

UNIVERSIDAD DIEGO PORTALES

INGENIERÍA CIVIL INFORMÁTICA Y  
TELECOMUNICACIONES

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## Laboratorio N°3

### Redes de Datos

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## 2 ACTIVIDAD

### 2.1 Dirección MAC de destino FF:FF:FF:FF:FF:FF

No.	Time	Source	Destination	Protocol	Length	Info
125	21.386308800	HewlettP_51:db:4c	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.101
126	21.443421000	HewlettP_53:4e:9f	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.114
127	21.752279800	HewlettP_53:4f:27	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.117
128	22.068338000	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.103
129	22.149143800	HewlettP_4e:e8:dd	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.105
130	22.172157600	Cisco_db:19:0c	Spanning-tree-(for-brSTP		60	Conf. Root = 32768/32/80:19:aa:db:19:00 Cost = 0 Port = 0x800c
131	22.386258000	HewlettP_51:db:4c	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.101
132	22.397457600	Cisco_db:19:0c	CDP/VTP/OT/PAGP/UDLCDP		396	Device ID: SWING38.287_P5_Lab.Informatica Port ID: FastEthernet0/12
133	22.443459800	HewlettP_53:4e:9f	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.114
134	22.696477600	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.109
135	23.103252000	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.103
136	23.149886800	HewlettP_4e:e8:dd	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.105
137	23.692738000	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.109
138	23.780872800	HewlettP_51:db:4e	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.104
139	23.875584800	127.0.0.1	127.0.0.1	ICMP	46	Echo (ping) request id=0x0000, seq=0/0, ttl=64 (no response found!)
140	24.180415800	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.103
141	24.149882800	HewlettP_4e:e8:dd	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.105
142	24.182263800	Cisco_db:19:0c	Spanning-tree-(for-brSTP		60	Conf. Root = 32768/32/80:19:aa:db:19:00 Cost = 0 Port = 0x800c
143	24.247570800	HewlettP_53:4e:9f	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.114
144	24.692723800	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.109
145	24.739883800	HewlettP_53:4f:27	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.117
146	24.777598800	HewlettP_51:db:4e	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.104
147	25.180362800	HewlettP_56:47:8b	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.103
148	25.149130800	HewlettP_4e:e8:dd	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.105
149	25.247468800	HewlettP_53:4e:9f	Broadcast	ARP	60	Who has 172.16.32.1? Tell 172.16.32.114
▶Frame 139: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface 0 ▶Ethernet II, Src: HewlettP_53:4e:8c (48:a8:f0:53:4e:8c), Dst: Broadcast (ff:ff:ff:ff:ff:ff) ▶Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1) ▶Internet Control Message Protocol						
0000 ff ff ff ff ff ff 40 a0 f0 53 4e 8c 00 00 45 00 .....0. .SN...E. 0010 00 20 00 01 00 00 40 01 7c da 7f 00 00 01 7f 00 .....0.  ..... 0020 00 01 00 00 23 2f 00 00 00 00 68 6f 6c 61 ...#/. ...hola						

(Imagen 1: Wireshark del PC fuente: Mensaje enviado "Hola")

