Department of Computer Science and Engineering

Islamic University of Technology (IUT)

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Lab Report 0

CSE 4512: Computer Networks Lab

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Section: 1

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Title: Familiarizing with the Packet Tracer environment

Objectives:

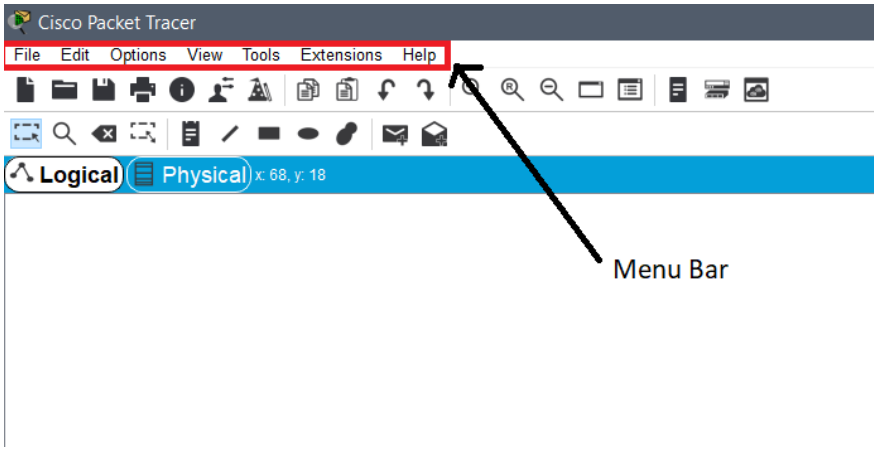
1. Download and install Cisco Packet Tracer
2. Learn about use-cases of Cisco Packet Tracer
3. Get acquainted with different components of Cisco Packet Tracer environment
4. Understand how to operate Cisco Packet Tracer

Introduction:

Cisco Packet Tracer is a network simulator software which can artificially build computer networks and explore various features of it. A computer network is formed by two or more connected computers following a communication protocol. In order to get used to the working principles of computer networks, we artificially recreate such conditions using a simulating software like Packet Tracer. This tool is designed by Cisco Systems, known for producing networking hardware and software. Packet Tracer tries to imitate the real world conditions of networking by a simple drag and drop visual interface making it an excellent tool for learners. Learners can gain skills of designing computer networks from scratch, configuring such networks, exploring aspects of pre-built networks and troubleshooting.

Interface of Cisco Packet Tracer:

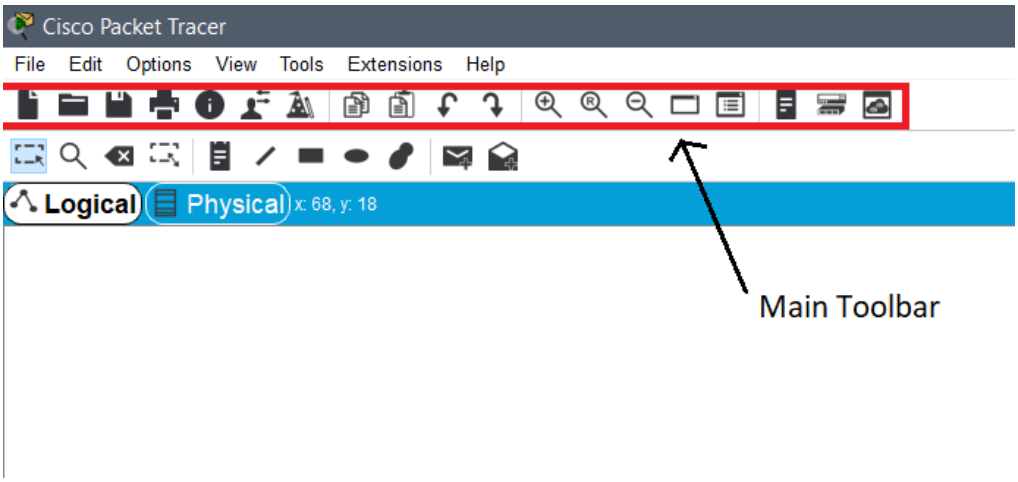
- **Menu Bar:** The menu bar is at the top of interface and consists of the standard menu bar elements as given in the screenshot. Each element has multiple options, which can be expanded by clicking.



