

DEPARTMENT OF INFORMATION TECHNOLOGY

Virtual Lab

Faculty: Mrs. S. Manoranjitham

Course: Computer Networks

Class: V Semester

Academic Year: 2024–2025

Date: 19.08.2025

No of Students Participated : 62

Topic : Network Layer – IP Addressing and Subnetting

Description of the Teaching Method

The Virtual Labs teaching strategy uses online simulation tools to help students perform network experiments digitally, providing a realistic lab experience without physical hardware.

Using platforms like IIT Virtual Labs and Labster, students can visualize and test computer networking concepts such as routing, switching, IP addressing, subnetting, and client-server communication.

This method supports experiential learning by enabling students to practice repeatedly in a safe online environment.

Objectives of the Innovation Method

1. To provide hands-on experience in computer networking through virtual simulations.
2. To strengthen understanding of IP addressing, subnetting, and routing using interactive labs.
3. To support remote learning where physical network devices are not accessible.
4. To improve student engagement through visual and step-by-step simulation activities.
5. To build problem-solving and analytical skills using real-time feedback from virtual labs.

Tools Used

1. IIT Virtual Labs

- Network simulation modules
- Routing and switching experiments
- Packet flow visualization
- Auto-graded test questions

Labster

- Interactive 3D network topology simulations
- Realistic lab environment
- Guided experiment steps
- Scenario-based problem solving

Implementation Procedure

Step 1: Introduction to Virtual Labs

The teacher demonstrated how to log in to IIT Virtual Labs and Labster, explaining:

- Access procedure
- Experiment layout
- Simulation controls
- Report generation

Step 2: Experiment Assignment

Students were assigned the simulation titled:
"IP Addressing and Subnetting – Network Layer Experiment"

The tasks included:

- Identifying IP ranges
- Creating subnet masks
- Calculating network and broadcast addresses
- Configuring routing tables in a virtual environment

Step 3: Student Virtual Lab Practice

Using the online tools, students performed:

- Packet transmission simulations
- IP addressing configuration
- Subnetting scenario calculations
- Verification through ping/traceroute tools
- Routing table updates

They were allowed multiple attempts to master the concepts.

Step 4: Observation and Teacher Guidance

The instructor monitored student progress through:

- Activity logs
- Screenshots
- Real-time simulation screens
- Online Q&A support

Guidance was provided for solving incorrect subnetting and misconfigured routing.

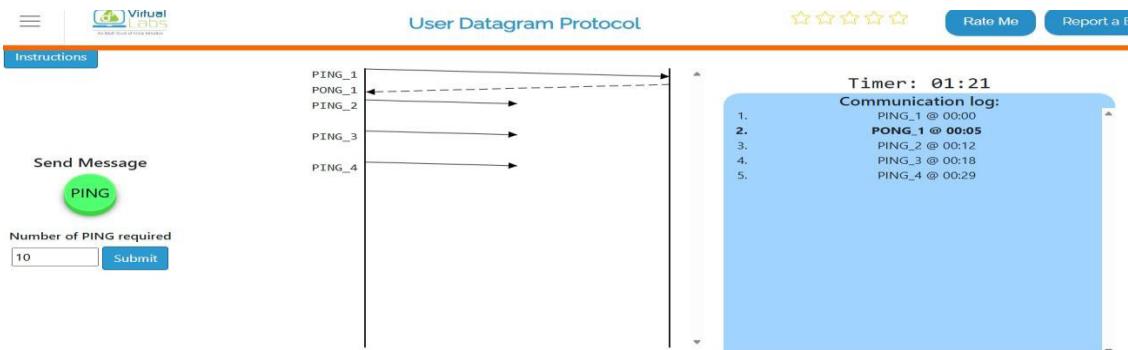
Step 5: Evaluation Through Auto-Graded Modules

Both IIT Virtual Labs and Labster provided:

- Quiz assessments
- Practical evaluation
- Simulation scorecards

Students submitted:

- Final results
- Screenshots of completed simulations
- A short reflective report



Screenshots of completed simulations for Network Layer – IP Addressing and Subnetting in IIT Virtual Labs
On 19.08.2025

Outcomes of the Innovation Method

PEO 1: Apply strong fundamentals and practical knowledge gained through **virtual laboratory experiences** to analyze, design, and solve real-world engineering/science problems.

