

**Lab Assignment No.1:****Ethernet Cable Connection Scheme  
(Straight Through Connection)**

Almost anyone who has connected to the Internet through a broadband connection like cable or DSL has used an Ethernet cable to do it. You have connected your PC's network interface card (NIC) to your cable modem, DSL modem, or home router with an Ethernet cable. However, there is more than one type of Ethernet cable.

**Types of Ethernet cabling:**

To start off with, you should know that not all Ethernet cabling is the same. If you go to a store you may find a variety of "categories" of cabling. These categories tell you the quality of the cabling. The quality determines, essentially, how much the cable can handle. Here are the categories that you need to know:

**Cat 3** – used for voice cabling and 10Mb Ethernet

**Cat 5** – used for 10/100Mb Ethernet and works for voice as well

**Cat 5E** – Enhanced Cat 5 cabling that helps to prevent cross-talk, works for 10/100Mb and 1000Mb (or Gigabit Ethernet)

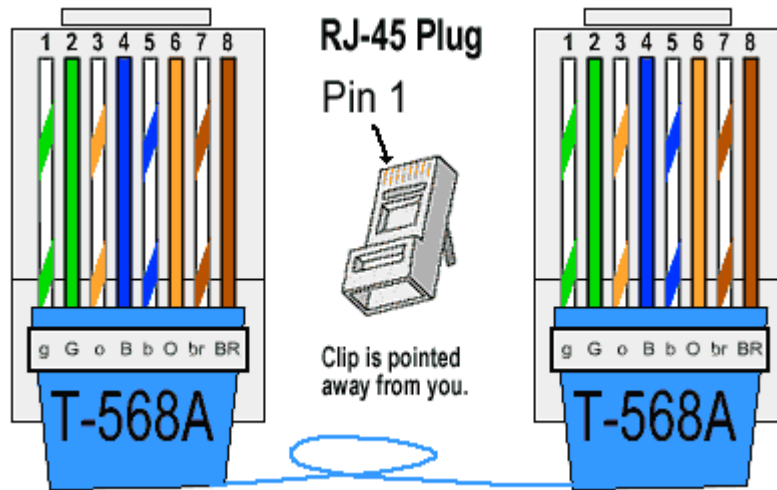
**Cat 6** – Like Cat 5E but with larger gauge wires, works for 10/100/1000Mb.

This cable is better than Cat 5e for Gigabit Ethernet.

**Cat 7** – Also called Class F, this is fully-shielded cabling and supports up to 600Mhz. This is a relatively new type of cabling and isn't used much.

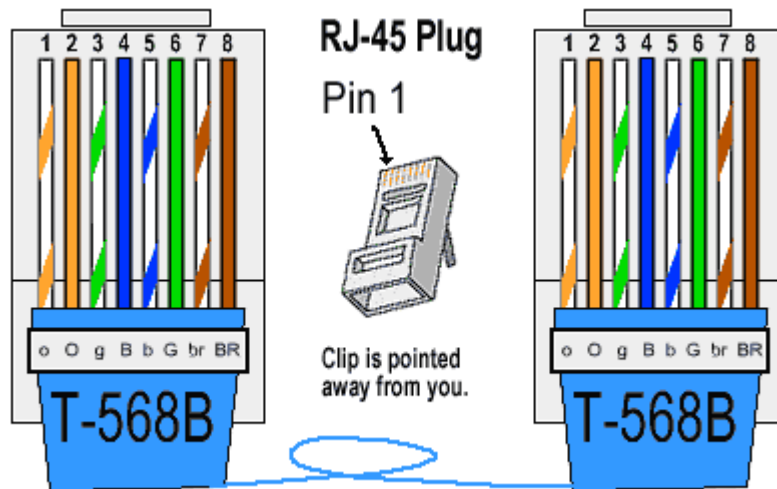
**Straight Through Cables:**

Next up, you should be familiar with the different types of "ends" or "plugs" at each end of the cable. When you go to a computer store and buy that "regular" Ethernet cable, what you are really buying is a straight-through cable. This means that if you hold both ends side by side, the colors of each of the different smaller cables inside an Ethernet cable, will be in the same order, from left to right. Take a look at the picture below to see what I am talking about.