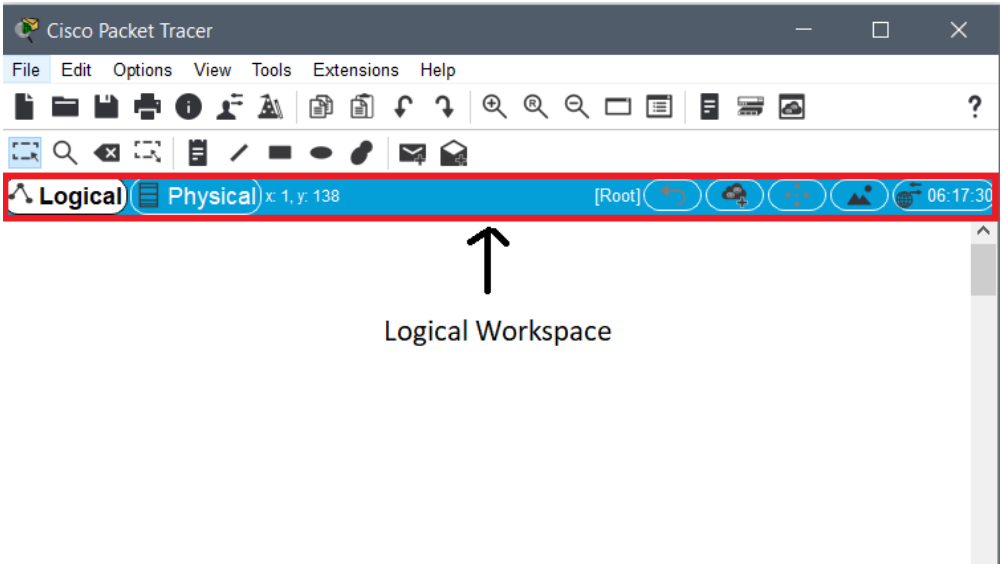
The options under File are similar to other software such as MS Word or Photoshop. However, there are exclusive options such as “Open Samples” which shows pre-built templates provided by Cisco and “Exit and Logout” which simply logs out the current user.

By clicking options on the menu bar we get access to user preferences and algorithm setting; both are useful to change networking parameters and the interface. Most of the other menu commands are self explanatory.

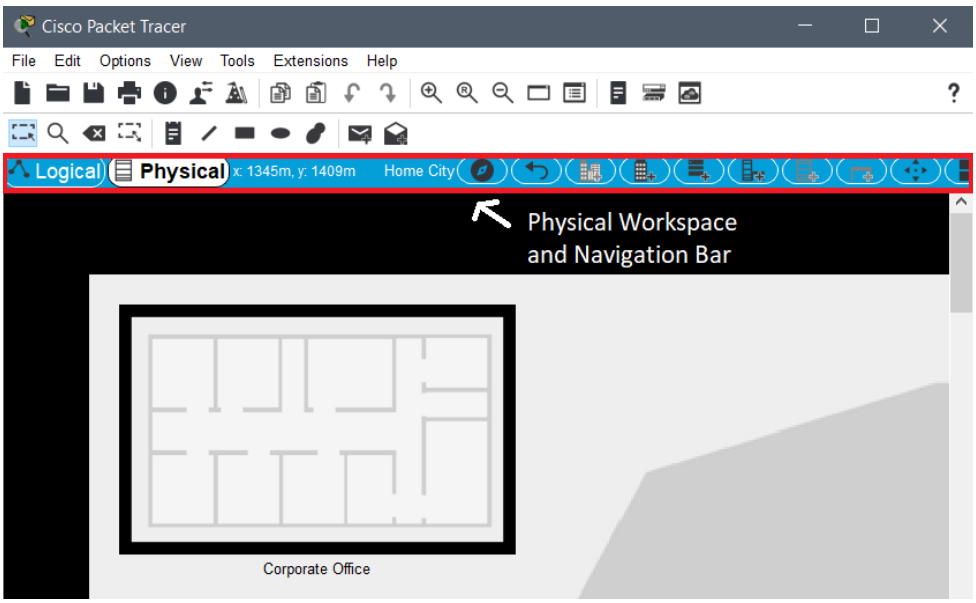
- **Main Toolbar:** The main toolbar consists of several icons corresponding to the main menu bar. The toolbar places commonly used main menu commands as icon shortcuts which can be quickly accessed by clicking. Some of the options include New File, Open File, Print, Undo, Redo, Activity Wizard and so on.



