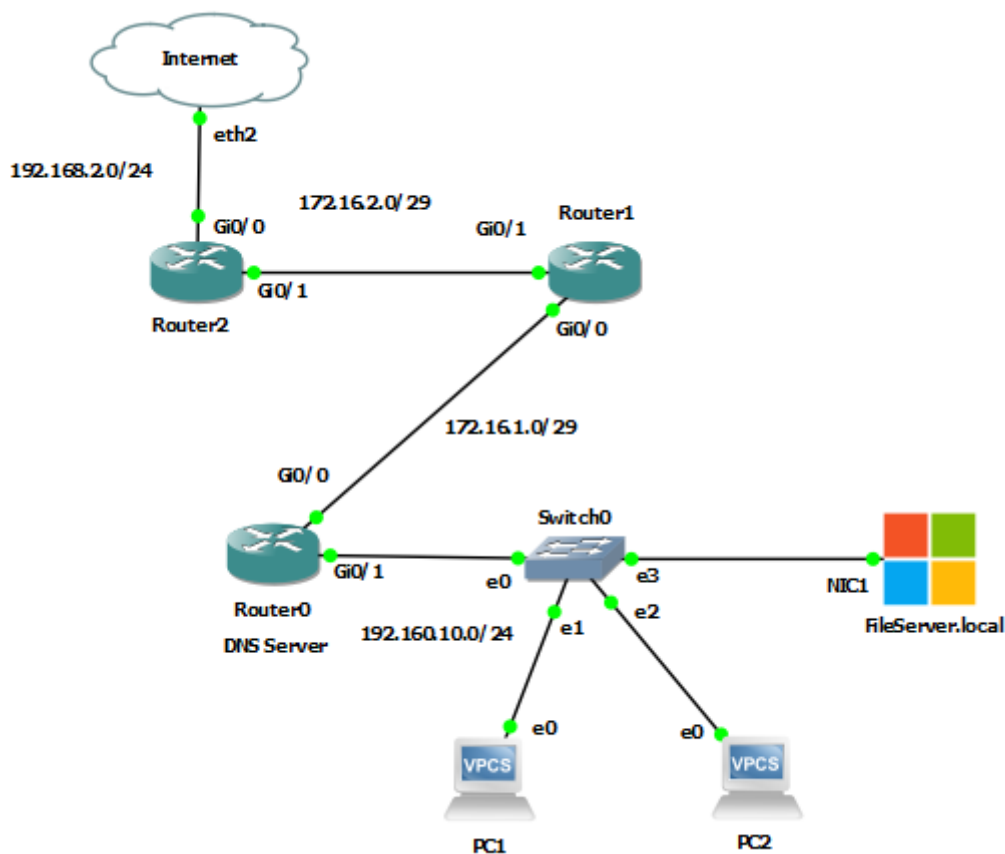


Cisco IOS Configure Router as DNS Server

Network Topology



To create this topology, I used GNS3 instead of Cisco Packet Tracer because Packet Tracer routers do not simulate the "ip dns server" command. In the above network Router0 is being configured as a DNS server. Through the configuration of Router0 I wanted to not only demonstrate the ability for the router to resolve local hosts on the network, but I also wanted to show how DNS resolution that Router0 was unable to do could be forwarded to a real DNS server (1.1.1.1) on the Internet. In this way Router0 has been configured to forward unknown requests to the Cloudflare and APNIC's DNS server at 1.1.1.1. I also decided to use a real Windows 2016 Server appliance in the topology. I could have just as easily used another VPCS QEMU device, but it gave me an opportunity to revisit GNS3 Windows appliances. Also, it is not the best practice to use a networking router as the DNS server, but it can be done as this shows.

Router0 Configuration Commands

```
Router0>enable
Router0#configure terminal
Router0(config)# interface gigabitEthernet 0/0
Router0(config-if)#ip address 192.168.10.1 255.255.255.0
Router0(config-if)#no shutdown
Router0(config-if)#interface gigabitEthernet 0/1
Router0(config-if)#ip address 172.16.1.1 255.255.255.248
Router0(config-if)#no shutdown
Router0(config-if)#exit
Router0(config)#ip dns server
Router0(config)#ip domain-name local
Router0(config)#ip name-server 1.1.1.1
Router0(config)# ip host fileserver.local 192.168.10.2
Router0(config)# ip host pc1.local 192.168.10.3
Router0(config)# ip host pc2.local 192.168.10.4
Router0(config)# ip host router0.local 192.168.10.1
Router0(config)# ip host router1.local 172.16.1.2
Router0(config)# ip host router2.local 172.16.2.1
Router0(config)# ip default-network 192.168.2.0
Router0(config)# router ospf 1
Router0(config-router)# network 172.16.1.0 0.0.0.7 area 0
Router0(config-router)# network 192.168.10.0 0.0.0.255 area 0
```