This type of cable is a “regular” or straight-through cable. You use this type of cable to connect a PC to a hub/switch or a router to a switch.

You should also know that there are two standards for how the colors are arranged on this cable. However, these coloring standards don’t affect the performance or function of the cable. The standard above was called the T-568A. The standard in the picture below is called the T-568B.



**Lab Assignment No.2:****Ethernet Cable Connection Scheme  
(Straight Through Connection)**

Almost anyone who has connected to the Internet through a broadband connection like cable or DSL has used an Ethernet cable to do it. You have connected your PC's network interface card (NIC) to your cable modem, DSL modem, or home router with an Ethernet cable. However, there is more than one type of Ethernet cable.

**Types of Ethernet cabling:**

To start off with, you should know that not all Ethernet cabling is the same. If you go to a store you may find a variety of "categories" of cabling. These categories tell you the quality of the cabling. The quality determines, essentially, how much the cable can handle. Here are the categories that you need to know:

**Cat 3** – used for voice cabling and 10Mb Ethernet

**Cat 5** – used for 10/100Mb Ethernet and works for voice as well

**Cat 5E** – Enhanced Cat 5 cabling that helps to prevent cross-talk, works for 10/100Mb and 1000Mb (or Gigabit Ethernet)

**Cat 6** – Like Cat 5E but with larger gauge wires, works for 10/100/1000Mb.

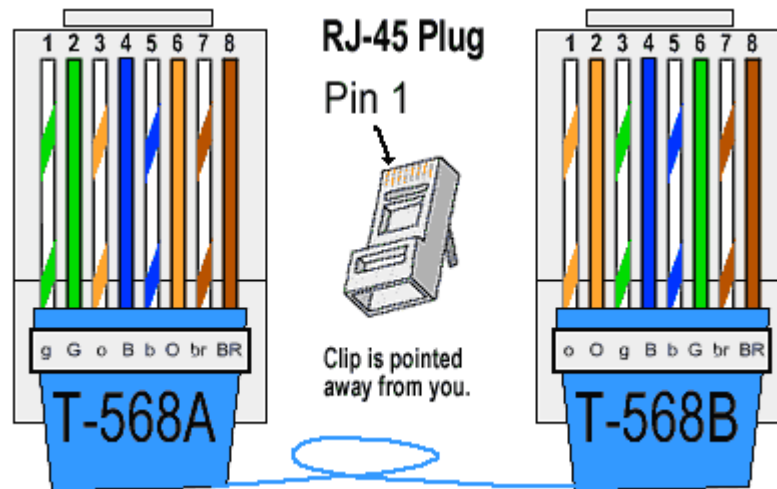
This cable is better than Cat 5e for Gigabit Ethernet.

**Cat 7** – Also called Class F, this is fully-shielded cabling and supports up to 600Mhz. This is a relatively new type of cabling and isn't used much.

**Crossover Cables:**

These cables have a different pinout on one side. The purpose of a crossover cable is to connect one device, directly, to another device, without a hub or switch in the middle. Usually, the hub/switch performs the crossover for you. So, you can use a crossover cable to connect a PC to a PC, directly, without any hub or switch. You can also use a crossover cable to connect two switches together.

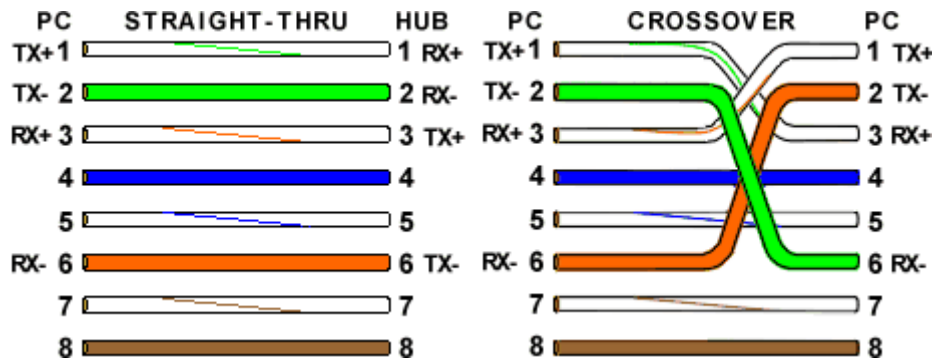
As you can see, the cross over cables sends pins 1 & 2 to 3 & 6 and 3 & 6 to 1 & 2. You can buy one of these special cables in a store or make one yourself.



