

Nslookup and Port Game

Pre-Requisite Knowledge and Skills

1. Understand the basics of domain name and IP address
2. Understand the basics of port numbers of HTTP/HTTPS//FTP protocols
3. Be able to use command line nslookup command

Learning Objective:

1. Understand the domain name and IP address
2. Understand the different network transportation protocols and port numbers
3. Be able to use nslookup command to find out IP address of a domain name
4. Be able to differentiate HTTP, HTTPS, FTP protocols and associated port number

Recommended Running Environment and Software:

1. Computers Running Windows 7 or Window 10 x64 OS
2. Unity3D Exe files and data folders of Nslookup and Port Game

Instructional Material:

1. Nslookup and Port Game
2. In-game Instructions of Gameplay
3. PPT Lecture Slides

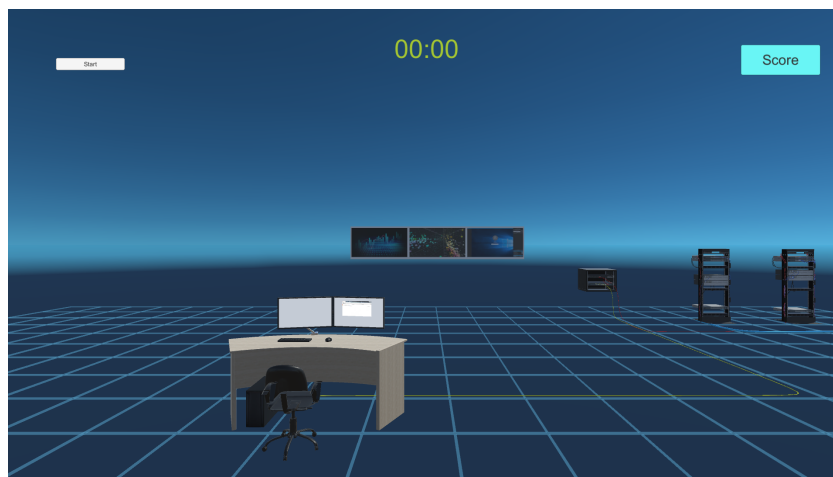
Video Demonstration:

1. to be developed

Lab Assessment:

1. Windows OS

Lab Instructions



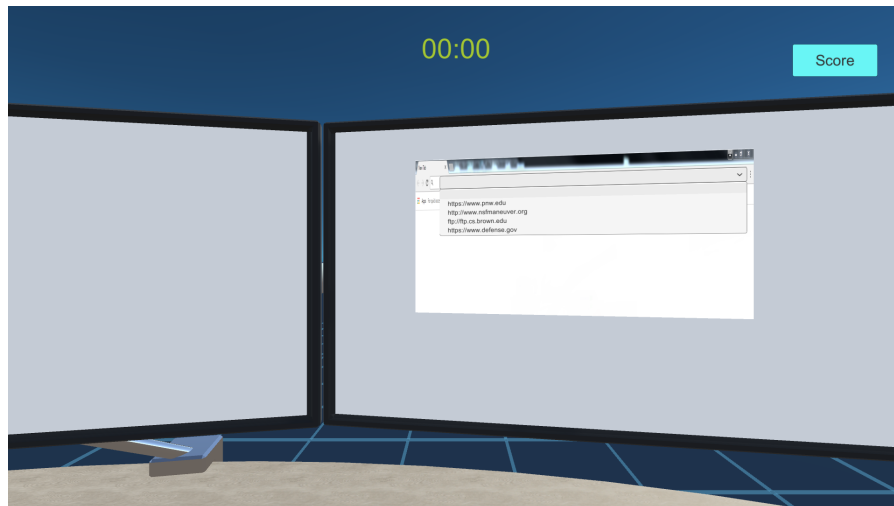
Nslookup and Port Game Main Menu

NSlookup and port number game simulates virtual internet connections with HTTP, HTTPS, and FTP protocols. Student needs to find out correct IP address of each website he/she connects to and identify correct port number for each connection.

