МИНОБРНАУКИ РОССИИ

САНКТ-ПЕТЕРБУРГСКИЙ ГОСУДАРСТВЕННЫЙ

ЭЛЕКТРОТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

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Кафедра МО ЭВМ

ОТЧЕТ

по лабораторной работе №2

по дисциплине «Сети и телекоммуникации»

Тема: Настройка таблиц маршрутизации

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Цель работы

Изучение методов статической маршрутизации в IP-сетях; овладение управлением таблицами маршрутизации на узлах сетевого уровня.

Задания

1. Для всех узлов сети установить IP-адреса, маски подсетей и шлюзы по умолчанию, чтобы добиться успешного выполнения Echo-запроса ближайших соседей (находящихся в одной подсети).

2. Настроить таблицы маршрутизации на маршрутизаторах, чтобы добиться доставки пакетов от узла K1 к узлу K2 и обратно, от узла K2 к K3 и обратно, от узла K3 к K1 и обратно. Пакеты должны доходить до узлов кратчайшим путем.

3. Настроить таблицы маршрутизации на узлах K1, K2 и K3, чтобы обеспечить кратчайшую доставку пакетов между этими узлами, если это невозможно было обеспечить в п. 2.

В отчете привести конфигурацию TCP/IP для каждого из узлов, таблицы маршрутизации, результаты Echo-запросов между узлами K1, K2 и K3, а также обоснование правильности и оптимальности выбранных маршрутов.

Вариант 5

Файл со схемой сети: lab2_var5.jfst. Сеть между узлами PC3 и R3, R4, R6: 204.188.45.128. Сеть между маршрутизаторами R1, R2, R3: 204.188.45.192. Компьютер PC1 имеет IP-адрес 204.188.45.1. Компьютер PC2 имеет IP-адрес 204.188.45.65. Компьютер PC3 имеет IP-адрес 204.188.45.129. Длина маски подсети должна быть минимально возможной. Обозначения в задании: K1 – PC1, K2 – PC2, K3 – PC3

Выполнение работы

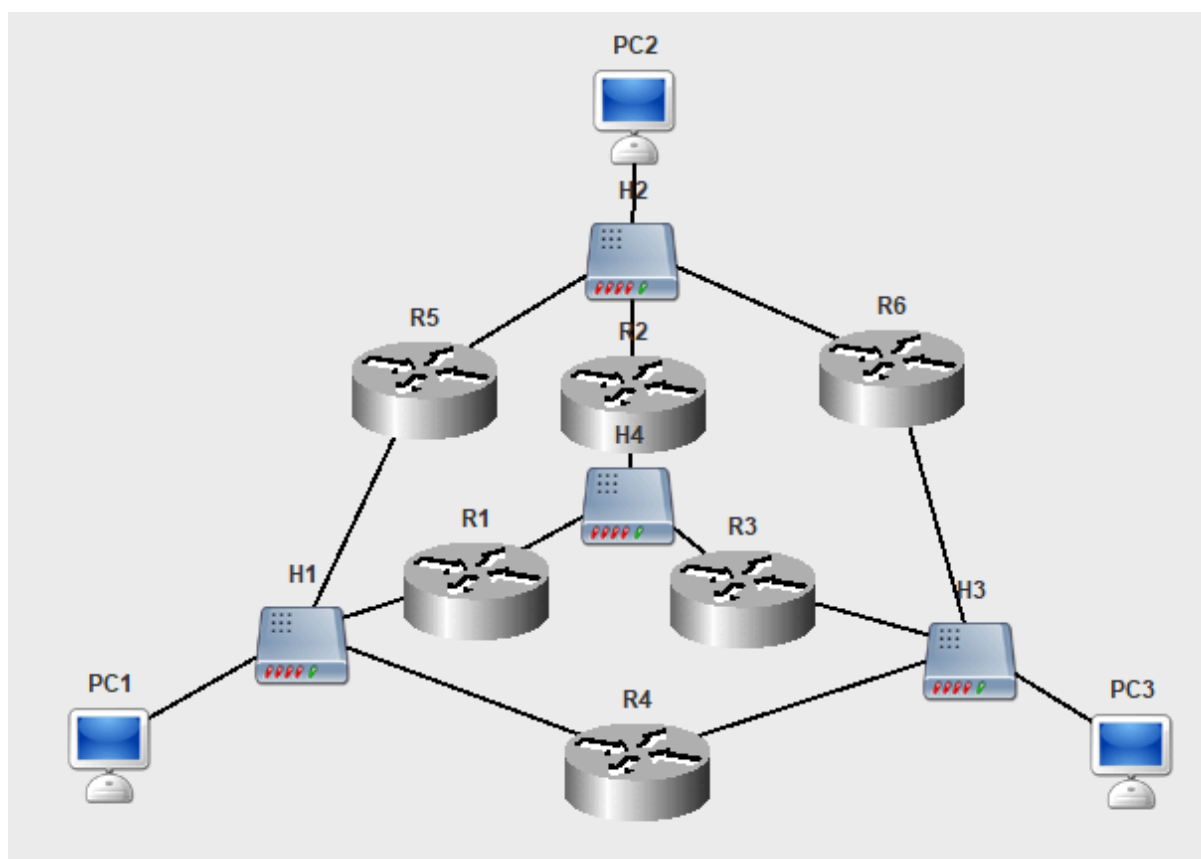Схема исследуемой сети представлена на рисунке 1.

