

```
except OSError:
    break
if v and vt == winreg.REG_SZ and os.path.isdir(vc_dir):
    try:
        version = int(float(v))
    except (ValueError, TypeError):
        continue
    if version >= 14 and version > best_version:
        best_version, best_dir = version, vc_dir
return best_version, best_dir

def _find_vc2017():
    """Returns "15, path" based on the result of invoking 'vcvarsall.bat'
    if no install is found, returns "None, None"
    """
    try:
        path = subprocess.check_output(
            os.path.join(root, "Microsoft Visual Studio", "VC", "vcvarsall.bat"),
            shell=True,
            cwd=root,
            env=dict(os.environ, "PATH", os.path.join(root, "Microsoft Visual Studio", "Common7", "Tools", "bin", "x86_x64"),
            encoding="mbcs", errors="strict").strip()
    except (subprocess.CalledProcessError, UnicodeDecodeError):
        return None, None

    path = os.path.join(path, "VC", "Auxiliary", "Build")
    if os.path.isdir(path):
        return 15, path

    return None, None

PLAT_SPEC_TO_RUNTIME = {
    'x86' : 'x86',
    'x86_amd64' : 'x64',
    'x86_arm' : 'arm',
    'x86_arm64' : 'arm64'
}

def _find_vcvarsall(plat_spec):
    # bpo-38597: Removed vcruntime return value
    _, best_dir = _find_vc2017()

    if not best_dir:
        best_version, best_dir = _find_vc2015()
```

# Reference Manual

## MOBOTIX MOVE NVR RTSP API V3.0.1

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Beyond Human Vision

MOBOTIX MOVE

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## RTSP API

RTSP (Real Time Streaming Protocol) is a network protocol designed for controlling the streaming video server. This document specifies the RTSP-based application programming interface of the NVR. The RTSP server in NVR only supports Unicast Mode. There are two available options for unicast mode: RTP+RTSP (UDP mode) and RTP/RTSP (TCP mode).

# RTSP URI

## The RTSP URI of NVR

```
rtsp://<username>:<password>@<server_name>/live?ch=%d&stype=<D/M>
```

```
rtsp://<username>:<password>@<server_
name>/playback?ch=%d&stype=<D/M>&pbkey=%s
```

### Parameters:

**<username>/<password >:** the user name/password with remote privilege of the NVR

**<server name>:** host name or the IP address of the server

**<ch%d>:** channel number, 4 digits

**<D/M>:** D means dual stream; M means main stream

**< pbkey>:** playback authority key

(get by [http://{server ip}/datasearch/gen\\_pbkey?group\\_id=%d& start\\_time=%d](http://{server ip}/datasearch/gen_pbkey?group_id=%d& start_time=%d))

### Example:

**Syntax:** connect to CH1 Live Dual Stream

```
rtsp://admin:123456@192.168.6.52/live?ch=0000&stype=D
```

**Syntax:** connect to CH2 Live Main Stream

```
rtsp://admin:123456@192.168.6.52/ live?ch=0002&stype=M
```

**Syntax:** connect to CH3 Playback Main Stream

```
rtsp://admin:123456@192.168.6.52/playback?ch=0002&stype=M&
pbkey=H584SGF4UYR3W...
```

**Syntax:** connect to CH4 Playback Dual Stream

```
rtsp://admin:123456@192.168.6.52/playback?ch=0004&stype=D&pbkey=
H589SGF4UYR6W...
```

**NOTE!** While using the playback function, please setup the time and get the playback authority key.



## RTSP Commands

The RTSP API provides several commands for streaming control. The RTSP commands such as DESCRIBE, OPTION, SETUP, PLAY, GET\_PARAMETERS and TEARDOWN will be supported by the NVR.

## Request Syntax

### Syntax:

```
COMMAND RTSP_URI RTSP/1.0 <CRLF>
Headerfield1: val1<CRLF> Headerfield2: val2<CRLF>
...
<CRLF>
```

As RTSP Request, COMMAND would be DESCRIBE, OPTION, SETUP, PLAY or TEARDOWN. RTSP requests always contain the RTSP URI.

