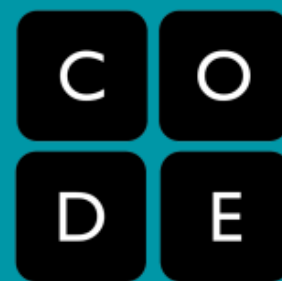
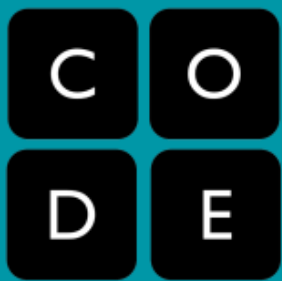


The Need for DNS

Unit 1 Lesson 12 (U1L12)



Warm-Up (Unplugged)

IN YOUR NOTES or on a piece of paper, copy down the following table, and leave a space for 20 people

	Name	IP address
1.		
2.		
3.		
4.		
5.		
6.		
7.		
...		
20.		

Warm-Up (Unplugged)

When you walked in, I handed you a slip of paper with an IP address on it.

For the next 5 minutes, your goal is to complete an accurate list of IP addresses and names for 20 students in the room.

Rules:

- You may only talk to **one person at a time**, but you may exchange **as much** information with that person **as you want**.

GO!



Warm-Up (Discussion)

1) Why did I keep taking your IP addresses?

This simulates the fact that a computer's IP address does not stay the same. For example, a person's IP address on their phone changes quite frequently as they move around throughout their day and their phone tries to connect to the Internet from different locations.

2) Do you think the system we just simulated is an efficient way of collecting IP addresses? Are there any inefficiencies you observe? How could it be made better?

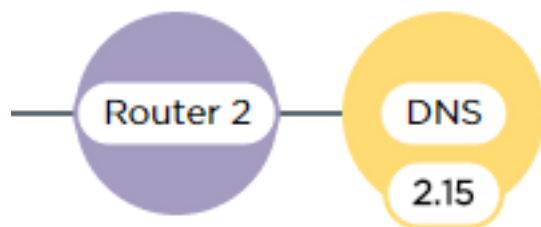
A central list would be better, and the Internet has a system for that.

Before we go to Code Studio, some instructions about the plugged activity.

Puzzle 2 of 7

The Need for DNS

In this version of the Internet Simulator, a Domain Name System (DNS) is provided for you and knows the IP addresses of all connected computers. You can only see the hostnames of other connected computers.



The address of the DNS is always `<yourRouterNumber>.15`. Send a message with protocol `GET [hostname]`, for example `GET Bob2`, to the DNS to get another student's address. **You can keep track of the responses in the Notes section in the DNS tab.**

The screenshot shows the 'DNS' tab in the Internet Simulator. It has three tabs: 'Instructions', 'My Device', and 'DNS'. Below the tabs is a section titled 'My Network' containing a table with two columns: 'Hostname' and 'Address'. The table lists 'student1 (Me)' with address '2.4' and 'dns (DNS)' with address '2.15'. Below the table is a section titled 'Notes' with an empty text area.

Hostname	Address
student1 (Me)	2.4
dns (DNS)	2.15

1st: Navigate to the Internet Simulator: DNS and cancel the notes.

2nd: Watch a demonstration of how to ask the DNS server about your partner's IP address

3rd: Join a router with your partner, but **DO NOT** share your IP address with them.

It's okay if you join a different router than your partner.

The screenshot shows a lesson menu for "Lesson 12: The Need for DNS" with four items: "Lesson Overview", "Internet Simulator: DNS" (highlighted with a red box), "The Internet: IP Addresses & DNS", and "Check Your Understanding". Below the menu is a lobby interface for "Lobby for CS1 - Per 1 (17/18)". It shows "Router 1 (router1)" and "Connected to GUHSD 09stutest. Room for 5 more." A "Join" button is highlighted with a red box and pointed to by a yellow arrow. At the bottom are "Add Router" and "Teacher View" buttons.

C O Unit 1 Lesson 12 (U1L12)
D E The Need for DNS

Follow the protocol to communicate with the DNS server to discover your partner's IP Address. Once this is known, silently interview your partner and fill-in the questions on the back of the activity guide.

