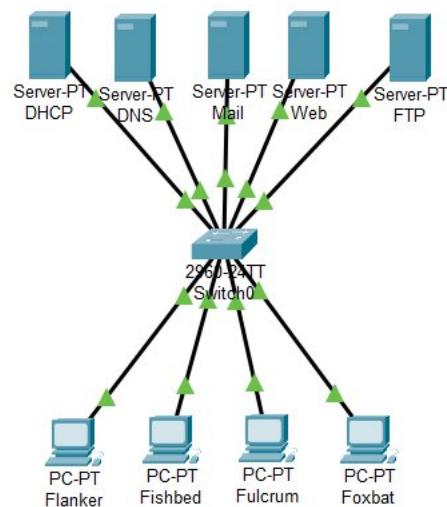


# CNSL Assignment 11: Application Layer Protocol

**Aim:** Study and analyse the performance of DHCP, Email, HTTP, HTTPS, and FTP protocol using the Packet Tracer tool. Create DHCP, DNS, HTTP AND HTTPS Web Server and Email Server on packet tracer and show the simulation between clients and servers. Also, Analyse packet formats at various Layers.

## Network Topology


1. Drop 3 PCs, 5 Servers, and 1 Switch from the network devices and end devices section.
2. Connect PCs with one switch and the switch to the five servers with a copper straight-through cable.
3. Name all PCs and Servers suitably.



## IP Address Configuration

### Configuring DHCP server

1. Go to the DHCP server -> Desktop > IP Configuration.
2. Set the configuration to static and manually set the IP Address and DNS server IP Address.
  - o IPv4 Address: 192.168.47.1
  - o Subnet Mask: 255.255.255.0
  - o DNS Server: 192.168.47.2
3. Then go to Services and configure DHCP.
4. Turn on the DHCP service and set the starting IP as 192.168.47.1.
5. Click on save and close.

 DHCP

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.47.1


Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

## Configuring IP address for the rest of the network

1. Go to the Web server -> IP Configuration and select DHCP.
2. This will automatically fill the IP Address and DNS server address. The result should show "DHCP request successful".
3. Repeat the same process for the DNS server, FTP server, Mail server, Flanker, Fishbed, Fulcrum and Foxbat. Each device should show a "DHCP request successful" message and receive an IP address from the 192.168.47.x range.

 DNS

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration


☒ DHCP ☐ Static

IPv4 Address 192.168.47.2

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

 Mail

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration


☒ DHCP ☐ Static

IPv4 Address 192.168.47.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

 Web

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration


☒ DHCP ☐ Static

IPv4 Address 192.168.47.4

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

 FTP

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.47.5

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

Flanker

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.47.6

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

Fishbed

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.47.7

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

Fulcrum

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.47.8

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

Foxbat

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.47.9

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.47.2

### Configuring Mail server Go to Mail Server -> Services -> Email.

1. Turn on both SMTP and POP3 services and add users with passwords for Flanker, Fishbed, Fulcrum and Foxbat.
2. After this, go to Flanker and configure mail from the desktop.
3. Provide the mail server details (e.g., iaf.in) and enter the user's login information.
4. Save and close. Repeat for other PCs.

Mail

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

**EMAIL**

FTP

IoT

VM Management

Radius EAP

EMAIL

SMTP Service ☒ ON ☐ OFF

POP3 Service ☒ ON ☐ OFF

Domain Name: iaf.in

User Setup

User Fishbed Password 1234

Flanker

Fishbed

Fulcrum

Foxbat

Flanker

Physical Config **Desktop** Programming Attributes

**Configure Mail**

User Information

Your Name: Flanker

Email Address: Flanker@iaf.in

Server Information

Incoming Mail Server iaf.in


Outgoing Mail Server iaf.in

Logon Information

User Name: Flanker

Password: .....

Save Remove

 Fishbed
 

Physical Config **Desktop** Programming Attributes

Configure Mail

User Information

Your Name: Fishbed

Email Address: Fishbed@iaf.in

Server Information

Incoming Mail Server: iaf.in


Outgoing Mail Server: iaf.in

Logon Information

User Name: Fishbed

Password: ....

Save Remove

 Fulcrum
 

Physical Config **Desktop** Programming Attributes

Configure Mail

User Information

Your Name: Fulcrum

Email Address: Fulcrum@iaf.in

Server Information

Incoming Mail Server: iaf.in


Outgoing Mail Server: iaf.in

Logon Information

User Name: Fulcrum

Password: ....