139	23.875584000	127.0.0.1	127.0.0.1	ICMP	46 Echo (ping) request	1d-3x0000, seq=0/0, ttl=64 (no response found!)
140	24.108415000	HewlettP_56:47:8b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.103
141	24.149082000	HewlettP_4e:e8:dd	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.105
142	24.182283000	Cisco db:19:8c	Spanning-Tree-(for-brSTP		60 Conf. Root = 32768/32/80:19:aa:db:19:80	Cost = 0 Port = 0x808c
143	24.247576000	HewlettP_53:4e:9f	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.114
144	24.692723000	HewlettP_56:84:6b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.109
145	24.759083000	HewlettP_53:4f:27	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.117
146	24.777590000	HewlettP_51:db:4e	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.104
147	25.108362000	HewlettP_56:47:8b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.103
148	25.149130000	HewlettP_4e:e8:dd	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.105
149	25.247468000	HewlettP_53:4e:9f	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.114
▼Frame 139: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface 0						
Interface id: 0 (eth0)						
Encapsulation type: Ethernet (1)						
Arrival Time: May 11, 2017 12:21:28.338829800 CLST						
[Time shift for this packet: 0.000000000 seconds]						
Epoch Time: 1494516888.338829800 seconds						
[Time delta from previous captured frame: 0.094912000 seconds]						
[Time delta from previous displayed frame: 0.094912000 seconds]						
[Time since reference or first frame: 23.875584000 seconds]						
Frame Number: 139						
Frame Length: 46 bytes (368 bits)						
Capture Length: 46 bytes (368 bits)						
[Frame is marked: False]						
[Frame is ignored: False]						
[Protocols in frame: eth:ethertype:ip:icmp:data]						
[Coloring Rule Name: ICMP]						
[Coloring Rule String: icmp    icmpv6]						
0000	ff ff ff ff ff ff 40 a0	f0 53 4e 0c 00 00 45 00	.....@..SN...E..			
0010	00 28 00 01 00 00 48 01	7c da 7f 80 80 01 7f 00	.....@.. .....			
0020	00 01 08 00 23 2f 00 00	00 00 68 6f 6c 61	...#f...hole			

(Imagen 2: Wireshark del PC fuente; Frame)

139	23.875584000	127.0.0.1	127.0.0.1	ICMP	46 Echo (ping) request	Id=0x0000, seq=0/0, ttl=64 (no response found!)
140	24.180415800	HewlettP_56:47:8b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.103
141	24.149882000	HewlettP_4e:e8:dd	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.105
142	24.182263800	Cisco db:19:0c	Spanning-tree-(for-brSTP	80	Conf. Root = 32768/32/80:19:0a:db:19:80	Cost = 0 Port = 0x808c
143	24.247570600	HewlettP_53:4e:9f	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.114
144	24.692723000	HewlettP_56:04:6b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.109
145	24.759883600	HewlettP_53:4f:27	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.117
146	24.777590600	HewlettP_51:db:4e	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.104
147	25.180362800	HewlettP_56:47:8b	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.103
148	25.149130000	HewlettP_4e:e8:dd	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.105
149	25.247468800	HewlettP_53:4e:9f	Broadcast	ARP	60 Who has 172.16.32.1?	Tell 172.16.32.114
▶Frame 139: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface 0						
▼Ethernet II, Src: HewlettP_53:4e:8c (40:a8:f0:53:4e:8c), Dst: Broadcast (ff:ff:ff:ff:ff:ff)						
▼Destination: Broadcast (ff:ff:ff:ff:ff:ff)						
Address: Broadcast (ff:ff:ff:ff:ff:ff)						
.... 1. .... = LG bit: Locally administered address (this is NOT the factory default)						
.... 1. .... = IG bit: Group address (multicast/broadcast)						
▼Source: HewlettP_53:4e:8c (40:a8:f0:53:4e:8c)						
Address: HewlettP_53:4e:8c (40:a8:f0:53:4e:8c)						
.... 0. .... = LG bit: Globally unique address (factory default)						
.... 0. .... = IG bit: Individual address (unicast)						
Type: IP (8x8800)						
▶Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)						
▶Internet Control Message Protocol						
0000 ff ff ff ff ff 40 a8 f0 53 4e 8c 08 00 45 00 .....@. .SN..E.						
0010 00 20 00 01 00 00 40 01 7c da 7f 00 00 01 7f 00 .....@.  .....						
0020 00 01 08 08 23 2f 00 08 00 00 08 0f 0c 01 .....#/.. .hola						

(Imagen 3: Wireshark del PC fuente; Ethernet II)