Router1 Configuration Commands

```
Router1>enable
Router1#configure terminal
Router1(config)# interface gigabitEthernet 0/0
Router1(config-if)#ip address 172.16.1.2 255.255.255.248
Router1(config-if)#no shutdown
Router1(config-if)#interface gigabitEthernet 0/1
Router1(config-if)#ip address 172.16.2.2 255.255.255.248
Router1(config-if)#no shutdown
Router1(config-if)#exit
Router1(config)#ip name-server 172.16.1.1
Router1(config)# ip default-network 192.168.2.0
Router1(config)# router ospf 1
Router1(config-router)# network 172.16.1.0 0.0.0.7 area 0
Router1(config-router)# network 172.16.2.0 0.0.0.7 area 0
```

Router2 Configuration Commands

```
Router2>enable
Router2#configure terminal
Router2(config)# interface gigabitEthernet 0/0
```

```
Router2(config-if)#ip address dhcp
Router2(config-if)#no shutdown
Router2(config-if)#ip nat outside
Router2(config-if)#interface gigabitEthernet 0/1
Router2(config-if)#ip address 172.16.2.1 255.255.255.248
Router2(config-if)#no shutdown
Router2(config-if)#ip nat inside
Router2(config-if)#exit
Router2(config)#ip nat inside source list 1 interface gigabitEthernet0/0 overload
Router2(config)#access-list 1 permit any
Router2(config)# router ospf 1
Router2(config-router)# network 192.168.2.0 0.0.0.255 area 0
Router2(config-router)# network 172.16.2.0 0.0.0.7 area 0
```

The configuration of nat on Router2 is so that the network can communicate to the connected network and then to the Internet through the GNS3 cloud object. I did this to demonstrate the DNS forwarder on Router0 to 1.1.1.1 Also, the IP address on gigabitEthernet 0/0 is set for DHCP as it is getting an address from my network DHCP server. You could also make this a static address if desired. If you do set a static IP address, remember to configure a gateway of last resort. The DHCP setting configures that for the interface automatically.

Check DNS (a few ping examples)

PC1>ping fileserver.local

```
PC1> ping fileserver.local
fileserver.local resolved to 192.168.10.2

84 bytes from 192.168.10.2 icmp_seq=1 ttl=128 time=0.571 ms
84 bytes from 192.168.10.2 icmp_seq=2 ttl=128 time=0.733 ms
84 bytes from 192.168.10.2 icmp_seq=3 ttl=128 time=0.463 ms
84 bytes from 192.168.10.2 icmp_seq=4 ttl=128 time=0.712 ms
84 bytes from 192.168.10.2 icmp_seq=5 ttl=128 time=0.610 ms
```

PC1>ping router2.local

```
PC1> ping router2.local
router2.local resolved to 172.16.2.1

84 bytes from 172.16.2.1 icmp_seq=1 ttl=253 time=3.441 ms
84 bytes from 172.16.2.1 icmp_seq=2 ttl=253 time=3.529 ms
84 bytes from 172.16.2.1 icmp_seq=3 ttl=253 time=3.337 ms
84 bytes from 172.16.2.1 icmp_seq=4 ttl=253 time=3.558 ms
84 bytes from 172.16.2.1 icmp_seq=5 ttl=253 time=4.156 ms
```

PC1>ping www.google.com

```
PC1> ping www.google.com
www.google.com resolved to 142.250.69.228

84 bytes from 142.250.69.228 icmp_seq=1 ttl=111 time=16.069 ms
84 bytes from 142.250.69.228 icmp_seq=2 ttl=111 time=18.812 ms
84 bytes from 142.250.69.228 icmp_seq=3 ttl=111 time=14.844 ms
84 bytes from 142.250.69.228 icmp_seq=4 ttl=111 time=21.866 ms
84 bytes from 142.250.69.228 icmp_seq=5 ttl=111 time=16.913 ms
```

Check the configured DNS Hosts on Router0

Router0#show hosts

```
Router0#show hosts
Default domain is local
Name/address lookup uses domain service
Name servers are 1.1.1.1

Codes: UN - unknown, EX - expired, OK - OK, ?? - revalidate
       temp - temporary, perm - permanent
       NA - Not Applicable None - Not defined

Host                Port  Flags      Age Type  Address(es)
fileserver.local    None (perm, OK) 0  IP    192.168.10.2
pc1.local           None (perm, OK) 0  IP    192.168.10.3
pc2.local           None (perm, OK) 0  IP    192.168.10.4
router0.local        None (perm, OK) 0  IP    192.168.10.1
router1.local        None (perm, OK) 0  IP    172.16.1.2
router2.local        None (perm, OK) 0  IP    172.16.2.1
```

GNS3 File

[net11 cisco router dns server.gns3](#)

Revision #10

Created 30 December 2022 22:48:33 by Glen Taylor

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