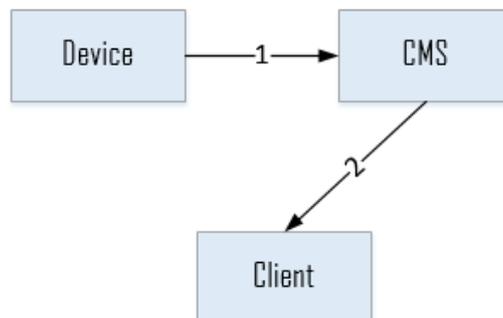
- 1) Step 1: CMS checks server status.
- 2) Step 2: The server returns running status to CMS.
- 3) Step 3: CMS sends alarm information to Control Client as configured and trigger the alarm linkage.

5.4 PTZ Control



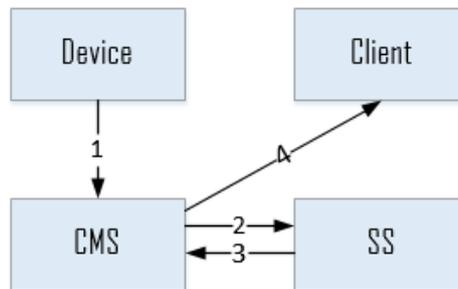
- 1) Step 1: Control Client sends PTZ control command to CMS via UDP protocol.
- 2) Step 2: CMS sends PTZ control command to Hikvision devices or 3rd party devices.

5.5 Inspection Management



- 1) Step 1: CMS regularly obtains the status of servers via SNMP, and obtains the status of the devices via device SDK.
- 2) Step 2: CMS sends the status information of servers and devices to Control Client.

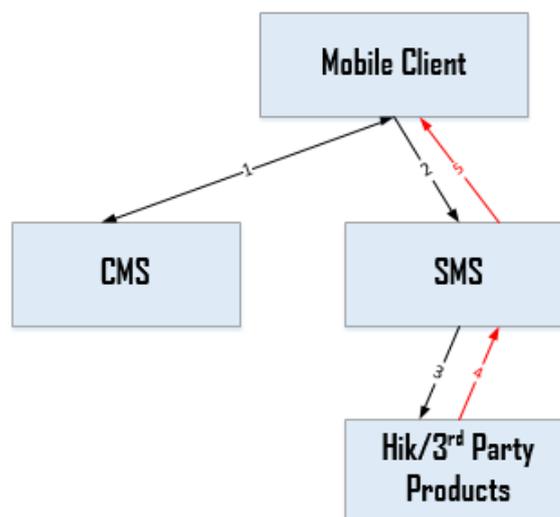
5.6 Picture Storage



- 1) Step 1: The device uploads the captured pictures to CMS.
- 2) Step 2: CMS sends the uploaded pictures to Storage Server.
- 3) Step 3: Storage Server sends the URL of picture storage back to CMS.
- 4) Step 4: CMS sends the picture URL to Control Client as needed.

5.7 Mobile Client

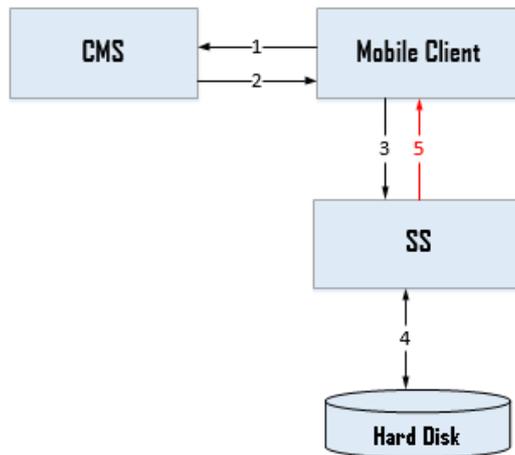
5.7.1 Live View



- 1) Step 1: The Mobile Client logs into CMS and asks for getting the resources of iVMS-5200 Pro, such as server information, camera information. And CMS responds to the request and returns the resource information.

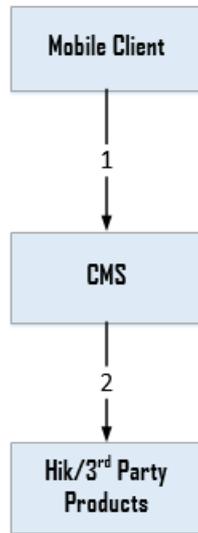
- 2) Step 2: The Mobile Client calls the SMS interface to get stream from SMS via URL which is combined with SMS information, camera information and transmission information.
- 3) Step 3: SMS gets stream from the device through SDK or ONVIF protocol according to the device address, port No., camera No., stream type and other information involved in the URL.
- 4) Step 4: The device sends the stream data to SMS.
- 5) Step 6: SMS forwards the stream data to Mobile Client for live viewing.

5.7.2 Playback (Storage on SS)



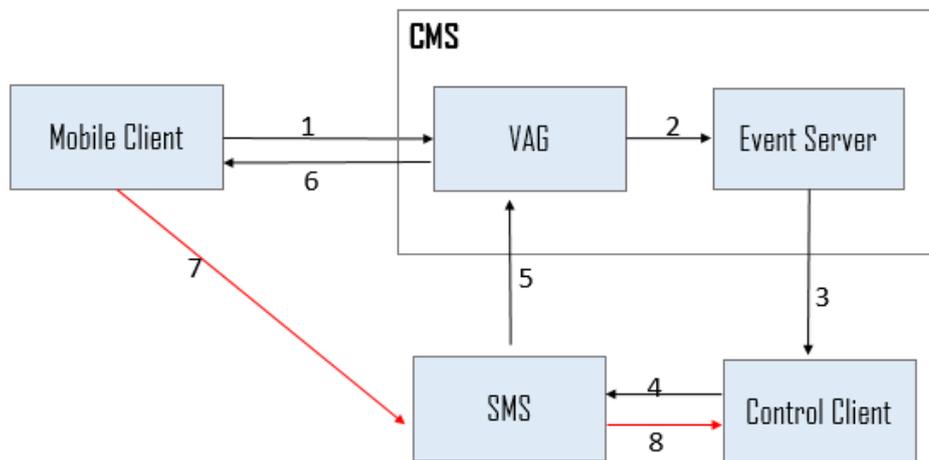
- 1) Step 1: Mobile Client logs into CMS and asks for getting the resources of channel for Playback.
- 2) Step 2: CMS sends back the streaming URL (SMS IP & Port) to Mobile Client.
- 3) Step 3: Mobile Client sends request to SS via RTSP protocol for playback.
- 4) Step 4: SS reads hard disk and obtains video & audio stream.
- 5) Step 5: SS sends video & audio to Mobile Client.

