

REDSCAN Event Code (R.E.C.) specifications

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Scope: REDSCAN mini series (RLS-2020I, RLS-2020S)

REDSCAN series (RLS-3060, RLS-3060L, RLS-3060SH)

1. Purpose of REDSCAN Event Code

When some object or error is detected, REDSCAN sends Event Code (R.E.C.) to VMS (Video Management Software). If the VMS supports generic events and the R.E.C. meets preset strings of the generic events, the VMS triggers preset action, PTZ control of cameras for example.

2. Data Structure of R.E.C.

R.E.C. is 26 bytes ASCII code and a null byte. It includes fixed sized 11 sections. Each section is stored in fixed position. When the section has nothing to do with current alarm, space (0x20) is stored.

Example:

R.E.C. when an object is detected in A1 area and master alarm is issued:

RLS126MOA1 _____

R.E.C. when preset time (default: 10 seconds) past after the object disappeared:

RLS126CL _____

Table of R.E.C. Sections

Section	Size (byte)	Codes	Descriptions
ID Number	6	RLS126	"RLS" and 3 bytes ID number of the REDSCAN. The ID number can be changed. Default 3 digits are representing the last group of the host IP address.
Master Alarm	2	MO CL	"MO" is master alarm which means some object is detected. "MO" is sent again if detected area is different from previous detected area. "CL" means that preset time (default: 10 seconds) past after master alarm was cleared.
The Latest Area	2	A1/A2/B1/B2 Or A11/A12/A21/A22/ B11/B12/B21/B22	The latest area where the object is detected. Possible Code of RLS-2020 series: A1/A2/B1/B2 Possible Code of RLS-3060 series: A1/A2/B1/B2 or A11/A12/A21/A22/B11/B12/B21/B22
Combination of Areas	2	AA/BB/BA/Ba/bA/ba/ EA/Ea/Eb/EB/AL	The code shows multiple areas where objects are detected. See the table below. (*1)

Multiple Areas	2	CC	"CC" means that objects are detected in multiple areas.
Disqualification	2	DQ dq	"DQ" means disqualification status. "dq" means that disqualification status is cleared.
Anti-rotation	2	AR ar	"AR" means that the unit is rotated. "ar" means that the rotation is recovered.
Anti-masking	2	AM am	"AM" means that the unit is masked. "am" means that the mask is recovered.
Internal Error	2	TR tr	"TR" means that internal error occurred. "tr" means that the error is recovered.
Soiling	2	SO so	"SO" means that laser window has dirt. "so" means that the dirt is removed.
Tamper or Device Monitoring	2	TA ta DM	"TA" means that the cover is opened, or the unit is removed from the wall. "ta" means that the trouble is recovered. If device monitoring is enabled, "DM" is stored in this section and sent repeatedly. "DM" is supported by RLS-2020 and RLS-3060 ver. 7.3.0 or later. (*2)

(*1) Possible Code of Multiple Areas:

RLS-3060 series and RLS-2020 series

Code	B2	B1	A1	A2
AA			detected	detected
BB	detected	detected		
BA	detected			detected
Ba	detected		detected	
bA		detected		detected
ba		detected	detected	

"a" means A1. "A" means A2. "b" means B1. "B" means B2.

RLS-2020 series Only

Code	B2	B1	A1	A2
EA	detected	detected	detected	
Ea	detected	detected		detected
Eb	detected		detected	detected
EB		detected	detected	detected
AL	detected	detected	detected	detected

"E" means "except".

Transmission interval for trouble event codes

"DQ", "AR", "AM", "TR", "SO", "TA" and "DM" are sent repeatedly during the trouble. The interval of sending them can be changed by "Transmission interval for Trouble code" in Fig.1.

(*2) Conditions of transmission for Device Monitoring code (DM)

"DM" code can be transmitted under the following conditions:

1. When in a state in which neither detected Object detection (alarm code, e.g. "MO" "A1"), Disqualification "DQ", Anti-rotation "AR", Anti-masking "AM", Internal Error "TR", Soiling "SO", Tamper "TA"
2. When in a state in detected Object detection and not detected Tamper. In this case, DM code is transmitted with Object detection (alarm codes, e.g. "MO" "A1"). Alarm code is transmitted immediately when the object is detected.

3. Protocol

Both of TCP and UDP are available simultaneously.

(1) TCP, UDP or TCP UDP and TCP

Destination IP address and port number can be changed.

