

Лабораторная работа №2. Работа с адресами IP сетей

Выполнили студенты группы М3311:

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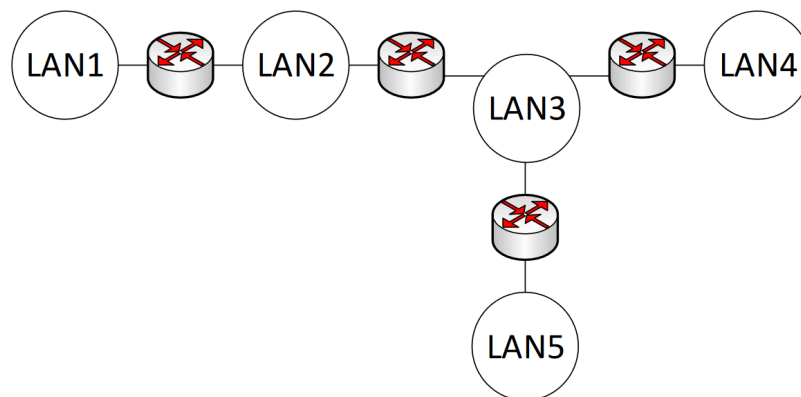
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Цель работы: получить практические навыки по работе с пространством IP-адресов, масками и управления адресацией в IP сетях.

Задание:



Вар.	IP- адрес из сети, маска	Количество компьютеров в сети				
		Сеть 1	Сеть 2	Сеть 3	Сеть 4	Сеть 5
1	194.85.32.19 255.255.255.0	10	6	1	18	100
2	10.12.12.15 255.255.254.0	25	16	240	117	1
3	212.24.15.199 255.255.255.192	7	0	0	11	10
4	120.13.120.120 255.255.255.224	5	2	2	1	1

Решение:

Часть 1

Вариант:	1				
Сеть	Сеть 1	Сеть 2	Сеть 3	Сеть 4	Сеть 5
IP-сети, маска	194.85.32.16 0 255.255.255. 240	194.85.32.17 6 255.255.255. 240	194.85.32.19 2 255.255.255. 248	194.85.32.12 8 255.255.255. 224	194.85.32.0 255.255.255. 128
Количество IP адресов в IP-сети	11	8	4	19	101
Начальный и конечный адреса сети, пригодные для адресации портов маршрутизаторов и компьютеров	194.85.32.16 1 194.85.32.17 4	194.85.32.17 7 194.85.32.19 0	194.85.32.19 3 194.85.32.19 8	194.85.32.12 9 194.85.32.15 8	194.85.32.1 194.85.32.12 6

Broadcast	194.85.32.17 5	194.85.32.19 1	194.85.32.19 9	194.85.32.15 9	194.85.32.12 7
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Вариант:	2				
Сеть	Сеть 1	Сеть 2	Сеть 3	Сеть 4	Сеть 5
IP-сети, маска	10.12.13.128 255.255.255. 224	10.12.13.160 255.255.255. 224	10.12.12.0 255.255.255. 0	10.12.13.0 255.255.255. 128	10.12.13.192 255.255.255. 252
Количество IP адресов в IP-сети	26	18	243	118	2
Начальный и конечный адреса сети, пригодные для адресации портов маршрутизаторов и компьютеров	10.12.13.129 10.12.13.158	10.12.13.161 10.12.13.190	10.12.12.1 10.12.12.254	10.12.13.1 10.12.13.126	10.12.13.193 10.12.13.194
Broadcast	10.12.13.159	10.12.13.191	10.12.12.255	10.12.13.127	10.12.13.195

Вариант:	3				
Сеть	Сеть 1	Сеть 2	Сеть 3	Сеть 4	Сеть 5
IP-сети, маска	212.24.15.22 4 255.255.255. 240	212.24.15.24 8 255.255.255. 252	212.24.15.24 0 255.255.255. 248	212.24.15.19 2 255.255.255. 240	212.24.15.20 8 255.255.255. 240
Количество IP адресов в IP-сети	8	2	3	12	11
Начальный и конечный адреса сети, пригодные для адресации портов маршрутизаторов и компьютеров	212.24.15.22 5 212.24.15.23 8	212.24.15.24 9 212.24.15.25 0	212.24.15.24 1 212.24.15.24 6	212.24.15.19 3 212.24.15.20 6	212.24.15.20 9 212.24.15.22 2
Broadcast	212.24.15.23 9	212.24.15.25 1	212.24.15.24 7	212.24.15.20 7	212.24.15.22 3