5.7.3 PTZ control



- 3) Step 1: Mobile Client sends PTZ control command to CMS via UDP protocol.
- 4) Step 2: CMS sends PTZ control command to Hikvision devices or 3rd party devices.

5.7.4 Upload Video

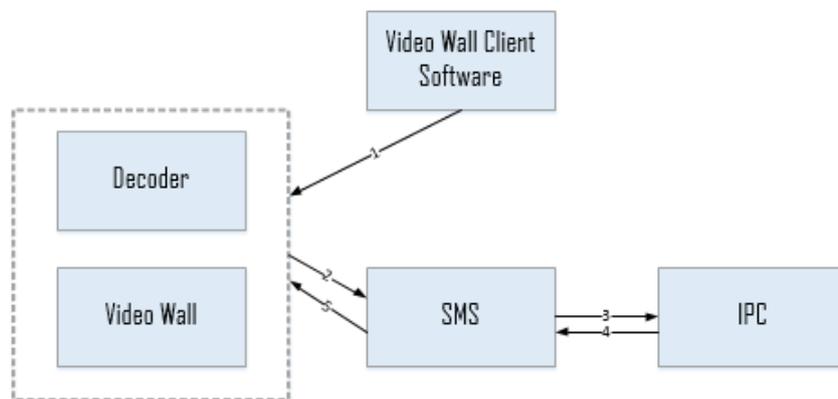


- 1) Step 1: Mobile Client sends uploading video request to VAG.
- 2) Step 2: VAG sends the request to Event Server.
- 3) Step 3: Event Server forwards the request to Control Client.
- 4) Step 4: Control Client agrees the request and asks for video of Mobile Client from SMS.

- 5) Step 5: SMS sends the request to VAG.
- 6) Step 6: VAG sends the request with SMS IP and port to Mobile Client.
- 7) Step 7: Mobile Client sends the uploading video to SMS.
- 8) Step 8: SMS forwards the uploading video to Control Client.

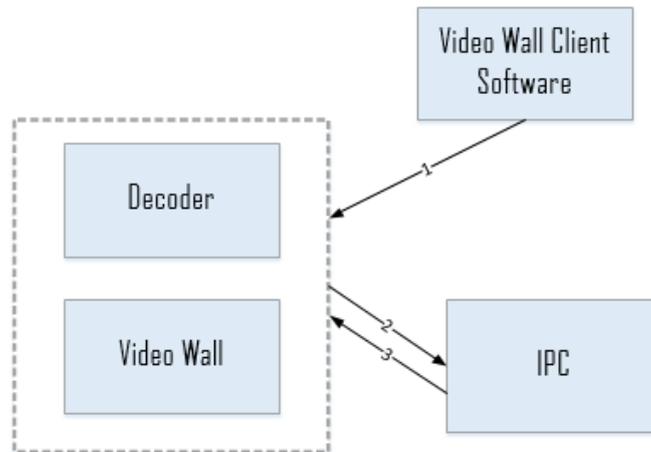
5.8 Video Wall Client

5.8.1 Live View via SMS



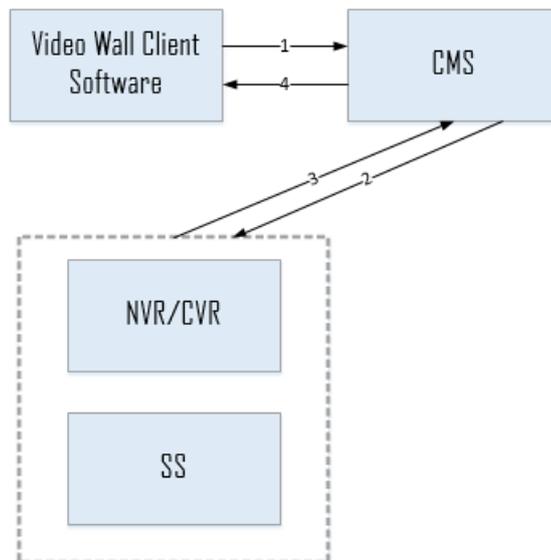
- 1) Step 1: The Video Wall Client pushes URL address to the decoder.
- 2) Step 2: The decoder calls the SMS interface to get stream from SMS via URL.
- 3) Step 3: SMS gets stream from the device.
- 4) Step 4: The device sends the stream data to SMS.
- 5) Step 5: SMS encapsulates the stream data and forwards it to the decoder for live viewing.

5.8.2 Live View with Direct Connection



- 1) Step 1: The Video Wall Client pushes URL address to Decoder.
- 2) Step 2: The decoder pushes the URL address to device to get stream.
- 3) Step 3: The device sends stream data to the decoder for live viewing.

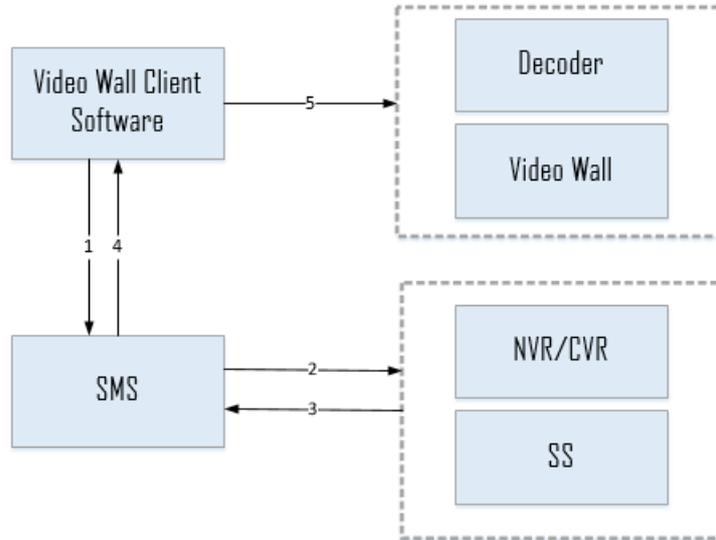
5.8.3 Query Recording Files



- 1) Step 1: The Video Wall Client sends request to CMS to check recording files.
- 2) Step 2: CMS sends request to storage media (NVR/CVR/SS).
- 3) Step 3: NVR/CVR/SS would return query results to CMS.

