

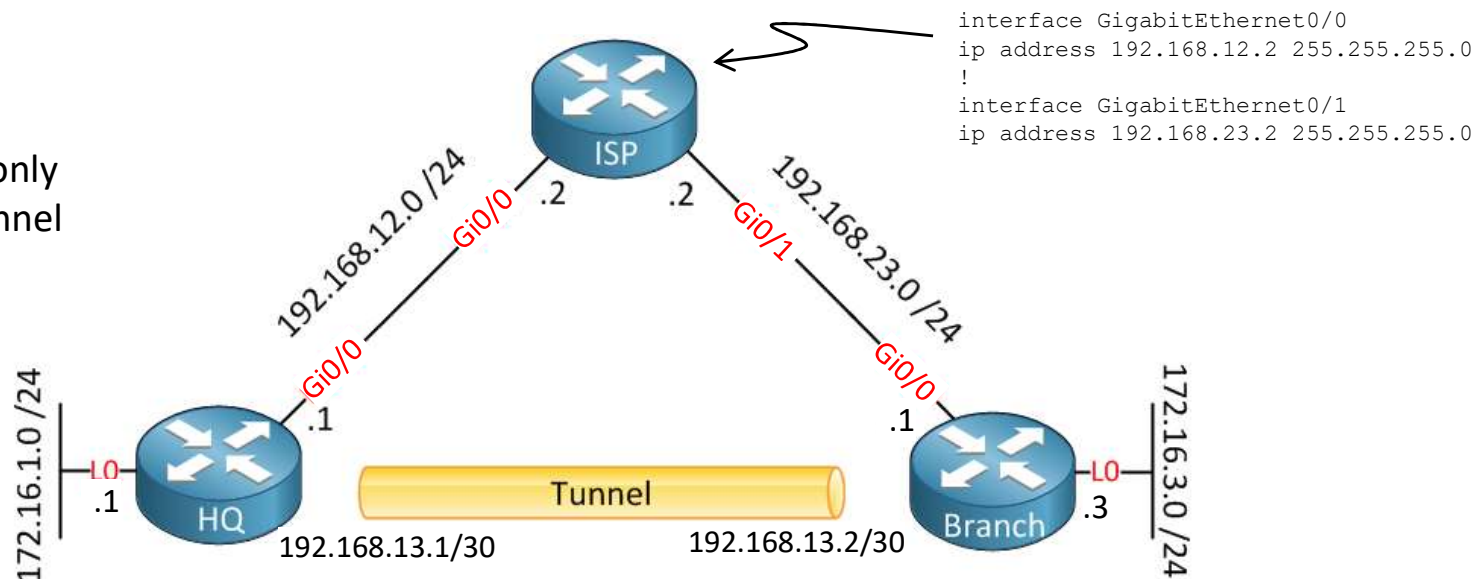
GRE Tunnel Review

B. Graham

7 Sep 2020

GRE Tunnel Example

Loopback interfaces only
move through the tunnel
Large WAN subnets



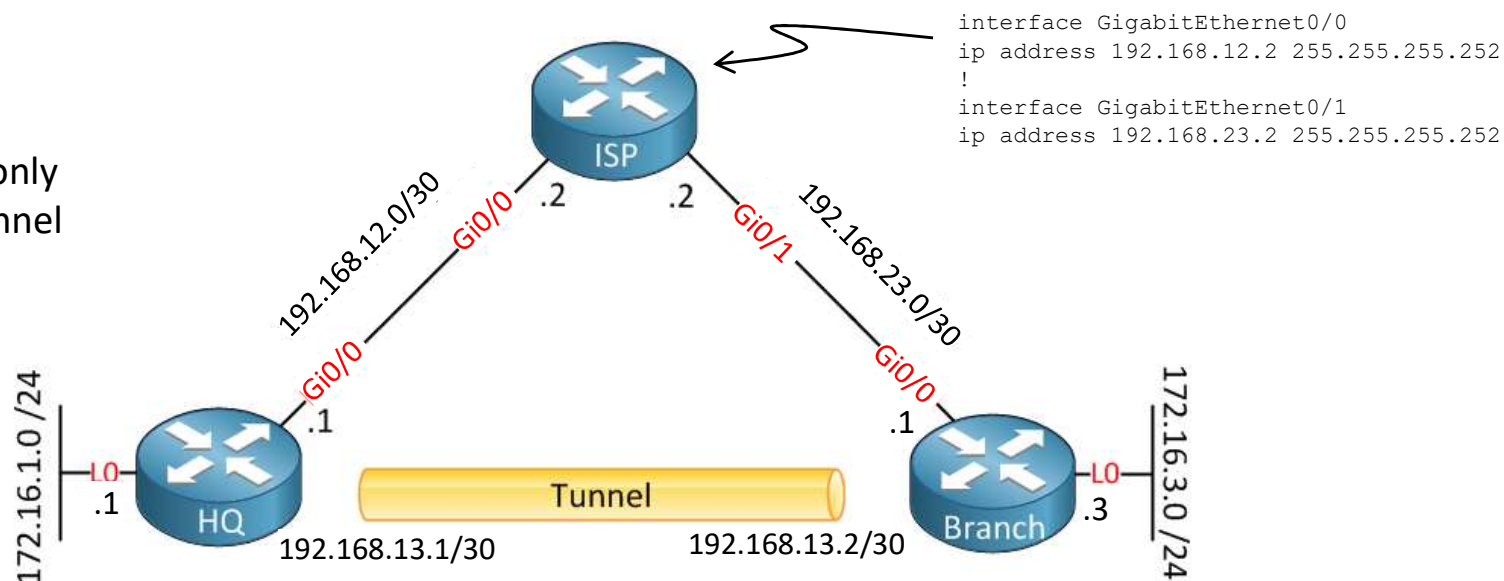
```
interface Loopback0
ip address 172.16.1.1 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.1 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.23.1
!
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
!
ip route 192.168.23.3 255.255.255.255 192.168.12.2
ip route 172.16.3.0 255.255.255.0 192.168.13.2
```

```
interface Loopback0
ip address 172.16.3.3 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.2 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.12.1
!
interface GigabitEthernet0/0
ip address 192.168.23.3 255.255.255.0
!
ip route 192.168.12.1 255.255.255.255 192.168.23.2
ip route 172.16.1.0 255.255.255.0 192.168.13.1
```