The following header fields are accepted by all commands. Some commands would require additional header fields.

Header Field	Description
CSeq	Request Sequence Number
Session	Session identifier (by SETUP response)
Content-Length	Length of content

---

## Response Syntax

### Syntax:

```
RTSP/1.0 <Response Code> <Result String> <CRLF> Headerfield1:
val3<CRLF>
Headerfield2: val4<CRLF>
...
<CRLF>
```

The response would include a response and string indicating the success/failure of the request. The following header fields can be generated for all responses by the RTSP server.

Header Field	Description
CSeq	Request Sequence Number (matches the sequence number of the request)
Session	Session identifier

---



# RTSP DESCRIBE

The DESCRIBE command is used to request an SDP description for the URI.

The DESCRIBE request command needs additional header fields:

Header Field	Description
Accept	List of content types that client supports (application/sdp is the only supported type)

The response to the DESCRIBE commands needs additional header fields:

Header Field	Description
Content-Type	Type of content
Content-Length	Length of SDP description
Content-Base	If relative URLs are used in the SDP description, then this is the base URL.

## Example:

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

### Request without Digest Authorization:

```
DESCRIBE rtsp://192.168.xxx.xxx:554/CH00D RTSP/1.0
CSeq: 3
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)
Accept: application/sdp
```

### Response: (Reject Connection)

```
RTSP/1.0 401 Unauthorized
CSeq: 3
Date: Sat, 31 May 2014 19:25:31 GMT
WWW-Authenticate: Digest realm="RTSP Server",
nonce="b6178554c731808e378559283e5483fc"
```

### Request with Digest Authorization:

```
DESCRIBE rtsp://192.168.xxx.xxx:554/CH00D RTSP/1.0
CSeq: 4
Authorization: Digest username="admin", realm="RTSP Server",
```

```
nonce="b6178554c731808e378559283e5483fc",  
uri="rtsp://192.168.xxx.xxx:554/CH00D",  
response="e0ff72846d2179b1e3e7ed983bb6ed75"  
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)  
Accept: application/sdp
```

**Response:** (Accept Connection)

```
RTSP/1.0 200 OK  
CSeq: 4  
Date: Sat, 31 May 2014 19:25:31 GMT  
Content-Base: rtsp://192.168.xxx.xxx:554/CH00D/ Content-Type:  
application/sdp  
Content-Length: 358 v=0  
o=- 1271956268066958 0 IN IP4 0.0.0.0  
s=Session streamed by "NVRMediaServer" i=CH00D  
t=0 0  
a=tool:NVR Streaming Media a=type:broadcast a=control:*  
a=range:npt=0- m=video 0 RTP/AVP 99  
c=IN IP4 0.0.0.0  
a=rtpmap:99 H264/90000 a=fmtp:99 packetization-mode=1  
a=control:track1 a=cliprect:0,0,576,720  
a=framerate:25.000000  
a=x-bufferdelay:0
```

## RTSP OPTIONS

The OPTIONS command will return a list of supported RTSP commands. The command could be used to keep RTSP sessions alive by repeating the OPTIONS request at regular intervals. The timeout parameter is specified by the response returned from the SETUP command

The response to OPTIONS request command needs additional header fields:

Header Field	Description
Public	Specify the supported RTSP commands

---

## Example

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

### Request:

```
OPTIONS rtsp://192.168.xxx.xxx:554/CH00D RTSP/1.0
CSeq: 2
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)
```

### Response:

```
RTSP/1.0 200 OK
CSeq: 2
Date: Sat, 31 May 2014 19:14:58 GMT
Public: OPTIONS, DESCRIBE, SETUP, TEARDOWN, PLAY, GET_PARAMETER
```

## RTSP SETUP

The SETUP command configures the delivery method for the data.

