



Cisco Packet Tracer

Opportunity

As networking systems continue to evolve in complexity, new curricula and educational tools are emerging to facilitate teaching and learning about networking technology. The Cisco Networking Academy® program is designed to keep pace with the evolution of networking systems by providing innovative curricula and educational tools that help students understand the complexities of information and communication technologies (ICTs). Within this framework, the Cisco® Packet Tracer e-learning software was developed to help Networking Academy students gain practical networking technology skills in a rapidly changing environment. Students seeking ICT skills can now benefit from the accessibility of online curricula and new opportunities for social learning, collaboration, and competition.



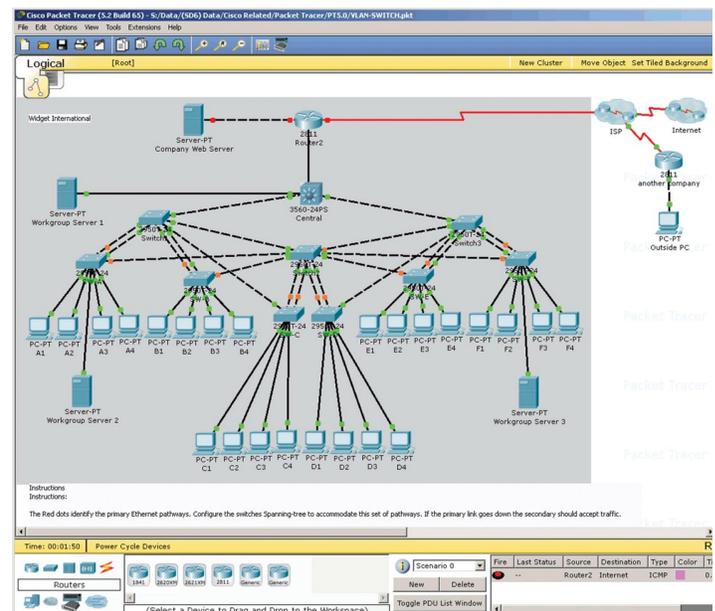
Solution

Cisco® Packet Tracer is a powerful network simulation program that allows students to experiment with network behavior and ask “what if” questions. As an integral part of the Networking Academy comprehensive learning experience, Packet Tracer provides simulation, visualization, authoring, assessment, and collaboration capabilities to facilitate the teaching and learning of complex technology concepts.

Packet Tracer supplements physical equipment in the classroom by allowing students to create a network with an almost unlimited number of devices, encouraging practice, discovery, and troubleshooting. The simulation-based learning environment helps students develop 21st century skills such as decision making, creative and critical thinking, and problem solving.

Packet Tracer complements the Networking Academy curricula, allowing instructors to easily teach and demonstrate complex technical concepts and networking systems design. Instructors can customize individual or multiuser activities, providing hands-on lessons for students that offer value and relevance in their classrooms. Students can build, configure, and troubleshoot networks using virtual equipment and simulated connections, alone or in collaboration with other students. Packet Tracer offers an effective, interactive environment for learning networking concepts and protocols. Most importantly, Packet Tracer helps students and instructors create their own virtual “network worlds” for exploration, experimentation, and explanation of networking concepts and technologies.

Figure 1. Packet Tracer’s drag-and-drop interface allows students to configure and validate system architecture



The Teaching Experience

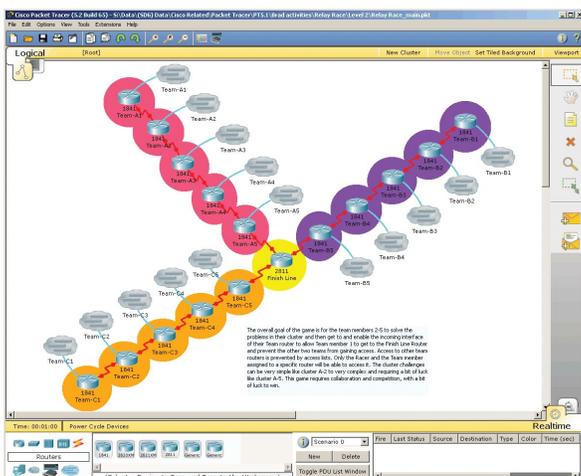
Cisco Packet Tracer provides multiple opportunities for instructors to demonstrate networking concepts. Although Packet Tracer is not a substitute for real equipment, it allows students to practice using a command-line interface. This “e-doing” capability is a fundamental component of learning how to configure routers and switches.

