



# **Unit 17**

## **Networking overview**



# Unit objectives

---

After completing this unit, you should be able to:

- Define the basic TCP/IP terminology
- Configure TCP/IP for an Ethernet or Token-Ring connection
- Use some of the standard TCP/IP facilities to:
  - Log in to another system
  - Transfer files
  - Run commands

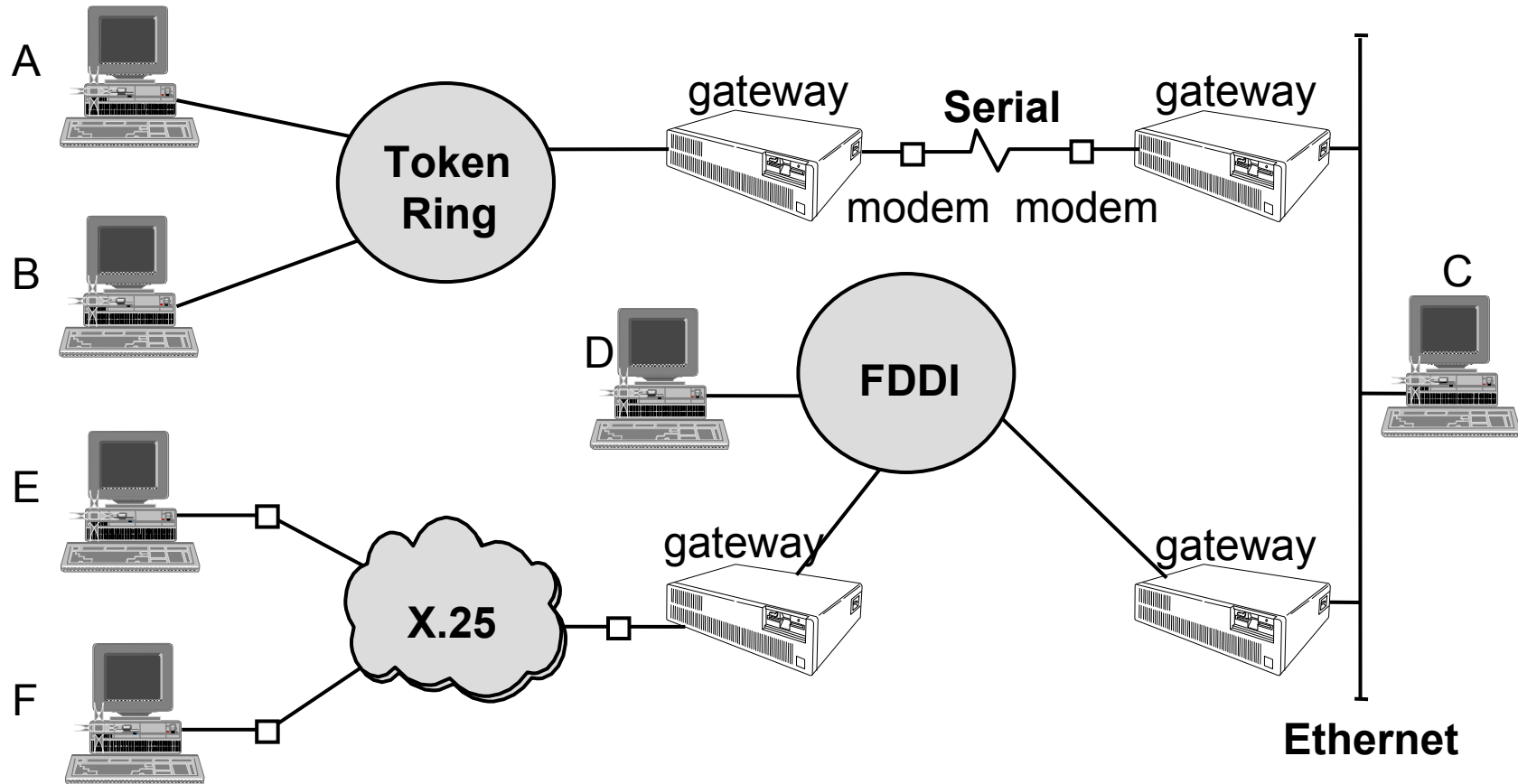
# What is TCP/IP?

