NetSDK_JAVA

Programming Manual

V2.0.0

Foreword

Purpose

Welcome to use NetSDK (hereinafter referred to be "SDK") programming manual (hereinafter referred to be "the manual").

SDK, also known as network device SDK, is a development kit for developer to develop the interfaces for network communication among surveillance products such as Network Video Recorder (NVR), Network Video Server (NVS), IP Camera (IPC), Speed Dome (SD), and intelligence devices.

The manual describes the SDK interfaces and processes of the general function modules for IPC, SD and Thermal IP Camera (TPC). For more function modules and data structures, refer to *NetSDK Development Manual*.

The example codes provided in the manual are only for demonstrating the procedure and not assured to copy for use.

Reader

- SDK software development engineers
- Project managers
- Product managers

Signals

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 **CAUTION**	Indicates a potential risk which, if not avoided, could result in property damage, data loss, lower performance, or unpredictable result.
 TIPS	Provides methods to help you solve a problem or save you time.
 NOTE	Provides additional information as the emphasis and supplement to the text.

Revision History

Version	Revision Content	Release Time
V2.0.0	Optimized the login module.	February 2025
V1.0.4	● Added sections about transcoding. ● Added extension commands for parameter 4 of PTZ control.	July 2024
V1.0.3	Added system permissions under the dynamic library path.	July 2023
V1.0.2	Updated some descriptions.	February 2023
V1.0.1	Deleted some library files.	April 2021
V1.0.0	First release.	February 2020

About the Manual

- The manual is for reference only. If there is inconsistency between the manual and the actual product, the actual product shall govern.
- All the designs and software are subject to change without prior written notice. The product updates might cause some differences between the actual product and the manual. Please contact the customer service for the latest program and supplementary documentation.
- There still might be deviation between the actual value of some data and the value provided, if there is any doubt or dispute, please refer to our final explanation.
- Please contact the supplier or customer service if there is any problem occurred when using the device.
- We are not liable for any loss caused by the operations that do not comply with the manual.
- All trademarks, registered trademarks and the company names in the manual are the properties of their respective owners.
- Please visit our website or contact your local service engineer for more information. If there is any uncertainty or controversy, please refer to our final explanation.

Glossary

This chapter provides the definitions to some of the terms appear in the manual to help you understand the function of each module.

Term	Definition
Main Stream	A type of video stream that usually has better resolution and clarity and provides a better experience if the network resource is not restricted.
Sub Stream	A type of video stream that usually has lower resolution and clarity than the main stream but demands less network resources. The user can choose the stream type according to the particular scenes.
Video Channel	The video is numbered from 0 and each video receives a channel number. Currently, except the TPC, the other types of devices usually have only one channel that is numbered as 0.
Login Handle	The first step to access to the device is login (authentication). The device receives a unique ID that refers to the login handle upon the successful login. This handle will be used by the subsequent procedures and stay valid until logout.
Relative Positioning	A fast positioning method in PTZ control by providing the difference value of the PTZ coordinates (X-axis and Y-axis) to the device which accord to the present PTZ location and the difference value to calculate and transfer to the final location. This method also supports ZOOM control.
Absolute Positioning	A fast positioning method in PTZ control which provides certain horizontal and vertical coordinates (angular coordinate) to the device. The device directly transfers to the user specified location. This method also supports ZOOM control.
PCM	Pulse Code Modulation is one of the coding methods of digital communication and converts the analog signal into digital signal without encoding loss. It is suitable for the user who requires higher data transfer rate and bandwidth.
PTZ	Pan Tilt Zoom is all-round movement and lens zoom control.

Table of Contents

1 Overview

1.1 General

The manual introduces SDK interfaces reference information that includes main function modules, interface functions, and callback functions.

The following are the main functions:

SDK initialization, device login, real-time monitoring, PTZ control, voice talk, alarm listening, smart subscription, record playback, record download and so on.

The development kit might be different dependent on the environment.

Table 1-1 Files of window development kit

Library type	Library file name	Library file description
Function library	dhnetsdk.h	Header file
	dhnetsdk.dll	Library file
	avnetsdk.dll	Library file
Configuration library	dhconfigsdk.h	Header file
	dhconfigsdk.dll	Library file
Auxiliary library of playing (coding and decoding)	dhplay.dll	Playing library
Auxiliary library of "dhnetsdk.dll"	StreamConvertor.dll	Transcoding library

Table 1-2 Files of Linux development kit

Library type	Library file name	Library file description
Function library	dhnetsdk.h	Header file
	libdhnetsdk.so	Library file
	libavnetsdk.so	Library file
Configuration library	dhconfigsdk.h	Header file
	libdhconfigsdk.so	Library file

- The function library and configuration library are necessary libraries.
- The function library is the main body of SDK, which is used for interaction between client and products, remotely controls device, queries device data, configures device data information, and gets and handles the streams.
- The configuration library packs and parses the structures of configuration functions.
- It is recommended to use auxiliary library of playing (coding and decoding) to parse and play the streams.
- The auxiliary library decodes the audio and video streams and collects the local audio for the functions such as monitoring, playback and voice talk.

1.2 Applicability

- Recommended memory: No less than 512 M
- Jdk version: jdk1.6; jdk1.8
- System supported by SDK:
  - ◇ Windows
    Windows 10, Windows 8.1, Windows 7 and Windows Server 2008/2003
  - ◇ Linux
    The common Linux systems such as Red Hat and SUSE

1.3 Solutions of Library Loading Error

There are three kinds of dynamic libraries, Windows(.dll), and Linux(.so).Windows and Linux have 64-bit version and 32-bit version. And there are two main methods to call the call C ++ dynamic library, which are using the Java project directly and running the Java project as a jar package for other projects. During the loading of the library, the error of "Unable to find the dynamic library" will appear.

The root cause of "Unable to find the dynamic library" is the mismatch between the code path and the physical path. Compared with the Windows version, the dynamic library name of the Linux has a lib prefix. Therefore, when loading a dynamic library in the Linux environment, you need to pay attention to the lib prefix and add the lib prefix when stitching the dynamic library path. When using java.io.tmpdir to implement path mapping, note that this method has a lower priority.

1.3.1 Using Java Project in Windows

Possible error information:

```
[Load dhnetsdk path : ./wrongpath/libs/win64/dhnetsdk]
Exception in thread    “AWT-EventQueue-0”java.lang.UnsatisfiiedLinkError: Unable to load library ‘./wrongpath/libs/win64/dhnetsdk’: Unable to find specified module.
at com.sun.jna.NativeLibrary.loadLibrary(NativeLibrary.java:169)
at com.sun.jna.NativeLibrary.getInstance(NativeLibrary.java:242)
at com.sun.jna.Library$Handler.<init>(Library.java:140)
```

When the above error information appears, you can locate the error according to the following code.

```
public interface NetSDKLib extends Library {
                NetSDKLib NETSDK_INSTANCE = Native.load(LibraryLoad.getLoadLibrary("dhnetsdk"), NetSDKLib.class);
~~~~ LibraryLoad. getLibraryFold code is as follows:
        // Get the dynamic library folder corresponding to the system
   private static String getLibraryFold() {
      String osType;
      String osName = System.getProperty("os.name");
      if (osName.toLowerCase().startsWith("linux")) {
```

```
            osType = ARCH_LINUX;
        } else if (osName.toLowerCase().startsWith("mac")
                || osName.toLowerCase().startsWith("darwin")) {
            osType = ARCH_MAC;
        } else if (osName.toLowerCase().startsWith("windows")) {
            osType = ARCH_WINDOWS;
        } else {
            osType = "";
        }
        String arch = System.getProperty("os.arch");
        arch = arch.toLowerCase().trim();
        if ("i386".equals(arch) || "i686".equals(arch) || "x86".equals(arch)) {
            arch = PREFIX_32 + "";
        } else if ("x86_64".equals(arch) || "amd64".equals(arch)) {
            arch = PREFIX_64 + "";
        } else if (arch.startsWith("arm")) {
            arch = PREFIX_ARM + "";
        }else {
            arch = PREFIX_ARM + "";
        }
        System.out.println("Dynamic library folder:"+osType + arch);
        return osType + arch;
    }
```

Solution

The error is usually caused by a mismatch between the jdk version and the system environment: If the jdk of the java project is 32-bit, the system environment is 64-bit, but the sdk is 64-bit, the error above will occur. The version of the sdk project, jdk, and operating system must be the same. They need to be win64 or win32.

Note

Winodws platform is less likely to have errors, and here is just an example. Note that the platform must correspond to the dynamic library, and the dynamic library suffix for Windows is .dll.

1.3.2 Using Java Project in Linux

Running the Example Code by Script Code in Linux (the script code path is run.sh in the root directory)

```
[user@localhost ~]# ./run.sh com/netsdk/demo/customize/ConfigDemo
-->
ClassPath:  ../resources/jna.jar:../resources/gson-2.6.2.jar:../resources/fastjson-1.2.70.jar:../resources/INetSDK.jar:../resources/dynamic-lib-load.xml:
--> Bin ../bin
Create ../bin.
--> linux 64 System.
cp: Cannot obtain the file status (stat) of '../resources/linux64': The file or directory does not exist.
--> path: pwd
load library: /tmp/libdhnetsdk.so
Exception in thread "main" java.lang.UnsatisfiedLinkError: Unable to load library '/tmp/libdhnetsdk.so':
/tmp/libdhnetsdk.so: Cannot open the shared object file: The file or directory does not exist.
/tmp/libdhnetsdk.so: Cannot open the shared object file: The file or directory does not exist.
Native library (tmp/libdhnetsdk.so) not found in resource path (../resources/jna.jar:../resources/gson-2.6.2.jar:../resources/fastjson-1.2.70.jar:../resources/INetSDK.jar:../resources/dynamic-lib-load.xml::.)
        at com.sun.jna.NativeLibrary.loadLibrary(NativeLibrary.java:302)
        at com.sun.jna.NativeLibrary.getInstance(NativeLibrary.java:455)
        at com.sun.jna.Library$Handler.<init>(Library.java:192)
        at com.sun.jna.Native.load(Native.java:596)
        at com.sun.jna.Native.load(Native.java:570)
        at com.netsdk.lib.NetSDKLib.<clinit>(NetSDKLib.java:20)
        at com.netsdk.demo.customize.ConfigDemo.<init>(ConfigDemo.java:30)
        at com.netsdk.demo.customize.ConfigDemo.main(ConfigDemo.java:48)
        Suppressed: java.lang.UnsatisfiedLinkError: /tmp/libdhnetsdk.so: Cannot open the shared object file: The file or directory does not exist.
                at com.sun.jna.Native.open(Native Method)
                at com.sun.jna.NativeLibrary.loadLibrary(NativeLibrary.java:191)
                ... 7 more
        Suppressed: java.lang.UnsatisfiedLinkError: /tmp/libdhnetsdk.so: Cannot open the shared object file: The file or directory does not exist.
                at com.sun.jna.Native.open(Native Method)
                at com.sun.jna.NativeLibrary.loadLibrary(NativeLibrary.java:204)
                ... 7 more
```

```
        Suppressed: java.io.IOException: Native library (tmp/libdhnetsdk.so) not found in resource path (../resources/jna.jar:../resources/gson-2.6.2.jar:../resources/fastjson-1.2.70.jar:../resources/INetSDK.jar:../resources/dynamic-lib-load.xml::.)
                at com.sun.jna.Native.extractFromResourcePath(Native.java:1095)
                at com.sun.jna.NativeLibrary.loadLibrary(NativeLibrary.java:276)
                ... 7 more
```

Part of Run.sh Script Code

```
##Specify the path of the library       Add dynamic link library
if [[ $os =~ "Darwin" ]]; then
    #CP+=:../libs/mac64
    echo "--> mac 64 System"
    cp -r ../resources/mac64 $BIN/mac64
elif [ $(getconf LONG_BIT) = '64' ]; then
    echo "--> linux 64 System."
    #export LD_LIBRARY_PATH=../resources/linux64
    cp -r ../resources/linux64 $BIN/linux64

else
    echo "--> linux 32 System."
    #export LD_LIBRARY_PATH=../libs/linux32
    cp -r ../resources/linux32 $BIN/linux32
fi
```

Note

Similar to windows. However, if the error is not found, check whether the PATH introduced in the script is consistent with the system path when the dynamic library is correct.

Solution

Select one of the methods to solve the issue.

- Method 1: Similar to Windows system, check whether the environment configuration is consistent.
- Method 2: Temporary folder loading method—java.io.tmpdir. This method is suitable for multiple platforms. You need to change the path parameter in public static void setExtractPath(String path) method to the absolute path.
  - ◇ Copy the required dynamic library to a folder, such as D:/win64.
  - ◇ Use the static statement block to call: (path should be consistent).

```
static{
        LibraryLoad.setExtractPath(String path) };
}
```

1.3.3 Using Project as a jar Package

The advantage of having the dynamic library built into the jar package is that as long as the jar package is exported, the jar can be executed directly regardless of the differences between the platforms.

Here is a way to make the build-in jar package. You need to write the dynamic library of jar package into the local temporary folder (java.io.tmpdir), read the dynamic library from the local machine, and then load it to memory. The following is the example code.

```
public interface NetSDKLib extends Library {
NetSDKLib NETSDK_INSTANCE = Native.load(LibraryLoad.getLoadLibrary("dhnetsdk"),
NetSDKLib.class);
NetSDKLib CONFIG_INSTANCE = Native.load(LibraryLoad.getLoadLibrary("dhconfigsdk"),
NetSDKLib.class);
    public class LibraryLoad {
            public static String getLoadLibrary(String libraryName) {
    currentFold = getLibraryFold();
    if (dynamicParseUtil == null) {
       try {
          dynamicParseUtil =
                new DynamicParseUtil(
        LibraryLoad.class.getClassLoader().getResourceAsStream("dynamic-lib-load.xml"));
          if (!written) {
             for (String libName : dynamicParseUtil.getLibsSystem(currentFold)) {
                extractLibrary(libName);
             }
             written = true;
          }
       } catch (ParserConfigurationException | IOException | SAXException e) {
          e.printStackTrace();
       }
    }
    String fullName = getLibraryName(libraryName);
    String path = EXTRACT_PATH;
    if (!(EXTRACT_PATH.endsWith("/") || EXTRACT_PATH.endsWith("\\"))) {
       path = EXTRACT_PATH + "/";
    }
    System.out.println("load library: " + path + fullName);
    return path + fullName;
```

```
    }
}
```

1.3.4 System Permissions under Dynamic Library Path

For Windows and Linux, the Java project copies the dynamic library to a temporary directory in the system. The temporary directory path can be obtained by using the following code function in the LibraryLoad class.

Make sure that you have the read and write permissions for the dynamic library files in this path. If not, you might fail to load the dynamic library.

```
String fullName = getLibraryName(libraryName);
String path = EXTRACT_PATH;
if (!(EXTRACT_PATH.endsWith("/") || EXTRACT_PATH.endsWith("\\"))) {
    path = EXTRACT_PATH + "/";
}
System.out.println("load library: " + path + fullName);
```

1.4 Upgrade Early jna to Latest Version

Step 1 Replace the jna package of the old version in the resources/ directory with the jna package of the new version. Configure the new version of jna into the current environment.

Step 2 Change the library loading method of NetSDKLib encapsulation class to the following.

```
NetSDKLib NETSDK_INSTANCE = Native.load(LibraryLoad.getLoadLibrary("dhnetsdk"), NetSDKLib.class);
```

Step 3 In the NativeString class, change the parameters in the Pointer.getString method and Pointer.setString method to pointer.getString (0) and pointer.setString (0, string).

After upgrading the jna, if there is a callback function in the running demo and StdCallCallback is inherited, you need to comment out StdCallCallback; otherwise it will crash when running under the Linux environment.

2 Function Modules

There are 10 function modules in this chapter. Each function module includes SDK initialization, device login, logout, and SDK resource release. The optional processes do not affect the use of other processes.

2.1 SDK Initialization

2.1.1 Introduction

Initialization is the first step of SDK to conduct all the function modules. It does not have the surveillance function but can set some parameters that affect the SDK overall functions.

- Initialization occupies some memory.
- Only the first initialization is valid within one process.
- After using this function, call cleanup interface to release SDK resource.

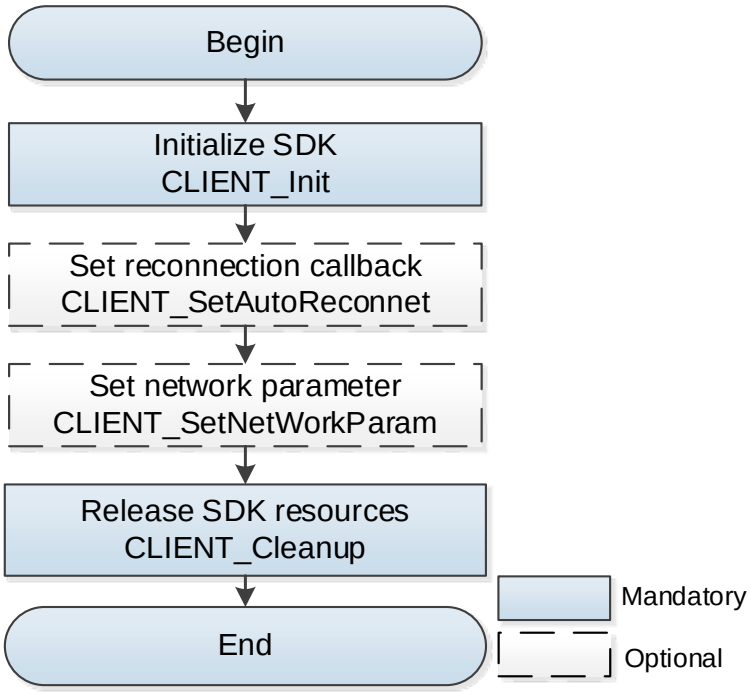
2.1.2 Interface Overview

Table 2-1 Interfaces of initialization

Interface	Implication
CLIENT_Init	SDK initialization
CLIENT_Cleanup	SDK cleaning up
CLIENT_SetAutoReconnect	Setting of reconnection after disconnection
CLIENT_SetNetworkParam	Setting of network environment

2.1.3 Process

Figure 2-1 Process of initialization



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 (Optional) Call **CLIENT_SetAutoReconnect** to set reconnection callback to allow the auto reconnecting after disconnection.

Step 3 (Optional) Call **CLIENT_SetNetworkParam** to set network login parameter that includes connection timeout and connection attempts.

Step 4 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Call **CLIENT_Init** and **CLIENT_Cleanup** in pairs. It supports single thread multiple calling but it is suggested to call the pair for only one time overall.
- Initialization: Calling **CLIENT_Init** multiple times is only for internal count without repeating applying resources.
- Cleaning up: The interface **CLIENT_Cleanup** clears all the opened processes, such as login, real-time monitoring, and alarm subscription.
- Reconnection: SDK can set the reconnection function for the situations such as network disconnection and power off. SDK will keep logging the device until succeeded. Only the real-time monitoring, alarm and snapshot subscription resume after reconnection is successful.
- Dynamic library loading: If there is an error "Unable to load library './wrongpath/libs/win64/dhnetsdk': The specified module cannot be found" when loading the dynamic library, usually the path does not match. You need to adjust the path of the dynamic library or modify the code based on the error codes. This problem is more common when packaging the whole project and providing the jar package to other projects. Because this

problem is related to the use of the platform and the project, it cannot be generalized and requires specific analysis.

For example, if you want to use the project directly on the Linux platform, you can load the dynamic library path into the dynamic library search path by the following ways:

- ◇ Enter "export LD_LIBRARY_PATH = $ LD_LIBRARY_PATH: / XXX" in the terminal. The current terminal takes effect.
- ◇ Modify "~ / .bashrc" or "~ / .bash_profile", and add "export LD_LIBRARY_PATH = $ LD_LIBRARY_PATH: / XXX" in the last line. After saving, you can use "source.bashrc" to execute the file. The current user takes effect.
- ◇ Modify "/ etc / profile", and then add "export LD_LIBRARY_PATH = $ LD_LIBRARY_PATH: / XXX". After saving, you can use "source" to execute the file. Effective for all users.

2.1.4 Example Code

```
import java.io.File;

import main.java.com.netsdk.lib.NetSDKLib;
import main.java.com.netsdk.lib.NetSDKLib.LLong;
import main.java.com.netsdk.lib.ToolKits;

import com.sun.jna.ptr.IntByReference;

/**
 * Implement login interface
 * Mainly are initialization, login and logout functions.
 */
public class LoginModule {

    public static NetSDKLib netsdk            = NetSDKLib.NETSDK_INSTANCE;
    public static NetSDKLib configsdk         = NetSDKLib.CONFIG_INSTANCE;

    // Login handle
    public static LLong m_hLoginHandle = new LLong(0);

    private static boolean bInit       = false;
    private static boolean bLogopen = false;

    //Initialize
    public static boolean init(NetSDKLib.fDisConnect disConnect, NetSDKLib.fHaveReConnect
haveReConnect) {
        bInit = netsdk.CLIENT_Init(disConnect, null);
        if(!bInit) {
```

```
            System.out.println("Initialize SDK failed");
            return false;
        }

