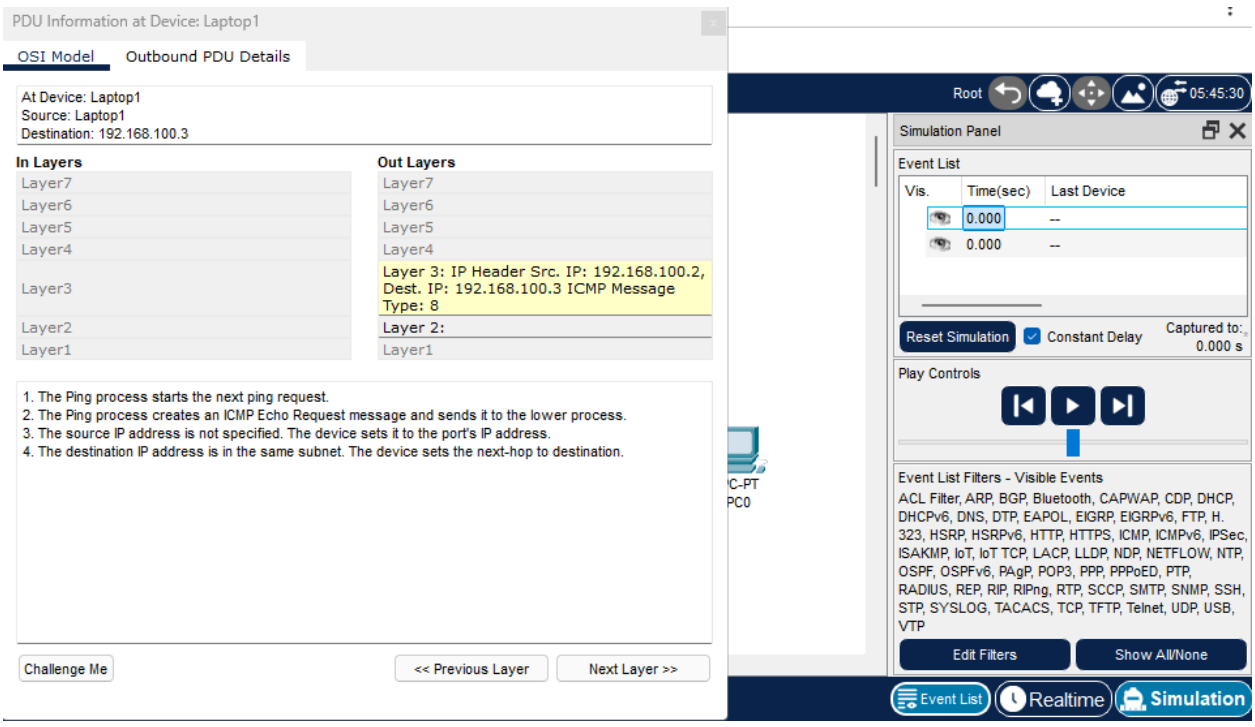
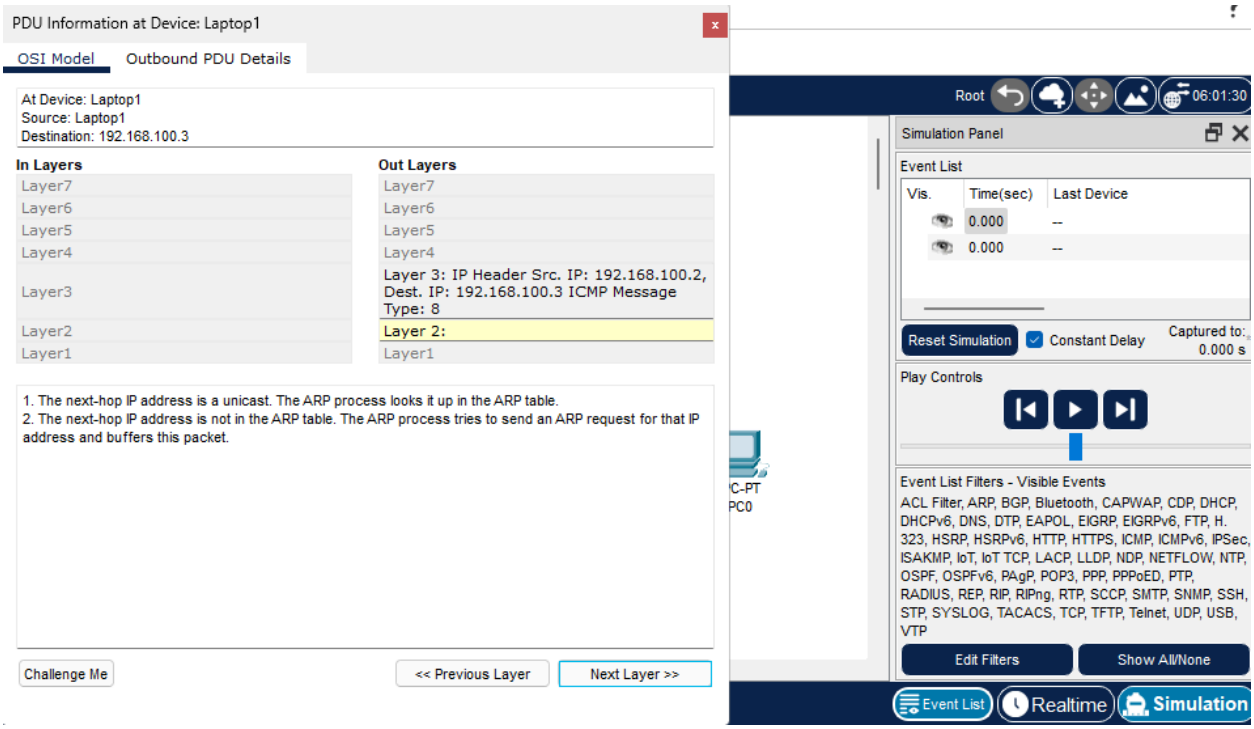
GIORNO 5 - PRATICA 27/06/2025 RELAZIONE ESERCIZIO P.TR.