---

- **T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol
- Software to enable different systems to exchange data over a variety of types of network
- The way in which systems are connected and how data is passed between them is transparent to the user
- TCP/IP is vendor-independent; development is overseen by the Internet Architecture Board

# An Internet

- A TCP/IP network is often called an *Internet*.



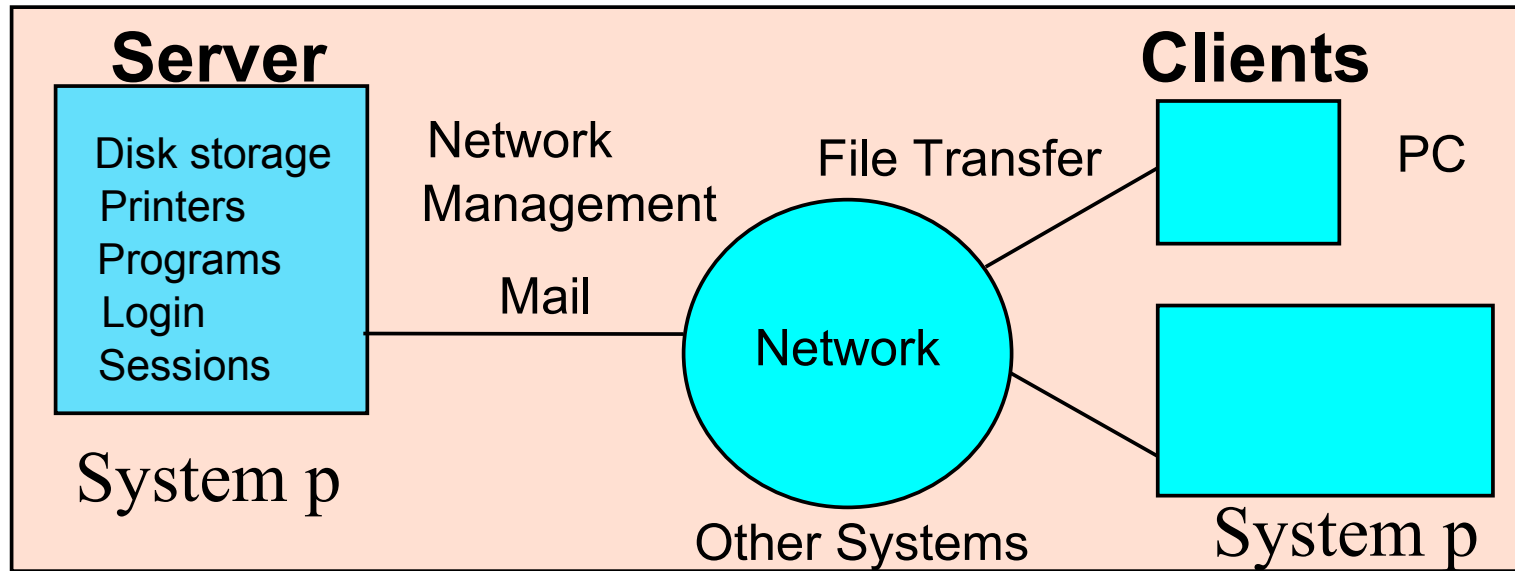
- Individual machines are called *hosts*
- Hosts may vary in size and functionality but have equal standing as far as TCP/IP is concerned
- Hosts which link two or more physical network segments to each other are called *gateways*

# Names and addresses

---

- Each system in a TCP/IP network is given a name:
  - For example: **sys3**
- When contacting another system you only need to know the name:
  - For example: **\$ telnet sys3**
- When contacting another user you need to know the system and user name:
  - For example: **\$ mail fred@sys3**
- Each system has one or more TCP/IP addresses:
  - For example: **10.0.0.3**
- If you know the address, but not the name, you can use some TCP/IP facilities with the address

# TCP/IP network facilities



- Standard TCP/IP facilities include: mail, file transfer, remote login, remote execution, and remote printing
- A number of AIX applications use TCP/IP:
  - Network File System (NFS)
  - Network Information Services (NIS)
  - Domain Name Service (DNS)
  - Dynamic Host Configuration Protocol (DHCP)
  - Network Computing System (NCS)
  - Distributed Computing Environment (DCE)
  - X Windows and AIXWindows
  - Tivoli Netview for AIX

# Information needed to configure TCP/IP

---

- Address:
  - Each adapter is given a unique TCP/IP address and often a subnet mask
  - These are usually assigned by your network administrator
- Name:
  - Each machine has a unique hostname
  - Each machine must have access to a table of name to address translations, which can be either:
    - **/etc/hosts** file
    - Domain Name Server - You must know:
      - Domain Name
      - Address of the Name Server
- Routes:
  - In order to communicate with systems in other networks, you may need to find the address of the default gateway

# Configuring TCP/IP

```
# smit mktcpip
```

## Minimum Configuration & Startup

To Delete existing configuration data, please use Further Configuration menus

Type or select values in entry fields.

