

VIT-AP UNIVERSITY, ANDHRA PRADESH

Lab Sheet 12- Simulation and Analysis of TCP AND UDP USING CISCO PACKET TRACER

Academic year: 2020-2021

Branch/ Class: B.Tech/M.Tech

Semester: Winter

Date: 24/4/2021

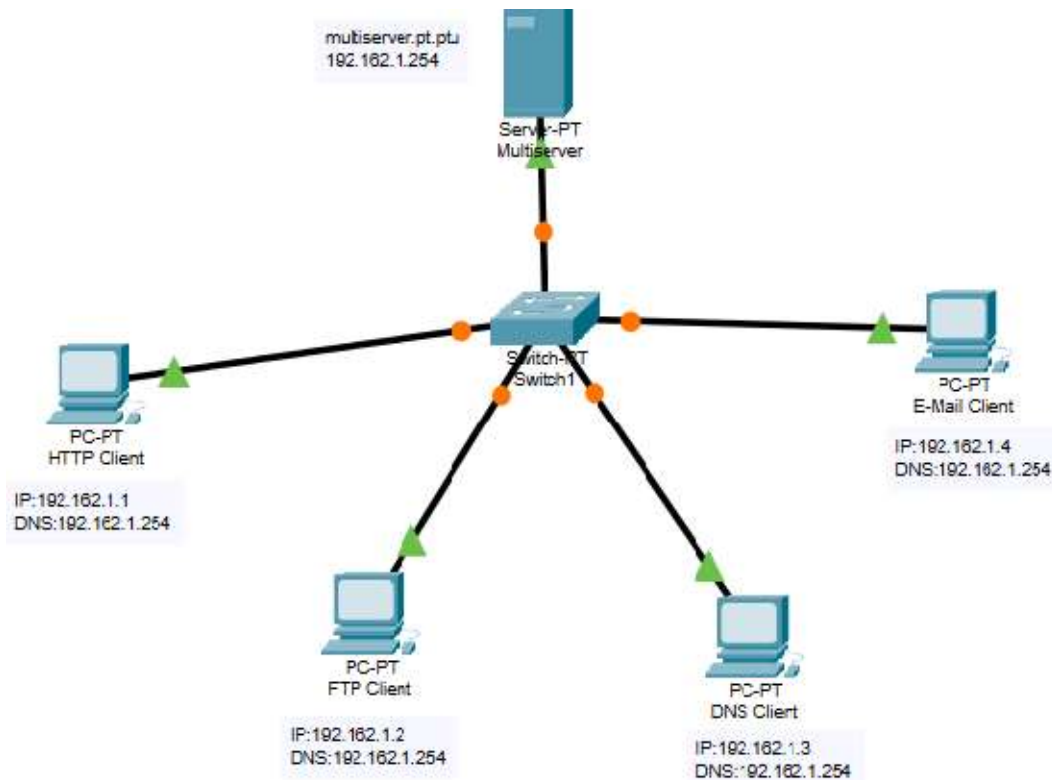
Faculty Name: Dr.HUSSAINSYED

School: SCOPE

Student name: Hariprasad K K

Reg. no.: 19BCE7079

Simulation & Analysis of Transport Layer Protocol (TCP) and User Datagram Protocol (UDP) using CISCO packet tracer.



TCP is connection oriented – once a connection is established, data can be sent bidirectional. **UDP** is a connectionless Internet protocol. Multiple messages are sent as packets in chunks using UDP.

Sr. No.	Key	TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)

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1	Definition	It is a communications protocol, using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.	It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.
2	Design	TCP is a connection-oriented protocol.	UDP is a connection less protocol.
3	Reliable	As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.
4	Data transmission	In TCP the data is transmitted in a particular sequence which means that packets arrive in-order at the receiver.	On other hand there is no sequencing of data in UDP in order to implement ordering it has to be managed by the application layer.
5	Performance	TCP is slower and less efficient in performance as compared to UDP. also TCP is heavy-weight as compared to UDP.	On other hand UDP is faster and more efficient than TCP.

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6	Retransmission	Retransmission of data packets is possible in TCP in case packet get lost or need to resend.	On other hand retransmission of packets is not possible in UDP.
7	Examples	World Wide Web (HTTP), E-mail (SMTP TCP), File Transfer Protocol (FTP), Secure Shell (SSH), DNS is TCP for Zone transfers	DNS, Streaming media applications such as movies, Online multiplayer games, Voice over IP (VoIP), Trivial File Transfer Protocol (TFTP)

There are many of the companies shifting to the multi-server environment because of high reliability and proficiency of their businesses. There are many reasons, you should use the multi-server environment for your business. In this article, I would discuss some benefits of multi-server environment for your business and what are the best multi server services option available in the market. The use of multi-server system in the business generally helps guarantee high performance and uptime, sustain security, and enables more efficient resource allocation. There are many other benefits of dividing the resources onto many servers, and on each server running changed operating systems. Web apps can be typically divided into application and web tiers if needed. All of the servers are configured and provisioned based on the demands of the function.

resources server splitting to run various functions on multi servers. This allows to make more connections and reduce the dependability on a single server. This rapidly turns out to be the most cost-effective way to confirm system performance and reliability and it is also an indicator of the mature network. Eventually, agencies and enterprises with huge networks may end up with a separate server for each function to reduce the redundancy

the major benefits you can get from multi-server environment.