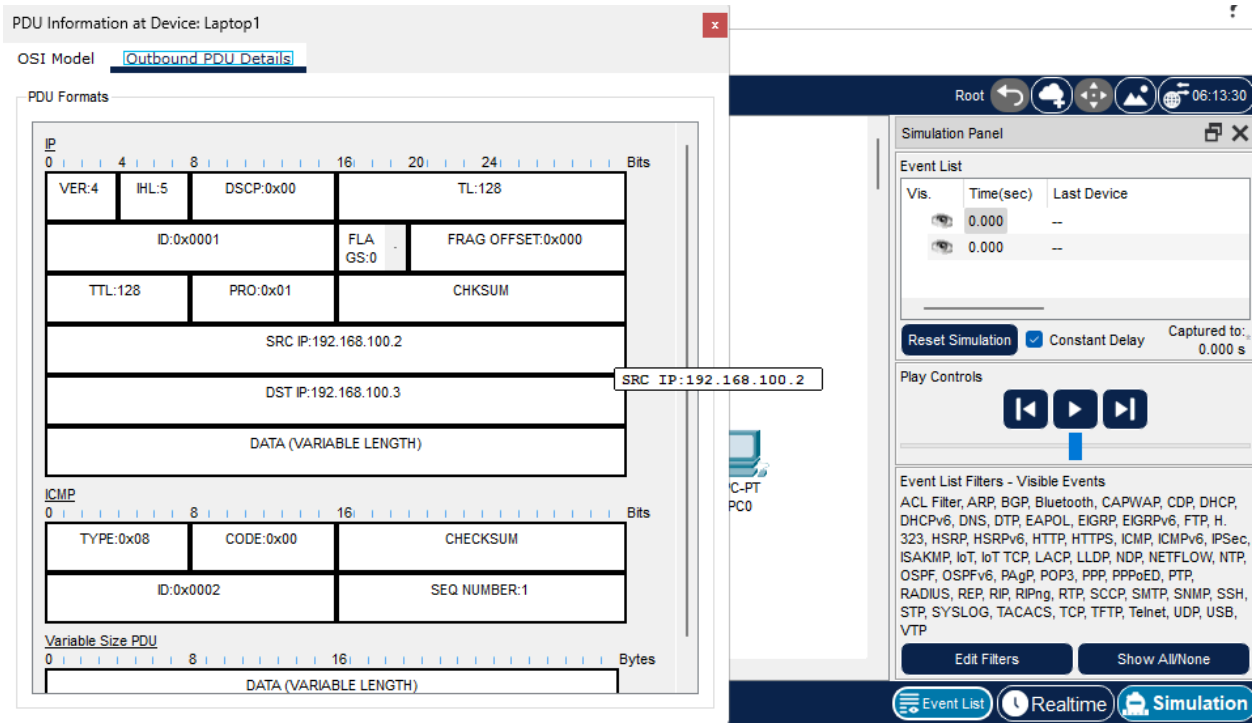
1°

Partendo dal livello 3 - Trasporto, viene utilizzato il protocollo ICMP*

acronimo di Internet Control Message Protocol, è un protocollo di rete utilizzato per inviare messaggi di controllo e segnalare errori tra dispositivi di rete. È fondamentale per la diagnostica di rete, la gestione degli errori e il supporto dei protocolli di routing.




PDU Information at Device: Laptop1
OSI Model
Outbound PDU Details
At Device: Laptop1
Source: Laptop1
Destination: 192.168.100.3
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer2
Layer1
Layer 3: IP Header Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3 ICMP Message Type: 8
Layer 2:
1. The next-hop IP address is a unicast. The ARP process looks it up in the ARP table.
2. The next-hop IP address is not in the ARP table. The ARP process tries to send an ARP request for that IP address and buffers this packet.
Challenge Me
<< Previous Layer
Next Layer >>
Root
06:01:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.000
--
Reset Simulation
Constant Delay
Captured to:
0.000 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation
C-PT
PC0



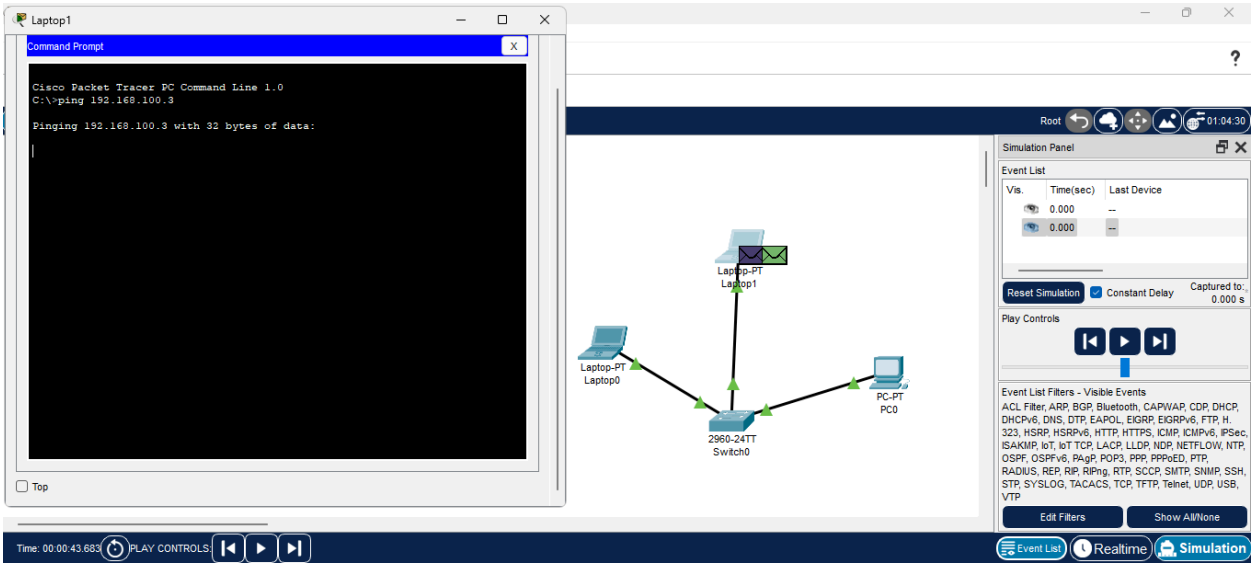
A livello 2 - Data Link*:

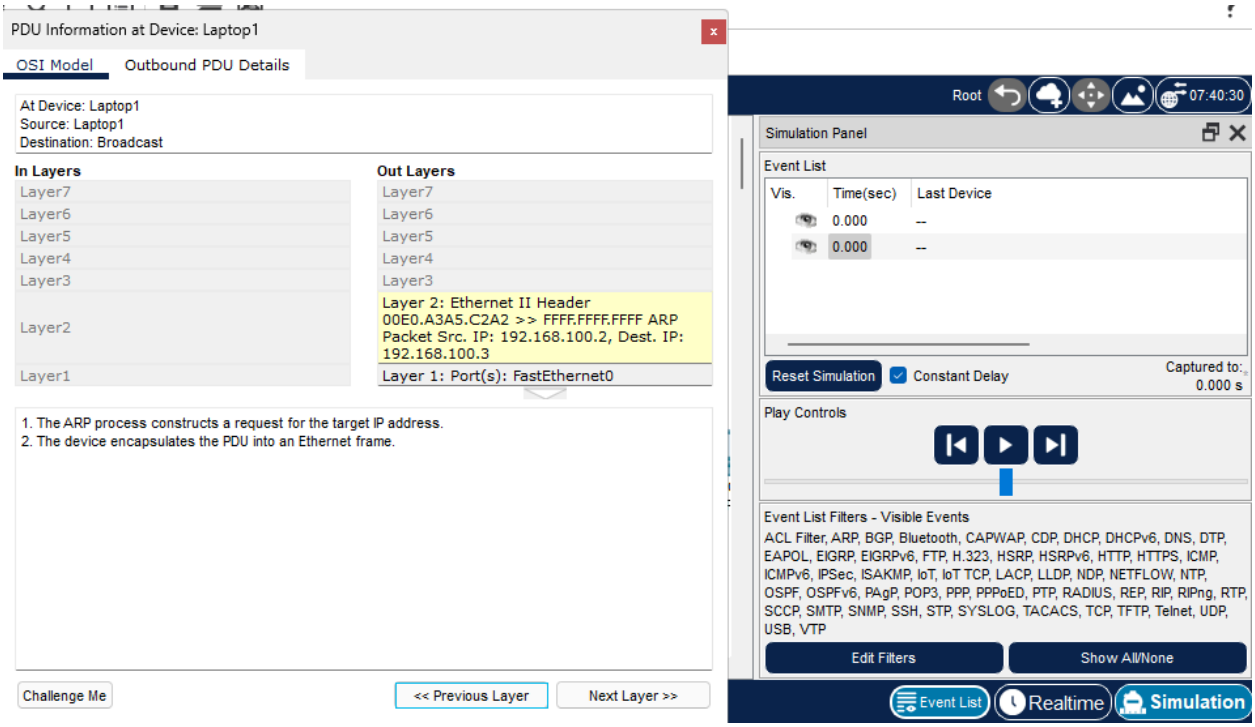
Il livello Data Link fa uso dei servizi del livello fisico per inviare e ricevere bit sui canali di comunicazione. I pacchetti del livello 2 prendono anche il nome di «frame» . comunicare tra di loro al livello Data Link utilizzando quello che viene chiamato indirizzo fisico della macchine, oppure più comunemente MAC Address*.