In summary, A straight-through cable is what you normally use to connect a PC to a hub or switch. A crossover cable is a special type of Ethernet cable used to connect a PC to a PC or a switch to a switch.

Both the T-568A and the T-568B standard Straight-Through cables are used most often as patch cords for your Ethernet connections. If you require a cable to connect two Ethernet devices directly together without a hub or when you connect two hubs together, you will need to use a Crossover cable instead.

A good way of remembering how to wire a Crossover Ethernet cable is to wire one end using the T-568A standard and the other end using the T-568B standard. Another way of remembering the color coding is to simply switch the Green set of wires in place with the Orange set of wires. Specifically, switch the solid Green (G) with the solid Orange, and switch the green/white with the orange/white.



By looking at a T-568A UTP Ethernet straight-thru cable and an Ethernet crossover cable with a T-568B end, we see that the TX (transmitter) pins are connected to the corresponding RX (receiver) pins, plus to plus and minus to minus. You can also see that both the blue and brown wire pairs on pins 4, 5, 7, and 8 are not used in either standard. What you may not realize is that, these same pins 4, 5, 7, and 8 are not used or required in 100BASE-TX as well.

So why bother using these wires, well for one thing its simply easier to make a connection with all the wires grouped together.

References:

<http://www.incentre.net/incentre/frame/ethernet.html>

## Lab Assignment No.3:

## Command Prompt

```

Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\ZAHID>ipconfig/all

Windows IP Configuration

    Host Name . . . . . : ZAHID-PC
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No

Wireless LAN adapter Wireless Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : Broadcom 802.11n Network Adapter
    Physical Address. . . . . : E0-CA-94-BB-32-06
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Local Area Connection 3:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : Realtek PCIe FE Family Controller
    Physical Address. . . . . : DC-0E-A1-3E-A7-AC
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix . :
    Description . . . . . : Remote NDIS based Internet Sharing Device
    #2
    Physical Address. . . . . : 00-1E-10-1F-00-00
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::34d1:5924:3de8:ee65%11<Preferred>
    IPv4 Address. . . . . : 192.168.1.100<Preferred>
    Subnet Mask . . . . . : 255.255.255.0
    Lease Obtained. . . . . : Wednesday, February 05, 2014 6:46:18 PM
    Lease Expires . . . . . : Thursday, February 06, 2014 6:46:18 PM
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DHCPv6 IAID . . . . . : 285220368
    DHCPv6 Client DUID. . . . . : 00-01-00-01-19-F3-73-F2-DC-0E-A1-3E-A7-AC

    DNS Servers . . . . . : 192.168.1.1
    192.168.1.1
    NetBIOS over Tcpi. . . . . : Enabled

Tunnel adapter Teredo Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix . :
    Description . . . . . : Teredo Tunneling Pseudo-Interface
    Physical Address. . . . . : 00-00-00-00-00-00-00-E0
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes
    IPv6 Address. . . . . : 2001:0:9d38:90d7:3c2c:fbf1:8865:dcd8<Prefer
    erred>
    Link-local IPv6 Address . . . . . : fe80::3c2c:fbf1:8865:dcd8%16<Preferred>
    Default Gateway . . . . . : ::
    NetBIOS over Tcpi. . . . . : Disabled

Tunnel adapter isatap.<697BE401-DF07-41F7-89E4-68D5A1C29260>:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : Microsoft ISATAP Adapter #2
    Physical Address. . . . . : 00-00-00-00-00-00-00-E0
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes

C:\Users\ZAHID>ipconfig/all_

```

## 2. Net Stat.

```
C:\Users\ZAHID>netstat
```

## Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:5357	ZAHID-PC:50153	TIME_WAIT
TCP	192.168.1.100:50146	93.184.217.19:http	TIME_WAIT
TCP	192.168.1.100:50148	93.184.217.19:http	TIME_WAIT
TCP	192.168.1.100:50150	93.184.217.19:http	TIME_WAIT
TCP	192.168.1.100:50151	58.27.124.225:http	TIME_WAIT

```
C:\Users\ZAHID>_
```

