

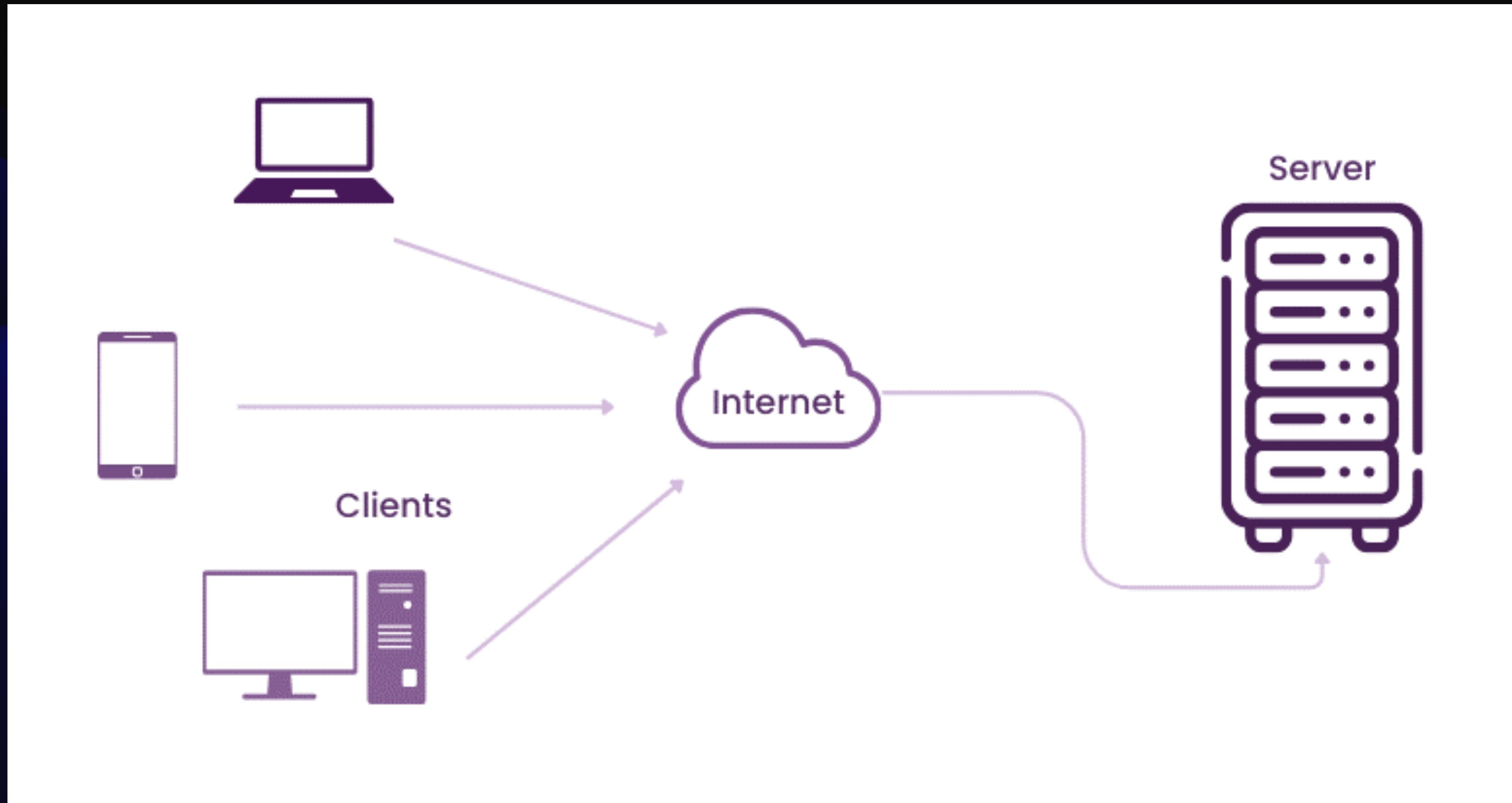
# In the name of God

**Amirkabir University of Technology**

Advanced Programming

**Mahdi Haeri**

# Client-Server Application

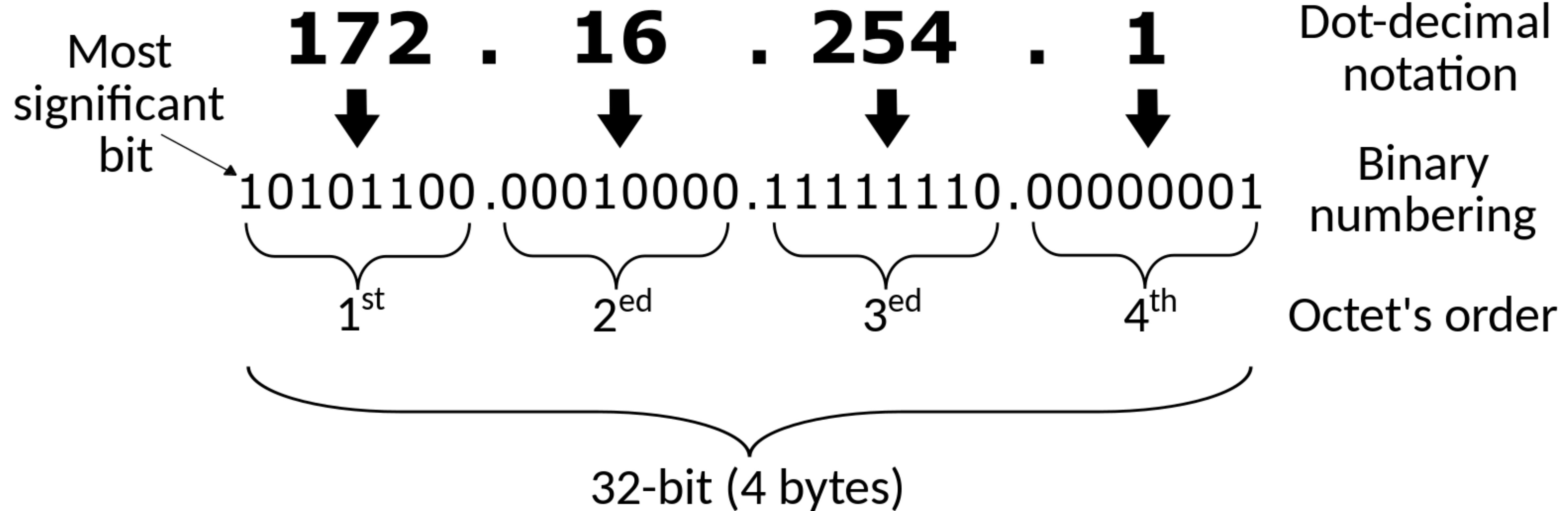


# Network



# What is IP Address?

