

# Автоматизированное тестирование

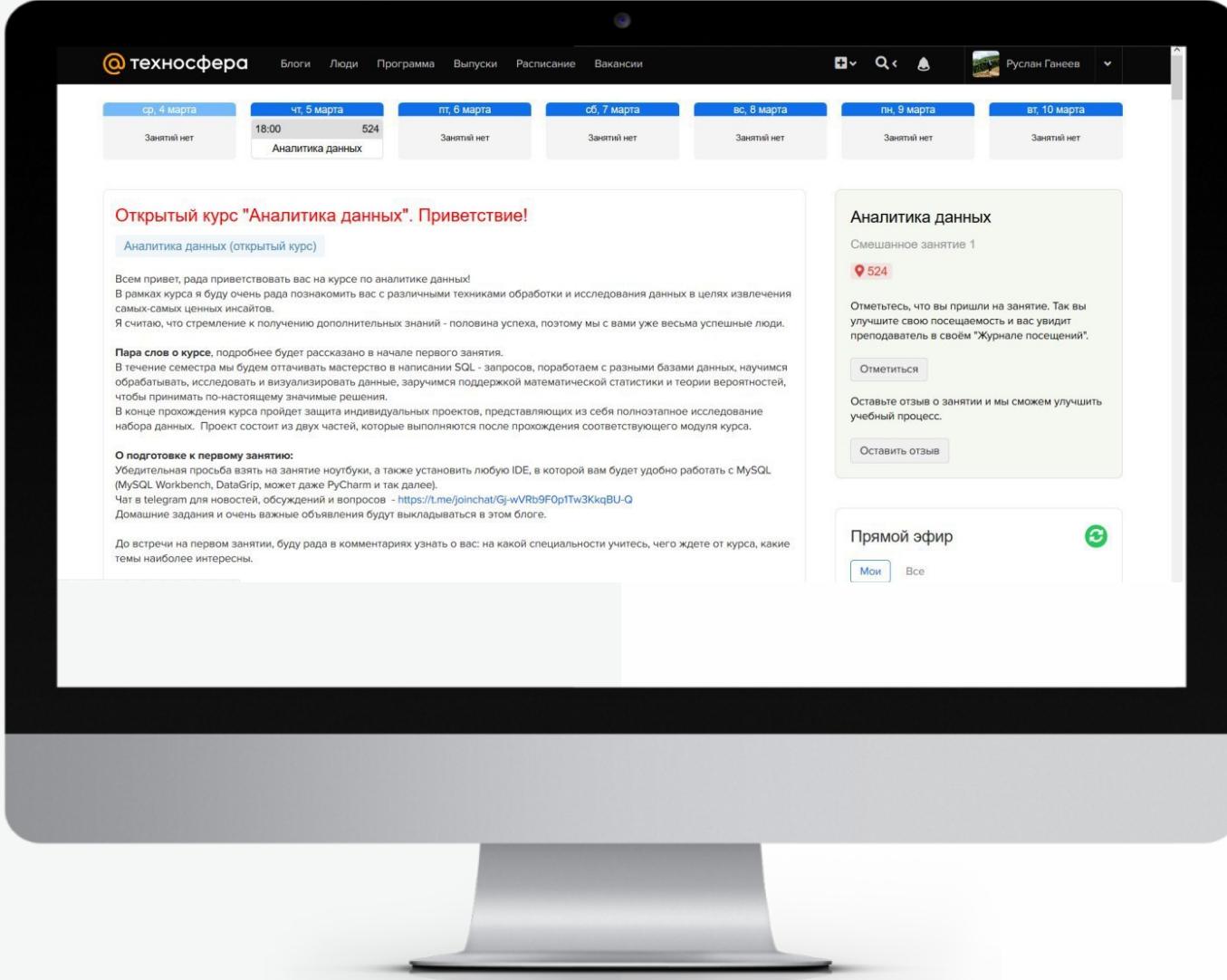
Кириллов Илья



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# Network

1. Модели OSI & TCP/IP
2. Сетевые протоколы – ARP, ICMP, TELNET
3. IPv4 vs IPv6
4. Mocks and Stubs
5. Варианты реализации HTTP