## 3. Tracert.

```
C:\Users\ZAHID>tracert www.google.com
```

```
Tracing route to www.google.com [173.194.39.48]
over a maximum of 30 hops:
```

Hop	RTT	Source	Destination	IP Address
1	1 ms	6 ms	7 ms	mobilewifi.home [192.168.1.1]
2	*	*	*	Request timed out.
3	*	*	*	Request timed out.
4	72 ms	71 ms	71 ms	lhr63.pie.net.pk [221.120.222.212]
5	59 ms	49 ms	210 ms	221.120.221.18
6	67 ms	48 ms	65 ms	221.120.221.57
7	48 ms	62 ms	62 ms	rwp44.pie.net.pk [221.120.252.1]
8	89 ms	88 ms	73 ms	khi275-P01-pie.net.pk [221.120.254.22]
9	72 ms	87 ms	88 ms	static.khi77.pie.net.pk [202.125.128.170]
10	*	*	*	Request timed out.
11	211 ms	224 ms	216 ms	be2345.ccr21.mrs01.atlas.cogentco.com [154.54.3
12	194 ms	212 ms	199 ms	be2024.ccr21.zrh01.atlas.cogentco.com [130.117.
13	218 ms	205 ms	197 ms	be2025.ccr22.muc01.atlas.cogentco.com [130.117.
14	212 ms	205 ms	222 ms	be2231.mpd22.fra03.atlas.cogentco.com [154.54.3
15	222 ms	218 ms	201 ms	be2009.mag21.fra03.atlas.cogentco.com [154.54.7
16	215 ms	216 ms	234 ms	149.6.42.46
17	215 ms	229 ms	203 ms	209.85.241.110
18	239 ms	234 ms	240 ms	209.85.251.246
19	234 ms	231 ms	231 ms	72.14.232.79
20	232 ms	226 ms	235 ms	209.85.253.9
21	225 ms	238 ms	237 ms	209.85.243.109
22	239 ms	242 ms	233 ms	mrs02s04-in-f16.1e100.net [173.194.39.48]

```
Trace complete.
```

```
C:\Users\ZAHID>
```



```
C:\Users\ZAHID>ftp ftp.cisco.com
Connected to ftp.cisco.com.
220-
220- Cisco Systems File Transfer Service.
220-
220-           |           |           Cisco Systems, Inc.
220-           |           |           170 West Tasman Drive
220- Phone: +1.800.553.2447  .:|||||:..:|||||:. San Jose, CA 95134
220-
220- Local time is Wed Feb 05 06:25:31 2014.
220-
220- This system hosts the following domains:
220- - FTP.CISCO.COM
220- - FILES.CISCO.COM
220-
220- Please read the following instructions before proceeding.
220-
220- WARNING! - YOU MUST USE AN FTP CLIENT THAT SUPPORTS TLS SSL TO ENSURE YO
UR USER ID AND
220- PASSWORD ARE ENCRYPTED WHEN USING THIS SITE.
220-
220- PLEASE CONFIGURE YOUR FTP CLIENT USING THE VALUES CONTAINED WITHIN THE D
OUBLE QUOTES:
220-
220- 1. PORT = "990" (port 990 is the FTP server's SSL port. If you do
not
220- specify port 990 the FTP client may default to port 21 and your
session will not be
220- encrypted).
220- 2. PROTOCOL = "FTP".
220- 3. ENCRYPTION = "explicit FTP over TLS".
220- 4. LOGON TYPE = "Anonymous" or "Normal" (use normal if you will log
on using
220- your cisco.com credentials).
220- 5. MODE = "Passive" (you must have an FTP client that supports Pass
ive FTP.
220- We do not support Active FTP).
220-
220- Guest Account - you can use the "anonymous" user ID and your email addre
ss as the
220- password to access publicly distributed software located in the /pub dir
ectory and when
220- uploading files to the TAC in the /incoming/TAC directory.
220-
220- CCO Account (cisco.com)- You can also use your cisco.com user ID and pas
sword to
220- access the publicly available software in /pub or when uploading files t
o the TAC in the
220- /incoming/TAC directory, however, if you do not use an FTP client to con
nect to the SSL
220- FTP server then do not use your CCO account. Use the anonymous user acc
ount instead in
220- order to protect your CCO account credentials.
220- =====> FTP.CISCO.COM <=====
220-
220- Cisco TAC customers - Files can be uploaded via the Support Case Manag
er (SCM) using one
220- of the following options:
220-
220- 1. Use the SCM Java tool to attach any size file to an open SR
220- 2. Use the SCM Non-Java tool to attach files less than 20 MB to an
open SR