Рисунок 1 – Схема сети

Видно, что всю эту сеть можно разбить на 4 подсети.

Таблица 1 – Подсети

Узлы	Адрес подсети
PC1, R1 (eth0), R4 (eth0), R5 (eth1)	204.188.45.0/26
PC2, R2 (eth0), R5 (eth0), R6 (eth0)	204.188.45.64/26
PC3, R3 (eth0), R4 (eth1), R6 (eth1)	204.188.45.128/26
R1 (eth1), R2 (eth1), R3 (eth1)	204.188.45.192/26

Необходимо настроить узлы: ip-адреса, шлюзы и маски.

Таблица 2 – Настройки подсети

Узел	Интерфейс	IP-адрес/маска	Шлюз по умолчанию
PC1	eth0	204.188.45.1/26	204.188.45.2

PC2	eth0	204.188.45.65/26	204.188.45.66
PC3	eth0	204.188.45.129/26	204.188.45.130
R1	eth0	204.188.45.2/26	204.188.45.194
	eth1	204.188.45.193/26	
R2	eth0	204.188.45.66/26	204.188.45.195
	eth1	204.188.45.194/26	
R3	eth0	204.188.45.130/26	204.188.45.193
	eth1	204.188.45.195/26	
R4	eth0	204.188.45.3/26	204.188.45.2
	eth1	204.188.45.131/26	
R5	eth0	204.188.45.67/26	204.188.45.66
	eth1	204.188.45.4/26	
R6	eth0	204.188.45.68/26	204.188.45.130
	eth1	204.188.45.132/26	

Данные настройки позволяют пакету дойти от источника к адресату, но путь, который они совершают, не является кратчайшим. Чтобы сократить путь, необходимо настроить таблицы маршрутизации.

Таблица 3 – Настройки таблиц маршрутизации

Узел	Адрес подсети	Шлюз	Интерфейс
R1	204.188.45.128/26	204.188.45.195	eth1
R2	204.188.45.0/26	204.188.45.193	eth1
R3	204.188.45.64/26	204.188.45.194	eth1
PC1	204.188.45.64/26	204.188.45.4	eth0
	204.188.45.128/26	204.188.45.3	eth0
PC2	204.188.45.0/26	204.188.45.67	eth0

	204.188.45.128/26	204.188.45.68	eth0
PC3	204.188.45.0/26	204.188.45.131	eth0
	204.188.45.64/26	204.188.45.132	eth0