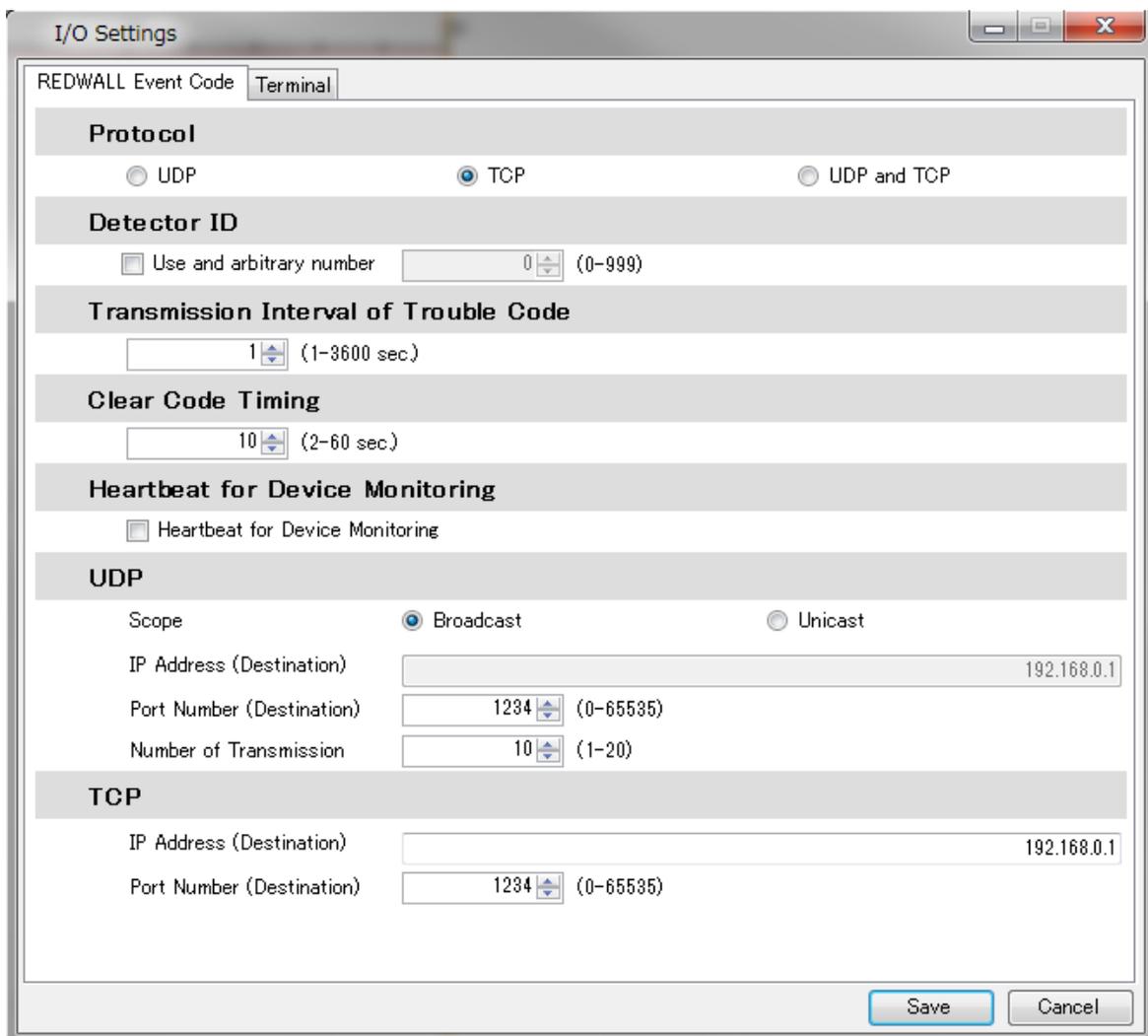


Fig.1 GUI of REDSCAN Manager Advanced

4. Sequence

(1) TCP

The image shows a Wireshark capture of a TCP sequence. The main pane displays a list of 16 packets. Packet 4 is highlighted in blue, indicating it is the selected packet. The packet list table is as follows:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.00000000	192.168.0.126	192.168.0.55	TCP	74	39569-1234 [SYN] Seq=0 win=14600 Len=
2	0.00027800	192.168.0.55	192.168.0.126	TCP	74	1234-39569 [SYN, ACK] Seq=0 Ack=1 win=
3	0.00066600	192.168.0.126	192.168.0.55	TCP	66	39569-1234 [ACK] Seq=1 Ack=1 win=1460
4	0.00089400	192.168.0.126	192.168.0.55	TCP	93	39569-1234 [PSH, ACK] Seq=1 Ack=1 win=
5	0.00108400	192.168.0.126	192.168.0.55	TCP	66	39569-1234 [FIN, ACK] Seq=28 Ack=1 wi
6	0.00116400	192.168.0.55	192.168.0.126	TCP	66	1234-39569 [ACK] Seq=1 Ack=29 win=665
7	0.04718100	192.168.0.55	192.168.0.126	TCP	66	1234-39569 [FIN, ACK] Seq=1 Ack=29 wi
8	0.04757800	192.168.0.126	192.168.0.55	TCP	66	39569-1234 [ACK] Seq=29 Ack=2 win=146
9	9.54933900	192.168.0.126	192.168.0.55	TCP	74	39570-1234 [SYN] Seq=0 win=14600 Len=
10	9.54961400	192.168.0.55	192.168.0.126	TCP	74	1234-39570 [SYN, ACK] Seq=0 Ack=1 win=
11	9.54999500	192.168.0.126	192.168.0.55	TCP	66	39570-1234 [ACK] Seq=1 Ack=1 win=1460
12	9.55022300	192.168.0.126	192.168.0.55	TCP	93	39570-1234 [PSH, ACK] Seq=1 Ack=1 win=