# Напоминание отметиться на портале

Еще какой-то текст



# Модели OSI & TCP/IP

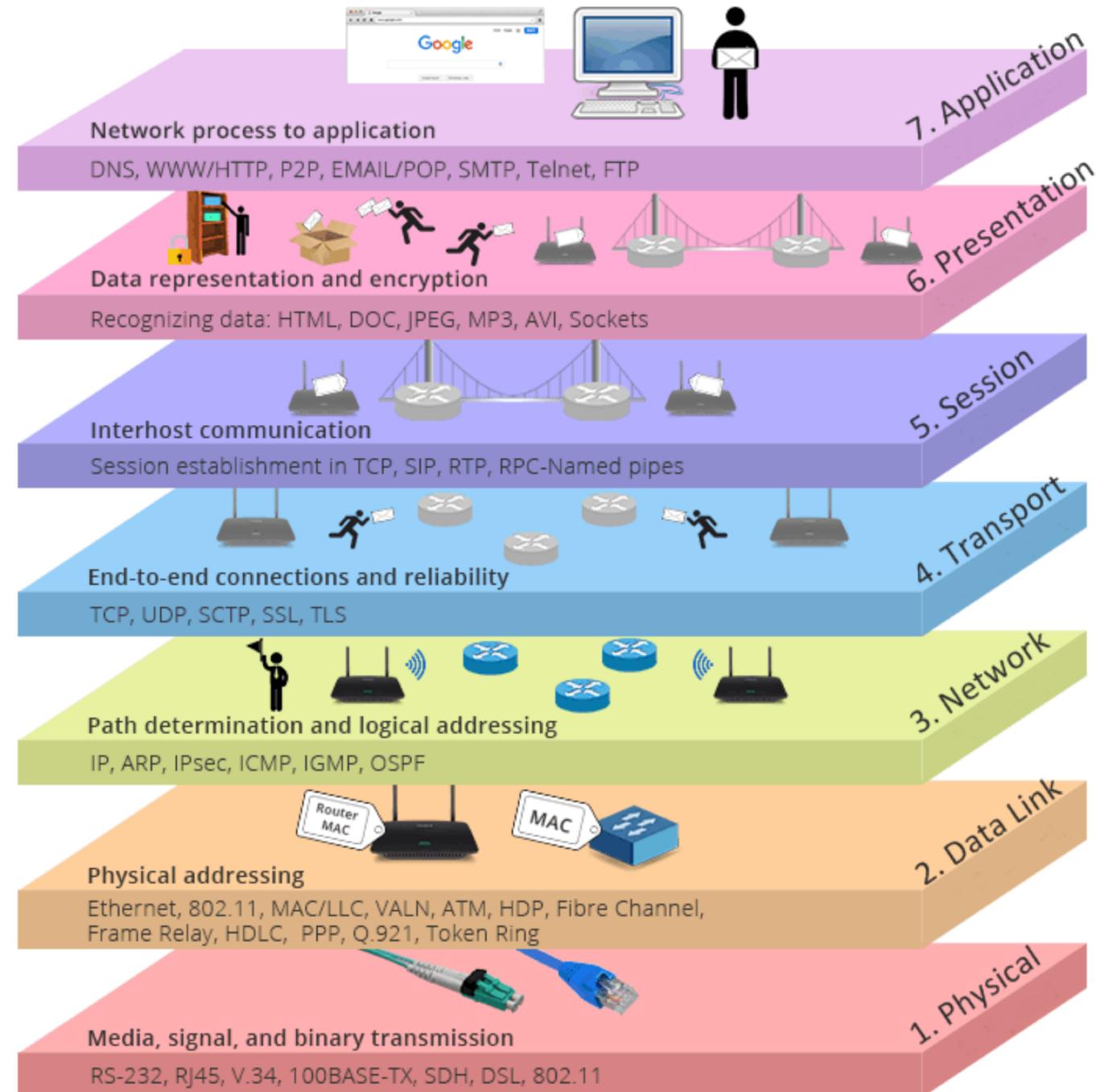
# OSI model

## Open Systems Interconnection

взаимодействие открытых систем

Инкапсуляция и декапсуляция – процесс трансформации данных между принимающей и передающей сторонами

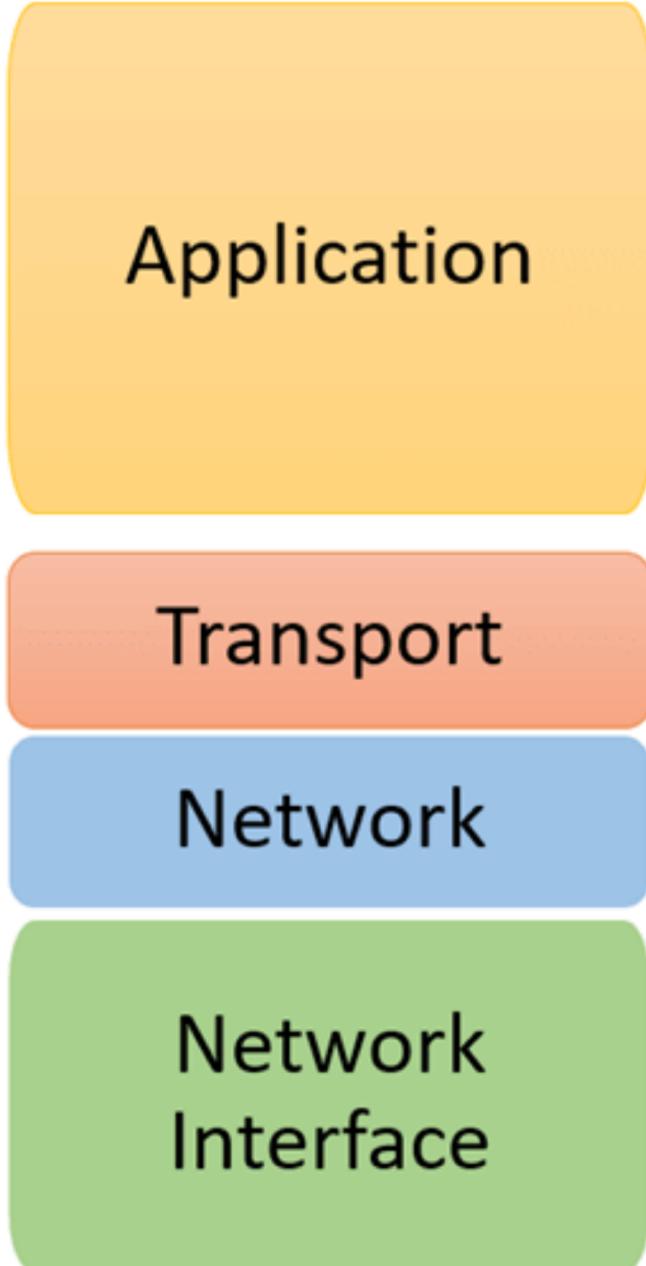
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## OSI Reference Model



