ОТЧЕТ

по лабораторной работе №1

по дисциплине «Сети и телекоммуникации»

Тема: Настройка IP-адресов в сети

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Цель работы.

Изучение и практическое освоение основ адресации, разрешения физических адресов и простейшей маршрутизации в IP-сетях.

Задания.

1. Исправить структуру сети (если это необходимо), обеспечив корректную доставку кадров на физическом уровне.

2. Задать IP-адреса, маски подсети и шлюзы по умолчанию для всех узлов сети, чтобы обеспечить корректную доставку Echo-запроса от K1 к K2 и Echo-ответа обратно. Обосновать свои установки.

3. Выполнить Echo-запрос с K1 на K2. Посмотреть вывод программы.

4. Добавить статическую запись ARP для K3 на K1 (или для ближайшего к K1 маршрутизатора, находящегося между K3 и K1). Подождать устаревания ARP-таблиц и выполнить Echo-запрос с K1 на K3. Объяснить результат.

5. Выполнить Echo-запрос на IP-адрес 200.100.0.1 с K1. Объяснить вывод программы.

6. Выполнить Echo-запросы с K1 и K2 на все узлы сети. Убедиться, что Echo-ответы приходят.

В отчет необходимо включить схему сети, настройки протокола TCP/IP для всех узлов сети и результаты вывода программы, полученные при выполнении Echo-запросов.

Вариант 5.

Файл со схемой сети: lab1_var5.jfst. Сеть между маршрутизаторами RServers, RManagers и RBosses: 10.0.0.0. Компьютер MegaBoss имеет IP-адрес 172.16.0.5. Компьютер Manager2 имеет IP-адрес 172.16.1.12.

Компьютер FileServer имеет IP-адрес 172.16.10.10. Обозначения в задании: K1 – MegaBoss, K2 – Manager2, K3 – File-Server.
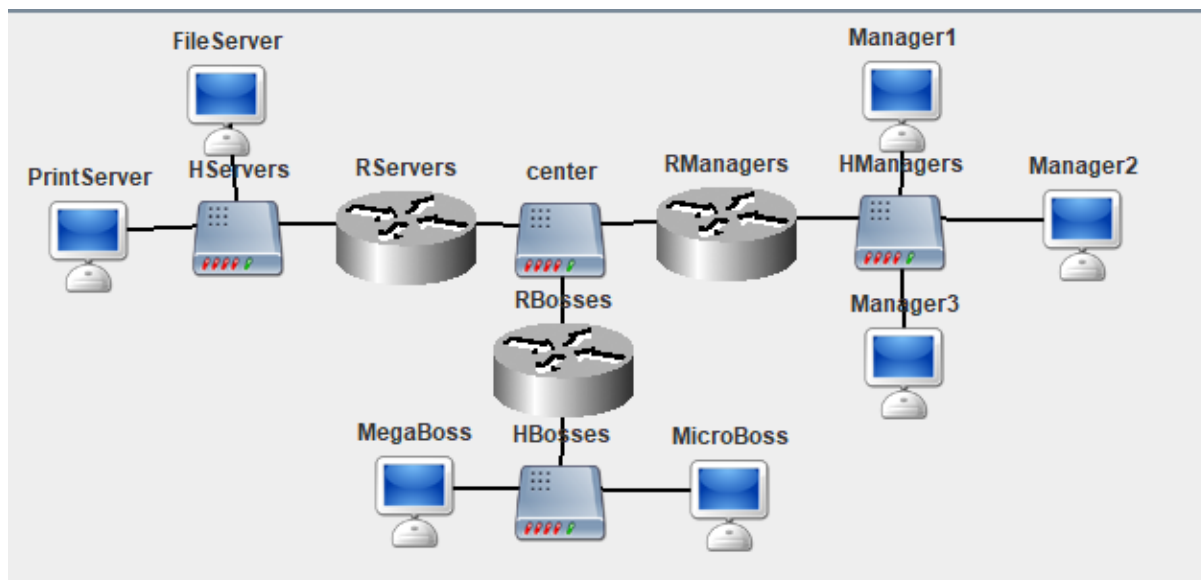
Выполнение работы.

Рисунок 1 – Схема сети

1. Исправление структуры сети на физическом уровне.

