

گزارش کار آزمایشگاه 2

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شبکه های کامپیوتری پیشرفته

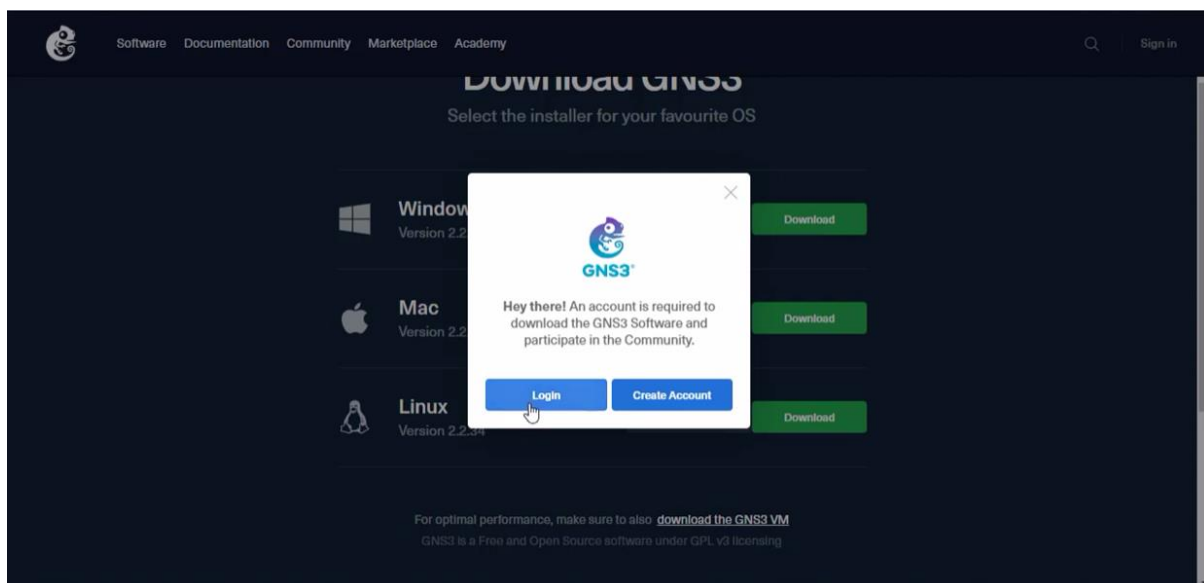
دکتر خونساری

پاییز 1401

نصب و راه اندازی GNS3:

در این بخش سعی داریم که به نحوه نصب و راه اندازی نرم افزار GNS3 بپردازیم.

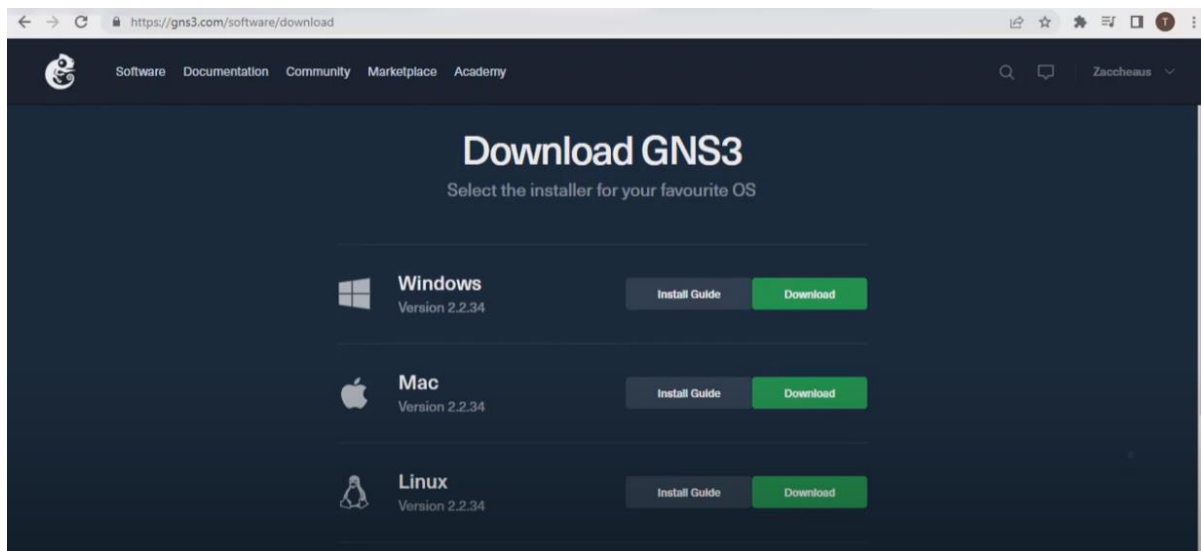
در ابتدا به سایت رسمی این نرم افزار مراجعه کرده و پس از ثبت نام، نرم افزار آنرا دانلود میکنیم.



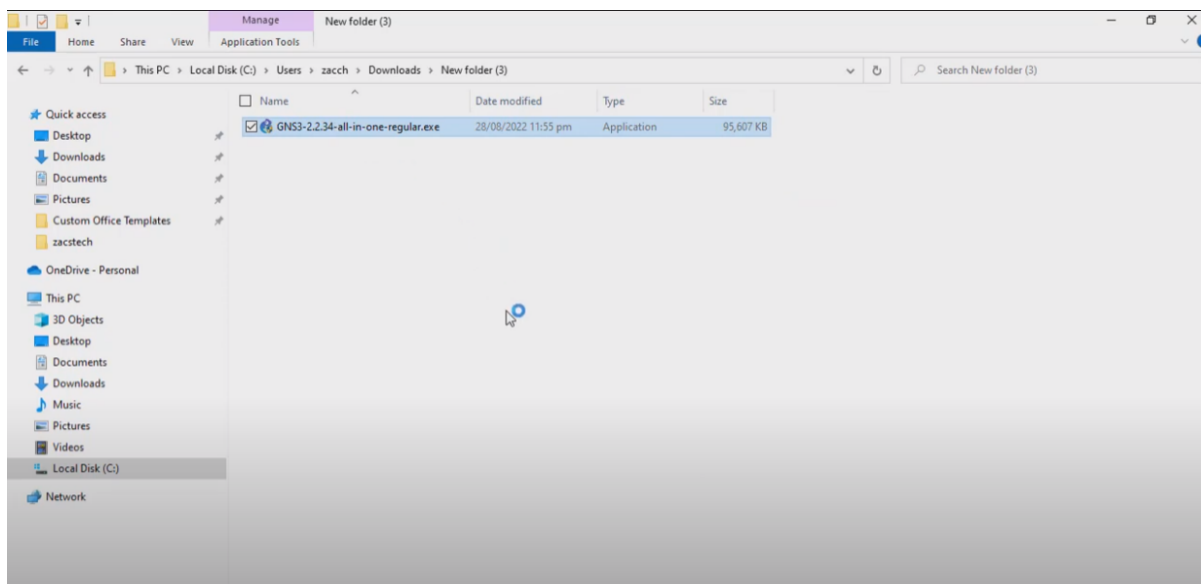
همانطور که در بالا مشاهده میکنید، به منظور دانلود باید حساب کاربری ایجاد کرد که در زیر قابل مشاهده است:

A screenshot of the GNS3 account registration page. The browser's address bar shows the URL: https://www.gns3.com/account/register?redirect=/software/download. The page has a light gray background with a blue gradient on the left. The GNS3 logo is at the top left of the form area. The heading is 'Create an Account'. Below it, a welcome message states: 'Welcome to the GNS3 Community! An account is required to download the GNS3 Software and participate in the Community. To create an account, just fill in the fields below!'. The form consists of several input fields: 'First Name', 'Last Name', 'Email', 'School/Organization', 'Password', 'Confirm Password', a dropdown for 'United States', 'Zip Code', and a dropdown for 'Education & Training'. At the bottom, there is a checkbox labeled 'I use GNS3 Software for:' and a checked checkbox for 'Sign me up for the GNS3 newsletter'.

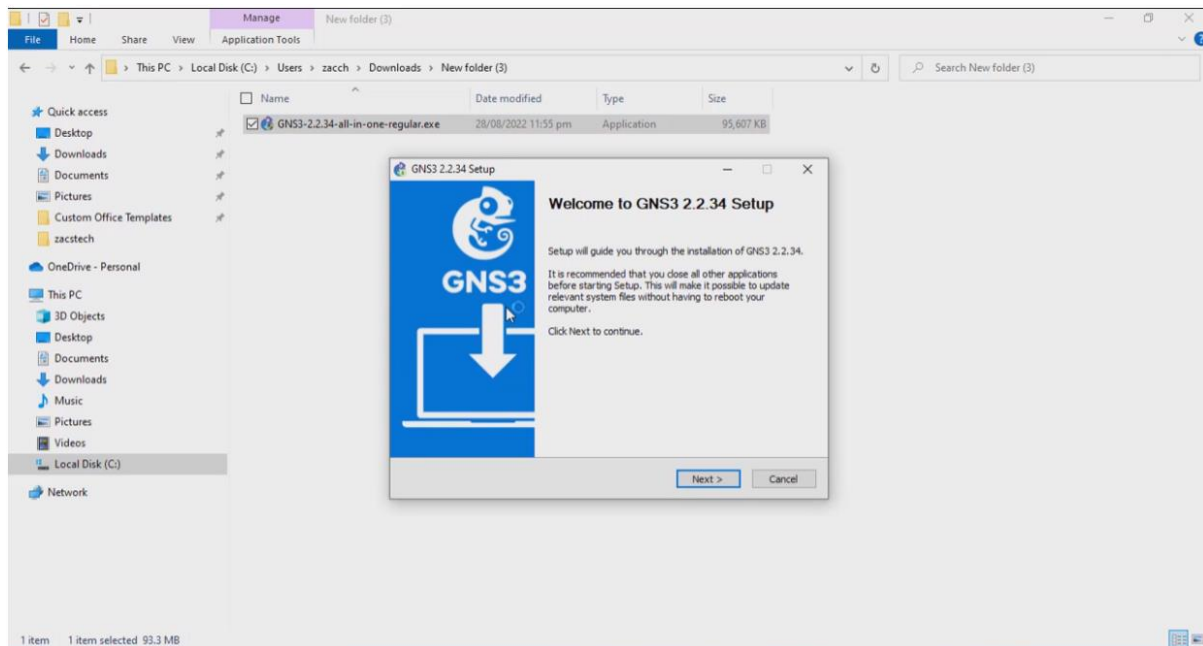
پس از این که اطلاعات را وارد کردیم، میتوانیم آنرا دانلود کنیم.