Save Remove

 Foxbat
 

Physical Config **Desktop** Program

Configure Mail

User Information

Your Name: Foxbat

Email Address: Foxbat@iaf.in

Server Information

Incoming Mail Server: iaf.in

Outgoing Mail Server: iaf.in

Logon Information


User Name: Foxbat

Password: ....

Save Remove

## Configuring DNS server

- Navigate to the DNS server's services tab and select DNS.
- Turn the DNS service on.
- Add an A Record to resolve the mail server's domain name. For example:
  - Name: iaf.in
  - Type: A Record
  - Address: 192.168.47.23

 DNS

Physical Config **Services** Desktop Programming Attributes

SERVICES

HTTP  
 DHCP  
 DHCPv6  
 TFTP  
**DNS**  
 SYSLOG  
 AAA  
 NTP  
 EMAIL  
 FTP  
 IoT  
 VM Management  
 Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name: iaf.in Type: A Record

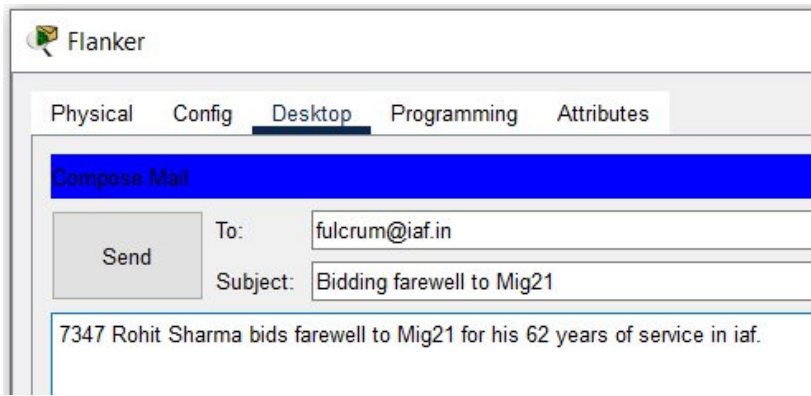
Address: 192.168.47.3

Add Save Remove

No.	Name	Type	Detail
0	bison	A Record	192.168.47.4
1	ftp_server	A Record	192.168.47.5
2	iaf.in	A Record	192.168.47.3

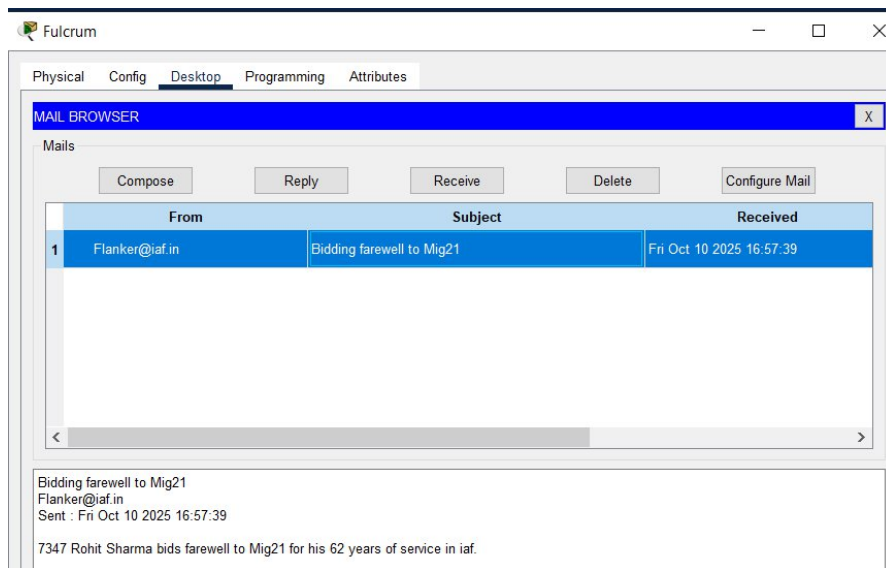
## Composing and Sending Mail from Flanker to Fulcrum

- From PC0's email client, compose a new email addressed to [fulcrum@iaf.in](mailto:fulcrum@iaf.in). After sending, open the email client on PC1 and receive the mail. The received mail should show the correct sender, recipient, and message body.