Вариант:	4				
Сеть	Сеть 1	Сеть 2	Сеть 3	Сеть 4	Сеть 5
IP-сети, маска	120.13.120.9 6 255.255.255.	120.13.120.1 12 255.255.255.	120.13.120.1 04 255.255.255.	120.13.120.1 20 255.255.255.	120.13.120.1 24 255.255.255.

	248	248	248	252	252
Количество IP адресов в IP-сети	6	4	5	2	2
Начальный и конечный адреса сети, пригодные для адресации портов маршрутизаторов и компьютеров	120.13.120.9 7 120.13.120.1 02	120.13.120.1 13 120.13.120.1 18	120.13.120.1 05 120.13.120.1 10	120.13.120.1 21 120.13.120.1 22	120.13.120.1 25 120.13.120.1 26
Broadcast	120.13.120.1 03	120.13.120.1 19	120.13.120.1 11	120.13.120.1 23	120.13.120.1 27

Часть 2

Проверка результатов с помощью ipcalc:

Вариант №1:

```

Address: 194.85.32.19      11000010.01010101.00100000. 00010011
Netmask: 255.255.255.0 = 24 11111111.11111111.11111111. 00000000
Wildcard: 0.0.0.255      00000000.00000000.00000000. 11111111
=>
Network: 194.85.32.0/24   11000010.01010101.00100000. 00000000
HostMin: 194.85.32.1     11000010.01010101.00100000. 00000001
HostMax: 194.85.32.254   11000010.01010101.00100000. 11111110
Broadcast: 194.85.32.255 11000010.01010101.00100000. 11111111
Hosts/Net: 254           Class C

1. Requested size: 11 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 194.85.32.160/29 11000010.01010101.00100000.10100 000
HostMin: 194.85.32.161   11000010.01010101.00100000.10100 001
HostMax: 194.85.32.166   11000010.01010101.00100000.10100 110
Broadcast: 194.85.32.167 11000010.01010101.00100000.10100 111
Hosts/Net: 6             Class C

2. Requested size: 8 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 194.85.32.176/29 11000010.01010101.00100000.10110 000
HostMin: 194.85.32.177   11000010.01010101.00100000.10110 001
HostMax: 194.85.32.182   11000010.01010101.00100000.10110 110
Broadcast: 194.85.32.183 11000010.01010101.00100000.10110 111
Hosts/Net: 6             Class C

3. Requested size: 4 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 194.85.32.192/29 11000010.01010101.00100000.11000 000
HostMin: 194.85.32.193   11000010.01010101.00100000.11000 001
HostMax: 194.85.32.198   11000010.01010101.00100000.11000 110
Broadcast: 194.85.32.199 11000010.01010101.00100000.11000 111
Hosts/Net: 6             Class C

4. Requested size: 19 hosts
Netmask: 255.255.255.224 = 27 11111111.11111111.11111111.111 00000
Network: 194.85.32.128/27 11000010.01010101.00100000.100 00000
HostMin: 194.85.32.129   11000010.01010101.00100000.100 00001
HostMax: 194.85.32.158   11000010.01010101.00100000.100 11110
Broadcast: 194.85.32.159 11000010.01010101.00100000.100 11111
Hosts/Net: 30           Class C

5. Requested size: 101 hosts
Netmask: 255.255.255.128 = 25 11111111.11111111.11111111.1 0000000
Network: 194.85.32.0/25   11000010.01010101.00100000.0 0000000
HostMin: 194.85.32.1     11000010.01010101.00100000.0 0000001
HostMax: 194.85.32.126   11000010.01010101.00100000.0 1111110
Broadcast: 194.85.32.127 11000010.01010101.00100000.0 1111111
Hosts/Net: 126          Class C