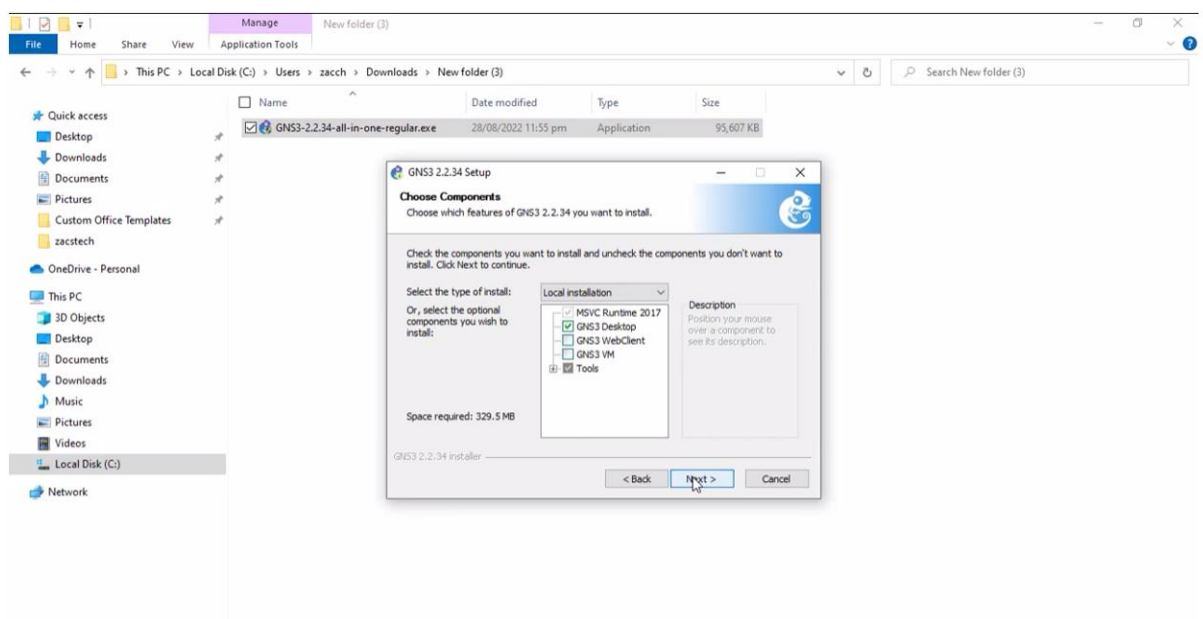
پس از کلیک بر روی دانلود، میتوانیم به شکل زیر آنرا نصب کنیم:



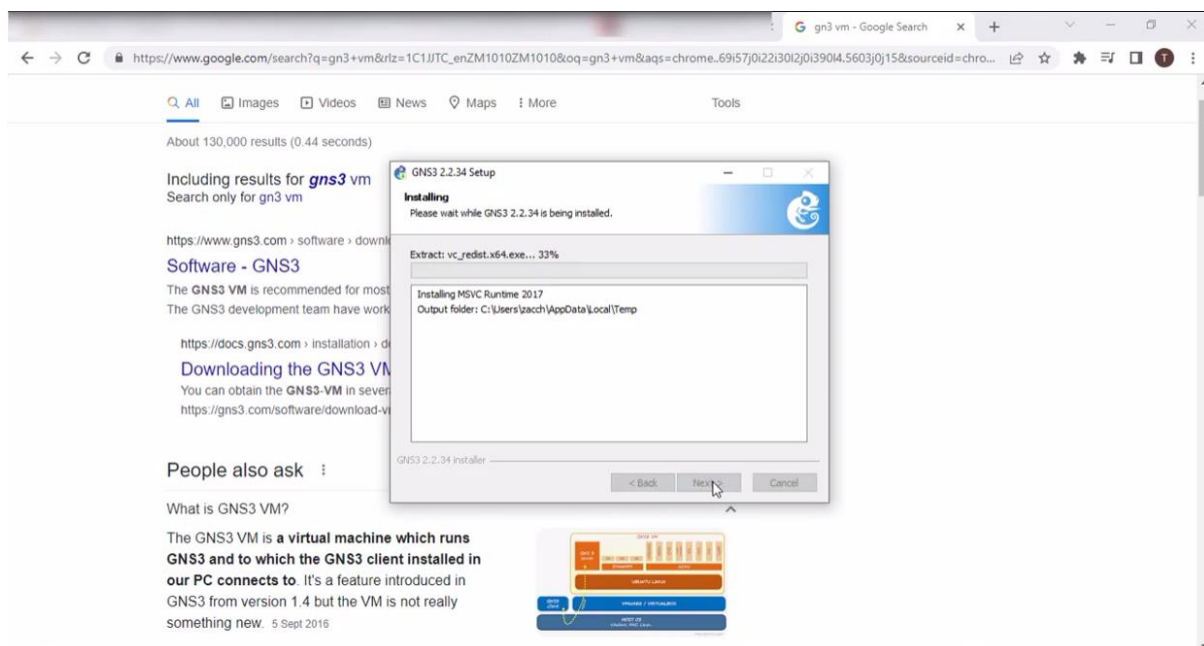
بر روی Next در تصویر زیر کلیک میکنیم:



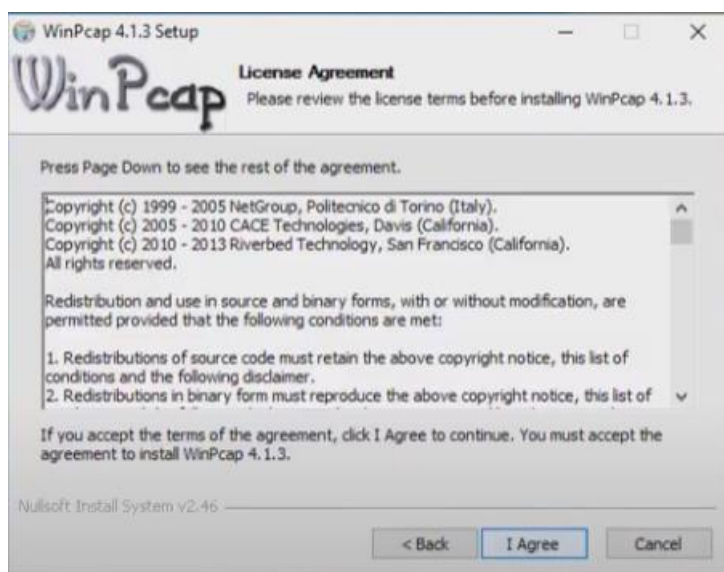
پس از موافقت با License و گذراندن این مرحله، component هایی را که نیاز هست را نصب میکنیم.



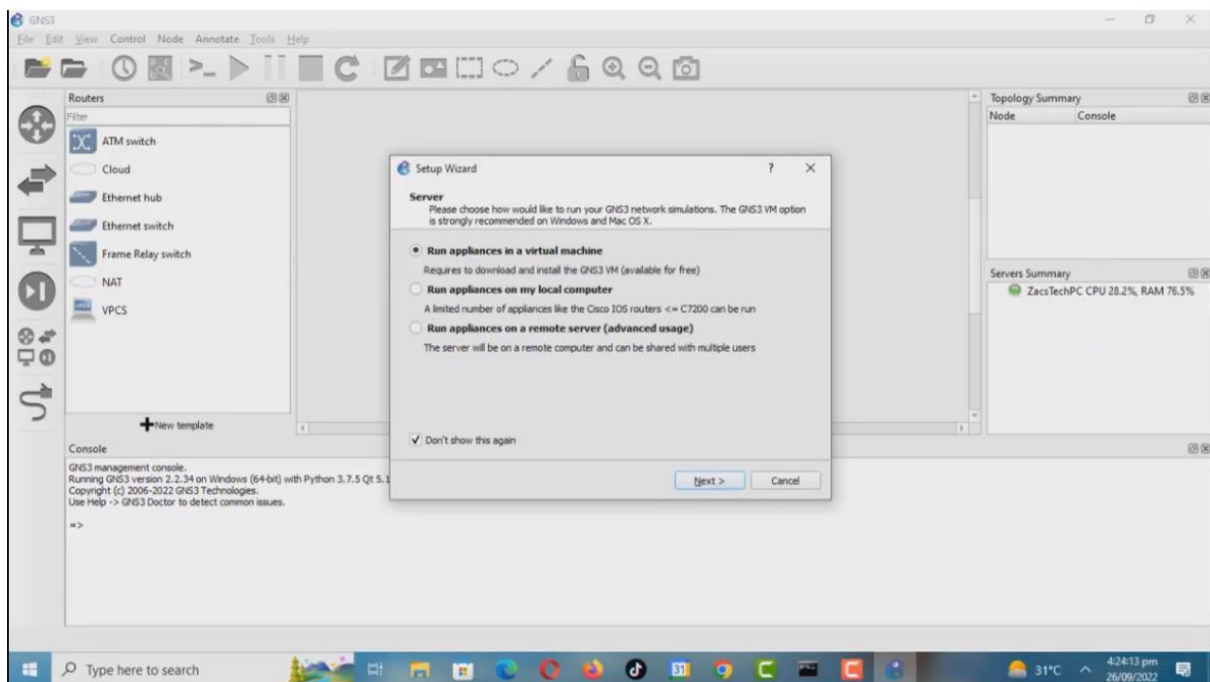
در اینجا سه گزینه وجود دارد، اگر نیاز به کار با نسخه دسکتاپ باشد باید گزینه **GNS3 Desktop** انتخاب شود، در صورت نیاز میتوان گزینه های دیگر را نیز انتخاب نمود. اگر نیاز به کار با ماشین مجازی باشیم گزینه **GNS3 VM** و اگر به اینترنتی وب **GNS3** نیاز داشته باشیم، **GNS3 WebClient** را باید نصب کنیم.