Ad esempio (come anche in questo caso) uno switch, due computer possono comunicare tramite gli indirizzi MAC delle loro schede di rete. Si dice in questo caso che la comunicazione avviene al livello 2, perché entrano in gioco solamente protocolli di livello 2 o minore.

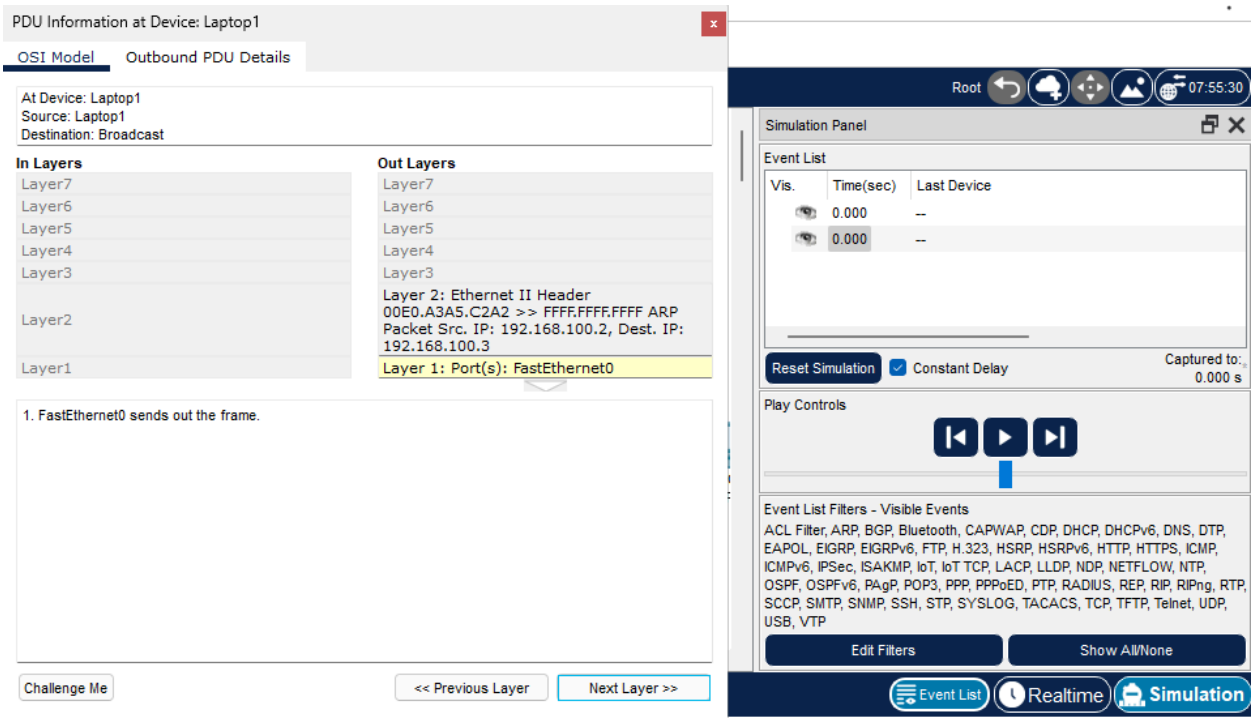
Acronico di Media Access Control, il MAC address non è altro che l'indirizzo fisico unico che viene assegnato alle schede di rete dei nostri computer.

Non appena viene utilizzato il tool ping, viene mandata la richiesta di comunicazione all'indirizzo 192.168.100.3

