

COURSE CONTENT

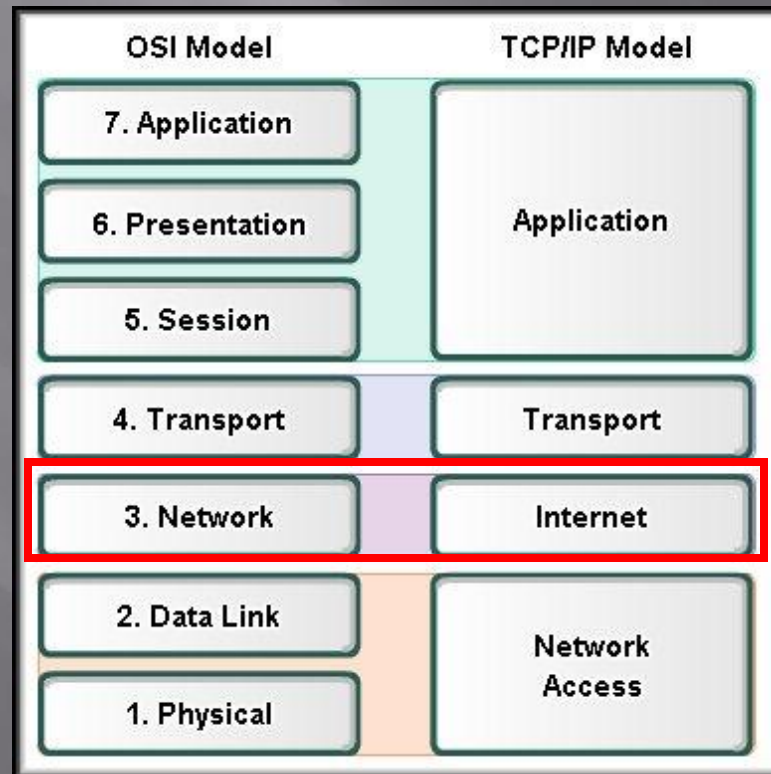
1. What is the Computer Network?
2. Network Fields.
3. Classification of Networks(Covered Area, Network Model, Network Topology)
4. Network Devices , Network Cables.
5. What do you need to build a computer network?
6. OSI & TCP/IP model.
7. IP Addressing.
8. DHCP,DNS And NAT.
9. Switching configurations.
10. Routing configurations.
11. Wireless
12. Security

