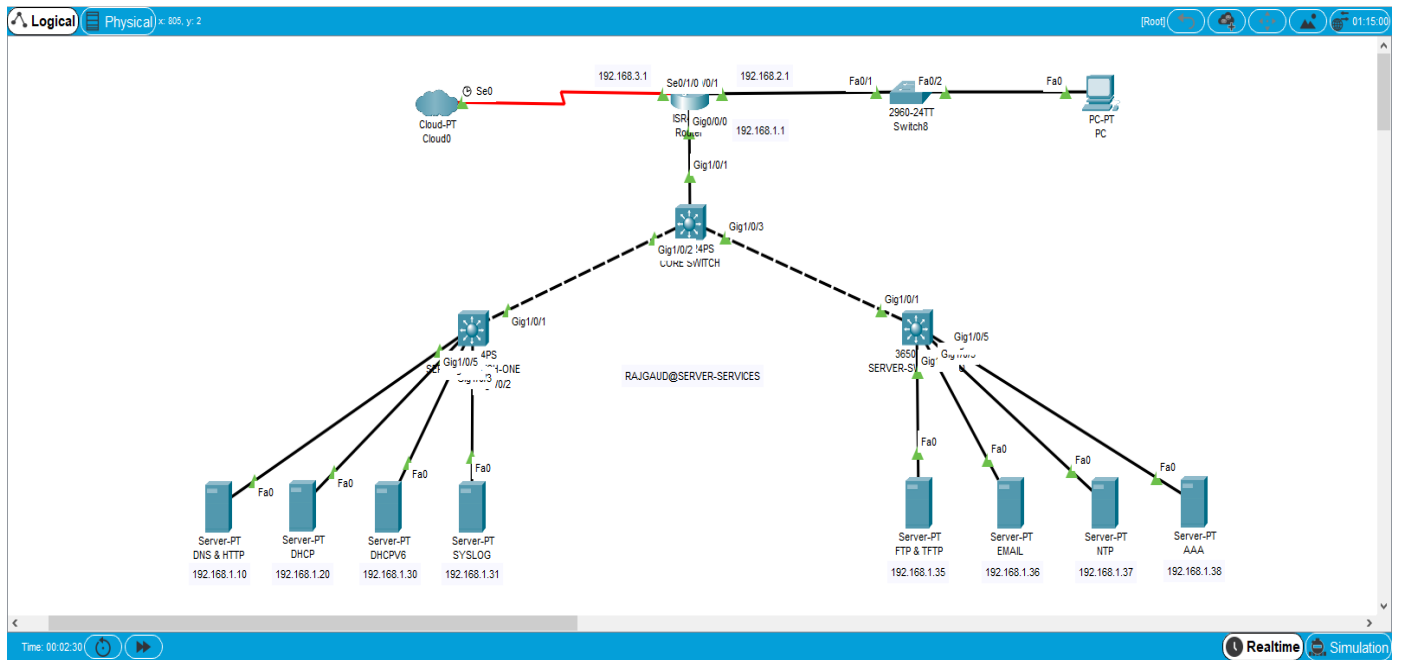


# ENTERPRISE SERVER SERVICES

This project showcases the successful configuration and integration of various essential server services like DNS, HTTP, DHCP, Email, Syslog, and more. The topology features a dedicated server for each service, all operating within the 192.168.1.0/24 network.



## Topology

The network topology consists of a main router acting as the default gateway (192.168.1.1), a central switch, and multiple servers, each providing a specific service.

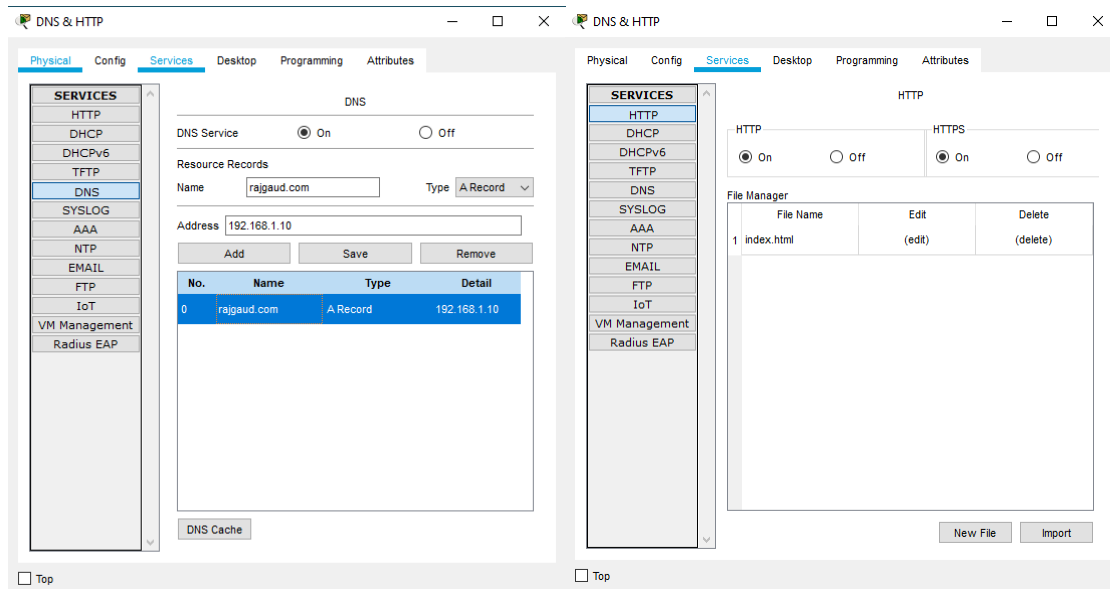
- **ISP** - Cloud-PT \* 1
- **Router** - 4331 \* 1
- **Multilayer Switches** - 3650 24PS \* 3
- **Switch** – 2960-24TT \* 1
- **PC** - End Devices \* 1
- **Servers** - Server-PT \* 8