138	23.788672808	HewlettP_51:00:4e	Broadcast	ARP	68 Who has 172.16.32.1? Tell 172.16.32.184
139	23.875584808	127.0.0.1	127.0.0.1	ICMP	46 Echo (ping) request id=0x0000, seq=8/8, ttl=64 (no response found!)
140	24.180415808	HewlettP_56:47:8b	Broadcast	ARP	68 Who has 172.16.32.1? Tell 172.16.32.183
141	24.149882808	HewlettP_4e:c8:dd	Broadcast	ARP	68 Who has 172.16.32.1? Tell 172.16.32.185
142	24.182263808	Cisco_db:19:0c	Spanning-tree-lfor-hi STP	68 Conf. Root = 32768/32/08-19-aa-db:19:08 Cost = 8 Port = 0x800c	

▶ Frame 139: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface 0

▶ Ethernet II, Src: HewlettP 53:4e:8c (40:a0:f0:53:4e:8c), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

▼ Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)

Version: 4

Header Length: 20 bytes

▼ Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))

0000 00.. = Differentiated Services Codepoint: Default (0x00)

.... 00 = Explicit Congestion Notification: Not-ECT (Not ECN-Capable Transport) (0x00)

Total Length: 32

Identification: 0x0001 (1)

▼ Flags: 0x00

0... .... = Reserved bit: Not set

.0... .... = Don't fragment: Not set

..0. .... = More fragments: Not set

Fragment offset: 0

Time to live: 64

Protocol: ICMP (1)

▼ Header checksum: 0x7cda [validation disabled]

[Good: False]

[Bad: False]

Source: 127.0.0.1 (127.0.0.1)

Destination: 127.0.0.1 (127.0.0.1)

[Source GeoIP: Unknown]

[Destination GeoIP: Unknown]

▶ Internet Control Message Protocol

0000	ff ff ff ff ff ff 40 a8	f0 53 4e 8c 00 00	45 00	.....0..SN...E.
0010	00 20 00 01 00 00 40 01	7c da 7f 00 00 01 7f 00		.....0. ....
0020	00 01 00 08 23 2f 00 00	00 00 00 6f 6c 01		....#/... ..hala

(Imagen 4: Wireshark del PC fuente; Internet Protocol)

139	23.875584000	127.0.0.1	127.0.0.1	ICMP	46 Echo (ping) request id=0x0000, seq=0/0, ttl=64 (no response found!)
140	24.180415800	HewlettP_53:4c:8b	Broadcast	ARP	60 Who has 172.16.32.1? Tell 172.16.32.103
141	24.149882800	HewlettP_4e:e8:dd	Broadcast	ARP	60 Who has 172.16.32.1? Tell 172.16.32.105
142	24.182263800	Cisco_db:19:0c	Spanning-tree-ffr-brSTP	60	Conf. Root = 32768/32/80:19:8a:db:19:80 Cost = 0 Port = 0x008c
▶Frame 139: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface 0 ▶Ethernet II, Src: HewlettP_53:4c:8b (40:a8:f0:53:4c:8b), Dst: Broadcast (ff:ff:ff:ff:ff:ff) ▶Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)					
▼ Internet Control Message Protocol					
Type: 8 (Echo (ping) request) Code: 0 Checksum: 0x232f [correct] Identifier (BE): 0 (0x0000) Identifier (LE): 0 (0x0000) Sequence number (BE): 0 (0x0000) Sequence number (LE): 0 (0x0000)					
▼ [No response seen]					
▼ [Expert Info (Warn/Sequence): No response seen to ICMP request in frame 139]					
[No response seen to ICMP request in frame 139] [Severity level: Warn] [Group: Sequence]					
▼ Data (4 bytes)					
Data: 686f6c61 [Length: 4]					
0000	ff ff ff ff ff 40 a8 f0 53 4c 8b 80 45 00	.....@. .SN...E.			
0010	00 20 00 01 00 00 40 01 7c da 7f 00 00 01 7f 00	. ....@.  .....			
0020	00 01 60 00 23 2f 00 00 00 00 60 6f 6c 61	.. .#/. ..hole			