13	9.55040500	192.168.0.126	192.168.0.55	TCP	66	39570-1234 [FIN, ACK] Seq=28 Ack=1 wi
14	9.55048500	192.168.0.55	192.168.0.126	TCP	66	1234-39570 [ACK] Seq=1 Ack=29 win=665
15	9.59152900	192.168.0.55	192.168.0.126	TCP	66	1234-39570 [FIN, ACK] Seq=1 Ack=29 wi
16	9.59199700	192.168.0.126	192.168.0.55	TCP	66	39570-1234 [ACK] Seq=29 Ack=2 win=146

The packet details pane for Frame 4 shows the following structure:

- Frame 4: 93 bytes on wire (744 bits), 93 bytes captured (744 bits) on interface 0
- Ethernet II, Src: Optex_00:00:00 (00:1f:d1:00:00:00), Dst: Toshiba_e7:3e:10 (b8:6b:23:e7:3e:10)
- Internet Protocol Version 4, Src: 192.168.0.126 (192.168.0.126), Dst: 192.168.0.55 (192.168.0.55)
- Transmission Control Protocol, Src Port: 39569 (39569), Dst Port: 1234 (1234), Seq: 1, Ack: 1, Len: 27
- Data (27 bytes)

The data bytes are displayed in hexadecimal and ASCII:

```
0000 b8 6b 23 e7 3e 10 00 1f d1 00 00 00 08 00 45 00 .k#.>... ..E.
0010 00 4f ab 9e 40 00 40 06 0d 05 c0 a8 00 7e c0 a8 .o..@.@. ....~..
0020 00 37 9a 91 04 d2 2b 64 9a 06 eb 04 79 0c 80 18 .7....+d ....y...
0030 0e 42 40 6b 00 00 01 01 08 0a 00 1d 31 99 00 23 .B@k.... ..1..#
0040 41 f8 52 4c 53 33 34 35 4d 4f 41 31 20 20 20 20 A.RLS345 MOA1
0050 20 20 20 20 20 20 20 20 20 20 20 20 00
```

Fig.3 Sample of TCP Sequence (R.E.C.Sample-TCP-MOandCL.pcapng)

When some alarm detected, REDSCAN connects to the destination (No.1-3), sends R.E.C. (No.4), and disconnects the TCP (No.5-8).