## Server Services

DNS | HTTP | DHCP | DHCPV6 | Syslog | FTP | TFTP | Email | NTP | AAA

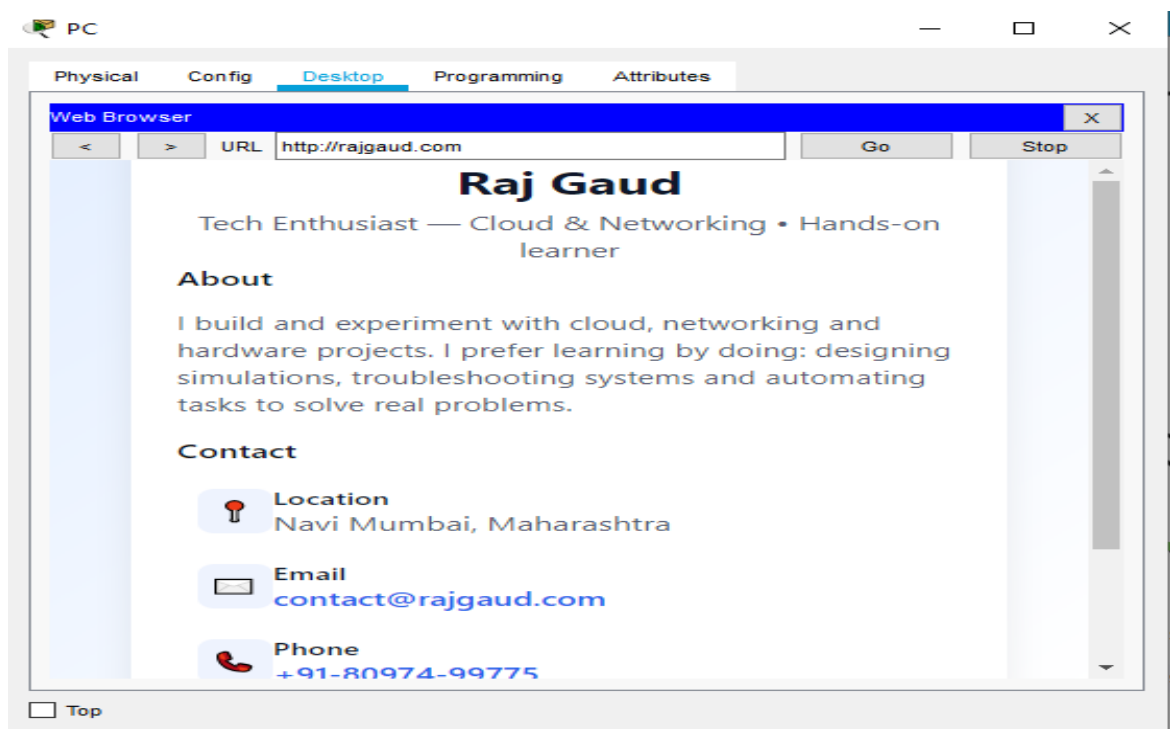
# SERVER SERVICES CONFIG

## 1. DNS and HTTP Server (192.168.1.10)



**Purpose:** The DNS service translates domain names to IP addresses, while the HTTP service hosts a basic webpage.

**Verify:**



## 2. DHCP Server (192.168.1.20)

The screenshot shows the DHCP configuration window. On the left, a sidebar lists services: HTTP, DHCP (selected), DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The main area is titled 'DHCP' and contains the following fields:

- Interface: FastEthernet0
- Service: ☒ On, ☐ Off
- Pool Name: serverPool
- Default Gateway: 192.168.1.1
- DNS Server: 192.168.1.10
- Start IP Address: 192, 168, 1, 30
- Subnet Mask: 255, 255, 255, 0
- Maximum Number of Users: 50
- TFTP Server: 0.0.0.0
- WLC Address: 0.0.0.0

Below these fields are buttons for 'Add', 'Save', and 'Remove'. A table at the bottom lists the configured pool:

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	192.168.1.1	192.168.1.10	192.168.1.30	255.255.255.0	50	0.0.0.0	0.0.0.0

**Purpose:** The DHCP server automatically assigns IPv4 addresses to clients on the network.

**Verify:**

The screenshot shows the IP Configuration window. The 'Desktop' tab is selected, and the 'IP Configuration' sub-tab is active. The window displays the following configuration:

- IP Configuration: ☒ DHCP, ☐ Static
- DHCP request successful.
- IPv4 Address: 192.168.1.30
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1
- DNS Server: 192.168.1.10

**Note:** First Go to DHCP Server > Desktop > IP Configuration > IPV4 > Static

- Static IP Address: 192.168.1.20
- Subnet: 255.255.255.0
- Default Gateway: 192.168.1.1
- DNS Server: 192.168.1.10

### 3. DHCPv6 Server (192.168.1.30)

The screenshot shows the DHCPv6 configuration window. On the left is a 'SERVICES' sidebar with options like HTTP, DHCP, DHCPv6 (selected), TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The main panel has tabs for Physical, Config, Services, Desktop, Programming, and Attributes. Under the 'Services' tab, the 'DHCPv6' section is active. It shows the 'Interface' set to 'FastEthernet0' and the 'Service' status as 'On'. Below this, the 'DHCPv6 Pool' section shows 'Pool List' as 'DHCPool' with 'Create Pool' and 'Remove Pool' buttons. The 'DNS Server' is set to '2001:DB8:1::2' and the 'Domain Name' is empty. The 'IPv6 Address Prefix' table is as follows:

Prefix	Prefix Length	Valid Lifetime	Preferred Lifetime
2001:DB8:1::	64	2592000	604800

Below the table are 'Create', 'Edit', and 'Remove' buttons. The 'IPv6 Prefix-Delegation' section has a table with columns: Prefix, DUID, Local Pool, Valid Lifetime, Preferred Lifetime, and buttons for Create, Edit, and Remove. The 'IPv6 Local Pool' section has a table with columns: Pool Name, Prefix, Prefix Length, and buttons for Create, Edit, and Remove.

**Purpose:** The DHCP server automatically assigns IPv6 addresses to clients on the network.

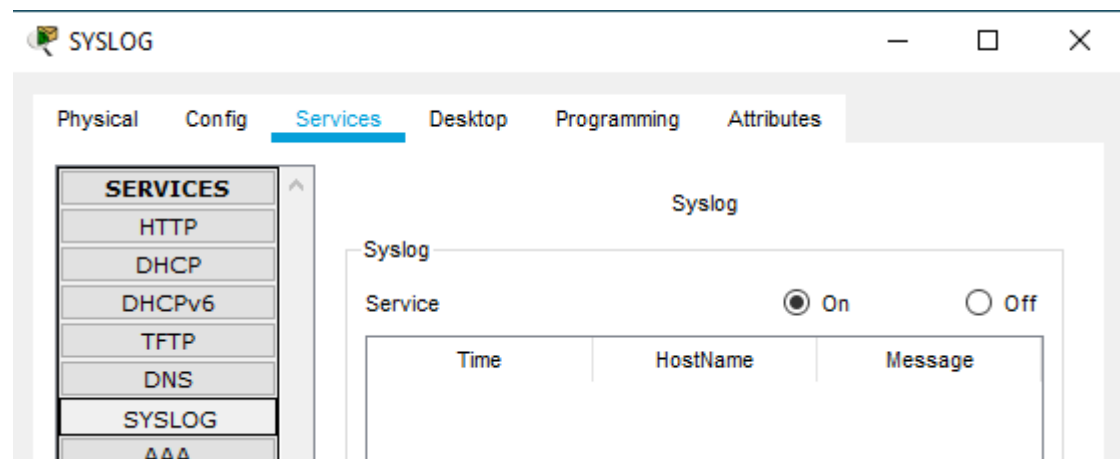
**Verify:**

The screenshot shows the SYSLOG configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing 'DHCP' as the selected option. The 'IPv4 Configuration' section shows 'DHCP' selected, with fields for IPv4 Address (192.168.1.31), Subnet Mask (255.255.255.0), Default Gateway (192.168.1.1), and DNS Server (192.168.1.10). The 'IPv6 Configuration' section shows 'Automatic' selected, with fields for IPv6 Address (2001:DB8:1:0:AC8F:805A:72C8:6526), Link Local Address (FE80::20C:CFFF:FE3A:E5ED), Default Gateway (FE80::20D:B0FF:FED6:CAA), and DNS Server (2001:DB8:1::2). The '802.1X' section shows 'Use 802.1X Security' unchecked, with 'Authentication' set to 'MD5' and empty fields for Username and Password. A message 'DHCP request successful.' is displayed at the top right of the configuration area.