(Imagen 5: Wireshark del PC fuente; Internet Control Message Protocol)

86751	2050.27594500	127.0.0.1	127.0.0.1	ICMP	62 Echo (ping) request 15-8x0000, seq=0/0, ttl=64 (no response)
86752	2050.42435400	172.16.32.48	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86753	2050.46112400	172.16.32.38	172.16.32.255	NBNS	94 Name query NB INQ SIP<20>
86754	2050.54952400	172.16.32.24	172.16.32.255	UDP	84 Source port: 55037 Destination port: 1947
86755	2050.57583400	172.16.32.11	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86756	2050.58118100	172.16.32.99	172.16.32.255	NBNS	94 Name query NB INQ<00>
86757	2050.61740900	172.16.32.30	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86758	2050.64186800	172.16.32.23	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86759	2050.66667000	172.16.32.37	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86760	2050.68704600	172.16.32.26	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
86761	2050.73206700	172.16.32.43	172.16.32.255	NBNS	94 Name query NB INQ SIP<00>
▶ Frame 86751: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0					
Linux cooked capture					
Packet type: Broadcast (1)					
Link-layer address type: 1					
Link-layer address length: 6					
Source: HewlettP 53:4e:0c (48:a0:f0:53:4e:0c)					
Protocol: IP (8x0000)					
Padding: 00000000000000000000000000000000					
▶ Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)					
▶ Internet Control Message Protocol					
▶ VSS-Monitoring ethernet trailer, Source Port: 0					

(Imagen 6: Wireshark del PC receptor: al enviar al broadcast el mensaje lo reciben todos los PC de la red)



## 2.2 Dirección MAC de destino otro equipo

No.	Time	Source	Destination	Protocol	Length	Info
1896	363.603258000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1? Tell 172.16.32.104
1897	363.366011000	HewlettP_56:47:8b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.103
1898	363.386007000	HewlettP_4e:e0:dd		ARP	62	Who has 172.16.32.1? Tell 172.16.32.105
1899	363.617912000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1? Tell 172.16.32.101
1900	363.675072000	HewlettP_53:4e:9f		ARP	62	Who has 172.16.32.1? Tell 172.16.32.114
1901	363.983844000	HewlettP_53:4e:27		ARP	62	Who has 172.16.32.1? Tell 172.16.32.117
1902	364.366094000	HewlettP_56:47:8b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.103
1903	364.386767000	HewlettP_4e:e0:dd		ARP	62	Who has 172.16.32.1? Tell 172.16.32.105
1904	364.617923000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1? Tell 172.16.32.101
1905	364.675080000	HewlettP_53:4e:9f		ARP	62	Who has 172.16.32.1? Tell 172.16.32.114
1906	364.928143000	HewlettP_56:84:6b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.109
1907	365.334839000	HewlettP_56:47:8b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.103
1908	365.386017000	HewlettP_4e:e0:dd		ARP	62	Who has 172.16.32.1? Tell 172.16.32.105
1909	365.924422000	HewlettP_56:84:6b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.109
1910	366.012415000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1? Tell 172.16.32.104
1911	366.107564000	127.0.0.1	127.0.0.1	ICMP	62	Echo (ping) request Id=0x0000, seq=0/0, ttl=
1912	366.332015000	HewlettP_56:47:8b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.103
1913	366.386787000	HewlettP_4e:e0:dd		ARP	62	Who has 172.16.32.1? Tell 172.16.32.105
1914	366.479236000	HewlettP_53:4e:9f		ARP	62	Who has 172.16.32.1? Tell 172.16.32.114
1915	366.924397000	HewlettP_56:84:6b		ARP	62	Who has 172.16.32.1? Tell 172.16.32.109
1916	366.990761000	HewlettP_53:4e:27		ARP	62	Who has 172.16.32.1? Tell 172.16.32.117
1917	367.000263000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1? Tell 172.16.32.104
▶Frame 1911: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0						
▶Linux cooked capture						
▶Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)						
▶Internet Control Message Protocol						
▶VSS-Monitoring ethernet trailer, Source Port: 0						