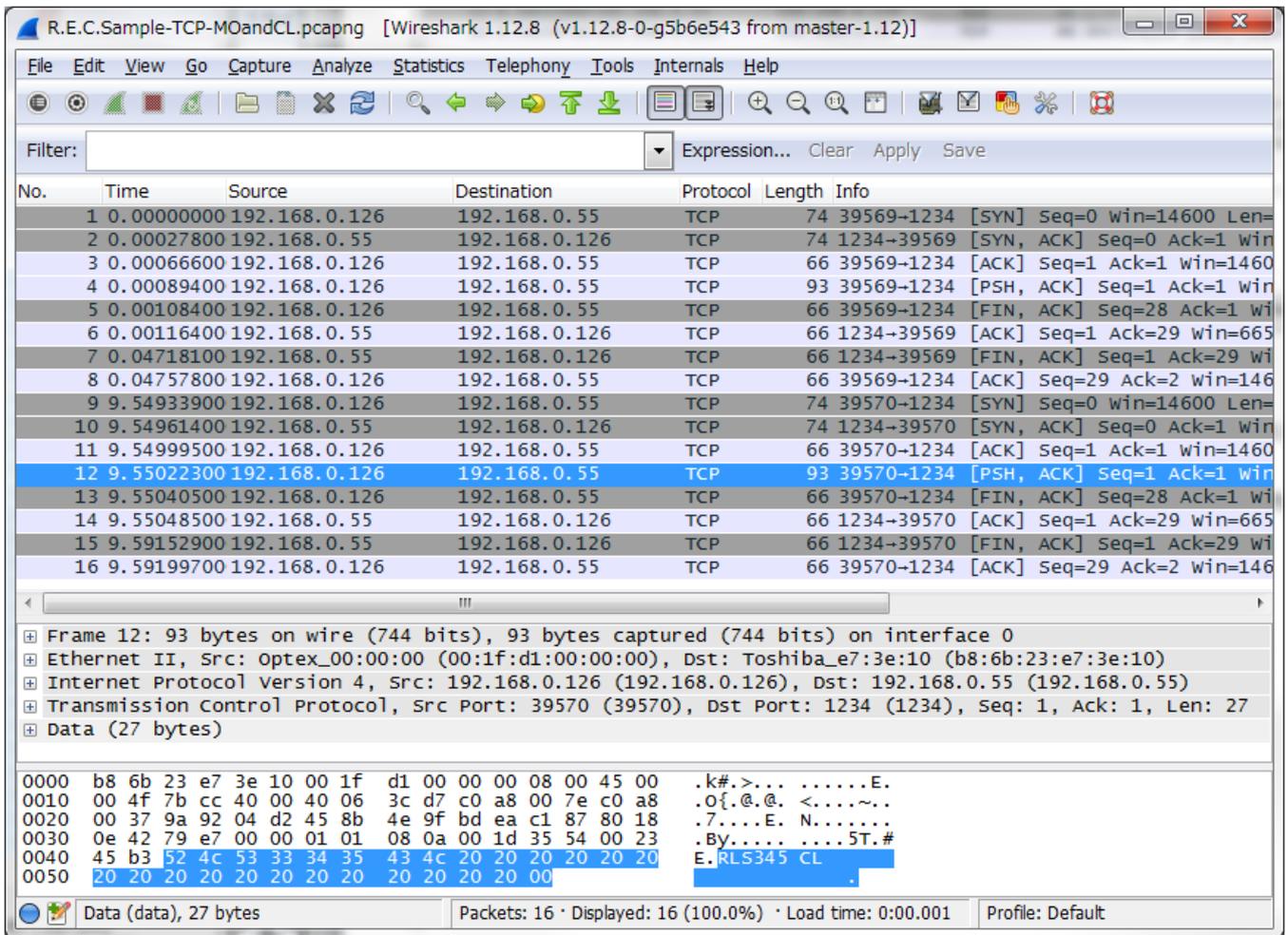


Fig.4 Sample of TCP Sequence (continue)

When the alarm is cleared, REDSCAN waits for "Transmission Interval for Clear code" (Fig.1), connects to the destination (No.9-11), sends R.E.C. (No.12), and disconnects the TCP (No.13-16).