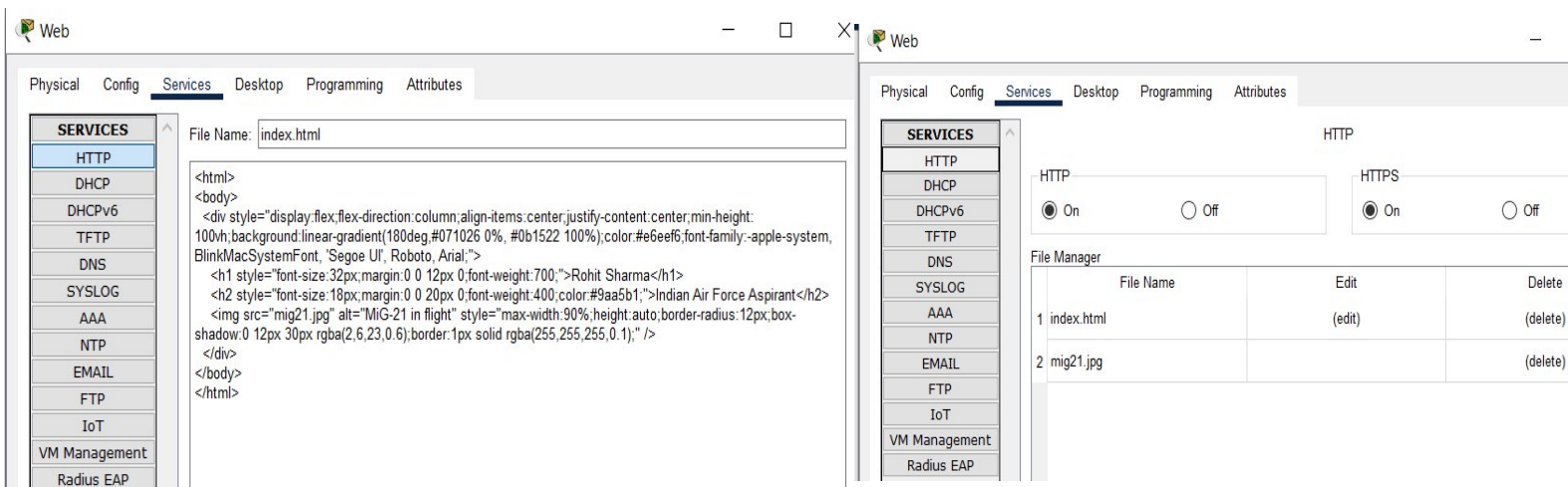
Sending mail to fulcrum@iaf.in , with subject : Bidding farewell to Mig21 .. Mail Server: iaf.in  
 DNS resolving. Resolving name: iaf.in by querying to DNS Server: 192.168.47.2  
 DNS resolved ip address: 192.168.47.3  
 Send Success.

## Mail received from Flanker to Fulcrum



## Configuring web server

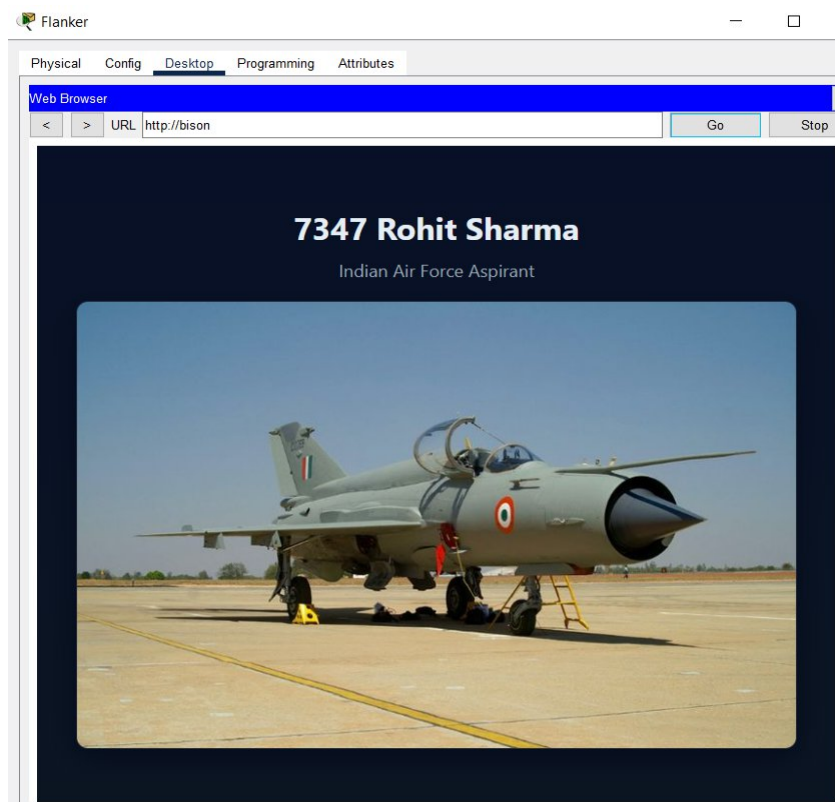
1. Go to the Web server -> services -> HTTP.
2. Edit index.html file to create the desired web page content.