The SETUP request command needs additional header fields as follows:

Header Field	Description
Transport	Specifies how the data stream is transported. Supported variants: RTP/AVP;unicast;client_port=port1-port2 RTP/AVP;multicast;client_port=port1-port2 RTP/AVP;unicast

The response of SETUP request will return a session identifier that could be used with stream control commands to the server (PLAY, TEARDOWN). If the Session header includes a timeout parameter, then the session needs to be kept alive. This can be done by sending RTSP requests to the server containing the session identifier (e.g. OPTIONS) before timeout or apply RTCP. The RTSP server does not support reconfiguration of the transport parameters.

## Example

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

### Request:

```
SETUP rtsp://192.168.6.202:554/CH00D/track1 RTSP/1.0
CSeq: 5
Authorization: Digest username="admin", realm="RTSP Server",
nonce="b6178554c731808e378559283e5483fc",
uri="rtsp://192.168.xxx.xxx:554/CH00D/",
response="e1f0a099d2edefca7d031d48b57eea8f"
```

#### Response:

```
RTSP/1.0 200 OK
CSeq: 5
Cache-Control: no-cache
Date: Sat, 31 May 2014 19:25:31 GMT
Transport: RTP/AVP/UDP;unicast;client_port=48646-48647;server_
port=17808-17809
Session: 538A2CBB
```

## RTSP PLAY

The PLAY command starts the data delivery to the client.

The PLAY command generates the following additional header fields:

Header Field	Description
Range	Specifies the range of time being played. Since only live streams are used, the specified time will always begin now and have no stop time.
RTP-Info	Information about the RTP stream, including the sequence number of the first packet of the stream.

## Example

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

#### Request:

```
PLAY rtsp://192.168.xxx.xxx:554/CH00D/ RTSP/1.0 CSeq: 6
```

```
Authorization: Digest username="admin", realm="RTSP Server",
nonce="b6178554c731808e378559283e5483fc",
uri="rtsp://192.168.xxx.xxx:554/CH00D/",
response="5377a23295c1f87e020210d725c72db0"
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)
Session: 538A2CBB
Range: npt=0.000-
```

**Response:**

```
RTSP/1.0 200 OK
CSeq: 6
Date: Sat, 31 May 2014 19:25:31 GMT
Range: npt=0.000- Session: 538A2CBB
RTP-Info:
url=rtsp://192.168.xxx.xxx:554/CH00D/track1;seq=11452;rtptime=14015
64347
```

## RTSP GET\_PARAMETER

The GET\_PARAMETER request retrieves the value of a parameter from ofa presentation or stream specified in the URI. The content of the reply and response is left to the implementation.

GET\_PARAMETER with no entity body may be used to test client or server aliveness which is similar to Ping function.

### Example

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

**Request:**

```
GET_PARAMETER rtsp://192.168.xxx.xxx:554/CH00D/ RTSP/1.0 CSeq: 6
Authorization: Digest username="admin", realm="RTSP Server",
nonce="b6178554c731808e378559283e5483fc",
uri="rtsp://192.168.xxx.xxx:554/CH00D/",
response="5377a23295c1f87e020210d725c72db0"
```

```
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)
Session: 538A2CBB
```

#### Response:

```
RTSP/1.0 200 OK
CSeq: 6
Date: Sat, 31 May 2014 19:25:31 GMT
Range: npt=0.000- Session: 538A2CBB
RTP-Info:
url=rtsp://192.168.xxx.xxx:554/CH00D/track1;seq=11452;rtptime=140156
4347
```

## RTSP TEARDOWN

The TEARDOWN command terminates the data delivery from the server.

### Example

(User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13))

#### Request:

```
TEARDOWN rtsp://192.168.xxx.xxx:554/CH00D/ RTSP/1.0 CSeq: 8
Authorization: Digest username="admin", realm="RTSP Server",
nonce="00cbdb905f55ceeda5ee47e93fdf37e8",
uri="rtsp://192.168.xxx.xxx:554/CH00D/",
response="c73c95c721bafd1fb524a0ffa2be975b"
User-Agent: LibVLC/2.1.4 (LIVE555 Streaming Media v2014.01.13)
Session: 538A3C4A
```

#### Response:

```
RTSP/1.0 200 OK
CSeq: 8
```

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