Cybersecurity:
Denial-of-Service Attack

Name _____

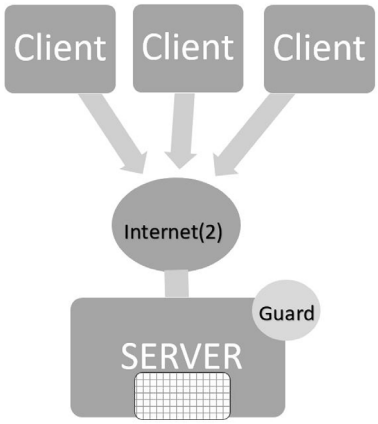
Date: _____

Student worksheet

Directions: Get ready for the activity.

Preparation

1. Write the steps involved in getting a request from a client (e.g., a person clicking a link to open a web page) to a server (machine hosting the web page and taking actions to deliver the web page).



2. The teacher will assign you a role. Read the tasks assigned to your role.

ROLE	TASKS
CLIENT	• Take a card from your stack, write your full name on the card, and place the card on the corner of your desk.
INTERNET	• Pick up request cards from the clients, picking up from a maximum of three clients before delivering. • Deliver request cards to the server by placing them on the next free slots in the server queue. • When all slots are full, count to 10, place request cards in slots that became available while counting, and drop the remaining request cards in the "Dropped" box. • Return to pick up new requests. Note: Second Internet person starts when the first Internet person arrives at the server queue.
SERVER	• Take requests, one by one, in order, from the server queue. • Write a checkmark in the column corresponding to the color of the request card on the processing paper. Start from the top line, one checkmark per line. • Place the cards in the "Processed" box.
GUARD	• Stop the activity when the teacher indicates it is time to stop, and do the following: 1. Instantly stop the Internet from delivering any more requests and ask clients to stop writing requests. 2. Count to 10 before asking the server to stop processing requests.

Cybersecurity: Denial-of-Service Attack—Page 2

Name: _____

Directions: Follow the directions below to do the activity.

STAGE 1: Normal Running Network

3. Act out the model.
4. What did you observe? What quantitative variables can you use to describe these observations? Give a name to the variables you pick and briefly describe them here.

5. Make a measurement of the variables described in Step 4. Fill in the variable names and their measured values in the table provided (see page 5).

STAGE 2: Unprotected Network Under DoS Attack

6. Read the role of the attacking client. The teacher will assign this role to one of the clients.

ROLE	TASKS
ATTACKING CLIENT	• Issue up to 10 requests at a time to the Internet. You do not need to write your full name on the requests.

7. Act out the model.
8. Make observations and write your measurements down in the table provided.

Cybersecurity: Denial-of-Service Attack—Page 3

Name: _____

Directions: Continue the activity and answer the questions.

STAGE 3: Protect the Network

9. Define the problem with the unprotected network under attack.

10. Write down the chosen design solution criteria.

11. Indicate the idea you will implement as a group to protect the network against a DoS attack.

Cybersecurity: Denial-of-Service Attack—Page 4

Name: _____

Directions: Continue the activity and answer the questions.

12. Write down how the model needs to be changed to implement the idea described in Step 11 (which roles change, and how).

13. How do you think this idea will change how the IT network runs, how do you expect the variables to change?

14. Act out the model.
15. Make observations and write your measurements down in the table provided.
16. How can you know if the network improved? How do we know if the solution meets the solution criteria?

Cybersecurity: Denial-of-Service Attack—Page 5

Name: _____

Directions: Use the table below for your data.

IT Network	Variable 1:	Variable 2:	Variable 3:	Variable 4:	Variable 5:	Variable 6:
Unprotected						
Unprotected Attacked						
Protected by Solution 1 Attacked						