```

Вариант №2:

```
Network: 10.12.12.0/24      00001010.00001100.00001100. 00000000
HostMin: 10.12.12.1        00001010.00001100.00001100. 00000001
HostMax: 10.12.12.254      00001010.00001100.00001100. 11111110
Broadcast: 10.12.12.255    00001010.00001100.00001100. 11111111
Hosts/Net: 254             Class A, Private Internet

1. Requested size: 243 hosts
Netmask: 255.255.255.128 = 25 11111111.11111111.11111111.1 00000000
Network: 10.12.12.0/25      00001010.00001100.00001100.0 00000000
HostMin: 10.12.12.1        00001010.00001100.00001100.0 00000001
HostMax: 10.12.12.126      00001010.00001100.00001100.0 11111110
Broadcast: 10.12.12.127    00001010.00001100.00001100.0 11111111
Hosts/Net: 126             Class A, Private Internet

2. Requested size: 118 hosts
Netmask: 255.255.255.128 = 25 11111111.11111111.11111111.1 00000000
Network: 10.12.13.0/25      00001010.00001100.00001101.0 00000000
HostMin: 10.12.13.1        00001010.00001100.00001101.0 00000001
HostMax: 10.12.13.126      00001010.00001100.00001101.0 11111110
Broadcast: 10.12.13.127    00001010.00001100.00001101.0 11111111
Hosts/Net: 126             Class A, Private Internet

3. Requested size: 26 hosts
Netmask: 255.255.255.224 = 27 11111111.11111111.11111111.111 000000
Network: 10.12.13.128/27    00001010.00001100.00001101.100 000000
HostMin: 10.12.13.129      00001010.00001100.00001101.100 000001
HostMax: 10.12.13.158      00001010.00001100.00001101.100 111110
Broadcast: 10.12.13.159    00001010.00001100.00001101.100 111111
Hosts/Net: 30              Class A, Private Internet

4. Requested size: 18 hosts
Netmask: 255.255.255.224 = 27 11111111.11111111.11111111.111 000000
Network: 10.12.13.160/27    00001010.00001100.00001101.101 000000
HostMin: 10.12.13.161      00001010.00001100.00001101.101 000001
HostMax: 10.12.13.190      00001010.00001100.00001101.101 111110
Broadcast: 10.12.13.191    00001010.00001100.00001101.101 111111
Hosts/Net: 30              Class A, Private Internet

5. Requested size: 2 hosts
Netmask: 255.255.255.254 = 31 11111111.11111111.11111111.1111111 0
Network: 10.12.13.192/31    00001010.00001100.00001101.1100000 0
HostMin: 10.12.13.192      00001010.00001100.00001101.1100000 0
HostMax: 10.12.13.193      00001010.00001100.00001101.1100000 1
Hosts/Net: 2               Class A, Private Internet, PtP Link RFC 3021
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Вариант №3:

```

Address: 212.24.15.199      11010100.00011000.00001111. 11000111
Netmask: 255.255.255.0 = 24 11111111.11111111.11111111. 00000000
Wildcard: 0.0.0.255        00000000.00000000.00000000. 11111111
=>
Network: 212.24.15.0/24    11010100.00011000.00001111. 00000000
HostMin: 212.24.15.1      11010100.00011000.00001111. 00000001
HostMax: 212.24.15.254    11010100.00011000.00001111. 11111110
Broadcast: 212.24.15.255  11010100.00011000.00001111. 11111111
Hosts/Net: 254            Class C

1. Requested size: 8 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 212.24.15.0/29      11010100.00011000.00001111.00000 000
HostMin: 212.24.15.1        11010100.00011000.00001111.00000 001
HostMax: 212.24.15.6        11010100.00011000.00001111.00000 110
Broadcast: 212.24.15.7      11010100.00011000.00001111.00000 111
Hosts/Net: 6                Class C