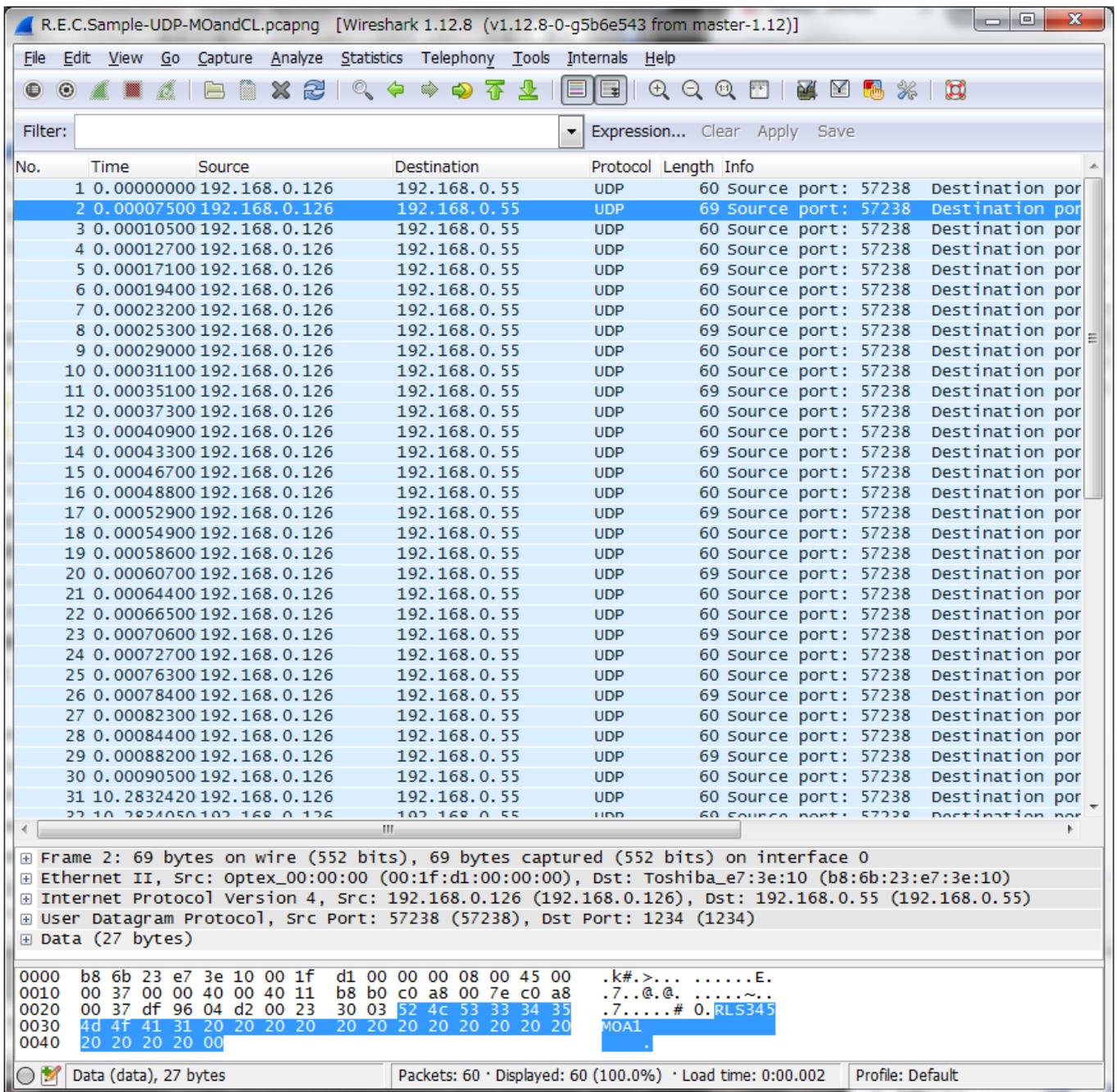


Fig.5 Sample of UDP Sequence (R.E.C.Sample-UDP-MOandCL.pcapng)

When some alarm detected, REDSCAN sends a series of 3 UDP packets to the destination (No.1-3). Second packet contains R.E.C. (No.2). According to "Number of Transmission" (Fig.2), REDSCAN repeats sending the series of 3 packets. (No.1 - No.30)

