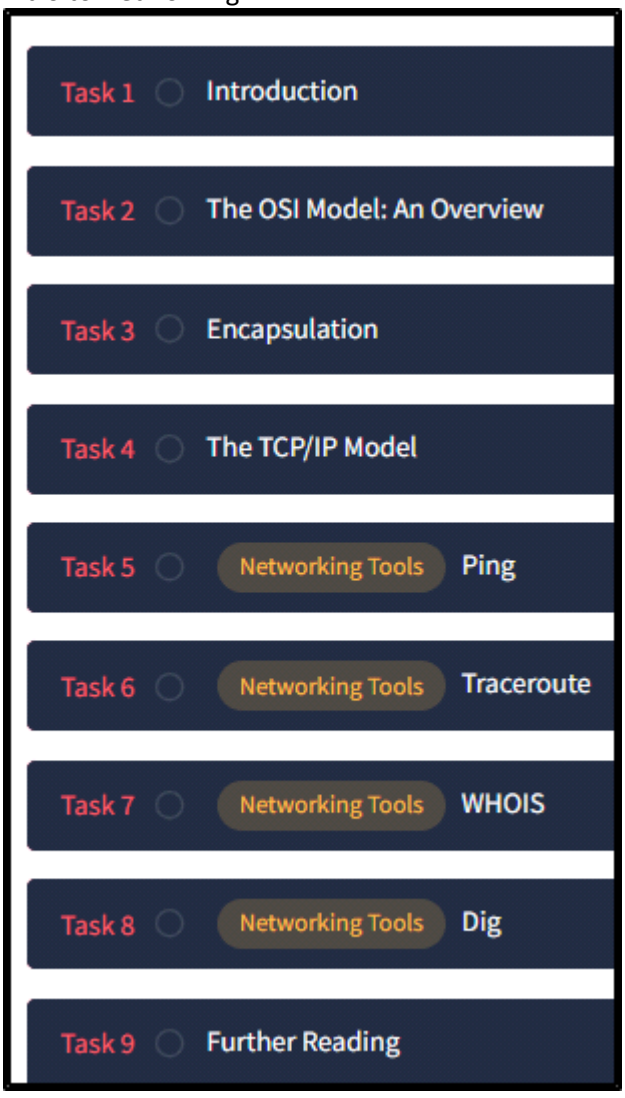
Introductory Networking

Sunday, July 6, 2025 11:00 AM

Ok guys, I am fairly new to the community, although this is the beginning of my 21 day challenge. let's get it.

Intro to Networking



Task 1: Introduction

- OSI Model (Brief description)
Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6	Layer 7
Application	Presentation	Session	Transport	Network	Data Link	Physical
  - Application Layer
    - provides network options to programs that run on a computer.
      - Applications
        - provides an interface for users
        - allows for transmitting of data
  - Presentation Layer
    - Translation of data into a standardized format

        - handles encryption, compression, or any other transformations to the data
    - Sessions Layer
        - Sets up the connection between devices (computers) across the network.
        - Maintain connections
        - If connection can't be made then, it sends back an error and the process goes no further.
    - Transport Layer
        - TCP (Transmission Control Protocol)
            - Connection-oriented
            - Three way handshake
            - Syn, Syn-Ack, Ack
            - reliable transmission
            - Segments
        - UDP (User Datagram Protocol)
            - Connectionless
            - speed
            - Almost opposite of TCP
            - datagrams
        - Network Layer
            - IP Address
            - decides on the best route
            - Logical Addressing
                - provide order to networks
                - categorizes addressing
                - properly sort addressing
                - IPv4 / IPv6
        - Data Link Layer
            - Physical addressing
            - Network Interface Card
            - Media Access Control
            - prepare data in a format suitable for transmission
            - Check corruption
        - Physical Layer
            - Conversion of binary data into signals
            - Bits
            - electrical pulsed
            - cables
            - Transmits and receives data

- FTP [Research question]
    - Layer 7 (Application)
        - This protocol primarily operates at the application (7) layer.
        - provides services directly to user applications for file transfer
        - FTP protocol operates at Layer (7) application, handling, commands like GET, PUT, and List, to name a few.
        - FTP uses TCP (4) transport layer to ensure reliable delivery
        - Layer (3) Network layer for IP and routing packets.