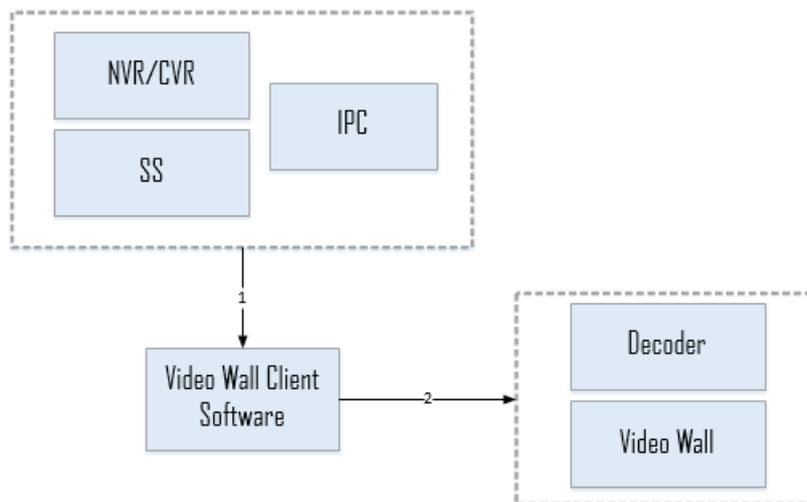
4) Step 4: CMS returns query results to the Video Wall Client.

5.8.4 Playback with SMS



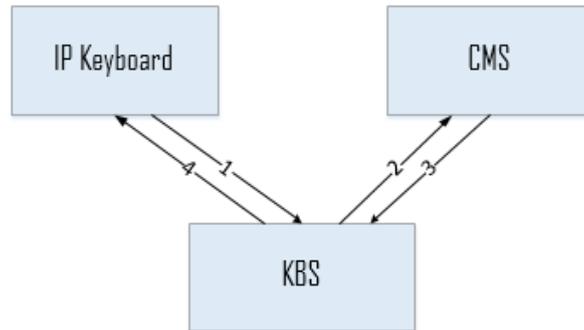
- 1) Step 1: The Video Wall Client sends stream request to SMS.
- 2) Step 2: SMS gets stream from NVR/CVR/SS.
- 3) Step 3: NVR/CVR/SS sends stream to SMS.
- 4) Step 4: SMS forwards stream back to the Video Wall Client.
- 5) Step 5: The Video Wall Client pushes stream back to decoder for live viewing.

5.8.5 Playback without SMS



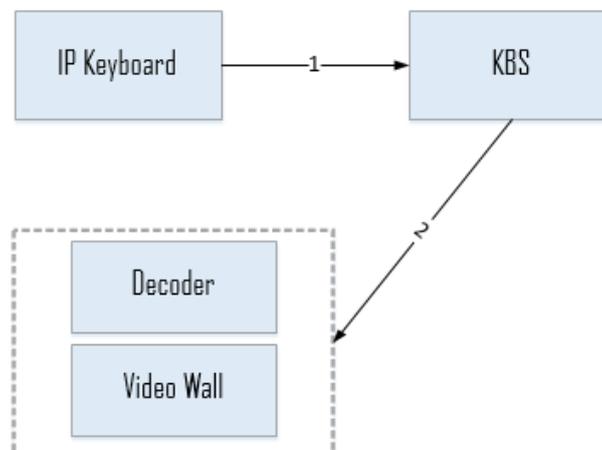
- 1) Step 1: The Video Wall Client gets playback stream from NVR/CVR/SS/IPC (IPC should support store the real-time stream in the local).
- 2) Step 2: The Video Wall Client forwards the stream to the decoder for live viewing.

5.8.6 Login with IP keyboard



- 1) Step 1: The IP keyboard sends login request to KBS.
- 2) Step 2: CMS would check the information sent by KBS.
- 3) Step 3: CMS returns the tested information to KBS.
- 4) Step 4: KBS returns the login result to IP Keyboard.

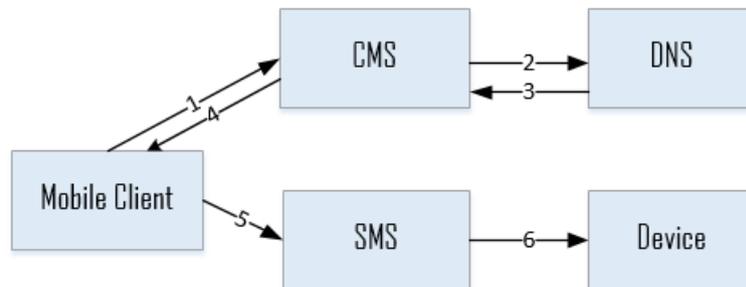
5.8.7 Display Live Video on the Video Wall with IP keyboard



- 1) Step 1: IP Keyboard downloads information and controls decoder via KBS.
- 2) Step 2: KBS sends request to decoder to display live video on the wall.

5.9 Domain Name Resolution

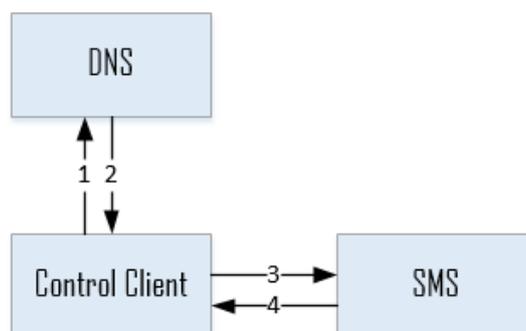
5.9.1 Mobile Client



- 1) Step 1: Mobile Client sends request to CMS to get Live View and Playback address.
- 2) Step 2: CMS sends domain name resolution request to DNS.
- 3) Step 3: DNS sends IP address back to SMS after resolution.
- 4) Step 4: CMS sends the IP address back to Mobile Client.
- 5) Step 5: Mobile Client gets stream from SMS.
- 6) Step 6: SMS gets stream from the device.

Note: The procedure above applies to situation in which users add devices by domain name.

5.9.2 Control Client



- 1) Step 1: Control Client sends domain name resolution request to DNS.
- 2) Step 2: DNS sends IP address back to Control Client.

- 3) Step 3: Control Client gets stream from SMS.
- 4) Step 4: SMS sends stream back to Control Client.

Note: The procedure above applies to situation in which users add devices by domain name.

Chapter 6 Functions Briefing

6.1 Web Client

6.1.1 Video Surveillance

6.1.1.1 Resource Management

➤ **Physical View**

- Add, edit and delete the encoding devices.
- Add devices by IP address or domain name, and remotely obtain the device information.
- Add devices by IP segment, port segment.
- Add devices by HiDDNS.
- Synchronize camera name.
- Get Device Record Schedule can be checked when adding devices to platform.
- Search online devices, add devices in batch.
- Support the remote configuration for HIKVISION devices, such as camera information, device information, network parameters, events and storage parameters.
- Remote configuration of the speed dome linkage for fisheye.
- Edit and delete the device. When deleting the device, the cameras and I/O linked to it are deleted, and the linked alarms, linkage actions and recording schedule (both on the CMS and device) of the cameras and I/O are also deleted.
- Support connecting with multiple third-party cameras (support connecting Axis, Bosch, by private protocol and other third-party cameras like Panasonic, Sony by ONVIF)
- Filter devices by device name, device type, etc.
- Add, edit and delete SMS (Stream Media Server), SS (Storage Server), CVR (Central Video Recorder) or NVR (Network Video Recorder).