        // (Optional) Open logs
        NetSDKLib.LOG_SET_PRINT_INFO setLog = new NetSDKLib.LOG_SET_PRINT_INFO();
        File path = new File("./sdklog/");
        if (!path.exists()) {
            path.mkdir();
        }
        String logPath = path.getAbsoluteFile().getParent() + "\\sdklog\\" + ToolKits.getDate() + ".log";
        setLog.nPrintStrategy = 0;
        setLog.bSetFilePath = 1;
        System.arraycopy(logPath.getBytes(), 0, setLog.szLogFilePath, 0, logPath.getBytes().length);
        System.out.println(logPath);
        setLog.bSetPrintStrategy = 1;
        bLogopen = netsdk.CLIENT_LogOpen(setLog);
        if(!bLogopen ) {
            System.err.println("Failed to open NetSDK log");
        }

        // Set the callback of reconnection after disconnection. After setting, the SDK will automatically
reconnect when device disconnects.
        // This operation is optional but recommended.
        netsdk.CLIENT_SetAutoReconnect(haveReConnect, null);

        // (Optional) Set login timeout and login times
        int waitTime = 5000; //Set the timeout of request response as 5 senconds
        int tryTimes = 1;       // Try to establish a link once during login
        netsdk.CLIENT_SetConnectTime(waitTime, tryTimes);

        // Set other network parameters, such as nWaittime of NET_PARAM, member of nConnectTryNum
and CLIENT_SetConnectTime.
        // (Optional) Set the login timeout of device and login times having same meaning.
        NetSDKLib.NET_PARAM netParam = new NetSDKLib.NET_PARAM();
        netParam.nConnectTime = 10000;          // Timeout of trying to establish a link during login
        netParam.nGetConnInfoTime = 3000;     // Timeout of setting subconnection
        netsdk.CLIENT_SetNetworkParam(netParam);

        return true;
```

```
    }

    // Clean up environment
    public static void cleanup() {
        if(bLogopen) {
            netsdk.CLIENT_LogClose();
        }

        if(bInit) {
            netsdk.CLIENT_Cleanup();
        }
    }
}
```

2.2 Device Login

2.2.1 Introduction

Device login, also called user authentication, is the precondition of all the other function modules.

You will obtain a unique login ID upon log in to the device and should introduce login ID before using other SDK interfaces. The login ID becomes invalid once logged out.

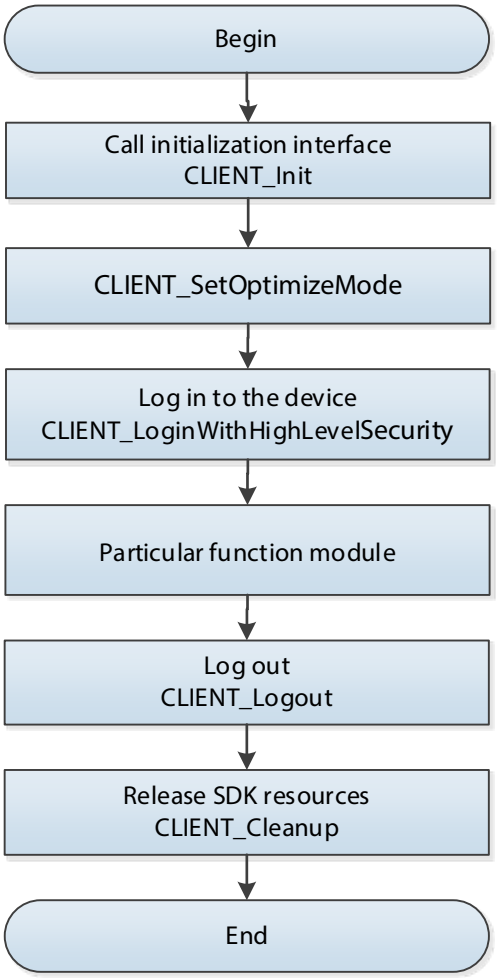
2.2.2 Interface Overview

Table 2-2 Interfaces of device login

Interface	Implication
CLIENT_Init	Initialize SDK.
CLIENT_Cleanup	Clean up SDK.
CLIENT_LoginWithHighLevelSecurity	High-security login.
CLIENT_Logout	Logout.
CLIENT_SetOptimizeMode	Optimize obtaining hard disk information.

2.2.3 Process

Figure 2-2 Process of login



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Optional. Call **CLIENT_SetOptimizeMode** to optimize obtaining hard disk information.

Step 3 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 4 After successful login, you can realize the required function module.

Step 5 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 6 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Login handle: When the login is successful, the returned value is not 0 (even the handle is smaller than 0, the login is also successful). One device can log in for multiple times with different handle at each login. If there is not special function module, it is suggested to login only one time. The login handle can be repeatedly used on other function modules.
- Duplicate handles: It is normal that the login handle is the same as the existed handle. For example, log in to device A and get handle loginIDA. However, if you log out of loginIDA and

then log in, you may get LoginIDA again. But the duplicate handles do not occur throughout the lifetime of the handle.

- Logout: The interface will release the opened functions internally, but it is not suggested to rely on the cleaning up function. For example, if you opened the monitoring function, you should call the interface that stops the monitoring function when it is no longer required.
- Use login and logout in pairs: The login consumes some memory and socket information and release sources once logout.
- Login failure: It is suggested to check the failure through the error parameter of the login interface. For the common error code, see Table 2-3.
- Multi-device login: After the SDK is initialized, you can log in to multiple devices, but the corresponding login handle and login information need to be adjusted.

Table 2-3 Error code and meaning

Error code	Meaning
1	Password is wrong
2	User name does not exist

3	Login timeout
	Evasion example code is as follows:
	NET_PARAM stuNetParam = {0};
	stuNetParam.nWaittime = 8000; // unit ms
	stunetParam.nGetConnInfoTime = 3000; // Set connection timeout
	CLIENT_SetNetworkParam (&stuNetParam);

4	The account has been logged in
5	The account has been locked
6	The account is blocklisted
7	Out of resources, the system is busy
8	Sub connection failed
9	Main connection failed
10	Exceeded the maximum user connections
11	Lack of avnetsdk or avnetsdk dependent library
12	USB flash disk is not inserted into device, or the USB flash disk information error
13	The client IP is not authorized with login

2.2.4 Example Code

```
import java.io.File;


import main.java.com.netsdk.lib.NetSDKLib;
import main.java.com.netsdk.lib.NetSDKLib.LLong;
import main.java.com.netsdk.lib.ToolKits;


import com.sun.jna.ptr.IntByReference;


public class LoginModule {
```

```
    public static NetSDKLib netsdk            = NetSDKLib.NETSDK_INSTANCE;
    public static NetSDKLib configsdk         = NetSDKLib.CONFIG_INSTANCE;

    //Initialize SDK and skip SDK cleanup
    public static void InitTest(){
        // Initialize SDK library.
        netSdk.CLIENT_Init(DisconnectCallback.getInstance(), null);

        // Set callback function for automatic reconnection from disconnection.
        netSdk.CLIENT_SetAutoReconnect(HaveReconnectCallback.getInstance(), null);
        //Reduce information queries during login to improve speed.
        int mode = EM_OPTTYPE_MOBILE_TYPE.OPTTYPE_MOBILE_DEVICE_ATTR.getValue() |
EM_OPTTYPE_MOBILE_TYPE.OPTTYPE_MOBILE_DEVICE_SN.getValue()
                | EM_OPTTYPE_MOBILE_TYPE.OPTTYPE_MOBILE_DISK_INFO.getValue();
        // Create an IntByReference object and assign the value of mode to it.
        IntByReference modeReference = new IntByReference(mode);
        netSdk.CLIENT_SetOptimizeMode(EM_OPTIMIZE_TYPE.EM_OPT_TYPE_MOBILE_OPTION.getValue(),
modeReference.getPointer());
        //Open the log. Optional: 0.
        NetSDKLib.LOG_SET_PRINT_INFO setLog = new NetSDKLib.LOG_SET_PRINT_INFO();
        String logPath = new File(".").getAbsoluteFile().getParent() + File.separator + "sdk_log" +
File.separator + "sdk.log";
        setLog.bSetFilePath = 1;
        System.arraycopy(logPath.getBytes(), 0, setLog.szLogFilePath, 0, logPath.getBytes().length);
        setLog.bSetPrintStrategy = 1;
        setLog.nPrintStrategy = 0;
        if (!netSdk.CLIENT_LogOpen(setLog)){
            System.err.println("Open SDK Log Failed!!!");
        }
    }
    /**
     * Device disconnection callback.
     */
    private static class DisconnectCallback implements NetSDKLib.fDisConnect {
        private static DisconnectCallback instance = new DisconnectCallback();

        private DisconnectCallback() {
        }

        public static DisconnectCallback getInstance() {
            return instance;
        }

        public void invoke(NetSDKLib.LLong lLoginID, String pchDVRIP, int nDVRPort, Pointer dwUser) {
            System.out.printf("Device[%s:%d] Disconnect!\n", pchDVRIP, nDVRPort);
```

```
        }
    }
    /**
     * Device reconnection callback.
     */
    private static class HaveReconnectCallback implements NetSDKLib.fHaveReConnect {
        private static HaveReconnectCallback instance = new HaveReconnectCallback();

        private HaveReconnectCallback() {
        }

        public static HaveReconnectCallback getInstance() {
            return instance;
        }

        public void invoke(NetSDKLib.LLong lLoginID, String pchDVRIP, int nDVRPort, Pointer dwUser) {
            System.out.printf("Device[%s:%d] HaveReconnected!\n", pchDVRIP, nDVRPort);
        }
    }

    // Device information
    public static NetSDKLib.NET_DEVICEINFO_Ex m_stDeviceInfo = new NetSDKLib.NET_DEVICEINFO_Ex();

    // Login handle
    public static LLong m_hLoginHandle = new LLong(0);

    // Log in to device
    public static boolean login(String m_strIp, int m_nPort, String m_strUser, String m_strPassword) {
        IntByReference nError = new IntByReference(0);
        m_hLoginHandle = netsdk.CLIENT_LoginEx2(m_strIp, m_nPort, m_strUser, m_strPassword, 0, null,
m_stDeviceInfo, nError);
        if(m_hLoginHandle.longValue() == 0) {
            System.err.printf("Login Device[%s] Port[%d]Failed. %s\n", m_strIp, m_nPort,
ToolKits.getErrorCodePrint());
        } else {
            System.out.println("Login Success [ " + m_strIp + " ]");
        }

        return m_hLoginHandle.longValue() == 0? false:true;
    }

    // Log out of device
    public static boolean logout() {
```

```
        if(m_hLoginHandle.longValue() == 0) {
            return false;
        }

        boolean bRet = netsdk.CLIENT_Logout(m_hLoginHandle);
        if(bRet) {
            m_hLoginHandle.setValue(0);
        }

        return bRet;
    }
}
```

2.3 Real-time Monitoring

2.3.1 Introduction

Real-time monitoring obtains the real-time stream from the storage device or front-end device, which is an important part of the surveillance system.

SDK can get the main stream and sub stream from the device once it logged.

- Supports calling the window handle for SDK to directly decode and play the stream (Windows system only).
- Supports calling the real-time stream to you to perform independent treatment.
- Supports saving the real-time record to the specific file though saving the callback stream or calling the SDK interface.

2.3.2 Interface Overview

Table 2-4 Interfaces of real-time monitoring

Interface	Implication
CLIENT_RealPlayEx	Start real-time monitoring extension interface.
CLIENT_StopRealPlayEx	Stop real-time monitoring extension interface.
CLIENT_SaveRealData	Start saving the real-time monitoring data to the local path.
CLIENT_StopSaveRealData	Stop saving the real-time monitoring data to the local path.
CLIENT_SetRealDataCallBackEx	Set real-time monitoring data callback function extension interface.

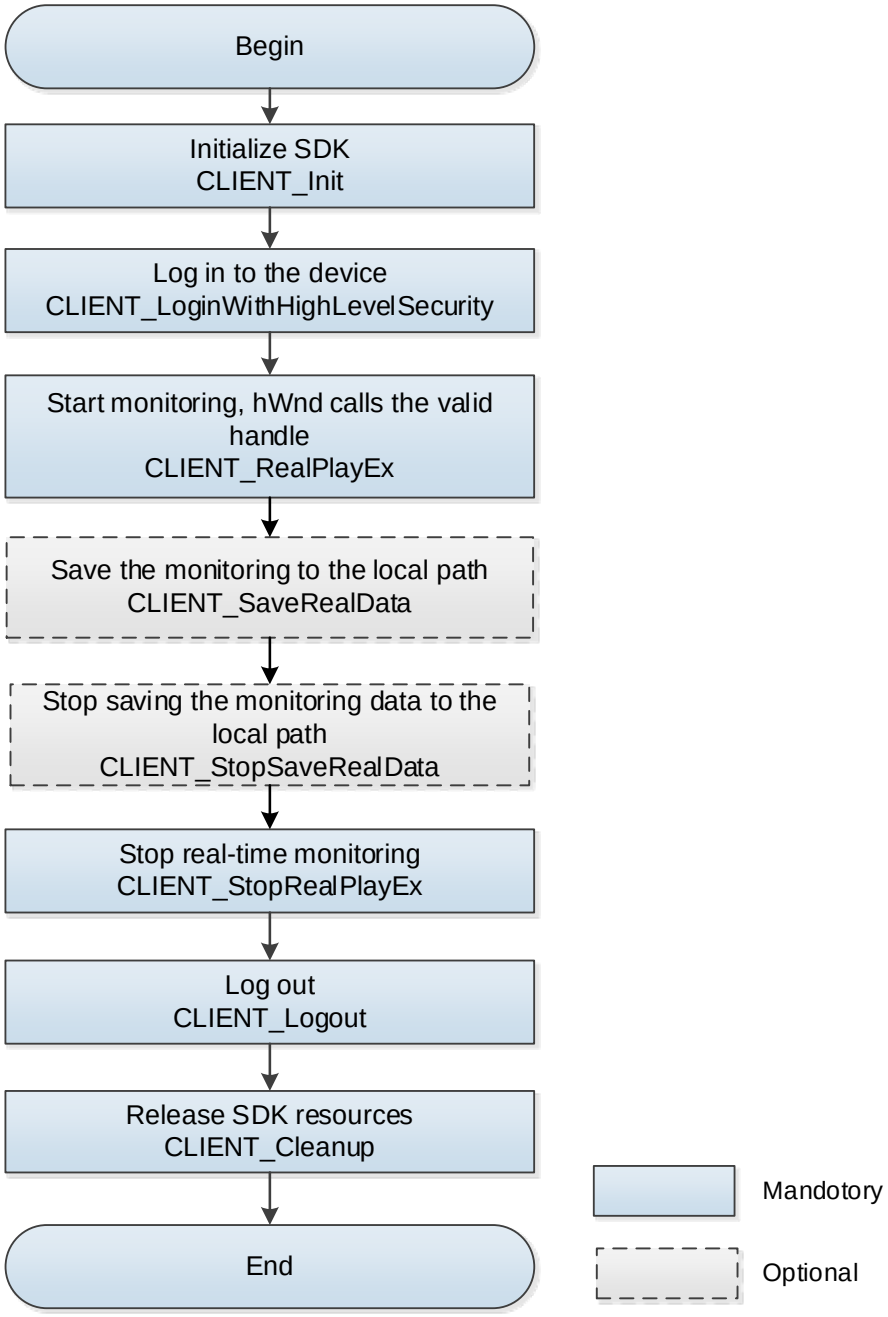
2.3.3 Process

You can realize the real-time monitoring through SDK decoding library or your play library.

2.3.3.1 SDK Decoding Play

Call PlaySDK library from the SDK auxiliary library to realize real-time play.

Figure 2-3 Process of playing by SDK decoding library



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_RealPlayEx** to enable the real-time monitoring. The parameter hWnd is a valid window handle.

Step 4 (Optional) Call **CLIENT_SaveRealData** to start saving the monitoring data.

Step 5 (Optional) Call **CLIENT_StopSaveRealData** to end the saving process and generate the local video file.

Step 6 After using the real-time function, call **CLIENT_StopRealPlayEx** to stop real-time monitoring**.**

Step 7 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 8 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- SDK decoding play only supports Windows system. You need to call the decoding after getting the stream in other systems.
- Multi-thread calling: Multi-thread calling is not supported for the functions within the same login session; however, multi-thread calling can deal with the functions of different login sessions although such calling is not recommended.
- Timeout: The request on applying for monitoring resources should have made some agreement with the device before requiring the monitoring data. There are some timeout settings (see "NET_PARAM structure"), and the field about monitoring is nGetConnInfoTime. If there is timeout due to the reasons such as bad network connection, you can modify the value of nGetConnInfoTime bigger.

  The example code is as follows. Call it for only one time after having called **CLIENT_Init**.

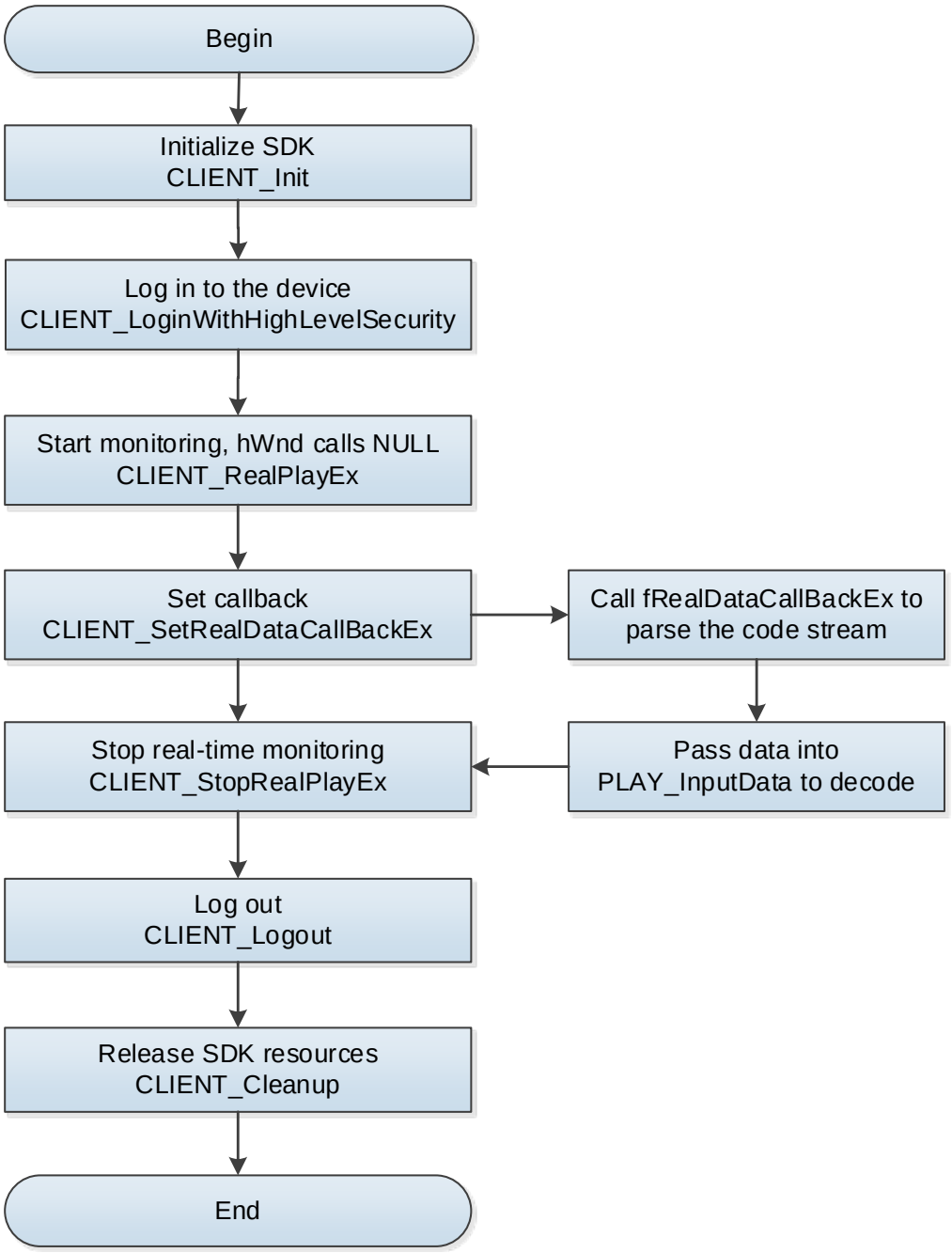
```
NET_PARAM stuNetParam = new NET_PARAM();
stuNetParam. nGetConnInfoTime = 5000; 0, default is 1000 ms.
CLIENT_SetNetworkParam (stuNetParam);
```

- Failed to repeat opening: For some models, the same channel cannot be opened for multiple times during the one entire logged in status. If you are trying to open it repeatedly, you will success in the first try but get failed afterwards. In this case, you can try the following:
  - ◇ Close the opened channel. For example, if you already opened the main stream video on the channel 1 and still want to open the sub stream video on the same channel, you can close the main stream first and then open the sub stream.
  - ◇ Login twice to obtain two login handles to deal with the main stream and sub stream respectively.
- Calling succeeded but no image: SDK decoding needs to use dhplay.dll. It is suggested to check if dhplay.dll and its auxiliary library are missing under the running directory. See Table 1-1.
- If the system resource is insufficient, the device might return error instead of stream. You can receive an event DH_REALPLAY_FAILD_EVENT in the alarm callback that is set in CLIENT_SetDVRMessCallBack. This event includes the detailed error codes. See "DEV_PLAY_RESULT Structure" in *Network SDK Development Manual.chm*.
- 32 channels limit: The decoding consumes resources especially for the high definition videos. Considering the limited resources at the client, currently the maximum channels are set to be 32. If more than 32, it is suggested to use third party play library. See "2.3.3.2 Call Third Party Play Library."

2.3.3.2 Call Third Party Play Library

SDK calls back the real-time monitoring stream to you and you call PlaySDK to decode and play.

Figure 2-4 Process of calling third party play library



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 After successful login, call **CLIENT_RealPlayEx** to enable real-time monitoring. The parameter hWnd is NULL.

Step 4 Call **CLIENT_SetRealDataCallBackEx** to set the real-time data callback.

Step 5 In the callback, pass the data to PlaySDK to finish decoding.

Step 6 After completing the real-time monitoring, call **CLIENT_StopRealPlayEx** to stop real-time monitoring.

Step 7 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 8 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Stream format: It is recommended to use PlaySDK for decoding.
- Lag image
  - ◇ When using PlaySDK for decoding, there is a default channel buffer size (the PLAY_OpenStream interface in playsdk) for decoding. If the stream resolution value is big, it is recommended to modify the parameter value smaller such as 3 M.
  - ◇ SDK callbacks can move to the next video data only after returning from you. It is not recommended for you to consume time for the unnecessary operations; otherwise the performance could be affected.

2.3.4 Example Code

2.3.4.1 SDK Decoding Play

```
import java.awt.Panel;

import main.java.com.netsdk.lib.NetSDKLib.LLong;
import main.java.com.netsdk.lib.ToolKits;

import com.sun.jna.Native;

/**
 * Implement live interface
 * Mainly are streaming starting function and streamimg stopping function.
 */
public class RealPlayModule {
    // Start live view
    public static LLong startRealPlay(int channel, int stream, Panel realPlayWindow) {
        LLong m_hPlayHandle = LoginModule.netsdk.CLIENT_RealPlayEx(LoginModule.m_hLoginHandle,
channel, Native.getComponentPointer(realPlayWindow), stream);

        if(m_hPlayHandle.longValue() == 0) {
            System.err.println("failed to real-time monitoring, and the error code " +
ToolKits.getErrorCodePrint());
        } else {
            System.out.println("Success to start realplay");

// Customize stream to save file. Do this operation when you need to save the video.
String outFile="example/outputfile";
LoginModule.netsdk.CLIENT_SaveRealData(m_hPlayHandle,outFile);
```

```
        }
        return m_hPlayHandle;
    }

    // Stop live view
    public static void stopRealPlay(LLong m_hPlayHandle) {
        if(m_hPlayHandle.longValue() == 0) {
            return;
        }
// Close file saving
LoginModule.netsdk.CLIENT_StopSaveRealData(m_hPlayHandle);
        boolean bRet = LoginModule.netsdk.CLIENT_StopRealPlayEx(m_hPlayHandle);
        if(bRet) {
            m_hPlayHandle.setValue(0);
        }
    }
}
```

2.3.4.2 Call Play Library

```
public class RealPlayModule {
    class DataCallBackEx implements NetSDKLib.fRealDataCallBackEx{
        @Override
        public void invoke(LLong lRealHandle, int dwDataType, Pointer pBuffer,
                int dwBufSize, int param, Pointer dwUser) {
            // TODO
            // Call PlaySDK interface to get stream data from device. For more details, see demo source code
of SDK monitoring.

