



MPLS Опорни мрежи

Задача 1 – Пресъздаване на
топология от 4 последователно
свързани рутера чрез Dynamips

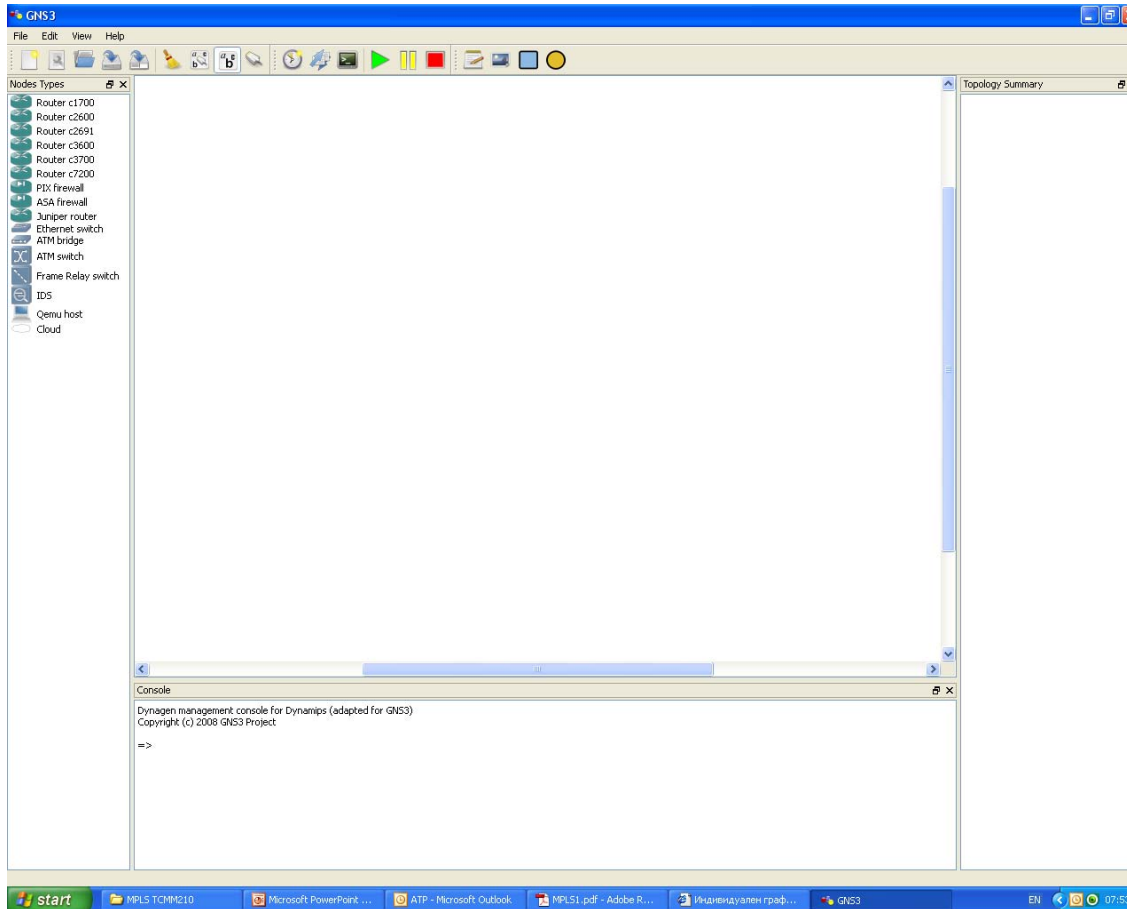


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Стъпка 1

Свалих програмата GNS3 от официалния сайт
и я инсталирах



Стъпка 3

Интегрирах Cisco IOS за рутери модел 1710, 3640, 7200 в GNS3.



