

RTSP Specification

DOCUMENT HISTORY

Version	Date	Supported Firmware	Release Notes
1.00	2007-May-14	V3.0.0.0	Initial version
1.01	2007-Dec-28	V3.0.2.1691	Support Mega-pixel streaming
1.02	2008-Mar-04	V3.0.2.1829	Corrected errors in examples
1.03	2008-May-20	V5.0.0.0	F/W version 5.0 which supports H.264 streaming
1.04	2008-Sep-26	V5.0.0.2565	New RTSP URL format

1 OVERVIEW

This document specifies the external RTSP-based application programming interface of the Videosec cameras with firmware version 3.00 and above.

1.1 Product and firmware versions

The support for the RTSP API is product and firmware dependent. Please refer to the Release Notes for the actual product for compliance information.

2 REFERENCES

- RTSP protocol
 - Real Time Streaming Protocol - RFC 2326
- SDP protocol
 - Session Description Protocol - RFC 2327
- HTTP protocol
 - Hypertext Transfer Protocol -- HTTP/1.0
- External application programming interfaces (Client side)
 - Videosec Video HTTP API
 - Videosec Video RTSP API
 - Videosec Video Parameter specification

3 RTSP API

New RTSP URL format has following type:

```
rtsp://<servername>/media/media.amp  
[?<parameter>=<value>[&<parameter>=<value>...]]
```

The following parameters are supported for H.264, MPEG-4 Part 2 and MJPEG streams.

Parameter	Valid values	Description
videocodec	h264, mpeg4, jpeg	The selected video codec. Default: Product dependent; in order of priority: h264, mpeg4, jpeg
resolution	1280x1024, 1280x960,1280x720, 768x576,4CIF, 704x576,704x480, VGA,640x480, 640x360,2CIFEXP, 2CIF,704x288, 704x240,480x360, CIF,384x288, 352x288,352x240, 320x240, 240x180, QCIF,192x144, 176x144,176x120, 160x120	Specify the resolution of the returned image.
audio	0, 1	Specify whether audio shall be available in the stream. 0=no audio, 1=audio Default: 1

Old RTSP URL format has following type:

1.3GPP

```
rtsp://<server name>/mpeg4/media.3gp
```

2.MJPEG

```
rtsp://<server name>/mjpg/video.mjpg?resolution=<width>x<height>  
width and height accord with platform
```

```
rtsp://<server name>/mjpg/1/video.mjpg?resolution=<width>x<height>  
width and height accord with platform spec
```

3.MPEG4

```
rtsp://<server name>/mpeg4/media.amp  
default  
  
rtsp://<server name>/mpeg4/media.amp?resolution=<width>x<height>  
width and height accord with platform  
  
rtsp://<server name>/mpeg4/1/media.amp  
default  
  
rtsp://<server name>/mpeg4/1/media.amp?resolution=<width>x<height>  
width and height accord with platform
```

4.H264

```
rtsp://<server name>/h264/media.amp?resolution=<width>x<height>  
width and height accord with platform  
  
rtsp://<server name>/h264/1/media.amp?resolution=<width>x<height>  
width and height accord with platform
```

where <server name> is the host name or IP address of the server.

<width> is stream width.

<height> is stream height.

The DESCRIBE, SETUP, OPTIONS, PLAY, PAUSE and TEARDOWN methods are supported. The RTSP protocol is described in RFC 2326.

Request syntax:

```
COMMAND URI RTSP/1.0<CRLF>
```

```
Headerfield1: val1<CRLF>
```

```
Headerfield2: val2<CRLF>
```

```
...
```

<CRLF>

Response syntax:

```
RTSP/1.0 ResultCode ResultString<CRLF>

Headerfield3: val3<CRLF>

Headerfield4: val4<CRLF>

...

<CRLF>
```

The following header fields are accepted by all commands. Other header fields are silently ignored (unless stated otherwise in the sections below).

Field	Description
Authorization	Authorization information from the client.
CSeq	Request sequence number.
Session	Session identifier (returned by server in SETUP response).
Content-Length	Length of content.

The following header fields can be generated for all responses by the RTSP server:

Field	Description
CSeq	Response sequence number (matches the sequence number of the request).
Session	Session identifier.
WWW-Authenticate	Authentication from client requested.

3.1 RTSP DESCRIBE

- The DESCRIBE command returns the SDP (RFC 2327) description for the URI.
- The DESCRIBE command accepts the following additional header fields:

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

	supported type).
--	------------------

The DESCRIBE command generates the following additional header fields:

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

Example:

```
DESCRIBE /mpeg4/1/media.amp RTSP/1.0

CSeq: 1

Accept: application/sdp

Authorization: Basic cm9vdDpwYXNz
```