Packet Tracer’s simulation mode enables instructors to demonstrate processes that were formerly hidden to students. These simulation capabilities can help simplify the learning process by providing tables, diagrams, and other visual representations of internal functions such as dynamic data transfers and packet content expansion. The simulation mode also decreases instructor presentation time by replacing whiteboards and static slides with real-time visuals.

Packet Tracer helps instructors teach complex networking concepts in the following ways:

- Provides a visual demonstration of complex technologies and configurations
- Allows instructors to author customized, guided activities that provide immediate feedback using the Activity Wizard
- Facilitates numerous learning activities such as lectures, individual and group lab activities, homework, assessments, games, network design, troubleshooting, modeling tasks, case studies, and competitions
- Enables visualization, animation, and detailed modeling for exploration, experimentation, and explanation
- Supports self-paced learning outside the classroom
- Supports social learning processes by enabling collaboration and competition
- Supports the majority of protocols and technologies taught in the following Networking Academy curricula: Cisco CCNA® Discovery, CCNA Exploration, and CCNA Security, and can be used to teach concepts from IT Essentials and Cisco CCNP® courses

Figure 2. Multiuser games provide fun learning opportunities for collaboration and competition



The Student Experience

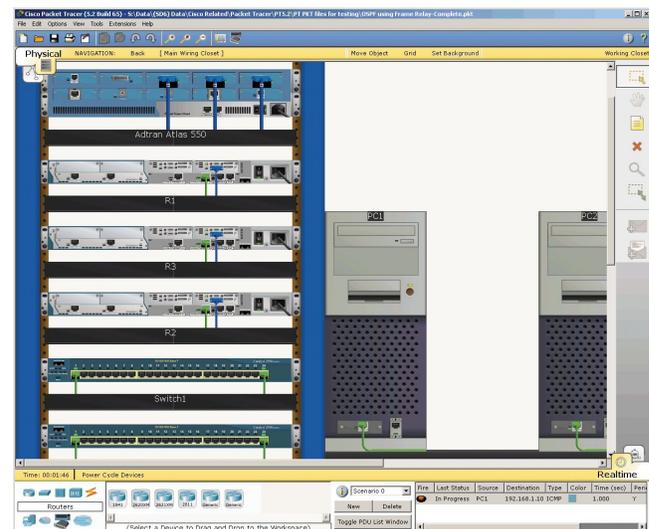
Students who spend more time in a hands-on mode of learning, with simulation and interactive capabilities, will be better equipped to apply concepts and configuration fundamentals when exposed to real equipment. As students gain practical experience with tasks such as configuration and troubleshooting, they become more confident in their abilities.

Cisco Packet Tracer’s multiuser functionality also provides an opportunity for social learning, allowing students to collaborate and compete with each other and play games that enhance the learning experience.

Key Features

Packet Tracer Workspaces: Cisco Packet Tracer has two workspaces—logical and physical. The logical workspace allows users to build logical network topologies by placing, connecting, and clustering virtual network devices. The physical workspace provides a graphical physical dimension of the logical network, giving a sense of scale and placement in how network devices such as routers, switches, and hosts would look in a real environment. The physical view also provides geographic representations of networks, including multiple cities, buildings, and wiring closets.

Figure 3. The physical workspace provides a graphical view of the logical network



Packet Tracer Modes: Cisco Packet Tracer provides two operating modes to visualize the behavior of a network—real-time mode and simulation mode. In real-time mode the network behaves as real devices do, with immediate real-time response for all network activities. The real-time mode gives students a viable alternative to real equipment and allows them to gain configuration practice before working with real equipment.