## TCP/IP Conceptual Layers



**Уровень приложений**

(HTTP, SMTP, DNS, TELNET,  
SSH FTP)

**Транспортный уровень**

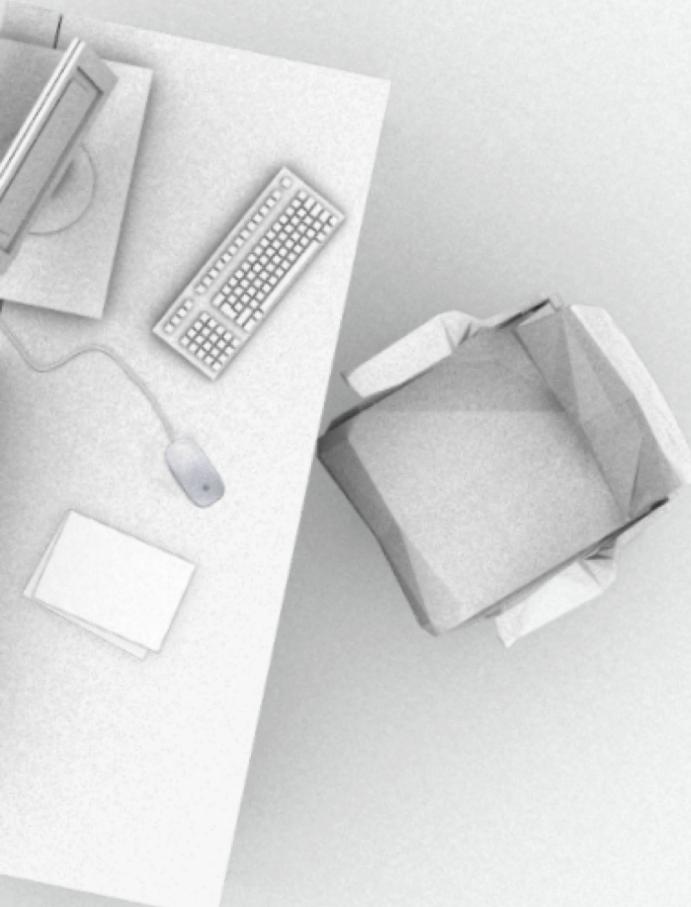
(TCP, UDP)

**Уровень сети или сетевой**

(IPv4, IPv6, Ipsec, OSPF)

**Уровень доступа к сети**

(Ethernet, IEEE 802.11, PPP)