# IP Address



$$2^{32} = 4,294,967,296 \approx 4.3 \text{ Billion}$$

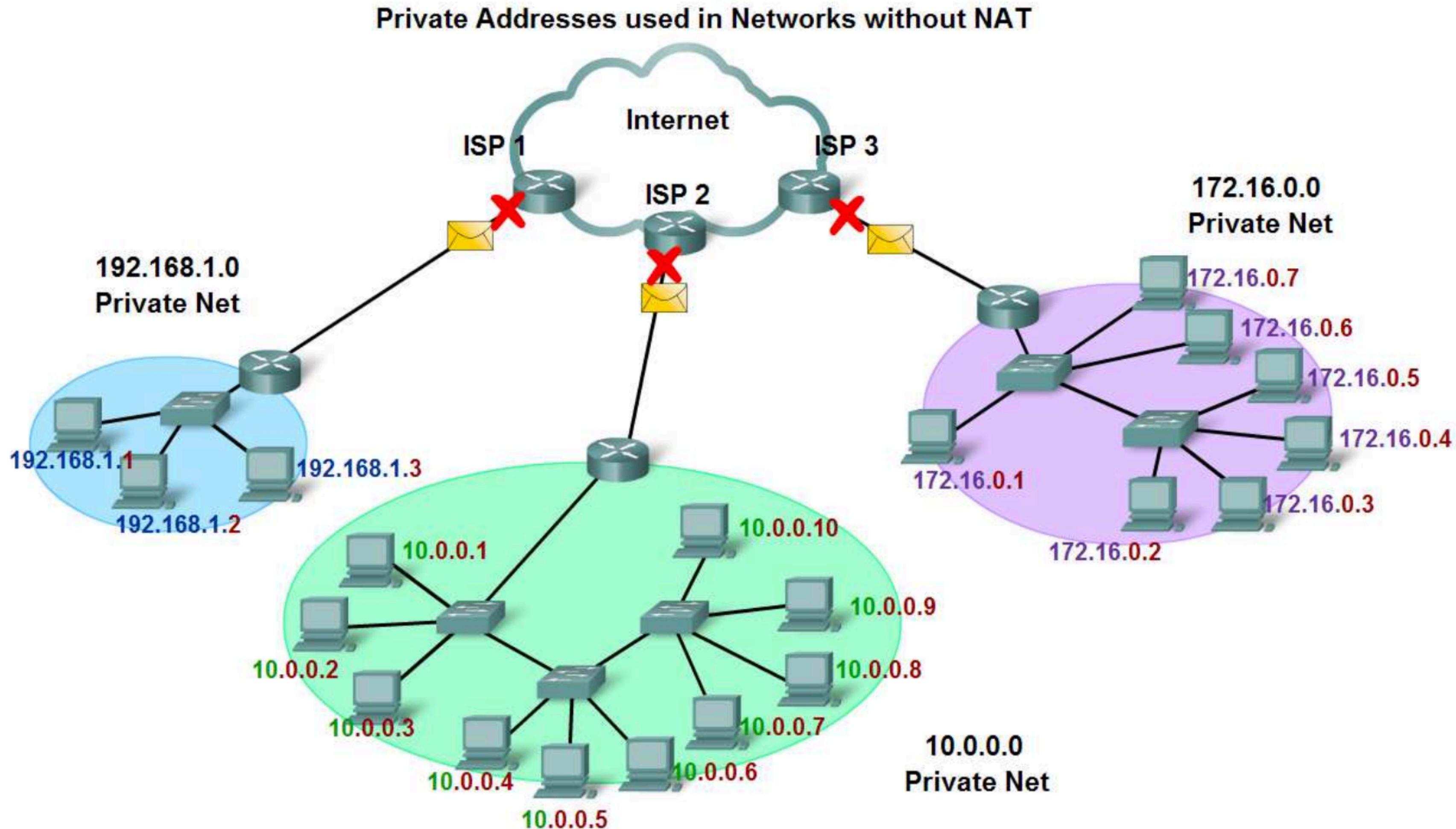
# Public IP vs Private IP

# Reserved private IPv4 network range

Name	CIDR block	Address range	Number of addresses	Classful description
24-bit block	10.0.0.0/8	10.0.0.0 – 10.255.255.255	16 777 216	Single Class A
20-bit block	172.16.0.0/12	172.16.0.0 – 172.31.255.255	1 048 576	Contiguous range of 16 Class B blocks
16-bit block	192.168.0.0/16	192.168.0.0 – 192.168.255.255	65 536	Contiguous range of 256 Class C blocks

