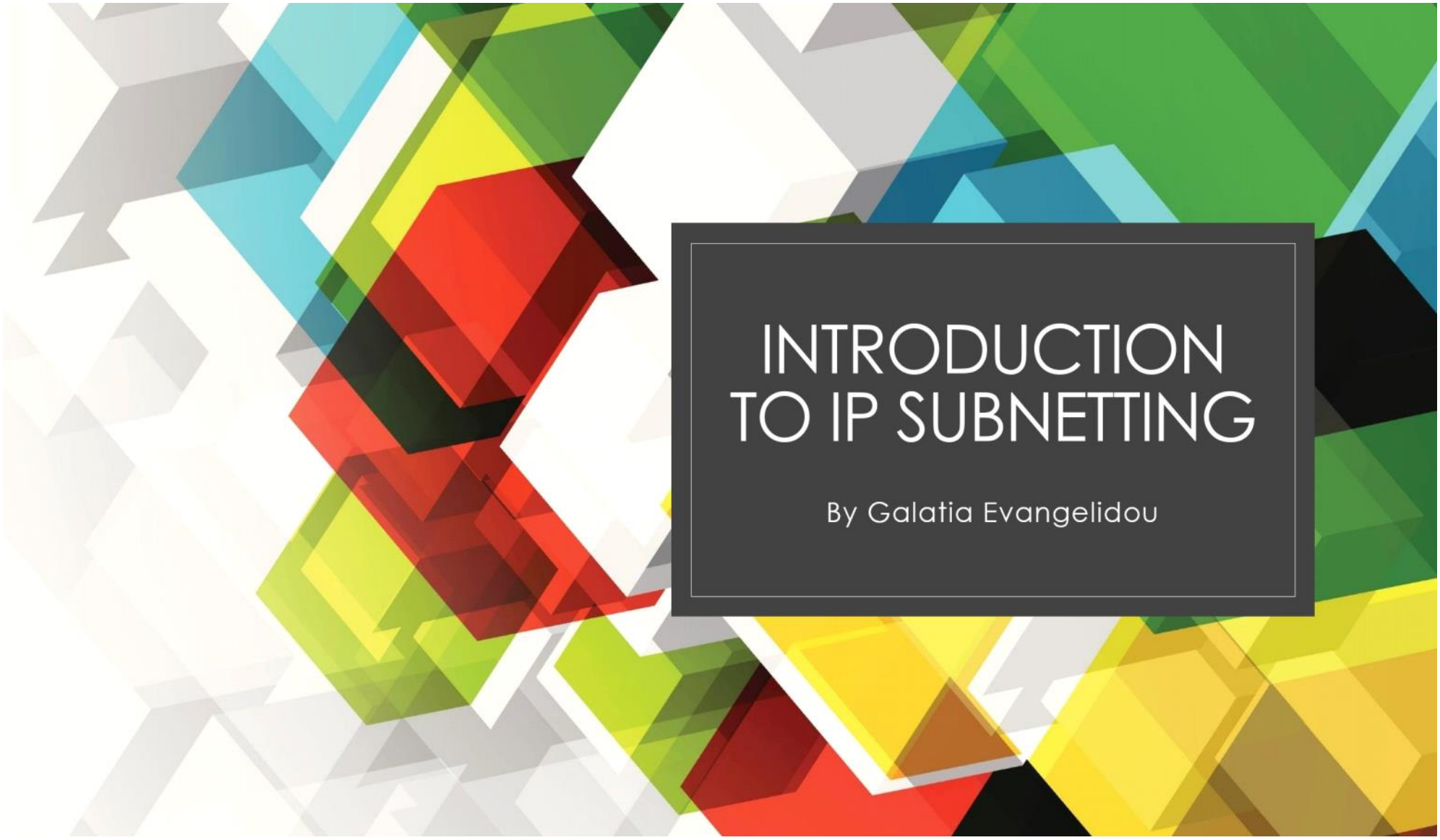

INTRODUCTION
TO IP SUBNETTING
By Galatia Evangelidou

# 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

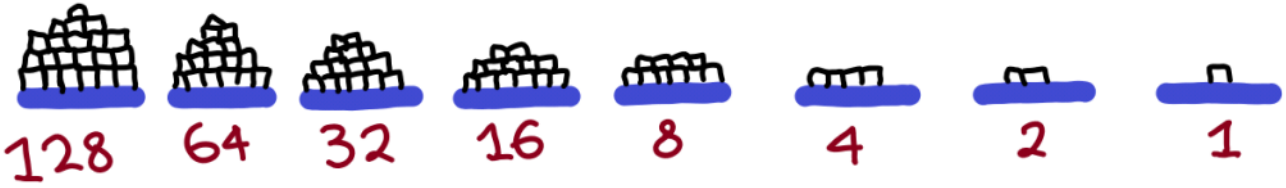
Class B:
172.16.0.0 - 172.31.255.255
16,384 possible networks x 65,536 hosts each

Class C:
192.168.0.0 - 192.168.255.255
