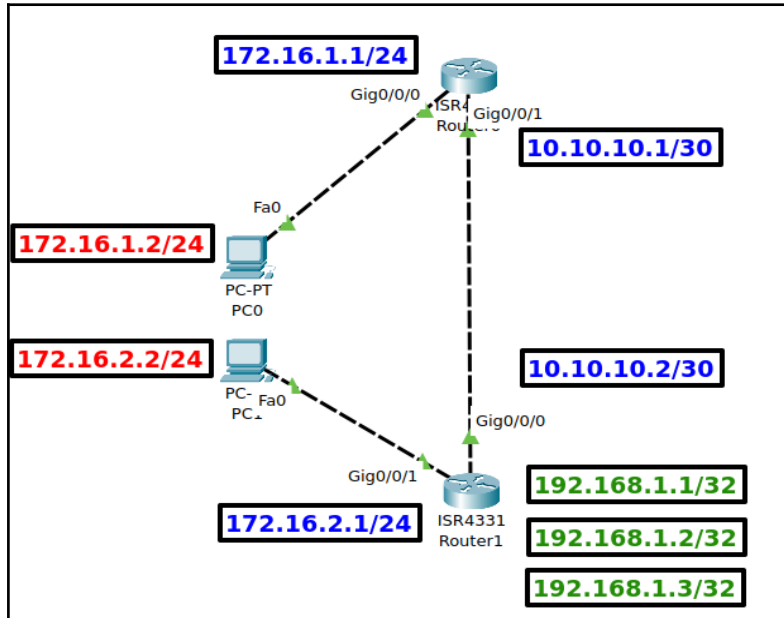


# Purpose of Lab 1

Creating **topology a** with information specified below.

## Topology a.



**Red:** Computer's IP address and Subnetmask.

**Blue:** IP address and Subnetmask of router's interfaces.

**Green:** Loopback IP addresses and Subnetmask of **Router1**.

- PC0 and PC1 can communicate.
- PC0 and PC1 can communicate with each loopback interface.
- Router0 has only one routing table configuration about loopback interfaces.

## Configuration of Computers

PC0	
Physical	Config Desktop Programming Attributes
IP Configuration	
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	172.16.1.2
Subnet Mask	255.255.255.0
Default Gateway	172.16.1.1

PC1	
Physical	Config Desktop Programming Attributes
IP Configuration	
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	172.16.2.2
Subnet Mask	255.255.255.0
Default Gateway	172.16.2.1
DNS Server	0.0.0.0

## Configuration of Routers

Open CLI of each router and execute related command set. Be sure that prompt is in user execution mode.

### Router0

- `en`
- `conf t`
- `int gig0/0/0`
- `ip address 172.16.1.1 255.255.255.0`
- `no sh`
- `int gig0/0/1`
- `ip address 10.10.10.1 255.255.255.252`
- `no sh`
- `ex`
- `ip route 172.16.2.0 255.255.255.0 10.10.10.2`
- `ip route 192.168.1.0 255.255.255.0 10.10.10.2`

### Router1

- `en`
- `conf t`
- `int gig0/0/1`
- `ip address 172.16.2.1 255.255.255.0`
- `no sh`
- `int gig0/0/0`
- `ip address 10.10.10.2 255.255.255.252`
- `no sh`
- `ex`
- `int lo0`
- `ip address 192.168.1.1 255.255.255.255`
- `int lo1`
- `ip address 192.168.1.2 255.255.255.255`
- `int lo2`
- `ip address 192.168.1.3 255.255.255.255`
- `ex`
- `ip route 172.16.1.0 255.255.255.0 10.10.10.1`

After issued last command, we should be able to ping from PC0 to PC1 or ping any IP in the three networks. Note that we didn't give a different routing rule for each loopback address, we covered all of them with giving one **/24 subnet**. Also we didn't give any rule about loopbacks on Router1, however we can access them because these interfaces are already on Router1 and PC1 has access to Router1.

**Ping from PC0 to PC1 and a loopback:**

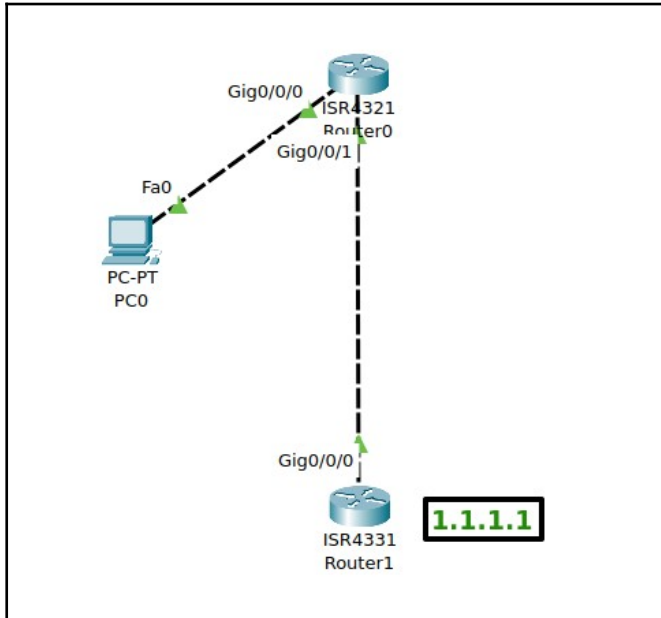
```
C:\>ping -n 1 172.16.2.2
Pinging 172.16.2.2 with 32 bytes of data:
Reply from 172.16.2.2: bytes=32 time<1ms TTL=126
```

```
C:\>ping -n 1 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<1ms TTL=254
```

## Purpose of Lab 2

Understanding **default routing** by modifying first topology.