Note: There is nothing special about the loopback interface in these cases. Its just a convenient way to add a second interface that is up. Could have used Gi0/1 on HQ and Branch Router but would then need some other device to keep it up.

GRE Tunnel Example

Loopback interfaces only
move through the tunnel
Small WAN subnets

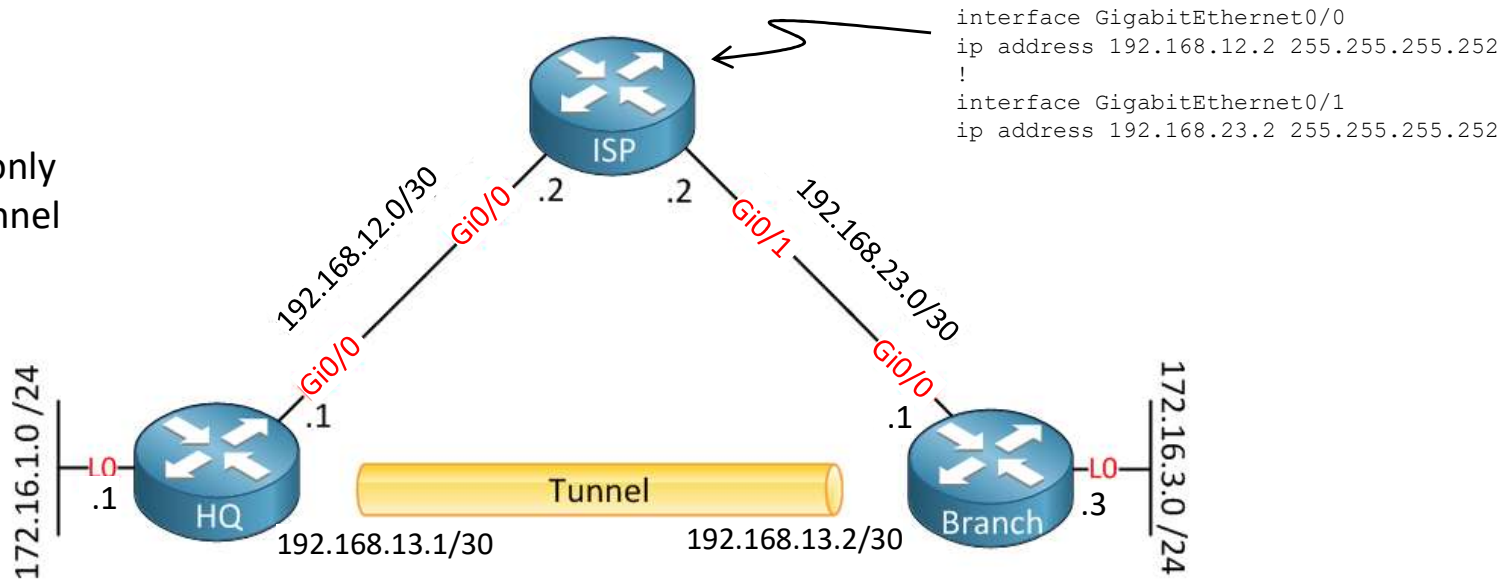


```
interface Loopback0
ip address 172.16.1.1 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.1 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.23.1
!
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.252
!
!
ip route 172.16.3.0 255.255.255.0 192.168.13.2
ip route 192.168.23.1 255.255.255.255 192.168.12.2
```

```
interface Loopback0
ip address 172.16.3.3 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.2 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.12.1
!
interface GigabitEthernet0/0
ip address 192.168.23.1 255.255.255.252
!
!
ip route 172.16.1.0 255.255.255.0 192.168.13.1
ip route 192.168.12.1 255.255.255.255 192.168.23.2
```

