



INTRODUCTION TO IP SUBNETTING

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Can you recognise a valid IP address?

192.128.3.111

1.2.3.4

333.333.333.333

1.1.1.1

10.10.10.10

222.222.222.222

123.456.789.10

IP Address Basics

- IP = Internet Protocol
- 4 octets
- In the form of x.x.x.x
- Each octet is equal to 1 byte
- Therefore, IP address is 32 bits long
- But why do devices need IP addresses?

Private & Public IP Ranges

Private Ranges:

Class A:

10.0.0.0 - 10.255.255.255

128 possible networks x 16,777,216 hosts each

Class B:

172.16.0.0 - 172.31.255.255

16,384 possible networks x 65,536 hosts each

Class C:

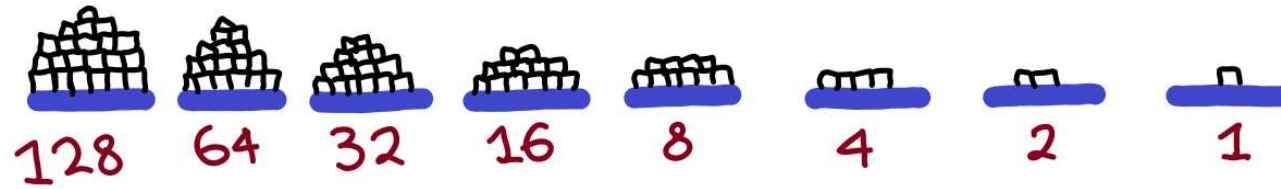
192.168.0.0 - 192.168.255.255

2,097,152 possible networks x 256 hosts each

Public Ranges:

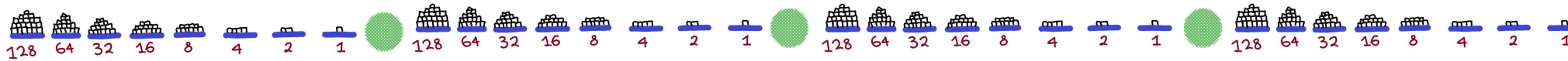
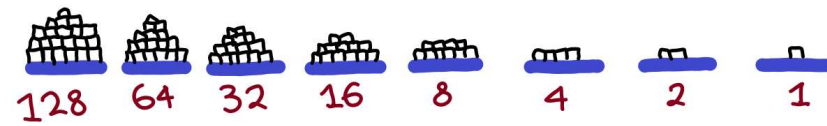
All the rest

Working with Binary



Binary in Networking

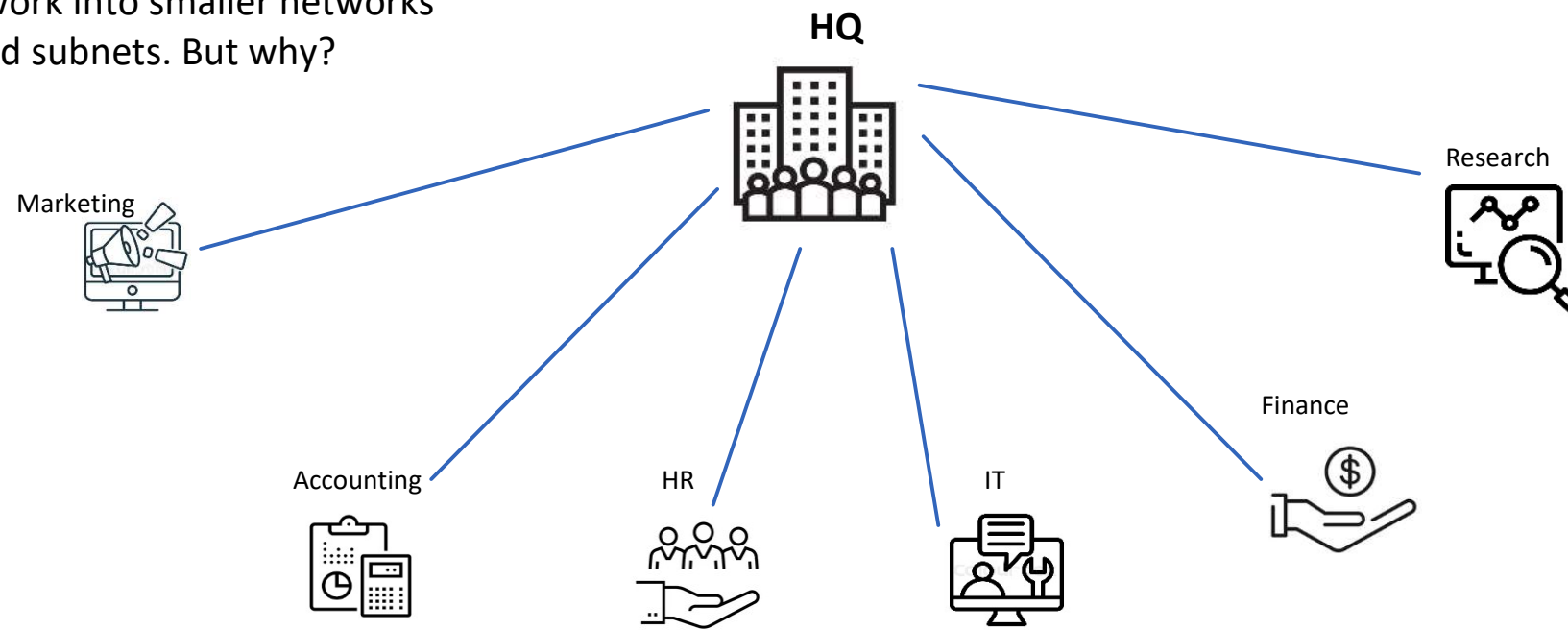
- IP address --> 4 octets
- Each octet equals 1 byte (8 bits)
- 8 bits --> 8 binary ones --> 11111111 --> 255



Subnetting 1

It is the process of dividing a big network into smaller networks called subnets. But why?