The screenshot shows the GNS3 application window with the 'IOS images and hypervisors' dialog box open. The dialog has two tabs: 'IOS Images' and 'External hypervisors'. The 'IOS Images' tab is active, showing a table of IOS images:

IOS image	Model/Chassis
127.0.0.1\C:\Documents and Settings\Administrator\Desktop\MPLS TCMM210\c1700-sv3-mz.122-4.YB.bin	1710
127.0.0.1\C:\Documents and Settings\Administrator\Desktop\MPLS TCMM210\c3640-i-mz.122-6.bin	3640
127.0.0.1\C:\Documents and Settings\Administrator\Desktop\MPLS TCMM210\c7200-i-mz.19991126	7200

Below the table, the 'Settings' section is visible for the selected image:

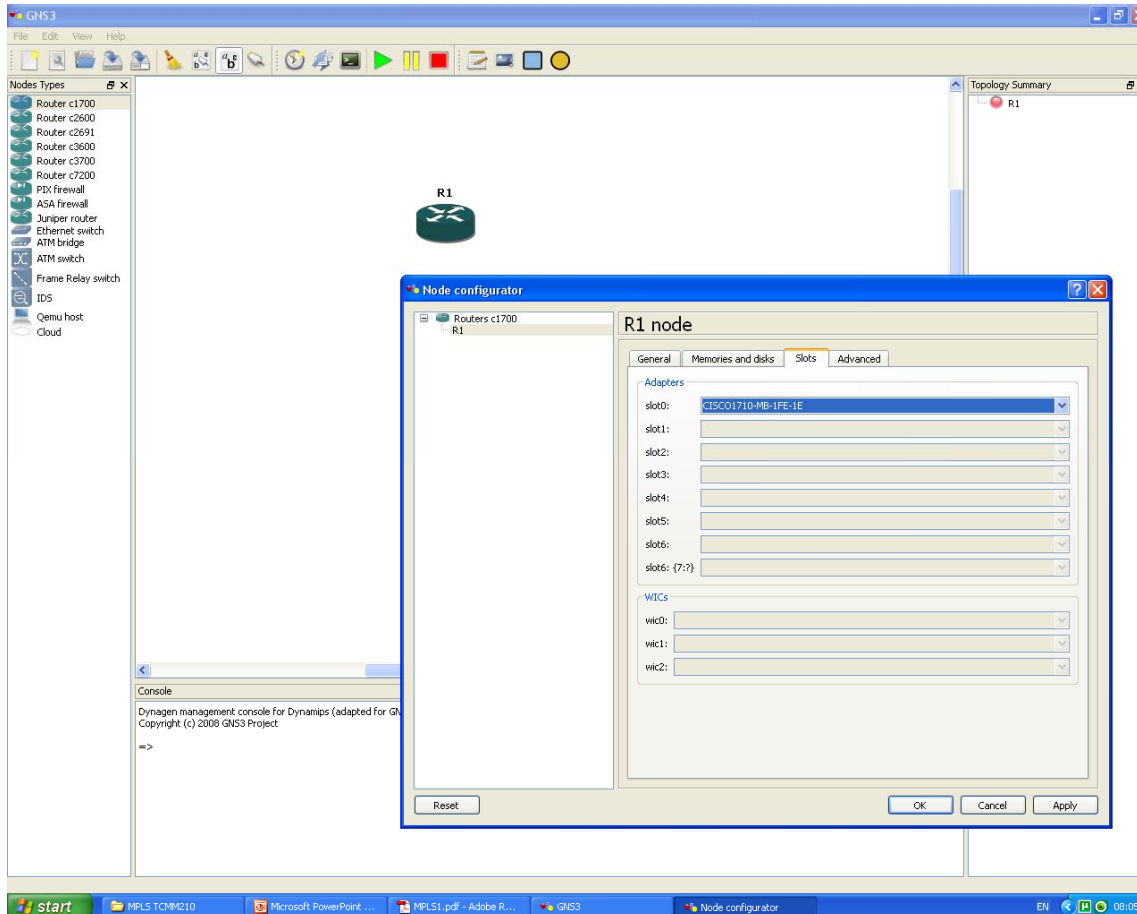
- Image file: ...
- Platform:
- Model:
- IDLE PC:
- Default RAM: [Check for minimum RAM requirement](#)
- Default image for this platform

The 'Hypervisors' section has the checkbox 'Use the hypervisor manager' checked.

The background shows the GNS3 main window with a 'Nodes Types' list on the left and a 'Topology Summary' on the right. The console window at the bottom shows the Dynagen management console prompt '=>'.