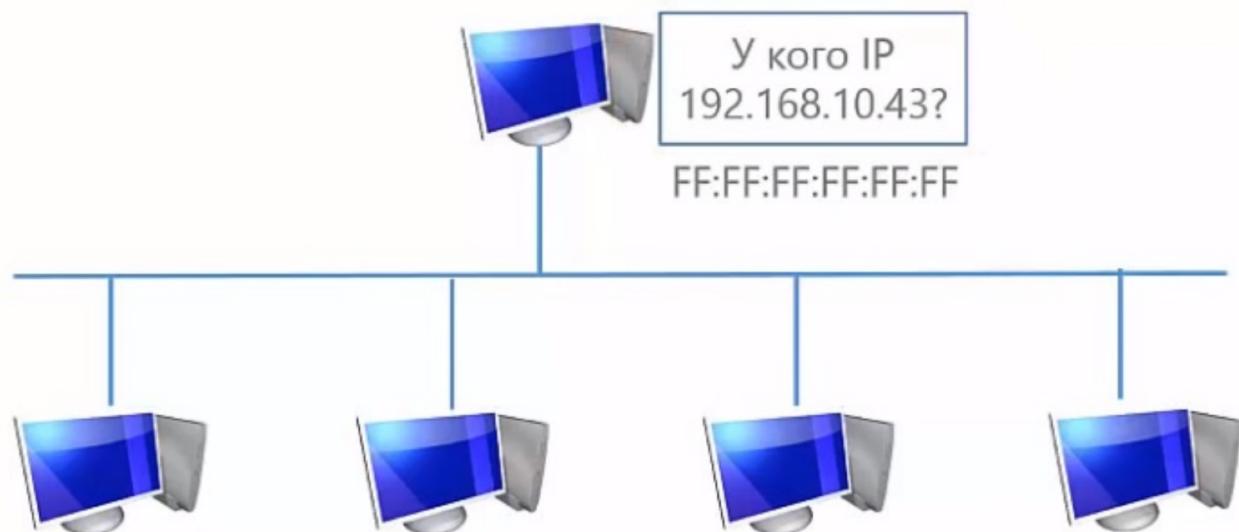


ARP | ICMP | TELNET

# ARP

**ARP - Address Resolution Protocol**  
или протокол разрешения адресов

Отвечает за преобразование IP  
адресов в MAC адреса.



```
bash-3.2$ arp -a
? (169.254.111.199) at a8:5e:45:e2:b7:80 on en0 [ether]
? (192.168.0.1) at 50:78:b3:8d:3d:db on en0 ifscope [ether]
? (192.168.0.12) at 3c:22:fb:ef:cc:61 on en0 ifscope permanent [ether]
? (192.168.0.17) at 8a:5c:f9:3a:ea:7c on en0 ifscope [ether]
? (192.168.0.255) at ff:ff:ff:ff:ff:ff on en0 ifscope [ether]
? (224.0.0.251) at 1:0:5e:0:0:fb on en0 ifscope permanent [ether]
? (230.230.230.230) at 1:0:5e:66:e6:e6 on en0 ifscope permanent [ether]
? (239.255.255.250) at 1:0:5e:7f:ff:fa on en0 ifscope permanent [ether]
```

# ICMP

## ICMP - Internet Control Message Protocol

```
bash-3.2$ ping mail.ru
PING mail.ru (217.69.139.202): 56 data bytes
64 bytes from 217.69.139.202: icmp_seq=0 ttl=61 time=56.025 ms
64 bytes from 217.69.139.202: icmp_seq=1 ttl=61 time=71.884 ms
64 bytes from 217.69.139.202: icmp_seq=2 ttl=61 time=68.669 ms
64 bytes from 217.69.139.202: icmp_seq=3 ttl=61 time=70.992 ms
^C
--- mail.ru ping statistics ---
4 packets transmitted, 4 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 56.025/66.892/71.884/6.383 ms
```

## TTL – Time To Live

Число хопов (hop – «прыжок»),  
в течении которого пакет  
может находиться в сети

```
bash-3.2$ traceroute 2ip.ru
traceroute to 2ip.ru (195.201.201.32), 64 hops max, 52 byte packets
 1  192.168.0.1 (192.168.0.1)  1.964 ms  3.162 ms  3.820 ms
 2  * * *
 3  192.168.126.218 (192.168.126.218)  4.964 ms  5.392 ms  3.879 ms
 4  77.37.250.227 (77.37.250.227)  4.081 ms  4.252 ms  4.155 ms
 5  87.226.221.64 (87.226.221.64)  7.640 ms  4.554 ms  4.483 ms
 6  213.59.211.255 (213.59.211.255)  9.431 ms  6.695 ms  4.206 ms
 7  195.122.183.218 (195.122.183.218)  40.566 ms  41.610 ms  41.350 ms
 8  195.122.183.217 (195.122.183.217)  44.875 ms  42.392 ms *
 9  195.122.182.238 (195.122.182.238)  45.668 ms  44.407 ms  46.309 ms
10  ae6-2011.nbg40.core-backbone.com (80.255.14.246)  44.132 ms  43.768 ms  43.935 ms
11  core-backbone.hetzner.com (81.95.15.6)  48.587 ms
      core-backbone.hetzner.com (80.255.9.22)  47.237 ms
      core-backbone.hetzner.com (5.56.20.254)  48.580 ms
12  * core23.fsn1.hetzner.com (213.239.252.230)  67.995 ms  62.933 ms
13  ex9k1.dc14.fsn1.hetzner.com (213.239.245.82)  49.978 ms  54.315 ms  54.041 ms
14  2ip.ru (195.201.201.32)  53.744 ms !Z  52.038 ms !Z  56.680 ms !Z
```

# TELNET

**Telnet** - сетевой протокол для реализации текстового терминального интерфейса по сети

**NVT** - Network Virtual Terminal

```
bash-3.2$ telnet mail.ru 80
Trying 94.100.180.200...
Connected to mail.ru.
Escape character is '^]'.
GET /index.html
<html>
<head><title>301 Moved Permanently</title></head>
<body bgcolor="white">
<center><h1>301 Moved Permanently</h1></center>
<hr><center>nginx/1.14.1</center>
</body>
</html>
Connection closed by foreign host.
```