Произведем отправку echo запросов, чтобы убедиться, что все узлы настроены корректно:

PC1 → PC3

14:38:31-945	PC1	Echo Request Packet	Network	Created Echo Request packet to 204.188.45.129
14:38:31-945	PC1	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.3
14:38:31-945	PC1	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:38:31-945	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:38:31-945	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	R4	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.1
14:38:31-945	R4	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.1).
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 8F:7E:4D:53:33:4C
14:38:31-945	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:38:31-945	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:38:31-945	PC1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC1	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R1	Ethernet Packet	Link	Recieved and accepted packet at interface C2:2A:4D:BF:69:18
14:38:31-945	R1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC1	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.3).
14:38:31-945	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:38:31-945	R4	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.

14:38:31-945	R4	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.129
14:38:31-945	R4	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 62:7C:C0:2E:8E:30
14:38:31-945	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:38:31-945	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R3	Ethernet Packet	Link	Recieved and accepted packet at interface 7A:61:A7:68:BE:1D
14:38:31-945	R3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:38:31-945	PC3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC3	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	PC3	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.131
14:38:31-945	PC3	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.131).
14:38:31-945	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 62:7C:C0:2E:8E:30
14:38:31-945	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	R6	Ethernet Packet	Link	Recieved and dropped packet at interface AB:BE:92:1A:2C:AC
14:38:31-945	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:38:31-945	R4	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.129).
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 62:7C:C0:2E:8E:30
14:38:31-945	R6	Ethernet Packet	Link	Recieved and dropped packet at interface AB:BE:92:1A:2C:AC
14:38:31-945	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:38:31-945	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:38:31-945	PC3	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC3	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	PC3	Echo Reply Packet	Network	Created Echo Reply packet to 204.188.45.1
14:38:31-945	PC3	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.131).
14:38:31-945	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 62:7C:C0:2E:8E:30
14:38:31-945	R4	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.

14:38:31-945	R4	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.1).
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 8F:7E:4D:53:33:4C
14:38:31-945	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:38:31-945	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:38:31-945	PC1	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC1	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	PC1	Echo Reply Packet	Network	Echo reply packet received from 204.188.45.129
14:38:31-945	R6	Ethernet Packet	Link	Recieved and dropped packet at interface AB:BE:92:1A:2C:AC
14:38:31-945	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:38:31-945	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:38:31-945	PC1	Echo Request Packet	Network	Created Echo Request packet to 204.188.45.129
14:38:31-945	PC1	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.3
14:38:31-945	PC1	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:38:31-945	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:38:31-945	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	R4	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.1
14:38:31-945	R4	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.1).
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 8F:7E:4D:53:33:4C
14:38:31-945	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:38:31-945	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:38:31-945	PC1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC1	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:38:31-945	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:38:31-945	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.

14:38:31-945	R1	Ethernet Packet	Link	Recieved and accepted packet at interface C2:2A:4D:BF:69:18
14:38:31-945	R1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	PC1	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.3).
14:38:31-945	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:38:31-945	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:38:31-945	R4	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:38:31-945	R4	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:38:31-945	R4	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.129
14:38:31-945	R4	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:38:31-945	R4	Ethernet Packet	Link	Sending packet from interface 62:7C:C0:2E:8E:30
14:38:31-945	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:38:31-945	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.

PC1 → PC2

14:40:55-584	PC1	Echo Request Packet	Network	Created Echo Request packet to 204.188.45.65
14:40:55-584	PC1	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.4
14:40:55-584	PC1	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:40:55-584	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:40:55-584	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:40:55-584	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	R5	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.1
14:40:55-584	R5	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.1).
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 49:B7:1D:AD:36:34
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:40:55-584	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:40:55-584	PC1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC1	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.