        }
    }
    private DataCallBackEx m_DataCallBackEx = new DataCallBackEx();
    public LLong startRealPlay(int channel, int stream, Panel realPlayWindow) {
        LLong m_hPlayHandle = LoginModule.netsdk.CLIENT_RealPlayEx(LoginModule.m_hLoginHandle,
channel, Native.getComponentPointer(realPlayWindow), stream);

        LoginModule.netsdk.CLIENT_SetRealDataCallBackEx(m_hPlayHandle,m_DataCallBackEx, null,
0x00000001);

        if(m_hPlayHandle.longValue() == 0) {
```

```
                System.err.println("failed to real-time monitoring, and the error code" +
ToolKits.getErrorCodePrint());
            } else {
                System.out.println("Success to start realplay");
            }

            return m_hPlayHandle;
        }

        public void stopRealPlay(LLong m_hPlayHandle) {
            if(m_hPlayHandle.longValue() == 0) {
                return;
            }
            boolean bRet = LoginModule.netsdk.CLIENT_StopRealPlayEx(m_hPlayHandle);
            if(bRet) {
                m_hPlayHandle.setValue(0);
            }
        }
}
```

2.4 Video Snapshot

2.4.1 Introduction

Video snapshot can get the picture data of the playing video. This section introduces the following snapshot ways:

- Synchronous snapshot: Call the SDK interface which sends the snapshot command to the device. The device will capture the current image and send to SDK through network, and then SDK returns the image data to you
- Asynchronous snapshot: Call the SDK interface and set snapshot callback so that the captured image data shows in callback function. At the same time, call asynchronous snapshot interface to snapshot.
- Local snapshot: When the monitoring is opened, you can save the monitoring data in the picture format which is the frame information that does not have network interaction with the device.

2.4.2 Interface Overview

Table 2-5 Interfaces of video snapshot

Interface	Implication
CLIENT_SnapPictureToFile	Snap picture and send to the user.

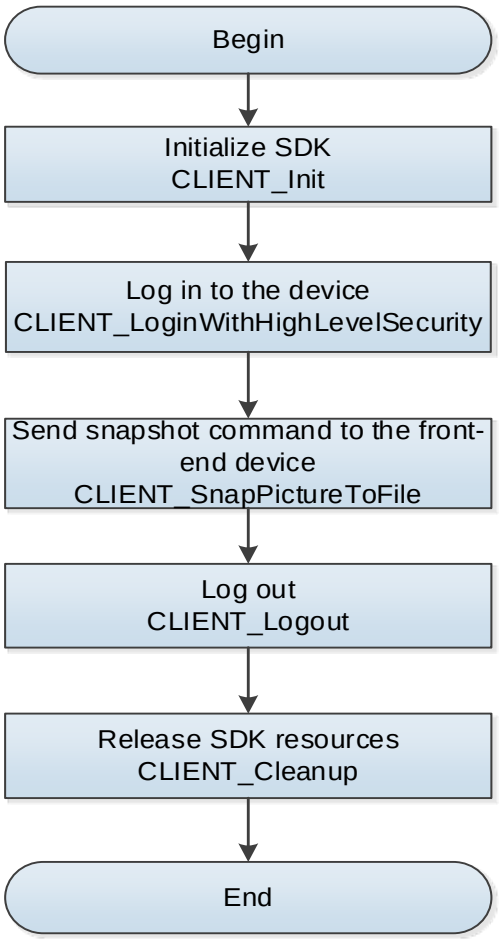
Interface	Implication
CLIENT_CapturePictureEx	Local snap and the parameter could be the handle of monitoring or playback.
CLIENT_SetSnapRevCallBack	Set snapshot callback to implement fSnapRev interface.
CLIENT_SnapPictureEx	Asynchronous snapshot which is suitable for non-intelligent traffic devices and parking lot devices, such as IPC and speed dome.

2.4.3 Process

Video snapshot is consisted of synchronous snapshot, asynchronous snapshot and local snapshot.

2.4.3.1 Synchronous Snapshot

Figure 2-5 Process of synchronous snapshot



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.
Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.
Step 3 Call **CLIENT_SnapPictureToFile** to get the picture data.
Step 4 Call **CLIENT_Logout** to log out of the device.

Step 5 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

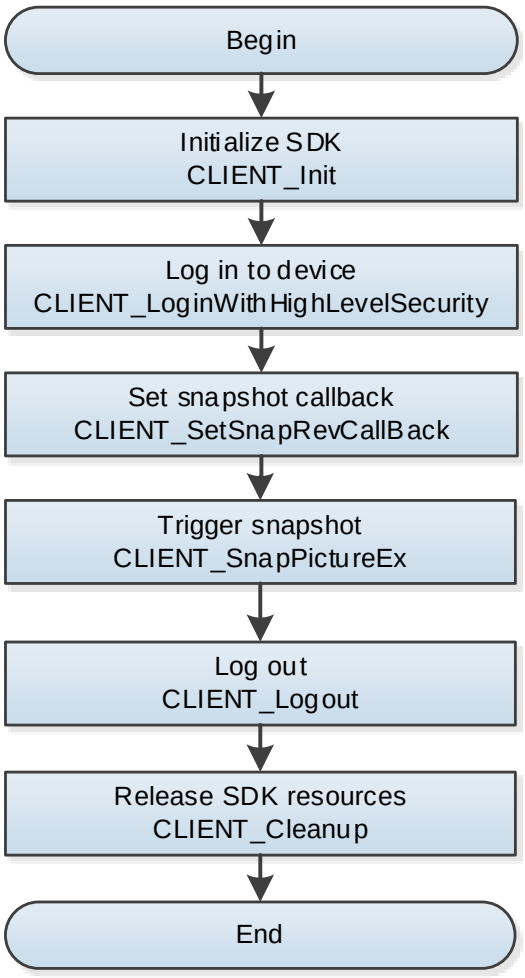
- Picture size limit: SDK allocates the fixed memory to receive the picture data returned from the device. If the picture is larger than the fixed memory, SDK will return the truncated data.
- SDK provides the interface to modify the default memory. If the picture (for example, the high definition picture) is truncated, you can modify the value of nPicBufSize bigger. The example code is as follows. After calling **CLIENT_Init**, call the example code just one time.

```
NET_PARAM stuNetParam = new NET_PARAM();
stuNetParam. nPicBufSize = 4000*1024*1024; nPicBufSize is 2M by default
CLIENT_SetNetworkParam (stuNetParam);
```

- Multi-thread calling: Multi-thread calling is not supported for the functions within the same login session.
- Snapshot configuration: You can configure the network snapshot such as quality and definition. However, if you are satisfied with the default configurations, do not modify them.
- Picture save format: The picture data returns as memory and the interface supports saving it as file (the precondition is that you have set the szFilePath field of NET_IN_SNAP_PIC_TO_FILE_PARAM).

2.4.3.2 Asynchronous Snapshot

Figure 2-6 Process of asynchronous snapshot



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_SetSnapRevCallBack** to set snapshot callback.

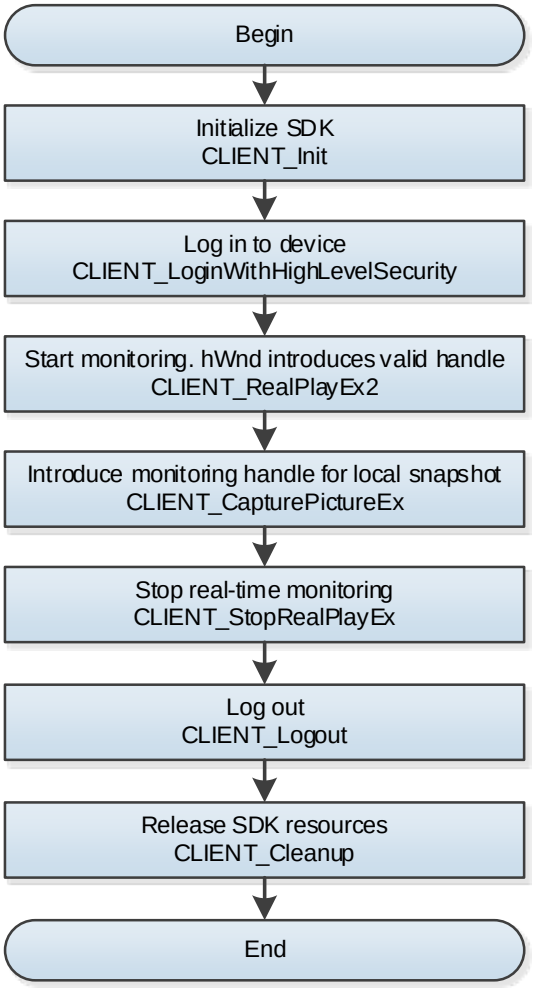
Step 4 Call **CLIENT_SnapPictureEx** to trigger snapshot and then analyze captured image data in the callback function.

Step 5 Call **CLIENT_Logout** to log out of the device.

Step 6 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

2.4.3.3 Local Snapshot

Figure 2-7 Process of local snapshot



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_RealPlayEx** to start monitoring and obtain the monitoring handle.

Step 4 Call **CLIENT_CapturePictureEx** to introduce the monitoring handle.

Step 5 Call **CLIENT_StopRealPlayEx** to stop the real-time monitoring.

Step 6 Call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

2.4.4 Example Code

```
/*
* Example of synchronous snapshot
*/
NetSDKLib.NET_IN_SNAP_PIC_TO_FILE_PARAM snapParamIn= new
NetSDKLib.NET_IN_SNAP_PIC_TO_FILE_PARAM();
```

```
NetSDKLib.NET_OUT_SNAP_PIC_TO_FILE_PARAM snapParamOut= new
NetSDKLib.NET_OUT_SNAP_PIC_TO_FILE_PARAM(1024 * 1024);
snapParamIn.stuParam.Channel = 0;
snapParamIn.stuParam.Quality = 3;
snapParamIn.stuParam.ImageSize = 1; // 0：QCIF,1：CIF,2：D1
snapParamIn.stuParam.mode = 0; // -1: Stop capturing, 0: Request one frame, 1: Send request by schedule, 2:
Request continuously
snapParamIn.stuParam.InterSnap = 5;
snapParamIn.stuParam.CmdSerial = serialNum;
SimpleDateFormat dateFormat = new SimpleDateFormat("yyyMMddHHmmss");
final String fileName = "SyncSnapPicture_" + dateFormat.format(new Date()) + "_" + serialNum + ".jpg";
System.arraycopy(fileName.getBytes(),0,snapParamIn.szFilePath,0, fileName.getBytes().length);
        final int timeOut = 5000; // 5 second
        Pointer pInbuf =new Memory(snapParamIn.size());
        pInbuf.clear(snapParamIn.size());
        ToolKits.SetStructDataToPointer(snapParamIn, pInbuf, 0);
        Pointer pOutbuf =new Memory(snapParamOut.size());
        pOutbuf.clear(snapParamOut.size());
        ToolKits.SetStructDataToPointer(snapParamOut, pOutbuf, 0);
if (!netsdkApi.CLIENT_SnapPictureToFile(loginHandle, pInbuf, pOutbuf, timeOut)) {
            System.err.printf("CLIENT_SnapPictureEx Failed! Last Error[%x]\n",
netsdkApi.CLIENT_GetLastError());
        }else {
            System.out.println("CLIENT_SnapPictureToFile Success. " + new
File(fileName).getAbsolutePath());
        }
        Native.free(Pointer.nativeValue(pInbuf));//Clear up memory
        Pointer.nativeValue(pInbuf, 0); //Prevent repeated gc collection

        Native.free(Pointer.nativeValue(pOutbuf));
        Pointer.nativeValue(pOutbuf, 0);
/*
*Example of local snapshot
*/
//Live view
int playType = NetSDKLib.NET_RealPlayType.NET_RType_Realplay; // Live view
m_hRealPlayHandle = netsdkApi.CLIENT_RealPlayEx(m_hLoginHandle, channel,
Native.getComponentPointer(realplayPanel), playType);
if (m_hRealPlayHandle.longValue() == 0) {
            System.err.println("Failed to start real-time monitoring , and error code " +
ToolKits.getErrorCode());
```

```
                return false;
            } else {
                System.out.println("Success to start realplay");
            }
//Local snapshot
if (!LoginModule.netsdk.CLIENT_CapturePictureEx(hPlayHandle, picFileName,
NetSDKLib.NET_CAPTURE_FORMATS.NET_CAPTURE_JPEG))
 {
                System.err.printf("CLIENT_CapturePicture Failed!" + ToolKits.getErrorCodePrint());
} else {
                System.out.println("CLIENT_CapturePicture success");
      }


//Stop live view
if(m_hRealPlayHandle.longValue() != 0) {
                netsdkApi.CLIENT_StopRealPlayEx(m_hRealPlayHandle);
            }

/*
* Example of asynchronous snapshot
*/
            /// Set snapshot callback: Pictures are mainly returned from SnapCallback.getInstance() invoke.
            netsdkApi.CLIENT_SetSnapRevCallBack(SnapCallback.getInstance(), null);

            NetSDKLib.SNAP_PARAMS snapParam = new NetSDKLib.SNAP_PARAMS();
            snapParam.Channel = 0; // Snapshot channel
            snapParam.mode = 0; // Require for 1 frame
            snapParam.CmdSerial = serialNum ++; //    Require for serial number, and the valid rage from 0
through 635535. The serial number out of the rage will be truncated.
            /// Trigger snapshot
            if (!netsdkApi.CLIENT_SnapPictureEx(loginHandle, snapParam , null)) {
System.err.printf("CLIENT_SnapPictureEx Failed ! Last Error[%x]\n", netsdkApi.CLIENT_GetLastError());
                return;
            }
            // Ensure the generation of image data
            try {
                synchronized (SnapCallback.class) {
                    SnapCallback.class.wait(3000L); // Wait for 3 seconds by default, to prevent that the
callback is not triggered and then device freezes when the device is disconnected and then.
```

```
                }
            } catch (InterruptedException e) {
                e.printStackTrace();
            }
System.out.println("--> " + Thread.currentThread().getName() + " CLIENT_SnapPictureEx Success." +
System.currentTimeMillis());
```

2.5 PTZ Control

2.5.1 Introduction

PTZ is a mechanical platform that carries the device and the protective enclosure and performs remote control in all directions.

PTZ is consisted of two motors that can perform horizontal and vertical movement to provide the all-around vision.

This section provides guidance to you about how to control directions (there are eight directions: upper, lower, left, right, upper left, upper right, bottom left, and bottom right), focus, zoom, iris, fast positioning, and 3-dimensional positioning through SDK.

CLIENT_DHPTZControlEx is a basic PTZ control interface. CLIENT_DHPTZControlEx2 provides more functions for the extension interface. Both have similar usage, with the latter having additional parameters.

2.5.2 Interface Overview

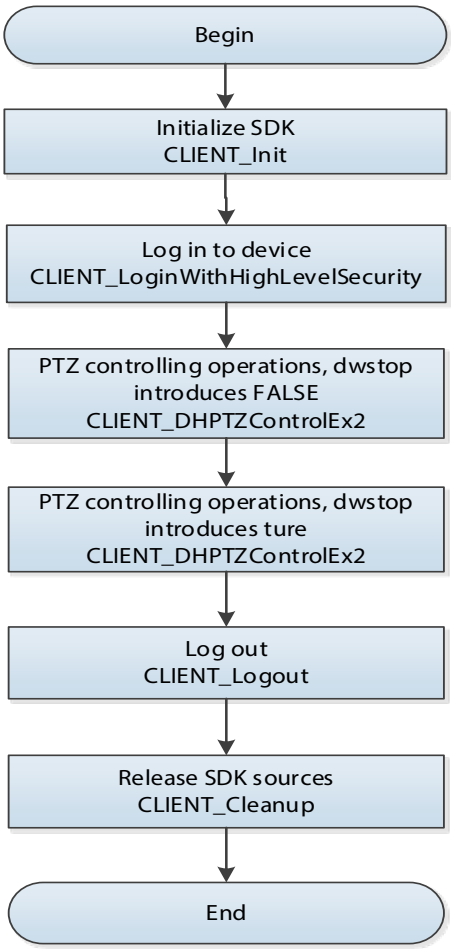
Table 2-6 Interface of PTZ control

Interface	Implication
CLIENT_DHPTZControlEx	PTZ control extension interface
CLIENT_DHPTZControlEx2	PTZ control extension interface (extension interface)

2.5.3 Process

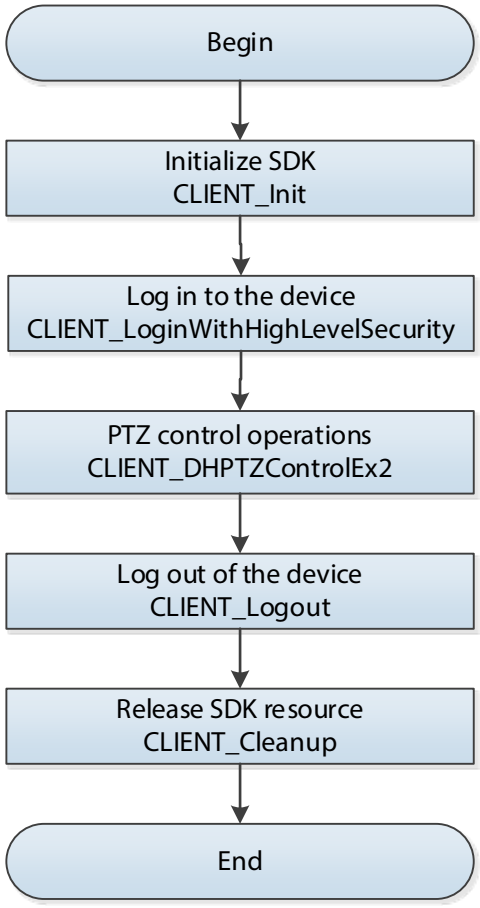
Direction control, focus, zoom and iris are the continuous operations. SDK provides start and stop interfaces to you for timing control.

Figure 2-8 Process of PTZ control



Both fast positioning and 3-dimensional positioning are considered as a single action, requiring only one call to the PTZ control interface.

Figure 2-9 Process of PTZ control (one-time)



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_DHPTZControlEx2** to operate the PTZ according to the situation. Different PTZ commands might need different parameters, and part of commands need to call the corresponding stop command, such as moving left and moving right. For details, see "2.5.4 Example Code."

Step 4 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 5 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Fast positioning: For the SD, take the current monitoring image center as origin, and the valid range of horizontal and vertical coordinates is [–8191, 8191]. For example, if the horizontal coordinate is 2000 and the vertical is 2000, the SD moves toward upper right and gets a new origin, which means the coordinate specified every time is only relative to the current location.
- 3-dimensional positioning: For the SD, there is an initial position first. The horizontal coordinate is [0, 3600] and the vertical is [–1800, 1800]. The coordinate specified each time is the absolute coordinate and is irrelevant to the location of the SD image last time.
- For more example code see the SDK package on the website (NetSDK_Chn_java\src\main\java\com\netsdk\demo\frame\PTZControl.java).

2.5.4 Example Code