GRE Tunnel Example

Loopback interfaces only
move through the tunnel
Small WAN subnets
Default routes



```
interface Loopback0
ip address 172.16.1.1 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.1 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.23.1
!
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.252
!
!
ip route 172.16.3.0 255.255.255.0 192.168.13.2
ip route 192.168.23.1 255.255.255.255 192.168.12.2
ip route 0.0.0.0 0.0.0.0 192.168.12.2
```

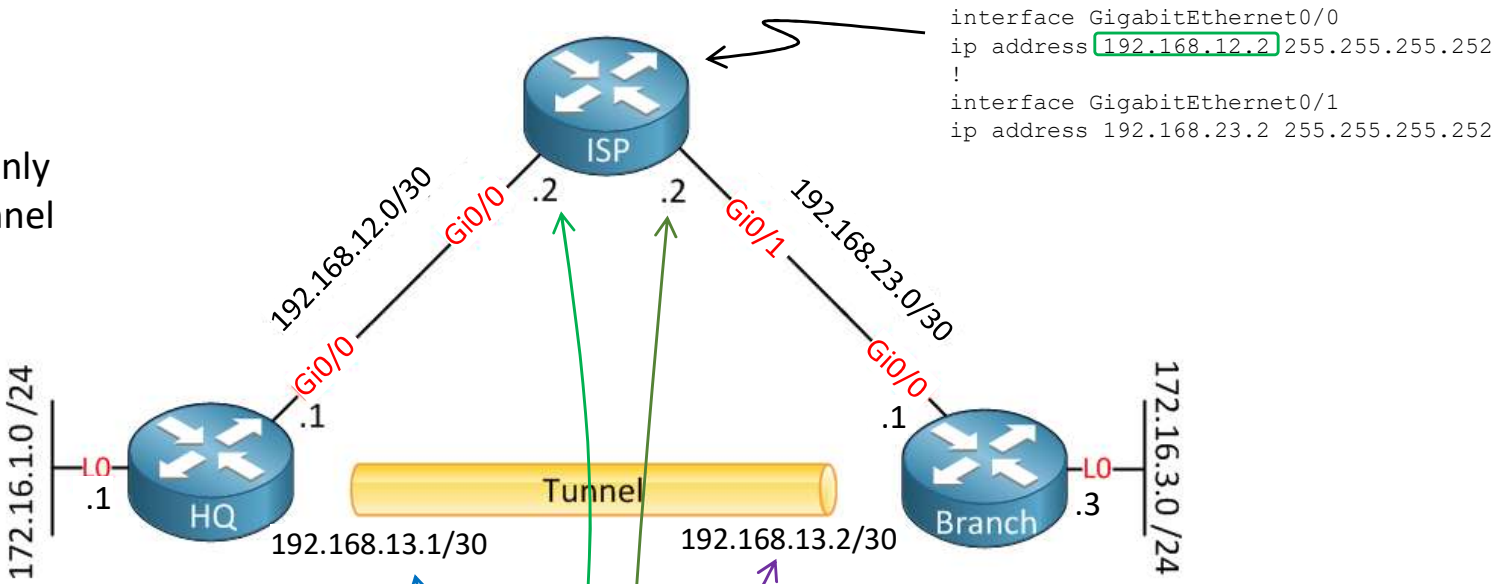
```
interface Loopback0
ip address 172.16.3.3 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.2 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.12.1
!
interface GigabitEthernet0/0
ip address 192.168.23.1 255.255.255.252
!
!
ip route 172.16.1.0 255.255.255.0 192.168.13.1
ip route 192.168.12.1 255.255.255.255 192.168.23.2
ip route 0.0.0.0 0.0.0.0 192.168.23.2
```