Стъпка 4

Опитах се да започна да пресъздавам въпросната топология с Cisco рутери модел 1710.



Опита беше неуспешен защото имаше възможност за добавяне само на един FE интерфейс

Стъпка 5

Добавих 4 рутера 3640 и им добавих по два FE порта.



The screenshot displays the GNS3 network simulator interface. The main window shows a network topology with four routers labeled R1, R2, R3, and R4. A 'Node configurator' dialog box is open for router R4, showing the 'Adapters' tab. The 'Adapters' section has dropdown menus for slot0, slot1, slot2, slot3, slot4, slot5, slot6, and slot6: (?). Slot0 and slot1 are set to 'NM-1FE-TX'. Below the adapters are 'VICs' (Virtual Interface Cards) for vic0, vic1, and vic2. The 'Nodes Types' list on the left includes various router models like Router c1700, Router c2600, Router c2691, Router c3600, Router c3700, Router c7200, PIX firewall, ASA firewall, Juniper router, Ethernet switch, ATM bridge, ATM switch, Frame Relay switch, IDS, Qemu host, and Cloud. The 'Topology Summary' on the right shows a list of nodes R1, R2, R3, and R4. The Windows taskbar at the bottom shows the Start button and several open applications including MPLS TCM210, Microsoft PowerPoint, MPLS1.pdf - Adobe R..., GNS3, and Node configurator. The system tray shows the time as 08:16.

Стъпка 6

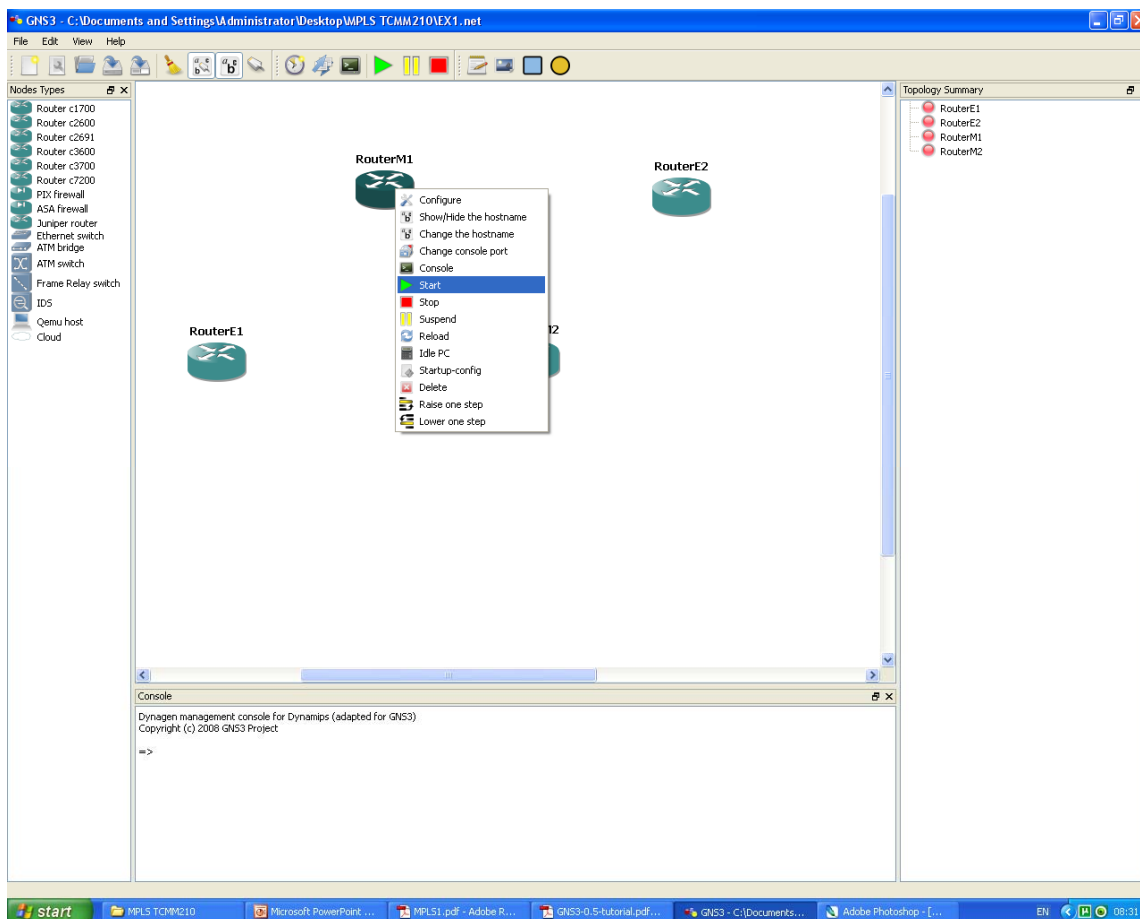
Промених имената на рутерите с индекс М (Middle) за тези свързващи по две мрежи и Е (End) за останалите свързани към една мрежа.