Response example:

```
RTSP/1.0 200 OK

CSeq: 1

Content-Base: rtsp://x.y.z.w:554/mpeg4/quad/media.amp

Content-Type: application/sdp

Content-Length: 680


v=0

o=- 1109162014219182 1109162014219192 IN IP4 x.y.z.w

s=Media Presentation


e=NONE
```

```

c=IN IP4 0.0.0.0

b=AS:8000

t=0 0

a=control:*

a=range:npt=now-

a=mpeg4-iod:
"data:application/mpeg4-iod;base64,AoDUAE8BAf/1AQOAbwABQFBkYXRhOmFwcG
xpY2

F0aW9uL21wZWc0LW9kLWF1O2Jhc2U2NCxBUjBCR3dVZkF4Y0F5U1FBW1FRTk1CRUVrK0F
BZWJhJQUFIb1NBQV1C

QkE9PQQNAQUABAAAAAAAAAAAAAYJAQAAAAAAAAAAzoAAkA2ZGF0YTphcHBsaWNhdGlvb
i9tcGVnNC1iaWZzLW

F1O2Jhc2U2NCx3QkFTWVFTSVVfVUZQd0E9BBICDQAAAgAAAAAAAAABQMAAEAGCQEAAAA
AAAAAA=="

m=video 0 RTP/AVP 96

b=AS:8000

a=control:trackID=1

a=rtpmap:96 MP4V-ES/90000

a=fmtp:96 profile-level-id=245;
config=000001B0F5000001B509000001000000012008D495880325

0B042414440F;

a=mpeg4-esid:201

```

3.2 RTSP OPTIONS

The OPTIONS command returns a list of supported RTSP commands.

Example:

```
OPTIONS * RTSP/1.0
```

```
CSeq: 2
```

Response example:

```
RTSP/1.0 200 OK
```

```
CSeq: 2
```

```
Public: DESCRIBE, PAUSE, PLAY, SETUP, TEARDOWN
```

3.3 RTSP SETUP

The SETUP command configures the delivery method for the data. The SETUP command requires and generates the following additional header field:

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/TCP;unicast

The response returns a session identifier that should be used with stream control commands to the server (PLAY, PAUSE, 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) within the specified timeout time or through the use of RTCP. The RTSP server does not support reconfiguring of the transport parameters.

Example:

```
SETUP /mpeg4/1/media.amp/trackID=1 RTSP/1.0
```

```
CSeq: 3
```

```
Transport: RTP/AVP;unicast;client_port=20000-20001
```

Response example:

```
RTSP/1.0 200 OK
```

```
CSeq: 3
```

```
Session: 1442774578;timeout=60
```

```
Transport:
```

```
RTP/AVP;unicast;mode=play;server_port=49000-49001;client_port=20000-20001
```

3.4 RTSP PLAY

The PLAY command starts (or restarts if paused) the data delivery to the client. The PLAY command generates the following additional header fields:

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. More specifically, it includes the next RTP sequence number that will be used.

Example:

```
PLAY /mpeg4/1/media.amp RTSP/1.0
```

```
CSeq: 4
```

```
Session: 1442774578
```

Response example:

```
RTSP/1.0 200 OK
```

```
CSeq: 4
```

```
Session: 1442774578
```

```
Range: npt=now-
```

```
RTP-Info: url=trackID=1;seq=2735
```


3.5 RTSP PAUSE

The PAUSE command pauses the data delivery from the server.

Example:

```
PAUSE /mpeg4/1/media.amp RTSP/1.0  
  
CSeq: 5  
  
Session: 1442774578
```

Response example:

```
RTSP/1.0 200 OK  
  
CSeq: 5  
  
Session: 1442774578
```

3.6 RTSP TEARDOWN

The TEARDOWN command terminates the data delivery from the server.

Example:

```
TEARDOWN /mpeg4/1/media.amp RTSP/1.0  
  
CSeq: 6  
  
Session: 1442774578
```

Response example:

```
RTSP/1.0 200 OK  
  
CSeq: 6  
  
Session: 1442774578
```

3.7 RTSP over HTTP

It is possible to tunnel RTSP through HTTP to get through firewalls etc. This is achieved by setting up two sessions, one GET (for command replies and stream data) and one POST (for commands). RTSP commands sent on the POST connection are base64 encoded, but replies on the GET connection are plain text. To bind the two sessions together the server needs a unique ID (conveyed in the x-sessioncookie header). The GET and POST request are accepted both on the HTTP port (default 80) and the RTSP server port (default 554). The RTSP/HTTP URL is: http://<server name>/mpeg4/1/media.amp. Supported methods are GET and POST.

GET example:

```
GET /mpeg4/1/media.amp HTTP/1.0  
  
x-sessioncookie: 944345808
```

Response example:

```
HTTP/1.0 200 OK  
  
Content-Type: application/x-rtsp-tunnelled
```

Note that the returned Content-Length is an arbitrary number and does not indicate the size of any data.

POST example:

```
POST /mpeg4/1/media.amp HTTP/1.0  
  
x-sessioncookie: 944345808  
  
Content-Length: 32767  
  
Content-Type: application/x-rtsp-tunnelled
```

Note that the x-sessioncookie present in the POST content is the same as the x-sessioncookie in the corresponding GET request. Also note that the POST request must be sent on a separate connection to the server (i.e. it cannot be sent on the same connection as the GET request). No response is sent for the POST request.

Command example (base 64 encoded PLAY on the POST connection):

UExBWSAvbXB1ZzQvMS9tZWRpYS5hbXAgu1RTUC8xLjANCkNTZXE6IDQNC1N1
c3Npb246IDEzNjk5MTc3MTINCgOK

Which corresponds to this command:

PLAY /mpeg4/1/media.amp RTSP/1.0

CSeq: 4

Session: 1369917712

Command response (plain-text on the GET connection):

RTSP/1.0 200 OK

CSeq: 4

Session: 1369917712