Press Enter AFTER making all desired changes.

	[Entry Fields]	
* HOSTNAME	[sys1]	
* Internet ADDRESS (dotted decimal)	[10.0.0.1]	
Network MASK (dotted decimal)	[255.255.255.0]	
* Network INTERFACE	en0	
NAMESERVER		
Internet ADDRESS (dotted decimal)	[ ]	
DOMAIN Name	[ ]	
Default Gateway		
Address (dotted decimal or symbolic name)	[10.0.0.192]	
Cost	[0]	#
Do Active Dead Gateway Detection?	no	+
Your CABLE Type	N/A	+
START TCP/IP daemons Now	no	+

F1=Help

Esc+5=Reset

Esc+9=Shell

F2=Refresh

Esc+6=Command

Esc+0=Exit

F3=Cancel

Esc+7=Edit

Enter=Do

F4=List

Esc+8=Image

# Flat name resolution

---

```
# more /etc/hosts
```

```
# The format of this file is:
```

```
# Internet Address      Hostname          # Comments
```

```
# Items are separated by any number of blanks and/or tabs. A '#'  
# indicates the beginning of a comment; characters up to the end  
# of the line are not interpreted by routines which search this  
# file. Blank lines are allowed.
```

#Internet Address	Hostname	#Comments
127.0.0.1	loopback	localhost
10.0.0.1	sys1	timeserver
10.0.0.2	sys2	
10.0.0.3	sys3	
10.0.0.4	sys4	

# Identifying the hostname

---

- **hostname** command:
  - Example:

```
# hostname  
sys3
```

- **host** command:
  - Examples:

```
# host sys3  
sys3 is 10.0.0.3, Aliases: sys3.washington.ibm.com  
  
# host 10.0.0.3  
sys3 is 10.0.0.3, Aliases: sys3.washington.ibm.com
```

# Basic TCP/IP user functions

---

- The following commands work with any TCP/IP system (not just UNIX/AIX):
  - Test connectivity: `ping`
  - Remote execution: `rexec`
  - File transfer: `ftp`
  - Remote login: `telnet`

# Checkpoint

1. What are the following commands used for?

- **ftp** \_\_\_\_\_
- **rexec** \_\_\_\_\_
- **telnet** \_\_\_\_\_

• What is the difference (if any) between a **host** and a **gateway**?

---

---

---

3. True or false? Each machine in a TCP/IP network must have a unique hostname and TCP/IP address.

• Which file holds the name and the TCP/IP address of each host in a flat network? \_\_\_\_\_

# Checkpoint solutions

1. What are the following commands used for?
  - **ftp** transfers files from one machine to another
  - **rexec** executes a command on a remote system
  - **telnet** logs in to another system
- What is the difference (if any) between a **host** and a **gateway**?  
A host is an individual machine connected to a network, whereas a gateway is a special kind of host which links two or more physical networks together.
- True or false? Each machine in a TCP/IP network must have a unique hostname and TCP/IP address.
- Which file holds the name and the TCP/IP address of each host in a flat network? /etc/hosts

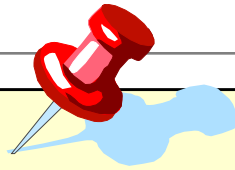
# Exercise 19: Networking

---



- Deconfigure TCP/IP
- Configure TCP/IP
- Testing the configuration
- Using `telnet`
- Using `ftp`

# Unit summary



- TCP/IP is a networking architecture which defines a set of rules. These rules describe how computers can communicate with one another over a network.
- A flat TCP/IP network can be configured through SMIT by supplying the following information: addresses, subnet mask and hostnames.
- There are many useful utilities which are provided by TCP/IP, such as **telnet** to login to another system, **ftp** to transfer files and **rexec** to execute a command on a remote system.
- Use the **ping** command to check for connectivity to remote hosts.