- Support remote configuration of the server port and parameters.
- Remotely allocate the storage space of the Storage Server, and set the storage percentage of video files and pictures.
- Support displaying the running status of the servers.
- Add the Mobile Terminal.

Alias	Address	Serial No.	Available Camera	Alarm Input	Alarm Output	Operation
test_ptc1	10.9.19.6	DS-2CD4224F-IS20150318CCWR508039040	1	1	1	Configuration
test_PC	10.33.3.161	IDB-2CD6124FWDIC201602290CCH577521017	1	1	1	Configuration
test_FTZ	10.18.138.7	DS-2DF5274-A20150514CCWR519067483B	1	7	2	Configuration

➤ **Logical View**

- Add, edit and delete the areas.
- Up to 5 levels of areas can be configured.
- Add, edit and delete the cameras, alarm inputs, alarm outputs.
- Support configuration of camera name, stream type (only for HIKVISION device), protocol type, and keyboard No.
- Customize the name of alarm input and alarm output.
- Set the VCA configuration for the VCA device.
- Up to 100 POS machine could be added.
- Filter camera, alarm input, alarm output by device name, device type, etc.
- Check the information of the encoding device that the camera, alarm input and alarm output belong to.

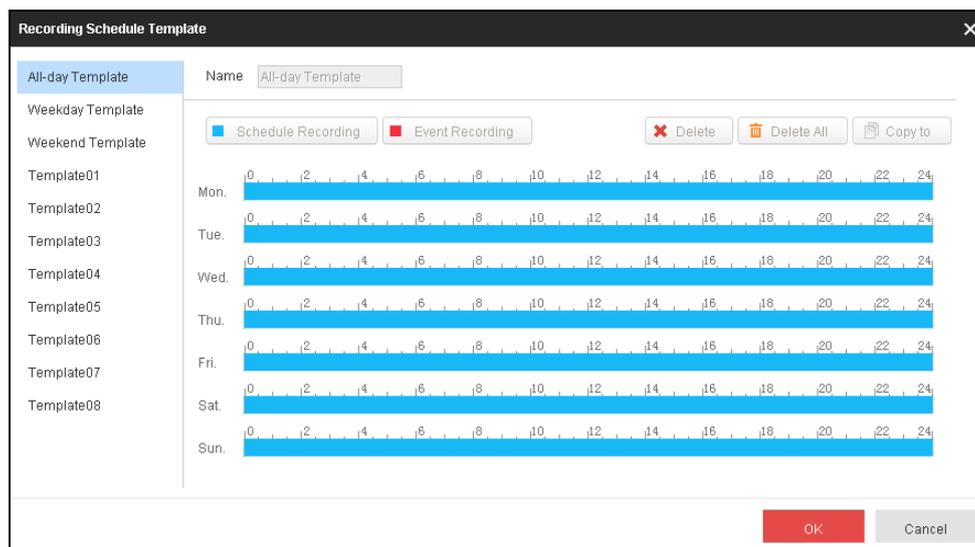
6.1.1.2 Record Schedule

➤ **Record Schedule Management**

- Get Device Record Schedule can be chosen to synchronize the record schedule.
- Configure recording schedule template, including all-day template, workday template, weekend template and 8 customized templates.

- Configure the schedule template by 7 days. The minimum unit of recording time is 30 mins, and 8 time periods can be set for each day.
- Configure the continuous recording, event recording.

Note: After the configured record schedule is executed properly, the record files can be searched and viewed on Remote Playback interface via Control Client.



➤ **Camera Recording Configuration**

- Support multiple storage mediums, such as HDD, SD card and IP SAN.
- Support multiple storage types, such as device storage.
- Storage Server supports main stream, sub stream and the third stream.
- Storage Server supports disk configuration.
- Support storage of the capture pictures of the camera.
- The information of recording configuration can be copied to other cameras.
- Display the recording configuration and recording schedule status.

6.1.1.3 Event Management

➤ **Camera Alarm**

- Support remote configuration of the camera parameters, enable/disable event, configure arming schedule of device.
- Customize the alarm name of the camera and arming region.

- Grade the alarm level to high, medium and low.
- Copy the information of alarm configuration in batch.

➤ **Alarm Input**

- Configure the arming schedule of the alarm input alarm and the schedule includes all-day template, workday template, weekend template and 8 customized templates.
- Customize the name of alarm input alarm.
- Grade the alarm level to high, medium and low.
- Support the configuration of Control Client linkage (pop-up image of camera, audible warning, two-way audio), recording linkage, PTZ linkage, alarm output linkage, email linkage, etc., for handling the alarm.
- The information of alarm configuration can be copied to other alarm inputs.
- Search the alarm input alarm by alarm input name, area name, etc.

➤ **Device Alarm**

- Configure the alarm for device offline, device HDD full, HDD R/W error, array exception, video standard mismatch, illegal login, HDD unformatted, resolution mismatch.
- Support Control Client linkage, e.g., audible warning and email linkage, for handling the alarm.
- Grade the alarm level to high, medium and low.
- Copy the information of alarm configuration in batch.
- Search the device alarm by device name, alarm type, etc.

➤ **Server Alarm**

- Configure arming schedule of the server alarm and the schedule including all-day template, workday template, weekend template and 8 customized templates.
- Edit the alarm name of Storage Server exception.
- Support Control Client linkage for handling the alarm.
- Grade the alarm level to high, medium and low.
- Copy the information of alarm configuration in batch.
- Search the server alarm by server name, alarm type.

- CVR alarm types: System over Temperature, CPU over Temperature, Mainboard over Temperature, Memory over Temperature, Chip over Temperature, Environment over Temperature, Insufficient Memory, Disk Loss, Disk Alarm, Bad Disk, External ISCSI Disk Disconnected, Physical Volume Loss, RAID: Array Initialization, RAID: Array Rebuilding, RAID: Array Expansion, Array Degradation, Array Testing, Array Recovery, RAID: Unavailable Array, Record File: No Record File, Record: Exception.

