:2

```
Router>enable\
% Unknown command or computer name, or unable to find computer address
Router>enable
Router#write erase
Erasing the nvram filesystem will remove all files! Continue? [confirm]
[OK]
Erase of nvram: complete
Router#
Router#
Router#dir
Directory of flash:/

    1  -rw-    16505800             <no date>  c2500-jk8os-l.122-1d.bin

16777216 bytes total (271352 bytes free)
Router#reload
Proceed with reload? [confirm]

00:24:06: %SYS-5-RELOAD: Reload requested
System Bootstrap, Version 11.0(10c), SOFTWARE
Copyright (c) 1986-1996 by cisco Systems
2500 processor with 14336 Kbytes of main memory

Notice: NVRAM invalid, possibly due to write erase.
```

:3

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostnmae R2
                   ^
% Invalid input detected at '^' marker.

Router(config)#hostname R2
R2(config)#show fast
R2(config)#show fastE
```

```
R2#show interfaces summ
R2#show interfaces summary

 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count

  Interface          IHQ   IQD  OHQ   OQD  RXBS RXPS  TXBS TXPS  TRTL
------------------------------------------------------------------------
  BRI0                 0     0    0     0     0    0     0    0    0
  BRI0:1               0     0    0     0     0    0     0    0    0
  BRI0:2               0     0    0     0     0    0     0    0    0
  Ethernet0            0     0    0     0     0    0     0    0    0
  Serial0              0     0    0     0     0    0     0    0    0
  Serial1              0     0    0     0     0    0     0    0    0
  Serial2              0     0    0     0     0    0     0    0    0
  Serial3              0     0    0     0     0    0     0    0    0
R2#co
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#in
R2(config)#interface E
R2(config)#interface Ethernet0
R2(config-if)#shu
R2(config-if)#shutdown
R2(config-if)#exit
R2(config)#in
R2(config)#interface se
R2(config)#interface serial0
R2(config-if)#shutdown
R2(config-if)#exit
R2(config)#interface serial1
R2(config-if)#shutdown
R2(config-if)#exit
R2(config)#interface serial2
R2(config-if)#shutdown
R2(config-if)#exit
R2(config)#interface serial3
R2(config-if)#shutdown
R2(config-if)#exit
```

```
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#no ip domain-lookup
R2(config)#
```

:4

```
10.1.2.0 overlaps with Loopback21
R2(config-if)#interface loopback21
R2(config-if)#ip address 10.1.2.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface loopback25
R2(config-if)#ip address 10.1.2.5 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface loopback25
00:35:45: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback25, p address 10.1.2.5 255.255.255.252
                  ^
% Invalid input detected at '^' marker.

R2(config)#interface loopback29
R2(config-if)#ip address 10.1.2.9 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
```

```
R2(config)#interface Serial0
R2(config-if)#ip address 10.1.200.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#no shutdown
00:49:31: %LINK-3-UPDOWN: Interface Serial0, changed stno shutdown
                ^
% Invalid input detected at '^' marker.

R2(config)#interface Serial2
R2(config-if)#ip address 172.16.23.2 255.255.255.248
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
00:50:04: %LINK-3-UPDOWN: Interface Serial2, changed state to down
R2(config)#
```

```
R2(config)#router rip
R2(config-router)#network 10.1.2.0
R2(config-router)#network 172.16.23.0
R2(config-router)#network 10.1.200.0
R2(config-router)#exit
R2(config)#version 1
R2(config)#
```

```
R2#show ip INTerface ?
  Async              Async interface
  BRI                ISDN Basic Rate Interface
  BVI                Bridge-Group Virtual Interface
  CTunnel            CTunnel interface
  Dialer             Dialer interface
  Ethernet           IEEE 802.3
  Lex                Lex interface
  Loopback           Loopback interface
  Multilink          Multilink-group interface
  Null               Null interface
  Serial             Serial
  Tunnel             Tunnel interface
  Vif                PGM Multicast Host interface
  Virtual-Template   Virtual Template interface
  Virtual-TokenRing  Virtual TokenRing
  brief              Brief summary of IP status and configuration
  |                  Output modifiers
  <cr>

R2#show ip INTerface
R2#show ip INTerface br
R2#show ip INTerface bri
R2#show ip INTerface brie
R2#show ip INTerface brief
01:14:43: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to down
Interface                  IP-Address      OK? Method Status                Protocol
BRI0                       unassigned      YES unset  administratively down down
BRI0:1                     unassigned      YES unset  administratively down down
BRI0:2                     unassigned      YES unset  administratively down down
Ethernet0                  unassigned      YES unset  administratively down down
Loopback21                 10.1.2.1        YES manual up                    up
Loopback25                 10.1.2.5        YES manual up                    up
Loopback29                 10.1.2.9        YES manual up                    up
Serial0                    10.1.200.2      YES manual up                    down
Serial1                    unassigned      YES unset  administratively down down
Serial2                    172.16.23.2     YES manual up                    down
Serial3                    unassigned      YES unset  administratively down down
R2#
01:19:23: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up
01:19:43: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2, changed state to up
```

:5

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#
```