Agenda

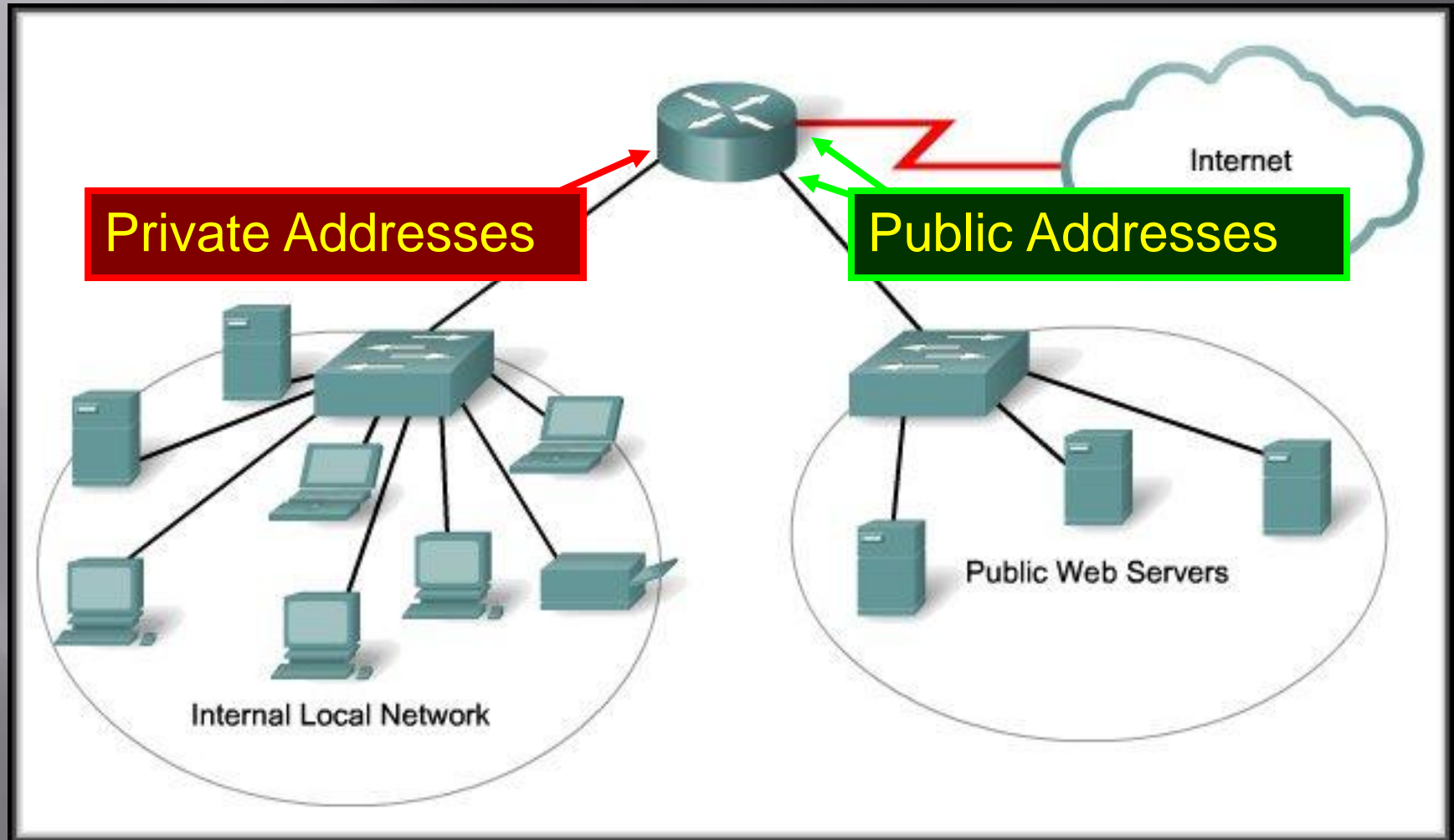
8.DHCP,DNS And NAT

Addressing the Network: IPv4

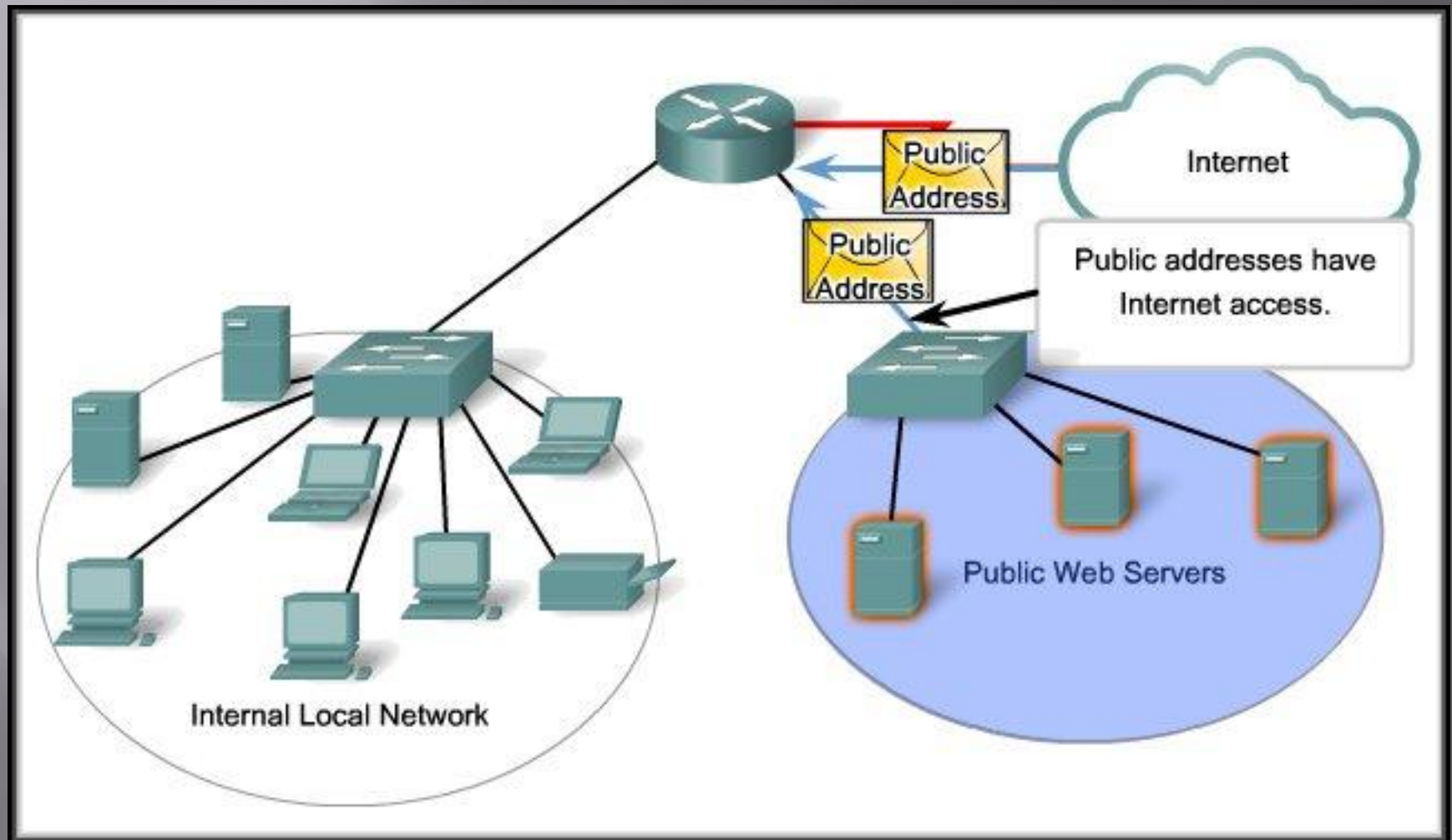
Assigning Addresses



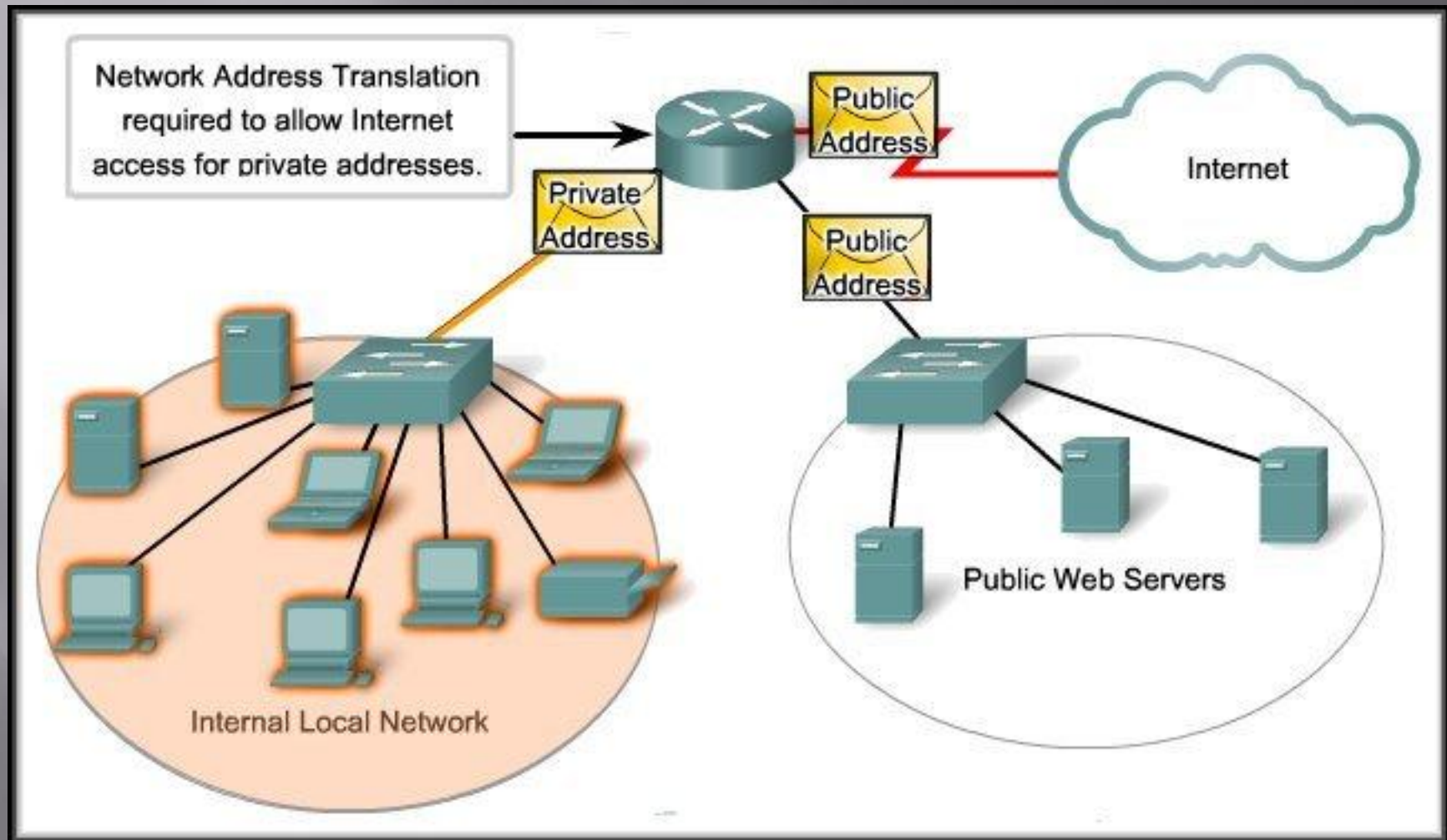
Assigning Addresses Within a Network



Assigning Addresses Within a Network



Assigning Addresses Within a Network



Static or Dynamic Addressing

Static Address Assignment

The image shows two windows from a Windows operating system. The left window is titled "Local Area Connection Properties" and shows a list of components checked for use by the connection, including "Internet Protocol (TCP/IP)". An arrow points from the "Configure" button in this window to the "Internet Protocol (TCP/IP) Properties" window on the right. In the right window, the "General" tab is active, and the "Use the following IP address" radio button is selected. The IP address, subnet mask, and default gateway fields are highlighted with an orange box. Below the windows, text explains that for manual static assignments, these addresses must be entered.