14:40:55-584	R1	Ethernet Packet	Link	Recieved and accepted packet at interface C2:2A:4D:BF:69:18
14:40:55-584	R1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC1	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.4).
14:40:55-584	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:40:55-584	R5	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:40:55-584	R5	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.65
14:40:55-584	R5	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 68:AA:BB:53:2A:A1
14:40:55-584	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R2	Ethernet Packet	Link	Recieved and accepted packet at interface 7D:92:AC:6F:A5:5C
14:40:55-584	R2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:40:55-584	PC2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	PC2	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.67
14:40:55-584	PC2	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.67).
14:40:55-584	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:40:55-584	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:40:55-584	R5	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.65).
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 68:AA:BB:53:2A:A1
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C

14:40:55-584	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:40:55-584	PC2	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	PC2	Echo Reply Packet	Network	Created Echo Reply packet to 204.188.45.1
14:40:55-584	PC2	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.67).
14:40:55-584	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:40:55-584	R5	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:40:55-584	R5	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.1).
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 49:B7:1D:AD:36:34
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:40:55-584	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:40:55-584	PC1	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC1	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-600	PC1	Echo Reply Packet	Network	Echo reply packet received from 204.188.45.65
14:40:55-600	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:40:55-600	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:40:55-584	PC1	Echo Request Packet	Network	Created Echo Request packet to 204.188.45.65
14:40:55-584	PC1	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.4
14:40:55-584	PC1	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:40:55-584	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:40:55-584	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:40:55-584	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	R5	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.1
14:40:55-584	R5	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.1).

14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 49:B7:1D:AD:36:34
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18
14:40:55-584	PC1	Ethernet Packet	Link	Recieved and accepted packet at interface 1C:BD:B6:AE:67:73
14:40:55-584	PC1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC1	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	R1	Ethernet Packet	Link	Recieved and accepted packet at interface C2:2A:4D:BF:69:18
14:40:55-584	R1	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC1	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.4).
14:40:55-584	PC1	Ethernet Packet	Link	Sending packet from interface 1C:BD:B6:AE:67:73
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 49:B7:1D:AD:36:34
14:40:55-584	R5	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:40:55-584	R5	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.65
14:40:55-584	R5	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 68:AA:BB:53:2A:A1
14:40:55-584	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R2	Ethernet Packet	Link	Recieved and accepted packet at interface 7D:92:AC:6F:A5:5C
14:40:55-584	R2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:40:55-584	PC2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	PC2	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.67
14:40:55-584	PC2	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.67).
14:40:55-584	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:40:55-584	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.

14:40:55-584	R5	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:40:55-584	R5	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.65).
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 68:AA:BB:53:2A:A1
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:40:55-584	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:40:55-584	PC2	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	PC2	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:40:55-584	PC2	Echo Reply Packet	Network	Created Echo Reply packet to 204.188.45.1
14:40:55-584	PC2	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.67).
14:40:55-584	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:40:55-584	R6	Ethernet Packet	Link	Recieved and dropped packet at interface B8:AF:C0:74:61:A5
14:40:55-584	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:40:55-584	R5	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:40:55-584	R5	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:40:55-584	R5	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.1).
14:40:55-584	R5	Ethernet Packet	Link	Sending packet from interface 49:B7:1D:AD:36:34
14:40:55-584	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 8F:7E:4D:53:33:4C
14:40:55-584	R1	Ethernet Packet	Link	Recieved and dropped packet at interface C2:2A:4D:BF:69:18

PC2 → PC3

14:24:37-722	PC2	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.68
14:24:37-722	PC2	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:24:37-722	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:24:37-722	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	R6	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.65
14:24:37-722	R6	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.65).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface B8:AF:C0:74:61:A5
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:24:37-722	PC2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC2	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.

