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Pledge: I pledge my honor that I have abided by the Stevens Honor System.

Case Study - Access My Server

------------------------------------------------------------------------------------------------------------------------------------------Reminder: x.x.x.x/24 means you have a subnet mask of 255.255.255.0, x.x.x.x/16 means your subnet mask is 255.255.0.0.

You are setting up a web server at home and want it accessible from the Internet. Your local IP address is 192.168.1.50, your router's LAN address is 192.168.1.1 (both on a class C network, so for example you could say your IP is 192.168.1.50/24). Your web server will run on port 80.

Your router's WAN port has the IP 65.24.56.14/16. Its LAN port 80 is used for the router's administration panel (which you can also access through 192.168.1.1:80), but for security reasons, we disabled WAN administration.

You have heard of a service called dyndns.org and have set up a dynamic host called yourname.dyndns.org which points to your WAN address 65.24.56.14/16.

You have a friend Brian that wants to access your server. He has a local IP of 192.168.1.36, a router's

LAN IP of 192.168.1.1, and a WAN address of 35.63.24.6/16.

Brian's ISP has a caching DNS server at 35.63.24.16/16. Assume it starts with nothing stored.

There is an authoritative DNS server at 35.63.63.115/16, containing the information: - dyndns.org nameserver: 35.63.12.134/16

As you can see, dyndns.org has its own authoritative name server, storing the IPs of all their subdomains (including yours).

All name servers listen on port 53.

You know of the following routers between yourself and Brian.

BrianRouter: 192.168.1.1/24 - 35.63.24.6/16

YourRouter: 192.168.1.1/24 - 65.24.56.14/16

WanRouter: 35.63.24.59/16 - 65.24.23.47/16

You called Brian and told him the domain name you registered.

Each answer is worth 10 points.

THIS IS INDIVIDUAL WORK. Any signs of copying will result in a 0.

1) What should you set up on your router so that Brian can access the web site you are hosting? Explain.

**Enable port forwarding.**

2) When Brian tries to access your server by domain name, what type of request will be made first?

a) HTTP

**b) DNS**

c) NAT

d) Routing

e) FTP

Explain your answer.

**Brian is giving a hostname, not an IP, so and DNS query is made to obtain the IP address.**

3) Assuming the ISP's DNS server's cache is initially blank, what must it do if it receives a request for dyndns.org? What happens if it has a valid entry in its cache?

**It must iteratively ask the authoritative DNS server for the information. If it has a valid entry, it just gives the information.**

4) The WAN Router connects two networks. Supply the addresses of those two networks in dotted decimal format.

**35.63.0.0 and 65.24.0.0**

5) Can the authoritative DNS server at 35.63.63.115/16 answer authoritatively for yourname.dyndns.org? If not, what action does it need to take to determine the IP address of yourname.dyndns.org?

**No, the ISP DNS server has to make an iterative query to the dyndns.org authoritative name server, to get the IP address of yourname.dyndns.org.**

6) Assuming Brian now knows the IP address of your computer and is ready to make a request to your web server, fill in the source and destination of the packet as it leaves his computer. You may assume the ephemeral source port has been set to 57000.

**/-----------------------------------------------\**

**| Source: 192.168.1.36: 57000 |**

**| Destination: 65.24.56.14: 80 |**

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7) Fill in the source and destination of the packet after it passes through Brian’s router.

**/-----------------------------------------------\**

**| Source: 35.63.24.6: 57000 |**

**| Destination: 65.24.56.14: 80 |**

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8) After the web server request leaves Brian’s home router, it passes through other devices in the network before it gets to your computer. List, in order, the devices it passes through up to but not including your computer. For each device, list the network address the packet goes from to the network address the packet goes to.

**WAN router: 35.63.0.0 → 65.24.0.0**

**My router: 64.24.0.0 → 192.168.1.0**

9) Fill in the source and destination of the response packet after it leaves your computer.

**/-----------------------------------------------\**

**| Source: 192.168.1.50: 80 |**

**| Destination: 35.63.24.6: 57000 |**

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10) Fill in the source and destination of the response packet after it leaves your router.

**/-----------------------------------------------\**

**| Source: 65.24.56.14: 80 |**

**| Destination: 35.63.24.6: 57000 |**

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