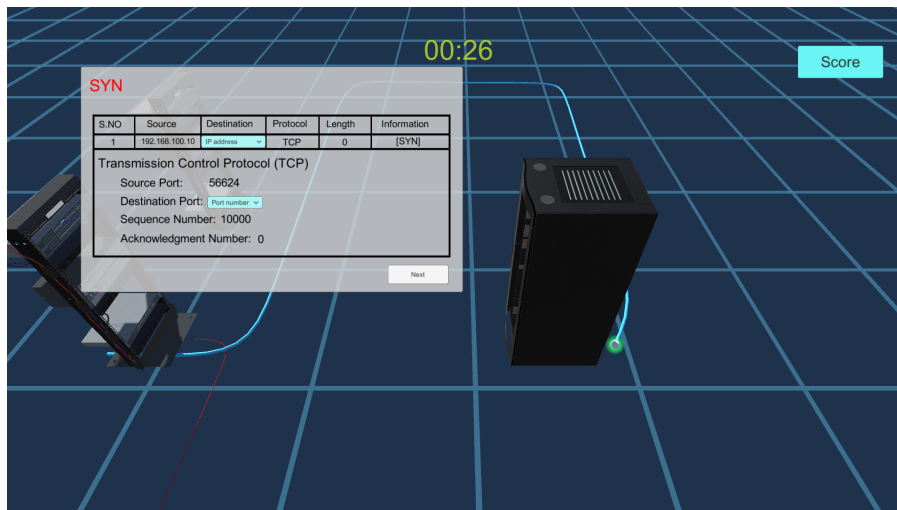
Step 1: Tutorial

- **Click on the “Start” button**

The student is going to use a web browser to access 4 different web sites.



1. Student will choose one of the web site and click “Execute” button.
2. After a brief animation, student will see SYNCH Packet screen to identify the IP address of the previously selected web site and port number of the HTTP, HTTPS or FTP protocol.



3. Student need to use Window command line “nslookup” command to look up the IP address of the selected web site

```
Command Prompt
Microsoft Windows [Version 10.0.17134.81]
(c) 2018 Microsoft Corporation. All rights reserved.

H:\>nslookup www.pnw.edu
Server: dc01-cal.pnw.edu
Address: 205.215.126.28

Name: www.pnw.edu
Address: 205.215.103.166

H:\>
```

4. If the student identified both the IP address and protocol port numbers correctly, there will be a second screen showing up to provide IP address and port numbers for the “ACKNOWLEDGE” packet

The screenshot shows a network simulation interface with a blue grid background. A timer at the top center displays '01:27'. A 'Score' button is in the top right. Two packet detail windows are visible:

- SYN:** A table with columns S.NO, Source, Destination, Protocol, Length, and Information. Row 1 shows S.NO: 1, Source: 192.168.100.10, Destination: 205.215.103.166, Protocol: TCP, Length: 0, Information: [SYN]. Below the table, it lists 'Transmission Control Protocol (TCP)' with fields: Source Port: 56624, Destination Port: 443 (dropdown), Sequence Number: 10000, and Acknowledgment Number: 0. A 'Next' button is at the bottom.
- SYN,ACK:** A table with columns S.NO, Source, Destination, Protocol, Length, and Information. Row 2 shows S.NO: 2, Source: 205.215.103.166, Destination: 192.168.100.10, Protocol: TCP, Length: 0, Information: [SYN,ACK]. Below the table, it lists 'Transmission Control Protocol (TCP)' with fields: Source Port: 443 (dropdown), Destination Port: 56624 (dropdown), Sequence Number: 0, and Acknowledgment Number: 10001. A 'Submit' button is at the bottom.

5. If the student identified both the IP address and protocol port numbers correctly, a screen will pop up to show the answers are correct. Otherwise, the student needs to continue modify the answers.

01:29

Score

SYN

S.NO	Source	Destination	Protocol	Length	Information
1	192.168.100.10	205.215.103.166	TCP	0	[SYN]

Transmission Control Protocol (TCP)

Source Port: 56624

Destination Port: 443

Sequence Number: 10000

Acknowledgment Number: 0

Next

SYN,ACK

S.NO	Source	Destination	Protocol	Length	Information
2	205.215.103.166	192.168.100.10	TCP	0	[SYN,ACK]

Transmission Control Protocol (TCP)

Source Port: 443

Destination Port: 56624

Sequence Number: 0

Acknowledgment Number: 10001

Submit

Correct
(Press to continue)

00:24

Score

SYN

S.NO	Source	Destination	Protocol	Length	Information
1	192.168.100.10	205.215.103.166	TCP	0	[SYN]

Transmission Control Protocol (TCP)

Source Port: 56624

Destination Port: 443

Sequence Number: 10000

Acknowledgment Number: 0

Next

SYN,ACK

S.NO	Source	Destination	Protocol	Length	Information
2	128.148.32.111	23.222.141.102	TCP	0	[SYN,ACK]

Transmission Control Protocol (TCP)

Source Port: 443

Destination Port: 21

Sequence Number: 0

Acknowledgment Number: 10001

Submit

Wrong
(Press to continue)

- After identification of each web site, the student can check the score, which is amount of time spent on identifying IP address and port numbers.



7. After completing all tasks, the student who completed in the shortest amount of time will be the winner.

Discussion

- **How to find out IP address of a certain domain?**
- **What are the differences of HTTP/HTTPS/FTP protocols? What port number is associated with each protocol?**