**Note:** First Go to DHCPv6 Server > Desktop > IP Configuration > IPV6 > Static >

- Static IP Address: 2001:DB8:1::2
- Default Gateway: 2001:DB8:1::1
- DNS Server: 2001:DB8:1::2

## 4. Syslog Server (192.168.1.31)

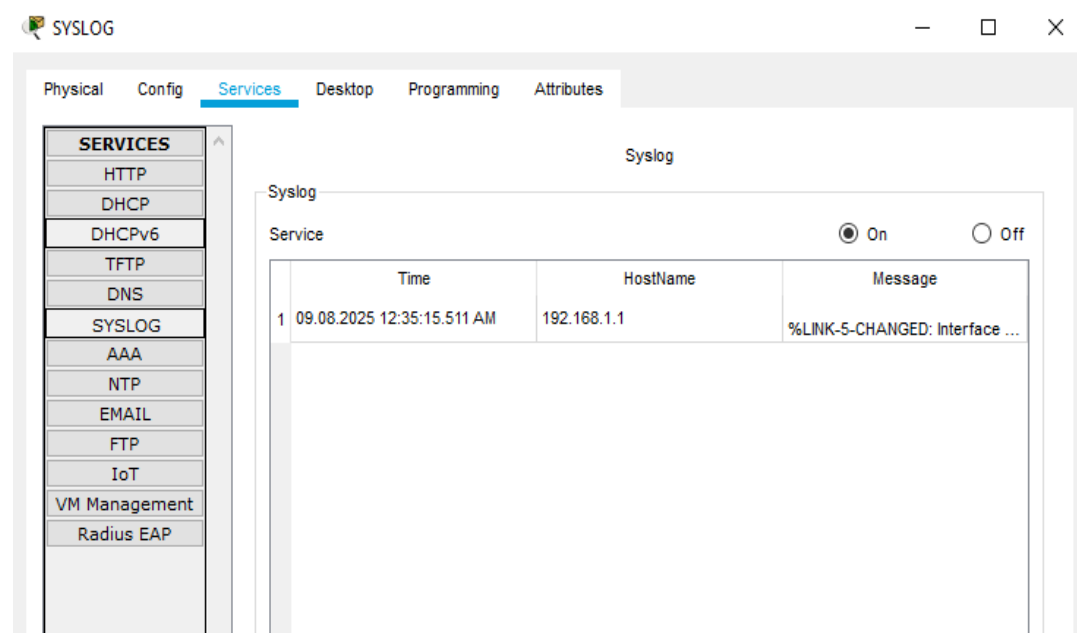


Enable Syslog at #Router:

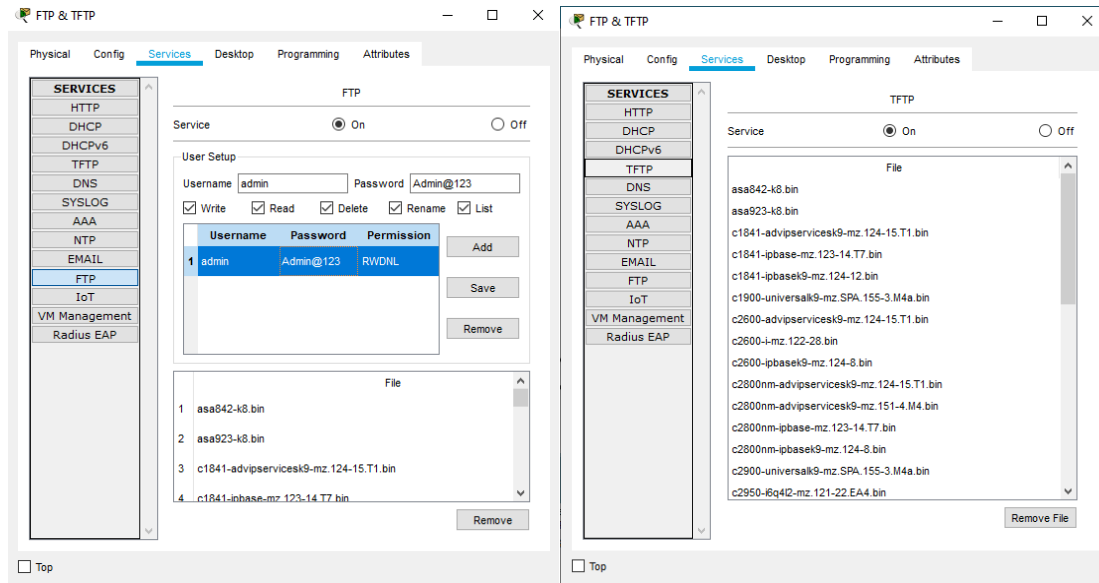
```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#logging 192.168.1.31
Router(config)#logging trap debugging
Router(config)#service timestamps log datetime msec
Router(config)#ex
Router#
*Sep 08, 00:33:14.3333: SYS-5-CONFIG_I: Configured from console by
console
*Sep 08, 00:33:14.3333: %SYS-6-LOGGINGHOST_STARTSTOP: Logging to
host 192.168.1.31 port 514 started - CLI initiated
Router#
```