In simulation mode the user can see and control time intervals, the inner workings of data transfer, and the propagation of data across a network. This helps students understand the fundamental concepts behind network operations. A solid understanding of network fundamentals can help accelerate learning about related concepts.

Protocols: Cisco Packet Tracer supports the following protocols:

Layer	Cisco Packet Tracer Supported Protocols
Application	• FTP, SMTP, POP3, HTTP, TFTP, Telnet, SSH, DNS, DHCP, NTP, SNMP, AAA, ISR VOIP, SCCP config and calls ISR command support, Call Manager Express
Transport	• TCP and UDP, TCP Nagle Algorithm & IP Fragmentation, RTP
Network	• BGP, IPv4, ICMP, ARP, IPv6, ICMPv6, IPSec, RIPv1/v2/ng, Multi-Area OSPF, EIGRP, Static Routing, Route Redistribution, Multilayer Switching, L3 QoS, NAT, CBAL, Zone-based policy firewall and Intrusion Protection System on the ISR, GRE VPN, IPSec VPN
Network Access/Interface	• Ethernet (802.3), 802.11, HDLC, Frame Relay, PPP, PPPoE, STP, RSTP, VTP, DTP, CDP, 802.1q, PAgP, L2 QoS, SLARP, Simple WEP, WPA, EAP

Modular Devices: Graphical representations visually simulate hardware and offer the ability to insert interface cards into modular routers and switches, which then become part of the simulation.

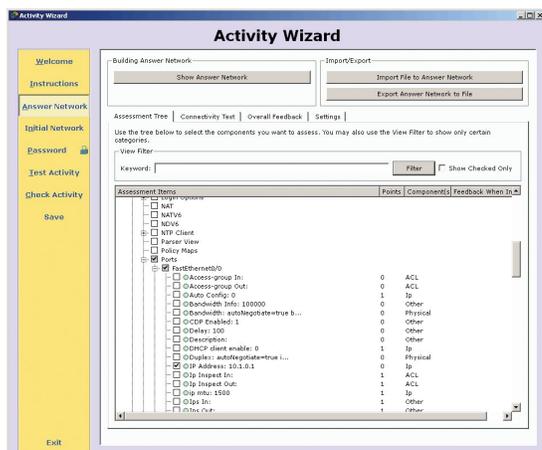
Multuser Functionality: Cisco Packet Tracer is a network-capable application, with a multuser peer-to-peer mode that allows collaborative construction of virtual networks over a real network. The multuser feature enables exciting collaborative and competitive interactions, providing the option to progress from individual to social learning and features opportunities for collaboration, competition, remote instructor-student interactions, social networking, and gaming.

Tutorials: Packet Tracer includes several basic step-by-step tutorials that familiarize users with the product features and explain how to engage in simulations. Additional advanced tutorials are available for download from Academy Connection.

Help: A help feature is available to familiarize users with the Cisco Packet Tracer interface, functions, and features. The help area includes important notes and tips and provides annotated screenshots to aid understanding.

Activity Wizard: The Activity Wizard allows users to author their own learning activities by setting up scenarios using instructional text, and creating initial and final network topologies and pre-defined packets. The Activity Wizard also includes grading and feedback capabilities.

Figure 4. The Activity Wizard enables the creation of customized learning activities



Additional Features

- Lab grading function
- International language support
- Compatible with the following platforms: Windows, Windows XP; Vista (Vista Basic, Vista Premium); Windows 7; and Linux (Ubuntu, Fedora)
- Available to registered Networking Academy instructors, students, and alumni

Cisco Networking Academy

In partnership with schools and organizations around the world, the Cisco Networking Academy program delivers a comprehensive learning experience to help students develop ICT skills for entry-level career opportunities, continuing education, and globally recognized career certifications. The curricula also help students build 21st century skills such as collaboration and problem solving by encouraging practical application of knowledge through hands-on activities and network simulations.

Networking Academy teaches ICT skills to students from virtually every socioeconomic background and region of the world. Students gain the skills needed to pursue networking careers in a variety of industries such as technology, healthcare, financial services, fashion, entertainment, and more. Students also gain access to a global support group, career developments tools, and social networking resources to help them become architects of the human network.

For More Information

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