Encapsulation

- As data passes down each layer of the OSI Model, TCP/IP model, each layer will add details specific to that layer in question and added to the start of the transmission (header).
    - Network Layer Header would include:
        - Source IP address

        - Destination IP address
    - Transport Layer Header would include:
        - TCP
        - UDP
    - Data Link Layer Header
        - verify that data has not been corrupted on transmission
- Layers 7,6,5 > simply referred to as data
- Layer 4 > Segment / Datagram whether TCP or UDP
- Layer 3 > Packet
- Layer 2 > frame
- Layer 1 > bits

TCP/IP

Layer 1	Layer 2	Layer 3	Layer 4
Application	Transport	Internet	Network Interface

Suite of Protocols:

- Sets of rules that define how an action is to be carried out.
- TCP (Transmission Control Protocol)
    - Controls the flow of data between two endpoints
- IP (Internet Protocol)
    - Controls how packets are addressed and sent.

TCP

- Connection based protocol
    - Three way handshake
        - SYN, SYN/ACK, ACK

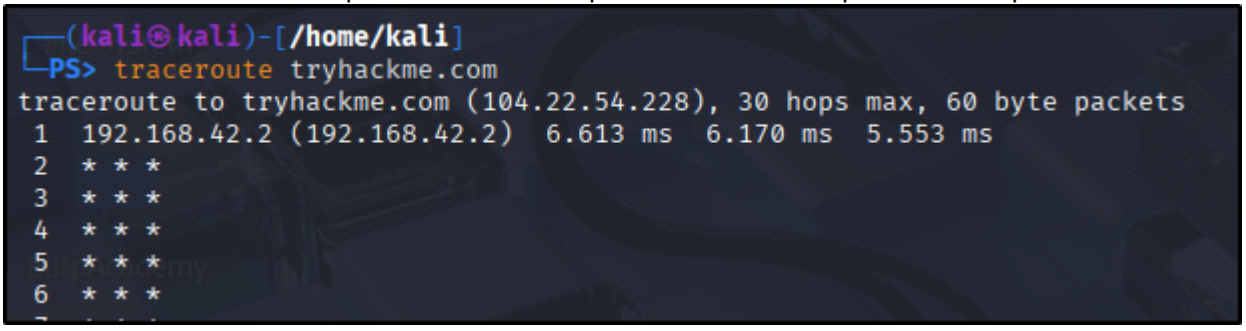
Ping Command

- Internet Control Message Protocol

Traceroute

- can be used to map the path your request takes as it heads to the target machine.

This screen shot shows not the whole traceroute, only because I quit the trace at 23. I found out that the *** means that those hops don't allow ICMP probes or doesn't respond to ICMP packets.



This screen shot I used the -I option for tryhackme.com IPv4 address, it provides a route from my network gateway of 192.168.42.2 to tryhackme.com IPv4 address of 10 hops.