Local Area Connection Properties

General

Connect using:

Intel(R) PRO/100 VE Network Connection

Configure

Components checked are used by this connection:

- Client for Microsoft Networks
- File and Printer Sharing for Microsoft Networks
- Internet Protocol (TCP/IP)

Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address:	192 . 168 . 1 . 1
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 1 . 99

Obtain DNS server address automatically

Use the following DNS server addresses:

Preferred DNS server:	172 . 16 . 55 . 150
Alternate DNS server:	172 . 16 . 55 . 200

Advanced...

OK Cancel

For manual static assignments,
enter addresses
IP Address
Subnet mask
Default gateway

Static or Dynamic Addressing

Dynamic Address Assignment - DHCP

The image shows a Windows XP desktop environment. On the left, the 'Internet Protocol (TCP/IP) Properties' dialog box is open, with the 'Alternate Configuration' tab selected. The 'Obtain an IP address automatically' radio button is selected. A yellow arrow points from this button to the 'Using DHCP' callout box. The callout box contains the text 'Using DHCP' and 'These addresses are assigned dynamically:', followed by a list of four items: 'IP Address', 'Subnet mask', 'Default gateway', and 'DHCP server'. On the right, a command prompt window titled 'C:\WINDOWS\system32\cmd.exe' shows the output of the 'ipconfig /all' command. A yellow box highlights the DHCP-related information in the output, which is also pointed to by yellow arrows from the callout box. The highlighted information includes: 'IP Address : 192.168.0.5', 'Subnet Mask : 255.255.255.0', 'Default Gateway : 192.168.0.1', and 'DHCP Server : 192.168.0.1'. Other information visible in the command prompt includes 'Host Name : AA_P4_2006', 'Primary Dns Suffix :', 'Node Type : Unknown', 'IP Routing Enabled. : No', 'WINS Proxy Enabled. : No', and 'Ethernet adapter Local Area Connection:'. The 'Connection-specific DNS Suffix' is also visible as 'vial.rhine.llnwd.net'.