جواب سوال:

وقتی روی rip ورژن یک است اون سابنت مسکاش با هم مطابقت ندارند و توی ip ورژن یک کلاس ها باید مطابقت داشته باشند که بتونه جدول را بگیره و ارسال کنه و اینجا چون سابنت مسکاشون یکی نیست این کار انجام نمی تونه بشه چون توی این حالت ما classful داریم و برامون کلاسا مهمه پس فقط پینگ اولی موفق میشه و بقیه نمی تونن پینگ بگیرن ولی وقتی rip رو روی ورژن دو قرار دادیم می تونیم پینگ بگیریم به این علت که دیگه classful نیست و می ره روی حالت classless و اینکه ip روی چه کلاسی باشند دیگه برای ما اهمیتی نداره توی این حالت و به همین خاطر الان همه پینگ ها موفق میشه

:6

```
R2(config)#interface Ethernet0
R2(config-if)#ip address 10.1.100.2 255.255.255.0
R2(config-if)#no shutdown\
                        ^
% Invalid input detected at '^' marker.

R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
01:33:39: %LINK-3-UPDOWN: Interface Ethernet0, changed state to up
R2(config)#
01:40:21: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0, changed state to up
01:41:45: %LINK-3-UPDOWN: Interface Serial0, changed state to up
01:41:45: %LINK-3-UPDOWN: Interface Serial2, changed state to up
01:41:46: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up
01:41:46: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2, changed state to up
R2(config)#router rip
R2(config-router)#network 10.1.100.0
R2(config-router)#
```

:7

```
R2#debug ip rip
RIP protocol debugging is on
R2#
01:51:18: RIP: received v2 update from 10.1.100.1 on Ethernet0
01:51:18:      10.1.1.0/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.1.4/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.1.8/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.200.0/24 via 0.0.0.0 in 1 hops
01:51:18:      172.31.0.0/16 via 0.0.0.0 in 1 hops
01:51:18: RIP: received v2 update from 10.1.200.1 on Serial0
01:51:18:      10.1.1.0/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.1.4/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.1.8/30 via 0.0.0.0 in 1 hops
01:51:18:      10.1.100.0/24 via 0.0.0.0 in 1 hops
01:51:18:      172.31.0.0/16 via 0.0.0.0 in 1 hops
01:51:21: RIP: ignored v1 packet from 172.16.23.3 (illegal version)
01:51:24: RIP: ignored v1 packet from 10.1.100.3 (illegal version)
01:51:27: RIP: sending v2 update to 224.0.0.9 via Ethernet0 (10.1.100.2)
01:51:27: RIP: build update entries
01:51:27:       10.1.2.0/30 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.2.4/30 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.2.8/30 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.200.0/24 via 0.0.0.0, metric 1, tag 0
01:51:27:       172.16.0.0/16 via 0.0.0.0, metric 1, tag 0
01:51:27: RIP: sending v2 update to 224.0.0.9 via Loopback21 (10.1.2.1)
01:51:27: RIP: build update entries
01:51:27:       10.1.1.0/30 via 0.0.0.0, metric 2, tag 0
01:51:27:       10.1.1.4/30 via 0.0.0.0, metric 2, tag 0
01:51:27:       10.1.1.8/30 via 0.0.0.0, metric 2, tag 0
01:51:27:       10.1.2.4/30 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.2.8/30 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.100.0/24 via 0.0.0.0, metric 1, tag 0
01:51:27:       10.1.200.0/24 via 0.0.0.0, metric 1, tag 0
01:51:27:       172.16.0.0/16 via 0.0.0.0, metric 1, tag 0
```

```
R2#no debug ip rip
RIP protocol debugging is off
R2#
```

```
R2#show ip route rip
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
R       172.16.0.0/16 [120/2] via 10.1.200.1, 00:00:02, Serial0
R    172.31.0.0/16 [120/1] via 10.1.100.1, 00:00:03, Ethernet0
                   [120/1] via 10.1.200.1, 00:00:02, Serial0
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
R       10.1.1.8/30 [120/1] via 10.1.100.1, 00:00:03, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:02, Serial0
R       10.1.1.0/30 [120/1] via 10.1.100.1, 00:00:03, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:02, Serial0
R       10.1.1.4/30 [120/1] via 10.1.100.1, 00:00:03, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:02, Serial0
R2#
R2#
R2#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 19 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is
  Incoming update filter list for all interfaces is
  Redistributing: rip
  Default version control: send version 2, receive version 2
    Interface             Send  Recv  Triggered RIP  Key-chain
    Ethernet0             2     2
    Loopback21            2     2
    Loopback25            2     2
    Loopback29            2     2
    Serial0               2     2
    Serial2               2     2
  Automatic network summarization is in effect
  Routing for Networks:
    10.0.0.0
    172.16.0.0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.100.1           120      00:00:16
    172.16.23.3          120      00:34:49
    10.1.200.1           120      00:00:15
  Distance: (default is 120)

R2#
```