1. Effective Resource Monitoring
2. More Security
3. Improves Server Performance
4. Cost Effective
5. Reduce Dependency
6. Improves Database Functions

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7.Solutions for multi-server environment

Execution:





<https://www.youtube.com/watch?v=14ym4xOYSyw&t=245s>

<https://www.youtube.com/watch?v=bj5j4boOk3Q>

Objectives:


1. Drag and drop 1 Server-PT, 1 Switch-PT, 4 PC-PTs. Give names to all devices as Multiserver, Switch0, HTTP client, FTP Client, DNS Client, E-mail Client respectively
2. Establish connections b/w devices
3. While connecting E-mail client we get connection error.

to rectify that error:

go to Switch0  physical  off the switch  select PT-SWITCH-NM-1CE  drag & drop ETHERNET 0 Link in the 3rd empty slot

Now connect PC to Switch0

Or

If you take switch 2950T-24 we won't get connection error and connect this switch to Gigabitethernet0/1 by selecting straight through cable multiserver  FastEthernet0/1

4. Configuration: check status on for all devices

Multi-Server: IP Address:192.168.1.254

HTTP Server: IP:192.168.1.1

DNS Server: 192.168.1.254

FTP Server: IP:192.168.1.2

DNS Server: 192.168.1.254

DNS Server: IP:192.168.1.3

DNS Server: 192.168.1.254



E-mail Server: IP:192.168.1.4

DNS Server: 192.168.1.254

Multiserver  services  http(on)

 DNS  name: multiserver.pt.ptu  address:192.162.1.254  Add 

 Email  domain name: multiserver.pt.ptu  username: vitap, password:123 

 username: cisco, password:123 

 FTP(on)

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




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Simulation:















Click on simulation panel:

Click on server  c:/>ping -n 1 192.162.1.255(single broadcast message to all four instead of four PDUs we get four replies instead of 16)

Click on HTTP Client  desktop  Web Browser  192.162.1.255  go  we view get links  do not close minimize the window

Click on FTP client  desktop  command prompt  C:>ping 192.162.1.254  we view get the reply from server  ftp 192.162.1.254-->username: cisco, password:cisco  C changes to ftp>→minimize the window

Click on DNS Client  desktop  command prompt  nslookup multiserver.pt.ptu  enter  displays server and DNS info  minimize the window

Click on E-mail Client  desktop  Email  desktop  configure mail  Your name: cisco, Email address: cisco@multiserver.pt.ptu, Incoming mail server: multiserver.pt.ptu, outgoing mail server: multiserver.pt.ptu, username:cisco, password: 123  save  compose  To: vitap@ multiserver.pt.ptu, subject: hi cisco  send  configure mail  Your name: vitap, Email address: vitap@multiserver.pt.ptu, Incoming mail server: multiserver.pt.ptu, outgoing mail server: multiserver.pt.ptu, username:vital, password: 123  save  receive  the mails which are received will be displayed below

Add 2-3 screenshots

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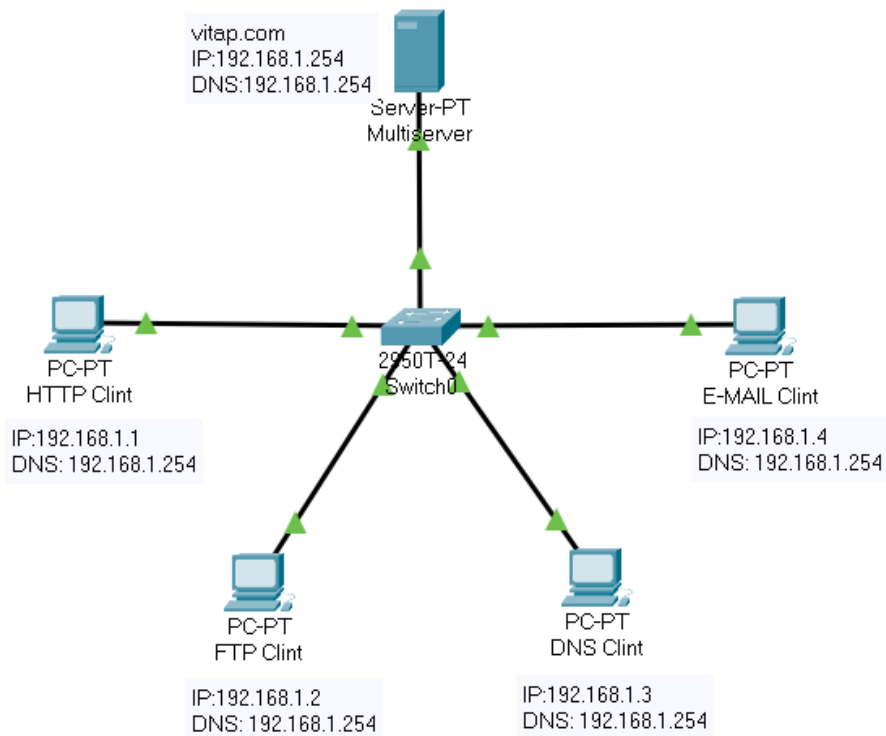
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The screenshot shows the 'Multiserver' configuration window with the 'Desktop' tab selected. The window contains three main configuration sections:

- IP Configuration:** Includes radio buttons for 'DHCP' and 'Static' (selected). Fields for IPv4 Address (192.168.1.254), Subnet Mask (255.255.255.0), Default Gateway (0.0.0.0), and DNS Server (192.168.1.254).
- IPv6 Configuration:** Includes radio buttons for 'Automatic' and 'Static' (selected). Fields for IPv6 Address (empty), Link Local Address (FE80::2D0:D3FF:FE4C:643E), Default Gateway (empty), and DNS Server (empty).
- 802.1X:** Includes a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' (MD5), and fields for 'Username' and 'Password' (both empty).

At the bottom left, there is a checkbox labeled 'Top'.

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The screenshot shows the 'Multiserver' configuration window in Cisco Packet Tracer, specifically the 'Services' tab. On the left, a 'SERVICES' list includes HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The 'HTTP' service is selected, and its configuration is shown on the right. Both 'HTTP' and 'HTTPS' are set to 'On'. Below this is a 'File Manager' table listing five files: copyrights.html, cscoptlogo177x111.jpg, helloworld.html, image.html, and index.html. Each file has 'edit' and 'delete' links. At the bottom right are 'New File' and 'Import' buttons. A 'Top' link is at the bottom left.

	File Name	Edit	Delete
1	copyrights.html	(edit)	(delete)
2	cscoptlogo177x111.jpg		(delete)
3	helloworld.html	(edit)	(delete)
4	image.html	(edit)	(delete)
5	index.html	(edit)	(delete)

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 Multiserver

PhysicalConfigServicesDesktopProgrammingAttributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type ARecord

Address

AddSaveRemove

No.	Name	Type	Detail
0	vitap.com	ARecord	192.168.1.254

DNS Cache

☐ Top

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The screenshot shows the 'Multiserver' configuration window in Cisco Packet Tracer. The 'Services' tab is selected, and the 'FTP' service is configured. The 'Service' is set to 'On'. The 'User Setup' section includes a table with one user named 'cisco' having the password 'cisco' and permissions 'RWDNL'. The 'File' section lists four files: 'asa842-k8.bin', 'asa923-k8.bin', 'c1841-advipservicesk9-mz.124-15.T1.bin', and 'c1841-inbase-mz.123-14.T7.bin'. A 'Top' button is located at the bottom left.

SERVICES

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

FTP

Service ☒ On ☐ Off

User Setup

Username Password

☐ Write ☐ Read ☐ Delete ☐ Rename ☐ List

	Username	Password	Permission
1	cisco	cisco	RWDNL

Add Save Remove

File

1	asa842-k8.bin
2	asa923-k8.bin
3	c1841-advipservicesk9-mz.124-15.T1.bin
4	c1841-inbase-mz.123-14.T7.bin

