

Lab #3 : Physical Layer

Communication Networks
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Academic Year : 2025/2026
Duration : 1 session

Objectives :

- Understand how data is sent over the physical layer
- Understand how a Hub operates.

Exercise #1 :

A. General questions about OSI physical layer :

1. What are the main tasks of the physical layer ?

Your Answer :

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2. Give two examples of network devices operating under the OSI physical layer.

Your Answer :

B. Suppose you have two rooms containing 3 PCs each.

1. Open Packet Tracer
2. Add 6 PCs.
3. Add 2 Hubs (Hub0 and Hub1).
4. Connect the first 3 PCs to the first Hub (Hub0). Use the appropriate wired connection cable.
5. Connect the remaining 3 PCs to the second Hub (Hub1). Use the appropriate wired connection cable.
6. Connect Hub0 to Hub1. Use the appropriate wired connection cable.
7. Set the IP addresses and Masks of the 6 PCs according to the following table.

PC	IP address	Mask	Connected to
PC0	10.10.10.1	255.0.0.0	Hub0
PC1	10.10.10.2	255.0.0.0	Hub0
PC2	10.10.10.3	255.0.0.0	Hub0
PC3	10.10.10.4	255.0.0.0	Hub1
PC4	10.10.10.5	255.0.0.0	Hub1
PC5	10.10.10.6	255.0.0.0	Hub1

8. Show the IP address of PC0 using a command.

Your Answer :

9. Do the same thing with PC1.

IP address of PC1 :

10. Test the connection from PC0 to PC5 using a command.

Report the result :

11. Show the IP address of Hub0.

Your Answer :

Explain :

12. Restart PC0.

13. Switch to simulation mode.

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14. Add Simple PDU (from PC0 to PC5). You will see two PDUs (messages) generated by

PC0 with different colors



. Identify their types from the event list.

PDU1 type :

PDU2 type :

15. Start simulation (Capture).

16. Watch and observe the behavior of the Hub0 and Hub1.

17. When Hub0 receives the first PDU from PC0, what does it do?

Your Answer :

18. Explain why PC1 drops the incoming PDU ?

Your Answer :

19. In the event list, investigate and identify the number of layers that are participating in the forwarding of ARP and ICMP PDUs at : PC0, Hub0, Hub1 and PC5.

PC0 :

Hub0 :

Hub1 :

PC5 :

20. Which OSI layer of PC0 has generated the ARP and ICMP PDUs ?

Your Answer :

21. Now, select the PDU information at device PC0 → Outband PDU details. What are the destination addresses of the Ethernet PDU and the IP PDU for both PDUs?

Ethernet :

IP :

22. Is it the same ? explain why.

Your Answer :

23. (Bonus question) : In question 12, explain why we have restarted PC0.