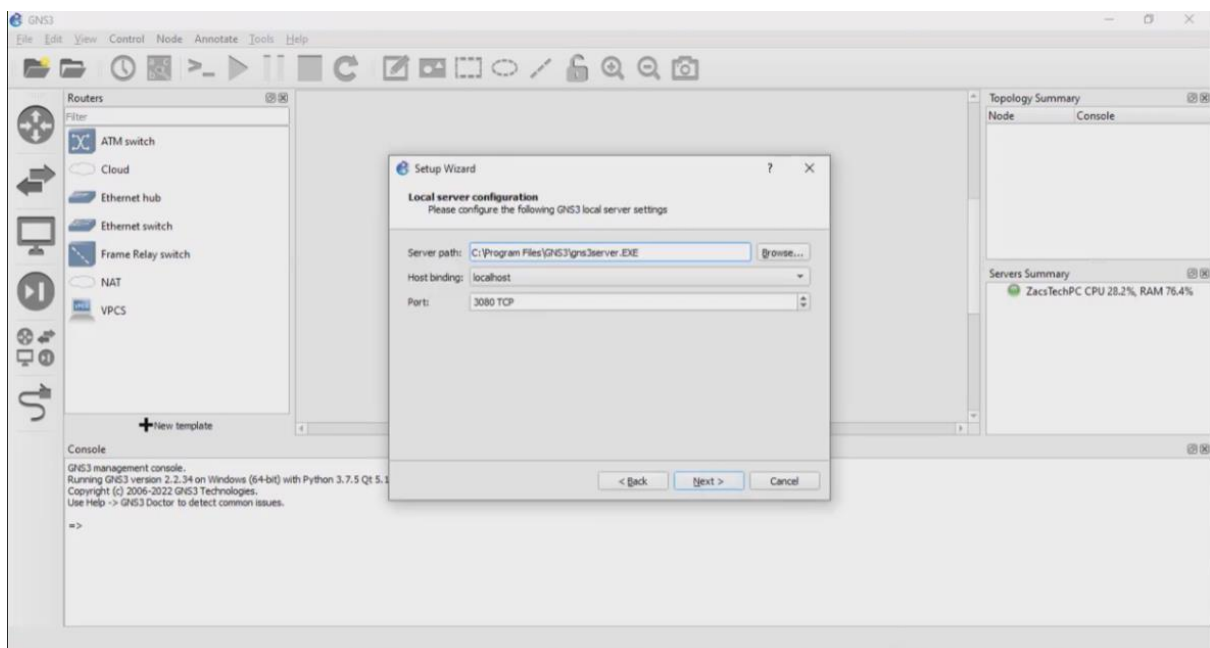
پس از انتخاب مقصد نصب، منتظر میمانیم تا نرم افزار نصب شود. پس از آن باید Win Pcap را نصب کنیم. که روند مشابه و سر راستی دارد.



حال پس از نصب و اجرای نرم افزار، با پنجره زیر رو به رو خواهیم شد:



حال در بخش Server باید انتخاب کنیم که چطور می‌خواهیم شبیه ساز های شبکه GNS3 خود را Run کنیم. در این بخش ما گزینه 2 انتخاب می‌کنیم (Run appliances on my local computer)



در قدم بعدی، همه چیز با به صورت پیش فرض خود گذاشته و ادامه می‌دهیم.

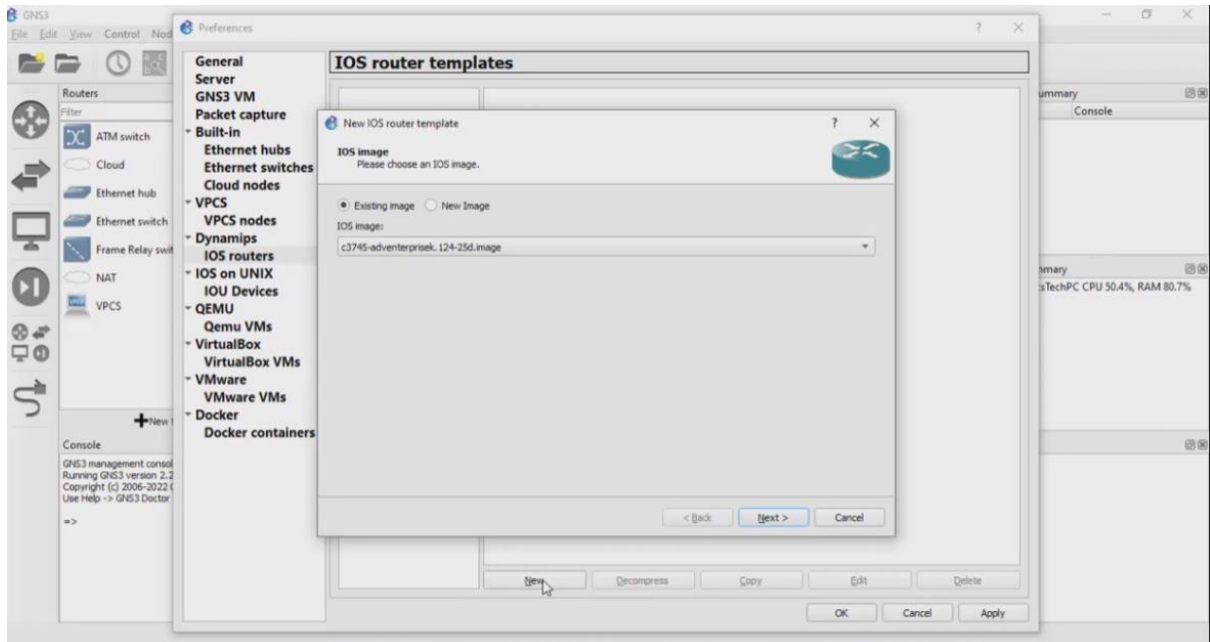
حال بیا ببینیم که چطور میتوان Image های Cisco را نصب کرد. طرق مختلفی برای انجام این کار وجود دارد، یک را مراجعه به سایت رسمی Cisco و دانلود Image ها از آنجا می باشد. که در زیر میتوانید مشاهده کنید:

Index of /cisco-ios/37xx/3725/

Name:	Last Modified:	Size:	Type:
../	2017-Jan-08 08:54:08	-	Directory
rowmon/	2017-Jan-08 08:54:08	-	Directory
c3725-adventerprisek9_ios-mz-123-11.73.bin	2011-Jan-30 19:27:22	29.7M	application/octet-stream
c3725-adventerprisek9_ios-mz-124-15.714.bin	2011-Jan-30 16:04:02	44.6M	application/octet-stream
c3725-adventerprisek9_ios-mz-124-25a.bin	2011-Jan-30 19:36:52	37.5M	application/octet-stream
c3725-adventerprisek9_ios-mz-124-25b.bin	2011-Jan-30 19:47:28	37.5M	application/octet-stream
c3725-adventerprisek9-mz-123-11.73.bin	2011-Jan-30 01:43:14	29.3M	application/octet-stream
c3725-adventerprisek9-mz-123-22.bin	2011-Jan-30 18:06:46	22.1M	application/octet-stream
c3725-adventerprisek9-mz-123-24.bin	2011-Jan-30 18:06:55	23.3M	application/octet-stream
c3725-adventerprisek9-mz-123-26.bin	2011-Jan-30 18:07:04	23.3M	application/octet-stream
c3725-adventerprisek9-mz-123-4.64.bin	2011-Jan-30 18:07:23	24.9M	application/octet-stream
c3725-adventerprisek9-mz-123-8.73.bin	2011-Jan-30 05:36:33	28.4M	application/octet-stream
c3725-adventerprisek9-mz-124-11.707.bin	2011-Jan-30 05:36:33	44.2M	application/octet-stream
c3725-adventerprisek9-mz-124-12.bin	2011-Jan-30 03:37:31	35.2M	application/octet-stream
c3725-adventerprisek9-mz-124-15.714.bin	2011-Jan-30 03:37:31	44.2M	application/octet-stream
c3725-adventerprisek9-mz-124-15.75.bin	2011-Jan-30 04:19:29	44.0M	application/octet-stream
c3725-adventerprisek9-mz-124-15.77.bin	2011-Jan-30 16:00:58	44.0M	application/octet-stream
c3725-adventerprisek9-mz-124-15.78.bin	2011-Jan-30 16:01:24	44.1M	application/octet-stream
c3725-adventerprisek9-mz-124-18.bin	2011-Jan-30 16:02:11	37.4M	application/octet-stream
c3725-adventerprisek9-mz-124-19.bin	2011-Jan-30 14:45:32	37.4M	application/octet-stream
c3725-adventerprisek9-mz-124-23.bin	2011-Jan-30 14:45:32	37.0M	application/octet-stream
c3725-adventerprisek9-mz-124-25.bin	2011-Jan-30 14:55:43	37.0M	application/octet-stream
c3725-adventerprisek9-mz-124-25b.bin	2011-Jan-30 03:02:01	37.0M	application/octet-stream
c3725-adventerprisek9-mz-124-25c.bin	2012-Jan-02 09:41:42	37.0M	application/octet-stream
c3725-adventerprisek9-mz-124-25d.bin	2011-Jan-30 03:02:01	37.0M	application/octet-stream
c3725-adventerprisek9-mz-124-7.bin	2011-Jan-30 04:07:21	31.4M	application/octet-stream
c3725-adviservicesk9-mz-123-19.bin	2011-Jan-30 16:04:40	20.7M	application/octet-stream
c3725-adviservicesk9-mz-124-13a.bin	2011-Jan-30 16:52:21	35.7M	application/octet-stream
c3725-adviservicesk9-mz-124-13.713.bin	2011-Jan-30 18:07:58	42.9M	application/octet-stream
c3725-adviservicesk9-mz-124-15.714.bin	2011-Jan-30 10:09:21	42.9M	application/octet-stream
c3725-adviservicesk9-mz-124-15.75.bin	2011-Jan-30 18:08:54	42.7M	application/octet-stream
c3725-adviservicesk9-mz-124-17a.bin	2011-Jan-30 21:03:38	35.8M	application/octet-stream
c3725-adviservicesk9-mz-124-18.bin	2011-Jan-30 21:05:24	35.7M	application/octet-stream
c3725-adviservicesk9-mz-124-19.bin	2011-Jan-30 21:05:54	35.7M	application/octet-stream
c3725-adviservicesk9-mz-124-21.bin	2011-Jan-30 21:06:33	35.8M	application/octet-stream
c3725-adviservicesk9-mz-124-23.bin	2011-Jan-30 21:07:05	35.4M	application/octet-stream
c3725-adviservicesk9-mz-124-25b.bin	2011-Jan-30 21:07:43	35.4M	application/octet-stream
c3725-adviservicesk9-mz-124-25d.bin	2011-Jan-30 21:08:13	35.3M	application/octet-stream
c3725-adviservicesk9-mz-124-3.bin	2011-Jan-30 16:52:38	29.9M	application/octet-stream
c3725-adviservicesk9-mz-124-5.bin	2011-Jan-30 21:09:04	30.0M	application/octet-stream
c3725-adviservicesk9-mz-124-6.f.bin	2011-Jan-30 21:09:32	32.5M	application/octet-stream