```
/**
* Implement interface of PTZ control.
 * Mainly are direction control, zoom, focus, and iris.
 */
public class PtzControlModule {
    /**
     * Upper-left
     */
    public static boolean ptzControlUpStart(int nChannelID, int lParam1, int lParam2) {
        return LoginModule.netsdk.CLIENT_DHPTZControlEx(LoginModule.m_hLoginHandle, nChannelID,
                                                NetSDKLib.NET_PTZ_ControlType.NET_PTZ_UP_CONTROL,
                                                lParam1, lParam2, 0, 0);
    }
    public static boolean ptzControlUpEnd(int nChannelID) {
        return LoginModule.netsdk.CLIENT_DHPTZControlEx(LoginModule.m_hLoginHandle, nChannelID,
                                                NetSDKLib.NET_PTZ_ControlType.NET_PTZ_UP_CONTROL,
                                                0, 0, 0, 1);
    }
……
// Call CLIENT_DHPTZControlEx2 to implement other functions which are the same as Up's. However, the input type parameter of NetSDKLib.NET_PTZ_ControlType is different.
}
```

2.6 Voice Talk

2.6.1 Introduction

Voice talk realizes the voice interaction between the local platform and the environment where front-end devices are located.

This section introduces how to use SDK to realize the voice talk with the front-end devices.

2.6.2 Interface Overview

Table 2-7 Interfaces of voice talk

Interface	Implication
CLIENT_StartTalkEx	Start voice talk
CLIENT_StopTalkEx	Stop voice talk
CLIENT_TalkSendData	Send voice data to the device

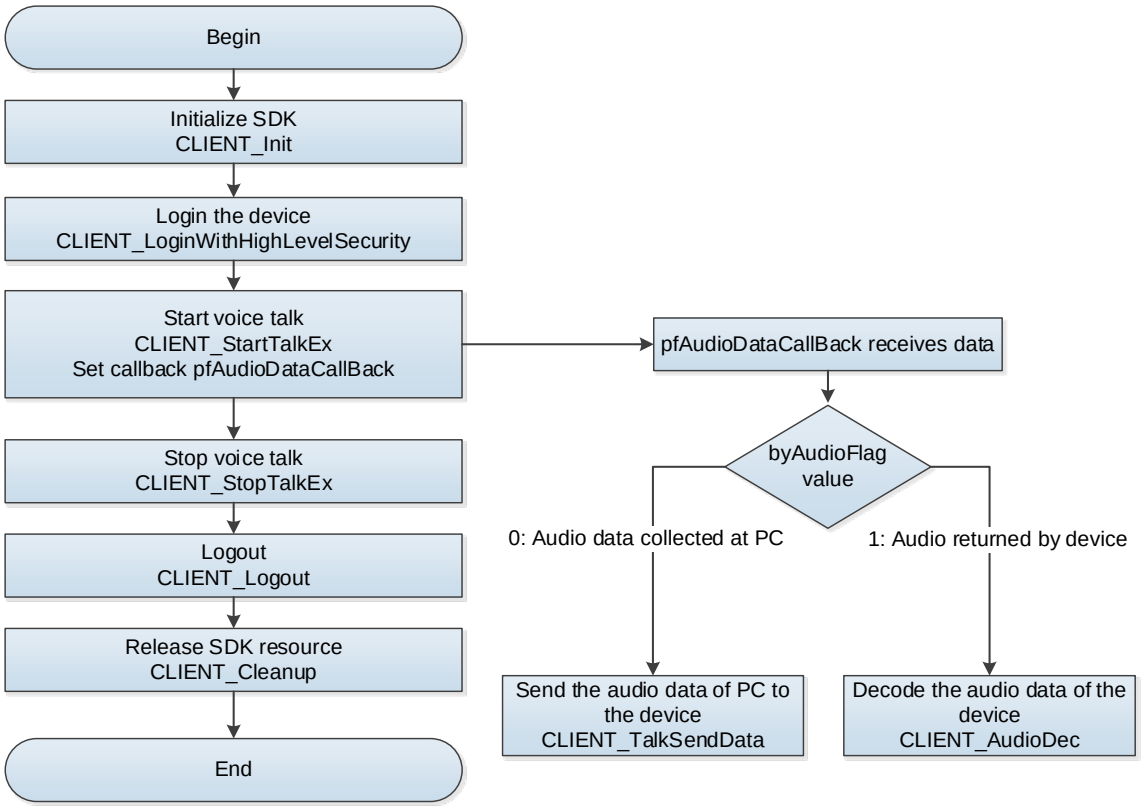
Interface	Implication
CLIENT_AudioDecEx	Decode audio data (valid only in Windows system)

2.6.3 Process

When SDK has collected the audio data from the local audio card, or SDK has received the audio data from the front-end devices, SDK will call the callback of audio data.

You can call the SDK interface in the callback parameters to send the local audio data to the front-end devices, or call SDK interface to decode and play the audio data received from the front-end devices.

Figure 2-10 Process of voice talk



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_SetDeviceMode** to set decoding information of voice talk. Set parameter emType as DH_TALK_ENCODE_TYPE.

Step 4 Call **CLIENT_StartTalkEx** to set callback and start voice talk. In the callback, call **CLIENT_AudioDec** to decode the audio data that is sent from the decoding device, and call **CLIENT_TalkSendData** to send the audio data of the PC end to the device.

Step 5 Call **CLIENT_StopTalkEx** to stop voice talk.

Step 6 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Voice encoding format: The example uses the common PCM format. SDK supports accessing the voice encoding format supported by the device. For more details of the example code, see the SDK package on the website (NetSDK_Chn_java\ src\main\java\com\netsdk\demo\frame\Talk.java). If the default PCM can satisfy the requirement, it is not recommended to obtain the voice encoding format from the device.
- No sound at the device: The audio data needs to be collected by the device such as microphone. It is recommended to check if the microphone or other equivalent device is plugged in and if the CLIENT_RecordStartEx succeeded in returning.

2.6.4 Example Code

```
/**
* Implement voice talk
 * Implement start, stop and data callback of voice talk.
* \endif
 */
public class TalkModule {
    public static LLong m_hTalkHandle = new LLong(0); // Voice talk handle
    private static boolean m_bRecordStatus    = false;                    // Is recording?
    /**
     * Start voice talk
     */
    public static boolean startTalk(int transferType, int chn) {
        // Set the encoding format of voice talk
        NetSDKLib.NETDEV_TALKDECODE_INFO talkEncode = new
NetSDKLib.NETDEV_TALKDECODE_INFO();
        talkEncode.encodeType = NetSDKLib.NET_TALK_CODING_TYPE.NET_TALK_PCM;
        talkEncode.dwSampleRate = 8000;
        talkEncode.nAudioBit = 16;
        talkEncode.nPacketPeriod = 25;
        talkEncode.write();
        if(LoginModule.netsdk.CLIENT_SetDeviceMode(LoginModule.m_hLoginHandle,
NetSDKLib.EM_USEDEV_MODE.NET_TALK_ENCODE_TYPE, talkEncode.getPointer())) {
            System.out.println("Set Talk Encode Type Succeed!");
        } else {
            System.err.println("Set Talk Encode Type Failed!" + ToolKits.getErrorCodePrint());
            return false;
        }
        // Set the speak parameter of voice talk
```

```
            NetSDKLib.NET_SPEAK_PARAM speak = new NetSDKLib.NET_SPEAK_PARAM();
           speak.nMode = 0;
            speak.bEnableWait = false;
           speak.nSpeakerChannel = 0;
           speak.write();
            if (LoginModule.netsdk.CLIENT_SetDeviceMode(LoginModule.m_hLoginHandle,
NetSDKLib.EM_USEDEV_MODE.NET_TALK_SPEAK_PARAM, speak.getPointer())) {
            System.out.println("Set Talk Speak Mode Succeed!");
            } else {
                System.err.println("Set Talk Speak Mode Failed!" + ToolKits.getErrorCodePrint());
                return false;
            }
            // Set the voice talk in transfer mode
            NetSDKLib.NET_TALK_TRANSFER_PARAM talkTransfer = new
NetSDKLib.NET_TALK_TRANSFER_PARAM();
            talkTransfer.bTransfer = transferType;
            talkTransfer.write();
            if(LoginModule.netsdk.CLIENT_SetDeviceMode(LoginModule.m_hLoginHandle,
NetSDKLib.EM_USEDEV_MODE.NET_TALK_TRANSFER_MODE, talkTransfer.getPointer())) {
                System.out.println("Set Talk Transfer Mode Succeed!");
            } else {
                System.err.println("Set Talk Transfer Mode Failed!" + ToolKits.getErrorCodePrint());
                return false;
            }
            if (talkTransfer.bTransfer == 1) {    // Set transfer channel for transfer mode
                IntByReference nChn = new IntByReference(chn);
                if(LoginModule.netsdk.CLIENT_SetDeviceMode(LoginModule.m_hLoginHandle,
NetSDKLib.EM_USEDEV_MODE.NET_TALK_TALK_CHANNEL, nChn.getPointer())) {
                    System.out.println("Set Talk Channel Succeed!");
                } else {
                    System.err.println("Set Talk Channel Failed!" + ToolKits.getErrorCodePrint());
                    return false;
                }
            }
            m_hTalkHandle = LoginModule.netsdk.CLIENT_StartTalkEx(LoginModule.m_hLoginHandle,
AudioDataCB.getInstance(), null);
            if(m_hTalkHandle.longValue() == 0) {
                System.err.println("Start Talk Failed!" + ToolKits.getErrorCodePrint());
                return false;
            } else {
```

```
            System.out.println("Start Talk Success");
            if(LoginModule.netsdk.CLIENT_RecordStart()){
                System.out.println("Start Record Success");
                m_bRecordStatus = true;
            } else {
                System.err.println("Start Local Record Failed!" + ToolKits.getErrorCodePrint());
                stopTalk();
                return false;
            }
        }
        return true;
    }
    /**
     * Stop voice talk
     */
    public static void stopTalk() {
        if(m_hTalkHandle.longValue() == 0) {
            return;
        }

        if (m_bRecordStatus){
            LoginModule.netsdk.CLIENT_RecordStop();
            m_bRecordStatus = false;
        }
        if(LoginModule.netsdk.CLIENT_StopTalkEx(m_hTalkHandle)) {
            m_hTalkHandle.setValue(0);
        }else {
            System.err.println("Stop Talk Failed!" + ToolKits.getErrorCodePrint());
        }
    }
    /**
     * Data callback of voice talk
     */
    private static class AudioDataCB implements NetSDKLib.pfAudioDataCallBack {

        private AudioDataCB() {}
        private static AudioDataCB audioCallBack = new AudioDataCB();
        public static AudioDataCB getInstance() {
            return audioCallBack;
        }
```

```
        public void invoke(LLong lTalkHandle, Pointer pDataBuf, int dwBufSize, byte byAudioFlag, Pointer
dwUser){
                    if(lTalkHandle.longValue() != m_hTalkHandle.longValue()) {
                        return;
                    }
                    if (byAudioFlag == 0) { // Send the sound card data which is detected by the local PC to the
device

                        LLong lSendSize = LoginModule.netsdk.CLIENT_TalkSendData(m_hTalkHandle, pDataBuf,
dwBufSize);
                        if(lSendSize.longValue() != (long)dwBufSize) {
                            System.err.println("send incomplete" + lSendSize.longValue() + ":" + dwBufSize);
                        }
                    }else if (byAudioFlag == 1) { // Send the voice talk data which is sent by the device to SDK , to
decode and playback.
                        LoginModule.netsdk.CLIENT_AudioDecEx(m_hTalkHandle, pDataBuf, dwBufSize);
                    }
                }
            }
```

2.7 Alarm Listening

2.7.1 Introduction

Alarm listening is the function to analyze real-time stream by smart devices. When the set event occurs, alarm triggers.

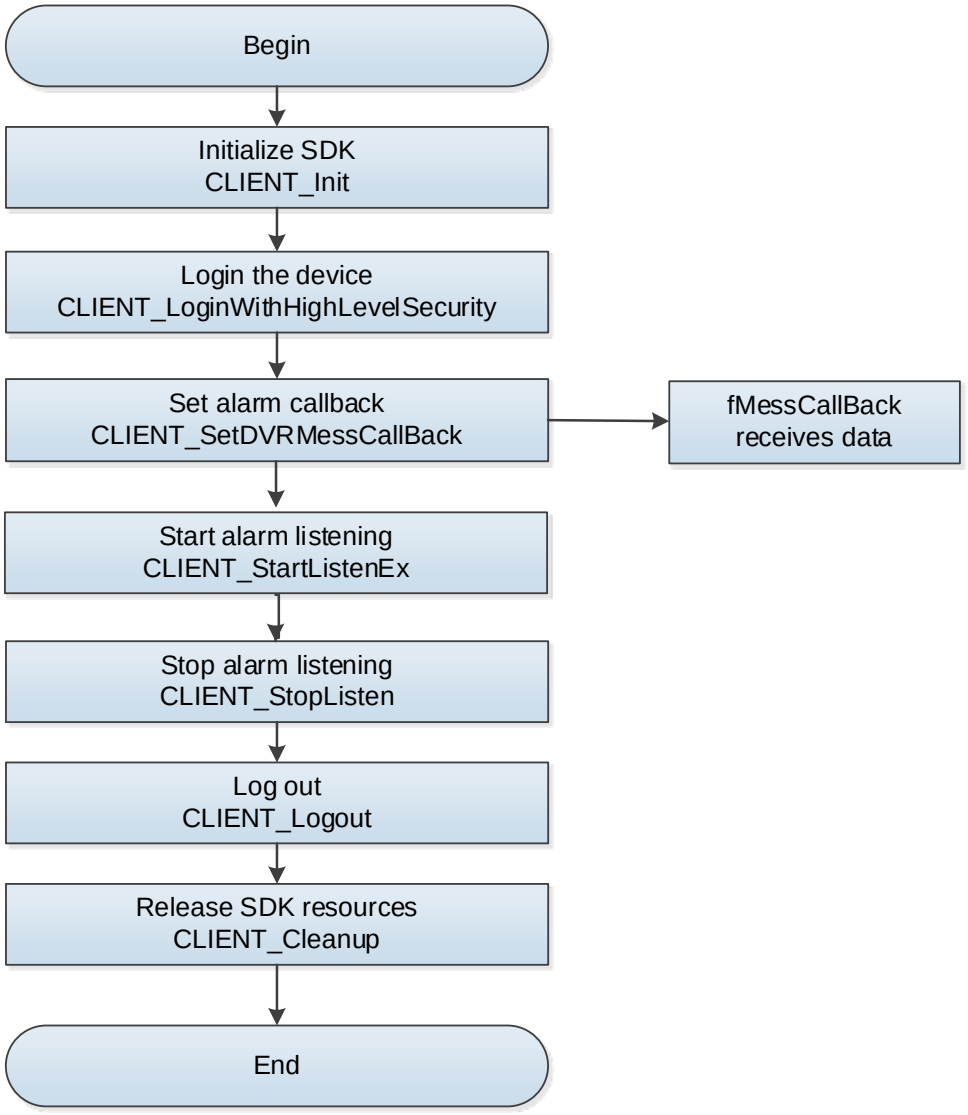
2.7.2 Interface Overview

Table 2-8 Interfaces of alarm listening

Interface	Implication
CLIENT_StartListenEx	Subscribe alarm from device
CLIENT_StopListen	Stop subscribing alarm
CLIENT_SetDVRMessCallBack	Set alarm listening

2.7.3 Process

Figure 2-11 Process of alarm listening



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Set alarm callback function and the way to call **CLIENT_SetDVRMessCallBack**.

Step 4 Call **CLIENT_StartListenEx** to start alarm listening.

Step 5 After alarm listening, the **fAnalyzerDataCallBack** callback gets the alarm events uploaded by devices and then notifies users.

Step 6 Call **CLIENT_StopListen** to stop alarm listening.

Step 7 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 8 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

No uploaded data: Only when you call **CLIENT_SetDVRMessCallBack**, will alarm data be acquired.

2.7.4 Example Code

```
// Set alarm callback
netSdk.CLIENT_SetDVRMessCallBack(callback, null);
// Start alarm listening
        if (listening) {
                return true;
            }
            listening = netSdk.CLIENT_StartListenEx(loginHandle);
            if (!listening) {
                System.err.println("Start Listen Failed!" + ToolKits.getErrorCode());
            } else {
                System.out.println("Start Listen Success.");
            }
//fmessCallback
public class MessCallBack implements NetSDKLib.fMessCallBack {
        private MessCallBack() {}
        private static class CallBackHolder {
            private static final MessCallBack cb = new MessCallBack();
        }

        public static final MessCallBack getInstance() {
            return CallBackHolder.cb;
        }
        @Override
        public boolean invoke(int lCommand, LLong lLoginID, Pointer pStuEvent,
                int dwBufLen, String strDeviceIP, NativeLong nDevicePort,
                Pointer dwUser) {
            switch (lCommand) {
                case NetSDKLib.NET_ALARM_ACCESS_CTL_EVENT : // Access control event
                {
                    ALARM_ACCESS_CTL_EVENT_INFO msg = new ALARM_ACCESS_CTL_EVENT_INFO();
                    ToolKits.GetPointerData(pStuEvent, msg);
                    System.out.println("【Access control event】  " + msg);
                    break;
                }
}
// Stop alarm listening
if (listening) {
                netSdk.CLIENT_StopListen(loginHandle);
```

```
            listening = false;
        }
```

2.8 Intelligent Event

2.8.1 Introduction

Intelligent event is the function to analyze real-time stream by smart devices. When the set event occurs, the alarm events will be sent to users, such as traffic violation and parking space.

SDK connects to the device and subscribes intelligent event function. When the device gets the intelligent events, they will be sent to SDK.

For the supported intelligent events, see the constants starting with EVENT_IVS_ in NetSDKLib.java, which include events such as regular traffic violation.

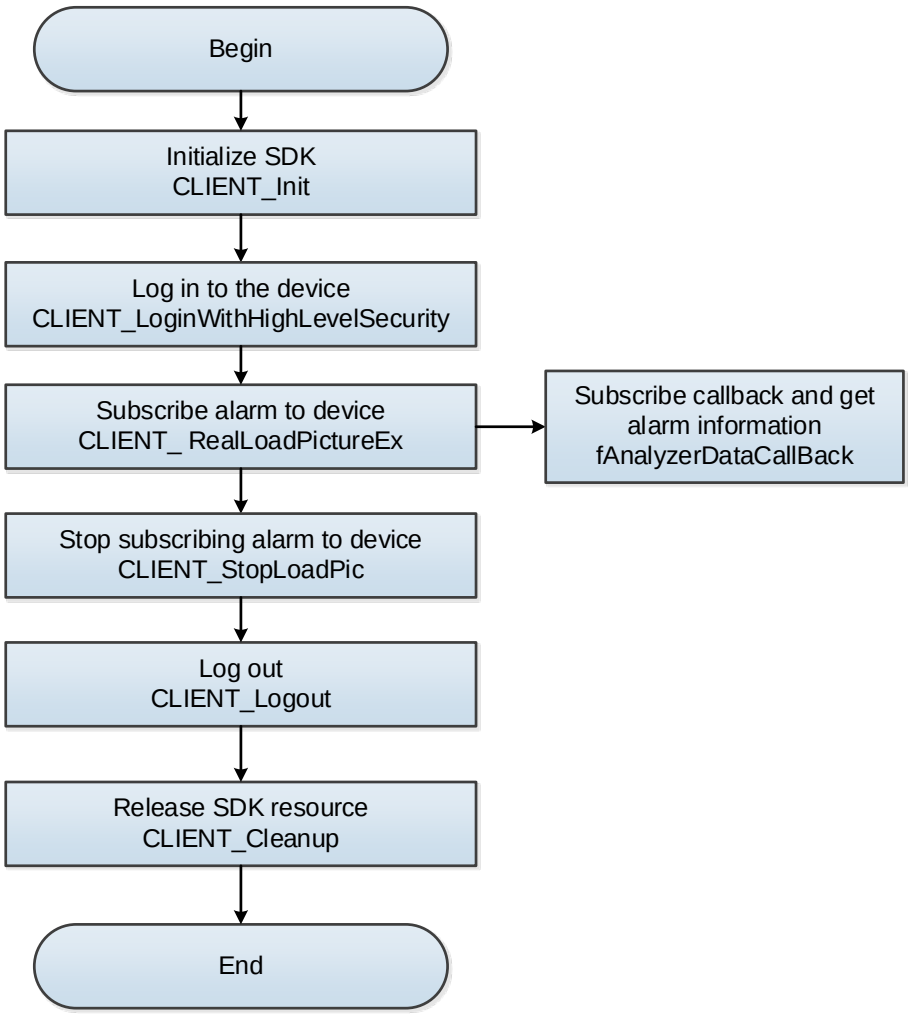
2.8.2 Interface Overview

Table 2-9 Interfaces of intelligent event

Interface	Implication
CLIENT_RealLoadPictureEx	Subscribe alarm events.
CLIENT_StopLoadPic	Stop subscribing intelligent events.
fAnalyzerDataCallBack	Get intelligent event information from callback.

2.8.3 Process

Figure 2-12 Process of intelligent event upload



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_ RealLoadPictureEx** to subscribe to smart traffic event to device.

Step 4 After subscribing, the **fAnalyzerDataCallBack** callback gets the alarm events uploaded by devices and then notifies users.

Step 5 After uploading, call **CLIENT_StopLoadPic** to stop subscription.

Step 6 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

Notes for Process

- Event type: Subscribe to all intelligent events (EVENT_IVS_ALL) if different intelligent events need to be uploaded. Also support to subscribe to a single intelligent event.
- Image receiving or not: The network environment of some devices is 3G or 4G. When the SDK is connected to the device, set bNeedPicFile parameter in the CLIENT_RealLoadPictureEx to false if

images are not needed. Then only receive information about smart traffic event, without images.

2.8.4 Example Code