- **Logical/Physical Workspace and Navigation Bar:** The logical and physical workspace can be toggled by clicking on the tabs. In the logical workspace we can see buttons such as Create New Cluster, Move Object, Set Background, Environment.

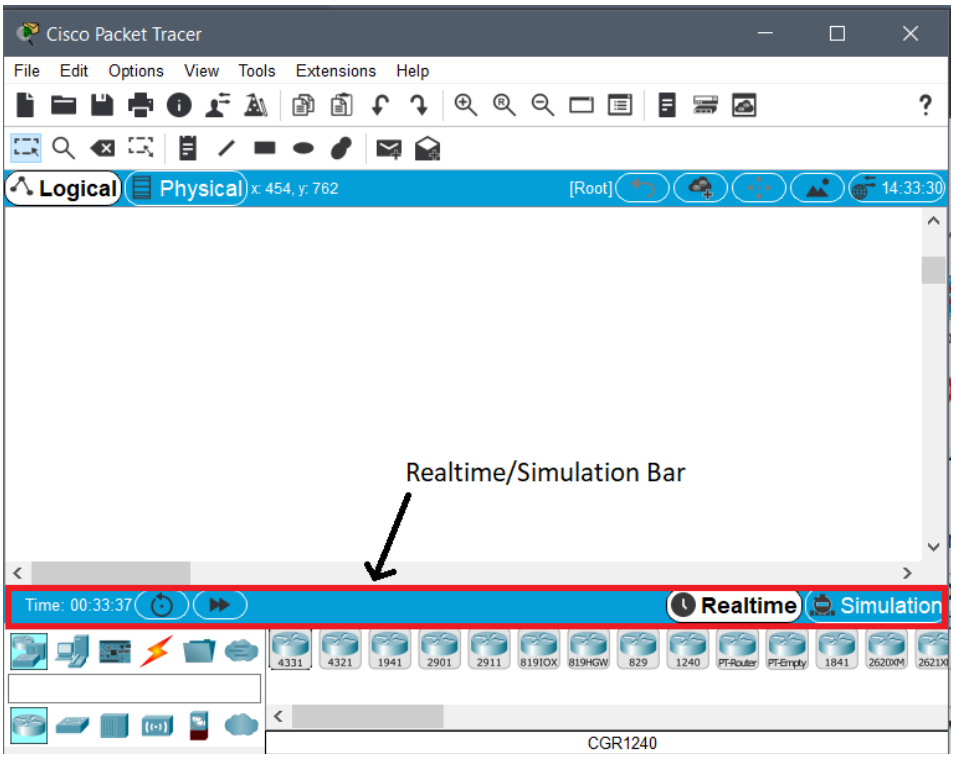


The physical workspace provides us a new set of buttons along with the navigation bar. At the rightmost corner, there are options to access the Navigation Panel, and creating new City, Building, Generic Container, Closet, Rack, Table. There is also an option to go back a level.