**Purpose:** Centralizes log messages from network devices for easier monitoring and troubleshooting.

**Verify:**

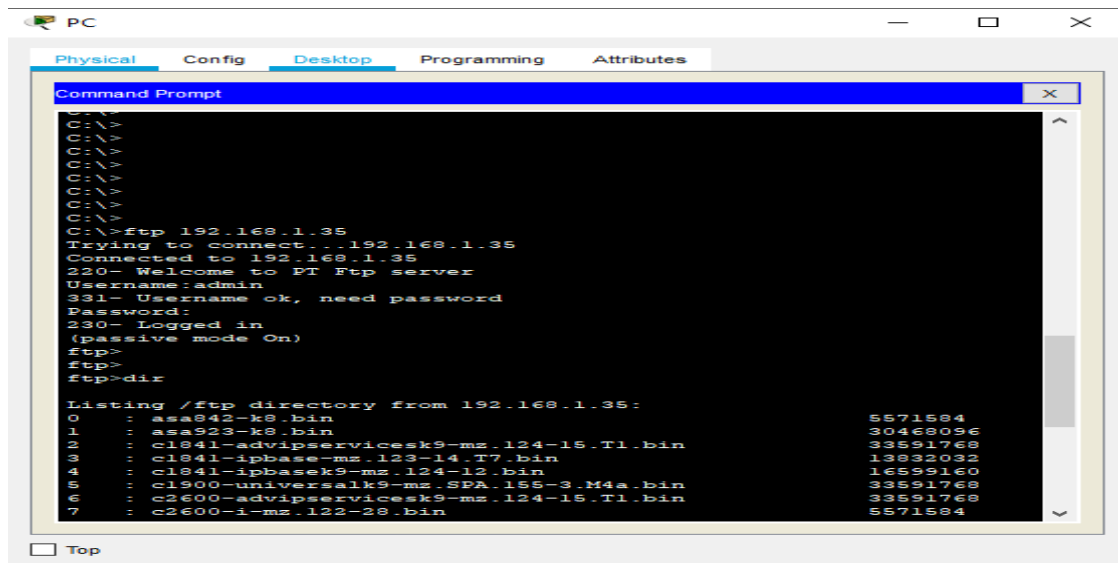


## 5. FTP and TFTP Server (192.168.1.35)



**Purpose:** FTP (File Transfer Protocol) allows for file transfers, while TFTP (Trivial File Transfer Protocol) is used for basic, unauthenticated file transfers, often for device configuration backups.