➤ **Custom Alarm**

- Customize the rules to create a new event to analyze the received TCP and/or UDP data packages.
- Trigger events when specified conditions are met.
- Edit rule name of the customized rule.
- Select transport type, TCP/UDP.
- Choose rule match type, two options are available: Search / Match.
- Define the event rule for analyzing the received package.
- Configure custom alarm for the area.
- Configure the alarm linkage, including trigger pop-up Image of camera, audible warning, PTZ linkage, trigger alarm output, recording linkage.

6.1.1.4 Camera Viewer

- The end-user can access Web Client page on Camera Viewer without repeated login.
- Support live view, playback and local configuration.
- Support window division, and the standard screen provides 1, 2*2, 1+5, 1+7, 3*3, 1+12, 4*4 window division for live view.
- Automatically switch the main stream and sub-stream.
- Support control of PTZ speed.
- Capture pictures, Instant Playback and recording are supported.

6.1.2 General Management

6.1.2.1 Logical Alarm

- The configured alarm can trigger the linkage actions of other sub-systems.
- At least one item of alarm settings should be configured before you set the logical alarm.

6.1.2.2 Security

➤ *User Management*

- Two kinds of users exist in the system: CMS user and RSM user.
- RSM's user is synchronized from RSM.
- Check, add, edit and delete the user by the users who have the permission.
- Obtain and import the users from AD domain controller.
- Edit the user information, including user name, password, PTZ control permission, user status, expiry date, and user description.
- Edit the user information, but excluding the name, status and expiry date of the default administrator.
- Delete the user, but excluding the default administrator.
- Divide the users by role.
- Set the expiry date for user.
- Divide the user in 100 levels to realize the permission assignment for PTZ control by level, and the default permission level is 50.
- Display the online users' information.
- Force logout the online user by the users who have the permission, but excluding the default administrator.
- Search user by user name.

➤ *Role Management*

There are two default roles: administrators and operators. Administrator has all the permissions of iVMS-5200 Pro and Operator has all the control permissions of operating Control Client.

- Add, edit and delete the roles.
- Assign permissions for the role.
- Assign permission for alarm output control.
- Assign the permission for receiving alarm information by area.
- Assign the device permission, including broadcast, device configuration.
- Assign the permission of Client Control, including Control Client configuration, exiting Control Client.
- Assign the permission of Web Manager, including resource management, user management, event management, recording management and system configuration.
- Support the hierarchical user management mechanism to grant or revoke the permission according to the user level.
- Clone and inherit the role and quick settings of the role.
- Set the temporary role and the expiry time of the role.
- Search the role by the role name.

6.1.2.3 System

- Configure the expiry date for the logs. The log can be saved up to 6 months.
- POS data can be saved up to 6 months.
- Support NTP function.
- A static IP address can be set to access the system via WAN.
- Support to obtain and import users from AD (Active Directory) domain controller.
- Videos taken by Mobile Client can be uploaded to the FTP server.

6.2 Remote Site Manager

6.2.1 Site Management

- Add, delete and edit CMS.
- Add CMS by IP address or domain name. Up to 5CMSs can be added.

6.2.2 Security

- Users can be added for managing RSM and accessing the added CMSs. And users of RSM can be synchronized to each CMS automatically.
- Assign permissions to the roles as required, and the user can link to the roles to obtain different permissions.

6.2.3 System Configuration

- Configure the expiry date for the logs. The log can be saved up to 6 months.
- Support NTP function.
- A static IP address can be set to access the system via WAN.
- Support to obtain and import users from AD (Active Directory) domain controller.

6.3 Control Client

End-users can choose CMS user or RSM user to login Control Client. If end-user chooses RSM user to login, then arming or disarming operation was based on a CMS.

6.3.1 Main View

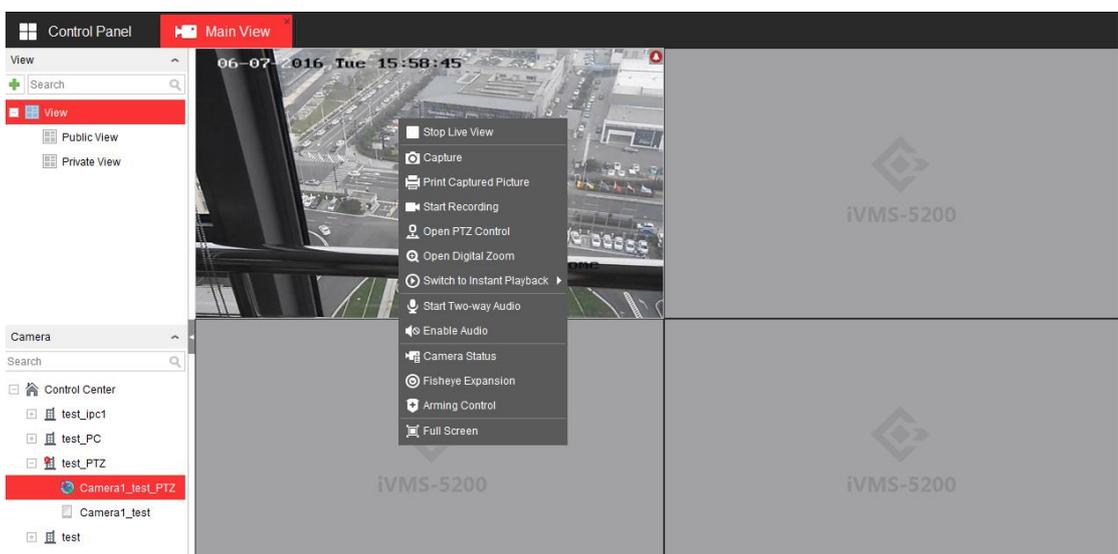
- Support Standard window division, wide window division and custom window division.

The standard window division provides 1, 4, 6, 8, 9, 13, 16, 25, 32, 36, 64-window

division, and the wide window division provides 4, 6, 7, 9, 12, 16, 24, 36, 48-window division.

- Users could set the view as public view and private view.
- Up to 4-screen (one main screen and 3 auxiliary screens) live view with the maximum 64 windows on all the screens. The specific decoding capability depends on the hardware performance.
- Search by area name and camera name on the device tree.
- Display the status of the camera.
- Automatically switch the main stream and sub-stream during live view.
- Support capture, and provide quick printing of the captured pictures.
- Support manual recording and packaging the record file by 1GB.
- Enable and disable the audio while the stream type set as video and audio.
- Support enable and disable camera auto-switch function, and manually switch pages, the auto-switch interval time is optional:20s, 40s, 1min, 3 min and 5 min, the interval time will take effect in the next auto-switch round.
- Support PTZ control during live view, including the movement in 8 directions
- 256 presets configurable and quick calling of the presets.
- 16 patrols configurable and quick calling of the patrols.
- 1 pattern configurable and quick calling of the patterns.
- Support PTZ control, PTZ lock and unlock. The lock time can be chosen: 5min, 10min or 16min. If the user who has higher permission locks the PTZ, user who has lower permission will receive error message. If one user locks the PTZ, then the user who has the same permission cannot operate or lock the PTZ. If user A locks the PTZ, When the PTZ was operated and locked by user B, the operation and lock status of user A will be unlocked.
- Support full-screen display in single-window or multiple windows.
- Keyboard (DS-1003KI/DS-1004KI/DS-1005KI) can be used for window switching and PTZ control.