## Accessing Web server from Flanker using DNS

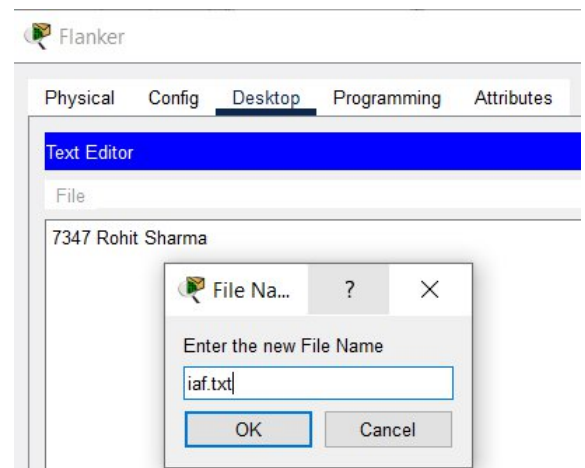
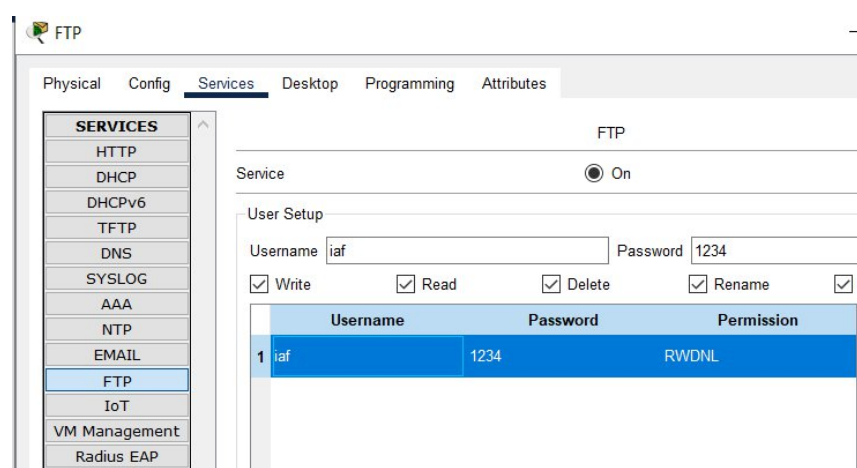


1. Open the Web browser on any PC, such as Flanker.
2. In the URL bar, type the domain name configured in the DNS server and press Go. The web page created on the server should be displayed.



### Configure FTP Server using packet tracer

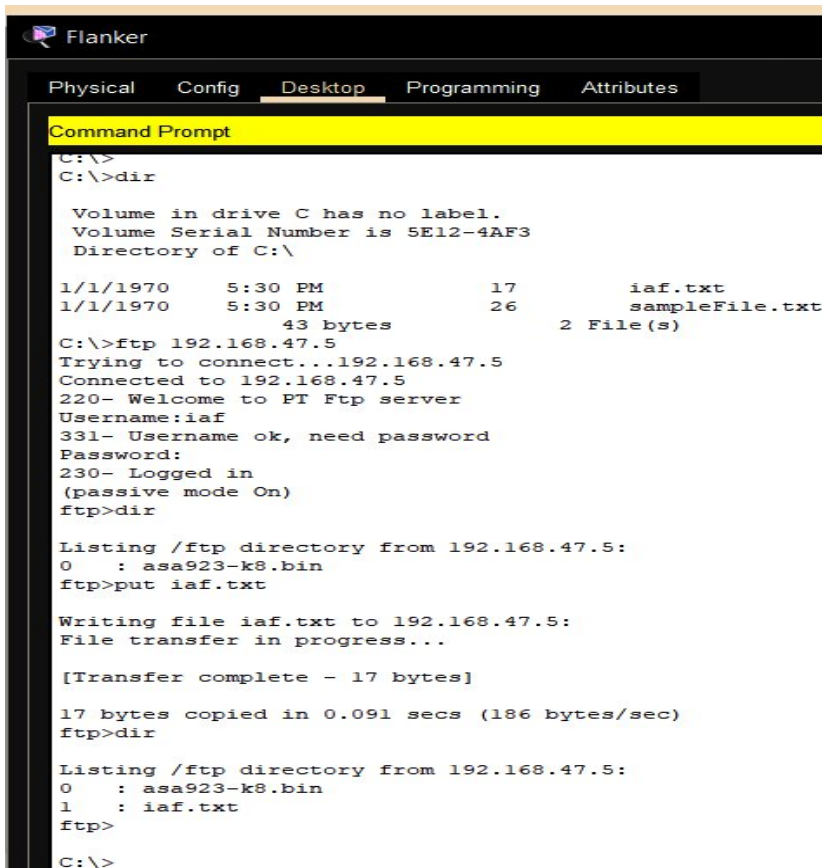
1. First, to set up, go to the FTP server.
2. Go to services -> FTP.
3. Enable the FTP service, then configure it by adding usernames and passwords, along with enabling read, write, and other permissions.
4. Go to any PC, say Flanker, then to Desktop->text editor.
5. Write some content.