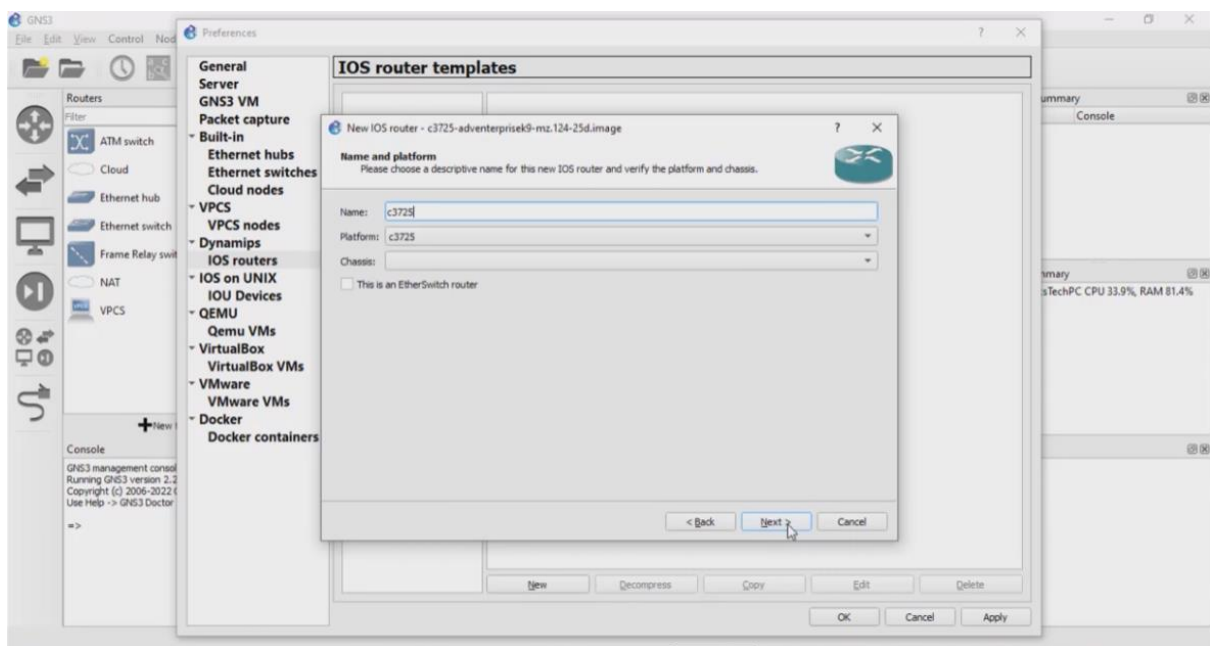
ما در این پروژه از روتر c3725 استفاده کرده ایم. حال باید ببینیم که چطور باید این Router را به GNS3 از طریق Image دانلود شده اضافه کرد.

به بخش edit و سپس Preferences را انتخاب میکنیم.



در پنجره باز شده، بر روی ISO routers کلیک کرده و سپس New را میزنیم.

در قدم بعد با Browse کردن و پیدا کردن فایل Image مورد نظر، آنرا Decompress میکنیم.

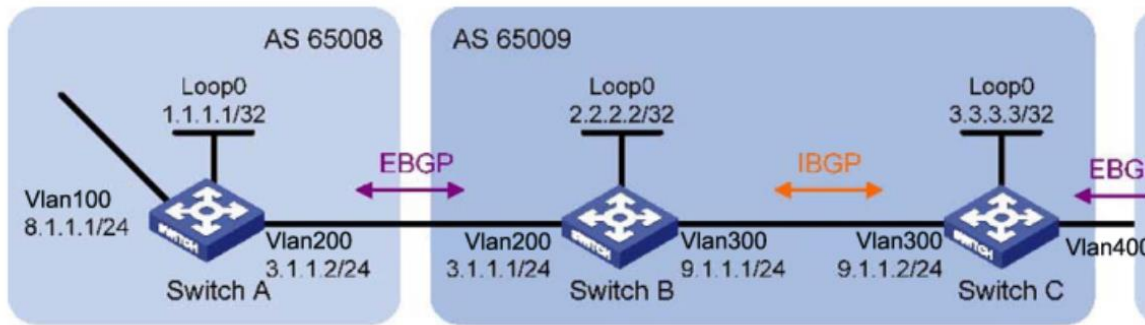


حال نام و Platform مورد نظر که همان c3725 است را انتخاب میکنیم.

پس از طی مراحل فوق و اضافه کردن روتر مطلوب به GNS3، به مرحله بعد که پیاده سازی توپولوژی است میرویم.

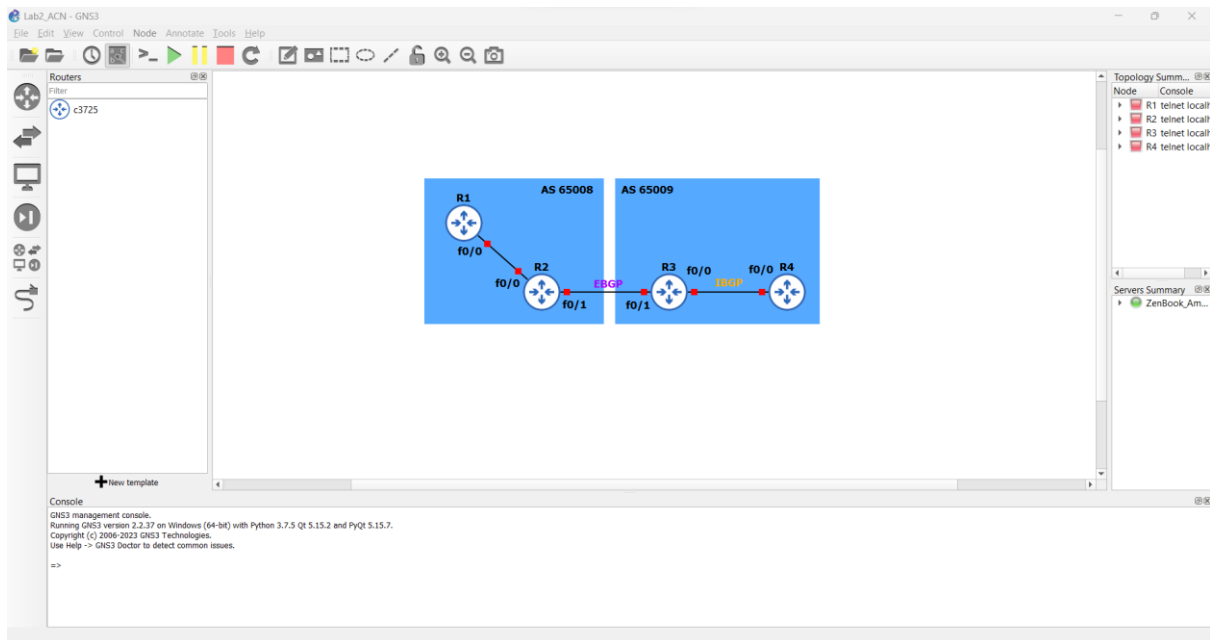
پیاده سازی توپولوژی بخش 1:

Network diagram for BGP basic configuration



در قدم بعدی باید یک توپولوژی شبکه همانند شکل بالا در GNS3 ایجاد کنیم، بدین منظور ما از 4 روتر بهره گرفته ایم. توجه کنید که روتر 1 متناظر با روتری است که در شکل وجود ندارد و در سمت چپ Switch A است، روتر 2 متناظر با Switch A و روتر 3 متناظر با Switch B و در نهایت روتر 4 متناظر با Switch C است.