- Window switching, PTZ control and picture capture by USB keyboard joystick.
- Support PC keyboard.
- Provide instant playback for playing back the record in last 30 seconds to 10 minutes.
- Support digital zoom.
- Support OSD.
- Support two-way audio.
- Display the status of online camera, live view, instant playback, alarm, audio and recording.
- Add, edit and delete view, support view auto-switch.
- Fisheye expansion is realized by software.

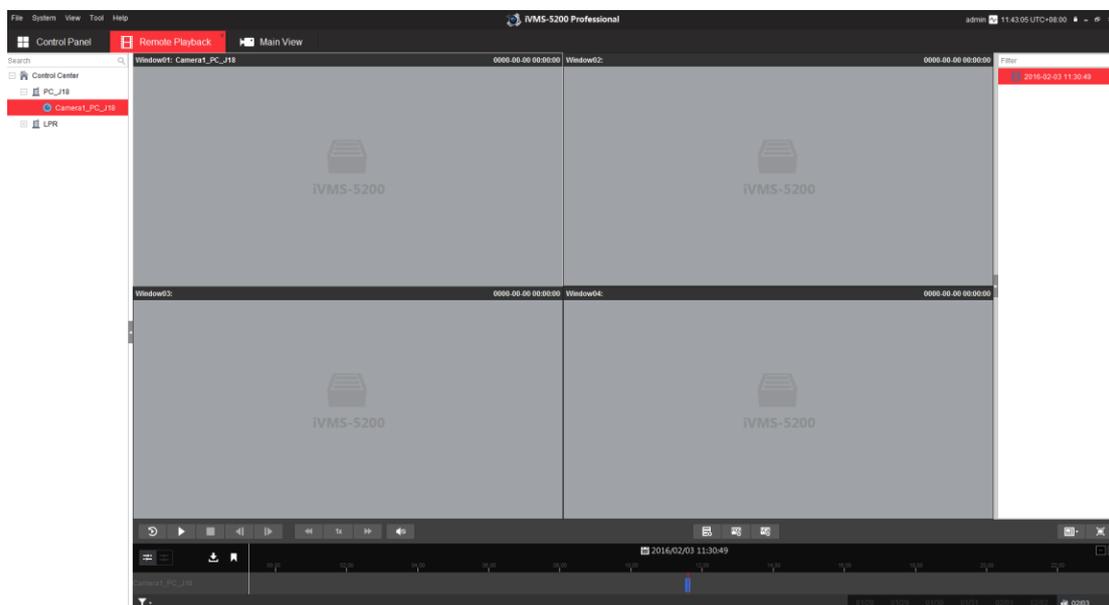


6.3.2 Playback and Download

➤ *Record Playback*

- Search video files by camera, time, recording type, alarm event, etc.
- Support VCA search and playback, search the record files triggered by line crossing, intrusion detection and motion detection.
- Search and play back the record files which contain POS information.
- Search the record files by camera, time, POS information, etc.

- Support playback of local and remote video files, and fast forward, slow forward, single-frame playback, reverse playback, locating by dragging the mouse.
- Set 1/2/4/8/16/32/64/128/256 playback speed of playback. The end-user can customize the maximum playback speed (33-65535) in Local Configuration.
- Fisheye expansion is realized by software.
- Tag management during remote playback.
- Provide video thumbnail on the timeline during playback.
- Enable the audio of the video and audio files.
- Provide synchronous and asynchronous playback of multiple windows, and support up to 16-ch synchronous playback.
- Support precisely locating the record data by time.
- Support digital zoom when playing back.
- Support capture during playback, and provides quick printing of the pictures.
- Mark on the calendar when record files are available on that day.
- Manage the video data via graphical interface.



➤ **Export and Download**

- Download record file by files, date and tag.
- Support downloads in batch.
- Export and download pictures.
- Configure the download speed.

- View the downloading status.
- The player can be downloaded.
- The maximum size of merged record file is 1G.

6.3.3 Alarm Management

➤ **Alarm Information**

- Control Client can receive all CMS's alarm information if the end-user chooses RSM user to login.
- Available alarm types include VCA alarm, server exception, audio exception, defocus detection and face detection, etc.
- Support Control Client linkage, e.g., pop-up image of camera, audible warning, two-way audio, e-map linkage and alarm picture preview for handling the alarm.
- Support e-mail linkage with alarm pictures.
- The alarm information can be sorted by time, alarm name, alarm content, status, level, etc.
- The alarm information can be searched by Event or Alarm.
- The alarm triggered recording can be played back and viewed.
- Locally save and live view the alarm pictures.
- Filter the alarm information to avoid the massive amount of repeated information.
- Mark the alarm information.

➤ **Alarm Output Control**

Enable and disable the alarm outputs.

➤ **Arming Control**

- Arm / disarm the camera and I/O alarm, and Control Client cannot receive the alarm information of the disarming camera or I/O alarm during the disarming duration.
- Customize the disarming duration (1~99 hours)
- Arm / disarm the cameras and I/O alarms in batch.

➤ **Alarm Acknowledgment**

- Manually acknowledge the alarm.
- Acknowledge the alarms in batch.
- Support describing and acknowledging the alarm.

6.3.4 E-map

➤ *E-map Management*

- Add, edit and delete the e-map.
- The map format should be PNG or BMP or JPEG and the photo size should be no more than 10MB.
- The resolution of map picture should be no more than 1900*1440.
- The e-map doesn't link with the area.
- Up to 1024 e-maps can be added.
- Manage by level and hierarchy, and the e-map is linkable to multiple sub-maps. Up to 5-level sub-maps can be supported.
- Add, edit and delete the map elements, including camera, alarm output, alarm input, link and label.
- Customize the name, icon, color and description of the e-map elements (e.g., hot spot and hot region), and the icons should be in JPEG / BMP / PNG format with size of 32*32 pixels.
- Configure the elements of e-map in batch.