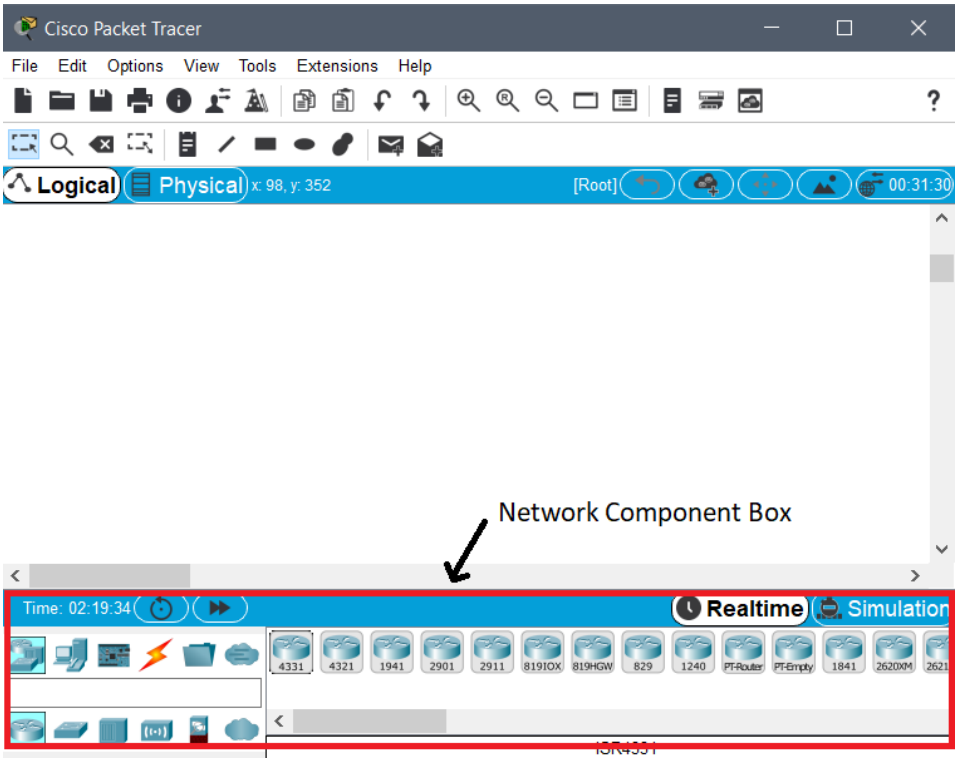


The area underneath the physical/logical bar is the workspace. The workspace changes when the physical and logical options are toggled.

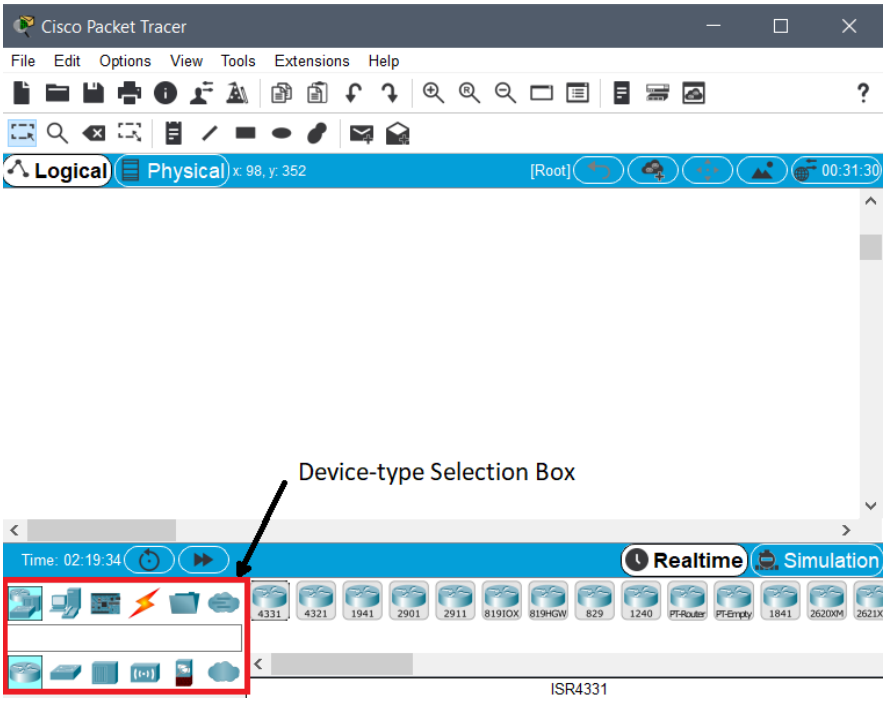
- **Realtime/Simulation Bar:** The realtime/simulation toggles between two modes. In the realtime mode, we have two buttons, Power Cycle Devices and Fast Forward Time. The simulation mode opens a simulation panel and shows Play Control buttons and an Event List Toggle button. Both modes have a clock to show time in real or simulation mode.