```
// Take access control event as an example.
// Skip steps of SDK initialization and login.
// Intelligence subscription handle
private    LLong attachHandle = new NetSDKLib.LLong(0);
    /**
     * Subscribe to intelligence tasks
     */
    public void AttachEventRealLoadPic() {
        // Unsubscribe first. The device does not verify duplicate subscriptions, and duplication events will be returned after repeated subscriptions.
        this.DetachEventRealLoadPic();
        // Need image.
        int bNeedPicture = 1;
        attachHandle = netsdkApi.CLIENT_RealLoadPictureEx(loginHandle, channel, NetSDKLib.EVENT_IVS_ALL, bNeedPicture,
                AnalyzerDataCB.getInstance(), null, null);
        if (attachHandle.longValue() != 0) {
            System.out.printf("Chn[%d] CLIENT_RealLoadPictureEx Success\n", channel);
        } else {
            System.out.printf("Ch[%d] CLIENT_RealLoadPictureEx Failed!LastError = %s\n", channel,ToolKits.getErrorCode());
        }
    }
    /**
     * Cancel subscription
     */
    public void DetachEventRealLoadPic() {
        if (attachHandle.longValue() != 0) {
            netsdkApi.CLIENT_StopLoadPic(attachHandle);
        }
    }

//The intelligence event callback of the access control system inherits the logic from fAnalyzerDataCallBack and implements it itself.
    private static class AnalyzerDataCB implements NetSDKLib.fAnalyzerDataCallBack {
        private final File picturePath;
```

```
        private static AnalyzerDataCB instance;
        private AnalyzerDataCB() {
            picturePath = new File("./AnalyzerPicture/");
            if (!picturePath.exists()) {
                picturePath.mkdirs();
            }
        }

        public static AnalyzerDataCB getInstance() {
            if (instance == null) {
                synchronized (AnalyzerDataCB.class) {
                    if (instance == null) {
                        instance = new AnalyzerDataCB();
                    }
                }
            }
            return instance;
        }
    private BufferedImage gateBufferedImage = null;
    @Override
    public int invoke(LLong lAnalyzerHandle, int dwAlarmType,
                      Pointer pAlarmInfo, Pointer pBuffer, int dwBufSize,
                      Pointer dwUser, int nSequence, Pointer reserved)
    {
        if (lAnalyzerHandle.longValue() == 0 || pAlarmInfo == null) {
            return -1;
        }

        switch(dwAlarmType)
            {
                case NetSDKLib.EVENT_IVS_ACCESS_CTL:    ///< Access control event
                {
       DEV_EVENT_ACCESS_CTL_INFO msg = new DEV_EVENT_ACCESS_CTL_INFO();
                    ToolKits.GetPointerData(pAlarmInfo, msg);

                    System.out.println("Event name :" + new String(msg.szName).trim());
                    if(msg.emEventType == 1) {
                        System.out.println("Access control event type: Enter.");
                    } else if(msg.emEventType == 2){
                        System.out.println("Access control event type: Exit");
```

```
                        }

                        if(msg.bStatus == 1) {
                            System.out.println("Card swiping result: Successful.");
                        } else if(msg.bStatus == 0) {
                            System.out.println("Card swiping result: Failed.");
                        }

                        System.out.println("Card Type:" + msg.emCardType);
                        System.out.println("Unlock Method:" + msg.emOpenMethod);
                        System.out.println("Card Number:" + new String(msg.szCardNo).trim());
                        System.out.println("Unlock User:" + new String(msg.szUserID).trim());
                        System.out.println("Unlock Failure Error Code:" + msg.nErrorCode);
                        System.out.println("Attendance Status:" + msg.emAttendanceState);
                        System.out.println("Card Name :" + new String(msg.szCardName).trim());

                        try {
System.out.println("Role:" + new String(msg.stuCustomWorkerInfo.szRole, "GBK").trim());
System.out.println("Project Number:" + new String(msg.stuCustomWorkerInfo.szProjectNo).trim());
System.out.println("Project Name:" + new String(msg.stuCustomWorkerInfo.szProjectName,
"GBK").trim());
System.out.println("Contractor Name:" + new String(msg.stuCustomWorkerInfo.szBuilderName,
"GBK").trim());
                        }catch(UnsupportedEncodingException e) {
                            System.err.println("...UnsupportedEncodingException...");
                        }

                        if (msg.nImageInfoCount == 0) {
                        // Take snapshot and the device only returns one snapshot.
                        String snapPicPath = path + "\\" + System.currentTimeMillis() +
"AccessSnapPicture.jpg";    //Image storage address
                        byte[] buffer = pBuffer.getByteArray(0, dwBufSize);
                        ByteArrayInputStream byteArrInputGlobal = new
ByteArrayInputStream(buffer);
                            try {
                            BufferedImage bufferedImage = ImageIO.read(byteArrInputGlobal);
                                if(bufferedImage != null) {
                                ImageIO.write(bufferedImage, "jpg", new File(snapPicPath));
                                    System.out.println("Snapshot storage path:" + snapPicPath);
                                }
```

```
                                    } catch (IOException e2) {
                                        e2.printStackTrace();
                                    }
                                }else {
                                    String snapPicPath;
                                    for (int i = 0; i < msg.nImageInfoCount; ++i) {
            snapPicPath = path + "\\" + System.currentTimeMillis() + "_AccessSnapPicture_" + i + ".jpg";
// Image storage address
byte[] buffer=pBuffer.getByteArray(msg.stuImageInfo[i].nOffSet, msg.stuImageInfo[i].nLength);
ByteArrayInputStream byteArrInputGlobal = new ByteArrayInputStream(buffer);
                                try {
                                BufferedImage bufferedImage = ImageIO.read(byteArrInputGlobal);
                                   if(bufferedImage != null) {
ImageIO.write(bufferedImage, "jpg", new File(snapPicPath));
System.out.println("Snapshot storage path:" + snapPicPath);
                                        }
                                    } catch (IOException e2) {
                                        e2.printStackTrace();
                                    }
                                }
                                break;
                            }
                            default:
                                break;
                        }

}
```

2.9 Record Playback

2.9.1 Introduction

Record playback function plays the videos of a particular period in some channels to find the target videos for check.

The playback includes the following functions: Start playback, pause Playback, resume playback, and stop playback.

2.9.2 Interface Overview

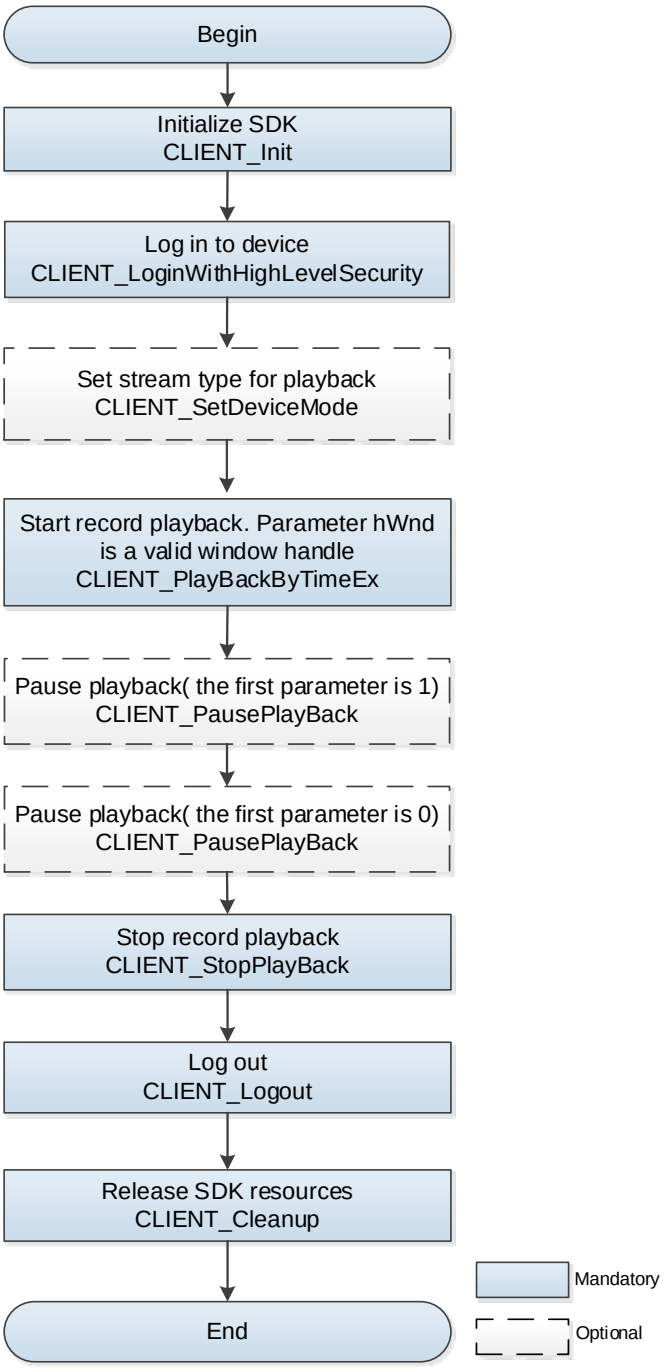
Table 2-10 Interfaces of record playback

Interface	Implication
CLIENT_PlayBackByTimeEx	Playback by time.
CLIENT_SetDeviceMode	Set the work mode such as voice talk, playback, and authority.
CLIENT_StopPlayBack	Stop record playback.
CLIENT_PausePlayBack	Pause or resume playback.

2.9.3 Process

After SDK initialization, you need to input channel number, start time, stop time, and valid window handle to realize the playback of the required record.

Figure 2-13 Process of record playback



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 (Optional) Call **CLIENT_SetDeviceMode** twice and set the stream type parameter emType as DH_RECORD_STREAM_TYPE and the record type parameter emType as DH_RECORD_TYPE.

Step 4 Call **CLIENT_PlayBackByTimeEx** to start playback. The parameter hWnd is a valid window handle value.

Step 5 (Optional) Call **CLIENT_PausePlayBack**. The playback will pause when the second parameter is 1.

Step 6 (Optional) Call **CLIENT_PausePlayBack.** The playback will resume when the second parameter is 0.

Step 7 Call **CLIENT_StopPlayBack** to stop playback.

Step 8 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 9 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

2.9.4 Example Code

```
// Start playback
private void StartPlayBack() {
    if (m_hLoginHandle.longValue() == 0) {
        System.err.printf("Please Login First");
            return;
    }

    // Playback and download cannot be performed simultaneously with the same login handle.
    if (m_hDownLoadHandle.longValue() != 0) {
            JOptionPane.showMessageDialog(playFrame, "Please stop downloading");
            return;
    }

    updatePlayBackParams(); // Update parameters

    // set stream type of playback
    IntByReference steamType = new IntByReference(m_streamType);// 0-Main and sub stream, 1-Mian stream, 2-Sub stream
    int emType = NetSDKLib.EM_USEDEV_MODE.NET_RECORD_STREAM_TYPE;

    boolean bret = NetSdk.CLIENT_SetDeviceMode(m_hLoginHandle, emType, steamType.getPointer());
    if (!bret) {
        System.err.printf("Set Stream Type Failed, Get last error [0x%x]\n", NetSdk.CLIENT_GetLastError());
    }

    // Set video type of recorded playback
    IntByReference emFileType = new IntByReference(m_recordType); // All recorded videos NET_RECORD_TYPE
    emType = NetSDKLib.EM_USEDEV_MODE.NET_RECORD_TYPE;
    bret = NetSdk.CLIENT_SetDeviceMode(m_hLoginHandle, emType, emFileType.getPointer());
    if (!bret) {
```

```
                System.err.printf("Set Record Type Failed, Get last error [0x%x]\n",
NetSdk.CLIENT_GetLastError());
            }

            m_hPlayHandle = NetSdk.CLIENT_PlayBackByTimeEx(m_hLoginHandle, m_channel.intValue(),
m_startTime, m_stopTime,
                    playWindow.getHWNDofFrame(), m_PlayBackDownLoadPos, null, m_dataCallBack, null);
            if (m_hPlayHandle.longValue() == 0) {
                int error = NetSdk.CLIENT_GetLastError();
                System.err.printf("PlayBackByTimeEx Failed, Get last error [0x%x]\n", error);
                switch(error) {
                case LastError.NET_NO_RECORD_FOUND:
                    JOptionPane.showMessageDialog(playFrame, "No recorded video");
                    break;
                default:
                    JOptionPane.showMessageDialog(playFrame, "Failed to start, and error code" +
String.format("0x%x", error));
                    break;
                }
            }
            else {
                System.out.println("PlayBackByTimeEx Successed");
                m_playFlag = true; // Enable the play flag
                playButton.setText("Stop playback");
                panelPlayBack.repaint();
                panelPlayBack.setVisible(true);
            }
        }

        // Stop playback
        private void StopPlayBack() {
            if (m_hPlayHandle.longValue() == 0) {
                System.err.println("Please make sure the PlayBack Handle is valid");
                return;
            }

            if (!NetSdk.CLIENT_StopPlayBack(m_hPlayHandle)) {
                System.err.println("StopPlayBack Failed");
                return;
            }
```

```
        m_hPlayHandle.setValue(0);
        m_playFlag = false;
        m_pauseFlag = true;
        playPos = 0;
        playButton.setText("Start playback");
        pauseButton.setText("Pause");
        panelPlayBack.repaint();
}

/**
  * Pause and play
  * @param pause true - Pause; false - Play
  */
private void PausePlayBack(boolean pause) {
        if (m_hPlayHandle.longValue() == 0) {
                System.err.println("Please make sure the PlayBack Handle is valid");
                return;
        }

        NetSdk.CLIENT_PausePlayBack(m_hPlayHandle, pause ? 1 : 0); // 1 – Pause 0 - Resume
        pauseButton.setText(pause ? "Play":"Pause");
}

// Play at normal speed
private void NormalPlayBack() {
        if (m_hPlayHandle.longValue() == 0) {
                System.err.println("Please make sure the PlayBack Handle is valid");
                return;
        }

        NetSdk.CLIENT_NormalPlayBack(m_hPlayHandle);
}

// Fast play
private void FastPlayBack() {
        if (m_hPlayHandle.longValue() == 0) {
                System.err.println("Please make sure the PlayBack Handle is valid");
                return;
        }
```

```
        NetSdk.CLIENT_FastPlayBack(m_hPlayHandle);
    }

    // Slow play
    private void SlowPlayBack() {
        if (m_hPlayHandle.longValue() == 0) {
            System.err.println("Please make sure the PlayBack Handle is valid");
            return;
        }

        NetSdk.CLIENT_SlowPlayBack(m_hPlayHandle);
    }
```

2.10 Record Download

2.10.1 Introduction

Video surveillance system widely applies to city, airport, metro, bank and factory. When any event occurs, you need to download the video records and report to the leaders, public security bureau, or mass media. Therefore, record download is an important function.

The record download function helps you obtain the records saved on the device through SDK and save into the local. It allows you to download from the selected channels and export to the local disk or external USB flash drive.

This function is available for some select models.

2.10.2 Interface Overview

Table 2-11 Interfaces of record download

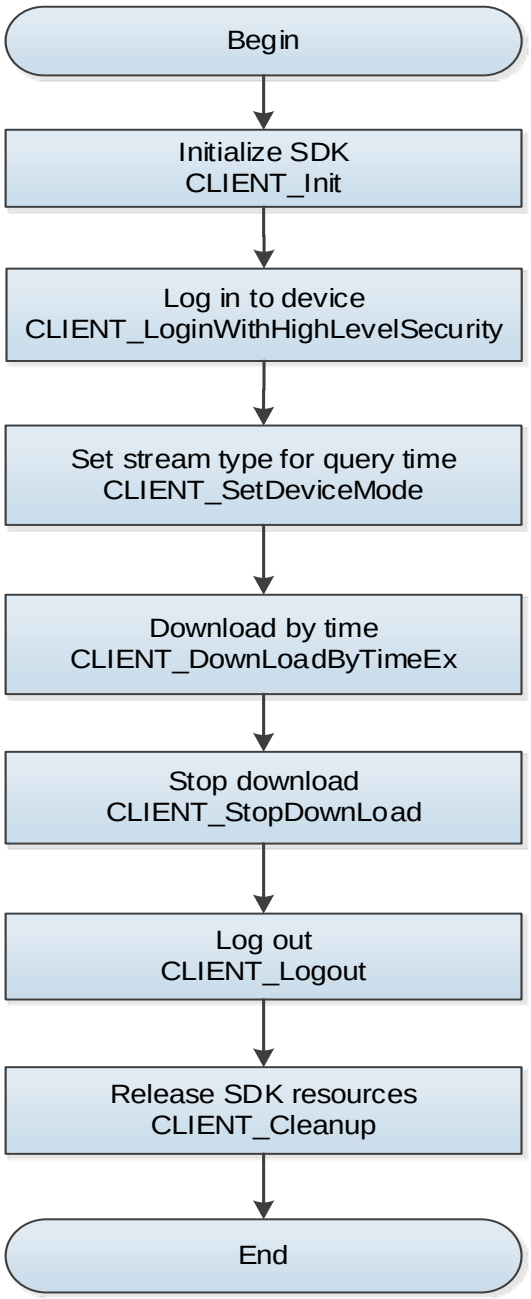
Interface	Implication
CLIENT_QueryRecordFile	Query for all the record files within a period.
CLIENT_DownloadByTimeEx	Download the record by time.
CLIENT_StopDownload	Stop the record download.

2.10.3 Process

You can import the start time and end time of download. SDK can download the specified record file and save to the required place.

You can also provide a callback pointer to SDK which calls back the specified record file to you for treatment.

Figure 2-14 Process of record download



Process Description

Step 1 Call **CLIENT_Init** to initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_SetDeviceMode** to set the stream type for query time, and the parameter emType should be DH_RECORD_STREAM_TYPE.

Step 4 Call **CLIENT_DownloadByTimeEx** to start downloading by time. Either sSavedFileName or fDownLoadDataCallBack is valid. You can decide whether to use cbDownLoadPos; if not, set it as NULL**.**

Step 5 Call **CLIENT_StopDownload** to stop download**.** You can close the download process after it is completed or it is just partially completed.

Step 6 After using the function module, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resource.

2.10.4 Example Code

```
import main.java.com.netsdk.lib.NetSDKLib;
import main.java.com.netsdk.lib.NetSDKLib.LLong;
import main.java.com.netsdk.lib.ToolKits;

import com.sun.jna.ptr.IntByReference;

/**
 * Implement record download
 * Mainly are record query, record download and setting of stream type.
 */
public class DownLoadRecordModule {
    // Download handle
    public static LLong m_hDownLoadHandle = new LLong(0);

    // Query for record file
    public static boolean queryRecordFile(int nChannelId,
                                          NetSDKLib.NET_TIME stTimeStart,
                                          NetSDKLib.NET_TIME stTimeEnd,
                                          NetSDKLib.NET_RECORDFILE_INFO[] stFileInfo,
                                          IntByReference nFindCount) {
    // RecordFileType 0: All recorded videos, 1: External alarm, 2: Dynamic monitoring alarm, 3: All alarms, 4:
 Card ID query, 5: combined condition query
        // 6: Record location and deviation length, 8: Image query by card ID (currently only supported by
select models of HB-U and NVS), 9: Image query (currently only supported by select models of HB-U and NVS)
        // 10: Query by field, 15: Return network data structure (Jinqiao Internet bar), 16: Query for all
recoding files of transparent string data
        int nRecordFileType = 0;
        boolean bRet = LoginModule.netsdk.CLIENT_QueryRecordFile(LoginModule.m_hLoginHandle,
nChannelId, nRecordFileType, stTimeStart, stTimeEnd, null, stFileInfo, stFileInfo.length * stFileInfo[0].size(),
nFindCount, 5000, false);

        if(bRet) {
            System.out.println("QueryRecordFile    Succeed! \n" + "The number of queried videos: " +
nFindCount.getValue());
        } else {
            System.err.println("QueryRecordFile    Failed!" + ToolKits.getErrorCodePrint());
            return false;
        }
        return true;
```

```
    }

    /**
     * Set stream type of playback
     * @param m_streamType
     */
    public static void setStreamType(int m_streamType) {