**Verify:**

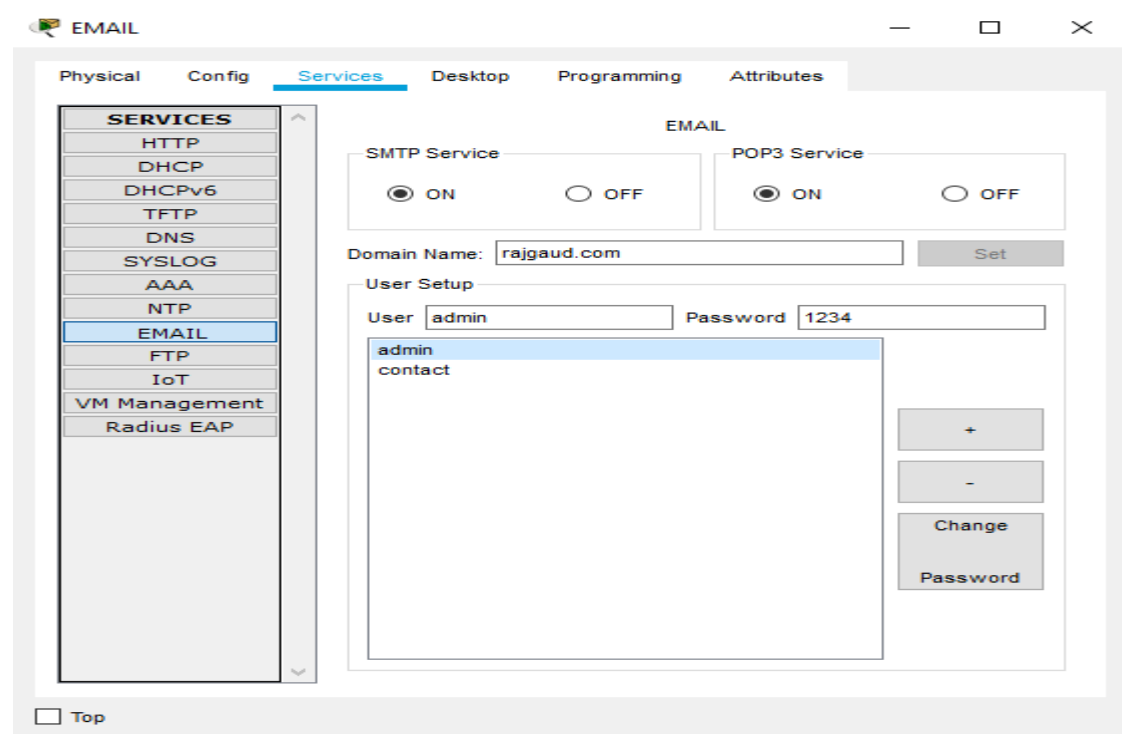


```
Router>en
Router#
Router#
Router#copy running-config tftp
Address or name of remote host [?: 192.168.1.35
Destination filename [Router-config]? backup.cfg

Writing running-config...!!
[OK - 1103 bytes]

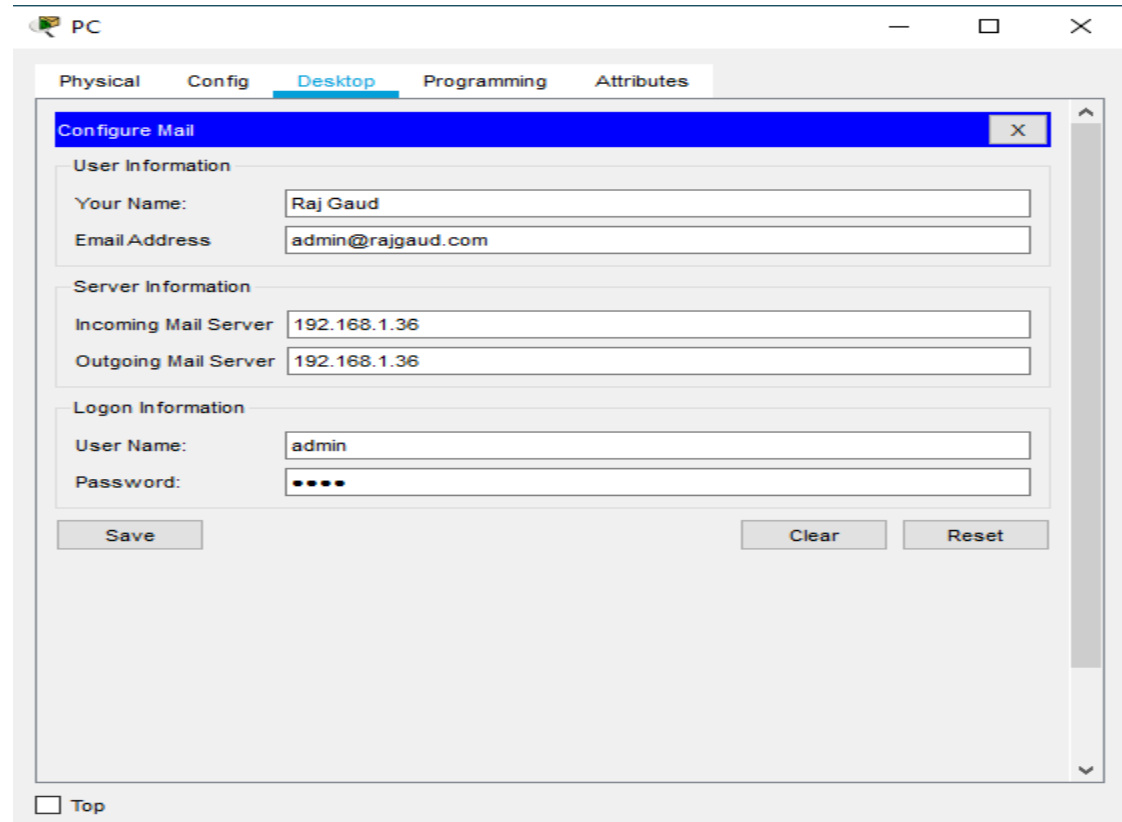
1103 bytes copied in 0.001 secs (1103000 bytes/sec)
Router#
```

## 6. Email Server (192.168.1.36)



The screenshot shows the 'EMAIL' configuration window with the 'Services' tab selected. On the left, a list of services includes HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL (highlighted), FTP, IoT, VM Management, and Radius EAP. The main area is titled 'EMAIL' and contains two sections: 'SMTP Service' and 'POP3 Service'. Both services have radio buttons for 'ON' (selected) and 'OFF'. Below these, the 'Domain Name' is set to 'rajgaud.com' with a 'Set' button. The 'User Setup' section shows a 'User' field with 'admin' and a 'Password' field with '1234'. Below the password field is a list box containing 'admin' and 'contact', with 'admin' selected. To the right of the list box are buttons for '+', '-', 'Change', and 'Password'. At the bottom left is a 'Top' button.