The screenshot displays the GNS3 network simulator interface. The main workspace shows a network topology with four routers: RouterE1, R2, R3, and R4. A dialog box titled "Change the hostna..." is open, showing the hostname "RouterM1" in the input field. The "Nodes Types" list on the left includes various network devices like Router c1700, Router c2600, Router c2691, Router c3600, Router c3700, Router c7200, PIX firewall, ASA firewall, Juniper router, Ethernet switch, ATM bridge, ATM switch, Frame Relay switch, IDS, Qemu host, and Cloud. The "Topology Summary" on the right lists R2, R3, R4, and RouterE1. The console at the bottom shows the Dynagen management console for Dynamips (adapted for GNS3) with a copyright notice for 2008 GNS3 Project and a prompt "=>".

Стъпка 7

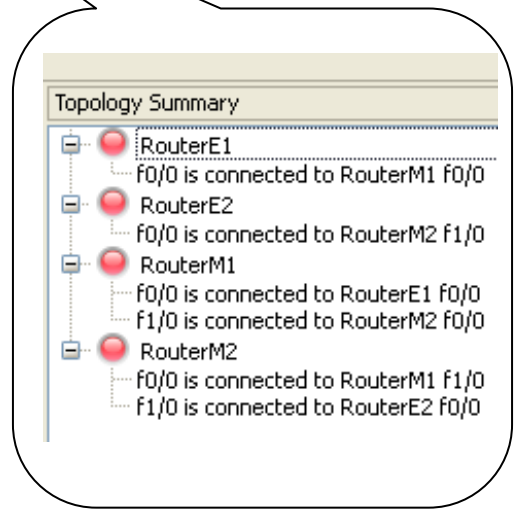
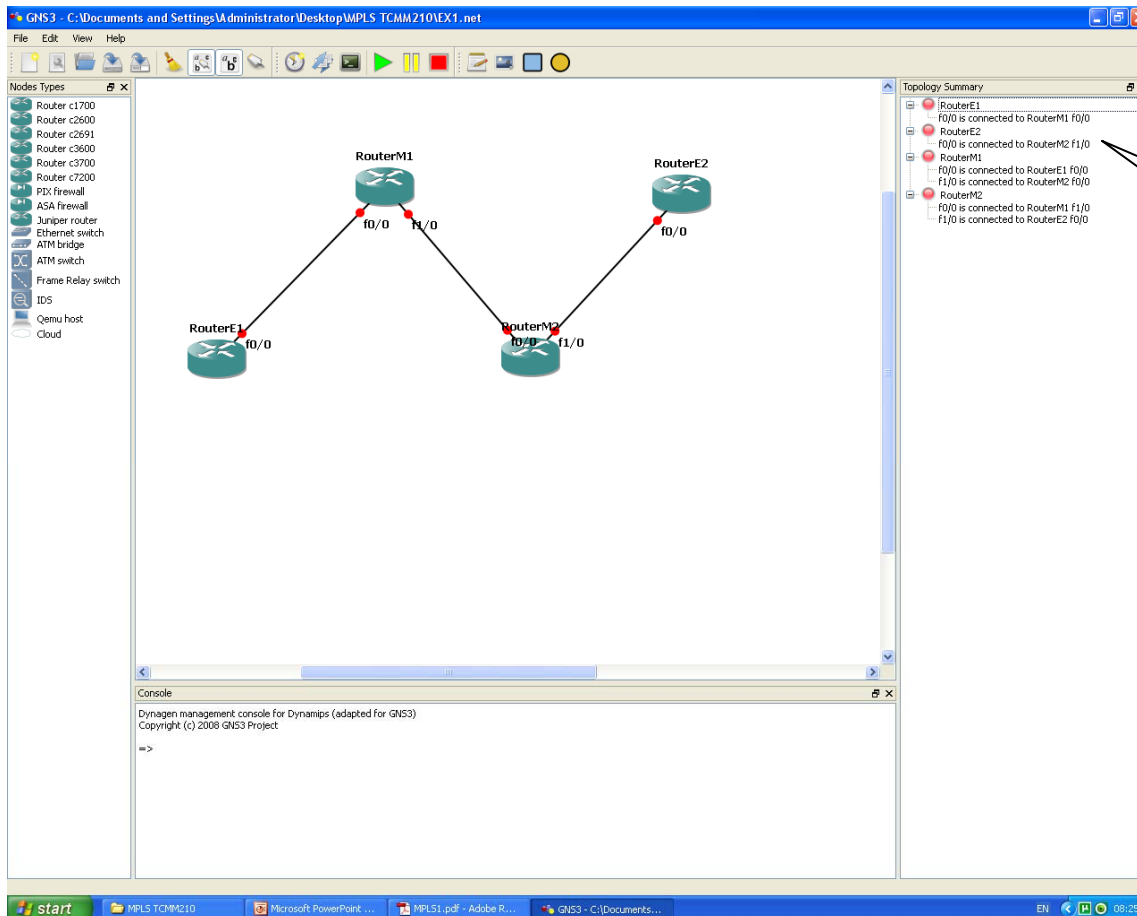
Както е описано в GNS3-0.5-tutorial.pdf стартирах последователно всички рутери и пуснах конзола за всеки от тях