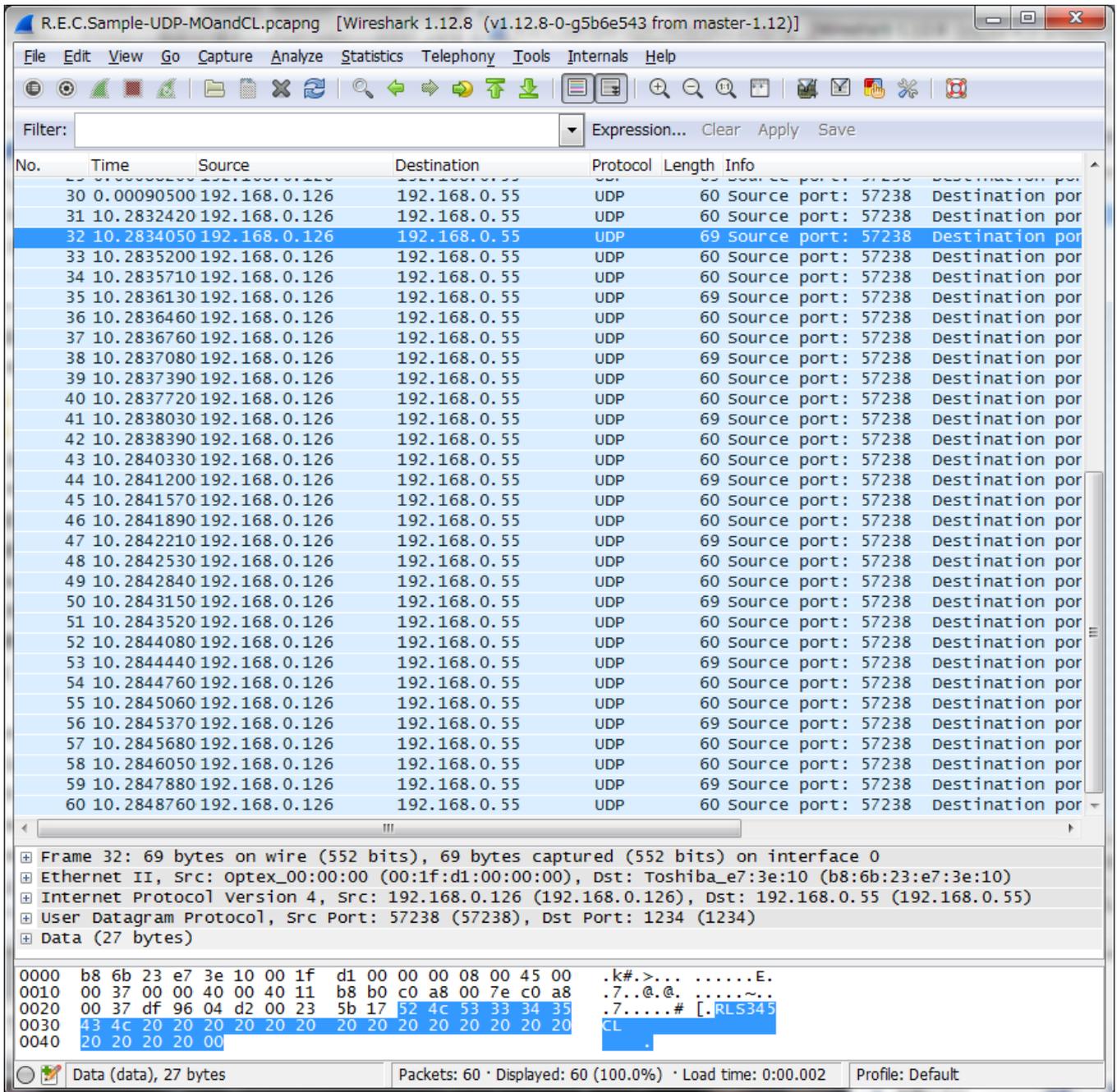


Fig.6 Sample of UDP Sequence (continue)

When the alarm is cleared, REDSCAN waits for "Transmission Interval for Clear code" (Fig.2). Then, REDSCAN sends a series of 3 UDP packets to the destination (No.31-33). Second packet contains R.E.C. (No.32). According to "Number of Transmission" (Fig.2), REDSCAN repeats sending the series of 3 packets. (No.31-No.60)

5. Packet Structure

(1) When R.E.C. is sent via TCP:

27 bytes R.E.C. code is stored in TCP payload.

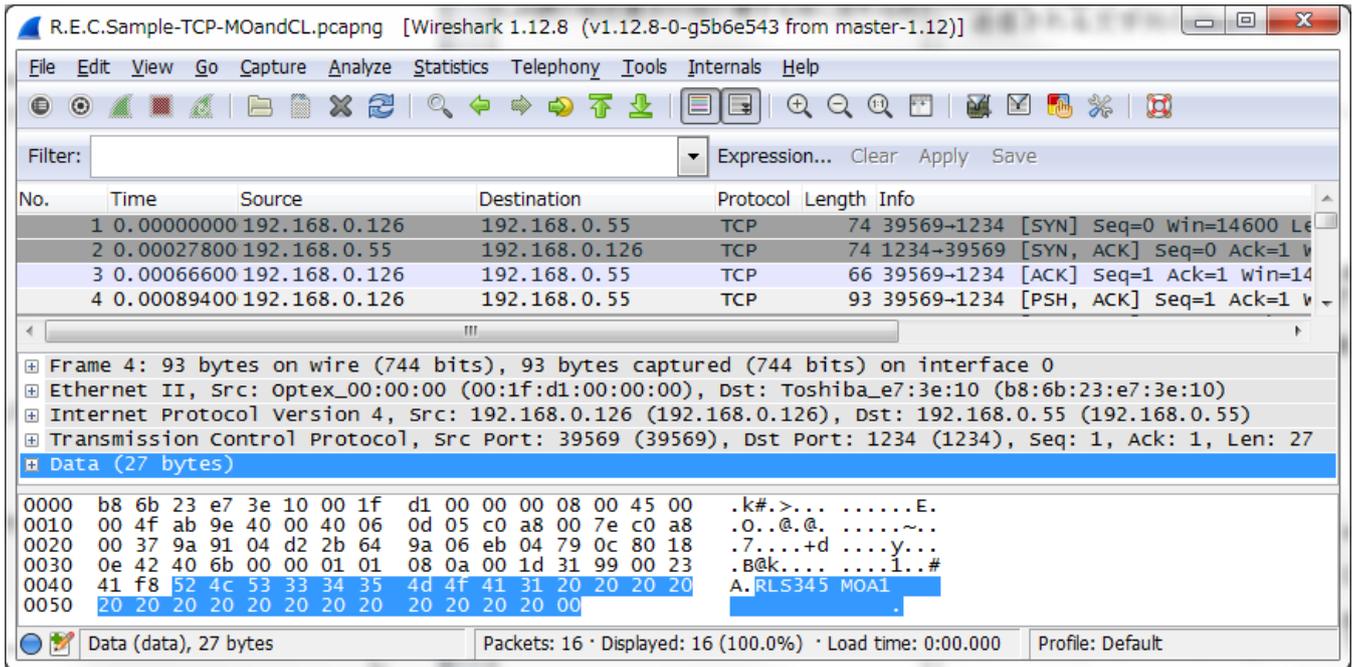


Fig.7 R.E.C. in TCP Payload

(2) When R.E.C. is sent via UDP:

REDSCAN sends a series of 3 UDP packets to the destination. The first packet contains 8 bytes header which starts from "URG.GC". The second packet contains R.E.C. The third packet contains 2 bytes checksum.