Configured Email Server > PC > Desktop > EMAIL > Configure Mail

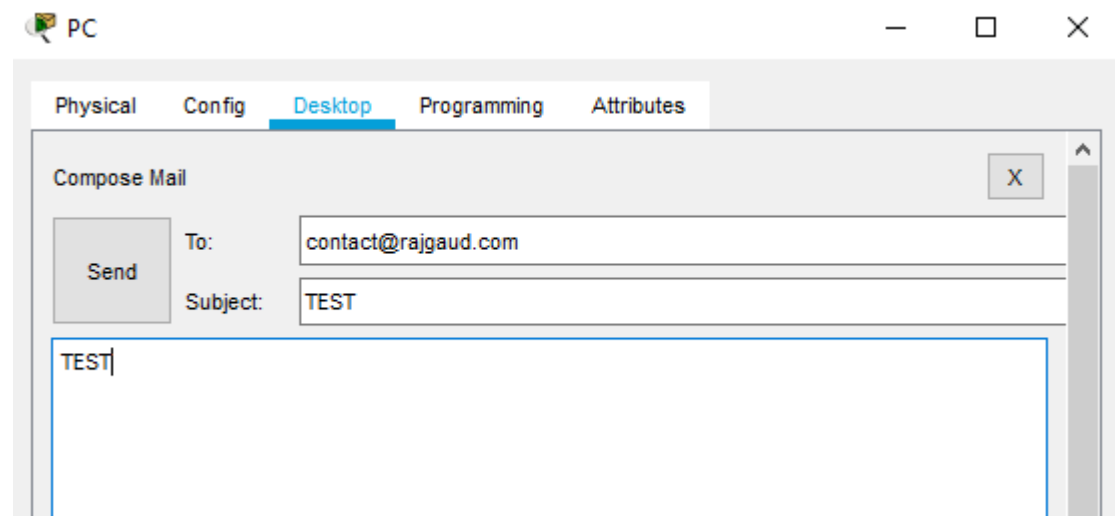


The screenshot shows the 'PC' configuration window with the 'Desktop' tab selected. A 'Configure Mail' dialog box is open, featuring three sections: 'User Information', 'Server Information', and 'Logon Information'. The 'User Information' section has fields for 'Your Name' (Raj Gaud) and 'Email Address' (admin@rajgaud.com). The 'Server Information' section has fields for 'Incoming Mail Server' (192.168.1.36) and 'Outgoing Mail Server' (192.168.1.36). The 'Logon Information' section has fields for 'User Name' (admin) and 'Password' (masked with dots). At the bottom of the dialog are 'Save', 'Clear', and 'Reset' buttons. A 'Top' button is located at the bottom left of the main window.

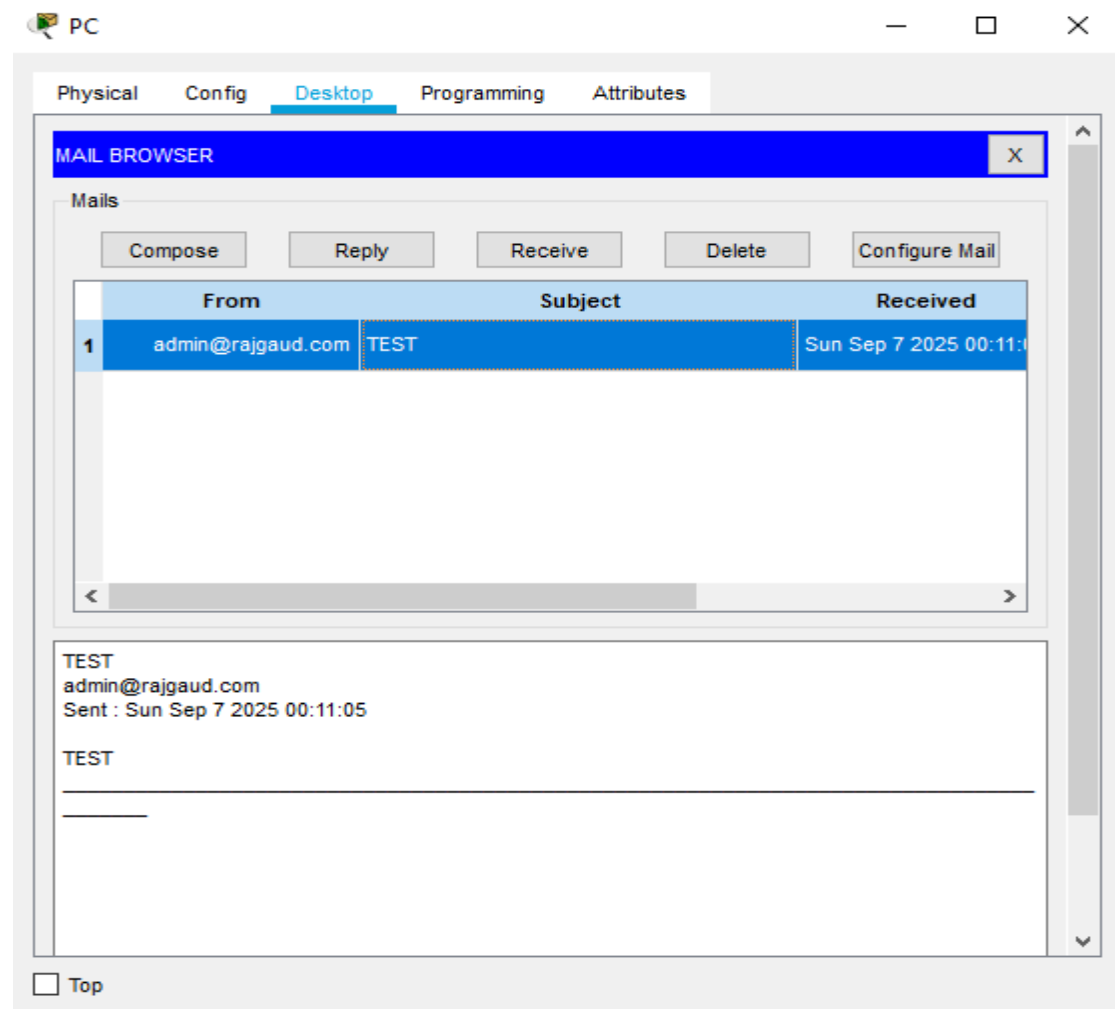
**Purpose:** Hosts and manages email accounts for clients on the network.