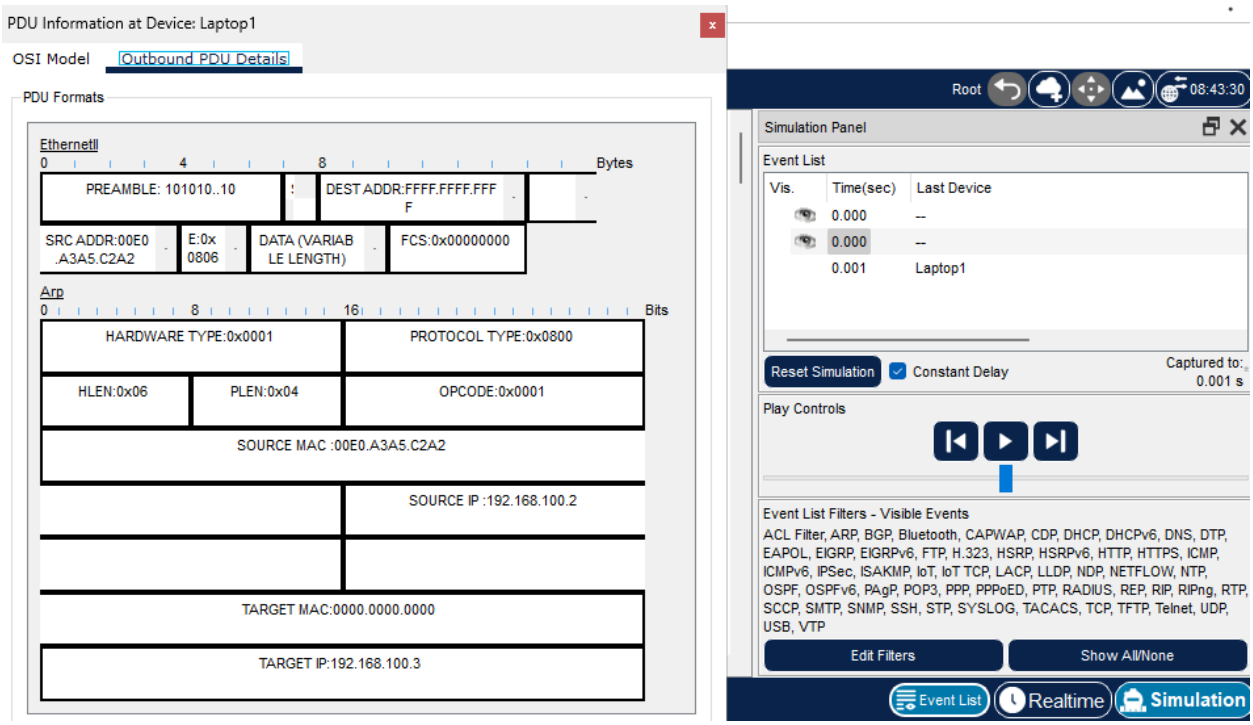

Laptop1
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.100.3
Pinging 192.168.100.3 with 32 bytes of data:
Top
Root
01:04:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.000
--
Reset Simulation
Constant Delay
Captured to:
0.000 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Laptop-PT
Laptop1
Laptop-PT
Laptop0
PC-PT
PC0
2960-24TT
Switch0
Time: 00:00:43.683
PLAY CONTROLS:
Event List
Realtime
Simulation


PDU Information at Device: Laptop1
OSI Model
Outbound PDU Details
At Device: Laptop1
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer2
Layer1
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port(s): FastEthernet0
1. The ARP process constructs a request for the target IP address.
2. The device encapsulates the PDU into an Ethernet frame.
Challenge Me
<< Previous Layer
Next Layer >>
Root
07:40:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.000
--
Reset Simulation
Constant Delay
Captured to:
0.000 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

A livello 1 - Fisico: Il livello fisico si occupa della trasmissione dei dati al livello più basso del modello ISO/OSI. Qui lo scambio avviene su cavi, come un filo di rame, o una fibra ottica. L'informazione proveniente dai livelli più alti del computer sorgente viene spacchettata ed inviata al livello fisico del ricevente sotto forma di «bit».

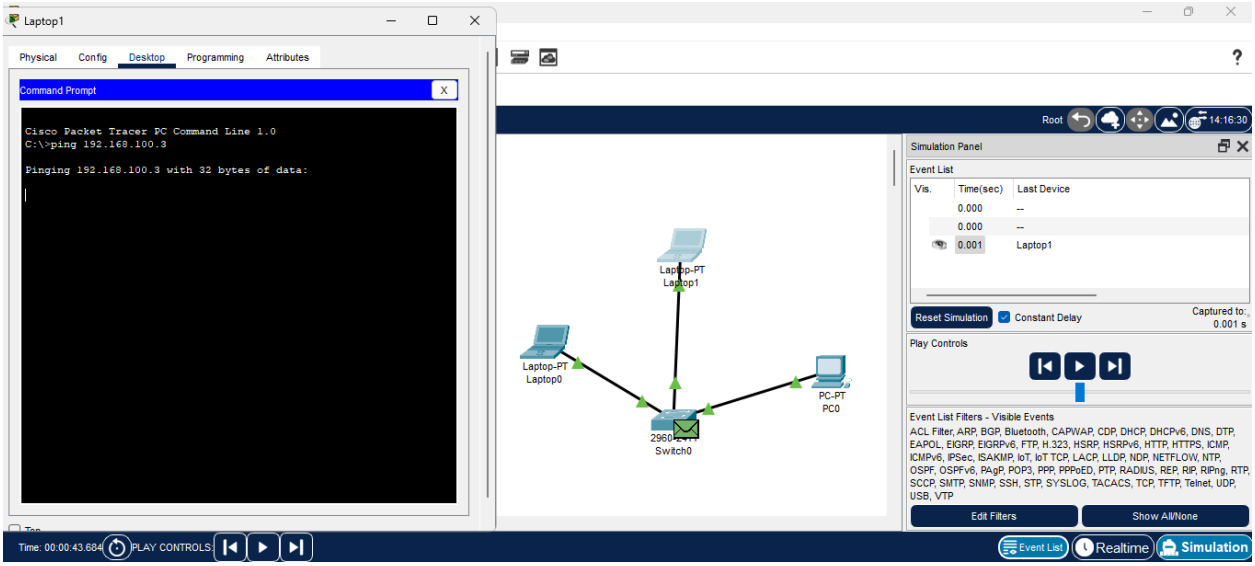


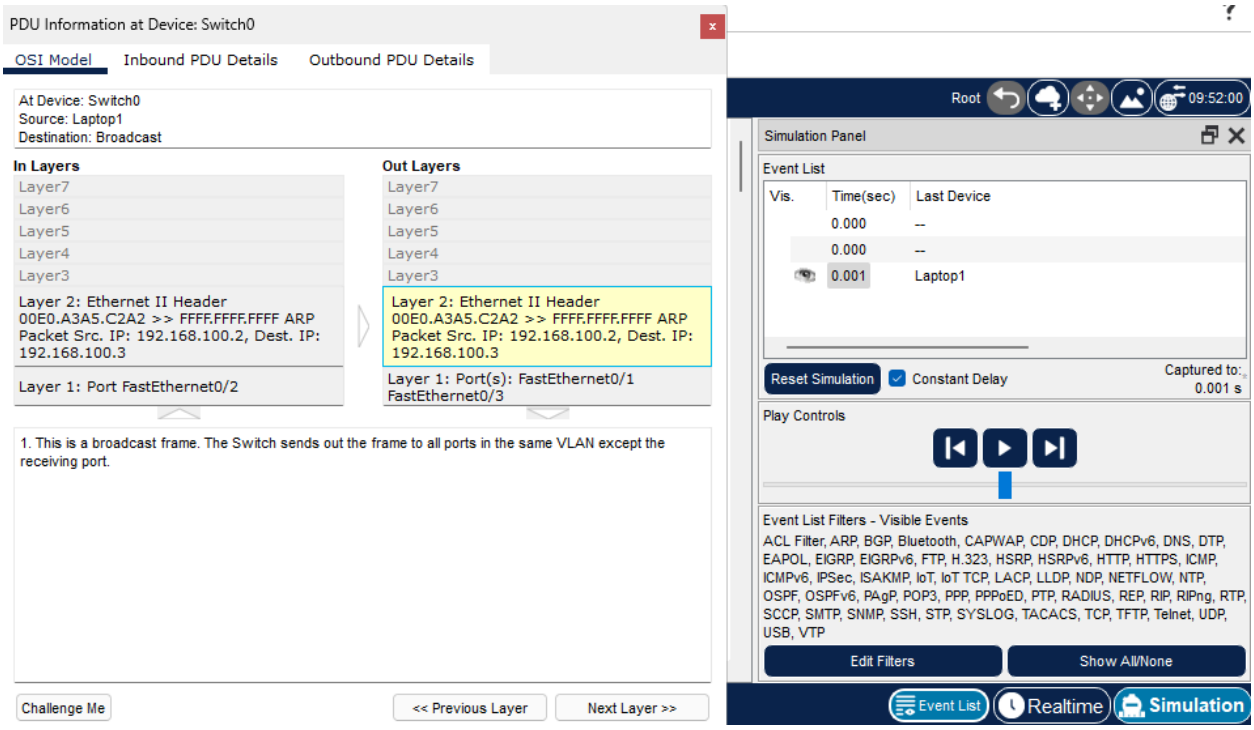
Durante la comunicazione tra due computer, l'intero pacchetto del protocollo superiore (compreso di header e payload) diventa il payload del protocollo di livello inferiore. Questo meccanismo prende il nome di "incapsulamento".