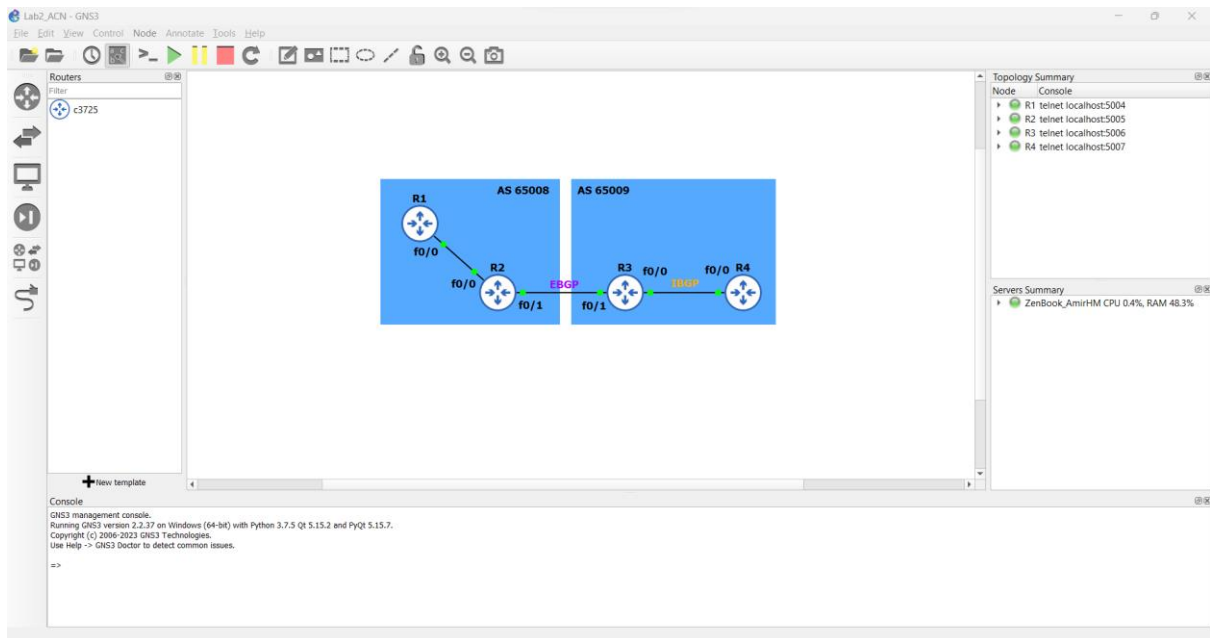
در شکل زیر میتوانید توپولوژی مذکور را مشاهده کنید.



همانطور که در بالا مشاهده میکنید، روتر 1 و 2 در AS65008 و روتر 3 و 4 در AS65009 قرار دارد. که در این بخش ها باید iBGP configuration پیاده سازی شود و بین روتر 2 و 3 باید EBGP Configuration پیاده سازی شود. پس با

در نظر گرفتن موارد ذکر شده، ابتدا برای پورت های هر روتر مطابق با Network Diagram for BGP Basic Configuration را پیاده سازی میکنیم.

ابتدا آنها را Start میکنیم.



پس از Start باید CLI مربوط به روتر ها را باز کنیم، فلذا داریم:

```
SETUP: new interface Serial1/0 placed in "shutdown" state
SETUP: new interface Serial1/1 placed in "shutdown" state
SETUP: new interface Serial1/2 placed in "shutdown" state
SETUP: new interface Serial1/3 placed in "shutdown" state
SETUP: new interface Serial2/0 placed in "shutdown" state
SETUP: new interface Serial2/1 placed in "shutdown" state
SETUP: new interface Serial2/2 placed in "shutdown" state
SETUP: new interface Serial2/3 placed in "shutdown" state
% Crashinfo may not be recovered at flash:crashinfo
% This file system device reports an error

Press RETURN to get started!

*Mar 1 00:00:02.319: %SW_VLAN-4-IFS_FAILURE: VLAN manager encountered file operation error: call = ifs_open/read / code = 3588 (No device available)
/ bytes transferred = 0
*Mar 1 00:00:02.327: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:02.511: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:02.607: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls, changed state to up
*Mar 1 00:00:02.667: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.667: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a cold start
*Mar 1 00:00:02.699: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.699: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.099: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.111: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
*Mar 1 00:00:03.143: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.143: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.147: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.147: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.151: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.151: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.155: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.155: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:04.099: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.111: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:04.143: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.143: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
```

حال همانطور که در بالا مشاهده میکنید، برای چهار روتر در توپولوژی شبکه داده شده، Tab باز شده است، که شامل R1، R2، R3 and R4 میشود.

این کار را برای روتر 2 انجام میدهیم و مراحل را توضیح میدهیم، روند مشابهی برای دیگر روتر ها وجود با این تفاوت که آی پی های متفاوتی دارند.

ابتدا دستور `conf t` را اجرا میکنیم تا وارد پیکربندی روتر 2 شویم:

```

R1 R2 R3 R4
SETUP: new interface Serial12/0 placed in "shutdown" state
SETUP: new interface Serial12/1 placed in "shutdown" state
SETUP: new interface Serial12/2 placed in "shutdown" state
SETUP: new interface Serial12/3 placed in "shutdown" state
% Crashinfo may not be recovered at flash:crashinfo
% This file system device reports an error

Press RETURN to get started!

*Mar 1 00:00:02.295: %SW_VLAN-4-IFS_FAILURE: VLAN manager encountered file operation error: call = ifs_open/read / code = 3588 (No device available)
/ bytes transferred = 0
*Mar 1 00:00:02.311: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:02.487: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:02.527: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls, changed state to up
*Mar 1 00:00:02.655: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.671: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Mar 1 00:00:02.711: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.715: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.071: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.083: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#
```

حال در مرحله بعد سراغ `int f0/0` میرویم؛ که پورت `f0/0` را تعریف میکند همچنین با اجرای کد زیر

`R2(config-if)#ip add 8.1.1.1 255.255.255.0`

IP مورد نظر را تخصیص میدهیم:

```

R1 R2 R3 R4
*Mar 1 00:00:02.311: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:02.487: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:02.527: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls, changed state to up
*Mar 1 00:00:02.655: %SYS-5-RESTART: System restarted -
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
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Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.671: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Mar 1 00:00:02.711: %CRYPTO-6-ISAAMP ON OFF: ISAAMP is OFF
*Mar 1 00:00:02.715: %CRYPTO-6-GDOI ON OFF: GDOI is OFF
*Mar 1 00:00:03.071: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.083: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#YX/Y
^
% Invalid input detected at '^' marker.
R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:08:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.
R2#
```

در مرحله بعد دستور `no sh` و `exi` را اجرا میکنیم، تا از پورت `f0/0` خارج شود.

حال باید پورت `f0/1` را باید پیکربندی کنیم، همانند قبل با دستور `int f0/1` شروع میکنیم.

```

: R1 R2 R3 R4
Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.671: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Mar 1 00:00:02.711: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.715: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.071: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.083: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#YX/Y
% Invalid input detected at '^' marker.
R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:08:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.
R2#int f0/1
^
% Invalid input detected at '^' marker.
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#
```

در قدم بعد آدرس IP مورد نظر را تخصیص میدهیم به صورت `ip add 3.1.1.2 255.255.255.0` و پس از آن `no sh` و `exi` را به منظور خارج شدن و `shut down` نشدن روتر اجرا میکنیم.

```

R1 R2 R3 R4
*Mar 1 00:00:02.715: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.071: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.083: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#YX/Y
% Invalid input detected at '^' marker.
R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:08:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.
R2#int f0/1
^
% Invalid input detected at '^' marker.
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#ip add 3.1.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#
```

حال باید loopback interface را اجرا کنیم. داریم:

دستور 0 loopback int را اجرا میکنیم:

```

R1 R2 R3 R4
*Mar 1 00:00:03.071: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.083: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.115: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#YX/Y
^
% Invalid input detected at '^' marker.

R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:08:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.

R2#int f0/1
^
% Invalid input detected at '^' marker.

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#ip add 3.1.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#int loopback 0
R2(config-if)#
```

حال با دستور ip add 1.1.1.1 255.255.255.255 به loopback تعریف شده IP مورد نظر را تخصیص می‌دهیم:

```

R1 R2 R3 R4
*Mar 1 00:00:03.119: %LINK-5-CHANGED: Interface Serial12/0, changed state to administratively down
*Mar 1 00:00:03.123: %LINK-5-CHANGED: Interface Serial12/1, changed state to administratively down
*Mar 1 00:00:03.131: %LINK-5-CHANGED: Interface Serial12/2, changed state to administratively down
*Mar 1 00:00:03.135: %LINK-5-CHANGED: Interface Serial12/3, changed state to administratively down
*Mar 1 00:00:03.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.071: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial11/0, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial11/1, changed state to down
*Mar 1 00:00:04.119: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial11/2, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial11/3, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial12/0, changed state to down
*Mar 1 00:00:04.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial12/1, changed state to down
*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial12/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial12/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#YX/Y
% Invalid input detected at '^' marker.
R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:08:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.
R2#int f0/1
^
% Invalid input detected at '^' marker.
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#ip add 3.1.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#int loopback 0
R2(config-if)#ip add 1.1.1.1 255.255.255.255
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#end
R2#
*Mar 1 00:32:26.895: %SYS-5-CONFIG_I: Configured from console by console
R2#
```

همچنین در ادامه دستورات داده شده، end , exit , no sh را اجرا میکنیم تا پایان دهیم.