10.0.0.0 - 10.0.7.255



Subnet Mask

It is the critical component to identify the scope of a network range.

In binary: a series of consecutive 1s (network part) followed by a series of consecutive 0s (hosts part).

Example 1

Network IP address: 10.0.0.0

Subnet mask: 255.255.255.0

Example 2

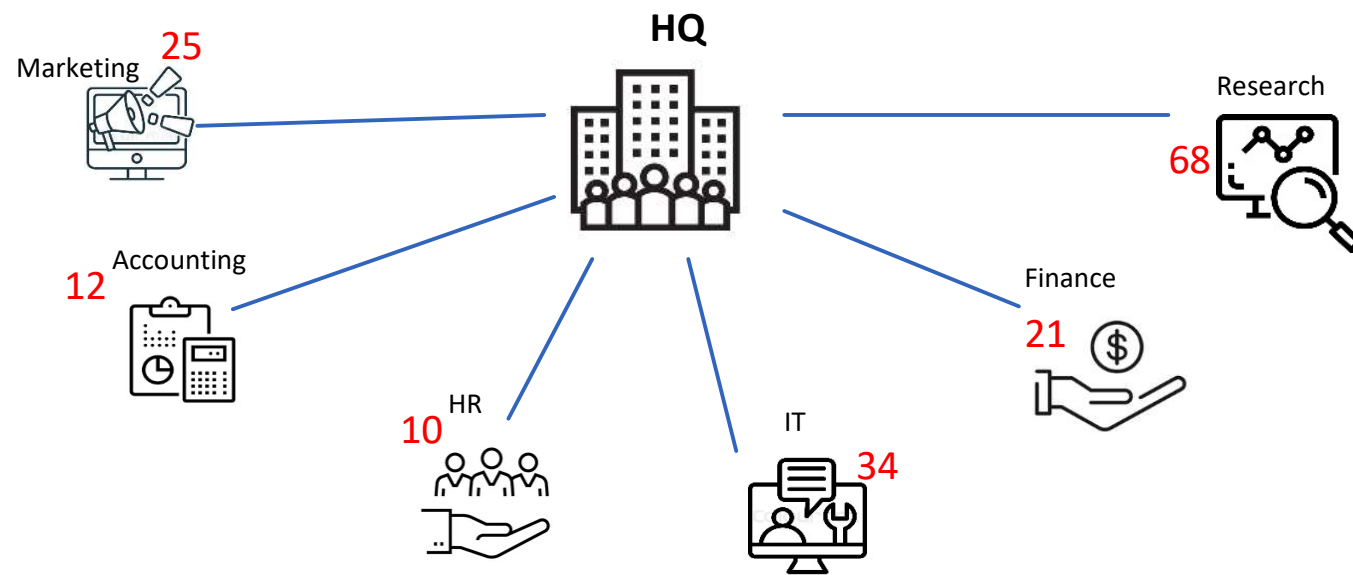
Network IP address: 10.0.0.0

Subnet mask: 255.255.255.128

Subnetting 2 - VLASM

Various Length Subnet Mask

10.0.0.0 - 10.0.7.255



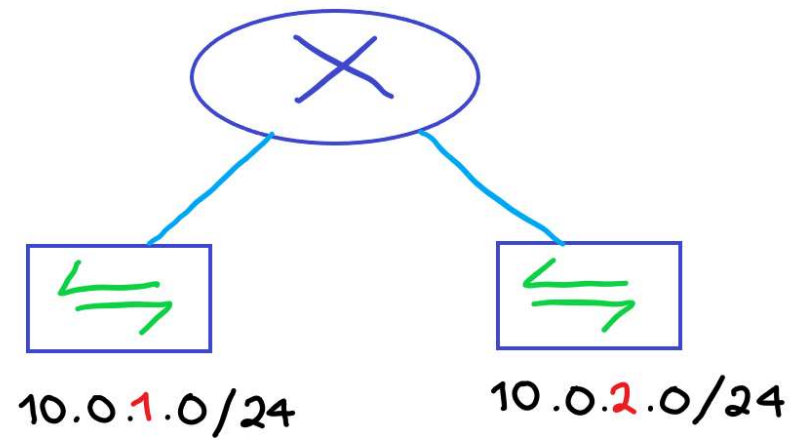
CIDR Notation

Classless Inter-Domain Routing

It is a different way to communicate the subnet scope (size).

Default Gateway

This is the IP address of the subnet's router.
It has to be on the same subnet as all the client devices.



Resources

Windows Command Line:
ipconfig/all

<http://jodies.de/ipcalc>

<https://www.freecodecamp.org/news/subnet-cheat-sheet-24-subnet-mask-30-26-27-29-and-other-ip-address-cidr-network-references/>

Questions?

Thank you!

I hope this has been informative for you.
Thank you for joining me!



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