        IntByReference steamType = new IntByReference(m_streamType);//    0-Main and sub stream, 1-Mian stream, 2-Sub stream
        int emType = NetSDKLib.EM_USEDEV_MODE.NET_RECORD_STREAM_TYPE;

        boolean bret = LoginModule.netsdk.CLIENT_SetDeviceMode(LoginModule.m_hLoginHandle, emType, steamType.getPointer());
        if (!bret) {
            System.err.println("Set Stream Type Failed, Get last error." + ToolKits.getErrorCodePrint());
        } else {
            System.out.println("Set Stream Type    Succeed!");
        }
    }
    // Download record
    public static LLong downloadRecordFile(int nChannelId,
                                           int nRecordFileType,
                                           NetSDKLib.NET_TIME stTimeStart,
                                           NetSDKLib.NET_TIME stTimeEnd,
                                           String SavedFileName,
                                           NetSDKLib.fTimeDownLoadPosCallBack cbTimeDownLoadPos) {

        m_hDownLoadHandle = LoginModule.netsdk.CLIENT_DownloadByTimeEx(LoginModule.m_hLoginHandle, nChannelId, nRecordFileType, stTimeStart, stTimeEnd, SavedFileName, cbTimeDownLoadPos, null, null, null, null);
        if(m_hDownLoadHandle.longValue() != 0) {
            System.out.println("Downloading RecordFile!");
        } else {
            System.err.println("Download RecordFile Failed!" + ToolKits.getErrorCodePrint());
        }
        return m_hDownLoadHandle;
    }
```

```
    public static void stopDownLoadRecordFile(LLong m_hDownLoadHandle) {
        if (m_hDownLoadHandle.longValue() == 0) {
            return;
        }
        LoginModule.netsdk.CLIENT_StopDownload(m_hDownLoadHandle);
    }
}
```

2.11 Real-time Monitoring Transcoding

2.11.1 Introduction

Real-time monitoring transcoding involves getting live videos from storage devices or front-end devices and transcoding the videos into the stream type that you need. The supported stream types include:

- GB program stream.
- Transport streams.
- MP4 format.
- H.264 and H.265.
- Program streams.
- RTP streams.

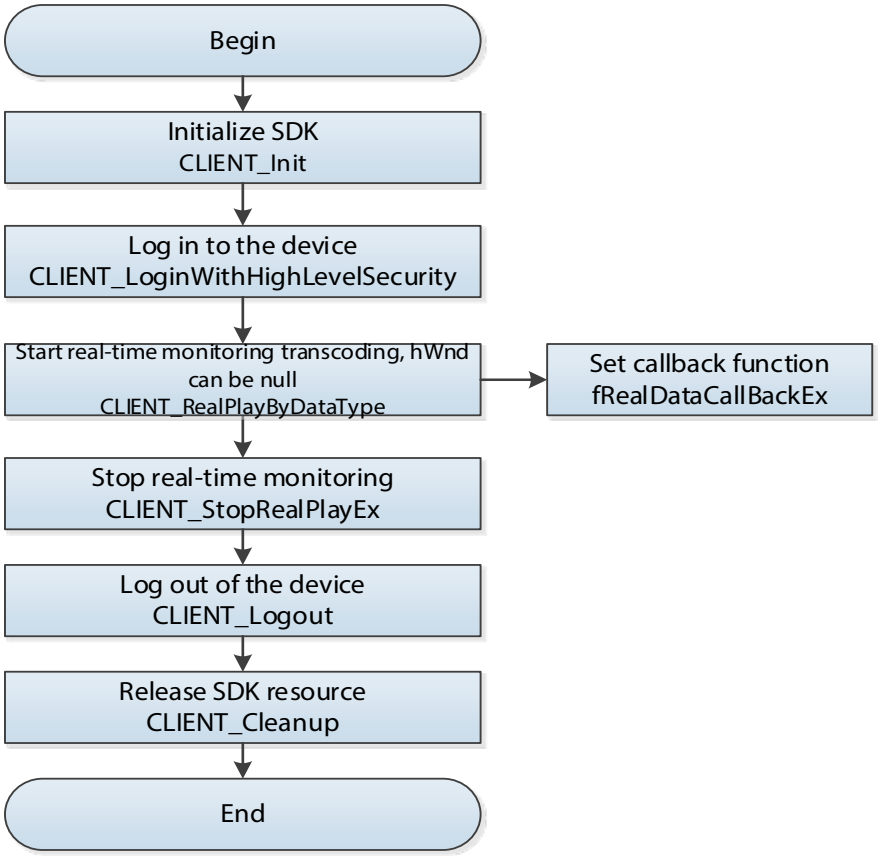
2.11.2 Interface Overview

Table 2-12 Interfaces of real-time monitoring transcoding

Interface	Implication
CLIENT_RealPlayByDataType	Start real-time monitoring transcoding interface.
CLIENT_StopRealPlay	Stop real-time monitoring transcoding interface.

2.11.3 Process

Figure 2-15 Process of real-time monitoring transcoding



Process Description

Step 1 Initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_RealPlayByDataType** to start real-time monitoring. The parameter hWnd can be set to null.

Step 4 Set the real-time data callback function fRealDataCallBackEx to save the transcoded data.

Step 5 After using the real-time monitoring transcoding, call **CLIENT_StopRealPlayEx** to stop it.

Step 6 After using the service, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resources.

2.11.4 Example Code

```
import com.netsdk.lib.NetSDKLib;
import com.netsdk.lib.NetSDKLib.*;
import com.sun.jna.Native;
import com.sun.jna.Pointer;

import javax.swing.*;
```

```
import java.awt.*;
import java.util.Vector;

public class CommonWithCallBack { // Callback method.
	static NetSDKLib netsdkApi   = NetSDKLib.NETSDK_INSTANCE;
	LLong loginHandle;
	JWindow wnd;
	private static final int MAX_WINDOW_NUM = 4;
	Vector<JWindow> vecWnd;
	public CommonWithCallBack(LLong loginHandle)
	{
		this.loginHandle = loginHandle;
		createWindow();
	}

	/**
	 * H.264 and H.265 callback requires a specific library that needs macro.
	 */
	public void RealPlayByDataType() {

		wnd.setVisible(true);

		NetSDKLib.NET_IN_REALPLAY_BY_DATA_TYPE stIn = new
NetSDKLib.NET_IN_REALPLAY_BY_DATA_TYPE();
		stIn.hWnd = Native.getComponentPointer(wnd);
		stIn.emDataType = EM_REAL_DATA_TYPE.EM_REAL_DATA_TYPE_FLV_STREAM;
		stIn.nChannelID = 0;
		stIn.rType = NET_RealPlayType.NET_RType_Realplay;
		stIn.cbRealData = RealDataCallBack.getInstance();
		stIn.dwUser = null;
		stIn.szSaveFileName = "d:/123.flv";	//The name of the video file of transcoded H.264
streams.

		NetSDKLib.NET_OUT_REALPLAY_BY_DATA_TYPE stOut = new
NetSDKLib.NET_OUT_REALPLAY_BY_DATA_TYPE();

		LLong lRealHandle = netsdkApi.CLIENT_RealPlayByDataType(loginHandle, stIn, stOut, 5000);
		if(lRealHandle.longValue() != 0) {
			System.out.println("RealPlayByDataType Succeed!");
		} else {
			System.err.printf("RealPlayByDataType Failed!Last Error[0x%x]\n",
netsdkApi.CLIENT_GetLastError());
			return;
		}

		try {
			Thread.sleep(10000);
```

```
            } catch (InterruptedException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }
            //Stop real-time monitoring.
            netsdkApi.CLIENT_StopRealPlay(lRealHandle);      //Stop pulling streams to generate
123.dat
            wnd.setVisible(false);
        }

        //It is recommended to write the callback in single mode. When handling data in the callback,
perform it in a separate thread.
        public static class RealDataCallBack implements NetSDKLib.fRealDataCallBackEx {
            private RealDataCallBack() {}

            private static class RealDataCallBackHolder {
                private static final RealDataCallBack realDataCB = new RealDataCallBack();
            }

            public static final RealDataCallBack getInstance() {
                return RealDataCallBackHolder.realDataCB;
            }

            @Override
            public void invoke(LLong lRealHandle, int dwDataType,
                               Pointer pBuffer, int dwBufSize, int param, Pointer dwUser) {
                  System.out.println("RealDataCallBack dwDataType : " + dwDataType);
                if (dwDataType == (NetSDKLib.NET_DATA_CALL_BACK_VALUE +
EM_REAL_DATA_TYPE.EM_REAL_DATA_TYPE_FLV_STREAM)) {
                    System.out.println("RealDataCallBack dwDataType : " + dwDataType);
                }
            }
        }


        public void createWindow() {
            wnd = new JWindow();
            Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
            screenSize.height /= 2;
            screenSize.width /= 2;
            wnd.setSize(screenSize);

            Dimension dim = Toolkit.getDefaultToolkit().getScreenSize();
            int w = wnd.getSize().width;
            int h = wnd.getSize().height;
            int x = (dim.width - w) / 2;
            int y = (dim.height - h) / 2;
```

```
            wnd.setLocation(x, y);
        }
}
```

2.12 Record Playback Transcoding

2.12.1 Introduction

Record playback transcoding refers to remotely playing videos from a specific time period on the client, searching for the needed videos, and transcoding them into the stream type that you need. The supported stream types include:

- GB program stream.
- Transport streams.
- MP4 format.
- H.264 and H.265.
- Program streams.
- RTP streams.

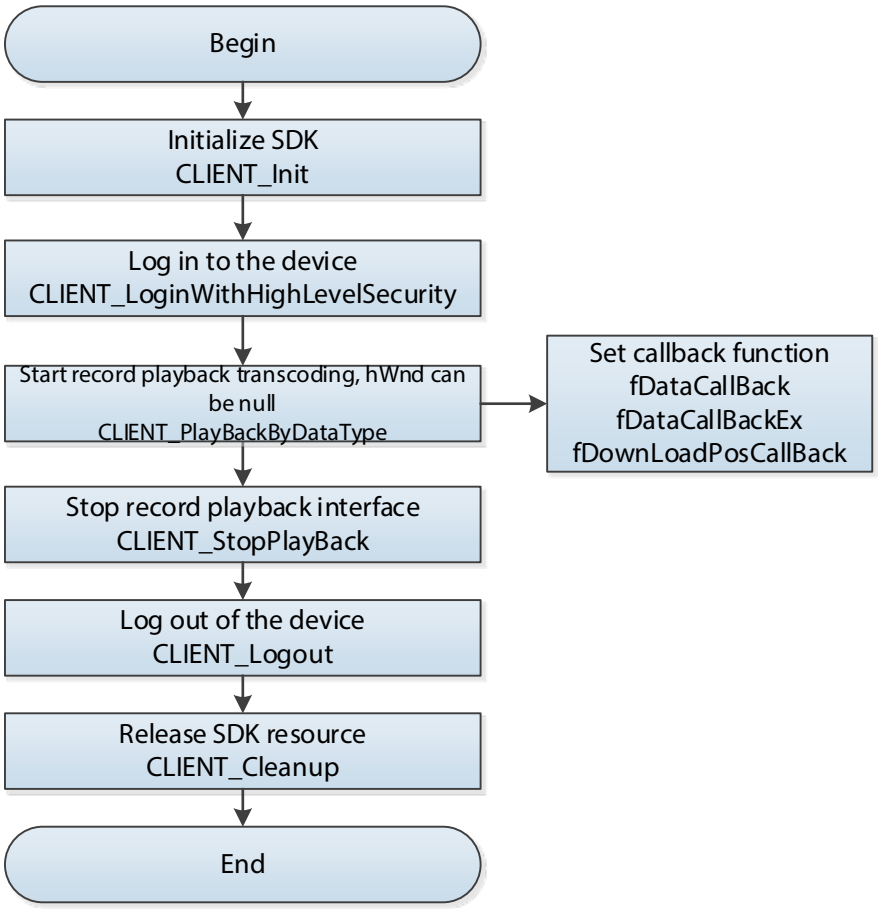
2.12.2 Interface Overview

Table 2-13 Interfaces of record playback transcoding

Interface	Implication
CLIENT_PlayBackByDataType	Start record playback transcoding interface.
CLIENT_StopPlayBack	Stop record playback transcoding interface.

2.12.3 Process

Figure 2-16 Process of record playback transcoding



Process Description

Step 1 Initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_PlayBackByDataType** to start downloading videos. The parameter hWnd can be set to null.

Step 4 Set the video playback data callback functions fDataCallBackEx and fDataCallBack, and the video playback process callback function fDownLoadPosCallBack to save the transcoded data.

Step 5 After using the record playback transcoding, call **CLIENT_StopPlayBack** to stop it.

Step 6 After using the service, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENT_Cleanup** to release SDK resources.

2.12.4 Example Code

```
import com.netsdk.lib.NetSDKLib;
import com.netsdk.lib.NetSDKLib.*;
```

```
import com.sun.jna.Native;
import com.sun.jna.Pointer;

import javax.swing.*;
import java.awt.*;
import java.util.Vector;

public class CommonWithCallBack { //Callback method.
    static NetSDKLib netsdkApi   = NetSDKLib.NETSDK_INSTANCE;
    LLong loginHandle;
    JWindow wnd;
    private static final int MAX_WINDOW_NUM = 4;
    Vector<JWindow> vecWnd;
    public CommonWithCallBack(LLong loginHandle)
    {
        this.loginHandle = loginHandle;
        createWindow();
    }


    public void PlayBackByDataType() {

        wnd.setVisible(true);

        NetSDKLib.NET_IN_PLAYBACK_BY_DATA_TYPE stIn = new
NetSDKLib.NET_IN_PLAYBACK_BY_DATA_TYPE();
        stIn.emDataType = EM_REAL_DATA_TYPE.EM_REAL_DATA_TYPE_GBPS;    //Private stream.
        stIn.nChannelID = 0;
        stIn.hWnd = Native.getComponentPointer(wnd);            //Playing window.
        stIn.stStartTime.setTime(2018, 5, 22, 13, 0, 0);     //The start time.
        stIn.stStopTime.setTime(2018, 5, 22, 14, 0, 0);      //The end time.
        stIn.nPlayDirection = 0;                                        //Forward playing.

        stIn.cbDownLoadPos = DownloadPosCB.getInstance();
        stIn.cbDownLoadPos = PlayBackPosCallBack.getInstance();
        stIn.dwPosUser = null;

        stIn.fDownLoadDataCallBack = PlayBackDataCallBack.getInstance();
        stIn.dwDataUser = null;

        NetSDKLib.NET_OUT_PLAYBACK_BY_DATA_TYPE stOut = new
NetSDKLib.NET_OUT_PLAYBACK_BY_DATA_TYPE();

        LLong lPlayHandle = netsdkApi.CLIENT_PlayBackByDataType(loginHandle, stIn, stOut,
5000);
        if(lPlayHandle.longValue() != 0) {
            System.out.println("PlayBackByDataType Succeed!");
```

```
            } else {
                System.err.printf("PlayBackByDataType Failed!Last Error[0x%x]\n",
netsdkApi.CLIENT_GetLastError());
                return;
            }

            try {
                Thread.sleep(10000);
            } catch (InterruptedException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }

            netsdkApi.CLIENT_StopPlayBack(lPlayHandle);      //Stop playback.
            wnd.setVisible(false);
        }


        //It is recommended to write the callback in single mode. When handling data in the callback,
perform it in a separate thread.
        //Playback process callback.
        public static class PlayBackPosCallBack implements NetSDKLib.fDownLoadPosCallBack {

            private PlayBackPosCallBack() {}

            private static class PlayBackPosCallBackHolder {
                private static final PlayBackPosCallBack posCB = new PlayBackPosCallBack();
            }

            public static final PlayBackPosCallBack getInstance() {
                return PlayBackPosCallBackHolder.posCB;
            }

            @Override
            public void invoke(LLong lPlayHandle, int dwTotalSize, int dwDownLoadSize, Pointer
dwUser) {

                  System.out.println("PlayBackPosCallBack dwTotalSize：  " + dwTotalSize + "
dwDownLoadSize：  " + dwDownLoadSize);
            }
        }

        //Playback data callback.
        public static class PlayBackDataCallBack implements NetSDKLib.fDataCallBack {

            private PlayBackDataCallBack() {}
```

```
        private static class PlayBackDataCallBackHolder {
            private static final PlayBackDataCallBack dataCB = new PlayBackDataCallBack();
        }

        public static final PlayBackDataCallBack getInstance() {
            return PlayBackDataCallBackHolder.dataCB;
        }

        @Override
        public int invoke(LLong lRealHandle, int dwDataType, Pointer pBuffer, int dwBufSize,
Pointer dwUser) {

            if (dwDataType == (NetSDKLib.NET_DATA_CALL_BACK_VALUE +
EM_REAL_DATA_TYPE.EM_REAL_DATA_TYPE_GBPS)) {
                System.out.println("PlayBack DataCallBack [ " + dwDataType +" ]");
            }
            return 0;
        }
    }

    //It is recommended to write the callback in single mode. When handling data in the callback,
perform it in a separate thread.
    //Download process callback.
    public static class DownloadPosCB implements NetSDKLib.fTimeDownLoadPosCallBack {

        private DownloadPosCB() {}

        private static class DownloadPosCallBackHolder {
            private static final DownloadPosCB posCB = new DownloadPosCB();
        }

        public static final DownloadPosCB getInstance() {
            return DownloadPosCB.DownloadPosCallBackHolder.posCB;
        }

        @Override
        public void invoke(LLong lPlayHandle, int dwTotalSize, int dwDownLoadSize, int index,
NetSDKLib.NET_RECORDFILE_INFO.ByValue recordfileinfo, Pointer dwUser) {

            System.out.println("DownloadPosCallBack dwTotalSize：  " + dwTotalSize + "
dwDownLoadSize：  " + dwDownLoadSize);
        }
    }

    public void createWindow() {
        wnd = new JWindow();
        Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
```

```
            screenSize.height /= 2;
            screenSize.width /= 2;
            wnd.setSize(screenSize);

            Dimension dim = Toolkit.getDefaultToolkit().getScreenSize();
            int w = wnd.getSize().width;
            int h = wnd.getSize().height;
            int x = (dim.width - w) / 2;
            int y = (dim.height - h) / 2;
            wnd.setLocation(x, y);
        }
}
```

2.13 Record Download Transcoding

2.13.1 Introduction

The record download function helps you obtain the records saved on the storage device through SDK and save into the local. It allows you to download records of different stream types from the selected channels and export to the local disk or external USB flash drive. The supported stream types include:

- GB program stream.
- Transport streams.
- MP4 format.
- H.264 and H.265.
- Program streams.
- RTP streams.

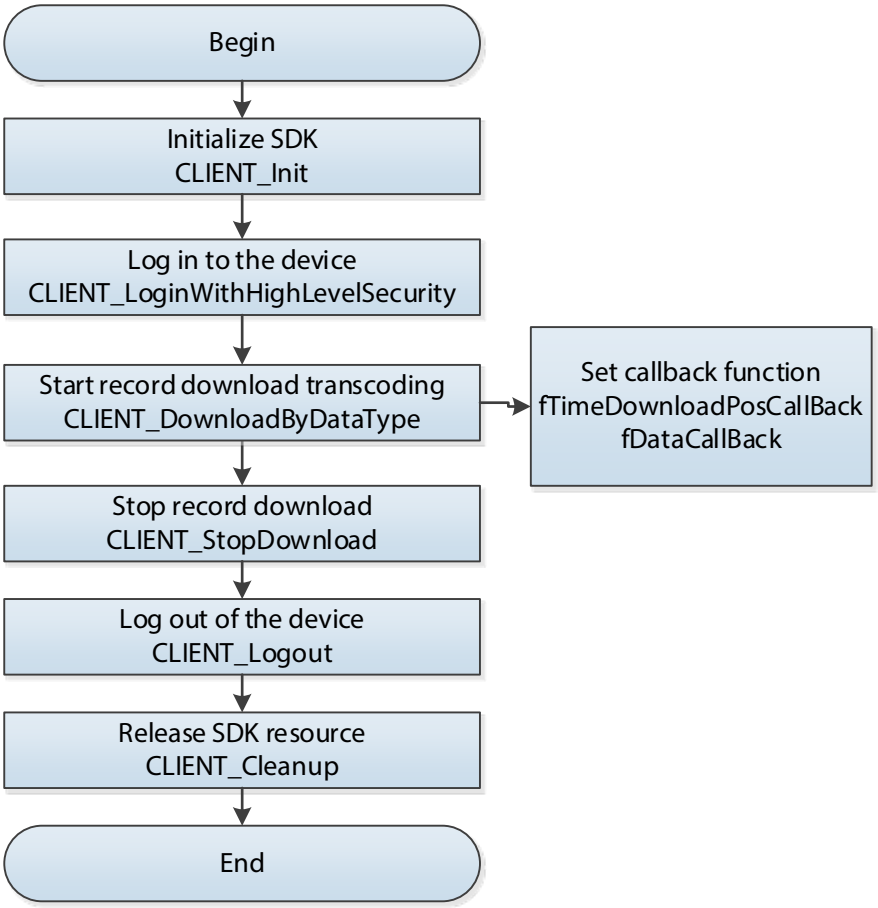
2.13.2 Interface Overview

Table 2-14 Interfaces of record download transcoding

Interface	Implication
CLIENT_DownloadByDataType	Start record download transcoding interface.
CLIENT_StopDownload	Stop record download transcoding interface.

2.13.3 Process

Figure 2-17 Process of record download transcoding



Process Description

Step 1 Initialize SDK.

Step 2 Call **CLIENT_LoginWithHighLevelSecurity** to log in to the device.

Step 3 Call **CLIENT_DownloadByDataType** to start record download transcoding. The parameter hWnd can be set as null.

Step 4 Set the video download process callback function fTimeDownloadPosCallBack, and the video download data callback function fDataCallBackEx to save the transcoded data.

Step 5 After using the record download transcoding, call **CLIENT_StopDownload** to stop it.

Step 6 After using the service, call **CLIENT_Logout** to log out of the device.

Step 7 After using all SDK functions, call **CLIENTCleanup** to release SDK resources.

2.13.4 Example Code