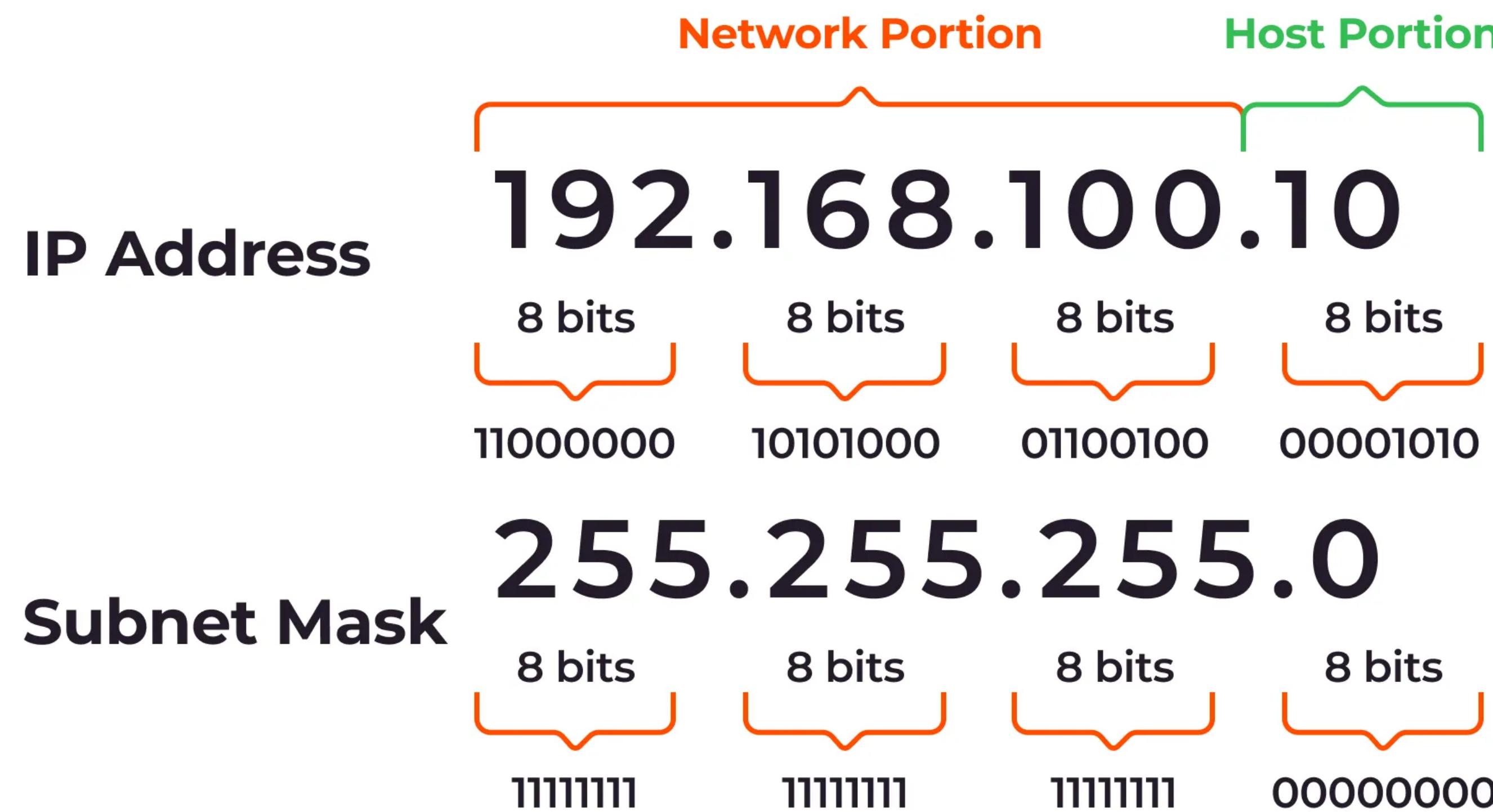


# Define public address and private address



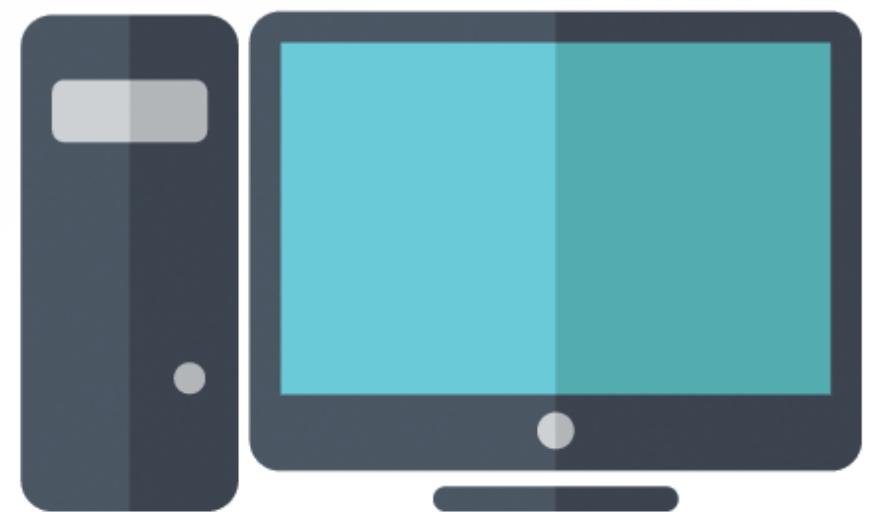
# What is Netmask?