220- 3. Send an email with the SR number in the subject to attach@cisco.
com with
220- an attachment of less than 20MB
220- 4. If you are unable to use the methods above, you can use FTP to u
pload the
220- files.
220-
220- Details regarding FTP transfers are listed below:
220-
220- 1. Configure your FTP client as outlined above to ensure your user
ID, password
220- and the files are encrypted in transit.
220- 2. If you are unable to use an FTP client that supports TLS, then y
ou should
220- encrypt the files before you upload them to the system.
220- 3. Once uploaded, be sure to notify the Customer Support Engineer a
nd provide the
220- file name and location.
220-
220- The link below has detailed information regarding the options outlined a
bove:
220- http://www.cisco.com/web/about/security/intelligence/01_12_TAC_Uploads.h
tml
```



```
220- NOTE: After Jan. 30, 2014, no file uploads will be permitted to the /i
220- ncoming directory
220- level. All file uploads must be placed in the /incoming/TAC directory.
220-
220- Publicly distributed software is available on ftp.cisco.com in the /pub
220- directory.
220- All the other software is available in the Download area on www.cisco.co
220- m.
220-
220- =====> FILES.CISCO.COM <=====
220-
220- FTS users:
220-
220- 1. Follow the instructions above to configure your FTP client for S
220- SL encryption.
220- 2. Logon using your CCO (cisco.com) account. If you do not use an
220- FTP client
220- that supports SSL then login as an anonymous user to protect you
220- r CCO credentials.
220- 3. Navigate to your private directory to transfer files.
220- 4. Detailed instructions can be found in the FTS User Guide on the
220- File
220- Transfer Services IWE Community site.
220-
220- NOTE: After Jan. 30, 2014, no file uploads will be permitted to the /i
220- ncoming directory
220- level. All file uploads must be placed in the private directory under t
220- he /incoming
220- directory. Consult the FTS User Guide for more information.
220-
220- By downloading Cisco Software using this system you agree to the
220- following:
220-
220- - Cisco products, technology and services are subject to U.S. and local
220- export
220- control laws and regulations.
220-
220- - Customer shall comply with such laws and regulations governing use, ex
220- port,
220- re-export, and transfer of products, technology and services and will ob
220- tain all required
220- U.S. and local authorizations, permits, or licenses.
220-
220- - Customer certifies that they are not on the U.S. Department of Commere
220- Denied
220- Persons List or affiliated lists, on the U.S. Department of Treasury Spe
220- cially Designated
220- Nationals List or on any U.S. Government export exclusion lists.
220-
220- - The export obligations under this clause shall survive the expiration
220- or
220- termination of this Agreement.
220-
220- - You are bound by the Cisco End User License Agreement ("EULA ") posted
220- at
220- http://cisco.com/go/eula regarding the use of any software you download
220- from this site.
220-
220- + If you are a Cisco customer and encounter any problems using this site
220- , please
220- contact your local Technical Assistance Center (TAC).
220-
220- + If you are a Cisco employee and encounter problems using this site, o
220- pen a
220- Remedy case using the "FTS Platform (FTP)" link in the "Business Service
220- s" section.
220-
220-
220- download-prod1-02 FTP Server (Apache/2.2) ready.
220- User (ftp.cisco.com:(none)):
220- Connection closed by remote host.
220-
220- C:\Users\ZAHID>_
```