PEO 2: Effectively utilize virtual labs, simulation tools, and emerging digital technologies to model experiments, validate concepts, and innovate in professional practice or higher studies.

PEO 3: Adapt to rapidly evolving technologies by engaging in self-directed and lifelong learning, supported by exposure to virtual experimentation and remote learning environments.

PEO 4:Work collaboratively in multidisciplinary teams using online/virtual platforms, communicate technical findings clearly, and uphold professional and ethical responsibilities.

PEO 5: Contribute responsibly to societal needs by applying virtual lab–based skills for sustainable, cost-effective, and globally accessible solutions.

Conclusion

The innovative use of Virtual Labs successfully enhanced student understanding of the Network Layer in Computer Networks. The combination of IIT Virtual Labs and Labster provided an immersive learning experience that compensated for the lack of physical hardware and enabled students to perform complex networking experiments safely and effectively. This teaching method significantly improved student engagement, conceptual clarity, and hands-on skills, making it a valuable addition to the Computer Networks course.

LIST OF STUDENTS ATTENDED

III YR STUDENTS LIST

S.No	REG. NO.	NAME
1.	312822205001	Ajay S
2.	312822205002	Ajay Kumar M
3.	312822205003	Ajay Kumar S K
4.	312822205004	Aksar S
5.	312822205005	Anto Maria Joshua B
6.	312822205006	Aravinth A
7.	312822205007	Badrinarayanan P S
8.	312822205008	Balaji S
9.	312822205009	Camila S
10.	312822205010	Cathrine S
11.	312822205011	Dhanush L
12.	312822205012	Dhanush R
13.	312822205013	Dheenadhayalan S
14.	312822205015	Elakkya G
15.	312822205016	Gideon A
16.	312822205017	Gowrisankar J
17.	312822205018	Harish R
18.	312822205019	Jabaraj S
19.	312822205020	Jai Akash L
20.	312822205021	Jayapriya G
21.	312822205022	Jeevanandham M
22.	312822205023	Kanchana B
23.	312822205024	Kavi Karthick T
24.	312822205025	Kavitha P
25.	312822205026	Keerthana E
26.	312822205027	Lekha A
27.	312822205028	Meenakshi K

28.	312822205029	Mohamed Aamer M A
29.	312822205030	Monanjana V
30.	312822205031	Monika S
31.	312822205032	Mukesh E
32.	312822205033	Muralitharan K
33.	312822205034	Nandhini S
34.	312822205035	Prabhu S
35.	312822205036	Pratheesh Kumar G
36.	312822205037	Rakash M
37.	312822205038	Sanghavi A
38.	312822205039	Saniya S
39.	312822205040	Sanjai S
40.	312822205041	Santhosh S
41.	312822205042	Saranya G
42.	312822205043	Selvam S
43.	312822205044	Sharmila C
44.	312822205046	Sharmila P
45.	312822205047	Sowmiya P
46.	312822205048	Sowmiya R
47.	312822205049	Sri Lekha R
48.	312822205050	Srinidhi
49.	312822205051	Sunitha K D
50.	312822205052	Tamizharasu M
51.	312822205053	Titu Jeshurun B
52.	312822205054	Udhayasuriyan U
53.	312822205055	Udith Yashica M
54.	312822205056	Vennila Sree.H
55.	312822205057	Vignesh V
56.	312822205059	Vimal Raj A S
57.	312822205060	Vinodhini M
58.	312822205061	Yugendhra E
59.	312822205062	Yuvaraja M
60.	312822205063	Yuvasree D
61.	312822205301	Devanthan S
62.	312822205302	Hemanth A



Course Handling Faculty

Feedback Link : <https://forms.gle/hRQcZrTA3a4ykF4r7>



HOD

Dr.S.GEERTHIK, B.E, M.E, PhD,
 Head of the Department,
 Information Technology,
 Agni College of Technology,
 Chennai - 600 130.