2. Requested size: 2 hosts
Netmask: 255.255.255.254 = 31 11111111.11111111.11111111.1111111 0
Network: 212.24.15.56/31    11010100.00011000.00001111.0011100 0
HostMin: 212.24.15.56      11010100.00011000.00001111.0011100 0
HostMax: 212.24.15.57      11010100.00011000.00001111.0011100 1
Hosts/Net: 2                Class C, PtP Link RFC 3021

3. Requested size: 3 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 212.24.15.48/29    11010100.00011000.00001111.00110 000
HostMin: 212.24.15.49      11010100.00011000.00001111.00110 001
HostMax: 212.24.15.54      11010100.00011000.00001111.00110 110
Broadcast: 212.24.15.55    11010100.00011000.00001111.00110 111
Hosts/Net: 6                Class C

4. Requested size: 12 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 212.24.15.16/29    11010100.00011000.00001111.00010 000
HostMin: 212.24.15.17      11010100.00011000.00001111.00010 001
HostMax: 212.24.15.22      11010100.00011000.00001111.00010 110
Broadcast: 212.24.15.23    11010100.00011000.00001111.00010 111
Hosts/Net: 6                Class C

5. Requested size: 11 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 212.24.15.32/29    11010100.00011000.00001111.00100 000
HostMin: 212.24.15.33      11010100.00011000.00001111.00100 001
HostMax: 212.24.15.38      11010100.00011000.00001111.00100 110
Broadcast: 212.24.15.39    11010100.00011000.00001111.00100 111
Hosts/Net: 6                Class C

```

Вариант №4:

```
Address: 120.13.120.120 01111000.00001101.01111000. 01111000
Netmask: 255.255.255.0 = 24 11111111.11111111.11111111. 00000000
Wildcard: 0.0.0.255 00000000.00000000.00000000. 11111111
=>
Network: 120.13.120.0/24 01111000.00001101.01111000. 00000000
HostMin: 120.13.120.1 01111000.00001101.01111000. 00000001
HostMax: 120.13.120.254 01111000.00001101.01111000. 11111110
Broadcast: 120.13.120.255 01111000.00001101.01111000. 11111111
Hosts/Net: 254 Class A

1. Requested size: 6 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 120.13.120.0/29 01111000.00001101.01111000.00000 000
HostMin: 120.13.120.1 01111000.00001101.01111000.00000 001
HostMax: 120.13.120.6 01111000.00001101.01111000.00000 110
Broadcast: 120.13.120.7 01111000.00001101.01111000.00000 111
Hosts/Net: 6 Class A

2. Requested size: 4 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 120.13.120.8/29 01111000.00001101.01111000.00001 000
HostMin: 120.13.120.9 01111000.00001101.01111000.00001 001
HostMax: 120.13.120.14 01111000.00001101.01111000.00001 110
Broadcast: 120.13.120.15 01111000.00001101.01111000.00001 111
Hosts/Net: 6 Class A

3. Requested size: 5 hosts
Netmask: 255.255.255.248 = 29 11111111.11111111.11111111.11111 000
Network: 120.13.120.16/29 01111000.00001101.01111000.00010 000
HostMin: 120.13.120.17 01111000.00001101.01111000.00010 001
HostMax: 120.13.120.22 01111000.00001101.01111000.00010 110
Broadcast: 120.13.120.23 01111000.00001101.01111000.00010 111
Hosts/Net: 6 Class A

4. Requested size: 2 hosts
Netmask: 255.255.255.254 = 31 11111111.11111111.11111111.1111111 0
Network: 120.13.120.24/31 01111000.00001101.01111000.0001100 0
HostMin: 120.13.120.24 01111000.00001101.01111000.0001100 0
HostMax: 120.13.120.25 01111000.00001101.01111000.0001100 1
Hosts/Net: 2 Class A, PtP Link RFC 3021

5. Requested size: 2 hosts
Netmask: 255.255.255.254 = 31 11111111.11111111.11111111.1111111 0
Network: 120.13.120.28/31 01111000.00001101.01111000.0001110 0
HostMin: 120.13.120.28 01111000.00001101.01111000.0001110 0
HostMax: 120.13.120.29 01111000.00001101.01111000.0001110 1
Hosts/Net: 2 Class A, PtP Link RFC 3021
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