### Verify:

Sent from [admin@rajgaud.com](mailto:admin@rajgaud.com) to [contact@rajgaud.com](mailto:contact@rajgaud.com)



Email successfully received at [contact@rajgaud.com](mailto:contact@rajgaud.com)





## 7. NTP Server (192.168.1.37)

The screenshot shows a network management interface with a window titled "NTP". The window has tabs for "Physical", "Config", "Services", "Desktop", "Programming", and "Attributes". The "Services" tab is active. On the left, a "SERVICES" list includes HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP (highlighted), EMAIL, FTP, IoT, VM Management, and Radius EAP. The main area shows the "NTP" service configuration. The "Service" is set to "On". Under "Authentication", "Disable" is selected. There are input fields for "Key:" and "Password:". Below this is a calendar for "September, 2025" showing dates from 25 to 5. A time display shows "08:52:58AM". At the bottom left, there is a "Top" button.

Mon	Tue	Wed	Thu	Fri	Sat	Sun
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

**Purpose:** Synchronizes the time across all network devices, which is crucial for logging and time-sensitive operations.

### Verify:

1. Configure NTP Client:

```
Router>en
Router#conf t
Router(config)#ntp server 192.168.1.37
```

2. Verify Synchronization:

```
Router#show ntp status
Router#show clock
```

## 8. AAA Server (192.168.1.38)

The screenshot shows the 'Services' tab of a configuration window. On the left, a list of services includes HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA (selected), NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The main area is titled 'AAA' and contains the following sections:

- Service:** A toggle switch set to 'On' and a 'Radius Port' field with the value '1645'.
- Network Configuration:**
  - Client Name:** 'Router 1', **Client IP:** '192.168.1.1', **Secret:** 'aaa1234', **ServerType:** 'Radius'.
  - A table with columns 'Client Name', 'Client IP', 'Server Type', and 'Key'. It contains one entry: '1 Router 1 192.168.1.1 Radius aaa1234'. Buttons for 'Add', 'Save', and 'Remove' are to the right.
- User Setup:**
  - Username:** 'rajgaud', **Password:** '1234'.
  - A table with columns 'Username' and 'Password'. It contains one entry: '1 rajgaud 1234'. Buttons for 'Add', 'Save', and 'Remove' are to the right.

At the bottom left, there is a 'Top' button.

Config AAA on Router:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#aaa new-model
Router(config)#radius-server host 192.168.1.38 key aaal234
Router(config)#aaa authentication login default group radius local
Router(config)#line vty 0 4
Router(config-line)#login authentication default
Router(config-line)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

**Purpose:** Provides Authentication, Authorization, and Accounting services for secure network access.

**Verify:**

The screenshot shows two windows side-by-side. The left window is a 'PC' window with a 'Command Prompt' showing a telnet session to 192.168.1.1. The right window is a 'Router' window with a 'CLI' tab showing the 'IOS Command Line Interface'.

**PC Command Prompt:**

```
C:\>
C:\>
C:\>
C:\>telnet 192.168.1.1
Trying 192.168.1.1 ...Open

User Access Verification

Username: rajgaud
Password:
Router>
Router>
Router>
Router>
Router>ex

[Connection to 192.168.1.1 closed by foreign host]
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
```

**Router CLI:**

```
Press RETURN to get started!

User Access Verification

Username: rajgaud
Password:
Router>
Router>
Router>
Router>
Router>
```

At the bottom of the Router window, there is a 'Top' button and 'Copy' and 'Paste' buttons.

## Conclusion

This project successfully demonstrates the integrated configuration of various server services within a single enterprise network topology. By setting up dedicated servers for DNS, HTTP, DHCP, DHCPv6, Syslog, FTP, Email, NTP, and AAA, I have built a strong and functional network environment. This setup not only proves that each service works properly on its own but also shows how they come together to support a secure, efficient, and well-managed network. The successful testing of features like dynamic IP assignment, time synchronization, and file transfers further confirms the practical use of these key networking concepts.

**Download Link:** [rajpgaud.com/servers.pkt](https://rajpgaud.com/servers.pkt)

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