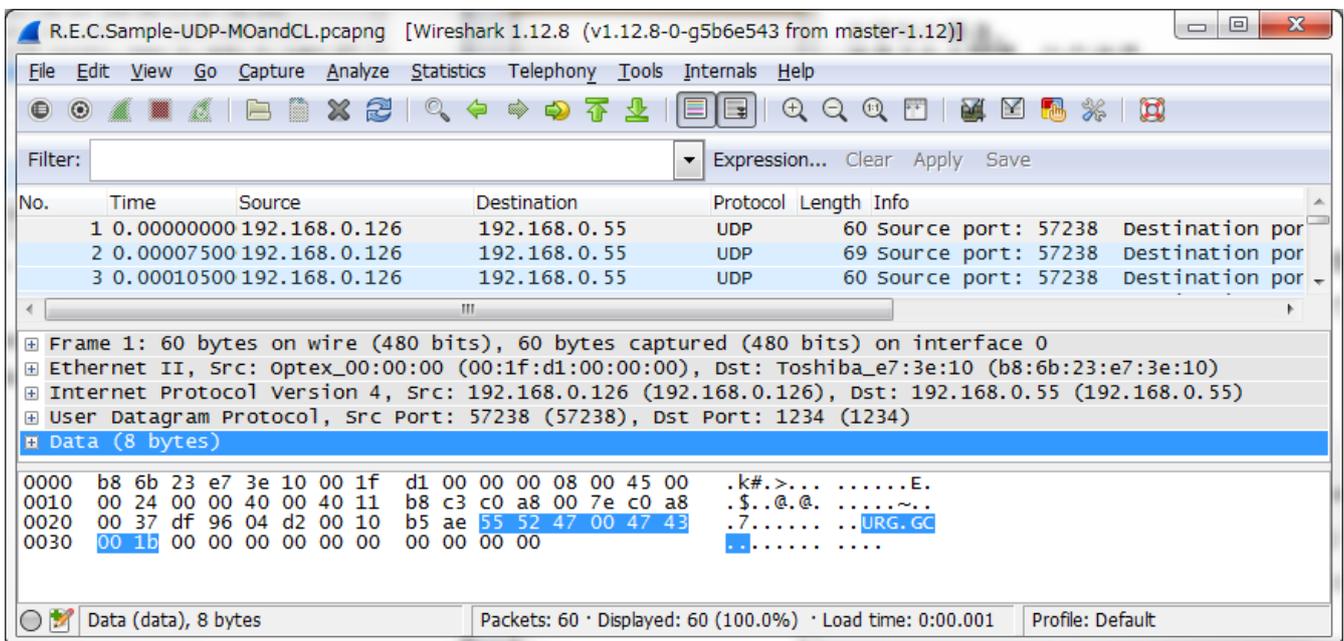


Fig.8 Header in the first UDP Packet

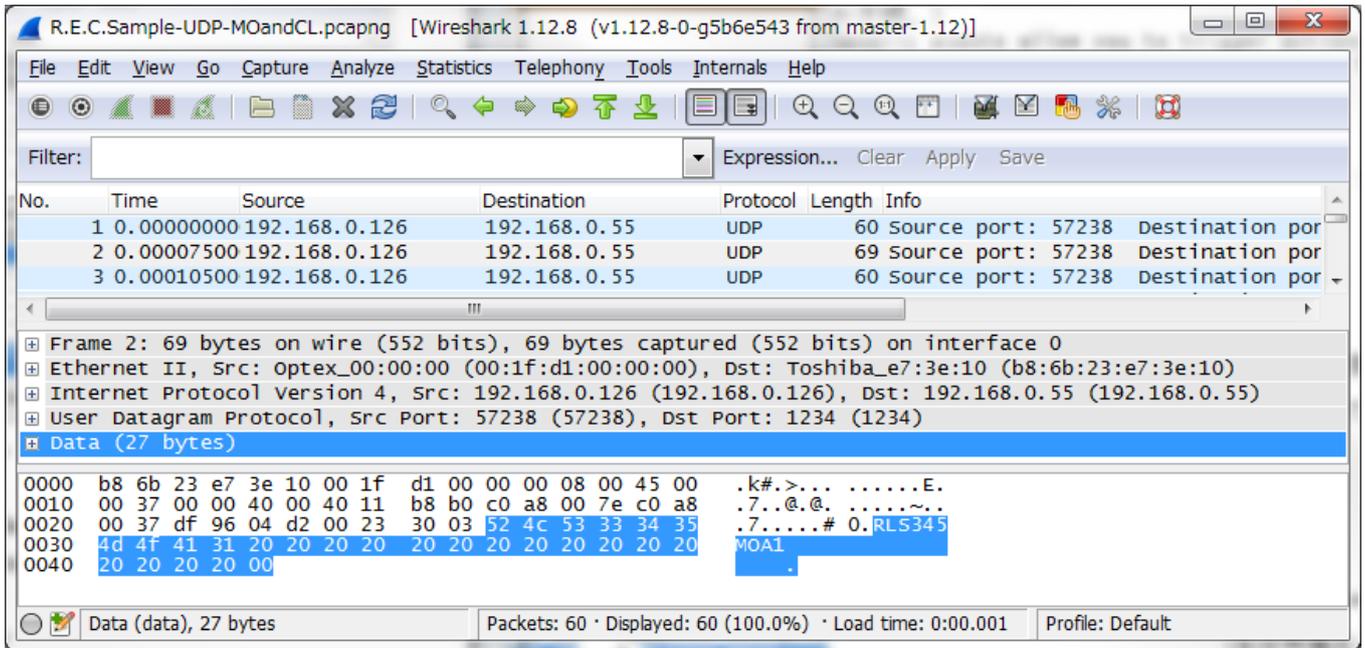


Fig9 R.E.C. in the second UDP Packet

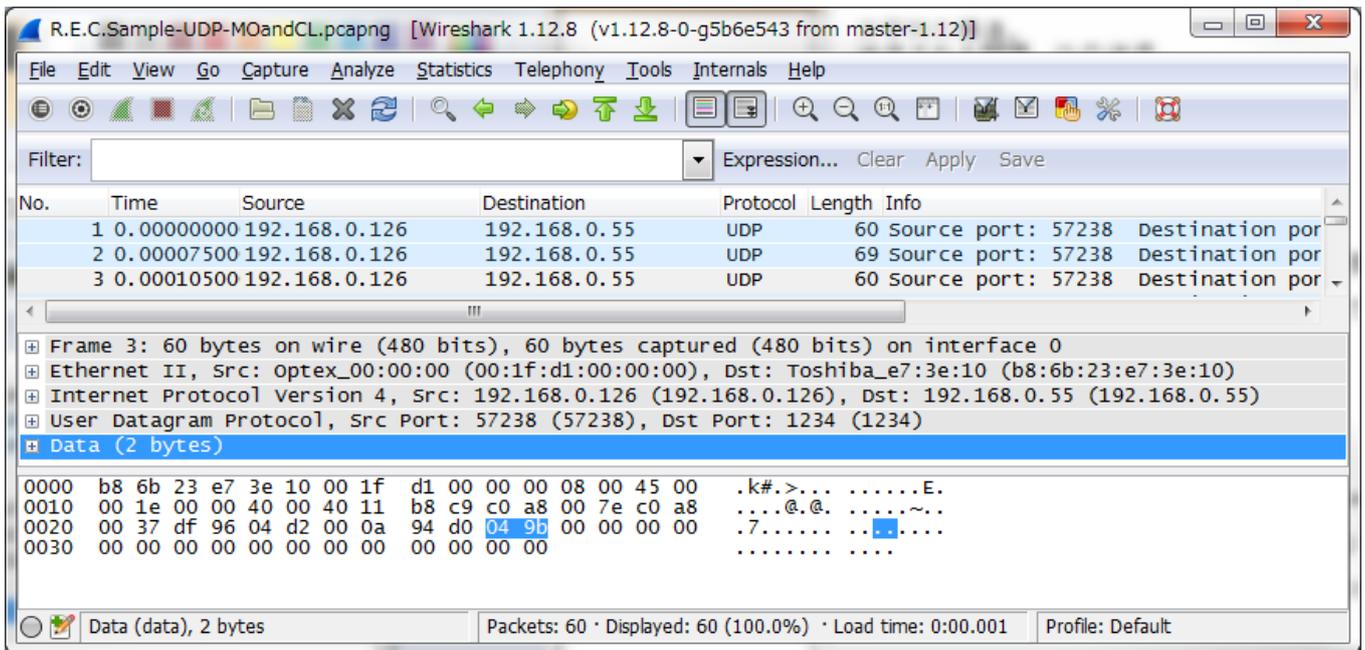


Fig.10 Checksum in the third UDP Packet

6. Sample Packets

Sample Files captured by WireShark are provided.

- R.E.C.Sample-TCP-MOandCL.pcapng
- R.E.C.Sample-TCP-Multiple.pcapng
- R.E.C.Sample-TCP-TAandta.pcapng
- R.E.C.Sample-UDP-MOandCL.pcapng
- R.E.C.Sample-UDP-Multiple.pcapng
- R.E.C.Sample-UDP-TAandta.pcapng