# IPv4 и IPv6

# IPv4

## IPv4 Address Format (Dotted-decimal Notation)

192 . 149 . 252 . 76



11000000 . 10010101 . 11111100 . 01001100



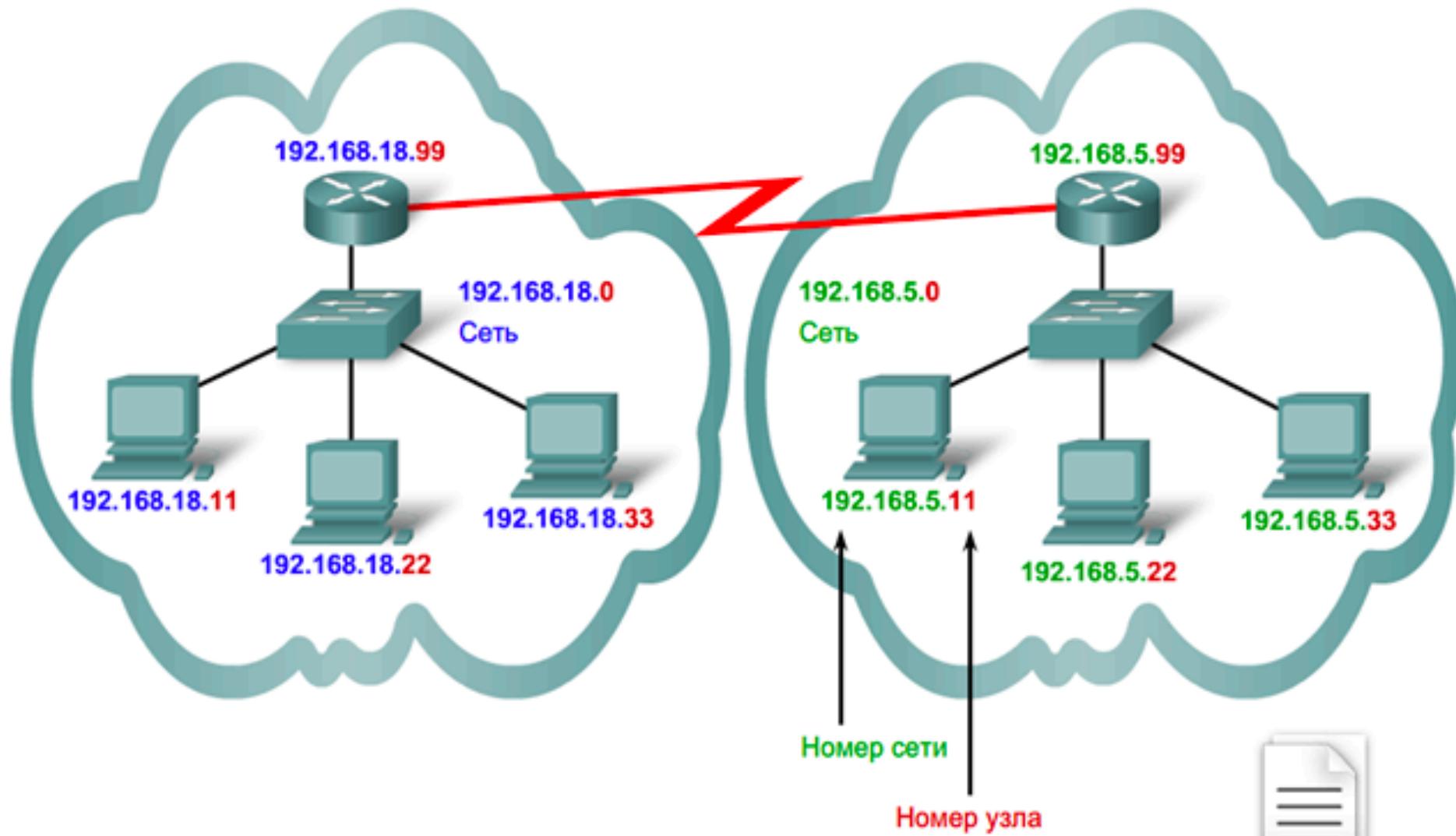
One Byte = Eight Bits



4 Bytes or 32 Bits

#012

# NAT



#013



# IPv6

IPv6 Address Format

(Colon Hexadecimal Notation)

3ffe:1900:fe21:4545:0000:0000:0000:0000



3ffe:1900:fe21:4545:: Zeroes can be omitted



00111111111110:0001100100000000:111111000100001:0100010101000101

Имя	Значение
Адрес	192.168.34.11
Bitmask	30
Netmask	255.255.255.252
Wildcard	0.0.0.3
Network	192.168.34.8
Broadcast	192.168.34.11
Hostmin	192.168.34.9
Hostmax	192.168.34.10
Hosts	2

## IPv4

172.16.4.3 10101100.00010000.00000100.00000011

255.255.255.0 11111111.11111111.11111111.00000000

**Broadcast:** 172.16.4.255

**HostMin:** 172.16.4.1

172.16.4.3/24

**HostMax:** 172.16.4.254

$32 - 24 = 8$ бит

**Hosts/Net:** 254

$2^8 - 1 = 255$  адресов

## IPv6

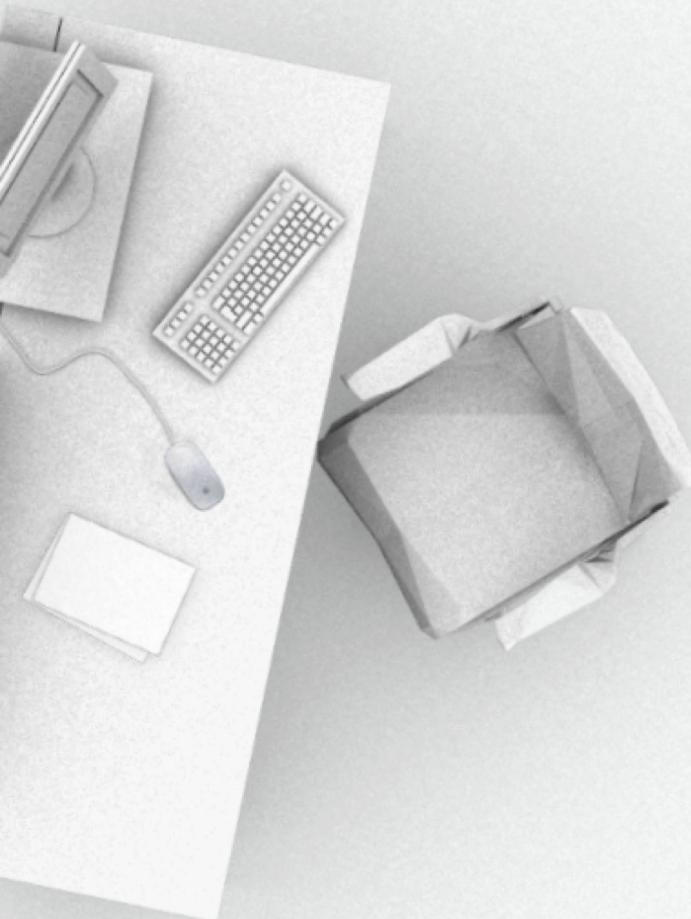
2001:0000:3238:DFE1:0063:0000:0000:FEFB 10.1.14.87