**Lab Assignment No.4:****Introduction To Cisco Packer Tracer**

As networking systems continue to evolve in complexity, new curricula and educational tools are emerging to facilitate teaching and learning about networking technology.

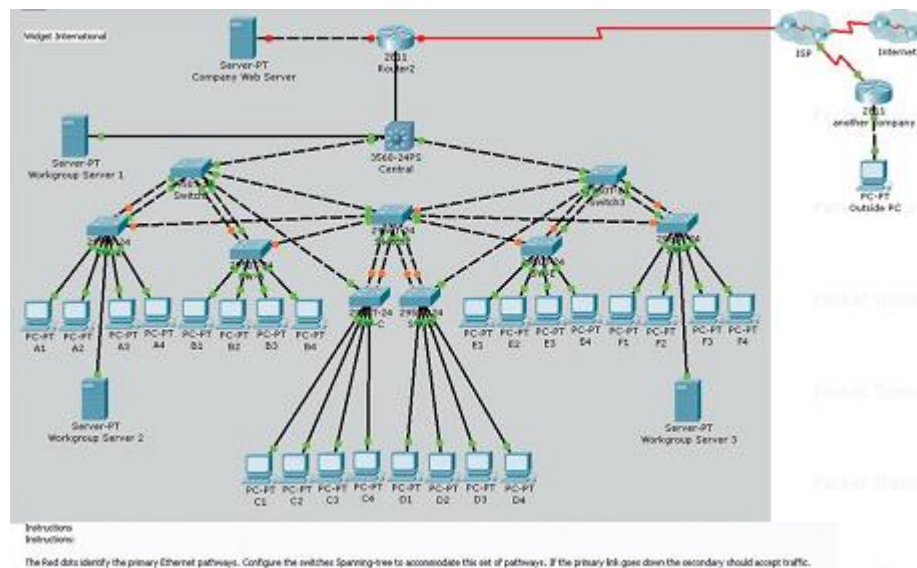
Cisco® Packet Tracer e-learning software was developed to help Networking Academy students gain practical networking technology skills in a rapidly changing environment. Students seeking ICT skills can now benefit from the accessibility of online curricula and new opportunities for social learning, collaboration, and competition.

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.



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.

### 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	<ul style="list-style-type: none"> <li>• FTP, SMTP, POP3, HTTP, TFTP, Telnet, SSH, DNS, DHCP, NTP, SNMP, AAA, ISR VOIP, SCCP config and calls ISR command support, Call Manager Express</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• TCP and UDP, TCP Nagle Algorithm &amp; IP Fragmentation, RTP</li> </ul>
Network	<ul style="list-style-type: none"> <li>• 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</li> </ul>
Network Access/Interface	<ul style="list-style-type: none"> <li>• 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</li> </ul>

### 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.

### Multiuser Functionality:

Cisco Packet Tracer is a network-capable application, with a multiuser peer-to-peer mode that allows collaborative construction of virtual networks over a real network. The multiuser 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 predefined packets. The Activity Wizard also includes grading and feedback capabilities.

**Reference:**

[www.cisco.com/go/netacad](http://www.cisco.com/go/netacad)

**Lab Assignment No.5:****Router Configuration**

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#hostname router0
```

```
router0(config)#enable secret class
```

```
router0(config)#line con 0
```

```
router0(config-line)#password admin
```

```
router0(config-line)#login
```

```
router0(config-line)#exit
```

```
router0(config)#line vty 0 4
```

```
router0(config-line)#password admin
```

```
router0(config-line)#login
```

```
router0(config-line)#exit
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
router0(config)#interface fastethernet 0/0
```

```
router0(config-if)#ip address 192.168.1.1 255.255.255.0
```

```
router0(config-if)#description router0 fastethernet 0/0
```

```
router0(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
```

```
router0(config-if)#exit
```

```
router0(config)#interface fastethernet 1/0
router0(config-if)#ip address 192.168.1.2 255.255.255.0
% 192.168.1.0 overlaps with FastEthernet0/0
router0(config-if)#ip address 192.168.2.1 255.255.255.0
router0(config-if)#description router0 fastethernet 1/0
router0(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
router0(config-if)#exit
router0(config)#exit
%SYS-5-CONFIG_I: Configured from console by console
router0#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
router0#show running-config
Building configuration...

Current configuration : 705 bytes
!
version 12.2
no service password-encryption
!
hostname router0
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
!
!
ip ssh version 1
```



```
!  
!  
interface FastEthernet0/0  
description router0 fastethernet 0/0  
ip address 192.168.1.1 255.255.255.0  
duplex auto  
--More--
```