```
import com.netsdk.lib.NetSDKLib;
import com.netsdk.lib.NetSDKLib.*;
import com.sun.jna.Pointer;
```

```
        }
```

```
            }

            @Override
            public int invoke(LLong lRealHandle, int dwDataType, Pointer pBuffer, int dwBufSize,
Pointer dwUser) {
                if (dwDataType == (NetSDKLib.NET_DATA_CALL_BACK_VALUE +
EM_REAL_DATA_TYPE.EM_REAL_DATA_TYPE_GBPS)) {
                    System.out.println("DownLoad DataCallBack [ " + dwDataType +" ]");
                }
                return 0;
            }
        }

        public void createWindow() {
            wnd = new JWindow();
            Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
            screenSize.height /= 2;
            screenSize.width /= 2;
            wnd.setSize(screenSize);

            Dimension dim = Toolkit.getDefaultToolkit().getScreenSize();
            int w = wnd.getSize().width;
            int h = wnd.getSize().height;
            int x = (dim.width - w) / 2;
            int y = (dim.height - h) / 2;
            wnd.setLocation(x, y);
        }

}
```

3 Interface Definition

3.1 SDK Initialization

3.1.1 SDK CLIENT_Init

Table 3-1 Initialize SDK

Item	Description	
Name	Initialize SDK.	
Function	public boolean CLIENT_Init(Callback cbDisConnect, Pointer dwUser);	
Parameter	[in]cbDisConnect	Disconnection callback.
	[in]dwUser	User parameter of disconnection callback.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	• The precondition for calling other function modules. • If the callback is set as NULL, the callback will not be sent to the user after the device is disconnected.	

3.1.2 CLIENT_Cleanup

Table 3-2 Clean up SDK

Item	Description
Name	Clean up SDK.
Function	public void CLIENT_Cleanup();
Parameter	None.
Return value	None.
Note	Call the SDK cleanup interface before the process ends.

3.1.3 CLIENT_SetAutoReconnect

Table 3-3 Set reconnection callback

Item	Description	
Name	Set auto reconnection callback.	
Function	public void CLIENT_SetAutoReconnect(Callback cbAutoConnect, Pointer dwUser);	
Parameter	[in]cbAutoConnect	Reconnection callback.
	[in]dwUser	User parameter of disconnection callback.
Return value	None.	
Note	Set the reconnection callback interface. If the callback is set as NULL, it will not connect automatically.	

3.1.4 CLIENT_SetNetworkParam

Table 3-4 Set network parameter

Item	Description	
Name	Set the related parameters for network environment.	
Function	public void CLIENT_SetNetworkParam(NET_PARAM pNetParam);	
Parameter	[in]pNetParam	Parameters such as network delay, reconnection times, and buffer size.
Return value	None.	
Note	Adjust the parameters according to the actual network environment.	

3.2 Device Login

3.2.1 CLIENT_LoginWithHighLevelSecurity

Table 3-5 Log in

Item	Description	
Name	Log in to the device.	
Function	public LLong CLIENT_LoginWithHighLevelSecurity(NET_IN_LOGIN_WITH_HIGHLEVEL_SECURITY pstInParam, NET_OUT_LOGIN_WITH_HIGHLEVEL_SECURITY pstOutParam);	
Parameter	[in] pstInParam	Input parameter.
	[out] pstOutParam	Output parameter.
Return value	• Success: not 0. • Failure: 0.	
Note	This method is encapsulated in the NetSDKLib interface and is usually called by: m_hLoginHandle = netsdk.CLIENT_CLIENT_LoginWithHighLevelSecurity(pstInParam, pstOutParam);	

3.2.2 CLIENT_Logout

Table 3-6 Log out

Item	Description	
Name	User logout the device.	
Function	public boolean CLIENT_Logout(LLong lLoginID);	
Parameter	[in]lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	This method is encapsulated in the NetSDKLib interface and is usually called by: netsdk.CLIENT_Logout(m_hLoginHandle);	

3.3 Real-time Monitoring

3.3.1 CLIENT_RealPlayEx

Table 3-7 Start monitoring

Item	Description	
Name	Open the real-time monitoring.	
Function	public LLong CLIENT_RealPlayEx(LLong lLoginID, int nChannelID, Pointer hWnd, int rType);	
Parameter	[in]lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in]nChannelID	Video channel number is a round number starting from 0.
	[in]hWnd	Window handle valid only under Windows system.
	[in]rType	Live type.
Return value	• Success: not 0 • Failure: 0	
Note	Windows system: • When hWnd is valid, the corresponding window displays picture. • When hWnd is NULL, get the video data through setting a callback and send to user for handle.	

Table 3-8 Live type and meaning

Live type	Meaning
DH_RType_Realplay	Real-time live
DH_RType_Multiplay	Multi-picture live
DH_RType_Realplay_0	Real-time monitoring—main stream, equivalent to DH_RType_Realplay
DH_RType_Realplay_1	Real-time monitoring—sub stream 1
DH_RType_Realplay_2	Real-time monitoring—sub stream 2
DH_RType_Realplay_3	Real-time monitoring—sub stream 3
DH_RType_Multiplay_1	Multi-picture live—1 picture
DH_RType_Multiplay_4	Multi-picture live—4 pictures
DH_RType_Multiplay_8	Multi-picture live—8 pictures
DH_RType_Multiplay_9	Multi-picture live—9 pictures
DH_RType_Multiplay_16	Multi-picture live—16 pictures
DH_RType_Multiplay_6	Multi-picture live—6 pictures
DH_RType_Multiplay_12	Multi-picture live—12 pictures
DH_RType_Multiplay_25	Multi-picture live—25 pictures
DH_RType_Multiplay_36	Multi-picture live—36 pictures

3.3.2 CLIENT_StopRealPlayEx

Table 3-9 Stop monitoring

Item	Description
Name	Stop the real-time monitoring.

Item	Description	
Function	public boolean CLIENT_StopRealPlayEx(LLong lRealHandle);	
Parameter	[in]lRealHandle	Return value of CLIENT_RealPlayEx.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	None.	

3.3.3 CLIENT_SaveRealData

Table 3-10 Save monitoring data

Item	Description	
Name	Save the real-time monitoring data as file.	
Function	public boolean CLIENT_SaveRealData(LLong lRealHandle, String pchFileName);	
Parameter	[in] lRealHandle	Return value of CLIENT_RealPlayEx.
	[in] pchFileName	Save path.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	None.	

3.3.4 CLIENT_StopSaveRealData

Table 3-11 Stop saving monitoring data

Item	Description	
Name	Stop saving the real-time monitoring data as file.	
Function	public boolean CLIENT_StopSaveRealData(LLong lRealHandle);	
Parameter	[in] lRealHandle	Return value of CLIENT_RealPlayEx.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	None.	

3.3.5 CLIENT_SetRealDataCallBackEx

Table 3-12 Set the callback of real-time monitoring data

Item	Description	
Name	Set the callback of real-time monitoring data.	
Function	public boolean CLIENT_SetRealDataCallBackEx(LLong lRealHandle, StdCallCallback cbRealData, Pointer dwUser, int dwFlag);	
Parameter	[in] lRealHandle	Return value of CLIENT_RealPlayEx.
	[in] cbRealData	Callback of monitoring data flow.
	[in] dwUser	Parameter of callback for monitoring data flow.
	[in] dwFlag	Type of monitoring data in callback.
Return value	• Success: TRUE. • Failure: FALSE.	

Item	Description
Note	None.

Table 3-13 Type and meaning of dwFlag

dwFlag	Meaning
0x00000001	Initial data of device.
0x00000004	Data converted to YUV format.

3.4 Video Snapshot

3.4.1 CLIENT_SnapPictureToFile

Table 3-14 Synchronous snapshot

Item	Description	
Name	Synchronous snapshot.	
Function	public boolean CLIENT_SnapPictureToFile(LLong lLoginID, Pointer pInParam, Pointer pOutParam, int nWaitTime)	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] pInParam	Input parameter. Refer to NET_IN_SNAP_PIC_TO_FILE_PARAM.
	[in] pOutParam	Output parameter. Refer to NET_OUT_SNAP_PIC_TO_FILE_PARAM.
	[in] nWaitTime	Timeout. The unit is millisecond.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	• Synchronous interface. The device captures snapshot and sends to the user through internet. • This function is available for some select models.	

3.4.2 CLIENT_CapturePictureEx

Table 3-15 Asynchronous snapshot

Item	Description	
Name	Asynchronous snapshot.	
Function	public boolean CLIENT_SnapPictureEx(LLong lLoginID, SNAP_PARAMS stParam, IntByReference reserved);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] stParam	Snapshot parameters structure.
	[in] reserved	Picture format.
Return value	• Success: TRUE. • Failure: FALSE.	

Item	Description
Note	● Synchronous interface. Directly write the picture data as file. ● Capture the pictures from the real-time monitoring data stream from device.

3.4.3 CLIENT_CapturePictureEx

Table 3-16 Local snapshot

Item	Description	
Name	Local snapshot.	
Function	public boolean CLIENT_CapturePictureEx(LLong hPlayHandle, String pchPicFileName, int eFormat);	
Parameter	[in] hPlayHandle	Return value of CLIENT_RealPlayEx.
	[in] pchPicFileName	Save path.
	[in] eFormat	Picture format.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	● Synchronous interface. Directly write the picture data as file. ● Capture the pictures from the real-time monitoring data stream from device.	

3.4.4 Setting Asynchronous Snapshot Callback

Table 3-17 Set asynchronous snapshot callback

Item	Description	
Name	Callback of asynchronous snapshot.	
Function	public void CLIENT_SetSnapRevCallBack(Callback OnSnapRevMessage, Pointer dwUser);	
Parameter	[out] OnSnapRevMessage	Function prototype of snapshot callback.
	[out] dwUser	User parameters of callback.
Return value	None.	
Note	None.	

3.5 PTZ Control

3.5.1 CLIENT_DHPTZControlEx

Table 3-18 Control PTZ

Item	Description
Name	PTZ control.

Item	Description	
Function	public boolean CLIENT_DHPTZControlEx(LLong lLoginID, int nChannelID, int dwPTZCommand, int lParam1, int lParam2, int lParam3, int dwStop);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] nChannelID	Video channel number that is a round number starting from 0.
	[in] dwPTZCommand	Control command type.
	[in] lParam1	Parameter 1.
	[in] lParam2	Parameter 2.
	[in] lParam3	Parameter 3.
	[in] dwStop	Stop mark, which is valid for operations of eight directions. When performing other operations, enter **FALSE** for this parameter.

Item	Description	
	[in] param4	Support the following extension command: NET_EXTPTZ_MOVE_ABSOLUTELY NET _EXTPTZ_MOVE_CONTINUOUSLY NET _EXTPTZ_GOTOPRESET NET _EXTPTZ_SET_VIEW_RANGE NET _EXTPTZ_FOCUS_ABSOLUTELY NET _EXTPTZ_HORSECTORSCAN NET _EXTPTZ_VERSECTORSCAN NET _EXTPTZ_SET_FISHEYE_EPTZ NET _EXTPTZ_AUXIOPEN NET _EXTPTZ_AUXICLOSE NET _EXTPTZ_SET_TRACK_START NET _EXTPTZ_SET_TRACK_STOP NET_EXTPTZ_INTELLI_TRACKMOVE NET_EXTPTZ_SET_FOCUS_REGION NET_EXTPTZ_INTELLI_SETLENSWISDOMSTATE NET_EXTPTZ_INTELLI_SETFOCUSAREA NET_EXTPTZ_SINGLEDIRECTIONCALIBRATION NET_EXTPTZ_MOVE_RELATIVELY NET_EXTPTZ_SET_DIRECTION NET_EXTPTZ_BASE_MOVE_ABSOLUTELY NET_EXTPTZ_BASE_MOVE_CONTINUOUSLY NET_EXTPTZ_BASE_SET_FOCUS_MAP_VALUE NET_EXTPTZ_BASE_MOVE_ABSOLUTELY_ONLYPT NET_EXTPTZ_BASE_MOVE_ABSOLUTELY_ONLYZOOM NET_EXTPTZ_STOP_MOVE NET_EXTPTZ_START NET_EXTPTZ_STOP NET_EXTPTZ_START_PATTERN_RECORD NET_EXTPTZ_STOP_PATTERN_RECORD NET_EXTPTZ_START_PATTERN_REPLAY NET_EXTPTZ_STOP_PATTERN_REPLAY NET_EXTPTZ_MOVE_DIRECTLY
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	For the relationship between dwPTZCommand and Param1, Param2 and Param3, see Table 3-19.	

Table 3-19 Relationship between command and parameters

dwPTZCommand macro definition	Function	param1	param2	param3
DH_PTZ_UP_CONTROL	Up	None	Vertical speed (1–8)	None
DH_PTZ_DOWN_CONTROL	Down	None	Vertical speed (1–8)	None

dwPTZCommand macro definition	Function	param1	param2	param3
DH_PTZ_LEFT_CONTROL	Left	None	Horizontal speed (1–8)	None
DH_PTZ_RIGHT_CONTROL	Right	None	Horizontal speed (1–8)	None
DH_PTZ_ZOOM_ADD_CONTROL	Zoom+	None	Multi-speed	None
DH_PTZ_ZOOM_DEC_CONTROL	Zoom-	None	Multi-speed	None
DH_PTZ_FOCUS_ADD_CONTROL	Focus+	None	Multi-speed	None
DH_PTZ_FOCUS_DEC_CONTROL	Focus-	None	Multi-speed	None
DH_PTZ_APERTURE_ADD_CONTROL	Aperture+	None	Multi-speed	None
DH_PTZ_APERTURE_DEC_CONTROL	Aperture-	None	Multi-speed	None
DH_PTZ_POINT_MOVE_CONTROL	Move to preset point	None	Value of preset point	None
DH_PTZ_POINT_SET_CONTROL	Set	None	Value of preset point	None
DH_PTZ_POINT_DEL_CONTROL	Delete	None	Value of preset point	None
DH_PTZ_POINT_LOOP_CONTROL	Cruise among points	Cruise route	None	76: Start 99: Automatic 96: Stop
DH_PTZ_LAMP_CONTROL	Lamp wiper	0x01: Start x00: Stop	None	None
DH_EXTPTZ_LEFTTOP	Left top	Vertical speed (1–8)	Horizontal speed (1–8)	None
DH_EXTPTZ_RIGHTTOP	Right top	Vertical speed (1–8)	Horizontal speed (1–8)	None
DH_EXTPTZ_LEFTDOWN	Left bottom	Vertical speed (1–8)	Horizontal speed (1–8)	None
DH_EXTPTZ_RIGHTDOWN	Right bottom	Vertical speed (1–8)	Horizontal speed (1–8)	None
DH_EXTPTZ_ADDTOLOOP	Add preset point to tour	Tour route	Value of preset point	None
DH_EXTPTZ_DELFROMLOOP	Delete preset point in cruise	Cruise route	Value of preset point	None
DH_EXTPTZ_CLOSELOOP	Delete cruise	Cruise route	None	None
DH_EXTPTZ_STARTPANCRUISE	Start horizontal rotation	None	None	None

dwPTZCommand macro definition	Function	param1	param2	param3
DH_EXTPTZ_STOPPANCRUISE	Stop horizontal rotation	None	None	None
DH_EXTPTZ_SETLEFTBORDER	Set left border	None	None	None
DH_EXTPTZ_RIGHTBORDER	Set right border	None	None	None
DH_EXTPTZ_STARTLINESCAN	Start line scan	None	None	None
DH_EXTPTZ_CLOSELINESCAN	Stop line scan	None	None	None
DH_EXTPTZ_SETMODESTART	Set mode start	Mode route	None	None
DH_EXTPTZ_SETMODESTOP	Set mode stop	Mode route	None	None
DH_EXTPTZ_RUNMODE	Running mode	Mode route	None	None
DH_EXTPTZ_STOPMODE	Stop mode	Mode route	None	None
DH_EXTPTZ_DELETEMODE	Delete mode	Mode route	None	None
DH_EXTPTZ_REVERSECOMM	Reverse command	None	None	None
DH_EXTPTZ_FASTGOTO	Fast positioning	Horizontal coordinate (0–8192)	Vertical coordinate (0–8192)	Zoom (4)
DH_EXTPTZ_AUXIOPEN	Open auxiliary switch	Auxiliary point	None	None
DH_EXTPTZ_AUXICLOSE	Close auxiliary switch	Auxiliary point	None	None
DH_EXTPTZ_OPENMENU	Open SD menu	None	None	None
DH_EXTPTZ_CLOSEMENU	Close menu	None	None	None
DH_EXTPTZ_MENUOK	Menu confirm	None	None	None
DH_EXTPTZ_MENUCANCEL	Menu cancel	None	None	None
DH_EXTPTZ_MENUUP	Menu up	None	None	None
DH_EXTPTZ_MENUDOWN	Menu down	None	None	None
DH_EXTPTZ_MENULEFT	Menu left	None	None	None
DH_EXTPTZ_MENURIGHT	Menu right	None	None	None

dwPTZCommand macro definition	Function	param1	param2	param3
DH_EXTPTZ_ALARMHANDLE	Alarm action with PTZ	Alarm input channel	Alarm action type: ● Preset point ● Line scan ● Cruise	Linkage value, such as preset point number
DH_EXTPTZ_MATRIXSWITCH	Matrix switch	Monitor device number (video output number)	Video input number	Matrix number
DH_EXTPTZ_LIGHTCONTROL	Light controller	Refer to DH_PTZ_LAMP_CONTROL	None	None
DH_EXTPTZ_EXACTGOTO	3D positioning	Horizontal angle (0–3600)	Vertical coordinate (0–900)	Zoom (1–128)
DH_EXTPTZ_RESETZERO	Reset to zero	None	None	None
DH_EXTPTZ_UP_TELE	Up +TELE	Speed (1–8)	None	None
DH_EXTPTZ_DOWN_TELE	Down +TELE	Speed (1–8)	None	None
DH_EXTPTZ_LEFT_TELE	Left +TELE	Speed (1–8)	None	None
DH_EXTPTZ_RIGHT_TELE	Right+TELE	Speed (1–8)	None	None
DH_EXTPTZ_LEFTUP_TELE	Leftup +TELE	Speed (1–8)	None	None
DH_EXTPTZ_LEFTDOWN_TELE	Leftdown +TELE	Speed (1–8)	None	None
DH_EXTPTZ_TIGHTUP_TELE	Rightup+TELE	Speed (1–8)	None	None
DH_EXTPTZ_RIGHTDOWN_TELE	Rightdown +TELE	Speed (1–8)	None	None
DH_EXTPTZ_UP_WIDE	Up +WIDE	Speed (1–8)	None	None
DH_EXTPTZ_DOWN_WIDE	Down+WIDE	Speed (1–8)	None	None
DH_EXTPTZ_LEFT_WIDE	Left +WIDE	Speed (1–8)	None	None
DH_EXTPTZ_RIGHT_WIDE	Right+WIDE	Speed (1–8)	None	None
DH_EXTPTZ_LEFTUP_WIDE	Leftup+WIDE	Speed (1–8)	None	None
DH_EXTPTZ_LEFTDOWN_WIDE	Leftdown+WIDE	Speed (1–8)	None	None
DH_EXTPTZ_RIGHTUP_WIDE	Rightup +WIDE	Speed (1–8)	None	None

dwPTZCommand macro definition	Function	param1	param2	param3
DH_EXTPTZ_RIGHTDOWN_WIDE	Rightdown +WIDE	Speed (1–8)	None	None

3.6 Voice Talk

3.6.1 CLIENT_StartTalkEx

Table 3-20 Start voice talk

Item	Description	
Name	Start voice talk.	
Function	public LLong CLIENT_StartTalkEx(LLong lLoginID, Callback pfcb, Pointer dwUser);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] pfcb	Audio data callback.
	[in] dwUser	Parameter of audio data callback.
Return value	• Success: Not 0. • Failure: 0.	
Note	None.	

3.6.2 CLIENT_StopTalkEx

Table 3-21 Stop voice talk

Item	Description	
Name	Stop voice talk.	
Function	public boolean CLIENT_StopTalkEx(LLong lTalkHandle);	
Parameter	[in] lTalkHandle	Return value of CLIENT_StartTalkEx.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	None.	

3.6.3 CLIENT_TalkSendData

Table 3-22 Send voice talk data

Item	Description	
Name	Send audio data to device.	
Function	public LLong CLIENT_TalkSendData(LLong lTalkHandle, Pointer pSendBuf, int dwBufSize);	
Parameter	[in] lTalkHandle	Return value of CLIENT_StartTalkEx.
	[in] pSendBuf	Pointer of audio data block that needs to be sent.

Item	Description	
	[in] dwBufSize	Length of audio data black that needs to be sent. The unit is byte.
Return value	● Success: Length of audio data block. ● Failure: -1.	
Note	None.	

3.6.4 CLIENT_AudioDecEx

Table 3-23 Decode audio data

Item	Description	
Name	Decode audio data.	
Function	public boolean CLIENT_AudioDecEx(LLong lTalkHandle, Pointer pAudioDataBuf, int dwBufSize);	
Parameter	[in] lTalkHandle	Return value of CLIENT_StartTalkEx.
	[in] pAudioDataBuf	Pointer of audio data block that needs decoding.
	[in] dwBufSize	Length of audio data black that needs decoding. The unit is byte.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	None.	

3.7 Alarm Listening

3.7.1 CLIENT_StartListenEx

Table 3-24 Start alarm listening

Item	Description	
Name	Start alarm listening.	
Function	public boolean CLIENT_StartListenEx(LLong lLoginID);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
Return value	● Success: Not 0. ● Failure: 0.	
Note	None.	

3.7.2 CLIENT_StopListen

Table 3-25 Stop alarm listening

Item	Description
Name	Stop alarm listening.
Function	public boolean CLIENT_StopListen(

Item	Description	
	LLong lLoginID);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	None.	

3.7.3 CLIENT_SetDVRMessCallBack

Table 3-26 Set alarm listening

Item	Description	
Name	Set alarm listening.	
Function	public void CLIENT_SetDVRMessCallBack(Callback cbMessage , Pointer dwUser);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] dwUser	Returned user information.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	None.	

3.8 Intelligent Event

3.8.1 CLIENT_RealLoadPictureEx

Table 3-27 Start subscribing intelligent event

Item	Description	
Name	Start subscribing intelligent event.	
Function	public LLong CLIENT_RealLoadPictureEx(LLong lLoginID, int nChannelID, int dwAlarmType, int bNeedPicFile, StdCallCallback cbAnalyzerData, Pointer dwUser, Pointer Reserved);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] nChannelID	Device channel number, starting from 0.
	[in] dwAlarmType	Type of subscribed alarm event.
	[in] bNeedPicFile	Subscribe to image file or not?
	[in] cbAnalyzerData	Callback of intelligent event.
	[in] dwUser	Type of customized data.
	[in] Reserved	Reserved handle.
Return value	● Success: Subscription handle of LLONG type. ● Failure: FALSE.	
Note	Get error code by CLIENT_GetLastError when the interface fails to return.	

Table 3-28 Intelligent event

dwAlarmType macro definition	Value of macro definition	Meaning	Corresponding structure of pAlarmInfo
EVENT_IVS_ALL	0x00000001	All event	None
EVENT_IVS_CROSSFENCEDETECTION	0x0000011F	Cross fence	DEV_EVENT_CROSSFENCEDETECTION_INFO