2001: 0: 3238: DFE1: 63 :: FEFB

## IPv4 CIDR (Classless Inter-Domain Routing)

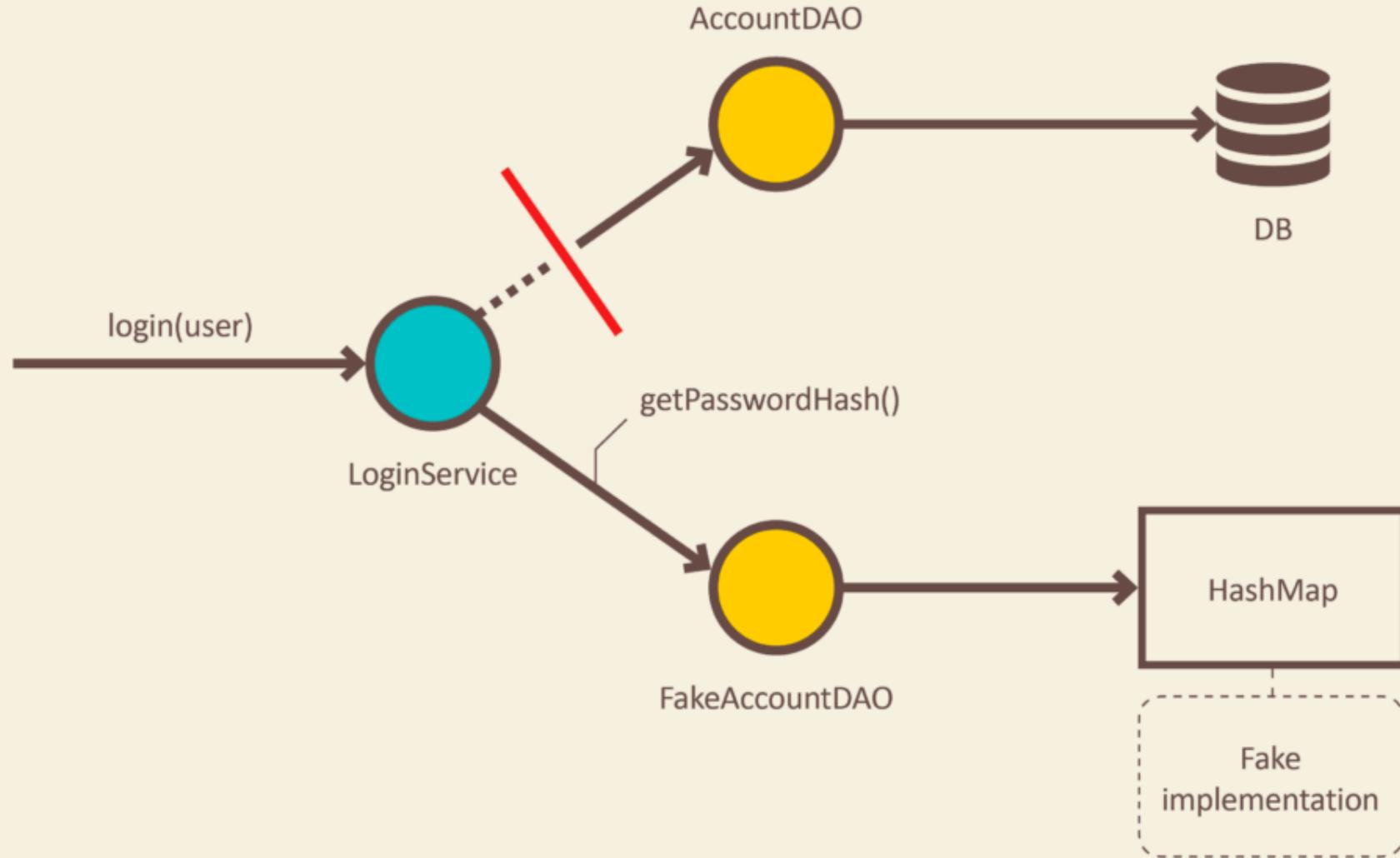
192.168.34.11/30

6.13.25.174/19