Internet Protocol (TCP/IP) Properties

General Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address:

Subnet mask:

Default gateway:

Obtain DNS server information automatically

Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

Using DHCP

These addresses are assigned dynamically:

- IP Address
- Subnet mask
- Default gateway
- DHCP server

```
C:\WINDOWS\system32\cmd.exe
C:\>
C:\>ipconfig /all

Windows IP Configuration

Host Name . . . . . : AA_P4_2006
Primary Dns Suffix . . . . . :
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

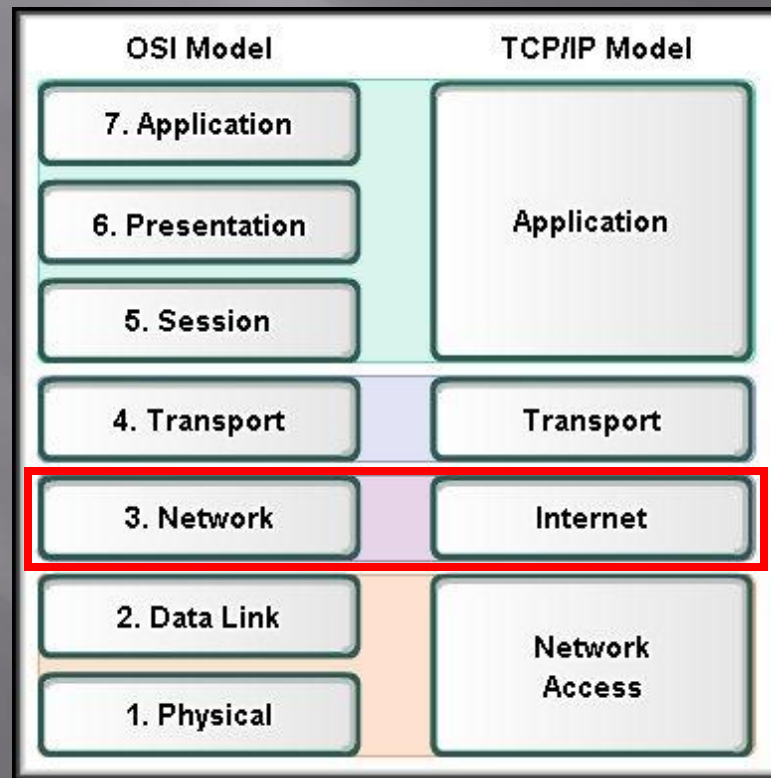
Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . . . : vial.rhine.llnwd.net
Description . . . . . : VIA Rhine II Fast Ethernet Controller
Physical Address. . . . . : 00-17-31-7C-35-4B
Dhcp Enabled. . . . . : Yes
Autotconfiguration Enabled . . . . . : Yes
IP Address. . . . . : 192.168.0.5
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1
DHCP Server . . . . . : 192.168.0.1
DNS Servers . . . . . : 192.168.0.1
Lease Obtained. . . . . : Tuesday, 5 June 2006 10:11:11 AM
Lease Expires . . . . . : Wednesday, 6 June 2006 10:11:11 AM

C:\>
```