EVENT_IVS_CROSSLINEDETECTION	0x00000002	Tripwire	DEV_EVENT_CROSSLINE_INFO
EVENT_IVS_CROSSREGIONDETECTION	0x00000003	Intrusion	DEV_EVENT_CROSSREGION_INFO
EVENT_IVS_LEFTDETECTION	0x00000005	Abandoned Object	DEV_EVENT_LEFT_INFO
EVENT_IVS_PRESERVATION	0x00000008	Object Protection	DEV_EVENT_PRESERVATION_INFO
EVENT_IVS_TAKENAWAYDETECTION	0x00000115	Missing object	DEV_EVENT_TAKENAWAYDETECTION_INFO
EVENT_IVS_WANDERDETECTION	0x00000007	Loitering	DEV_EVENT_WANDER_INFO
EVENT_IVS_VIDEOABNORMALDETECTION	0x00000013	Video error	DEV_EVENT_VIDEOABNORMALDETECTION_INFO
EVENT_IVS_AUDIO_ABNORMALDETECTION	0x00000126	Audio error	DEV_EVENT_IVS_AUDIO_ABNORMALDETECTION_INFO
EVENT_IVS_CLIMBDETECTION	0x00000128	Sticker detection	DEV_EVENT_IVS_CLIMB_INFO
EVENT_IVS_FIGHTDETECTION	0x0000000E	Fighting detection	DEV_EVENT_FLOWSTAT_INFO
EVENT_IVS_LEAVEDETECTION	0x00000129	AWOL detection	DEV_EVENT_IVS_LEAVE_INFO
EVENT_IVS_PSRISEDETECTION	0x0000011E	Stand detection	DEV_EVENT_PSRISEDETECTION_INFO
EVENT_IVS_PASTEDETECTION	0x00000004	Sticker detection	DEV_EVENT_PASTE_INFO

3.8.2 CLIENT_StopLoadPic

Table 3-29 Stop subscribing intelligent event

Item	Description	
Name	Stop subscribing intelligent event.	
Function	public boolean CLIENT_StopLoadPic(LLong lAnalyzerHandle);	
Parameter	[in] lAnalyzerHandle	Subscription handle of intelligent event.
Return value	BOOL type: ● Success: TRUE. ● Failure: FALSE.	
Note	Get error code by CLIENT_GetLastError when the interface fails to return.	

3.9 Record Playback

3.9.1 CLIENT_PlayBackByTimeEx

Table 3-30 Playback by time

Item	Description	
Name	Playback by time.	
Function	public LLong CLIENT_PlayBackByTimeEx(LLong lLoginID, int nChannelID, NET_TIME lpStartTime, NET_TIME lpStopTime, Pointer hWnd, Callback cbDownLoadPos, Pointer dwPosUser, Callback fDownLoadDataCallBack, Pointer dwDataUser);	
Parameter	[in] lLoginID	Login handle.
	[in] nChannelID	Device channel number, starting from 0.
	[in] lpStartTime	Start time.
	[in] lpStopTime	Stop time.
	[in] hWnd	Window handle (valid only in Windows system).
	[in] cbDownLoadPos	Callback of fDownLoadPosCallBack.
	[out] dwPosUser	None.
	[out] fDownLoadDataCallBack	Callback of fDataCallBack.
	[in] dwDataUser	None.
Return value	● Success: Network playback ID. ● Failure: 0.	
Note	None.	

3.9.2 CLIENT_SetDeviceMode

Table 3-31 Set the work mode

Item	Description	
Name	Set the work mode.	
Function	public boolean CLIENT_SetDeviceMode(LLong lLoginID, int emType, Pointer pValue);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] emType	Work mode enumeration.
	[in] pValue	The corresponding structure of work mode.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	None.	

The following table shows information about work mode enumeration and structure.

Table 3-32 Work mode enumeration and structure

emType enumeration	Meaning	Structure
DH_RECORD_STREAM_TYPE	Set the stream type of recorded videos to be queried or played back	None

emType enumeration	Meaning	Structure
	by time. ● 0: Main and sub stream ● 1: Main stream ● 2: Sub stream	
DH_RECORD_TYPE	Set the record file type to play back and download by time.	NET_RECORD_TYPE

3.9.3 CLIENT_StopPlayBack

Table 3-33 Stop record playback

Item	Description	
Name	Stop video playback.	
Function	public boolean CLIENT_StopPlayBack(LLong lPlayHandle);	
Parameter	[in] 1PlayHandle	Return value of playback interface.
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	None.	

3.9.4 CLIENT_PausePlayBack

Table 3-34 Pause or resume record playback

Item	Description	
Name	Pause or resume playback.	
Function	public boolean CLIENT_PausePlayBack(LLong lPlayHandle, int bPause);	
Parameter	[in] lPlayHandle	Return value of playback interface.
	[out] bPause	Parameters for network playback stops and resumes: 1: Pause 0: Resume
Return value	● Success: TRUE. ● Failure: FALSE.	
Note	Pause or resume the ongoing playback.	

3.10 Record Download

3.10.1 CLIENT_QueryRecordFile

Table 3-35 Query for all record files within a period

Item	Description
Name	Query for all record files within a period.

Item	Description	
Function	public boolean CLIENT_QueryRecordFile(LLong lLoginID, int nChannelId, int nRecordFileType, NET_TIME tmStart, NET_TIME tmEnd, String pchCardid, NET_RECORDFILE_INFO[] stFileInfo, int maxlen, IntByReference filecount, int waittime, boolean bTime);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] nChannelId	Device channel number, starting from 0.
	[in] nRecordFileType	Record file type.
	[in] tmStart	Record start time.
	[in] tmEnd	Record end time.
	[in] pchCardid	Card ID.
	[out] nriFileinfo	The returned record file is a LPNET_RECORDFILE_INFO structured data.
	[in] maxlen	The maximum length of nriFileinfo buffer, whose unit is byte and recommended to be between "(100~200) *sizeof(NET_RECORDFILE_INFO)".
	[out] filecount	Check the number of returned files only in the cache.
	[in] waittime	Waiting time.
	[in] bTime	Currently invalid.
Return value	• Success: TRUE. • Failure: FALSE.	
Note	Before playback, call this interface to query for the records. When the queried records within the defined time are larger than the cache size, it will only return the records that can be stored by cache. Continue with the query if needed.	

The following table shows information about record file and card ID.

Table 3-36 Record file and card ID

Value	Record file type	Card ID
0	All recorded videos	NULL
1	External alarm	NULL
2	Alarm by motion detection	NULL
3	All the alarms	NULL
4	Card ID query	Card ID
5	Combined condition query	Card ID && Transaction type && Transaction amount (If you want to skip a field, set as blank)
6	Record location and deviation length	NULL
8	Image query by card ID (Only supported by select models of HB-U and NVS)	Card ID
9	Image query (Only supported by select models of HB-U and NVS)	NULL
10	Query by field	FELD1&&FELD2&&FELD3&& (If you want to skip a field, set as blank)

3.10.2 CLIENT_DownloadByTimeEx

Table 3-37 Download record by file

Item	Description	
Name	Download record by time.	
Function	public LLong CLIENT_DownloadByTimeEx(LLong lLoginID, int nChannelId, int nRecordFileType, NET_TIME tmStart, NET_TIME tmEnd, String sSavedFileName, StdCallCallback cbTimeDownLoadPos, Pointer dwUserData, StdCallCallback fDownLoadDataCallBack, Pointer dwDataUser, Pointer pReserved);	
Parameter	[in] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[in] nChannelId	The device channel number starting from 0.
	[in] nRecordFileType	Query type of file. 0: All recorded videos. 1: External alarm. 2: Records of motion detection. 3: All alarms. 4: Recorded video query by card ID. 5: Combined condition query. 8: Image query by card ID. 9: Image query. 10: Query by field.
	[in] tmStart	Start time of download.
	[in] tmEnd	End time of download.
	[in] sSavedFileName	The record file name and full save path.
	[in]cbTimeDownLoadPos	Download progress callback.
	[in] dwUserData	Download progress callback customized data.
	[in] fDownLoadDataCallBack	Data callback.
	[in] dwUserData	Download data callback customized data.
	[in] pReserved	Parameter reserved and the default is NULL.
Return value	● Success: Download ID. ● Failure: 0.	
Note	● For callback declaration of fDownLoadPosCallBack and fDataCallBack, refer to section 4 Callback Definition for details. ● sSavedFileName is not blank, and the record data is input into the file corresponding with the path. ● fDownLoadDataCallBack is not blank, and the record data is returned through callback.	

3.10.3 CLIENT_StopDownload

Table 3-38 Stop record download

Item	Description	
Name	Stop record download.	
Function	public boolean CLIENT_StopDownload(LLong lFileHandle);	
Parameter	[in] lFileHandle	Return value of CLIENT_DownloadByTimeEx.
Return value	• Success: ID of download. • Failure: 0.	
Note	Stop downloading after it is completed or partially completed according to particular situation.	

4 Callback Definition

4.1 fDisConnect

Table 4-1 Disconnection callback

Item	Description	
Name	Disconnection callback.	

Function	public interface fDisConnect extends StdCallCallback {
	public void invoke(
	LLong lLoginID,
	String pchDVRIP, int nDVRPort,
	Pointer dwUser);
	}	

Parameter	[out] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[out] pchDVRIP	IP of the disconnected device.
	[out] nDVRPort	Port of the disconnected device.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.2 fHaveReConnect

Table 4-2 Reconnection callback

Item	Description	
Name	Reconnection callback.	

Function	public interface fHaveReConnect extends StdCallCallback {
	public void invoke(
	LLong lLoginID,
	String pchDVRIP, int nDVRPort,
	Pointer dwUser);
	}	

Parameter	[out] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[out] pchDVRIP	IP of the reconnected device.
	[out] nDVRPort	Port of the reconnected device.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.3 fRealDataCallBackEx

Table 4-3 Callback of real-time monitoring data

Item	Description	
Name	Callback of real-time monitoring data.	

Function	public interface fRealDataCallBackEx extends StdCallCallback {
	public void invoke(
	LLong lRealHandle,
	int dwDataType, Pointer pBuffer, int dwBufSize,
	int param, Pointer dwUser);
	}	

Parameter	[out] lRealHandle	Return value of CLIENT_RealPlayEx.
	[out] dwDataType	Data type: ● 0: Initial data. ● 2: YUV data.
	[out] pBuffer	Address of monitoring data block.
	[out] dwBufSize	Length of the monitoring data block. The unit is byte.
	[out] param	Callback parameter structure. Different dwDataType value corresponds to different type. ● The param is blank pointer when dwDataType is 0. ● The param is the pointer of tagCBYUVDataParam structure when dwDataType is 2.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.4 pfAudioDataCallBack

Table 4-4 Audio data callback

Item	Description	
Name	Audio data callback of voice talk.	

Function	public interface pfAudioDataCallBack extends StdCallCallback {
	public void invoke(
	LLong lTalkHandle,
	Pointer pDataBuf, int dwBufSize,
	byte byAudioFlag, Pointer dwUser);
	}	

Parameter	[out] lTalkHandle	Return value of CLIENT_StartTalkEx.
	[out] pDataBuf	Address of audio data block.
	[out] dwBufSize	Length of the audio data block. The unit is byte.
	[out] byAudioFlag	Data type: 0: Local collecting. 1: Sending from device.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.5 fAnalyzerDataCallBack

Table 4-5 Callback of intelligent event

Item	Description	
Name	Callback of intelligent event.	

Function	public interface fAnalyzerDataCallBack extends StdCallCallback {
	public int invoke(
	LLong lAnalyzerHandle, int dwAlarmType,
	Pointer pAlarmInfo, Pointer pBuffer, int dwBufSize,
	Pointer dwUser, int nSequence, Pointer reserved);
	}	

Parameter	[out] lAnalyzerHandle	Return value of CLIENT_RealLoadPictureEx.
	[out] dwAlarmType	Intelligent event type.
	[out] pAlarmInfo	Event information buffer.
	[out] pBuffer	Image buffer.
	[out] dwBufSize	Image buffer size.
	[out] dwUser	User data.
	[out] nSequence	Information about the uploaded picture. 0 means the first occurrence, 2 means the last occurrence or only one occurrence, and 1 means there are still appearances after this time.
	[out] reserved	Reserved.
Return value	None.	
Note	None.	

4.6 fTimeDownLoadPosCallBack

Table 4-6 Callback of download by time

Item	Description	
Name	Callback of download by time.	

Function	public interface fTimeDownLoadPosCallBack extends StdCallCallback {
	public void invoke(
	LLong lPlayHandle,
	int dwTotalSize, int dwDownLoadSize,
	int index, NET_RECORDFILE_INFO.ByValue recordfileinfo,
	Pointer dwUser);
	}	

Parameter	[out]lPlayHandle	Return value of CLIENT_DownloadByTimeEx.
	[out] dwTotalSize	Total size of playback. The unit is KB.
	[out]dwDownLoadSize	The size that has been played. The unit is KB. ● -1: Current download finished. ● -2: Write file failed.
	[out] index	Index.
	[out] recordfileinfo	Record file information.
	[out] dwUser	User data.

Item	Description
Return value	None.

4.7 fMessCallBack

Table 4-7 Alarm subscription callback

Item	Description	
Name	Callback of real-time monitoring data.	

Function	public interface fMessCallBack extends StdCallCallback{
	public boolean invoke(
	int lCommand , LLong lLoginID ,
	Pointer pStuEvent , int dwBufLen ,
	String strDeviceIP , NativeLong nDevicePort ,
	Pointer dwUser);
	}	

Parameter	[out] lCommand	Concrete alarm event.
	[out] lLoginID	Return value of CLIENT_LoginWithHighLevelSecurity.
	[out] pStuEvent	Returned data pointer.
	[out] dwBufLen	Length of the returned pointer.
	[out] strDeviceIP	Returned IP.
	[out] nDevicePort	Returned port number.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.8 Asynchronous Snapshot

Table 4-8 Callback of asynchronous snapshot.

Item	Description	
Name	Callback of asynchronous snapshot.	

Function	public interface fSnapRev extends Callback{
	public void invoke(
	LLong lLoginID ,
	Pointer pBuf, int RevLen, int EncodeType,
	int CmdSerial, Pointer dwUser);
	}	

Parameter	[out] lLoginID	Return value of CLIENT_LoginWithHighLevelSerity.
	[out] pBuf	Address of asynchronous snapshot.
	[out] RevLen	Length of asynchronous snapshot.
	[out] EncodeType	Encoding type.
	[out] CmdSerial	Operation serial number.
	[out] dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.9 Real-time Monitoring Transcoding Data Callback Function

Table 4-9 Callback of real-time monitoring transcoding data.

Item	Description	
Name	Extension 2 of the prototype for the live view transcoding data callback function.	

Function	public interface fRealDataCallBackEx extends SDKCallback{
	public void invoke(LLong lRealHandle,
	int dwDataType,
	Pointer pBuffer,
	int dwBufSize,
	int param,
	Pointer dwUser);
	}	

Parameter	[out]lRealHandle,	Return value of CLIENT_RealPlayByDataType.
	[out]dwDataType	0: Raw data. 1: Frame data. 2: YUV data. 3: PCM audio data.
	[out]pBuffer	Byte data.
	[out]dwBufSize	Byte length.

	[out]param	When the type is 0 (raw data) and 2 (YUV data), it is set to 0. When the callback data type is 1, the param is a structure pointer of tagVideoFrameParam. When the data type is 3, the parameter is also a structure pointer of tagCBPCMDataParam.
	[out]dwUser	User parameter of the callback.
Return value	None.	
Note	None.	

4.10 Playback Process Callback Function

Table 4-10 Callback of playback process.

Item	Description	
Name	Playback process callback function.	

Function	public interface fDownLoadPosCallBack extends SDKCallback {
	public void invoke(
	LLong lPlayHandle,
	int dwTotalSize,
	int dwDownLoadSize,
	Pointer dwUser);
	}	

Parameter	[out]lPlayHandle	Return value of CLIENT_PlayBackByDataType.
	[out]dwTotalSize	Total size (KB).
	[out]dwDownLoadSize	Played video size (KB). -1: Playback ends. -2: Failed to write the file.
	[out]dwUser	User parameter of the callback.
Return value	None.	
Note	During video playback, a callback function is used for playback process. We recommend you not call NetSDK interface under this callback function. However, if the callback function within the demo calls NetSDK interface, you can handle it similarly.	

4.11 Playback Data Callback Function

Table 4-11 Callback of playback data.

Item	Description
Name	Playback data callback function.

Function	public interface fDataCallBack extends SDKCallback {
	public void invoke(
	LLong lPlayHandle,
	int dwDataType,
	Pointer pBuffer,
	int dwBufSize,
	Pointer dwUser);
	}	

Parameter	[out]lPlayHandle	Return value of CLIENT_PlayBackByDataType.
	[out]dwDataType	Use with EM_REAL_DATA_TYPE. The value of the parameter dwDataType in the data callback functions fRealDataCallBackEx and fDataCallBack for the transcoded streams.
	[out]pBuffer	Byte data.
	[out]dwBufSize	Byte length.
	[out]dwUser	User parameter of the callback.
Return value	None.	
Note	During video playback, a callback function is used for playback process. We recommend you not call NetSDK interface under this callback function. However, if the callback function within the demo calls NetSDK interface, you can handle it similarly.	

Appendix 1 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations on how to create a more secured security system.

Mandatory actions to be taken for basic device network security:

1. **Use Strong Passwords**

   Please refer to the following suggestions to set passwords:

   - The length should not be less than 8 characters;
   - Include at least two types of characters; character types include upper and lower case letters, numbers and symbols;
   - Do not contain the account name or the account name in reverse order;
   - Do not use continuous characters, such as 123, abc, etc.;
   - Do not use overlapped characters, such as 111, aaa, etc.;

2. **Update Firmware and Client Software in Time**

   - According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the "auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
   - We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. **Physical Protection**

   We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. **Change Passwords Regularly**

   We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. **Set and Update Passwords Reset Information Timely**

   The device supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. **Enable Account Lock**

   The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. **Change Default HTTP and Other Service Ports**

   We suggest you to change default HTTP and other service ports into any set of numbers between 1024~65535, reducing the risk of outsiders being able to guess which ports you are using.

6. **Enable HTTPS**

   We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

7. **MAC Address Binding**

   We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing the risk of ARP spoofing.

8. **Assign Accounts and Privileges Reasonably**

   According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

9. **Disable Unnecessary Services and Choose Secure Modes**

   If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

   If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

   - SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
   - SMTP: Choose TLS to access mailbox server.
   - FTP: Choose SFTP, and set up strong passwords.
   - AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

10. **Audio and Video Encrypted Transmission**

    If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

    Reminder: encrypted transmission will cause some loss in transmission efficiency.

11. **Secure Auditing**

    - Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
    - Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

12. **Network Log**

    Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

13. **Construct a Safe Network Environment**

    In order to better ensure the safety of device and reduce potential cyber risks, we recommend:

    - Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
    - The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.
    - Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
    - Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.