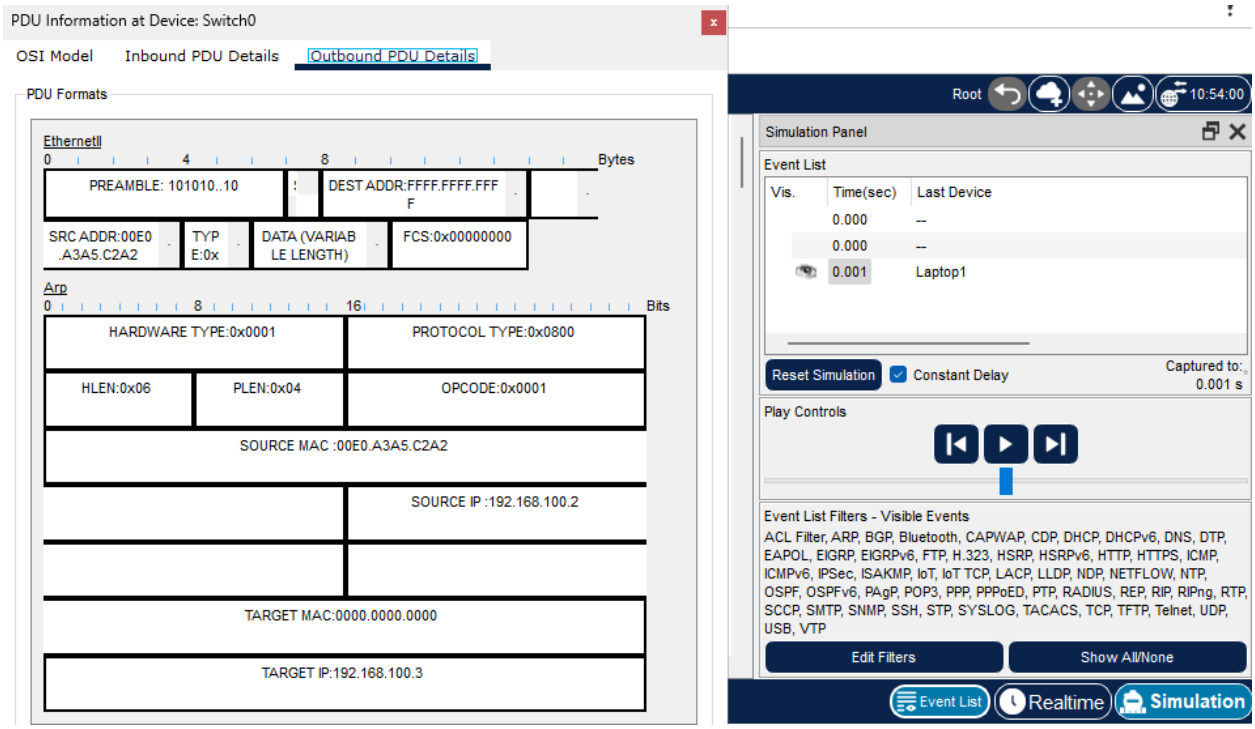


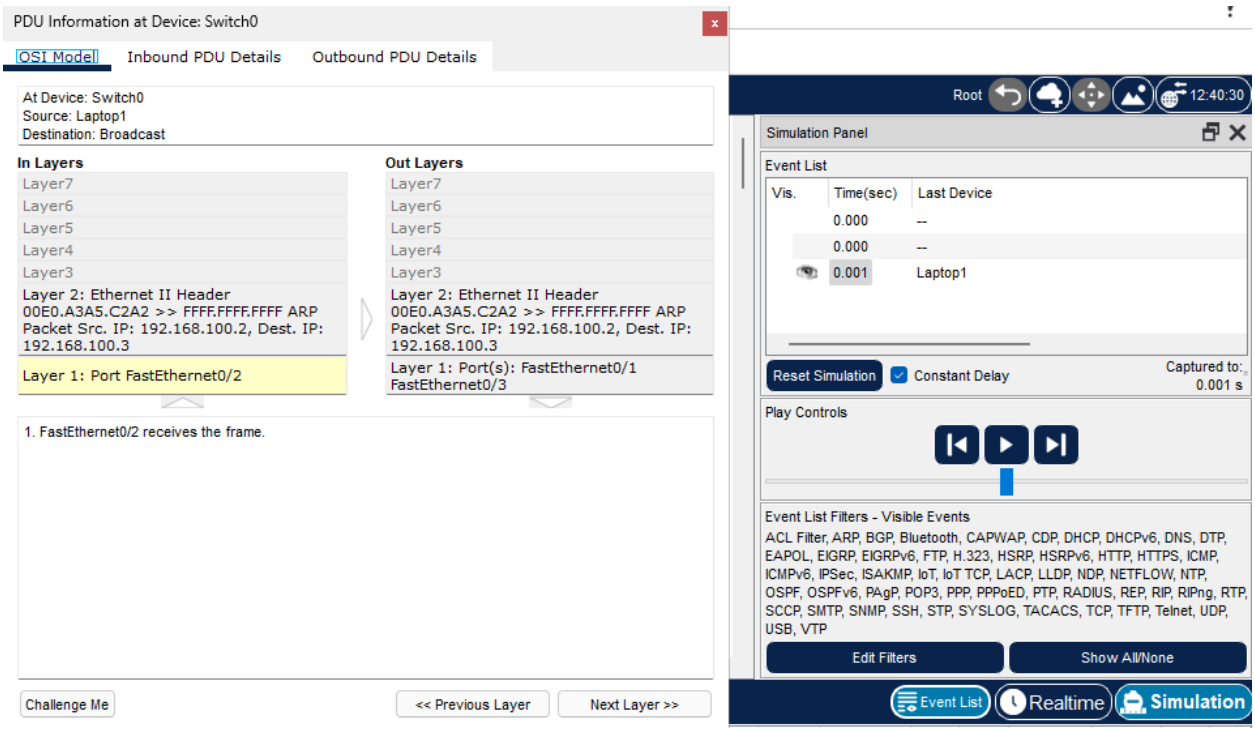
Primo pacchetto in uscita da Laptop1 in broadcast