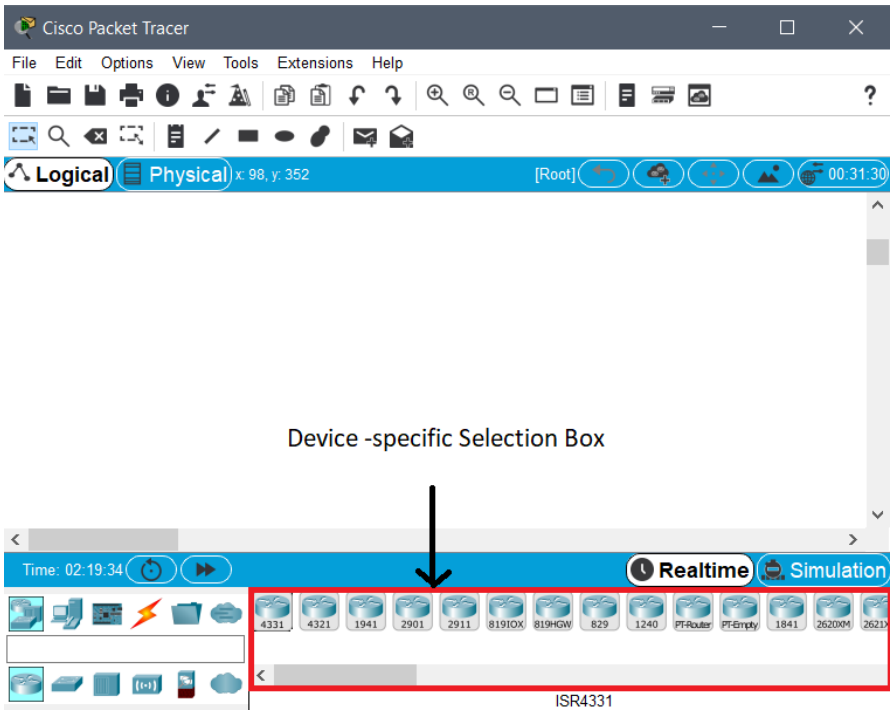
- **Network Component Box:** The network component box allows us to choose various networking devices. This box consists of Device Type Selection Box and Device Specific Selection Box.



