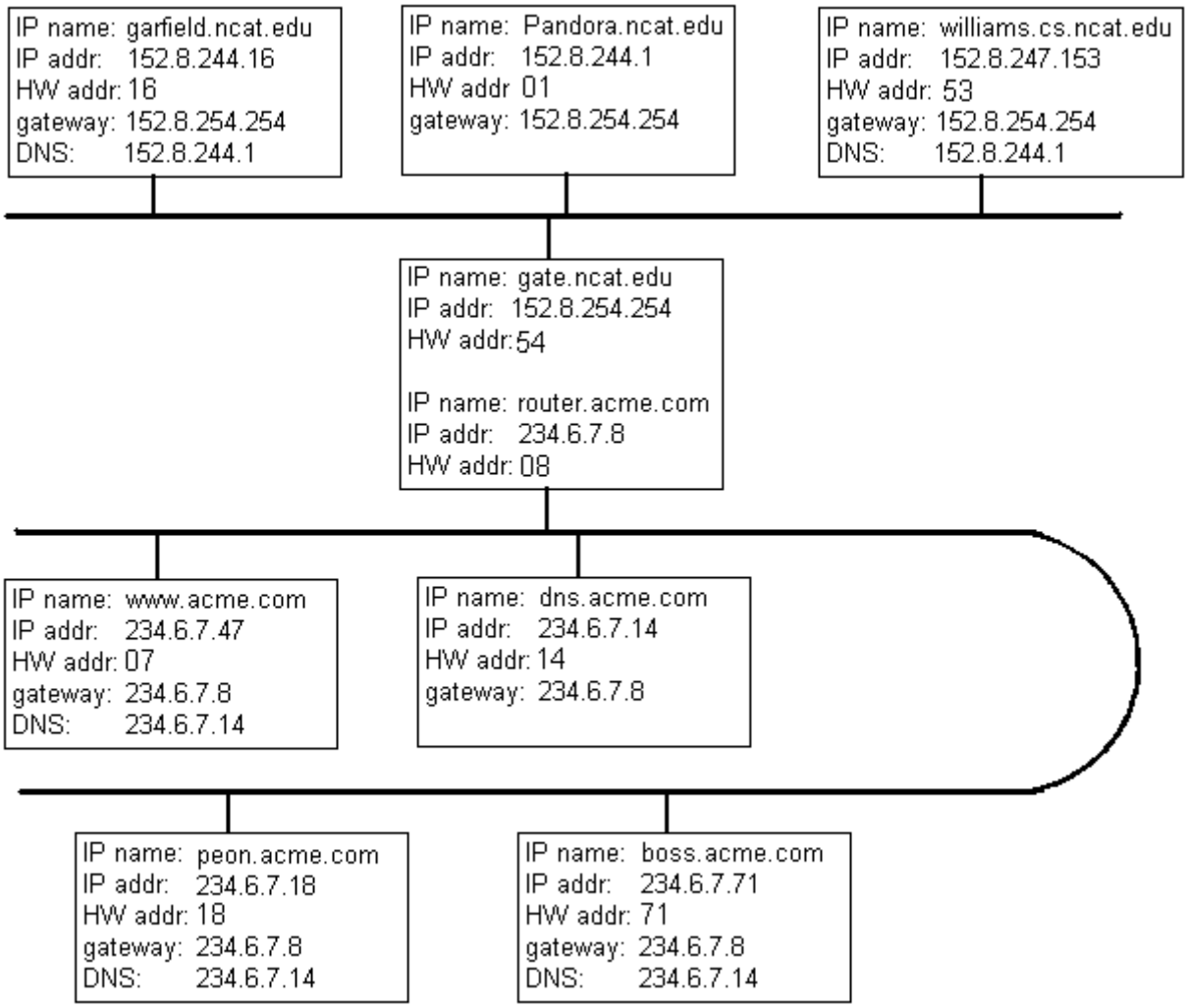
Solutions

Use this network to complete this homework assignment.



Note: Ethernet addresses are 48 bit values usually shown as six pairs of hexadecimal digits, such as 12:34:56:78:90:AB. For simplicity, only two hexadecimal digits are used in this assignment. Any similarity between hardware addresses and IP addresses is purely coincidental.

Consider the above network assuming that every node was just powered on and has no additional information beyond what is shown. Assume that each Domain Name Server knows the IP address of every node everywhere.

1. In the table below, show all of the frames that will be sent to transfer a single data packet from **peon.acme.com** to **www.acme.com** For ARP frames, indicate the IP address of the desired host in the IP destination field. IP addresses may be abbreviated by their rightmost byte.

HW source	HW dest	IP source	IP destination	Purpose
18	Broadcast	.18	.14	ARP DNS
14	18	.14	.18	ARP reply
18	14	.18	.14	DNS request www addr
14	18	.14	.18	DNS reply
18	Broadcast	.18	.47	ARP www.acme.com
07	18	.47	.18	ARP reply
18	07	.18	.47	Send message

2. Use the same network and again assuming that every node was just powered on and has no additional information beyond what is shown. In the table below, show all of the frames that will be sent to transfer **two** data packets from **williams.cs.ncat.edu** to **www.acme.com**

HW source	HW dest	IP source	IP destination	Purpose
53	Broadcast	.153	.1	ARP DNS
01	53	.1	.153	ARP reply
53	01	.153	.1	DNS request www addr
01	53	.1	.153	DNS reply
53	Broadcast	.153	.254	ARP gateway
54	53	.254	.153	ARP reply
53	54	.153	.47	Send msg 1
53	54	.153	.47	Send msg 2 *(could be later)*
08	Broadcast	.8	.47	ARP www
07	08	.47	.8	ARP reply
08	07	.153	.47	Send msg 1
08	07	.153	.47	Send msg 2

3. In this problem assume that just previously two packets were sent from williams.cs.ncat.edu to www.acme.com. (Assume problem 2 ran before this problem.) Information from the previous transmissions will be cached. The computers have no other knowledge except what was configured and what they learned from the previous transmissions. In the table below, show all of the frames that will be sent to transfer a single data packet from **williams.cs.ncat.edu** to **boss.acme.com**

HW source	HW dest	IP source	IP destination	Purpose
53	01	.153	.1	DNS request
01	53	.1	.153	DNS reply
53	54	.153	.71	Send message
08	Broadcast	..8	.71	ARP boss
71	.8	.71	.8	ARP reply
08	71	.153	.71	Send message

4. **In this problem assume that the network activity in problem 2 and problem 3 occurred immediately before**. Information from the previous transmission will be cached. The computers have no other knowledge except what was configured and what they learned from the previous transmissions. In the table below, show all of the frames that will be sent to transfer a single data packet from **williams.cs.ncat.edu** to **garfield.ncat.edu**

HW source	HW dest	IP source	IP destination	Purpose
53	01	.153	.1	DNS request Garfield addr
01	53	.1	.153	DNS reply
53	Broadcast	.153	.16	ARP request
16	53	.16	.153	ARP reply
53	16	.153	.16	Send msg