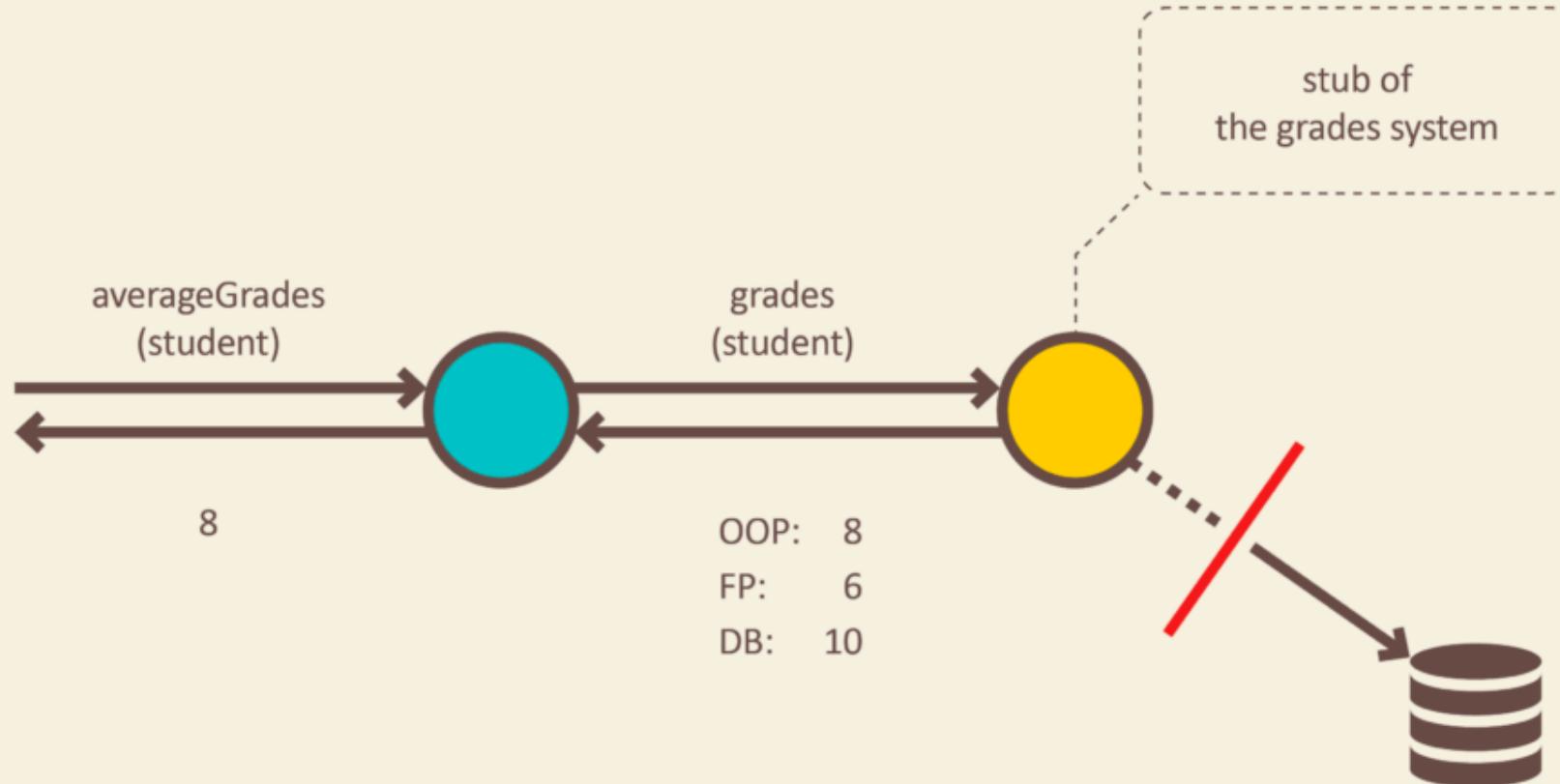
# Mocks and Stubs

# Fake

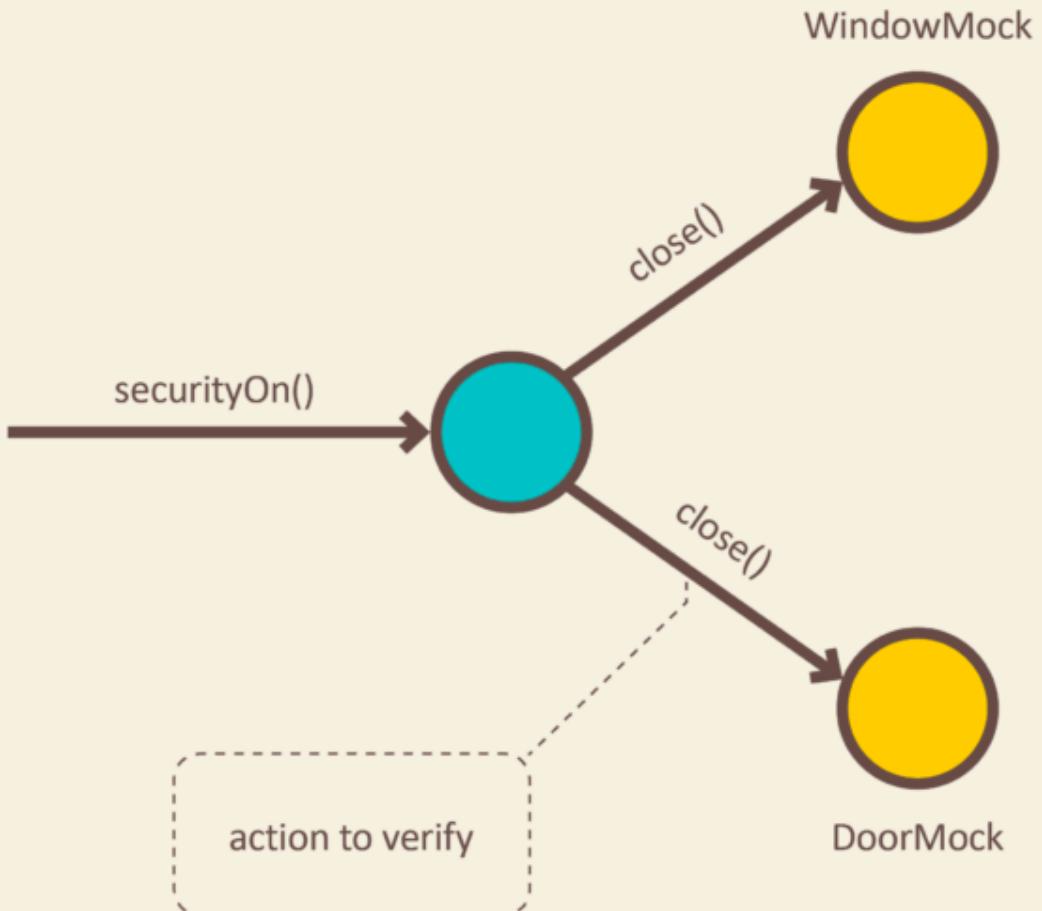


#017

# Stub



# Mock





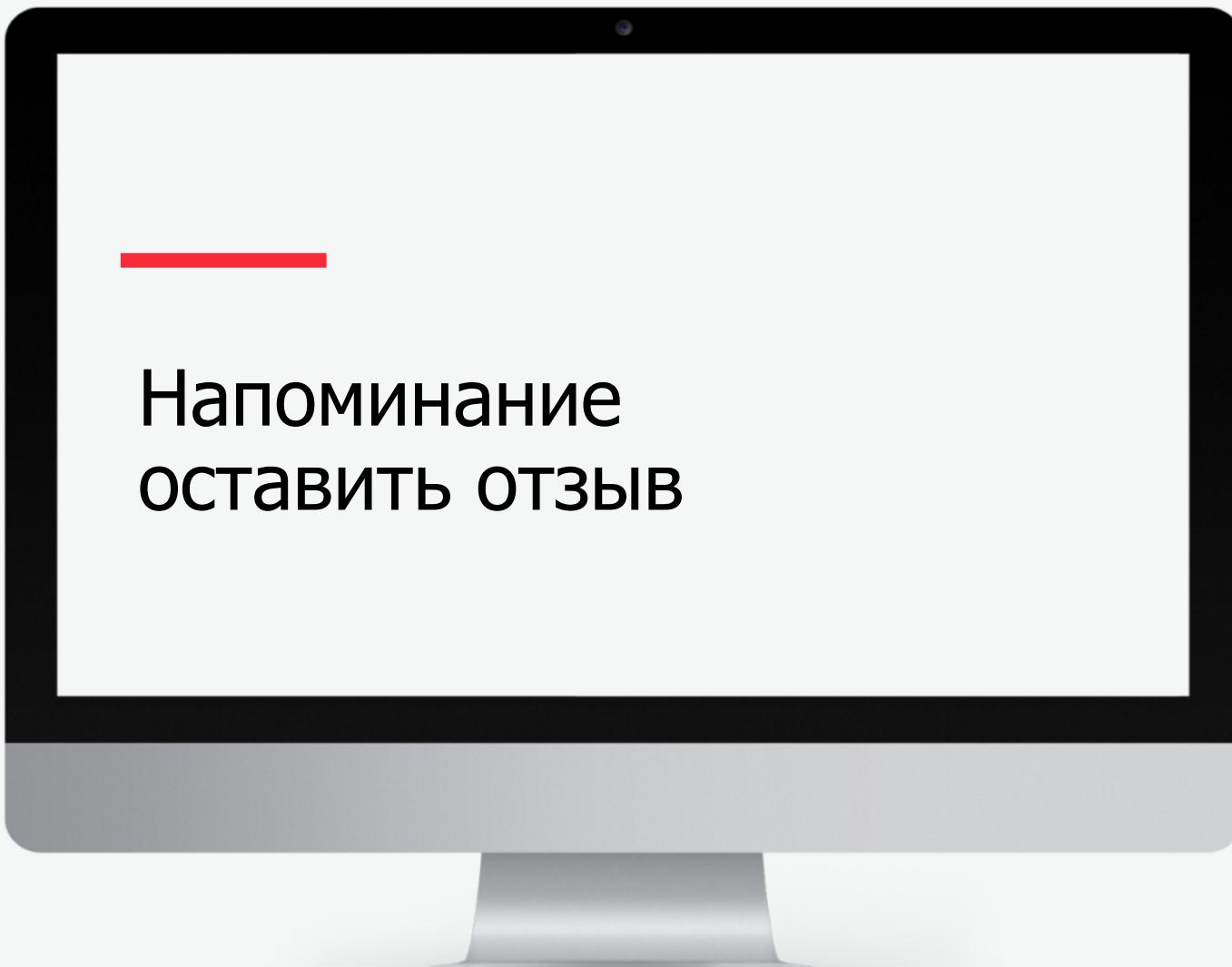
# HTTP Servers

# Варианты реализаций HTTP сервера



Python built-in

SimpleHTTPServer  
Socket



Напоминание  
оставить отзыв



**СПАСИБО  
ЗА ВНИМАНИЕ**

