RTSP / RTP

RTSP traffic analysis when capturing a stream from the IP camera

We use the 'rtsp' filter to see RTSP traffic between WCS and the IP camera.

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ſ	ilter: rtsp			Y Expr	ession Clear Apply Save
lo.	Time	Source	Destination	Protocol L	ength Info
	33 13.35966	188.40.69.75	.211.205.45	RTSP	191 OPTIONS rtsp://dlink2103.noip.me/live1.sdp RTSP/1.0
	35 13.45271	.7 .211.205.45	188.40.69.75	RTSP	218 Reply: RTSP/1.0 200 OK
	37 13.45338	188.40.69.75	.211.205.45	RTSP	217 DESCRIBE rtsp://dlink2103.noip.me/live1.sdp RTSP/1.0
	38 13.54620	.211.205.45	188.40.69.75	RTSP	227 Reply: RTSP/1.0 401 Unauthorized
	39 13.54832	188.40.69.75	. 211. 205. 45	RTSP	416 DESCRIBE rtsp://dlink2103.noip.me/live1.sdp RTSP/1.0
	40 13.64306	.211.205.45	188.40.69.75	RTSP/SE	869 Reply: RT5P/1.0 200 OK
	41 13.66957	9 188.40.69.75	.211.205.45	RTSP	242 SETUP rtsp://dlink2103.noip.me/live1.sdp/track2 RTSP/1
	42 13.76527	1 .211.205.45	188.40.69.75	RTSP	269 Reply: RT5P/1.0 200 OK
	43 13.76614	0 188.40.69.75	.211.205.45	RTSP	261 SETUP rtsp://dlink2103.noip.me/live1.sdp/track1 RTSP/1
	44 13.86209	.211.205.45	188.40.69.75	RTSP	269 Reply: RT5P/1.0 200 OK
	60 14.60629	1 188.40.69.75	.211.205.45	RTSP	226 PLAY rtsp://dlink2103.noip.me/live1.sdp RTSP/1.0
	120 17.39963	.211.205.45	188.40.69.75	RTSP	302 Reply: RTSP/1.0 200 ок

RTP traffic from the RTSP IP camera

After a connection is established via RTSP, usual RTP traffic starts coming from the IP camera.

			Wireshark: F	TP Streams				×	
Detected 2 RTP streams. Choose one for forward and reverse direction for analysis									
Payload	 Packets 	 Lost 	 Max Delta (ms) 	 Max Jitter (ms) 🕨	Mean Jitter (ms)	◆ Pb?	•	
RTPType-96	2085	0 (0,0%)	0,000000	0,000000		0,000000	Х		
g711U	62	0 (0,0%)	168,264000	17,190320		15,222839			
c								>	
Select a forward stream with left mouse button, and then Select a reverse stream with Ctrl + left mouse button									
Unselect	Find Reverse	Save As	Mark Packets	Prepare Filter	Copy	Analyze	Close		

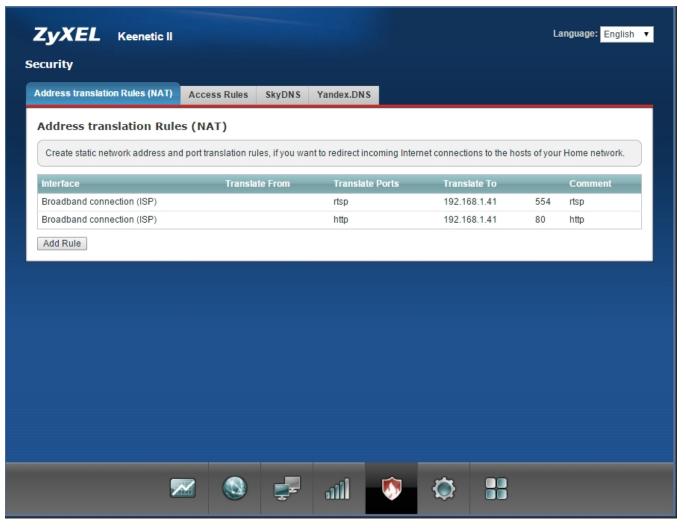
If we filter the same dump by UDP and follow the instructions from the SRTP traffic analysis section, we can find that there is SRTP traffic flowing from the WCS server to the browser. This being said, if you see video in your browser this means RTP traffic from the IP camera comes to the WCS server via the successfully established RTSP connection, and further converts to WebRTC / SRTP traffic to display in a browser.

Possible problems

If RTSP and RTP traffic will not flow between the WCS server and the IP camera, video from the camera will not be displayed in the browser. Most likely, you will see just the dark screen.

Troubleshooting

Typically, cameras are set behind NAT, so to connect to the IP camera via RTSP without hassle, you should ass two NAT rules on your router the IP camera is connected to. For example, on the Zyxel router these settings will look as follows:



Here, 192.168.1.41 is the IP address of the camera in the local network. The router says it will redirect RTSP queries sent to the corresponding ports to the IP camera.

Then, if you know your external IP address, if you query this address, for instance, rtsp://9.9.9.9:554 you will end up in the RTSP port of your camera. If something goes wrong, contact your intervye provider. If you have dynamic IP address, you can use the dynamic DNS service. Then, you will be able to address using the host name, so IP address tracking is not necessary. Example: rtsp://myhost.noip.com:554.

If all traffic goes through, but video still does not play and logs contain many packet lost errors, check MTU. Some IP cameras send large enough UDP packets containing video that might be cut off by the MTU of the router. Use this command: ping -f -l 1460 8.8.8.8. Replace 8.8.8.8 with any external host that responds to pinging. If packets do not pass through, perform the same test with the router: ping -f -l 1460 192.168.1.1, where 192.168.1.1 is the address of the router. If packets do reach the router and do not reach the external host, this means the MTU of the router is not large enough. Use the router settings to increase its value to standard 1500. For example, for Zyxel you can set MTU in the console:

telnet 192.168.1.1

>show interface ISP >interface ISP ip mtu 1500 >system config-save

C4.	Telnet 192.168.1.1 –	×
(config)) show int	erface ISP	^
id: index: type: description: state: link: connected: mtu: tx-queue: address:	ULAN Broadband connection up up yes 1500 1000 255.255.255.240 yes Yes 700 public	
Core::Configurator	: done.	~

In this case 'ISP' is a network interface on the router the internet cable of the provider is connected to.

Finally, if after executing the command ping -f -l 1460 192.168.1.1 packets do not reach even the router, check the MTU value in your operating system. For instance, on Windows you can set MTU in the system registry.