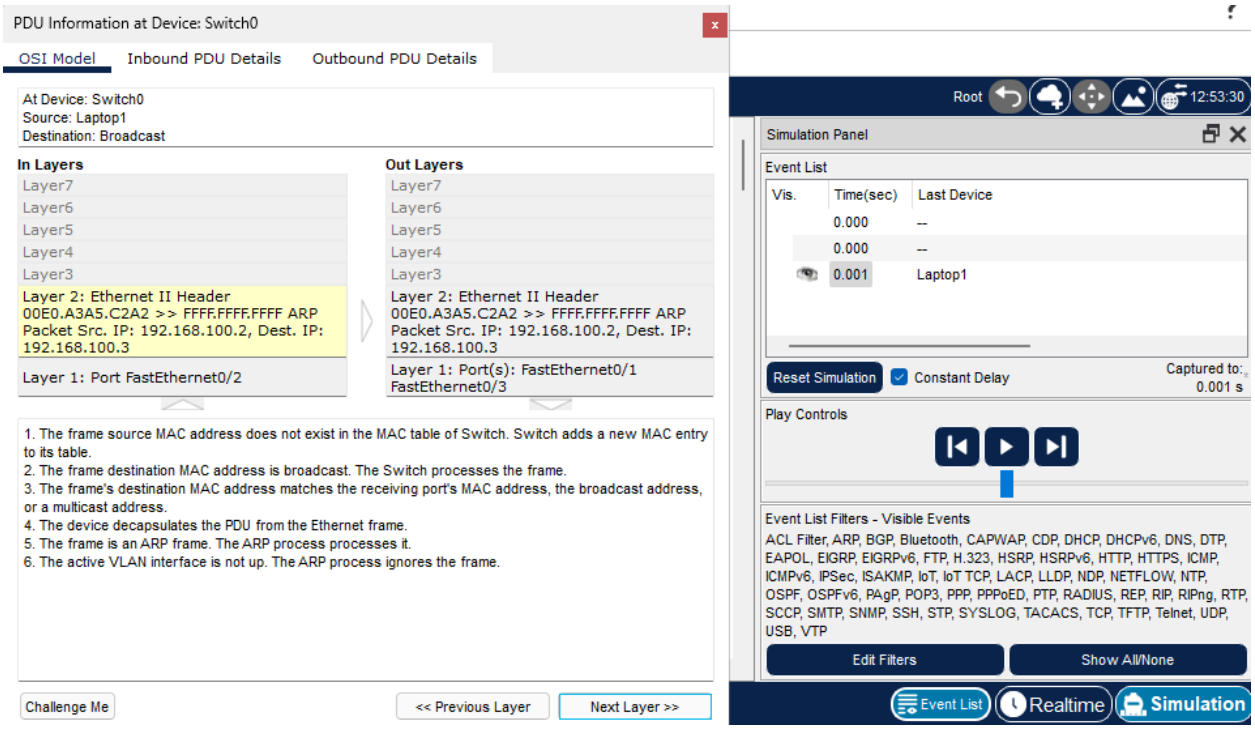
2° : Viene inviato il pacchetto di controllo verso lo switch

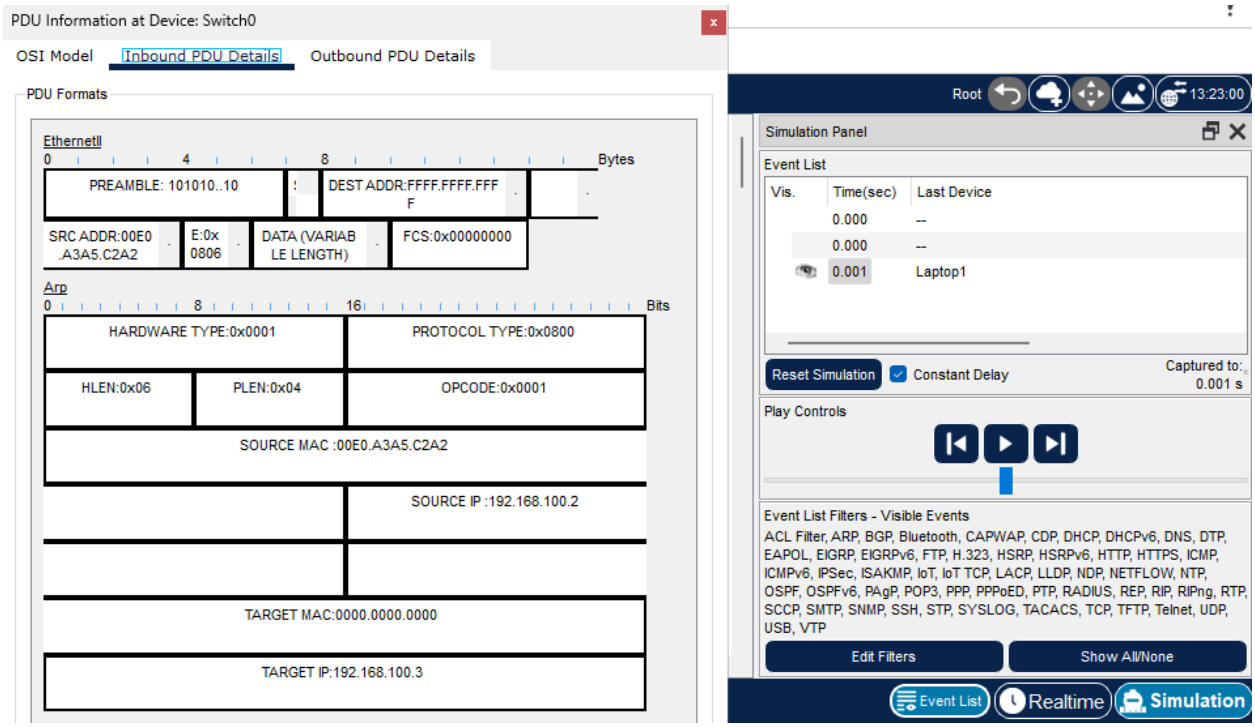



PDU Information at Device: Switch0
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: Switch0
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port FastEthernet0/2
Layer 1: Port(s): FastEthernet0/1 FastEthernet0/3
1. This is a broadcast frame. The Switch sends out the frame to all ports in the same VLAN except the receiving port.
Challenge Me
<< Previous Layer
Next Layer >>
Root
09:52:00
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
0.001
Laptop1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