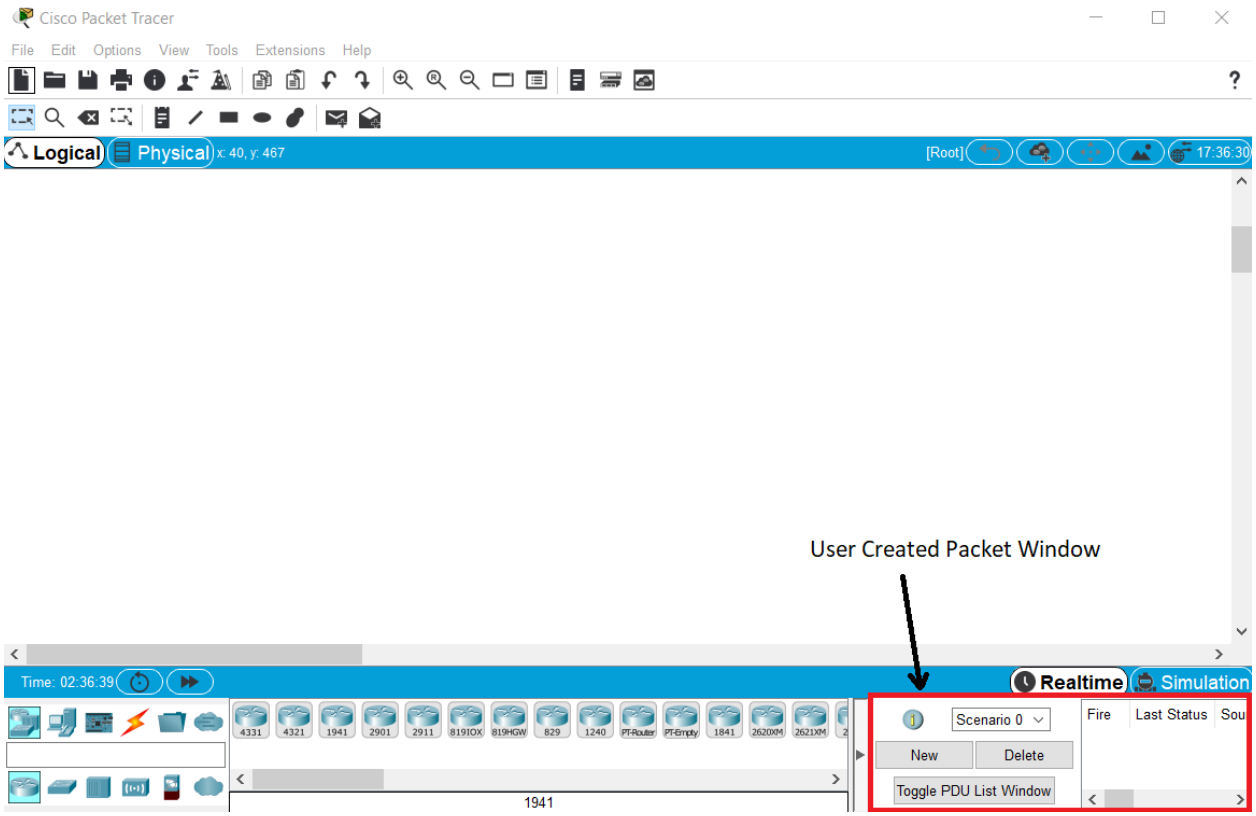
- **Device-type Selection Box:** At the leftmost corner of the Network Component Box, we have the device type selection box which lets us choose the type of networking device. The type varies from Network Devices, End Devices, Components, Miscellaneous, Multi-user connection. Selecting on the type shows further options to specify the device type. For instance, Networking Devices consists of routers, switches, hubs and so on.



- **Device-specific Selection Box:** The device specific box shows the exact device under the selected type. The device model varies from old obsolete ones to the newer ones. However, the legacy devices can be hidden from preferences if the user wants.



- **User Created Packet Window:** This window shows all the packets created by the user in the created simulation scenarios.



Key Features of Cisco Packet Tracer:

- **Workspace Modes:** Cisco Packet Tracer provides two modes of representation for the users with their corresponding workspace. The first mode, logical mode, can be used to create a network topology disregarding all the environmental variables. On the other hand, physical mode creates a virtual map and sets up all the environmental variables for the users to create a realistic computer network. In real life scenarios distance and related factors affect the network - especially wireless ones.

- **Operating Modes:** Cisco offers two operating modes based on the user's use case. The Realtime Mode operates based on instantaneous changes, i.e. any change done to the network would instantly be reflected on the workspace. Simulation mode, on the other hand, grants you access to pause the time and tinker with elements without any instantaneous changes on the network. However, some of the aspects will keep running in realtime.

- **Activity Wizard:** The activity wizard is used as an assessment tool. The user can create networking scenarios for other users using this tool.

- **Multi User Communication:** Multiple users can have point to point (peer) connections between various instances of Packet Tracer. So, it is possible for instructors to interact with students while they are using Packet Tracer. PTMP is used to communicate between the instances, which is a TCP based communication protocol.

Challenges faced and Solutions: I faced no challenges in particular. The instructions provided in the lab material was sufficient to install Packet Tracer on my computer. Packet Tracer's instruction manual was also helpful in getting information regarding the user interface.

References:

(i) Packet Tracer - Wikipedia

(ii) Packet Tracer Official Tutorials (ptnetacad.net)

(iii) Cisco Packet Tracer -> Help -> Contents

(iv) Packet Tracer Official Tutorials (ptnetacad.net)