В исходной схеме не было произведено манипуляций для исправления структуры сети на физическом уровне, так как, исходя из требований модели OSI на физическом уровне, она удовлетворяла им: три подсети связанные через маршрутизаторы, находящиеся в четвертой подсети, а также во всех подсетях используется концентратор.

2. Настройка исходной сети на сетевом уровне (IP-адреса, шлюзы, маски подсетей).

Полученная конфигурация узлов представлена на рисунках 2 и 3:

Name: center	Default gateway: Not Applicable				
Interface: eth0	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: RServers-TO-center
Interface: eth1	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: RBosses-TO-center
Interface: eth2	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: center-TO-RManagers
Interface: eth3	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth4	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Name: RManagers	Default gateway: 10.0.0.1				
Interface: cua0	Type: Console	MAC address: 58:B1:4B:A9:3C:98	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 58:B1:4B:A9:3C:98	IP address: 172.16.1.14	Subnet mask: 255.255.255.0	Link name: RManagers-TO-HManagers
Interface: eth1	Type: Copper Ethernet	MAC address: 96:2E:9F:72:29:60	IP address: 10.0.0.3	Subnet mask: 255.0.0.0	Link name: center-TO-RManagers
Interface: ser0	Type: Serial	MAC address: Not Applicable	IP address: IP Address not set	Subnet mask: 0.0.0.0	Link name: Not Connected
Name: MicroBoss	Default gateway: 172.16.0.6				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 12:19:50:53:88:19	IP address: 172.16.0.4	Subnet mask: 255.255.255.0	Link name: HBosses-TO-MicroBoss
Name: HBosses	Default gateway: Not Applicable				
Interface: eth0	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: RBosses-TO-HBosses
Interface: eth1	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: MegaBoss-TO-HBosses
Interface: eth2	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: HBosses-TO-MicroBoss
Interface: eth3	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth4	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Name: Manager3	Default gateway: 172.16.1.14				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 24:29:65:C3:63:89	IP address: 172.16.1.13	Subnet mask: 255.255.255.0	Link name: HManagers-TO-Manager3
Name: Manager2	Default gateway: 172.16.1.14				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 9A:7F:57:95:58:98	IP address: 172.16.1.12	Subnet mask: 255.255.255.0	Link name: HManagers-TO-Manager2
Name: Manager1	Default gateway: 172.16.1.14				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 78:65:91:35:5E:98	IP address: 172.16.1.11	Subnet mask: 255.255.255.0	Link name: Manager1-TO-HManagers
Name: HManagers	Default gateway: Not Applicable				
Interface: eth0	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: RManagers-TO-HManagers
Interface: eth1	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Manager1-TO-HManagers
Interface: eth2	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: HManagers-TO-Manager2
Interface: eth3	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: HManagers-TO-Manager3
Interface: eth4	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Name: HServers	Default gateway: Not Applicable				
Interface: eth0	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: RServers-TO-HServers
Interface: eth1	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: HServers-TO-FileServer
Interface: eth2	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: HServers-TO-PrintServer
Interface: eth3	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth4	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected

Рисунок 2 – Конфигурация узлов

	Type: Copper Ethernet	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Name: RBosses	Default gateway: 10.0.0.3				
Interface: cua0	Type: Console	MAC address: 29:BD:A9:6D:31:AC	IP address: 172.16.0.6	Subnet mask: 255.255.255.0	Link name: RBosses-TO-HBosses
Interface: eth0	Type: Copper Ethernet	MAC address: 29:BD:A9:6D:31:AC	IP address: 172.16.0.6	Subnet mask: 255.255.255.0	Link name: RBosses-TO-HBosses
Interface: eth1	Type: Copper Ethernet	MAC address: AA:35:76:BC:9D:AA	IP address: 10.0.0.2	Subnet mask: 255.0.0.0	Link name: RBosses-TO-center
Interface: ser0	Type: Serial	MAC address: Not Applicable	IP address: IP Address not set	Subnet mask: 0.0.0.0	Link name: Not Connected
Name: RServers	Default gateway: 10.0.0.2				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 39:78:80:56:71:8C	IP address: 172.16.10.12	Subnet mask: 255.255.255.0	Link name: RServers-TO-HServers
Interface: eth1	Type: Copper Ethernet	MAC address: 44:2E:A8:95:C4:BC	IP address: 10.0.0.1	Subnet mask: 255.0.0.0	Link name: RServers-TO-center
Interface: ser0	Type: Serial	MAC address: Not Applicable	IP address: IP Address not set	Subnet mask: 0.0.0.0	Link name: Not Connected
Name: PrintServer	Default gateway: 172.16.10.12				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 25:35:71:2A:3F:44	IP address: 172.16.10.11	Subnet mask: 255.255.255.0	Link name: HServers-TO-PrintServer
Name: FileServer	Default gateway: 172.16.10.12				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 8F:5C:7C:C6:8F:9D	IP address: 172.16.10.10	Subnet mask: 255.255.255.0	Link name: HServers-TO-FileServer
Name: MegaBoss	Default gateway: 172.16.0.6				
Interface: cua0	Type: Console	MAC address: Not Applicable	IP address: Not Applicable	Subnet mask: Not Applicable	Link name: Not Connected
Interface: eth0	Type: Copper Ethernet	MAC address: 3E:28:39:AF:65:56	IP address: 172.16.0.5	Subnet mask: 255.255.255.0	Link name: MegaBoss-TO-HBosses

Рисунок 3 – Конфигурация узлов

Первая подсеть 172.16.10.0/24 серверов:

1) для K3(FileServer) и PrintServer меняется маска на 255.255.255.0;

2) RServers получает IP 172.16.10.12 в подсети 172.16.10.0/24;

3) PrintServer получает IP 172.16.10.11 в подсети 172.16.10.0/24;

4) Шлюзом для K3(FileServer) и PrintServer становится RServers (172.16.10.12);

5) Шлюзом для RServers становится RBosses (10.0.0.2).

Вторая подсеть боссов 176.16.0.0/24:

1) Для K1(MegaBoss) и MicroBoss меняется маска на 255.255.255.0;

2) RBosses получает IP 176.16.0.6 в подсети 176.16.0.0/24;

3) MicroBoss получает IP 176.16.0.4 в подсети 176.16.0.0/24;

4) Шлюзом для K1(MegaBoss) и MicroBoss становится RBosses (176.16.0.6);

5) Шлюзом для RBosses становится RManagers (10.0.0.3).

Третья подсеть менеджеров 176.16.1.0/24:

1) Для K2(Manager2), Manager1, Manager3 меняется маска на 255.255.255.0;

2) RManagers получает IP 176.16.1.14 в подсети 176.16.1.0/24;

3) Manager1 и Manager3 получают IP 176.16.1.11 и 176.16.1.13 в подсети 176.16.1.0/24;

4) Шлюзом для Manager1, K2(Manager2), Manager3 становится RManagers (176.16.1.14);

5) Шлюзом для RManagers становится RServers (10.0.0.1).

Данный подбор адресов можно обосновать тем, что для узлов K1 – MegaBoss, K2 – Manager2, K3 – File-Server IP адреса уже были заданы, маска подсети была увеличена до 24. Шлюзами стали роутеры, а для самих роутеров шлюзами становились другие роутеры, поэтому было реализовано "круговое" решение, что помогло достичь все подсети.

3. Выполнение Echo-запроса с K1(MegaBoss) на K2(Manager2).

MegaBoss	Echo Request Packet	Network	Created Echo Request packet to 172.16.1.12
MegaBoss	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.0.6
MegaBoss	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 12:19:50:53:88:19
MicroBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC

RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.0.5
RBosses	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.6).
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.3
RBosses	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.

RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RManagers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.2
RManagers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.2).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.3).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RManagers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.1.12
RManagers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RManagers	Ethernet Packet	Link	Sending packet from interface 58:B1:4B:A9:3C:98
Manager 3	Ethernet Packet	Link	Recieved and accepted packet at interface 24:29:65:C3:63:89
Manager 3	ARP_packet	Network	ProtocolStack received packet from local Interface.