6. Give the file a suitable name with a .txt extension and save.

### Putting a file from the FTP server from Flanker

- Open the Command Prompt on Flanker.
- Connect to the FTP server: ftp 192.168.47.5
- Log in with the configured username and password.
- Use the put command to upload the text file: put iaf.txt
- A "Transfer complete" message confirms the upload.



```
C:\>
C:\>dir

Volume in drive C has no label.
Volume Serial Number is 5E12-4AF3
Directory of C:\

1/1/1970    5:30 PM                17          iaf.txt
1/1/1970    5:30 PM                26      sampleFile.txt
                                43 bytes                2 File(s)

C:\>ftp 192.168.47.5
Trying to connect...192.168.47.5
Connected to 192.168.47.5
220- Welcome to PT Ftp server
Username:iaf
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>dir

Listing /ftp directory from 192.168.47.5:
0   : asa923-k8.bin
ftp>put iaf.txt

Writing file iaf.txt to 192.168.47.5:
File transfer in progress...

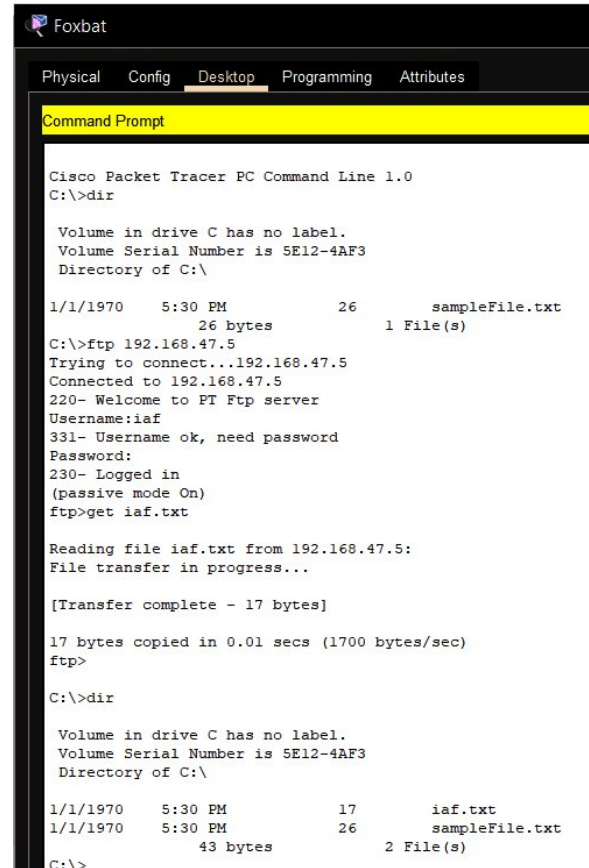
[Transfer complete - 17 bytes]

17 bytes copied in 0.091 secs (186 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.47.5:
0   : asa923-k8.bin
1   : iaf.txt
ftp>
C:\>
```

### Getting a file from the FTP server from Foxbat

- Open the Command Prompt on Foxbat.
- Connect to the FTP server: ftp 192.168.47.5
- Log in with the configured username and password.
- Use the get command to upload the text file: get iaf.txt
- A "Transfer complete" message confirms the download.



```
Cisco Packet Tracer PC Command Line 1.0
C:\>dir

Volume in drive C has no label.
Volume Serial Number is 5E12-4AF3
Directory of C:\

1/1/1970    5:30 PM                26      sampleFile.txt
                                26 bytes                1 File(s)

C:\>ftp 192.168.47.5
Trying to connect...192.168.47.5
Connected to 192.168.47.5
220- Welcome to PT Ftp server
Username:iaf
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>get iaf.txt

Reading file iaf.txt from 192.168.47.5:
File transfer in progress...

[Transfer complete - 17 bytes]

17 bytes copied in 0.01 secs (1700 bytes/sec)
ftp>

C:\>dir

Volume in drive C has no label.
Volume Serial Number is 5E12-4AF3
Directory of C:\

1/1/1970    5:30 PM                17          iaf.txt
1/1/1970    5:30 PM                26      sampleFile.txt
                                43 bytes                2 File(s)

C:\>
```