

Cisco Virtual Internship Program 2022

Industry Problem Statements



VIP 2022 - Industry Problem Statement

1. Cyber Security

Design Secure network for your institution – Select your college or a building of your college and study the network topology of the same and design the same using on packet tracer tool(Please don't configure just design the network). Once done, apply your learnings of NetAcad cyber security course to upgrade / secure the existing network of your college

2. Cloud Security

Your college's current file sharing service is hosted out of a private server in a computer lab, and it is experiencing acute bandwidth and resource constraints. Conceptually design a cloud service to host this file sharing application, which is accessible from Internet, while being scalable and secure.

Utilize the Cisco Networking Academy cloud security course and suggested tools to assess the security of the of your new cloud-based solution. Conclude by creating a comparative report on security between privately hosted and cloud-based service.

Problem Outcomes:

Understand the shared responsibility model with cloud services.

Understand different cloud deployment and service models.

Develop understanding of data security and protection in cloud.

VIP 2022 – Industry Problem Statement

3. Programming

Python Problem Statement

Task 1: Ask the user to input 10 ipv4 addresses.

Task 2: Check if the addresses are valid ipv4 addresses.

Task 3: Convert the ipv4 addresses which are in decimal format to Binary, Octal and Hexadecimal format

For conversion use functions (inbuilt or library)

Task 4: Create a list which will hold the addresses. [Decimal, Binary, Octal and Hexadecimal]

Task 5: Transfer the contents of the list to a file named conversion.txt

Task 6: Print the following output on the screen

The first IP address in Decimal, Binary, Octal and hexadecimal format is <output from the file conversion. txt>

The second IP address in Decimal, Binary, Octal and hexadecimal format is <output from the file conversion. txt>

...

<The tenth IP address in Decimal, Binary, Octal and hexadecimal format is <output from the file conversion. txt>

VIP 2022 - Industry Problem Statement

4. Networking

The goal of this industry problem is to create Packet Flow Visualizer to depict the packet flow from student's laptop/Desktop (Host) to outside college network. This project has two parts :

Create a Network topology - Students can use the tools like traceroute as well as talk to network administrator of the college to know which all devices are present in the college network. Based on the inputs, Students can use the Cisco Packet tracer to draw the network topology. This topology will depict different Network devices, Network design as well as Network Boundaries as explained in the Network essential course from a host to the external network (outside college network).

Investigate Packet flow - In this section, based on the topology created above & with ipv4 Addresses configured on all (layer-3) devices in the topology created on Cisco Packet tracer. Students will use any packet Sniffer (Inbuilt sniffer in Cisco packet tracer: <https://www.youtube.com/watch?v=qsCSKQAVT2M> or Wireshark) collect the packets at each device. By analyzing the packet from various devices (nodes), students can stitch the information from packet headers (changes happening in the Ethernet Header and IP Header) to create the flow of packet path from their device (Host) to the external network from their campus. For creating flow diagram of the packet flow, students can use any flow chart creator application.

Problem Outcome

Based on the packet inspection & investigation done on packet headers at each node, Student should be able to demonstrate an understanding of–

Different blocks of network design.

Understand the different OSI model layers and be able to articulate the need for layering. Understand the relationship between the layers and packet headers and the meta data carried at each layer in the packet header.

Understand the role of different devices in a network. Clearly able to distinguish the role of a router (L3 device) from that of a switch (L2 device).