(Imagen 7: Wireshark del PC destino: Mensaje recibido "Hola")

1911	366.167564000	127.0.0.1	127.0.0.1	ICMP	62	Echo (ping) request	id=8x0000, seq=0/0, ttl=64 (m
1912	366.332015000	HewlettP_56:47:8b		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.183
1913	366.380787000	HewlettP_4b:c8:dd		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.185
1914	366.479236000	HewlettP_53:4c:9f		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.114
1915	366.924397000	HewlettP_56:84:6b		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.189
1916	366.990761000	HewlettP_53:4f:27		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.117
1917	367.004263000	HewlettP_51:db:4e		ARP	62	Who has 172.16.32.1?	Tell 172.16.32.184
▼ Frame 1911: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0							
Interface id: 0 (any)							
Encapsulation type: Linux cooked-mode capture (25)							
Arrival Time: May 11, 2017 12:21:28.351430000 CEST							
[Time shift for this packet: 0.000000000 seconds]							
Epoch Time: 1494510000.351430000 seconds							
[Time delta from previous captured frame: 0.095149000 seconds]							
[Time delta from previous displayed frame: 0.095149000 seconds]							
[Time since reference or first frame: 366.167564000 seconds]							
Frame Number: 1911							
Frame Length: 62 bytes (496 bits)							
Capture Length: 62 bytes (496 bits)							
[Frame is marked: False]							
[Frame is ignored: False]							
[Protocols in frame: ethernetII:ip:icmp:data:vssmonitoring]							
[Coloring Rule Name: ICMP]							
[Coloring Rule String: icmp    icmpv6]							
► Linux cooked capture							
► Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)							
► Internet Control Message Protocol							
▼ 1911: Ethernet II, Src: Hewlett-Packard Fast Ethernet Controller, Dst: 01:00:0c:00:00:00							
0000	00 01 00 01 00 00 00 00 00 00 00 00 00 00 00 00	.....0..5h.....					
0010	45 00 00 20 00 01 00 00 00 01 7c da 7f 00 00 01	E.....0.....					
0020	7f 00 00 01 00 00 23 2f 00 00 00 00 00 0f 0c 01	.....#/....hole					
0030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....					

(Imagen 8: Wireshark del PC destino; Frame)

1911	366.197564000	127.0.0.1	127.0.0.1	ICMP	62 Echo [ping] request	id=0x0000, seq=0/0, ttl=64	no response
1912	366.332815000	HewlettIP_5b:47:0b		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.103	
1913	366.388787000	HewlettIP_4e:c8:dd		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.105	
1914	366.479236000	HewlettIP_53:4e:9f		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.114	
1915	366.924397000	HewlettIP_56:84:6b		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.109	
1916	366.990761000	HewlettIP_53:4f:27		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.117	
1917	367.089263000	HewlettIP_51:db:4c		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.104	
▶Frame 1911: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0							
▼Linux cooked capture							
Packet type: Broadcast (1)							
Link-layer address type: 1							
Link-layer address length: 6							
Source: HewlettP_53:4e:8c (48:a8:f0:53:4e:8c)							
Protocol: IP (0x0000)							
Padding: 00000000000000000000000000							
▶Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)							
▶Internet Control Message Protocol							
▶VSS-Monitoring ethernet trailer, Source Port: 0							
0000	00 01 00 01 00 00 40 00	f0 53 4e 8c 86 dd 00 00	.....0..SN.....				
0010	45 00 00 20 00 01 00 00	40 01 7c 00 7f 00 00 01	E.. ....0.. .....				
0020	7f 00 00 01 00 00 23 2f	00 00 00 00 68 6f 6c 61	.....#/ ....hola				
0030	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00	.....				