Стъпка 7.1
Избрах стойности
за IdlePC.
(Казано честно
не разбрах
смисъла на тази
стъпка)

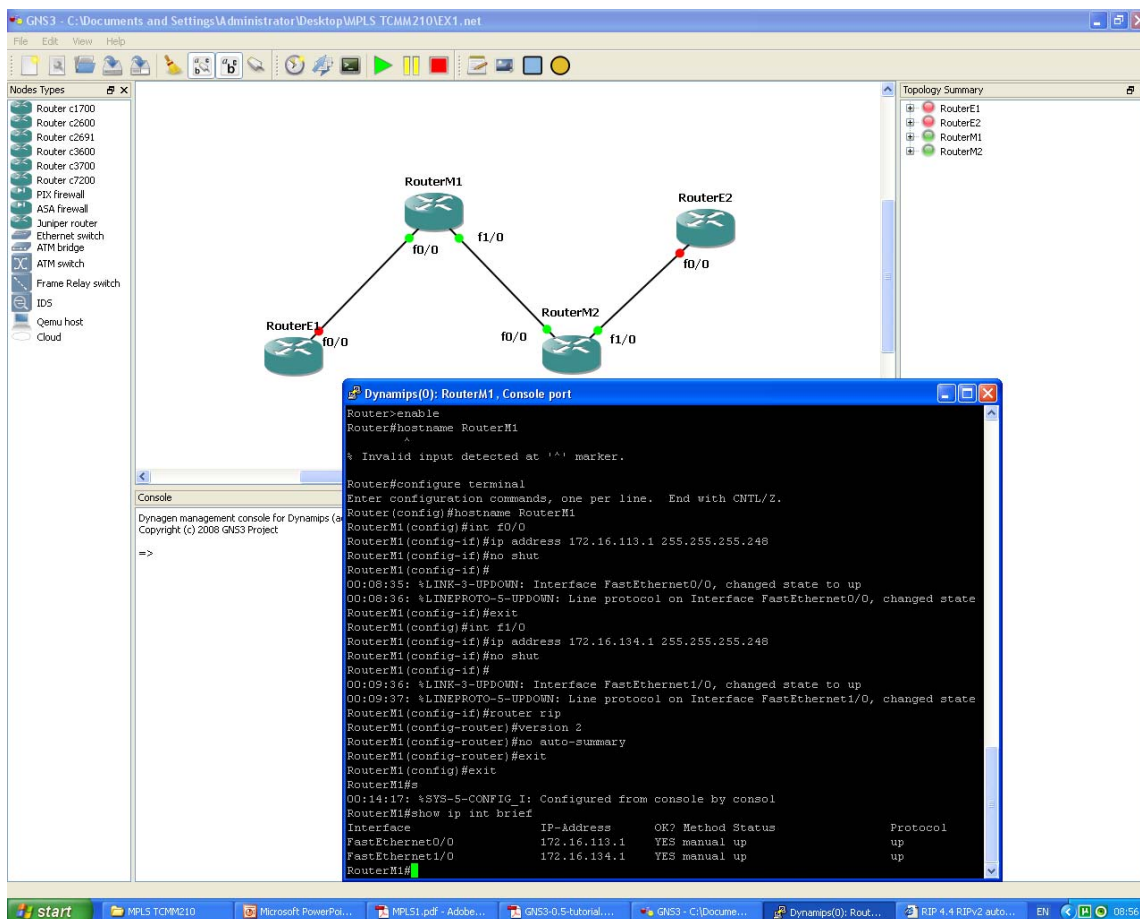
Стъпка 8

Изградих връзките между рутерите



Стъпка 9

В конзолата на всеки от рутерите зададох IP адресите на всеки отделен интерфейс



The screenshot displays the GNS3 interface with a network topology of four routers: RouterE1, RouterM1, RouterM2, and RouterE2. RouterM1 is connected to RouterE1 and RouterM2. RouterM2 is connected to RouterM1 and RouterE2. The terminal window for RouterM1 shows the following configuration steps:

```
Router#enable
Router#hostname RouterM1
RouterM1(config)#int f0/0
RouterM1(config-if)#ip address 172.16.113.1 255.255.255.248
RouterM1(config-if)#no shut
RouterM1(config-if)#
00:08:35: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
00:08:36: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
RouterM1(config-if)#exit
RouterM1(config)#int f1/0
RouterM1(config-if)#ip address 172.16.134.1 255.255.255.248
RouterM1(config-if)#no shut
RouterM1(config-if)#
00:09:36: %LINK-3-UPDOWN: Interface FastEthernet1/0, changed state to up
00:09:37: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
RouterM1(config-if)#router rip
RouterM1(config-router)#version 2
RouterM1(config-router)#no auto-summary
RouterM1(config-router)#exit
RouterM1(config)#exit
RouterM1#
00:14:17: %SYS-5-CONFIG I: Configured from console by console
RouterM1#show ip int brief
Interface      IP-Address      OK? Method Status  Protocol
FastEthernet0/0 172.16.113.1    YES manual up      up
FastEthernet1/0 172.16.134.1   YES manual up      up
RouterM1#
```