Manager 2	Ethernet Packet	Link	Recieved and accepted packet at interface 9A:7F:57:95:58:98
Manager 2	ARP_packet	Network	ProtocolStack received packet from local Interface.
Manager 2	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
Manager 2	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.1.14
Manager 2	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.1.14).
Manager 2	Ethernet Packet	Link	Sending packet from interface 9A:7F:57:95:58:98
Manager 3	Ethernet Packet	Link	Recieved and dropped packet at interface 24:29:65:C3:63:89
Manager 1	Ethernet Packet	Link	Recieved and dropped packet at interface 78:65:91:35:5E:98
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 58:B1:4B:A9:3C:98
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
Manager 1	Ethernet Packet	Link	Recieved and accepted packet at interface 78:65:91:35:5E:98
Manager 1	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.1.12).
RManagers	Ethernet Packet	Link	Sending packet from interface 58:B1:4B:A9:3C:98
Manager 3	Ethernet Packet	Link	Recieved and dropped packet at interface 24:29:65:C3:63:89
Manager 2	Ethernet Packet	Link	Recieved and accepted packet at interface 9A:7F:57:95:58:98
Manager 2	ICMP_packet	Network	ProtocolStack received packet from local Interface.
Manager 2	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
Manager 2	Echo Reply Packet	Network	Created Echo Reply packet to 172.16.0.5

Manager 2	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.1.14).
Manager 2	Ethernet Packet	Link	Sending packet from interface 9A:7F:57:95:58:98
Manager 3	Ethernet Packet	Link	Recieved and dropped packet at interface 24:29:65:C3:63:89
Manager 1	Ethernet Packet	Link	Recieved and dropped packet at interface 78:65:91:35:5E:98
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 58:B1:4B:A9:3C:98
RManagers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RManagers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.1
RManagers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.3
RServers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.3).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.

RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RManagers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.1).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.2
RServers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.1
RBosses	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.1).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60

RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.2).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ICMP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.1.12
Manager1	Ethernet Packet	Link	Recieved and dropped packet at interface 78:65:91:35:5E:98
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC

Можно увидеть, как K1(MegaBoss) формирует Echo-запрос:

MegaBoss	Echo Request Packet	Network	Created Echo Request packet to 172.16.1.12

После прохождения маршрута до К2(Manager2) можно увидеть, как формируется Echo-ответ:

Manager 2	Echo Reply Packet	Networ k	Created Echo Reply packet to 172.16.0.5

Также можно увидеть получение ответа на К1:

MegaBos s	Echo Reply Packet	Networ k	Echo reply packet received from 172.16.1.12

Полученный результат говорит о том, что между К1 и К2 корректно настроена связь.

4. Добавление статической записи ARP для К3(FileServer) на К1(MegaBoss) (или для ближайшего к К1 маршрутизатора, находящегося между К3 и К1). Подождать устаревания ARP-таблиц и выполнить Echo-запрос с К1 на К3.

Так как узлы находятся в разных подсетях, то статическая запись в ARP таблицу была добавлена для шлюза по умолчанию для К1(MegaBoss):

То есть К1(MegaBoss) в ARP таблице имеет для IP 172.16.0.6 сопоставление физического адреса RBosses 29:BD:A9:6D:31:AC.

Вывод, полученный при запуске со статической ARP записью:

MegaBoss	Echo Request Packet	Network	Created Echo Request packet to 172.16.10.10
MegaBoss	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.6).
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19

RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.3
RBosses	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RManagers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.2
RManagers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.2).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.3).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA

RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RManagers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.1
RManagers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.3
RServers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.3).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RManagers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.1).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60

RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.10.10
RServers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RServers	Ethernet Packet	Link	Sending packet from interface 39:78:80:56:71:8C
PrintServer	Ethernet Packet	Link	Recieved and accepted packet at interface 25:35:71:2A:3F:44
PrintServer	ARP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:5C:7C:C6:8F:9D
FileServer	ARP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
FileServer	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.10.12
FileServer	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.10.12).
FileServer	Ethernet Packet	Link	Sending packet from interface 8F:5C:7C:C6:8F:9D
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 39:78:80:56:71:8C
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.

RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.10.10).
RServers	Ethernet Packet	Link	Sending packet from interface 39:78:80:56:71:8C
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
FileServer	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:5C:7C:C6:8F:9D
FileServer	ICMP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
FileServer	Echo Reply Packet	Network	Created Echo Reply packet to 172.16.0.5
FileServer	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.10.12).
FileServer	Ethernet Packet	Link	Sending packet from interface 8F:5C:7C:C6:8F:9D
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 39:78:80:56:71:8C
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.2
RServers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA

RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.1
RBosses	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.1).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.2).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.0.5
RBosses	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 12:19:50:53:88:19

MicroBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.0.6
MegaBoss	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.6).
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ICMP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.10.10
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC

Теперь отправим запрос без статической ARP записи:

MegaBoss	Echo Request Packet	Network	Created Echo Request packet to 172.16.10.10
MegaBoss	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.0.6
MegaBoss	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 12:19:50:53:88:19
MicroBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.0.5
RBosses	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ARP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.0.6).
MegaBoss	Ethernet Packet	Link	Sending packet from interface 3E:28:39:AF:65:56
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface 29:BD:A9:6D:31:AC

RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.3
RBosses	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RManagers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.2
RManagers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.2).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.3).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60

RManagers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RManagers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.1
RManagers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.3
RServers	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.3).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RManagers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.1).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA

RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 172.16.10.10
RServers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RServers	Ethernet Packet	Link	Sending packet from interface 39:78:80:56:71:8C
PrintServer	Ethernet Packet	Link	Recieved and accepted packet at interface 25:35:71:2A:3F:44
PrintServer	ARP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:5C:7C:C6:8F:9D
FileServer	ARP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
FileServer	ARP Response Packet	DataLink	Created ARP Response packet to 172.16.10.12
FileServer	ARP_packet	Network	Sending packet from ProtocolStack (to 172.16.10.12).
FileServer	Ethernet Packet	Link	Sending packet from interface 8F:5C:7C:C6:8F:9D
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 39:78:80:56:71:8C
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.10.10).

RServers	Ethernet Packet	Link	Sending packet from interface 39:78:80:56:71:8C
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
FileServer	Ethernet Packet	Link	Recieved and accepted packet at interface 8F:5C:7C:C6:8F:9D
FileServer	ICMP_packet	Network	ProtocolStack received packet from local Interface.
FileServer	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
FileServer	Echo Reply Packet	Network	Created Echo Reply packet to 172.16.0.5
FileServer	ICMP_packet	Network	Sending packet from ProtocolStack (to 172.16.10.12).
FileServer	Ethernet Packet	Link	Sending packet from interface 8F:5C:7C:C6:8F:9D
PrintServer	Ethernet Packet	Link	Recieved and dropped packet at interface 25:35:71:2A:3F:44
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 39:78:80:56:71:8C
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ARP Discovery Packet	DataLink	Created ARP discovery packet to source MAC address for IP 10.0.0.2
RServers	ARP_packet	Network	Sending broadcast packet from ProtocolStack.
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ARP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.

RBosses	ARP Response Packet	DataLink	Created ARP Response packet to 10.0.0.1
RBosses	ARP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.1).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ARP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ARP_packet	Network	Confirmed Packet is for this Network Layer Device.
RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.2).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ICMP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.10.10

RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC

Результат получился одинаковый: ответ от K3 в K1 пришел. Однако есть различия в том, как это происходило: со статической ARP записью с узла K1 не запускался ARP протокол для поиска MAC-адреса (физического адреса) маршрутизатора RBosses, однако из-за этого на обратном пути от узла K3 самому маршрутизатору пришлось воспользоваться ARP протоколом для поиска физического адреса узла назначения, ведь раннее ARP запись в его таблицу не вносилась динамически. Именно поэтому во втором случае (без внесения статической записи) роутер не инициировал широковещательный ARP запрос для поиска MAC-адреса K1.

5. Выполнение Echo-запроса на IP-адрес 200.100.0.1 с K1.