Addressing the Network: IPv4

Testing the Network Layer



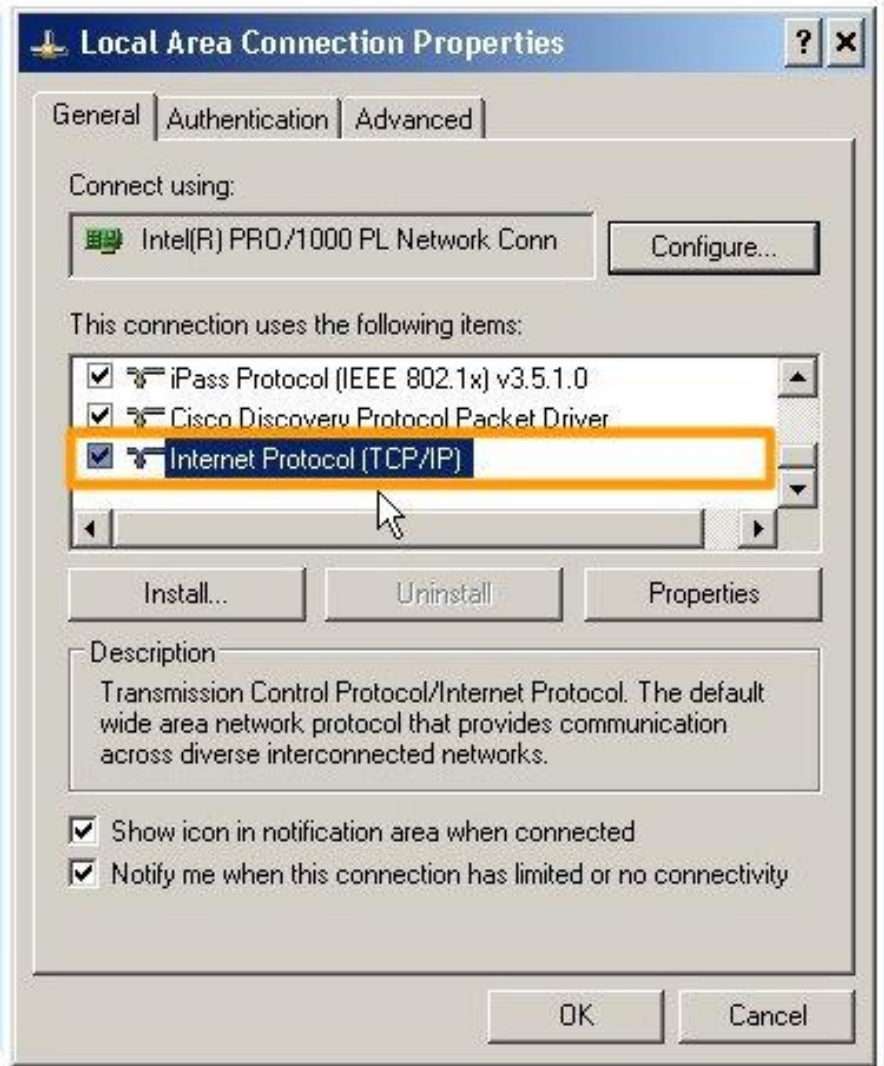
Testing the Network Layer

Testing Local TCP/IP Stack

Pinging the local host confirms that TCP/IP is installed and working on the local host.

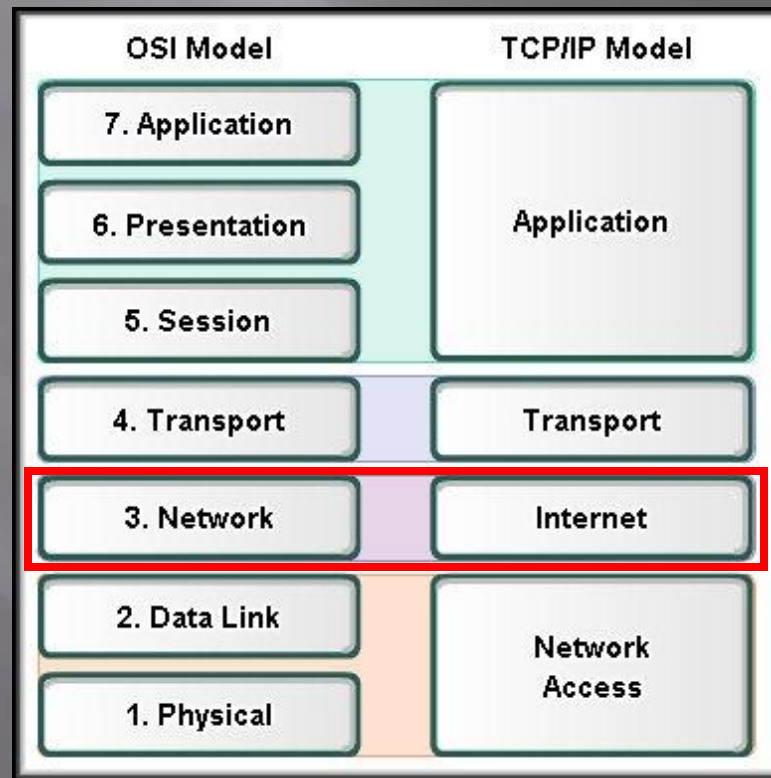


Pinging 127.0.0.1 causes a device to ping itself.



Assignment (1)

Testing the Network Layer



- Dynamic host configuration protocol (DHCP) :-
It is gives a dynamic IP address + subnet mask
+ default gateway + DNS IP from DHCP
server has a DHCP pool
- Domain Name Server (DNS) :-
That Convert URL Address To IP Address.
- Network address translation (NAT) :-
It is a software built in routers that convert
private IP address to public IP address