14:24:37-722	R2	Ethernet Packet	Link	Recieved and accepted packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	R2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC2	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.68).
14:24:37-722	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:24:37-722	R6	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:24:37-722	R6	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.129
14:24:37-722	R6	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface AB:BE:92:1A:2C:AC
14:24:37-722	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R3	Ethernet Packet	Link	Recieved and accepted packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:24:37-722	PC3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC3	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.132
14:24:37-722	PC3	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.132).
14:24:37-722	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:24:37-722	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R6	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.129).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface AB:BE:92:1A:2C:AC
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:24:37-722	PC3	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC3	Echo Reply Packet	Network	Created Echo Reply packet to 204.188.45.65
14:24:37-722	PC3	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.132).
14:24:37-722	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:24:37-722	R6	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:24:37-722	R6	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.65).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface B8:AF:C0:74:61:A5
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:24:37-722	PC2	ICMP_packet	Network	ProtocolStack received packet from local Interface.

14:24:37-722	PC2	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC2	Echo Reply Packet	Network	Echo reply packet received from 204.188.45.129
14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	PC2	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.68
14:24:37-722	PC2	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:24:37-722	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:24:37-722	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	R6	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.65
14:24:37-722	R6	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.65).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface B8:AF:C0:74:61:A5
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:24:37-722	PC2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC2	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	R5	Ethernet Packet	Link	Recieved and accepted packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R5	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R2	Ethernet Packet	Link	Recieved and accepted packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	R2	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC2	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.68).
14:24:37-722	PC2	Ethernet Packet	Link	Sending packet from interface 5A:B8:A8:26:5E:55
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface B8:AF:C0:74:61:A5
14:24:37-722	R6	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:24:37-722	R6	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 204.188.45.129
14:24:37-722	R6	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface AB:BE:92:1A:2C:AC
14:24:37-722	R4	Ethernet Packet	Link	Recieved and accepted packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R4	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R3	Ethernet Packet	Link	Recieved and accepted packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:24:37-722	PC3	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC3	ARP Response Packet	DataLink	Created ARP Response packet to 204.188.45.132
14:24:37-722	PC3	ARP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.132).
14:24:37-722	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:24:37-722	R6	ARP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.

14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R6	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.129).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface AB:BE:92:1A:2C:AC
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	PC3	Ethernet Packet	Link	Recieved and accepted packet at interface 39:C6:B7:8C:53:59
14:24:37-722	PC3	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC3	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC3	Echo Reply Packet	Network	Created Echo Reply packet to 204.188.45.65
14:24:37-722	PC3	ICMP_packet	Network	Sending packet from ProtocolStack (to 204.188.45.132).
14:24:37-722	PC3	Ethernet Packet	Link	Sending packet from interface 39:C6:B7:8C:53:59
14:24:37-722	R4	Ethernet Packet	Link	Recieved and dropped packet at interface 62:7C:C0:2E:8E:30
14:24:37-722	R6	Ethernet Packet	Link	Recieved and accepted packet at interface AB:BE:92:1A:2C:AC
14:24:37-722	R6	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	R6	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
14:24:37-722	R6	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 204.188.45.65).
14:24:37-722	R6	Ethernet Packet	Link	Sending packet from interface B8:AF:C0:74:61:A5
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1
14:24:37-722	R2	Ethernet Packet	Link	Recieved and dropped packet at interface 7D:92:AC:6F:A5:5C
14:24:37-722	PC2	Ethernet Packet	Link	Recieved and accepted packet at interface 5A:B8:A8:26:5E:55
14:24:37-722	PC2	ICMP_packet	Network	ProtocolStack received packet from local Interface.
14:24:37-722	PC2	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
14:24:37-722	PC2	Echo Reply Packet	Network	Echo reply packet received from 204.188.45.129
14:24:37-722	R3	Ethernet Packet	Link	Recieved and dropped packet at interface 7A:61:A7:68:BE:1D
14:24:37-722	R5	Ethernet Packet	Link	Recieved and dropped packet at interface 68:AA:BB:53:2A:A1

Можно увидеть, все запросы выполняются корректно и проходят по кратчайшему пути: через один маршрутизатор. Путь сделать короче невозможно: компьютеры не соединены напрямую.

Выводы

Были изучены методы статической маршрутизации в IP-сетях. Также был получен навык работы с таблицами маршрутизации.