## Binary Notation of IP Address and Subnet





# What is Socket?



**192.168.1.255**

IP Address  
(Computer)



**3389**

Port Number  
(Application)

**=**

**192.168.1.255:3389**

**Socket Address**

## Socket Programming

**Client**

socket()

connect()

Read/write  
Data

close()

**Server**

socket()

bind()

listen()

accept()

Read/write  
Data

close()

# Data Serialization Formats

**JSON - YAML - XML**

# Data Serialization Formats

YAML

```
apis:  
  - name: login  
    port: 8080  
  - name: profile  
    port: 8090
```

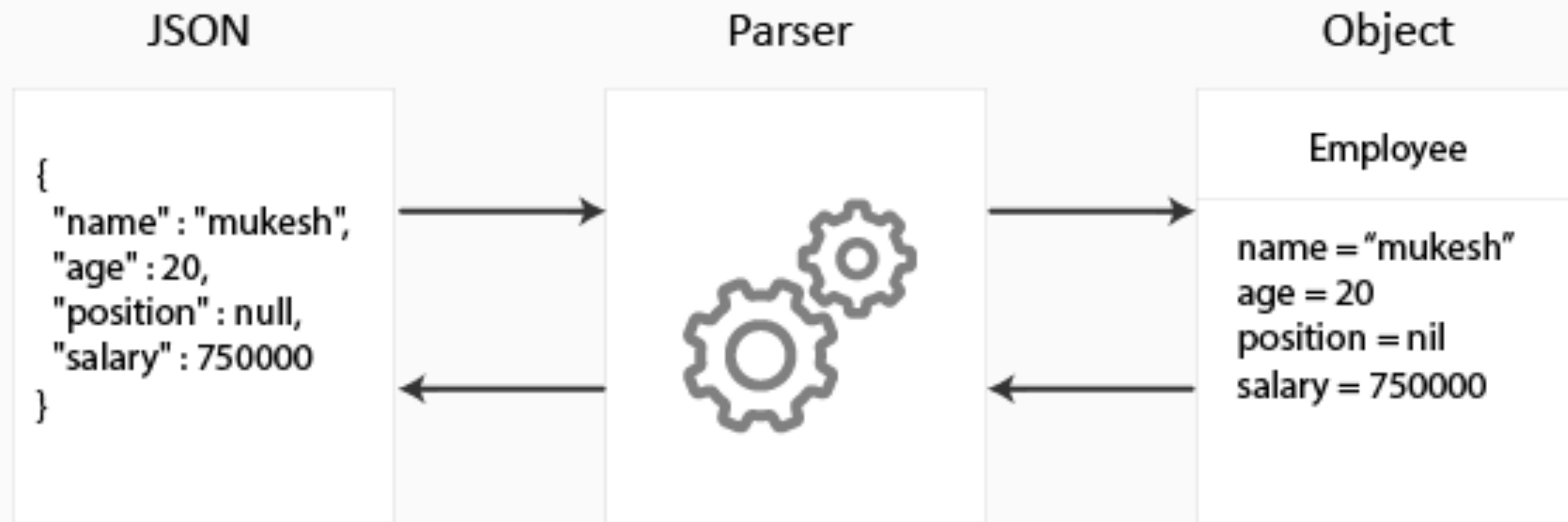
XML

```
<apis>  
  <api>  
    <name>login</name>  
    <port>8080</port>  
  </api>  
  <api>  
    <name>profile</name>  
    <port>8090</port>  
  </api>  
</apis>
```

JSON

```
{  
  "apis": [  
    {  
      "name": "login",  
      "port": 8080  
    },  
    {  
      "name": "profile",  
      "port": 8090  
    }  
  ]}
```

# JSON Parser Swift



The background features a dark blue gradient with three prominent, wavy horizontal bands that create a sense of depth and motion.

# What is HTTP Protocol?

# HTTP Request

Method	URL	Protocol Version
GET /index.html		HTTP/1.1
Host: www.example.com		
User-Agent: Mozilla/5.0		
Accept: text/html, */*		
Accept-Language: en-us		
Accept-Charset: ISO-8859-1,utf-8		
Connection: keep-alive		
<i>blank line</i>		

Headers {

Body (optional) {

POST /?id=1 HTTP/1.1

## Request line

Host: www.swingvy.com

Content-Type: application/json; charset=utf-8

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.12; rv:53.0)

Gecko/20100101 Firefox/53.0

Connection: close

Content-Length: 136

## Header

```
{  
  "status": "ok",  
  "extended": true,  
  "results": [  
    {"value": 0, "type": "int64"},  
    {"value": 1.0e+3, "type": "decimal"}  
  ]  
}
```