:8

```
R2#
R2#maximum-paths 1
Translating "maximum-paths"

Translating "maximum-paths"
% Unknown command or computer name, or unable to find computer address
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router rip
R2(config-router)#maximum-paths 1
R2(config-router)#do show ip rip
                   ^
% Invalid input detected at '^' marker.

R2(config-router)#do show ip route rip
                   ^
% Invalid input detected at '^' marker.

R2(config-router)#exit
R2(config)#do show ip route rip
              ^
% Invalid input detected at '^' marker.

R2(config)#exit
R2#maximum-paths 1
02:04:29: %SYS-5-CONFIG_I: Configured from conconf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#exit
R2#maximum-paths 1
02:04:36: %SYS-5-CONFIG_I: Configured from con
R2#show ip route rip
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
R       172.16.0.0/16 [120/2] via 10.1.200.1, 00:00:11, Serial0
R    172.31.0.0/16 [120/1] via 10.1.200.1, 00:00:11, Serial0
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
R       10.1.1.8/30 [120/1] via 10.1.200.1, 00:00:11, Serial0
R       10.1.1.0/30 [120/1] via 10.1.200.1, 00:00:11, Serial0
R       10.1.1.4/30 [120/1] via 10.1.200.1, 00:00:11, Serial0
R2#
```

جواب سوال:

بله وجود دارد چون از چندتا مسیر داره می فرسته و پکت ها رو بین مسیرهای مختلف توزیع کرده است در تصویر پایین که درست تر است هم چندتا مسیر نشون داده شده یعنی بارها رو توزیع میکنه روی چند مسیر که همش از یک مسیر رد نشه و برای این که حداکثر تعداد مسیرو بفهمیم از دستور

Ip protocols می تونیم استفاده کنیم که توی مرحله قبل زدیم

```
R2(config-router)#maximum-paths 2
R2(config-router)#do show ip route rip
                  ^
% Invalid input detected at '^' marker.

R2(config-router)#
R2#show ip route rip
02:13:10: %SYS-5-CONFIG_I: Configured from cconf t
R2#show ip route rip
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
R       172.16.0.0/16 [120/2] via 10.1.200.1, 00:00:17, Serial0
R    172.31.0.0/16 [120/1] via 10.1.100.1, 00:00:18, Ethernet0
                   [120/1] via 10.1.200.1, 00:00:17, Serial0
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
R       10.1.1.8/30 [120/1] via 10.1.100.1, 00:00:18, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:17, Serial0
R       10.1.1.0/30 [120/1] via 10.1.100.1, 00:00:18, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:17, Serial0
R       10.1.1.4/30 [120/1] via 10.1.100.1, 00:00:18, Ethernet0
                    [120/1] via 10.1.200.1, 00:00:17, Serial0
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router rip
R2(config-router)#maximum-paths 1
R2(config-router)#
R2#show ip route rip
02:20:23: %SYS-5-CONFIG_I: Configured from console by console

R2#show ip route rip
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
R       172.16.0.0/16 [120/2] via 10.1.200.1, 00:00:00, Serial0
R    172.31.0.0/16 [120/1] via 10.1.100.1, 00:00:01, Ethernet0
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
R       10.1.1.8/30 [120/1] via 10.1.100.1, 00:00:01, Ethernet0
R       10.1.1.0/30 [120/1] via 10.1.100.1, 00:00:01, Ethernet0
R       10.1.1.4/30 [120/1] via 10.1.100.1, 00:00:01, Ethernet0
R2#
```

جواب سوال:

توی این حالت maximum path رو غیر فعال کردیم و مقدارشو یک میدیم ینی فقط از یک مسیر کل ترافیک شبکه رد بشه و همان طور که توی تصویر بالا می تونیم ببینم برای هر کدوم از ip ها یک مسیر نشون داده شده است

:9

بخش سوم:

```
R2(config)#router rip
R2(config-router)#timers basic 20 60 185 245
R2(config-router)#
```