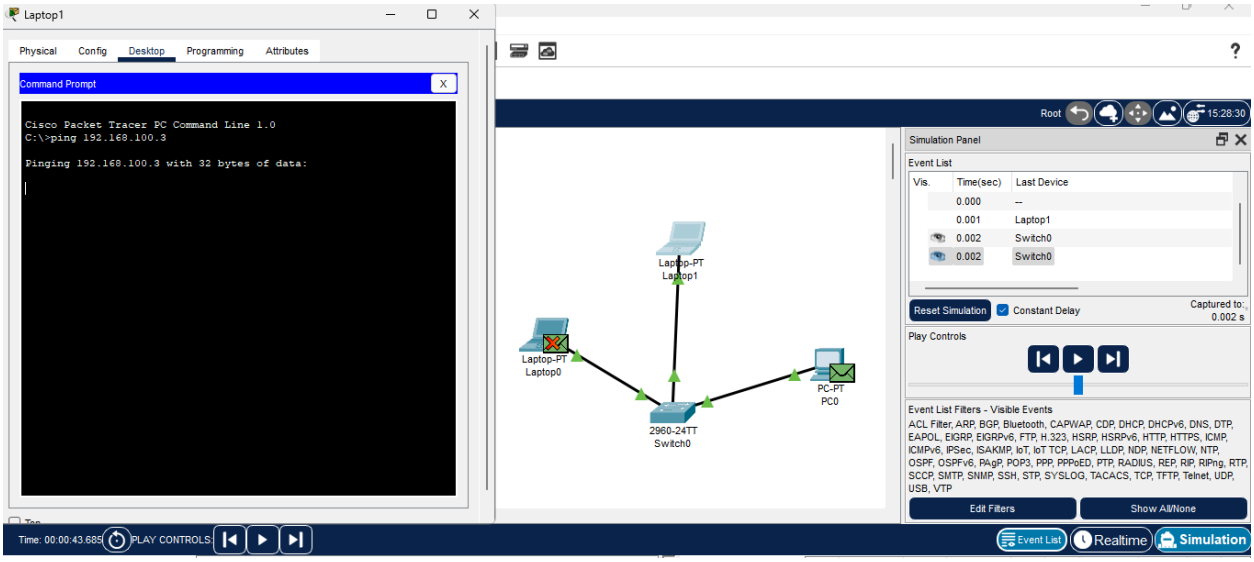

PDU Information at Device: Switch0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernetll
0
4
8
Bytes
PREAMBLE: 101010..10
DEST ADDR:FFFF.FFFF.FFFF
SRC ADDR:00E0.A3A5.C2A2
TYPE:0x
DATA (VARIABLE LENGTH)
FCS:0x00000000
Arp
0
8
16
Bits
HARDWARE TYPE:0x0001
PROTOCOL TYPE:0x0800
HLEN:0x06
PLEN:0x04
OPCODE:0x0001
SOURCE MAC :00E0.A3A5.C2A2
SOURCE IP :192.168.100.2
TARGET MAC:0000.0000.0000
TARGET IP:192.168.100.3
Root
10:54:00
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
0.001
Laptop1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

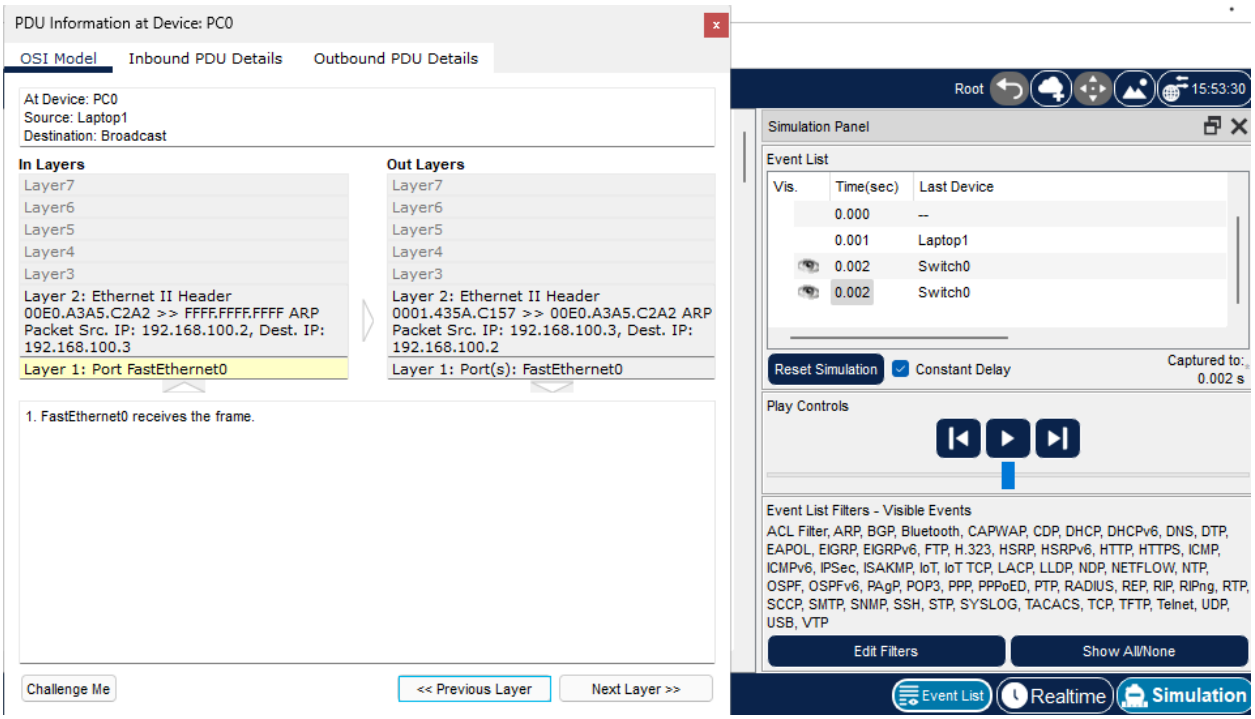

PDU Information at Device: Switch0
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: Switch0
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port FastEthernet0/2
Layer 1: Port(s): FastEthernet0/1 FastEthernet0/3
1. FastEthernet0/2 receives the frame.
Challenge Me
<< Previous Layer
Next Layer >>
Root
12:40:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Laptop1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

