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Description automatically generatedLab program Number: 5 Date: 2082-04-16

Title: Introduction to Packet Tracer

**THEORY**

**Background Information**

Cisco Packet Tracer is a network simulation tool developed by Cisco Systems, mainly used for educational purposes. It allows users to design and test network topologies using virtual devices like routers, switches, and computers without requiring physical hardware. The software supports important protocols such as RIP, OSPF, and DHCP, and includes both Real-Time and Simulation Modes to observe and analyse network behaviour. Its user-friendly interface includes a toolbar, device panel, and workspace, allowing easy configuration through GUI or CLI. The Activity Wizard helps create guided learning tasks, making it ideal for students to practice and improve their networking skills in a virtual environment.

**Key Concepts of Cisco Packet Tracer**

Packet Tracer comes with several useful tools to help design and understand networks. Some key concepts include:

**Network Simulation:** A method to virtually model and test network behaviour using software without physical devices.

**Real-Time and Simulation Modes:**

* **Real-Time Mode:** Shows actual network behaviour instantly.
* **Simulation Mode:** Lets users view packet flow step-by-step for better analysis.

**Activity Wizard:** A tool to create custom learning tasks and auto-check network configurations in Packet Tracer.

**Interface of cisco Packet Tracer**

The program is made to be easy to use. It has different panels and tools that help you build and test network designs easily.

**Workspace Area**

The workspace is where you build your network. You can drag and drop items like routers, switches, and computers onto it. Then you connect them with different types of cables. The grid helps keep everything organized so your network diagram looks neat and clear.

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Fig: Cisco Packet Tracer Workspace

**Toolbar**

The toolbar gives quick access to important tasks like saving/opening files, zooming in or out, and managing the simulation. It also lets users switch between different views of the network, such as physical or logical layout. This helps make work faster and smoother by giving easy access to frequently used tools and settings.

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Fig: Toolbar in Cisco Packet Tracer

**Device-Type Selection Panel**

This panel is found on the left side of the screen, this panel displays all the available network devices grouped into categories like routers, switches, and end devices. Users can simply drag and drop any of these devices into the workspace for use in their network design. This panel helps users easily find and place devices they need for creating a network layout.

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Fig: Device Selection Panel

**Device Configurations**

Once a device is placed on the workspace, you can set it up using a configuration window. This includes giving IP addresses, setting routing options, or enabling features like DHCP and NAT. You can do this either using a graphical interface or by typing commands in the command-line interface (CLI). This offers flexibility for both new learners and experienced users.

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Fig: Device Configuration Settings

**Real-Time and Simulate Mode**

Cisco Packet Tracer offers two main working modes:

* Real-Time Mode lets you see network activity happening instantly, just like in a real-world network.
* Simulation Mode lets you slow down and view each step of how the network operates.

Simulation Mode is especially useful for studying how packets move, checking how protocols behave, and fixing network problems by closely watching data flow.

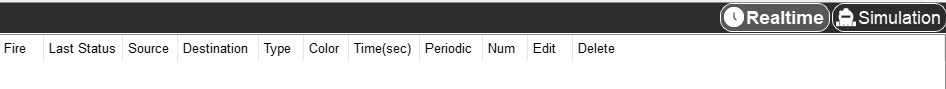


Fig: Modes in Cisco packet tracer

**Network Component Icons and Labels**

In the workspace, all devices and connections are shown using icons that represent different types of network components. These icons help users quickly recognize what each item is. We can also add labels to these icons to give extra information like IP addresses, devices names, or VLAN IDs. Labels help keep your network layout clean and easy to follow, which makes it simpler to design and manage more complex networks.

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Fig: Network Component icons and labels

**Options and Preferences**

The Options and Preferences menu lets you personalize your Packet Tracer experience. You can change visual elements like background colour and font size, set default values for device setup, and control how fast simulations run. This menu helps you adjust the software according to your style and needs, making your work easier and more comfortable.

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Fig: Option and preferences menu

**Activity Wizard**

The Activity Wizard is a tool that helps create interactive and guided learning tasks in Packet Tracer. Teachers can use it to design exercises with instructions, steps, and questions. Students can follow these activities to practice networking concepts. It’s especially useful for learning, as it gives students hands-on experience in a structured and supportive environment.

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Fig: Activity Wizard Feature

**Conclusion**

In this lab, we explored the basic functions and interface of Cisco Packet Tracer, a powerful tool for simulating computer networks. We learned how to place and configure devices, use Real-Time and Simulation Modes, and apply basic network configurations. Packet Tracer provides a virtual environment that helps students understand how networks operate without needing physical equipment. This lab helped us build foundational skills in network design, device setup, and packet flow analysis, which are essential for real-world networking and further practical learning.