حال با دستور sh ip int br اطلاعات مربوط به سه Interface که به آنها IP تخصیص داریم را مشاهده میکنیم:


```

R1
R2
R3
R4

*Mar 1 00:00:04.135: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#VX/Y
^
% Invalid input detected at '^' marker.

R2(config)#int f0/0
R2(config-if)#ip add 8.1.1.1 255.255.255.0
R2(config-if)#
R2#
*Mar 1 00:00:45.271: %SYS-5-CONFIG_I: Configured from console by console
R2#R2(config-if)#ip add 8.1.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.

R2#int f0/1
^
% Invalid input detected at '^' marker.

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#ip add 3.1.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#int loopback 0
R2(config-if)#ip add 1.1.1.1 255.255.255.255
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#end
R2#
*Mar 1 00:32:26.895: %SYS-5-CONFIG_I: Configured from console by console
R2#sh ip int br
Interface                IP-Address      OK? Method Status          Protocol
FastEthernet0/0          8.1.1.1         YES NVRAM    up              up
FastEthernet0/1          3.1.1.2         YES NVRAM    up              up
Serial1/0                 unassigned      YES unset    administratively down down
Serial1/1                 unassigned      YES unset    administratively down down
Serial1/2                 unassigned      YES unset    administratively down down
Serial1/3                 unassigned      YES unset    administratively down down
Serial2/0                 unassigned      YES unset    administratively down down
Serial2/1                 unassigned      YES unset    administratively down down
Serial2/2                 unassigned      YES unset    administratively down down
Serial2/3                 unassigned      YES unset    administratively down down
Loopback0                 1.1.1.1         YES NVRAM    up              up
R2#
```

روند مشابهی برای سه روتر دیگر وجود فلذا فقط در اینجا خروجی دستور `sh ip int br` را نشان می‌دهیم

روتر 3 (R3):

```

/ bytes transferred = 0
*Mar 1 00:00:02.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:02.451: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:02.479: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpl1, changed state to up
*Mar 1 00:00:02.615: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.623: %SNMP-5-COLDSTART: SNMP agent on host R3 is undergoing a cold start
*Mar 1 00:00:02.651: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.651: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.039: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.051: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.107: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.051: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.095: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R3#
R3#sh ip int br
Interface                IP-Address      OK? Method Status          Protocol
FastEthernet0/0          9.1.1.1         YES NVRAM    up              up
FastEthernet0/1          3.1.1.1         YES NVRAM    up              up
Serial1/0                 unassigned      YES unset    administratively down down
Serial1/1                 unassigned      YES unset    administratively down down
Serial1/2                 unassigned      YES unset    administratively down down
Serial1/3                 unassigned      YES unset    administratively down down
Serial2/0                 unassigned      YES unset    administratively down down
Serial2/1                 unassigned      YES unset    administratively down down
Serial2/2                 unassigned      YES unset    administratively down down
Serial2/3                 unassigned      YES unset    administratively down down
Loopback0                 2.2.2.2         YES NVRAM    up              up
R3#
```

برای روتر 4 (R4):

```

R1 R2 R3 R4
*Mar 1 00:00:02.307: XSW_VLAN-4-IFS_FAILURE: VLAN manager encountered file operation error: call = ifs_open/read / code = 3588 (No device available)
/ byt-as transferred = 0
*Mar 1 00:00:02.323: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:02.539: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls, changed state to up
*Mar 1 00:00:02.559: %SYS-5-CONFIG I: Configured from memory by console
*Mar 1 00:00:02.699: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod-rel team
*Mar 1 00:00:02.699: %SNMP-5-COLDSTART: SNMP agent on host R4 is undergoing a cold start
*Mar 1 00:00:02.727: %CRYPTO-6-ISAKMP ON OFF: ISAKMP is OFF
*Mar 1 00:00:02.727: %CRYPTO-6-GDOI ON OFF: GDOI is OFF
*Mar 1 00:00:03.147: %LINK-5-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.163: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
*Mar 1 00:00:03.179: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.195: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.195: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.199: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.423: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R4#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 9.1.1.2 YES NVRAM up up
FastEthernet0/1 unassigned YES NVRAM administratively down down
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
Loopback0 3.3.3.3 YES NVRAM up up
R4#
```

روتر 1 (R1):

```

R1 R2 R3 R4
*Mar 1 00:00:02.667: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a cold start
*Mar 1 00:00:02.699: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.699: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.099: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.111: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
*Mar 1 00:00:03.143: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.143: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.147: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.147: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.151: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.151: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.155: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.155: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:04.099: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.111: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:04.143: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.143: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.151: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R1#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 8.1.1.2 YES NVRAM up up
FastEthernet0/1 unassigned YES NVRAM administratively down down
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
R1#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 8.1.1.2 YES NVRAM up up
FastEthernet0/1 unassigned YES NVRAM administratively down down
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
R1#
```

حال قصد داریم که برای روتر 3، OSPF را فعال کنیم.
ابتدا دستور router ospf 1 را در روتر 3 اجرا میکنیم.

```

R1 R2 R3 R4
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Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:02.623: %SNMP-5-COLDSTART: SNMP agent on host R3 is undergoing a cold start
*Mar 1 00:00:02.651: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.651: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.039: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.051: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.107: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.051: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.095: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R3#
R3#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 9.1.1.1 YES NVRAM up up
FastEthernet0/1 3.1.1.1 YES NVRAM up up
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
Loopback0 2.2.2.2 YES NVRAM up up
R3#router ospf 1
^
% Invalid input detected at '^' marker.

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#
```

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حال به فرم زیر روتر را پیکربندی میکنیم:

```

R1 R2 R3 R4
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.083: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.087: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.107: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.051: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.095: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R3#
R3#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 9.1.1.1 YES NVRAM up up
FastEthernet0/1 3.1.1.1 YES NVRAM up up
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
Loopback0 2.2.2.2 YES NVRAM up up
R3#router ospf 1
^
% Invalid input detected at '^' marker.

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#X/X+Y
^
% Invalid input detected at '^' marker.

R3(config-router)#network 2.2.2.2 255.255.255.255 area 0
R3(config-router)#network 9.1.1.1 255.255.255.0 area 0
R3(config-router)#exit
R3(config)#
```

حال باید روتر 3 را پیکربندی BGP کنیم:

توجه داریم که روتر 3 و 4 دارای پیکربندی iBGP هستند، فلذا این پیکربندی صرفا برای این دو روتر میباشد. حال iBGP را برای روتر 3 به شکل زیر پیاده سازی میکنیم.

```

R1 R2 R3 R4
*Mar 1 00:00:04.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial12/3, changed state to down
R3#
R3#sh ip int br
Interface                IP-Address      OK? Method Status              Protocol
FastEthernet0/0          9.1.1.1         YES NVRAM    up                  up
FastEthernet0/1          3.1.1.1         YES NVRAM    up                  up
Serial1/0                 unassigned      YES unset    administratively down down
Serial1/1                 unassigned      YES unset    administratively down down
Serial1/2                 unassigned      YES unset    administratively down down
Serial1/3                 unassigned      YES unset    administratively down down
Serial2/0                 unassigned      YES unset    administratively down down
Serial2/1                 unassigned      YES unset    administratively down down
Serial2/2                 unassigned      YES unset    administratively down down
Serial2/3                 unassigned      YES unset    administratively down down
Loopback0                 2.2.2.2         YES NVRAM    up                  up
R3#router ospf 1
^
% Invalid input detected at '^' marker.

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#X/X+Y
^
% Invalid input detected at '^' marker.

R3(config-router)#network 2.2.2.2 255.255.255.255 area 0
R3(config-router)#network 9.1.1.1 255.255.255.0 area 0
R3(config-router)#exit
R3(config)#conf t
^
% Invalid input detected at '^' marker.

R3(config)#router bgp 65009
R3(config-router)#conf t
^
% Invalid input detected at '^' marker.

R3(config-router)#bgp router-id 2.2.2.2
R3(config-router)#neighbor 3.3.3.3 remote-as 65009
R3(config-router)#exit
R3(config)#end
R3#
*Mar 1 01:21:58.035: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
R3#
```

در بالا، دستورات لازم برای پیاده سازی iBGP روتر 3 مذکور زده شده است.

حال باید همین روال را برای روتر 4 نیز انجام دهیم.

بدین منظور، ابتدا پیکربندی iBGP را برای روتر 4 پیاده سازی میکنیم:

```

R1 R2 R3 R4
*Mar 1 00:00:02.699: %SNMP-5-COLDSTART: SNMP agent on host R4 is undergoing a cold start
*Mar 1 00:00:02.727: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:02.727: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.147: %LINK-5-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.163: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
*Mar 1 00:00:03.179: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.179: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.183: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.195: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:03.195: %LINK-5-CHANGED: Interface Serial2/2, changed state to administratively down
*Mar 1 00:00:03.199: %LINK-5-CHANGED: Interface Serial2/3, changed state to administratively down
*Mar 1 00:00:03.423: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R4#sh ip int br
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 9.1.1.2 YES NVRAM up up
FastEthernet0/1 unassigned YES NVRAM administratively down down
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
Loopback0 3.3.3.3 YES NVRAM up up
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router bgp 65009
R4(config-router)#bgp router-ip 3.3.3.3
% Invalid input detected at '^' marker.
R4(config-router)#bgp router-id 3.3.3.3
R4(config-router)#neighbor 2.2.2.2 remote-as 65009
R4(config-router)#exit
R4(config)#