## Body message

# HTTP Request Methods

**GET**



Retrieving a  
single or  
multiple  
resources

**POST**



Creating a  
new resource

**PATCH**



Updating an  
existing  
resource

**PUT**



Updating Or  
Creating new  
resource

**DELETE**



Destroying a  
resource



Mahmoud217TR



mahmoud-mahmoud-ab8708183

# URL Anatomy

https://example.com:80/blog?search=test&sort\_by=created\_at#header



Protocol



Domain



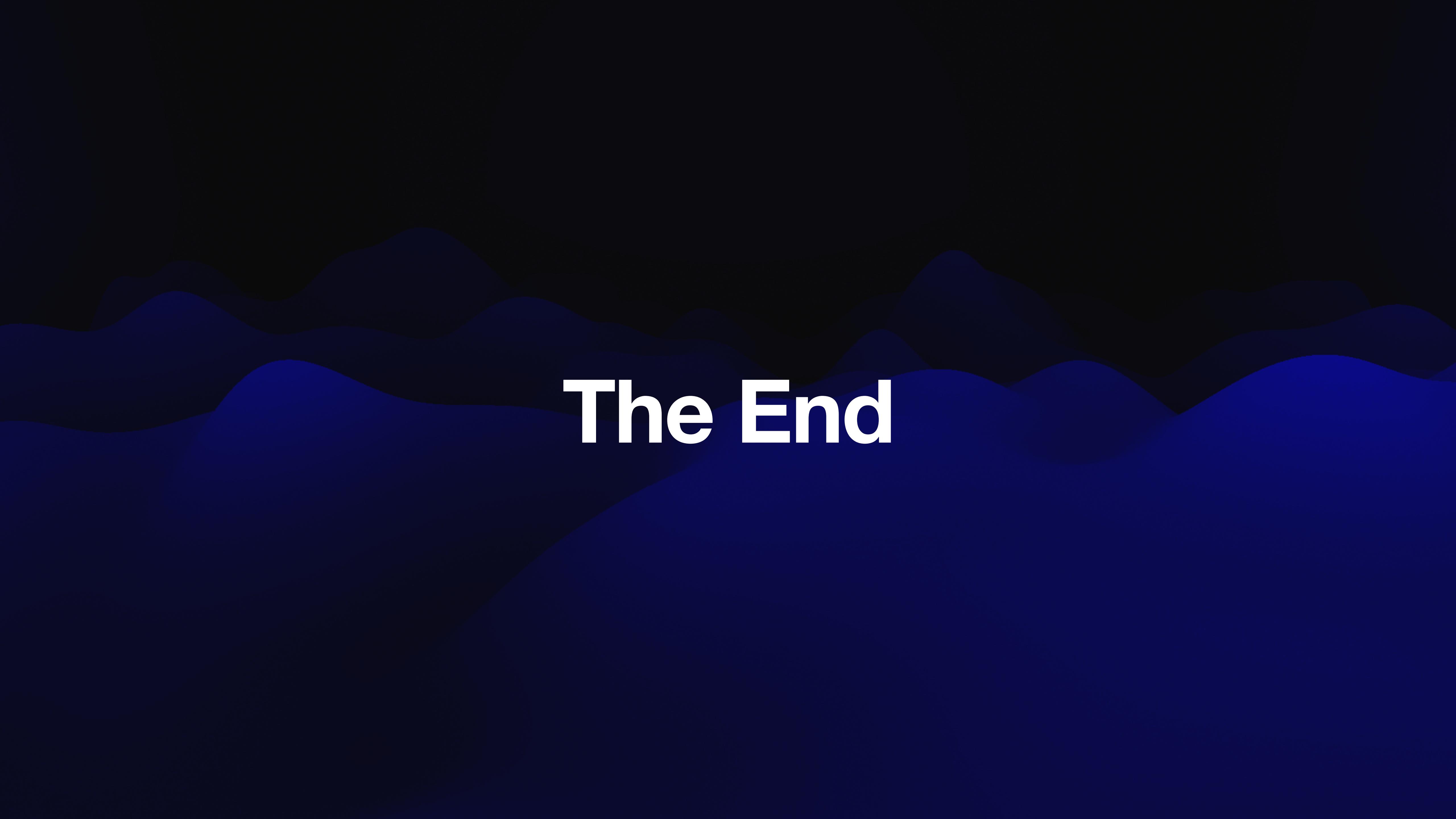
Port Path



Query Parameters



Fragment/Anchor

The background features a dark blue gradient with three distinct wavy layers. The top layer is a solid dark blue. Below it is a layer with a medium-dark blue gradient, and the bottom layer has a medium blue gradient. These waves create a sense of depth and motion.

The End