Вывод программы (оставлена последняя часть, так как объемный кусок вывода до этого представляет из себя «петлю» между маршрутизаторами, которые пересылают пакет друг другу, по причине того, что они настроены шлюзами друг для друга):

RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RServers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.2).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA

RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.3).
RBosses	Ethernet Packet	Link	Sending packet from interface AA:35:76:BC:9D:AA
RManagers	Ethernet Packet	Link	Recieved and accepted packet at interface 96:2E:9F:72:29:60
RManagers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RManagers	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RManagers	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 10.0.0.1).
RManagers	Ethernet Packet	Link	Sending packet from interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and dropped packet at interface AA:35:76:BC:9D:AA
RServers	Ethernet Packet	Link	Recieved and accepted packet at interface 44:2E:A8:95:C4:BC
RServers	ICMP_packet	Network	ProtocolStack received packet from local Interface.
RServers	ICMP_packet	Network	Packet Dropped: Hop count exceeded. Host 200.100.0.1 Unreachable
RServers	ICMP Time Exceeded	Network	Sending ICMP Time Exceeded to 172.16.0.5
RServers	ICMP_packet	Network	Sending packet from ProtocolStack (to 10.0.0.2).
RServers	Ethernet Packet	Link	Sending packet from interface 44:2E:A8:95:C4:BC
RManagers	Ethernet Packet	Link	Recieved and dropped packet at interface 96:2E:9F:72:29:60
RBosses	Ethernet Packet	Link	Recieved and accepted packet at interface AA:35:76:BC:9D:AA
RBosses	ICMP_packet	Network	ProtocolStack received packet from local Interface.

RBosses	ICMP_packet	Network	Packet Received: Network Layer Device is Routable forwarding packet.
RBosses	ICMP_packet	Network	Forwarding packet from ProtocolStack(to 172.16.0.5).
RBosses	Ethernet Packet	Link	Sending packet from interface 29:BD:A9:6D:31:AC
MicroBoss	Ethernet Packet	Link	Recieved and dropped packet at interface 12:19:50:53:88:19
MegaBoss	Ethernet Packet	Link	Recieved and accepted packet at interface 3E:28:39:AF:65:56
MegaBoss	ICMP_packet	Network	ProtocolStack received packet from local Interface.
MegaBoss	ICMP_packet	Network	Confirmed Packet is for this Network Layer Device.
MegaBoss	ICMP Time Exceeded	Network	Recieved ICMP Time Exceeded from 10.0.0.1
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC
RServers	Ethernet Packet	Link	Recieved and dropped packet at interface 44:2E:A8:95:C4:BC

Можно заметить, что в определенный момент на маршрутизаторе RServers TTL пакета был исчерпан, потому что узел с ip 200.100.0.1 не был найден:

RServers	ICMP_packet	Network	Packet Dropped: Hop count exceeded. Host 200.100.0.1 Unreachable

После этого был отправлен ICMP пакет в узел, инициировавший запрос, K1(MegaBoss), который был успешно получен:

RServers	ICMP Time Exceeded	Network	Sending ICMP Time Exceeded to 172.16.0.5

Данное поведение можно было предсказать, так как узел с IP 200.100.0.1 не существует.

6. Выполнить Echo-запросы с К1 и К2 на все узлы сети. Убедиться, что Echo-ответы приходят.

В данном задании будет исключена проверка запросов между К1(MegaBoss) и К2(Manager2), так как она была в задании 2, а также проверка между К1(MegaBoss) и К3(FileServer), так как была в задании 4. Чтобы избежать множество длинных выводов эмулятора, будет лишь продемонстрирована строка ответа из листинга.

1) К1 (MegaBoss):

MicroBoss:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.0.4

Manager1:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.1.11

Manager3:

MegaBoss	Echo Reply Packet	Network k	Echo reply packet received from 172.16.1.13

PrintServer:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.10.11

RBosses:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 172.16.0.6

RManagers:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 10.0.0.3

RServers:

MegaBoss	Echo Reply Packet	Network	Echo reply packet received from 10.0.0.1

2) К2 (Manager2):

MicroBoss:

Manager 2	Echo Reply Packet	Networ k	Echo reply packet received from 172.16.0.4

Manager1:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 172.16.1.11

Manager3:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 172.16.1.13

FileServer:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 172.16.10.10

PrintServer:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 172.16.10.11

RManager:

Manager 2	Echo Reply Packet	Networ k	Echo reply packet received from 172.16.1.14

RBosses:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 10.0.0.2

RServers:

Manager2	Echo Reply Packet	Network	Echo reply packet received from 10.0.0.1

Вывод.

Изучены и применены на практике знания об основах IP-адресации и работе ARP протокола.

Проведена настройка сети и проверка ее работоспособности, а также осуществлен анализ полученных результатов на основе листинга эмулятора.