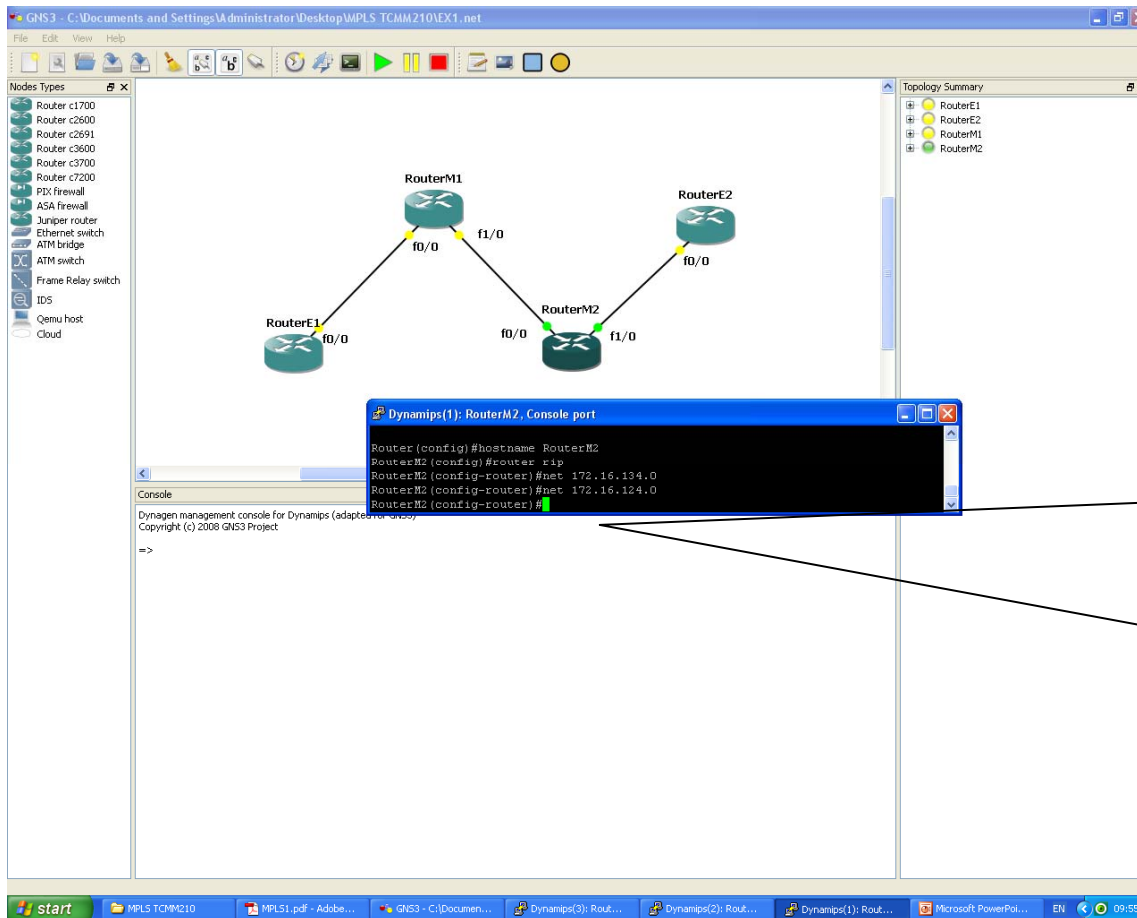


Използвах само номера "1" и "2" като крайна IP адресация на интерфейсите

Пример:
За f0/0 на RouterM1:
172.16.113.1
За f0/0 на RouterE1:
172.16.113.2

Стъпка 10

Установявам че при пускането на рутирация протокол RIP ver.2 съм забравил да окажа за кои мрежи се отнася той.



The screenshot shows the GNS3 interface with a network topology. The topology consists of four routers: RouterE1, RouterM1, RouterM2, and RouterE2. RouterE1 is connected to RouterM1 (f0/0 to f0/0). RouterM1 is connected to RouterM2 (f1/0 to f0/0). RouterM2 is connected to RouterE2 (f0/0 to f1/0). A console window for RouterM2 is open, showing the following configuration commands:

```
Dynamips(1): RouterM2, Console port
RouterM2 (config)#hostname RouterM2
RouterM2 (config)#router rip
RouterM2 (config-router)#net 172.16.134.0
RouterM2 (config-router)#net 172.16.124.0
RouterM2 (config-router)#
```



Отново отивам в конзолата на всеки от рутерите и допълнително оказвам по 2 мрежи на рутерите с индекс М и по една мрежа на рутерите с индекс Е.

Стъпка 11

С командата PING пускам ICMP пакет от RouterE1 до RouterE2 и обратно



The screenshot shows a GNS3 network simulation. The main window displays a topology with four routers: RouterE1, RouterM1, RouterM2, and RouterE2. RouterE1 is connected to RouterM1 (f0/0 to f0/0). RouterM1 is connected to RouterM2 (f1/0 to f0/0). RouterM2 is connected to RouterE2 (f0/0 to f1/0). Two terminal windows are open, showing the results of ping commands:

```
Dynamips(2): RouterE1. Console port
RouterE1#
RouterE1#
RouterE1#
RouterE1#ping 172.16.124.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.124.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 592/740/852 ms
RouterE1#
```

```
Dynamips(3): RouterE2. Console port
RouterE2#
RouterE2#
RouterE2#
RouterE2#ping 172.16.113.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.113.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 628/690/732 ms
RouterE2#
```

Пакетите преминават през всички рутери и аз оставам с убеждението, че всичко работи!!!



Благодаря за вниманието