➤ *E-map Control*

- Provide map navigation to quickly switch to the designated location (that is, eagle eye mode).
- Show / hide the elements (e.g., camera, alarm input,) of the e-map, and only show the selected element type.
- Support zoom in, zoom out and roaming. The scaling ratio ranges from 25% to 400%.
- Quickly switch to superior e-map and previous e-map.
- Support alarm output control.

- View the history alarm of the camera.
- Set and call the preset of the e-map.
- Support pop-up of live view window for manual recording, audio control, capture, PTZ control, digital zoom, etc.
- The icon of the alarm source (e.g., camera, alarm input) twinkles when the alarm occurs and the information of alarm source can be displayed.
- Manually refresh the e-map.
- Quickly locate the e-map elements.
- Capture and mark the e-map.

6.3.5 POS Live View

- Display POS information on the right when viewing one camera.
- Overlay POS information on the video image when viewing multiple cameras.
- Mark, edit or delete transaction event.

6.3.6 POS Search

- Search POS information by transaction No.
- Search POS information by flag.
- Search POS information by event.
- Search POS information by advanced conditions, such as item, price, quantity, cashier, POS terminal, barcode, etc.
- Click on the searched item to pop up the detailed transaction information
- Playback related record files according to POS information
- Export the video file with the transaction information
- Capture the image with transaction information during playback and send it via email.

6.3.7 BI Report

You could set a customized name for the report. And you could select the cameras, devices under areas to generate the report. There are 4 main types of report and 12 sub types:

➤ **Transaction Data Analysis**

- Transaction Report: Display the total number of every cashier's transaction volume during a period of time, to reflect the performance of cashier
- Commodity Sales Volume: Calculate the sales volume of selected commodities to help the manager make sales decision.
- Top Selling: To know the bestselling and the bottom selling, thus the manager can rearrange the goods storage.

➤ **Traffic Analysis**

- Traffic Distribution: Provide a report on the total traffic volume of every store during a period of time, to know which store has the least traffic and then take action to get a better performance.
- Traffic Trending: Predict the afterward traffic flow according the historic traffic data.
- Customer Gender Analysis: To have a vivid view of in which gender group the product is more popular.
- Conversion Rate: Calculate the conversion rate to know whether the commodity meets the market requirements.

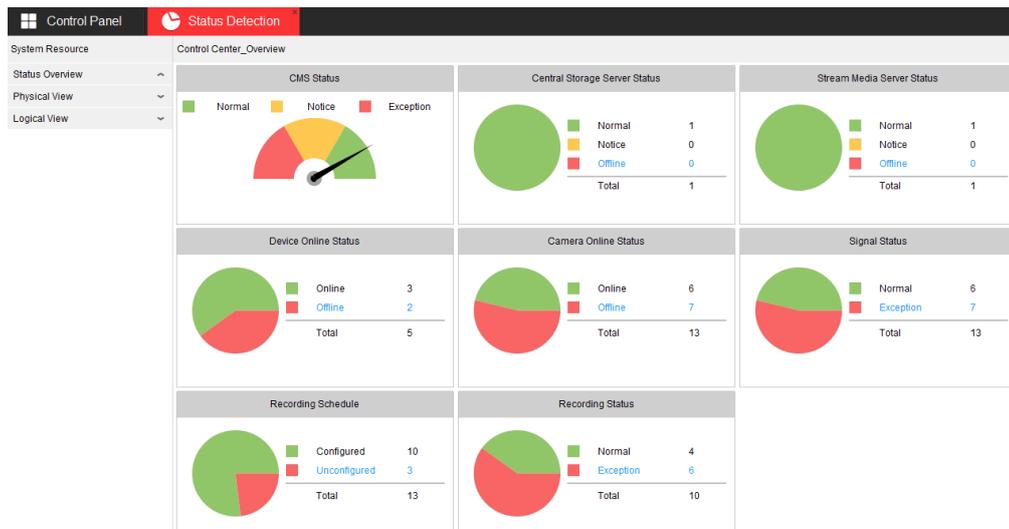
➤ **Retail Traffic Analysis**

- Heat Map: To know the rush hour from a specific camera, to help the manager get more information to provide better customer experience.
- Interested Area Analysis: To show which is the most interested area, and where the customer rarely patronized.

6.3.8 Status Detection

➤ **Status Overview**

- Display the system status by graph



➤ Physical View

- The status of the servers, connected devices and recording can be displayed.
- Display the network status, HDD status and device information of the connected devices.
- Show the network status, CPU, memory, information, real-time status of the servers.
- Support displaying the devices or servers in exceptional status only, and quick query

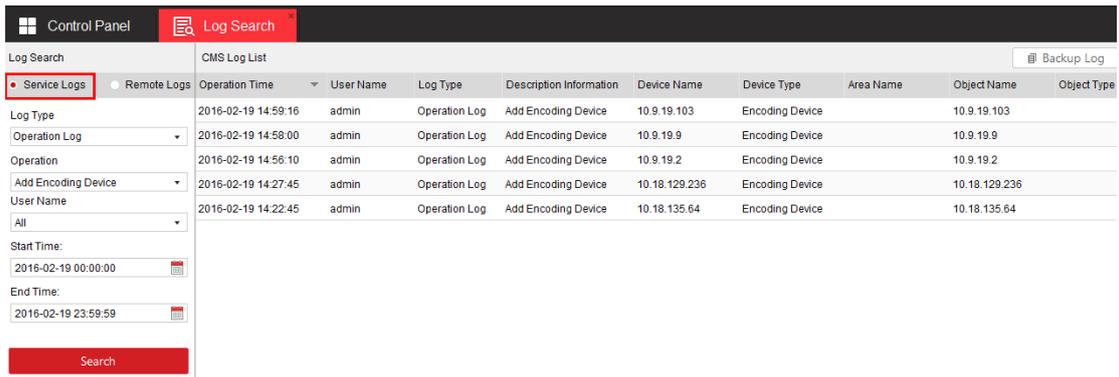
➤ Logical View

- Display the online status, signal status, recording schedule and recording status of all the cameras.
- Display the network status, signal status, recording status, camera information of the camera separately.
- Support displaying the cameras in exceptional status only, and quick query.