### Topology b.



- Everything same but this time there is only one loopback address which is 1.1.1.1

### Configuration of Routers

#### Router0 (additional)

- en
- conf t
- ip route 0.0.0.0 0.0.0.0 10.10.10.2

#### Router1

- en
- conf t
- no int lo0
- no int lo1
- no int lo2
- int lo1
- ip address 1.1.1.1 255.255.255.255

```
C:\>ping -n 1 1.1.1.1

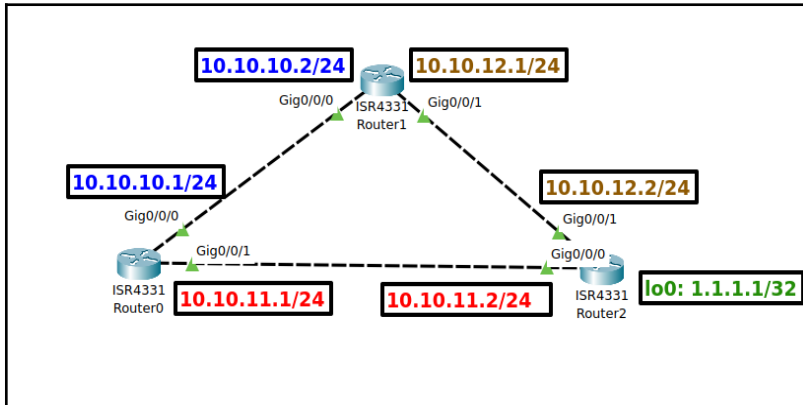
Pinging 1.1.1.1 with 32 bytes of data:

Reply from 1.1.1.1: bytes=32 time<1ms TTL=254
```

## Purpose of Lab 3

Understanding **floating static routing**.

### Topology c.



## Configuration of Routers

### Router0

- en
- conf t
- int gig0/0/0
- ip address 10.10.10.1 255.255.255.0
- no sh
- int gig0/0/1
- ip address 10.10.11.1 255.255.255.0
- no sh
- ex
- ip route 1.1.1.1 255.255.255.255 10.10.10.2
- ip route 1.1.1.1 255.255.255.255 10.10.11.2 100

### Router1

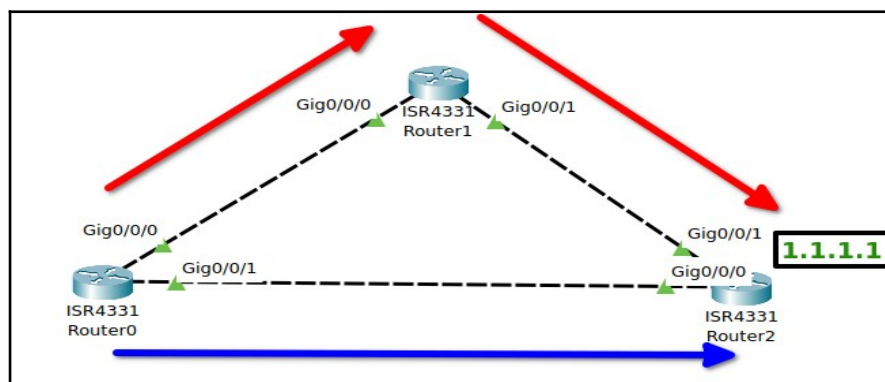
- en
- conf t
- int gig0/0/0
- ip address 10.10.10.2 255.255.255.0
- no sh
- int gig0/0/1
- ip address 10.10.12.1 255.255.255.0
- no sh
- ex
- ip route 1.1.1.1 255.255.255.255 10.10.12.2

## Router2

- `en`
- `conf t`
- `int gig0/0/0`
- `ip address 10.10.11.2 255.255.255.0`
- `no sh`
- `int gig0/0/1`
- `ip address 10.10.12.2 255.255.255.0`
- `no sh`
- `ex`
- `int lo0`
- `ip address 1.1.1.1 255.255.255.255`
- `ip route 10.10.10.0 255.255.255.0 10.10.11.1`

## What did we do here ?

We specified two paths whenever **Router0** wants to reach **1.1.1.1** . **Red path** is the primary and **blue** is the secondary.



If we try to go 1.1.1.1 from Router0 in this topology, we're going to see that it's going via **10.10.10.2** which is **red path**.

```
Router#traceroute 1.1.1.1
Type escape sequence to abort.
Tracing the route to 1.1.1.1

 1  10.10.10.2      0 msec    0 msec    0 msec    R1
 2  10.10.12.2      0 msec    0 msec    0 msec    R2, lo0
Router#
```

However if I **shutdown** gig0/0/0 interface of Router0, we'll see that we can still ping 1.1.1.1 but this time path will be **blue one**.

```
Router(config)#int gig0/0/0
Router(config-if)#shu
Router(config-if)#shutdown
```

```
Router#traceroute 1.1.1.1
Type escape sequence to abort.
Tracing the route to 1.1.1.1

 1  10.10.11.2      0 msec    0 msec    0 msec
Router# R2, lo0
```