Summary

GRE tunnel add 24 bytes header to the packet

GRE Tunnel Summary

Loopback interfaces only
move through the tunnel
Small WAN subnets
Default routes

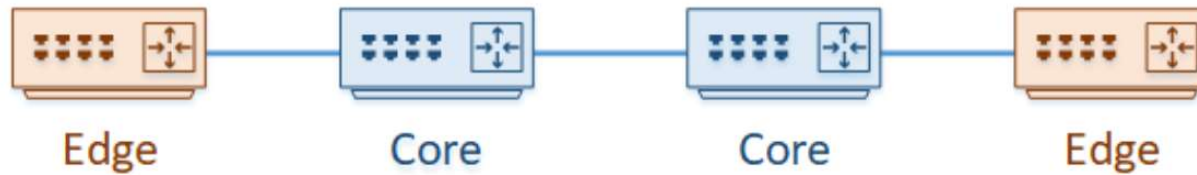


```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.252
!
interface GigabitEthernet0/1
ip address 192.168.23.2 255.255.255.252
```

```
interface Loopback0
ip address 172.16.1.1 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.1 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.23.1
!
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.252
!
!
ip route 172.16.3.0 255.255.255.0 192.168.13.2
ip route 192.168.23.1 255.255.255.255 192.168.12.2
ip route 0.0.0.0 0.0.0.0 192.168.12.2
```

```
interface Loopback0
ip address 172.16.3.3 255.255.255.0
!
interface Tunnel1
ip address 192.168.13.2 255.255.255.252
mtu 1476
tunnel source GigabitEthernet0/0
tunnel destination 192.168.12.1
!
interface GigabitEthernet0/0
ip address 192.168.23.1 255.255.255.252
!
!
ip route 172.16.1.0 255.255.255.0 192.168.13.1
ip route 192.168.12.1 255.255.255.255 192.168.23.2
ip route 0.0.0.0 0.0.0.0 192.168.23.2
```

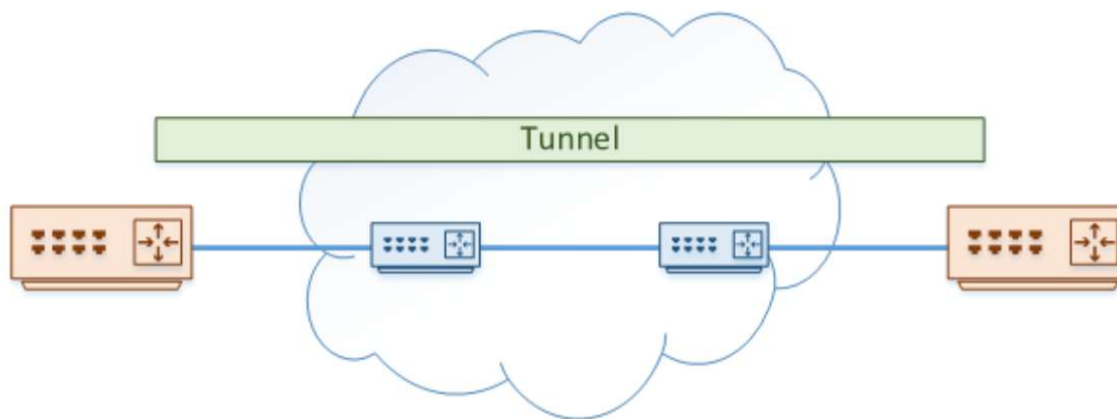
- 1. Each router has a default route to the other end of its own WAN (Gi0/0) Link
In the previous examples this was an explicit route: ip route 192.168.23.1 255.255.255.255 192.168.12.2
- 2. Each router has a route to the other router's Tunnel Source IP
The router knows that this is the end point to its tunnel's 'WAN' link



GRE tunnel add 24 bytes header to the packet

The core routers are known as the **underlay network**. This is responsible for taking GRE packets and transporting them from one side of the network to the other.

The tunnel itself is the **overlay network**. Packets passing through the overlay network are unaware of the routers in the underlay.



Changing tunnel source to loopback doesn't work