(Imagen 9: Wireshark del PC destino; Linux cooked capture)

1911	366.187561808	127.0.0.1	127.0.0.1	ICMP	62 Echo (ping) request	id=0x0000, seq=0/0, ttl=64 (no response)
1912	366.132015000	HewlettP_56:47:8b		ARP	62 Who has 172.16.32.1? Tell 172.16.32.103	
1913	366.380787000	HewlettP_4e:e8:dd		ARP	62 Who has 172.16.32.1? Tell 172.16.32.105	
1914	366.470238000	HewlettP_53:4e:9f		ARP	62 Who has 172.16.32.1? Tell 172.16.32.114	
1915	366.924397000	HewlettP_56:84:6b		ARP	62 Who has 172.16.32.1? Tell 172.16.32.109	
1916	366.990761000	HewlettP_53:4f:27		ARP	62 Who has 172.16.32.1? Tell 172.16.32.117	
1917	367.089263000	HewlettP_51:db:4e		ARP	62 Who has 172.16.32.1? Tell 172.16.32.104	
▶Frame 1911: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0						
▶Linux cooked capture						
▼Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)						
Version: 4						
Header Length: 20 bytes						
▶Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))						
Total Length: 32						
Identification: 0x0001 (1)						
▶Flags: 0x00						
Fragment offset: 0						
Time to live: 64						
Protocol: ICMP (1)						
▶Header checksum: 0x7cda [validation disabled]						
Source: 127.0.0.1 (127.0.0.1)						
Destination: 127.0.0.1 (127.0.0.1)						
[Source GeoIP: Unknown]						
[Destination GeoIP: Unknown]						
▶Internet Control Message Protocol						
▶VSS-Monitoring ethernet trailer, Source Port: 0						
0000	00 01 00 01 00 00 40 05 f0 55 4c 8c 56 dd 08 00	.....0..5N....				
0010	45 00 00 20 00 01 00 00 40 01 7c da 7f 00 00 01	E.. ....0.]....				
0020	7f 00 00 01 00 00 23 2f 00 00 00 00 00 ef 0c 01	.....#/ ....hole				
0030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....				

(Imagen 10: Wireshark del PC destino; Internet Protocol)

1911	366.197564900	127.0.0.1	127.0.0.1	ICMP	62 Echo (ping) request	id=0x0000, seq=0/0, ttl=64	no response
1912	366.332815000	HewlettIP_5b:47:0b		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.103	
1913	366.388787000	HewlettIP_4c:c8:dd		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.105	
1914	366.479236000	HewlettIP_53:4e:9f		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.114	
1915	366.924397000	HewlettIP_56:84:6b		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.109	
1916	366.990761000	HewlettIP_53:4f:27		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.117	
1917	367.009263000	HewlettIP_51:db:4e		ARP	62 Who has 172.16.32.1?	Tell 172.16.32.104	
▶ Frame 1911: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0							
▶ Linux cooked capture							
▶ Internet Protocol Version 4, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)							
▼ Internet Control Message Protocol							
Type: 8 (Echo (ping) request)							
Code: 0							
Checksum: 0x232f [correct]							
Identifier (BE): 0 (0x0000)							
Identifier (LE): 0 (0x0000)							
Sequence number (BE): 0 (0x0000)							
Sequence number (LE): 0 (0x0000)							
▶ [No response seen]							
▼ Data (4 bytes)							
Data: 000f0001							
[Length: 4]							
▼ VSS-Monitoring ethernet trailer, Source Port: 0							
Src Port: 0							

0000	00 01 00 01 00 06 40 08	f0 53 4c 8c 86 dd 05 00	.....g...50.....
0010	45 00 00 20 00 01 00 00	40 01 7c 0a 7f 00 00 01	E... ..0.].....
0020	7f 00 00 01 00 00 23 2f	00 00 00 00 00 0f 0c 01	.....#/...hola
0030	00 00 00 00 00 00 00 00	00 00 00 00 00 00	.....