Remove

☐ Top

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Multiserver

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: vitap.com

User Setup

User Password

vitap
cisco

☐ Top

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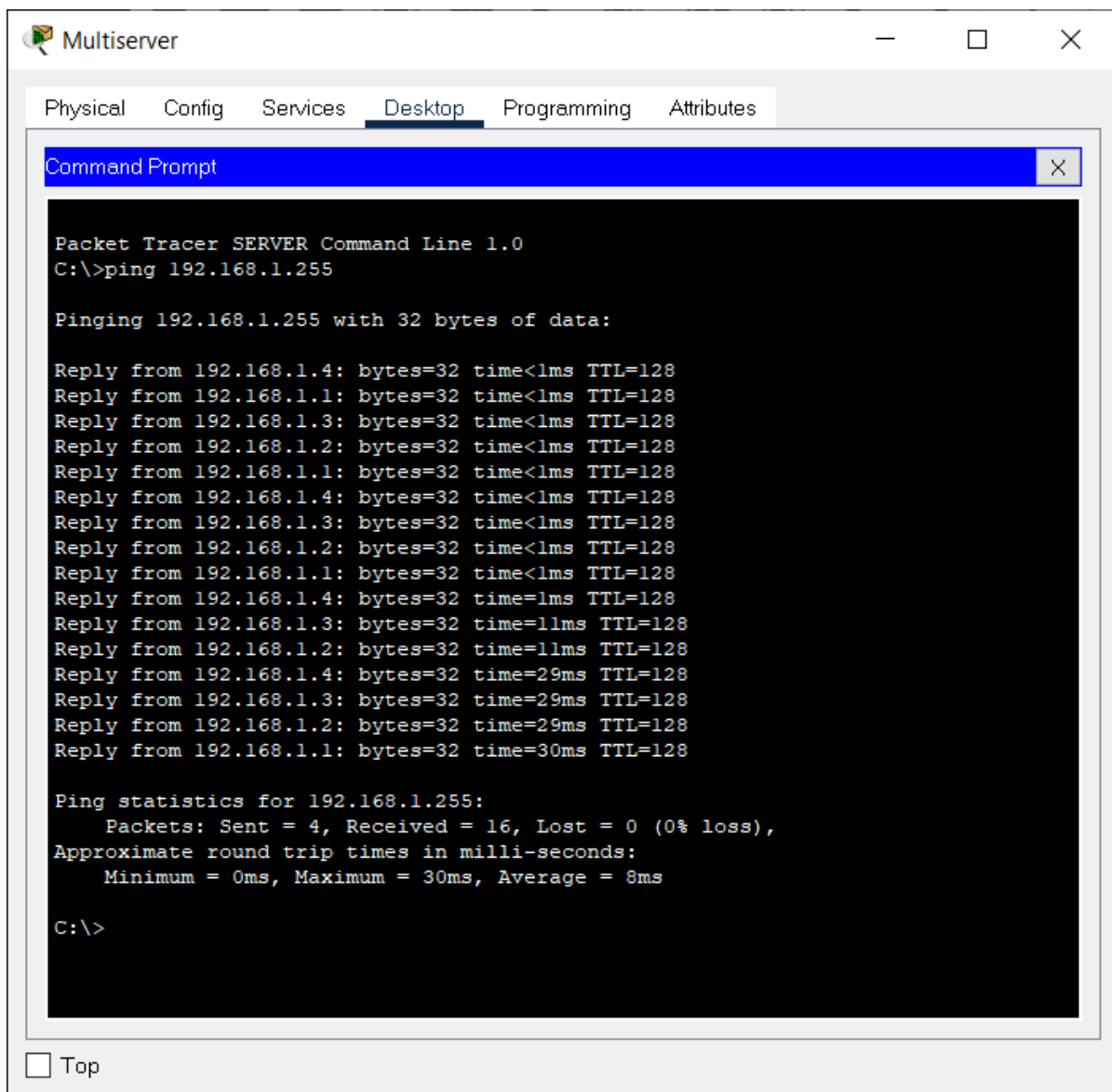
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The screenshot shows the Multiserver application window with the Desktop tab selected. A Command Prompt window is open, displaying the output of a ping command. The output shows 16 successful replies from various IP addresses in the 192.168.1.0/24 network, all with a TTL of 128. The ping statistics indicate 4 packets sent, 16 received, and 0% loss, with an average round trip time of 8ms.

```
Packet Tracer SERVER Command Line 1.0
C:\>ping 192.168.1.255

Pinging 192.168.1.255 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=11ms TTL=128
Reply from 192.168.1.2: bytes=32 time=11ms TTL=128
Reply from 192.168.1.4: bytes=32 time=29ms TTL=128
Reply from 192.168.1.3: bytes=32 time=29ms TTL=128
Reply from 192.168.1.2: bytes=32 time=29ms TTL=128
Reply from 192.168.1.1: bytes=32 time=30ms TTL=128

Ping statistics for 192.168.1.255:
    Packets: Sent = 4, Received = 16, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 30ms, Average = 8ms

C:\>
```