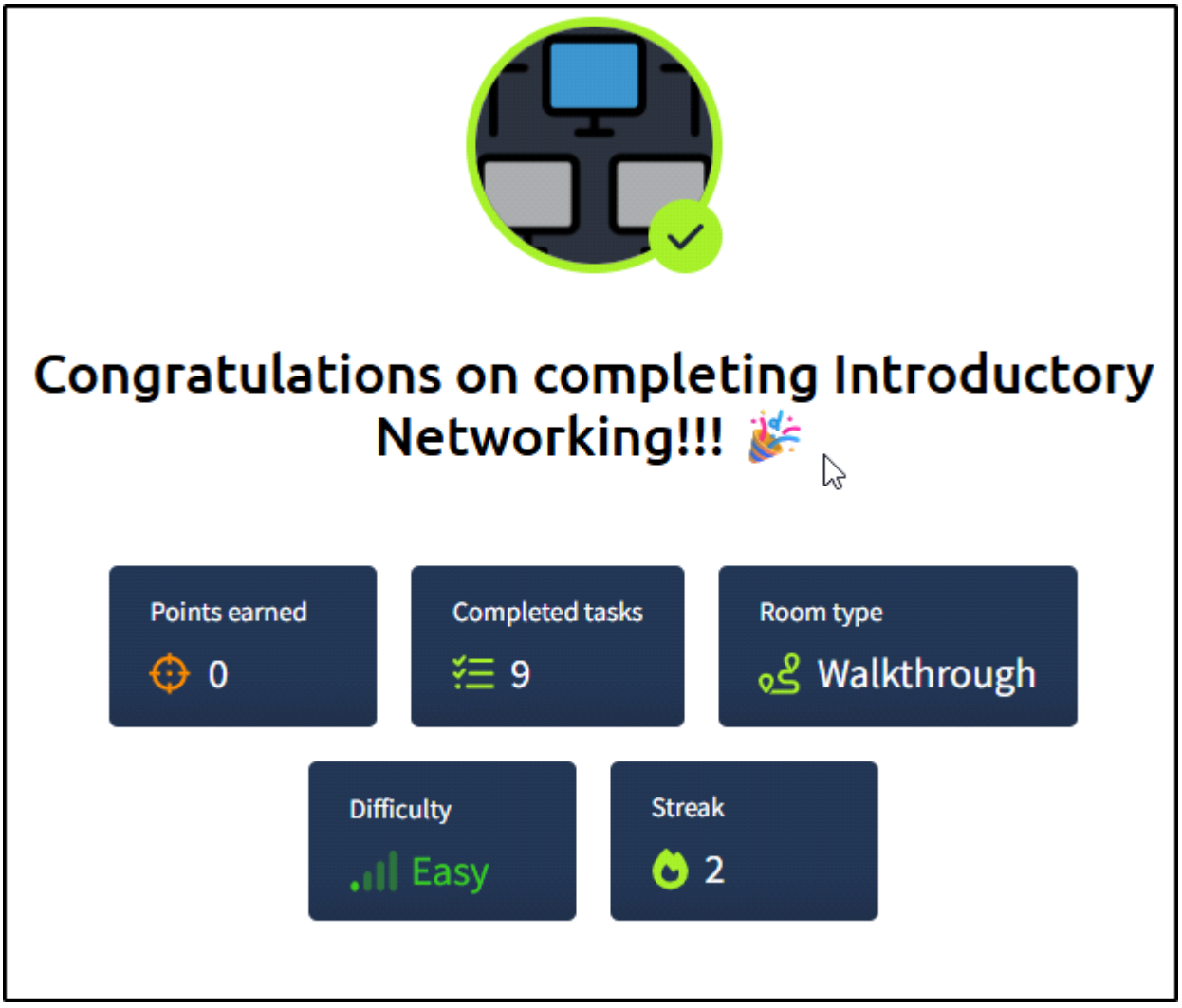
```
┌──(kali㉿kali)-[/home/kali]
└─PS> traceroute -I 104.22.55.228
traceroute to 104.22.55.228 (104.22.55.228), 30 hops max, 60 byte packets
 1  192.168.42.2 (192.168.42.2)  0.896 ms * *
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  104.22.55.228 (104.22.55.228)  31.073 ms  30.618 ms  30.149 ms
```

Whois

- Whois essentially allows you to query who a domain name is registered to. In Europe personal details are redacted; however, elsewhere you can potentially get a great deal of information from a whois search.

```
┌──(kali㉿kali)-[/home/kali]
└─PS> whois tryhackme.com
   Domain Name: TRYHACKME.COM
   Registry Domain ID: 2282723194_DOMAIN_COM-VRSN
   Registrar WHOIS Server: whois.namecheap.com
   Registrar URL: http://www.namecheap.com
   Updated Date: 2025-05-11T14:06:02Z
   Creation Date: 2018-07-05T19:46:15Z
   Registry Expiry Date: 2034-07-05T19:46:15Z
   Registrar: NameCheap, Inc.
   Registrar IANA ID: 1068
   Registrar Abuse Contact Email: abuse@namecheap.com
   Registrar Abuse Contact Phone: +1.6613102107
   Domain Status: clientTransferProhibited https://icann.org/epp#
erProhibited
   Name Server: KIP.NS.CLOUDFLARE.COM
   Name Server: UMA.NS.CLOUDFLARE.COM
   DNSSEC: unsigned
   URL of the ICANN Whois Inaccuracy Complaint Form: https://www.
cf/
>>> Last update of whois database: 2025-07-09T03:03:18Z <<<
```

a URL gets converted into an IP address that your computer can understand using TCP/IP protocol called DNS (Domain Name System).


Congratulations on completing Introductory Networking!!!
Points earned
0
Completed tasks
9
Room type
Walkthrough
Difficulty
Easy
Streak
2