(Imagen 11: Wireshark del PC destino; Internet Control Message Protocol y Monitoring Ethernet Trailer)

## 2.3 Dirección MAC de destino otro equipo fuera de la red

No.	Time	Source	Destination	Protocol	Length	Info
1109	40.441000000	172.16.32.13	255.255.255.255	UDP	84	Source port: 63949 Destination port: 1947
1110	40.463900000	172.16.32.49	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1111	40.505100000	172.16.32.27	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1112	40.525670000	172.16.32.48	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1113	40.533150000	172.16.32.23	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1114	40.593200000	172.16.32.50	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1115	40.665100000	172.16.32.57	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1116	40.677400000	172.16.32.25	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1117	40.746430000	172.16.32.48	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1118	40.771000000	172.16.32.13	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1119	40.797800000	127.0.0.1	127.0.0.1	ICMP	64	echo (ping) request id=63000, seq=0/0, ttl=64 (no response found)
1120	40.797040000	172.16.32.17	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1121	40.811210000	172.16.32.11	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1122	40.869167000	172.16.32.15	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1123	41.117100000	172.16.32.50	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1124	41.125720000	172.16.32.38	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1125	41.148501000	172.16.32.52	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1126	41.213520000	172.16.32.49	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1127	41.228657000	172.16.32.39	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1128	41.254100000	172.16.32.27	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1129	41.273807000	172.16.32.40	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
1130	41.282660000	172.16.32.23	172.16.32.255	NBNS	94	Name query NB TNG STD<00>
<pre> Ethernet II, Src: RealtekUPL40x00:c2 (40:06:0b:40:c0:c2), Dst: 20:04:f3:c2:c2:c2 (20:04:f3:c2:c2:c2) Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 (127.0.0.1) Internet Control Message Protocol 0010 00 04 00 01 00 00 00 00 00 00 00 00 00 00 00 ..... 0010 20 04 f3 c2 c2 00 00 f0 0e e6 e2 00 00 45 00 .....0.....E. 0010 00 22 00 01 00 00 00 01 7c 00 74 00 00 01 71 00 .....0. .... 0010 00 01 00 00 0e c8 00 00 00 00 84 73 81 64 73 81 .....2u81u </pre>						

(Imagen 12: Wireshark del PC fuente)

### **3 CUESTIONARIO**

#### **3.1 ¿Qué sucede cuando se envía un paquete a la dirección FF:FF:FF:FF:FF:FF? ¿Quiénes lo reciben? ¿Porqué?**

Al ser FF:FF:FF:FF:FF:FF la MAC broadcast el mensaje llega a cada computador de la red, ya que el switch busca la dirección en todos los PC conectados a la red, es la dirección de difusión de la red.

#### **3.2 ¿Qué pasa cuando se envía un paquete a la MAC de otro equipo? ¿Quiénes lo pueden recibir? ¿Porqué?**

Cuando se envía un paquete a una MAC, el computador que posee aquella MAC, podrá acceder a los datos del paquete. Para esto el PC envía el paquete al switch, este verifica entre los computadores de la red la MAC de destino, luego la envía a este.

#### **3.3 ¿Qué sucede si se envía un paquete a una MAC que no corresponda a ningún equipo de la red? ¿Quiénes lo pueden recepcionar? ¿Por qué?**

Cuando se envía un paquete a una MAC de un PC no conectado a la red, no es recibido por ninguno, ya que el PC emisor envía el paquete al switch y este al no reconocer la MAC anula la operación.

## 4 CONCLUSIÓN

Este laboratorio nos ayudó a comprender la utilización del software Scapy, el cual utilizamos para crear paquetes dentro de la red, y conocimos sus diferentes efectos dependiendo de la MAC de destino, esto nos sirvió para lograr comunicar computadores dentro de una misma red, enviando mensajes y comprender la utilidad de los protocolos del proceso, además logramos entender el software Wireshark, el cual nos ayudó a visualizar en pantalla la información enviada y recibida, con información detallada de esta.

## 5 BIBLIOGRAFÍA

Python  
Wireshark  
Scapy