Name(s) _____ Period _____ Date _____

Activity Guide - DNS Partner Questionnaire



Directions

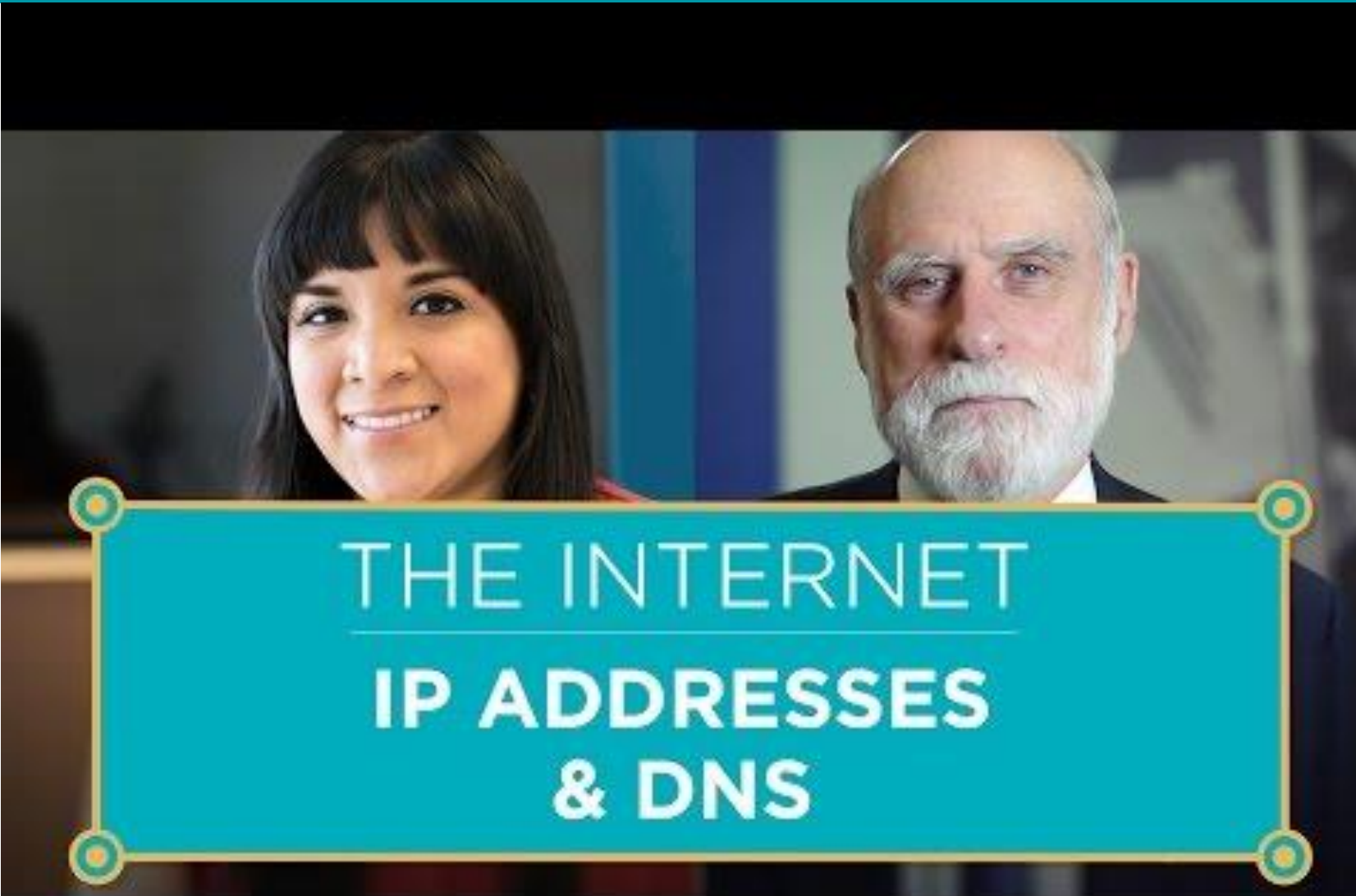
Log on to Code Studio and join the Internet Simulator. You are going to interview/have a conversation with a classmate using only the Internet Simulator. We've created a list of interview questions (on the next page) and you should both jot down each other's responses.

HOWEVER...As you're working, if your teacher taps you and your partner, you both **MUST** disconnect and reconnect from the simulation. This is to simulate changing IP addresses. Even though your IP address will change, your hostname will stay the same, so you'll need to re-join a router and ask the DNS for your partner's new IP address in order to continue having your conversation!



WARNING: If I tap you and your partner on the shoulder, you both **MUST** disconnect and reconnect from the simulation. This is to simulate changing IP addresses. Join a router and communicate with the DNS server once again to find your partner's new IP

The Internet:
IP Addresses
& DNS
(Start at 4:12)



Thoughts:

Hopefully we all get the basic idea: the DNS is the large-scale system that translates human-readable web addresses into their numeric IP addresses so that computers can communicate.

This system however was not designed to be secure and that has resulted in some major security incidents over time.

You're now going to learn about some of them and how they work.

Rapid Research: DNS in the Real World (pass out Research Activity Guide)

Name(s) _____ Period _____ Date _____

Activity Guide - Research: DNS in the Real World¹

Directions
Carefully read and analyze your resource with your group. After you have finished you will share your analysis with other members of the class as directed by your teacher.

Resource: _____

Summary: _____



- Re-group: all the 2's sit together, all the 3's sit together, etc.
- Read your assigned article (see Classroom), and fill-in your activity guide. Compare your answers with your group (15 min.)
- Re-re-group: sit with someone with the same suit, in order (A, 2, 3, 4) then, (5, 6, 7, 8), etc. Each member share out the article, and the main points. This information should be filled-in on the worksheet

Wrap-Up: (In your notes)





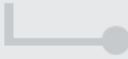
What is DNS?

- Why does the Internet use IP addresses?
- Why don't we need to know IP addresses?
- Why do we need a Domain Name System?
- Why don't we all maintain our own DNS?
- Is there one big DNS for the entire Internet?
- How do you think all these DNS servers are maintained?

Security

- What is one vulnerability of DNS and how is that vulnerability attacked?
- What are the implications of an attack on a DNS server (or servers) - how does this affect your life?

▼ Lesson 12: The Need for DNS

-  1 Lesson Overview
 -  2 Internet Simulator: DNS
 -  3 The Internet: IP Addresses & DNS
 -  4-7 Check Your Understanding
-  4 5 6 7