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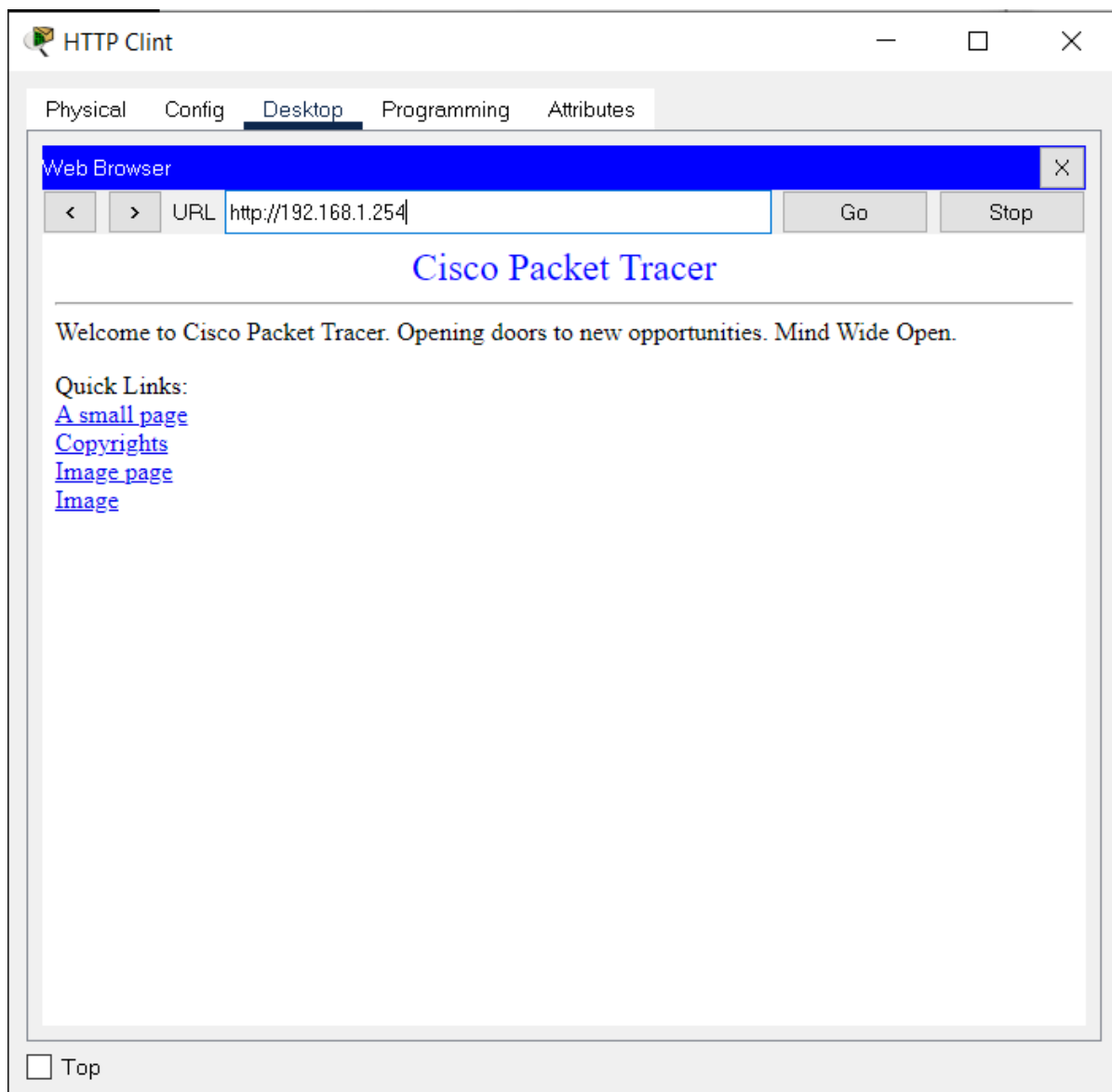
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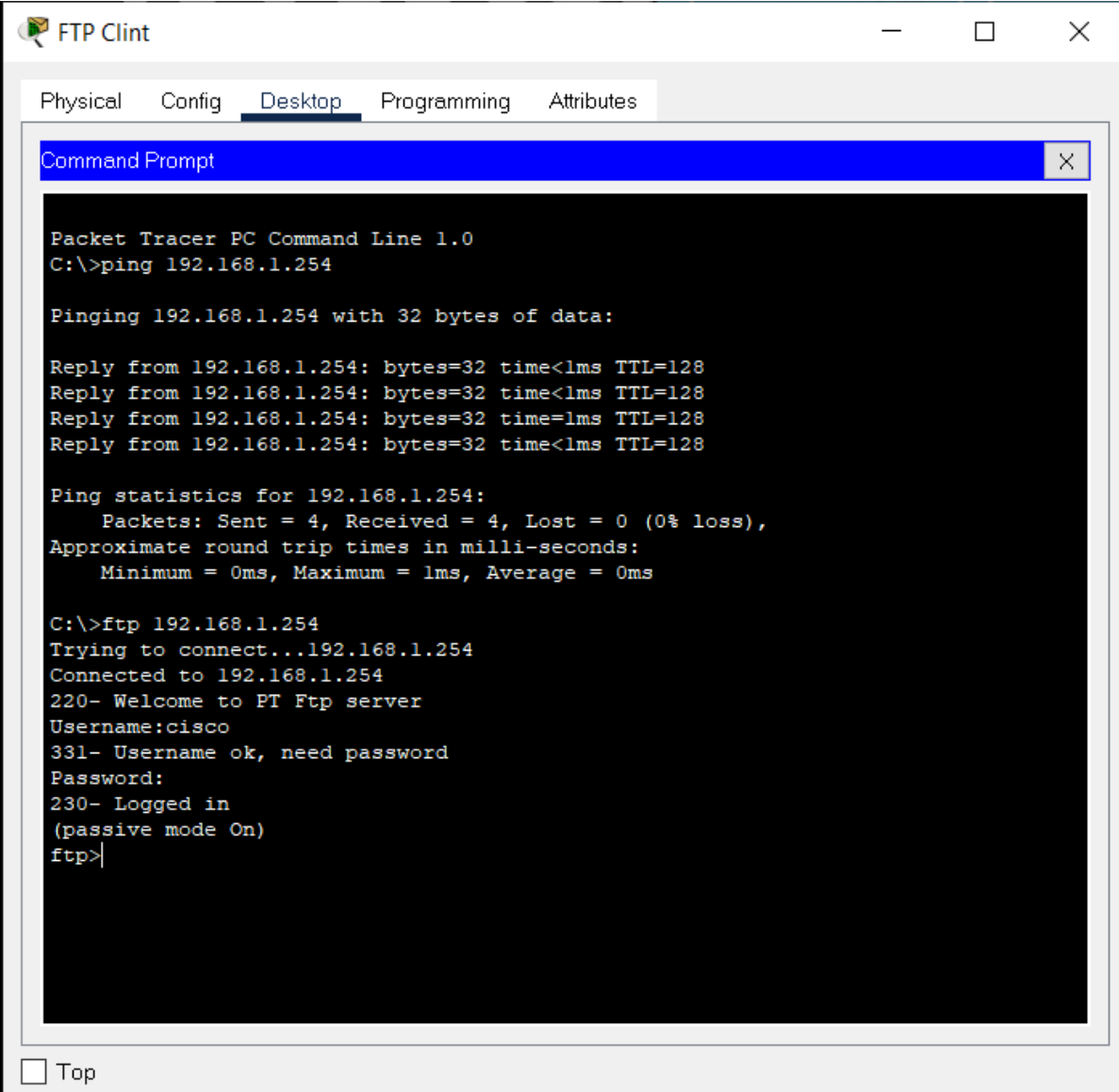
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The screenshot shows the Packet Tracer Desktop tab with a Command Prompt window open. The window title is 'Command Prompt'. The text inside the window is as follows:

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.254

Pinging 192.168.1.254 with 32 bytes of data:

Reply from 192.168.1.254: bytes=32 time<1ms TTL=128
Reply from 192.168.1.254: bytes=32 time<1ms TTL=128
Reply from 192.168.1.254: bytes=32 time=1ms TTL=128
Reply from 192.168.1.254: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ftp 192.168.1.254
Trying to connect...192.168.1.254
Connected to 192.168.1.254
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

At the bottom left of the window, there is a 'Top' button with a small square icon next to it.

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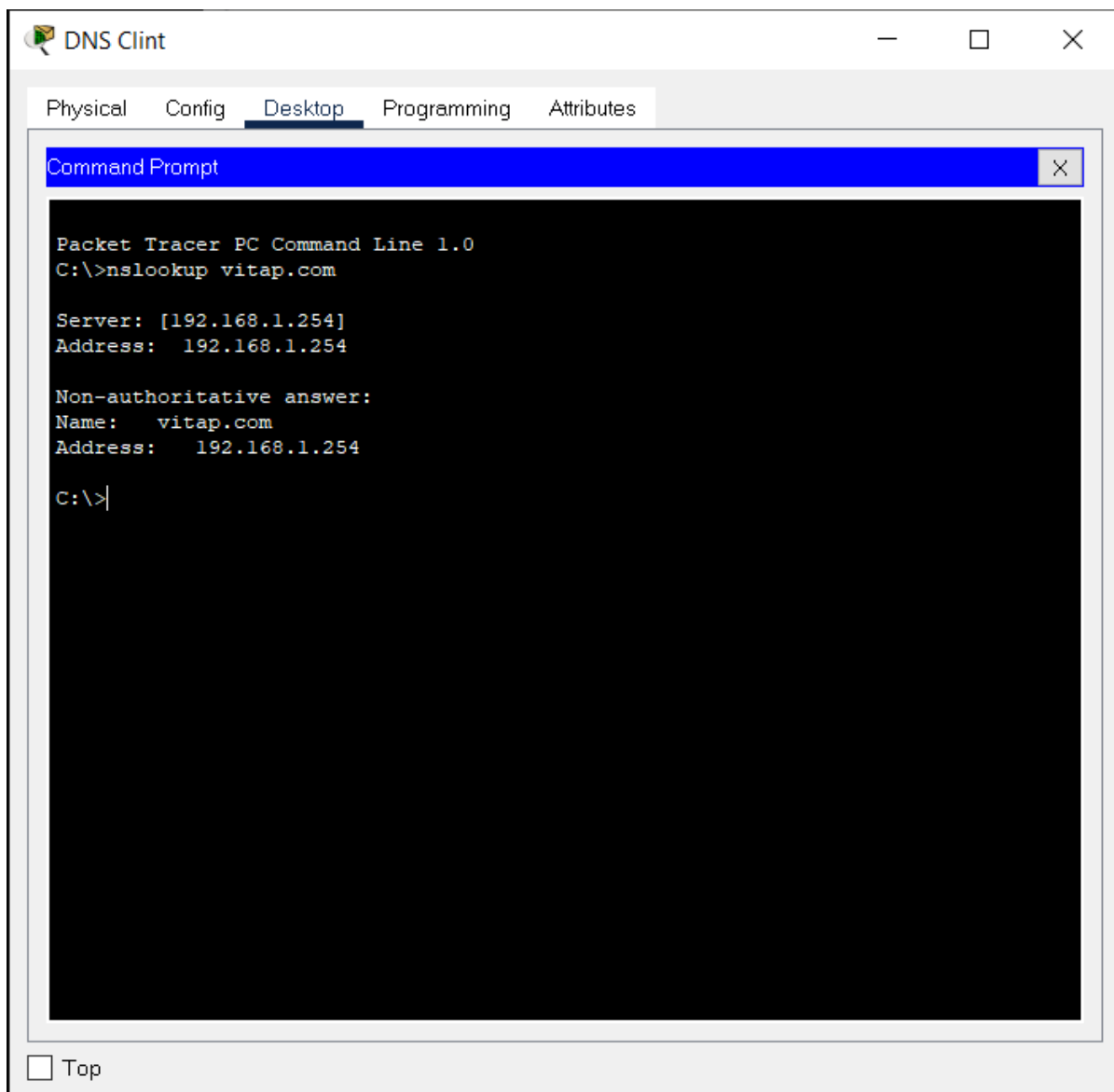
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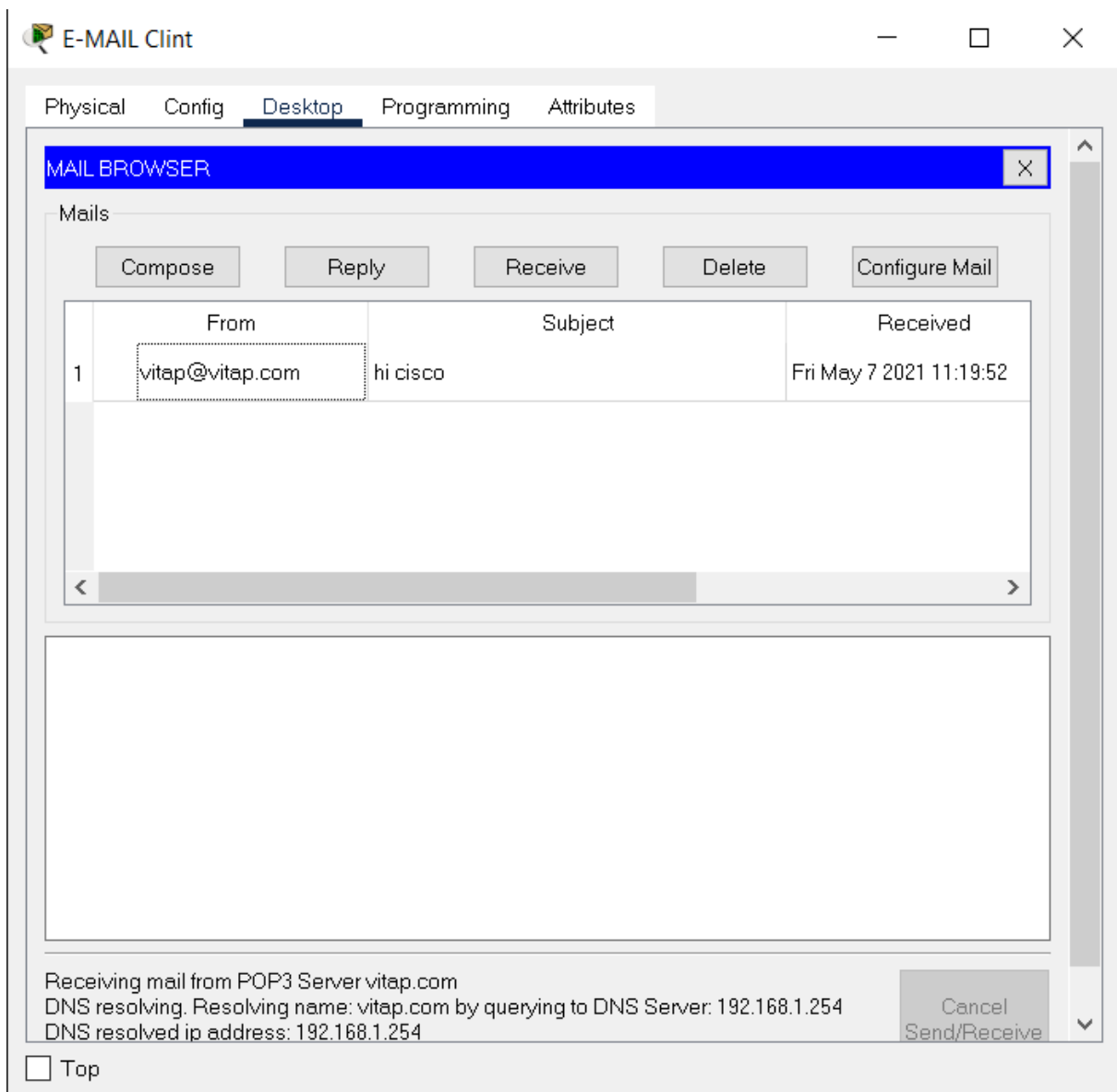
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Simulation:

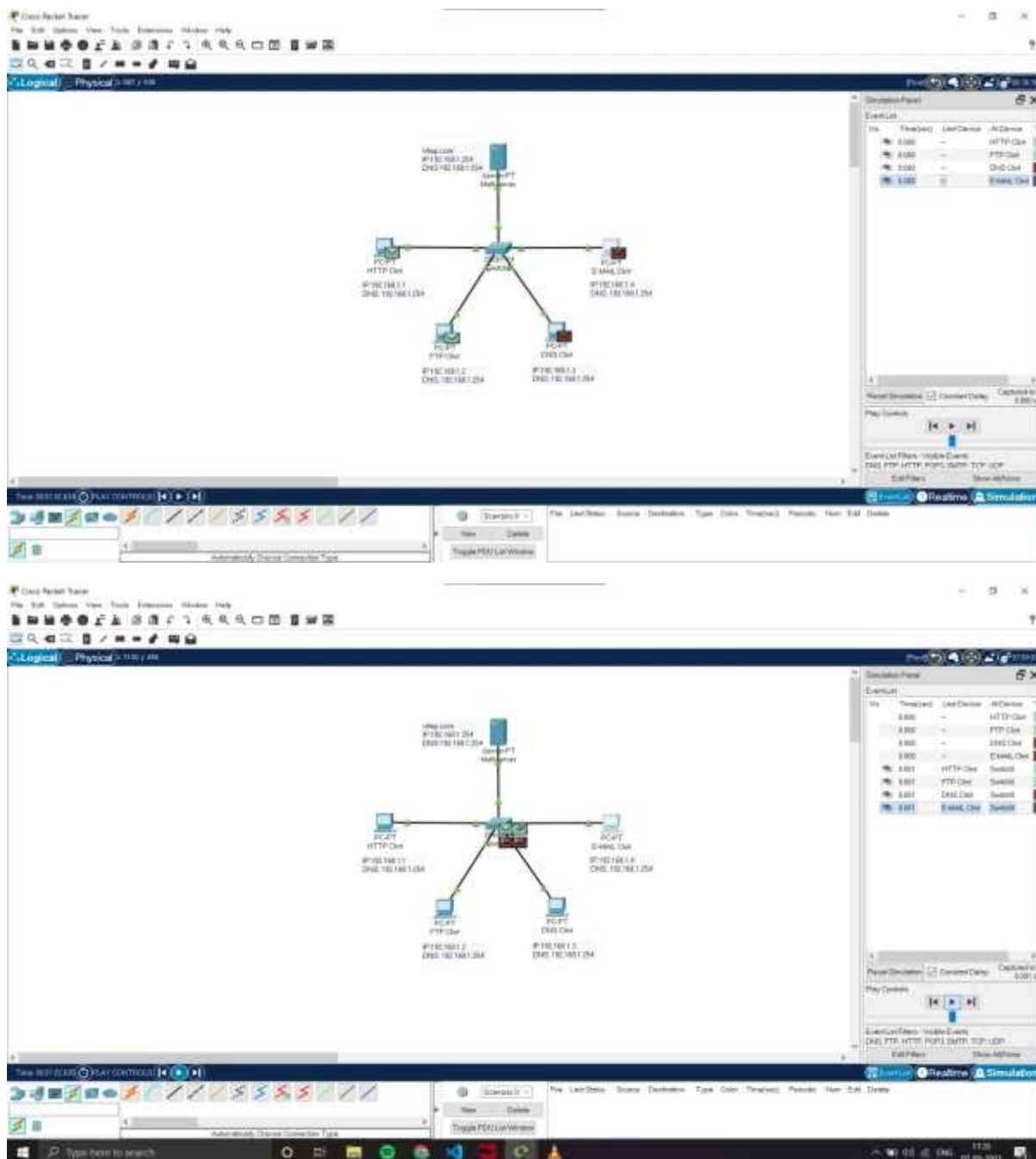
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