6.3.9 Log Search

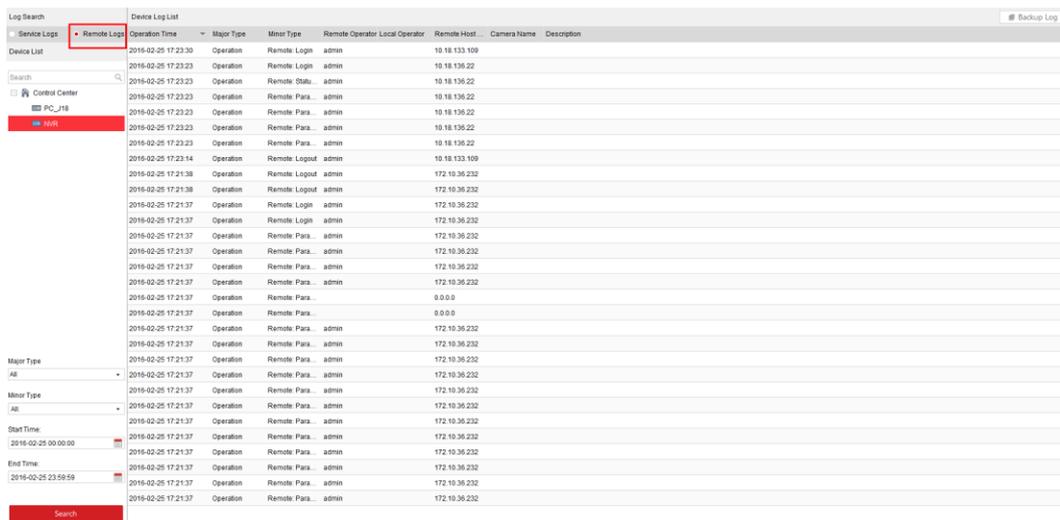
➤ Service Logs

- Service logs refer to log files of CMS or RSM.
- Search the system logs by log type, operation type, user, start/end time, etc.
- Export and backup logs.



➤ **Remote Logs**

- Remote logs refer to the log files of the connected devices and are stored on the local device.
- Search the device log by device, major type, minor type, start/end time, etc.
- Backup the logs.



6.3.10 Local Configuration

➤ **General Settings**

- Support view scale configuration.
- Support network performance configuration.
- Support play performance configuration.
- Support the configuration of captured picture format.
- Auto-login mode of Control Client configurable.

- Support auto-changing the stream type.
- High-speed playback speed can be set.
- Enable screen toolbar display.
- Mark the detected objects with green rectangles in live view and playback.
- Record the audio during two-way audio.
- Display the VCA rule on live view screen.
- CMS configuration information would pop-up on Control Client when end-user does configuration on Web Manager.
- Support Update configuration information manually.

➤ ***File Settings***

- Configure the saving path for captured pictures, local recording and the audio file recorded during two-way audio.
- Configure FTP parameters.

➤ ***Keyboard and Joystick Settings***

- Configure parameters of the external keyboard.

➤ ***Alarm Sound Settings***

- Support configuration of voice engine.
- Configure the local audio files for handling the alarm.

6.3.11 Auxiliary Function

➤ ***Two-way Audio***

- Support two-way audio between user and device.
- Support the broadcast function.

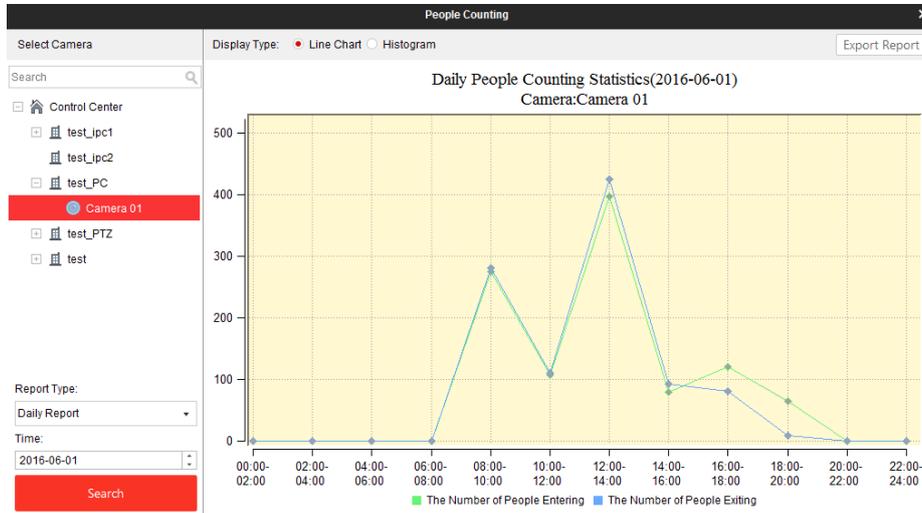
➤ ***Alarm Output Control***

- Manually enable or disable the alarm output.
- Display the alarm output status.

➤ ***People Counting***

- Search the people counting statistics by camera, time and report type.

- Three report types are available: daily report, monthly report and annual report. And the statistics can be displayed in line chart or histogram.
- Export the data of people counting statistics.



➤ **Heat Map**

- Support generating the heat map of the network cameras.
- Generate the heat map according to the camera and time.
- Up to 3 months of data can be generated as heat map.

6.4 Mobile Client

- Support live view and playback via mobile phone.
- Capture pictures, clip video, and save record files.
- Upload mobile phone real-time video to Control Client.
- Upload GPS information to Control Client.
- Support various operating systems, such as iOS 7/8/9 and Android3/4/5.
- Login with domain user via Mobile Client.

6.5 Video Wall Client Software

- Support scene management.

- Support management of decoders' information. Support adding or deleting decoders and support the remote configuration of decoders.
- Wizard helps users to finish the basic configuration of Video Wall Controller.
- Support normal login and domain login.
- Support 2048 cameras.
- Support configuration of the roaming windows, merge windows.
- Support cycle decoding configuration.
- Support customization of background picture, virtual LED and logo.
- The background picture should be in BMP format with size of 32*32 pixels-256*128 pixels.
- Support scene auto-switch.
- Support playback record files on video wall.
- Support showing alarm images on video wall.
- Support video wall control over IP keyboard.
- Setup Wizard is supported to configure the system.
- Support PTZ control.
- Support window configuration, such as Alarm Window, Decoding Delay, Fluent Video, 3D DNR, Defog, and Low Illumination.
- Support decoding status display, such as window No., video stream, resolution, frame rate, and so on.
- Support screen parameters adjustment, such as **Serial Port Protocol, Screen Protocol, Screen Control, Input Source, Image Parameters, Image Position** .
- Support alarm information display. And users could display related camera on the video wall directly.
- Support log search and system configuration.

Chapter 7 Network Communication Protocol

Server/Device	Protocol
Client-Server	SSL
VAG-Hikvision Products	Hikvision SDK
VAG-Ehome Device	Ehome Protocol
Access the 3 rd Party Device	Onvif Protocol /3 rd Party Products SDK Protocol
CMS-Active Directory	ADSI
Servers-CMS	Http Protocol