

Write your name below and indicate your role,

Project Manager (PM), Recorder (R)

Name \_\_\_\_\_ Role \_\_\_\_\_

Name \_\_\_\_\_ Role \_\_\_\_\_

## IP Addresses

### Your Tasks

- ☐ Watch the Video: IP Address and DNS
- ☐ Define key vocabulary
- ☐ Explain the parts of an IPv4 address
- ☐ Compare IPv4 and IPv6
- ☐ Look up your IP address
- ☐ Recieve credit for the group portion of this lab

### ☐ Watch the Video: IP Addresses and DNS

- Navigate to the following link and watch the video: IP Addresses and DNS  
<https://www.youtube.com/watch?v=5o8CwafCxnU&feature=youtu.be>

### ☐ Define key vocabulary

Refer to the video above or a search engine to define the following,

#### IP Address

#### IPv4

#### IPv6

#### IP Packet

## □ Explain the parts of an IPv4 address

IPv4 uses 32 bits for addressing. The 32 bits are split into **4 bytes** and each byte is separated by a dot(.). So it is of this form:

**00000000.00000000.00000000.00000000**

A typical IP address in decimal form appears like this:

**192.168.0.1**

What is the range of decimal numbers for each part of an IPv4 address?

How many IPv4 addresses are there?

An IP address has two components – A, network component, and a node component.

As an analogy, if you think of the street address of your house it is of the form,

**House Number + Street Name (e.g. 12 King Street)**

For computer networks the network number is equivalent to the street name and the house number is the Node Address.

How networks and nodes are allocated in the address depends on the size of the network. For example a very large network (like a large company) might be allocated as follows. Because large networks have lots of computers on them, we need more nodes to accommodate them.

**net.node.node.node**

Where as a medium network, would be allocated as,

**net.net.node.node**

And a small network, would be allocated as,

**net.net.net.node**

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| To which of the following networks could you connect the most devices? Explain.              |
| (a) <b>net.node.node.node</b><br>(b) <b>net.net.node.node</b><br>(c) <b>net.net.net.node</b> |

## ❑ Compare IPv4 and IPv6

The IPv4 system for addressing Internet connected devices cannot keep up with the rapidly growing Internet. The IPv6 system however can accommodate more devices than grains of sand on the earth – that’s a lot of devices!

In a previous exercise, you determined the number of possible connections using IPv4. To understand the number of connections in IPv6 you must first be aware that instead of using binary, each part of the IPv6 address uses hexadecimal (base 16) – that is  $2^4$ .

IPv6 addresses are represented as eight groups, separated by colons, of four hexadecimal digits. Below is an example of a full IPv6 address

FE80:0000:0000:0202:B3FF:FE1E:8329

Given 4 places, how many possible combinations of numbers are there in a base 16 system. Recall (base<sup>place</sup>)

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How many IPv6 addresses are possible.

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How many more IPv6 addresses are possible than IPv4 addresses?

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## ❑ Look up your IP address

The Internet keeps track of your IP address. In fact if you search “What is my IP address” you can find out what it is.

What is your IP address?

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Is your IP address the same as your partners? Why or why not?

□ **Receive Credit for the group portion of this lab**



Indicate the names of all group members.

Have Ms. Pluska check your Need for Addressing lab

Submit your lab to the needs to be graded folder to receive credit for the group portion of this lab.

Do not submit your lab until you have Ms. Pluska's (or her designated TA's) signature \_\_\_\_\_