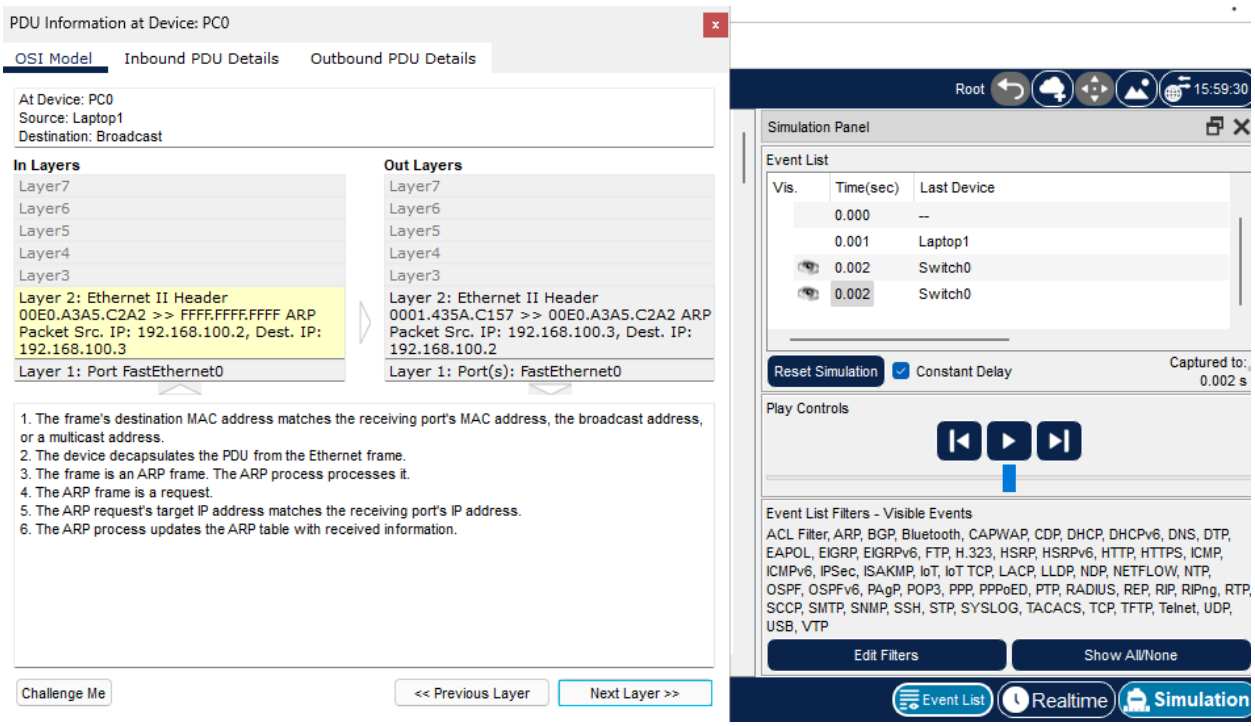

PDU Information at Device: Switch0
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: Switch0
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port FastEthernet0/2
Layer 1: Port(s): FastEthernet0/1 FastEthernet0/3
1. The frame source MAC address does not exist in the MAC table of Switch. Switch adds a new MAC entry to its table.
2. The frame destination MAC address is broadcast. The Switch processes the frame.
3. The frame's destination MAC address matches the receiving port's MAC address, the broadcast address, or a multicast address.
4. The device decapsulates the PDU from the Ethernet frame.
5. The frame is an ARP frame. The ARP process processes it.
6. The active VLAN interface is not up. The ARP process ignores the frame.
Challenge Me
<< Previous Layer
Next Layer >>
Root
12:53:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Laptop1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

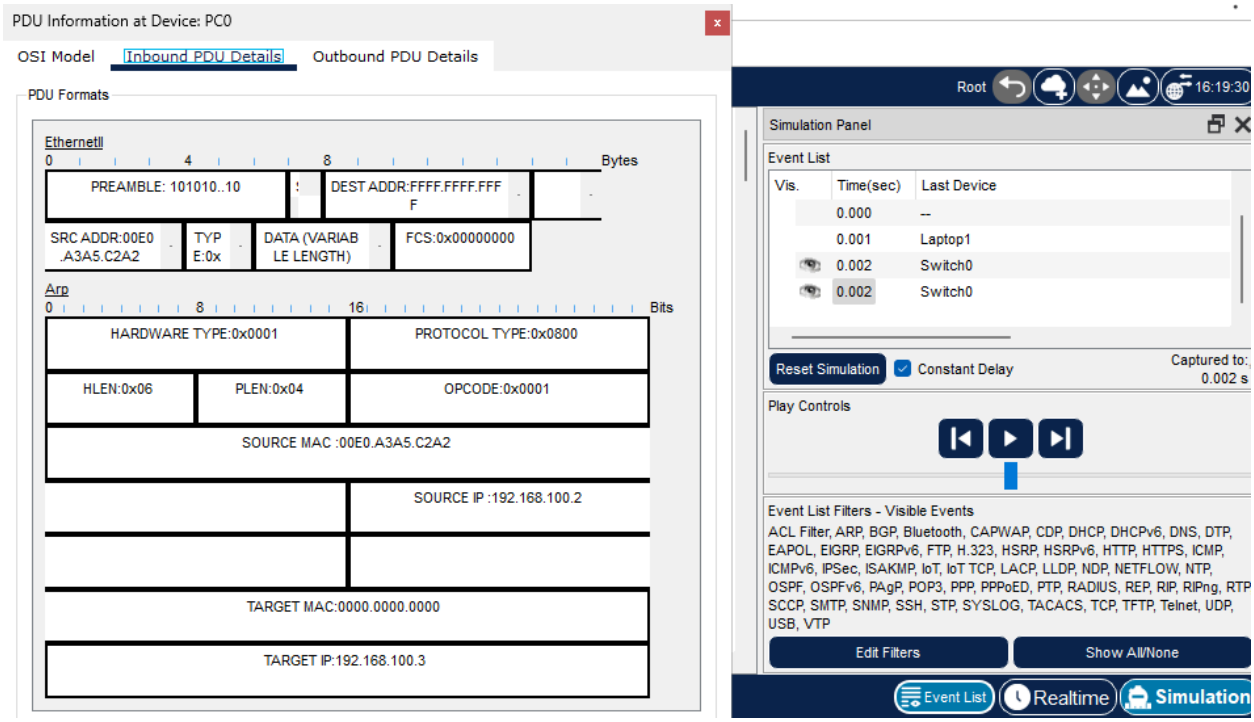

PDU Information at Device: Switch0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
EthernetII
0
4
8
Bytes
PREAMBLE: 101010..10
DEST ADDR:FFFF.FFFF.FFFF
SRC ADDR:00E0.A3A5.C2A2
E:0x0806
DATA (VARIABLE LENGTH)
FCS:0x00000000
Arp
0
8
16
Bits
HARDWARE TYPE:0x0001
PROTOCOL TYPE:0x0800
HLEN:0x06
PLEN:0x04
OPCODE:0x0001
SOURCE MAC :00E0.A3A5.C2A2
SOURCE IP :192.168.100.2
TARGET MAC:0000.0000.0000
TARGET IP:192.168.100.3
Root
13:23:00
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Laptop1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation

3°: Viene inviato in broadcast ad entrambe le macchine, per verificare quale sia quella corretta




PDU Information at Device: PC0
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: PC0
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port FastEthernet0
Layer 2: Ethernet II Header 0001.435A.C157 >> 00E0.A3A5.C2A2 ARP Packet Src. IP: 192.168.100.3, Dest. IP: 192.168.100.2
Layer 1: Port(s): FastEthernet0
1. FastEthernet0 receives the frame.
Challenge Me
<< Previous Layer
Next Layer >>
Root
15:53:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Laptop1
0.002
Switch0
0.002
Switch0
Reset Simulation
Constant Delay
Captured to:
0.002 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation


PDU Information at Device: PC0
OSI Model
Inbound PDU Details
Outbound PDU Details
At Device: PC0
Source: Laptop1
Destination: Broadcast
In Layers
Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3
Layer 2: Ethernet II Header 00E0.A3A5.C2A2 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 192.168.100.2, Dest. IP: 192.168.100.3
Layer 1: Port FastEthernet0
Layer 2: Ethernet II Header 0001.435A.C157 >> 00E0.A3A5.C2A2 ARP Packet Src. IP: 192.168.100.3, Dest. IP: 192.168.100.2
Layer 1: Port(s): FastEthernet0
1. The frame's destination MAC address matches the receiving port's MAC address, the broadcast address, or a multicast address.
2. The device decapsulates the PDU from the Ethernet frame.
3. The frame is an ARP frame. The ARP process processes it.
4. The ARP frame is a request.
5. The ARP request's target IP address matches the receiving port's IP address.
6. The ARP process updates the ARP table with received information.
Challenge Me
<< Previous Layer
Next Layer >>
Root
15:59:30
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Laptop1
0.002
Switch0
0.002
Switch0
Reset Simulation
Constant Delay
Captured to:
0.002 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation



Si conclude qui l'esercizio