

INTRODUCTION TO NETWORKING

ASSIGNMENT REPORT



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1. INTRODUCTION

This module focused on the fundamentals of networking. It covered core concepts such as network topologies like the bus, star, ring, and tree topologies, network models such as the OSI and TCP/IP models, addressing, subnetting, and network protocols.

2. ANSWERS TO QUESTIONS

Questions in this module were only available for the Subnetting section.

Subnetting

An IPv4 address is divided into 4 octets, each octet consisting of 8 bits, a total of 32 bits.

11111111.11111111.11111111.11111111

Below is a decimal representation of each bit's value. All bits sum to 255

128	64	32	16	8	4	2	1
1	1	1	1	1	1	1	1

- a. **Submit the decimal representation of the subnet mask from the following CIDR:**

10.200.20.0/27

/ 27 subnet mask means that the first 3 octets are full(bit 1), and the first 3 bits of the 4th octet are also full, i.e 11111111.11111111.11111111.11100000

In decimal representation, the last octet will be $128 + 64 + 32 = 224$

Therefore, the decimal representation of the subnet mask will be

255.255.255.224

- b. **Submit the broadcast address of the following CIDR: 10.200.20.0/27**

The full bits in the last octet define the number of networks that will be formed, i.e. 2^n where n is the number of bits.

Therefore: $2^3 = 8$ subnets

Each subnet will consist of 32 hosts

The IP address 10.200.20.0 lies within the first subnet. The broadcast address is the last IP address within the subnet, that is **10.200.20.31**

- c. **Split the network 10.200.20.0/27 into 4 subnets and submit the network address of the 3rd subnet as the answer.**

We've identified that this network will consist of 32 hosts only. Splitting the network further into 4 subnets will have each subnet containing 8 hosts.

Subnet	IP Range
1	10.200.20.0 – 10.200.20.7
2	10.200.20.8 – 10.200.20.15
3	10.200.20.16 – 10.200.20.23
4	10.200.20.24 – 10.200.20.31

The network address of the 3rd subnet refers to the first IP address in the subnet, that is **10.200.20.16**

- d. Split the network 10.200.20.0/27 into 4 subnets and submit the broadcast address of the 2nd subnet as the answer.

The broadcast address of the 2nd subnet refers to the last IP address in the subnet, that is **10.200.20.15**

Questions

Answer the question(s) below to complete this Section and earn cubes!

+2 🟢 Submit the decimal representation of the subnet mask from the following CIDR: 10.200.20.0/27

255.255.255.224

Submit

+2 🟢 Submit the broadcast address of the following CIDR: 10.200.20.0/27

10.200.20.31

Submit

+3 🟢 Split the network 10.200.20.0/27 into 4 subnets and submit the network address of the 3rd subnet as the answer.

10.200.20.16

Submit

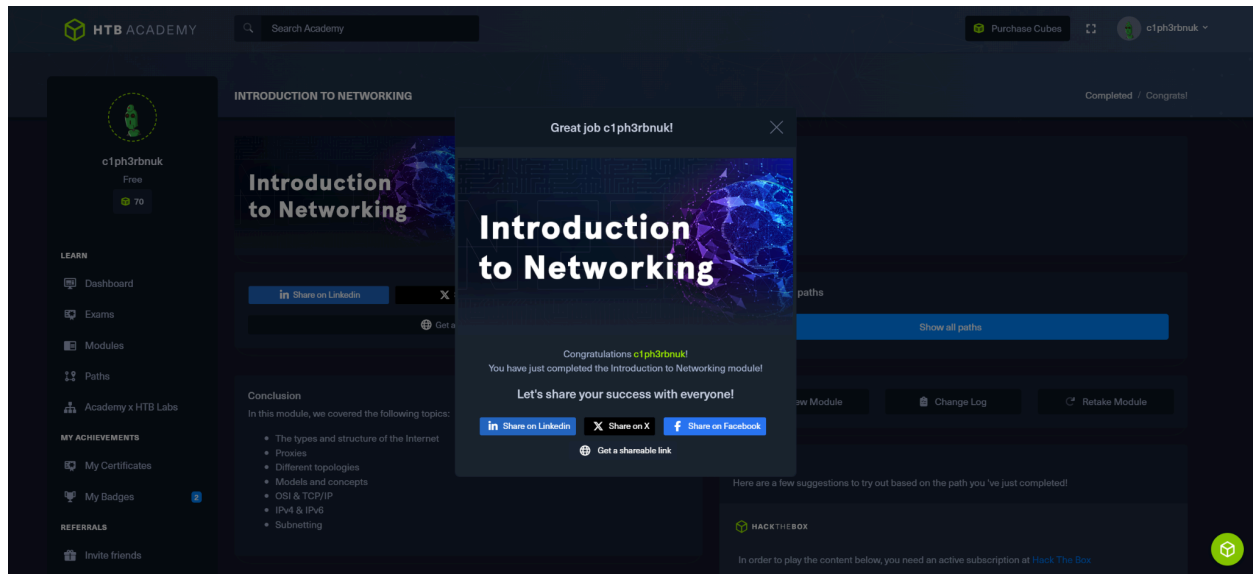
+3 🟢 Split the network 10.200.20.0/27 into 4 subnets and submit the broadcast address of the 2nd subnet as the answer.

10.200.20.15

Submit

3. MODULE COMPLETION

<https://academy.hackthebox.com/achievement/144829/34>



4. CONCLUSION

This was a very comprehensive introduction to networking concepts. I have learned a lot from dividing a network into smaller networks using subnetting to network protocols like TCP, UDP, ICMP etc and cryptography concepts like Diffie-Hellman key exchange, DES, AES and RSA. This assignment has helped me build a solid foundation for networking, which is crucial for me as a security analyst to understand how communication works over the Internet and also during the Network Scanning phase in penetration testing.