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

Case Study -­‐ Access My Server -­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐-­‐

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). Your web server will run on port 80.

Your router's WAN port has the IP 65.24.56.14. 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.

You have a friend Hercules 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

Hercules’s ISP has a caching DNS server at 35.63.24.16. Assume it starts with nothing stored.

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

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 Hercules.

HerculesRouter: 192.168.1.1 -­‐ 35.63.24.6

YourRouter: 192.168.1.1 -­‐ 65.24.56.14

WanRouter: 35.63.24.59 -­‐ 65.24.23.47

You called Hercules 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.

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**My answers are in bold.**

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

**On your router, you should set up a static IP for the computer hosting the web site so that web browser connections can always be forwarded to your computer. You should also port forward port 80 so that computers outside of the LAN can access it. On the computer you should also enable traffic to the computer in the firewall.**

1. When Hercules tries to access your server by domain name, what type of request will be made first?
   1. HTTP

**b) DNS**

* 1. NAT
  2. routing
  3. FTP

Explain your answer.

**The browser will request the IP address from the DNS.**

1. 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?

**If the cache is initially blank, it would point to the ORG name server. From there it would keep asking IP’s in the ORG name server for dyndns.org until one of them pointed to the correct IP. If the cache had a valid entry of dyndns.org, it would just return the IP address immediately.**

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

**35.63.24.59 -­‐ 65.24.23.47**

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

**The DNS can answer authoritatively because the IP address is in its cache. If the IP address wasn’t in the cache it would ORG name server like in #3.**

1. Assuming Hercules 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.

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| Source: **192.168.1.36** : 57000 |

| Destination: **192.168.1.1** : **57000** |

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

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| Source: **192.168.1.1** : 57000 |

| Destination: **35.63.24.6** : **57000** |

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8) After the web server request leaves Hercules’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.

**DNS Cache** - **35.63.24.16**

**Authoritative server - 35.63.63.115**

**Dyndns.org - 35.63.12.134**

**My WAN address - 65.24.56.14**

**My LAN address - 192.168.1.1**

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

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| Source: **192.168.1.50:80** |

| Destination: **192.168.1.1:80** |

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

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| Source: **192.168.1.1:80** |

| Destination: **65.24.56.14:80** |

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