```

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دستورات لازم در عکس بالا زده شده اند، حال باید OSPF را برای روتر 4 پیکربندی کنیم. داریم:


```

R1 R2 R3 R4
*Mar 1 00:00:03.199: %LINK-5-CHANGED: Interface Serial12/3, changed state to administratively down
*Mar 1 00:00:03.423: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
*Mar 1 00:00:04.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.179: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R4#sh ip int br
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          9.1.1.2         YES NVRAM    up          up
FastEthernet0/1          unassigned      YES NVRAM    administratively down down
Serial1/0                 unassigned      YES unset    administratively down down
Serial1/1                 unassigned      YES unset    administratively down down
Serial1/2                 unassigned      YES unset    administratively down down
Serial1/3                 unassigned      YES unset    administratively down down
Serial2/0                 unassigned      YES unset    administratively down down
Serial2/1                 unassigned      YES unset    administratively down down
Serial2/2                 unassigned      YES unset    administratively down down
Serial2/3                 unassigned      YES unset    administratively down down
Loopback0                 3.3.3.3         YES NVRAM    up          up
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router bgp 65009
R4(config-router)#bgp router-ip 3.3.3.3

% Invalid input detected at '^' marker.

R4(config-router)#bgp router-id 3.3.3.3
R4(config-router)#neighbor 2.2.2.2 remote-as 65009
R4(config-router)#exit
R4(config)#router ospf 1
R4(config-router)#network 3.3.3.3 255.255.255.255 area 0
R4(config-router)#network 9.1.1.2 255.255.255.0 area 0
R4(config-router)#
*Mar 1 01:42:31.935: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/0 from LOADING to FULL, Loading Done
R4(config-router)#exit
R4(config)#end
R4#
*Mar 1 01:42:42.091: %SYS-5-CONFIG_I: Configured from console by console
R4#wr
Building configuration...
[OK]
R4#
```

دستورات بالا پیکربندی روتر 4 را به اتمام رسانده اند. (توضیحات لازم داده شده اند و تکرار آنها بیهوده خواهد بود، پس فقط نتیجه آورده شده است.)

حال با دستور `show ip bgp summary` میتوان لینک iBGP را میان دو روتر مذکور مشاهده کرد:

R1

R2

R3

R4

```

*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R4#sh ip int br
Interface                IP-Address      OK? Method Status              Protocol
FastEthernet0/0          9.1.1.2         YES NVRAM    up                  up
FastEthernet0/1          unassigned      YES NVRAM    administratively down down
Serial1/0                 unassigned      YES unset    administratively down down
Serial1/1                 unassigned      YES unset    administratively down down
Serial1/2                 unassigned      YES unset    administratively down down
Serial1/3                 unassigned      YES unset    administratively down down
Serial2/0                 unassigned      YES unset    administratively down down
Serial2/1                 unassigned      YES unset    administratively down down
Serial2/2                 unassigned      YES unset    administratively down down
Serial2/3                 unassigned      YES unset    administratively down down
Loopback0                 3.3.3.3         YES NVRAM    up                  up
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router bgp 65009
R4(config-router)#bgp router-id 3.3.3.3
^
% Invalid input detected at '^' marker.

R4(config-router)#bgp router-id 3.3.3.3
R4(config-router)#neighbor 2.2.2.2 remote-as 65009
R4(config-router)#exit
R4(config)#router ospf 1
R4(config-router)#network 3.3.3.3 255.255.255.255 area 0
R4(config-router)#network 9.1.1.2 255.255.255.0 area 0
R4(config-router)#
*Mar 1 01:42:31.935: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/0 from LOADING to FULL, Loading Done
R4(config-router)#exit
R4(config)#end
R4#
*Mar 1 01:42:42.091: %SYS-5-CONFIG_I: Configured from console by console
R4#wr
Building configuration...
[OK]
R4#show ip bgp summary
BGP router identifier 3.3.3.3, local AS number 65009
BGP table version is 1, main routing table version 1

Neighbor      V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
2.2.2.2        4 65009      0       0         0    0    0 never        Active
R4#

```

Solar-PuTTY *free tool*

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حال در قدم بعدی باید بین روتر 2 و 3، eBGP Configuration را پیاده سازی کنیم.

به صورت زیر عمل میکنیم:

```
R1 R2 R3 R4
R2#int f0/1
^
% Invalid input detected at '^' marker.

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/1
R2(config-if)#ip add 3.1.1.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#int loopback 0
R2(config-if)#ip add 1.1.1.1 255.255.255.255
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#end
R2#
*Mar 1 00:32:26.895: %SYS-5-CONFIG_I: Configured from console by console
R2#sh ip int br
Interface            IP-Address      OK? Method Status          Protocol
FastEthernet0/0      8.1.1.1         YES NVRAM    up              up
FastEthernet0/1      3.1.1.2         YES NVRAM    up              up
Serial1/0             unassigned      YES unset    administratively down down
Serial1/1             unassigned      YES unset    administratively down down
Serial1/2             unassigned      YES unset    administratively down down
Serial1/3             unassigned      YES unset    administratively down down
Serial2/0             unassigned      YES unset    administratively down down
Serial2/1             unassigned      YES unset    administratively down down
Serial2/2             unassigned      YES unset    administratively down down
Serial2/3             unassigned      YES unset    administratively down down
Loopback0            1.1.1.1         YES NVRAM    up              up
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 65008
R2(config-router)#bgp router-id 1.1.1.1
R2(config-router)#neighbor 3.1.1.1 remote-as 65009
R2(config-router)#network 8.1.1.1
R2(config-router)#exit
R2(config)#wr
% Incomplete command.

R2(config)#end
R2#wr
*Mar 1 02:30:27.439: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
R2#
```

با توجه به دستورات زده شده، روتر 2 برای eBGP پیکربندی شده است.

حال روند مشابهی را برای روتر 3 پیش خواهیم رفت.

```
Serial2/3      unassigned  YES unset  administratively down down
Loopback0      2.2.2.2      YES NVRAM  up        up
R3#router ospf 1
^
% Invalid input detected at '^' marker.

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#X/Y
^
% Invalid input detected at '^' marker.

R3(config-router)#network 2.2.2.2 255.255.255.255 area 0
R3(config-router)#network 9.1.1.1 255.255.255.0 area 0
R3(config-router)#exit
R3(config)#conf t
^
% Invalid input detected at '^' marker.

R3(config)#router bgp 65009
R3(config-router)#conf t
^
% Invalid input detected at '^' marker.

R3(config-router)#bgp router-id 2.2.2.2
R3(config-router)#neighbor 3.3.3.3 remote-as 65009
R3(config-router)#exit
R3(config)#end
R3#
*Mar  1 01:21:58.035: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
R3#
*Mar  1 01:46:12.707: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on FastEthernet0/0 from LOADING to FULL, Loading Done
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router bgp 65009
R3(config-router)#neighbor 3.1.1.2 remote-as 65008
R3(config-router)#exit
R3(config)#show ip bgp summary
^
% Invalid input detected at '^' marker.

R3(config)#
*Mar  1 02:23:18.143: %BGP-5-ADJCHANGE: neighbor 3.1.1.2 Up
R3(config)#
```

حال به منظور verification با استفاده از دستور Show ip bgp summary در روتر 2 و 3 خواهیم داشت:

```
R1 R2 R3 R4
R3(config-router)#network 2.2.2.2 255.255.255.255 area 0
R3(config-router)#network 9.1.1.1 255.255.255.0 area 0
R3(config-router)#exit
R3(config)#conf t
^
% Invalid input detected at '^' marker.
R3(config)#router bgp 65009
R3(config-router)#conf t
^
% Invalid input detected at '^' marker.
R3(config-router)#bgp router-id 2.2.2.2
R3(config-router)#neighbor 3.3.3.3 remote-as 65009
R3(config-router)#exit
R3(config)#end
R3#
*Mar 1 01:21:58.035: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
R3#
*Mar 1 01:46:12.707: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on FastEthernet0/0 from LOADING to FULL, Loading Done
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router bgp 65009
R3(config-router)#neighbor 3.1.1.2 remote-as 65008
R3(config-router)#exit
R3(config)#show ip bgp summary
^
% Invalid input detected at '^' marker.
R3(config)#
*Mar 1 02:23:18.143: %BGP-5-ADJCHANGE: neighbor 3.1.1.2 Up
R3(config)#exit
R3#
*Mar 1 02:23:48.099: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
R3#show ip bgp summary
BGP router identifier 2.2.2.2, local AS number 65009
BGP table version is 1, main routing table version 1

Neighbor        V    AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
3.1.1.2          4 65008      6       6        1    0    0 00:02:43      0
3.3.3.3          4 65009      0       0        0    0    0 never      Active
R3#
```

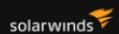
و همچنین برای روتر 4 خواهیم داشت:

```

R1 R2 R3 R4
FastEthernet0/1 unassigned YES NVRAM administratively down down
Serial1/0 unassigned YES unset administratively down down
Serial1/1 unassigned YES unset administratively down down
Serial1/2 unassigned YES unset administratively down down
Serial1/3 unassigned YES unset administratively down down
Serial2/0 unassigned YES unset administratively down down
Serial2/1 unassigned YES unset administratively down down
Serial2/2 unassigned YES unset administratively down down
Serial2/3 unassigned YES unset administratively down down
Loopback0 3.3.3.3 YES NVRAM up up
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router bgp 65009
R4(config-router)#bgp router-id 3.3.3.3
^
% Invalid input detected at '^' marker.
R4(config-router)#bgp router-id 3.3.3.3
R4(config-router)#neighbor 2.2.2.2 remote-as 65009
R4(config-router)#exit
R4(config)#router ospf 1
R4(config-router)#network 3.3.3.3 255.255.255.255 area 0
R4(config-router)#network 9.1.1.2 255.255.255.0 area 0
R4(config-router)#
*Mar 1 01:42:31.935: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/0 from LOADING to FULL, Loading Done
R4(config-router)#exit
R4(config)#end
R4#
*Mar 1 01:42:42.091: %SYS-5-CONFIG_I: Configured from console by console
R4#wr
Building configuration...
[OK]
R4#show ip bgp summary
BGP router identifier 3.3.3.3, local AS number 65009
BGP table version is 1, main routing table version 1

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd
2.2.2.2 4 65009 0 0 0 0 0 never Active
R4#wr
Building configuration...
[OK]
R4#show ip bgp summary
BGP router identifier 3.3.3.3, local AS number 65009
BGP table version is 1, main routing table version 1

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd
2.2.2.2 4 65009 0 0 0 0 0 never Active
R4#
```