2,097,152 possible networks x 256 hosts each

Public Ranges:

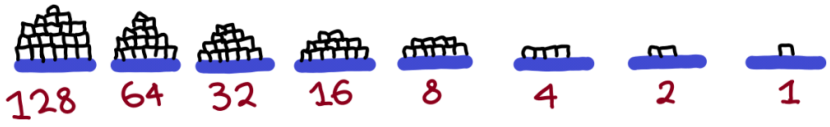
All the rest

# Working with Binary




# Binary in Networking

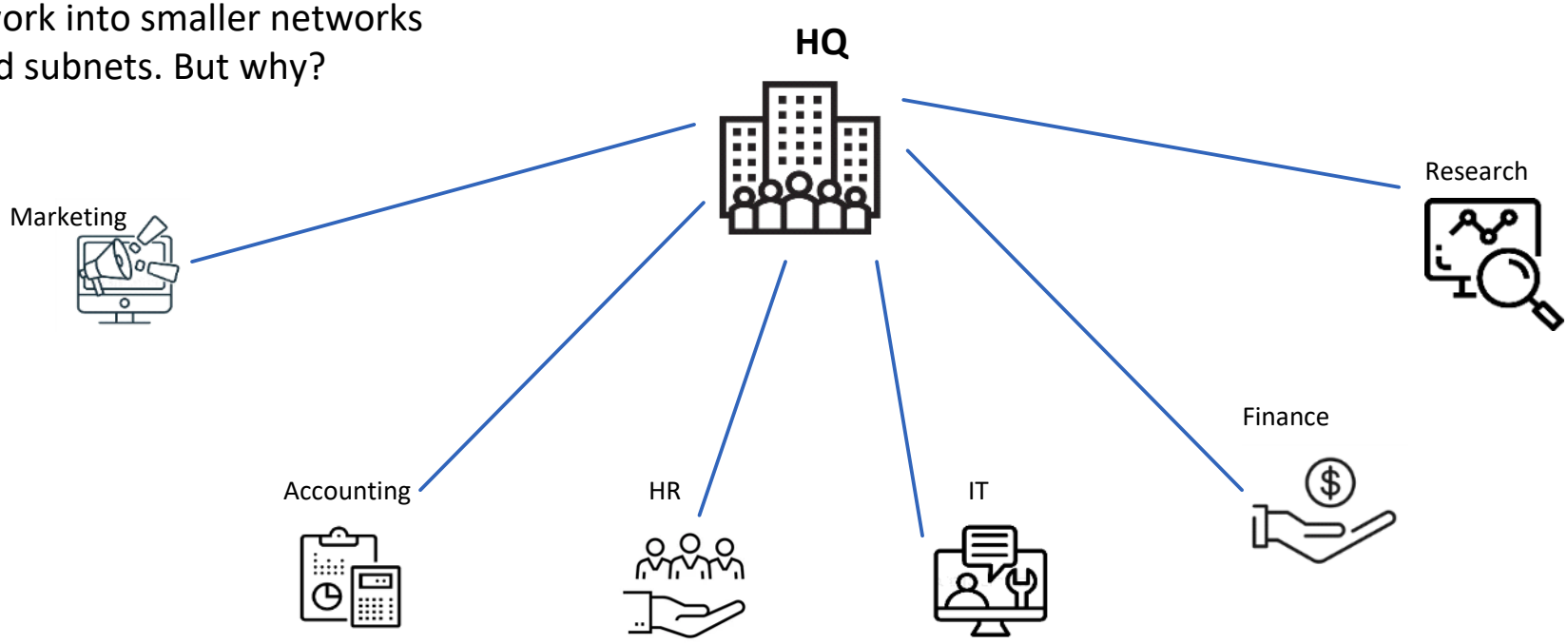
- IP address --> 4 octets
- Each octet equals 1 byte (8 bits)
- 8 bits --> 8 binary ones --> 11111111 --> 255




# Subnetting 1

10.0.0.0 - 10.0.7.255

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



# 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).

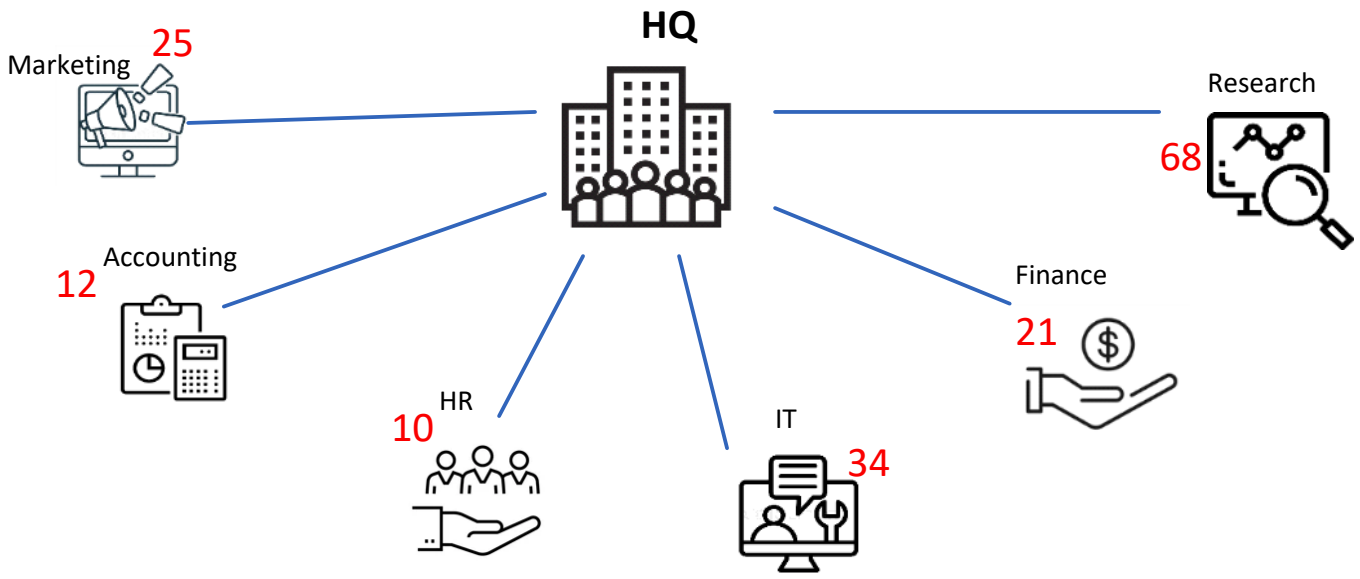
Example 1
Network IP address: 10.0.0.0
Subnet mask: 255.255.255.0

Example 2
Network IP address: 10.0.0.0
Subnet mask: 255.255.255.128

# Subnetting 2 - VLSM

10.0.0.0 - 10.0.7.255

Various Length Subnet Mask



# 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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