و همچنین برای روتر 2:

```
R2(config)#int loopback 0
R2(config-if)#ip add 1.1.1.1 255.255.255.255
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#end
R2#
*Mar 1 00:32:26.895: %SYS-5-CONFIG_I: Configured from console by console
R2#sh ip int br
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          8.1.1.1         YES NVRAM    up          up
FastEthernet0/1          3.1.1.2         YES NVRAM    up          up
Serial1/0                 unassigned      YES unset   administratively down down
Serial1/1                 unassigned      YES unset   administratively down down
Serial1/2                 unassigned      YES unset   administratively down down
Serial1/3                 unassigned      YES unset   administratively down down
Serial2/0                 unassigned      YES unset   administratively down down
Serial2/1                 unassigned      YES unset   administratively down down
Serial2/2                 unassigned      YES unset   administratively down down
Serial2/3                 unassigned      YES unset   administratively down down
Loopback0                1.1.1.1         YES NVRAM    up          up
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 65008
R2(config-router)#bgp router-id 1.1.1.1
R2(config-router)#neighbor 3.1.1.1 remote-as 65009
R2(config-router)#network 8.1.1.1
R2(config-router)#exit
R2(config)#wr
% Incomplete command.

R2(config)#end
R2#wr
*Mar 1 02:30:27.439: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
R2#
*Mar 1 02:35:58.475: %BGP-5-ADJCHANGE: neighbor 3.1.1.1 Up
R2#wr
Building configuration...
[OK]
R2#show ip bgp summary
BGP router identifier 1.1.1.1, local AS number 65008
BGP table version is 1, main routing table version 1

Neighbor      V   AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down State/PfxRcd
3.1.1.1       4 65009    10     10      1    0   0 00:06:04      0
R2#
```

با توجه به خلاصه های ارائه شده بالا، میتوان دریافت که پیکربندی های iBGP و eBGP برای روتر های 2 و 3 و 4 به درستی پیاده شده اند.

حال در ادامه توزیع مسیر های متصل را نشان خواهیم داد:

با استفاده از دستور redistribute connected در روتر 3:

```
ation error: call = ifs_open/read / code = 3588 (No device available)
/ bytes transferred = 0
*Mar 1 00:00:02.511: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0
, changed state to up
*Mar 1 00:00:02.727: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls,
changed state to up
*Mar 1 00:00:02.807: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:03.011: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14
, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod_rel_team
*Mar 1 00:00:03.027: %SNMP-5-COLDSTART: SNMP agent on host R3 is undergoing a c
old start
*Mar 1 00:00:03.063: %CRYPTO-6-ISA_KMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:03.063: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.215: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Mar 1 00:00:03.227: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state t
o up
*Mar 1 00:00:03.255: %c
hanged state to administrativel
y down
*Mar 1 00:00:03.255: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.259: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.271: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.271: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.275: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:04.215: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.227: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.271: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.271: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.275: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.279: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.279: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#rou
*Mar 1 00:00:43.419: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on FastEthernet0/0 from LOADING to FULL, Loading Done
R3(config)#router bgp 65009
R3(config-router)#redistribute connected
R3(config-router)#
*Mar 1 00:01:10.031: %BGP-5-ADJCHANGE: neighbor 3.1.1.2 Up
R3(config-router)#
```

حال در روتر 2 مشاهده میشود که

R1

R2

R3

R4

```

*Mar 1 00:00:02.483: %SW_VLAN-4-IFS_FAILURE: VLAN manager encountered file oper
ation error: call = ifs_open/read / code = 3588 (No device available)
/ bytes transferred = 0
*Mar 1 00:00:02.499: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0
, changed state to up
*Mar 1 00:00:02.715: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls,
changed state to up
*Mar 1 00:00:02.779: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:02.999 %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3700Sof
tware (C3725-ADVENTERPRISEK9-M)
, Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:00 by prod_rel_team
*Mar 1 00:00:02.999: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Mar 1 00:00:03.039: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Mar 1 00:00:03.043: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Mar 1 00:00:03.199: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:03.223: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:03.255: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Mar 1 00:00:03.255: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Mar 1 00:00:03.259: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Mar 1 00:00:03.259: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Mar 1 00:00:03.259: %LINK-5-CHANGED: Interface Serial2/0, changed state to administratively down
*Mar 1 00:00:03.263: %LINK-5-CHANGED: Interface Serial2/1, changed state to administratively down
*Mar 1 00:00:04.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*Mar 1 00:00:04.223: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
*Mar 1 00:00:04.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Mar 1 00:00:04.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Mar 1 00:00:04.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Mar 1 00:00:04.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Mar 1 00:00:04.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
*Mar 1 00:00:04.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to down
*Mar 1 00:00:04.267: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
*Mar 1 00:00:04.267: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3, changed state to down
*Mar 1 00:01:10.019: %BGP-5-ADJCHANGE: neighbor 3.1.1.1 Up

R2#show ip bgp
BGP table version is 5, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

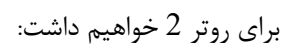
   Network        Next Hop         Metric LocPrf Weight Path
*> 2.2.2.2/32     3.1.1.1           0             0 65000 ?
r> 3.1.1.0/24     3.1.1.1           0             0 65000 ?
*> 9.1.1.0/24     3.1.1.1           0             0 65000 ?
R2#

```

Solar-PuTTY *free tool*

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Network diagram for BGP GR configuration



```
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
R2(config)#router bgp 65008  
R2(config-router)#bgp router-id 1.1.1.1  
R2(config-router)#bgp graceful-restart stalepath-time 360  
R2(config-router)#neighbor 200.1.1.1 remote as 65009  
^  
% Invalid input detected at '^' marker.  
  
R2(config-router)#neighbor 200.1.1.1 remote-as 65009  
R2(config-router)#network 8.0.0.0 255.0.0.0 area 0  
^  
% Invalid input detected at '^' marker.  
  
R2(config-router)#network 8.0.0.0  
R2(config-router)#neighbor 200.1.1.1  
% Incomplete command.  
  
R2(config-router)#bgp graceful-restart  
R2(config-router)#
```

حال برای روتر 3 خواهیم داشت:

```
R3#  
R3#  
R3#  
R3#  
R3#  
R3#  
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R3#  
R3#  
R3#  
R3#  
R3#  
R3#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
R3(config)#router bgp 65009  
R3(config-router)#redistributed connected  
^  
% Invalid input detected at '^' marker.  
  
R3(config-router)#redistribute connected  
R3(config-router)#router bgp 65009  
R3(config-router)#bgp graceful-restart restart-time 120  
R3(config-router)#bgp router-id 2.2.2.2  
R3(config-router)#neighbor 200.1.1.2 remote-as 65008  
R3(config-router)#neighbor 9.1.1.2 remote-as 65009  
R3(config-router)#re  
*Mar 1 01:02:02.879: %BGP-5-ADJCHANGE: neighbor 9.1.1.2 Up  
R3(config-router)#redi  
% Incomplete command.  
  
R3(config-router)#redistribute connected  
R3(config-router)#exit  
R3(config)#
```

و برای روتر 4:

```

R1 R2 R3 R4
*Mar 1 00:00:43.059: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/0 from LOADING to FULL, Loading Done
R4#
R4#show ip bgp
R4#
R4#show ip bgp
R4#
R4#
R4#
R4#
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#show ip bgp
% Invalid input detected at '^' marker.
R4(config)#exit
R4#
*Mar 1 00:05:21.955: %SYS-5-CONFIG_I: Configured from console by console
R4#show ip bgp
R4#
R4#(X)z
R4#T}R
R4#XTERM
Translating "XTERM"
Translating "XTERM"
% Unknown command or computer name, or unable to find computer address
R4#
R4#
*Mar 1 01:02:02.323: %BGP-5-ADJCHANGE: neighbor 2.2.2.2 Up
R4#
R4#
R4#
R4#
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router bgp 65009
R4(config-router)#bgp router-id 3.3.3.3
R4(config-router)#neighbor 9.1.1.1 remote-as 65009
R4(config-router)#redistribute connected
R4(config-router)#
*Mar 1 01:07:04.563: %BGP-5-ADJCHANGE: neighbor 9.1.1.1 Up
R4(config-router)#

```

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در نهایت پس از configuration هایی که انجام شد، برای روتر 2 خواهیم داشت:

```
R1 R2 R3 R4
R2#
R2#
R2#
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 65008
R2(config-router)#bgp router-id 1.1.1.1
R2(config-router)#bgp graceful-restart stalepath-time 360
R2(config-router)#neighbor 200.1.1.1 remote as 65009
^
% Invalid input detected at '^' marker.

R2(config-router)#neighbor 200.1.1.1 remote-as 65009
R2(config-router)#network 8.0.0.0 255.0.0.0 area 0
^
% Invalid input detected at '^' marker.

R2(config-router)#network 8.0.0.0
R2(config-router)#neighbor 200.1.1.1
% Incomplete command.

R2(config-router)#bgp graceful-restart
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2(config-router)#X/X+Y
^
% Invalid input detected at '^' marker.

R2(config-router)#network 8.0.0.0
R2(config-router)#neighbor 200.1.1.1
% Incomplete command.

R2(config-router)#bgp graceful-restart
R2(config-router)#exit
R2(config)#exit
R2#
*Mar 1 01:14:35.979: %SYS-5-CONFIG_I: Configured from console by console
R2#ping 9.1.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 9.1.1.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 48/57/64 ms
R2#
```

و دیگر هیچ ...