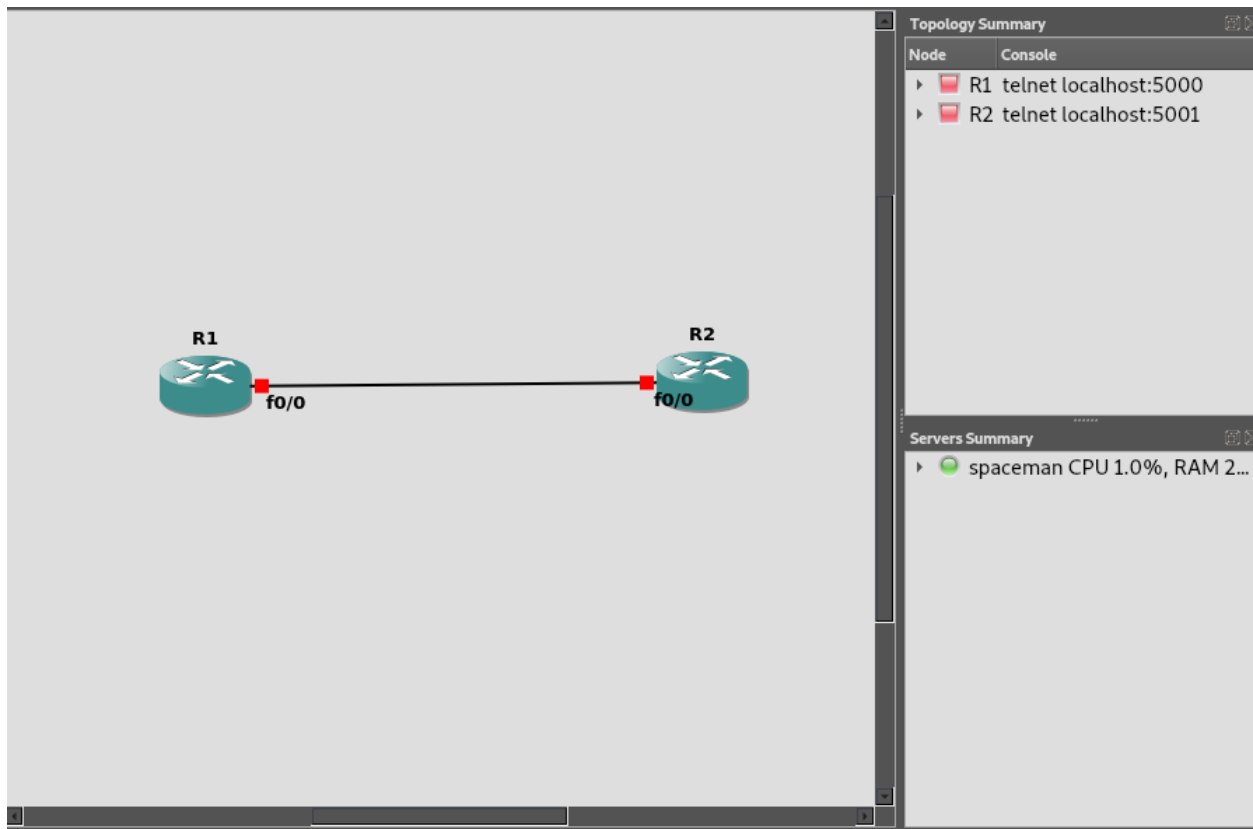


**Q1.** Configure the below topology to setup DNS server. R1 will use R2 as DNS server to make DNS resolutions. First, let's begin with R1. We will setup hostname and IP related information.



## R1 configuration:

```
R1#enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#hostname R1
R1(config)#interface f0/0
R1(config-if)#ip address 10.10.10.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar  1 00:03:07.679: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:03:08.679: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#write
^
% Invalid input detected at '^' marker.

R1(config-if)#do wr
Building configuration...
[OK]
R1(config-if)#end
R1#
*Mar  1 00:03:35.907: %SYS-5-CONFIG_I: Configured from console by console
R1#
```

## R2 configuration:

```
R2#enable
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#hostname R2
R2(config)#interface f0/0
R2(config-if)#ip address 10.10.10.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#
*Mar 1 00:05:14.295: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:05:15.295: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config-if)#do wr
Building configuration...
[OK]
R2(config-if)#end
R2#
*Mar 1 00:05:41.255: %SYS-5-CONFIG_I: Configured from console by console
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dns server
R2(config)#ip host loopback.R2.com 2.2.2.2
R2(config)#interface loopback 1
R2(config-if)#
*Mar 1 00:07:48.271: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#end
R2#
*Mar 1 00:08:10.971: %SYS-5-CONFIG_I: Configured from console by console
R2#
```

```
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#end
R2#
*Mar 1 00:15:29.791: %SYS-5-CONFIG_I: Configured from console by console
R2#ping loopback.R2.com

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
R2#
```

## R1 configuration again

```
R1#enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip domain lookup
R1(config)#ip name-server 10.10.10.2
R1(config)#ip route 0.0.0.0 0.0.0.0 10.10.10.2
R1(config)#do wr
Building configuration...
[OK]
R1(config)#end
R1#
*Mar  1 00:17:25.255: %SYS-5-CONFIG_I: Configured from console by console
R1#ping loopback.R2.com repeat 3
Translating "loopback.R2.com"...domain server (10.10.10.2) [OK]
Type escape sequence to abort.
Sending 3, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!
Success rate is 100 percent (3/3), round-trip min/avg/max = 12/16/20 ms
R1#
```

## Wireshark output

The image shows the Wireshark network traffic capture window. The title bar indicates it is capturing from the interface [R1 FastEthernet0/0 to R2 FastEthernet0/0]. The menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. The toolbar contains icons for various functions like opening files, saving, and zooming.

The packet list pane shows a table of captured packets:

No.	Time	Source	Destination	Protocol	Length	Info
58	279.995627	c4:01:07:68:00:00	c4:01:07:68:00:00	LOOP	60	Reply
59	288.987699	c4:02:0a:00:00:00	c4:02:0a:00:00:00	LOOP	60	Reply
60	290.005287	c4:01:07:68:00:00	c4:01:07:68:00:00	LOOP	60	Reply
61	298.993464	c4:02:0a:00:00:00	c4:02:0a:00:00:00	LOOP	60	Reply
62	299.995078	c4:01:07:68:00:00	c4:01:07:68:00:00	LOOP	60	Reply
63	302.071098	c4:01:07:68:00:00	CDP/VTP/DTP/PagP/UD...	CDP	359	Device ID: R1 Port ID: Fa
64	304.277311	c4:02:0a:00:00:00	CDP/VTP/DTP/PagP/UD...	CDP	350	Device ID: R2 Port ID: Fa
65	308.478948	10.10.10.1	10.10.10.2	DNS	75	Standard query 0xd599 A 10
66	308.540037	c4:02:0a:00:00:00	Broadcast	ARP	60	Who has 10.10.10.1? Tell
67	308.542835	c4:01:07:68:00:00	c4:02:0a:00:00:00	ARP	60	10.10.10.1 is at c4:01:07
68	308.997709	c4:02:0a:00:00:00	c4:02:0a:00:00:00	LOOP	60	Reply
69	309.996284	c4:01:07:68:00:00	c4:01:07:68:00:00	LOOP	60	Reply
70	311.457624	10.10.10.1	10.10.10.2	DNS	75	Standard query 0xd599 A 10
71	311.468032	10.10.10.2	10.10.10.1	DNS	91	Standard query response 0

The packet details pane for the selected packet (Frame 1) shows:

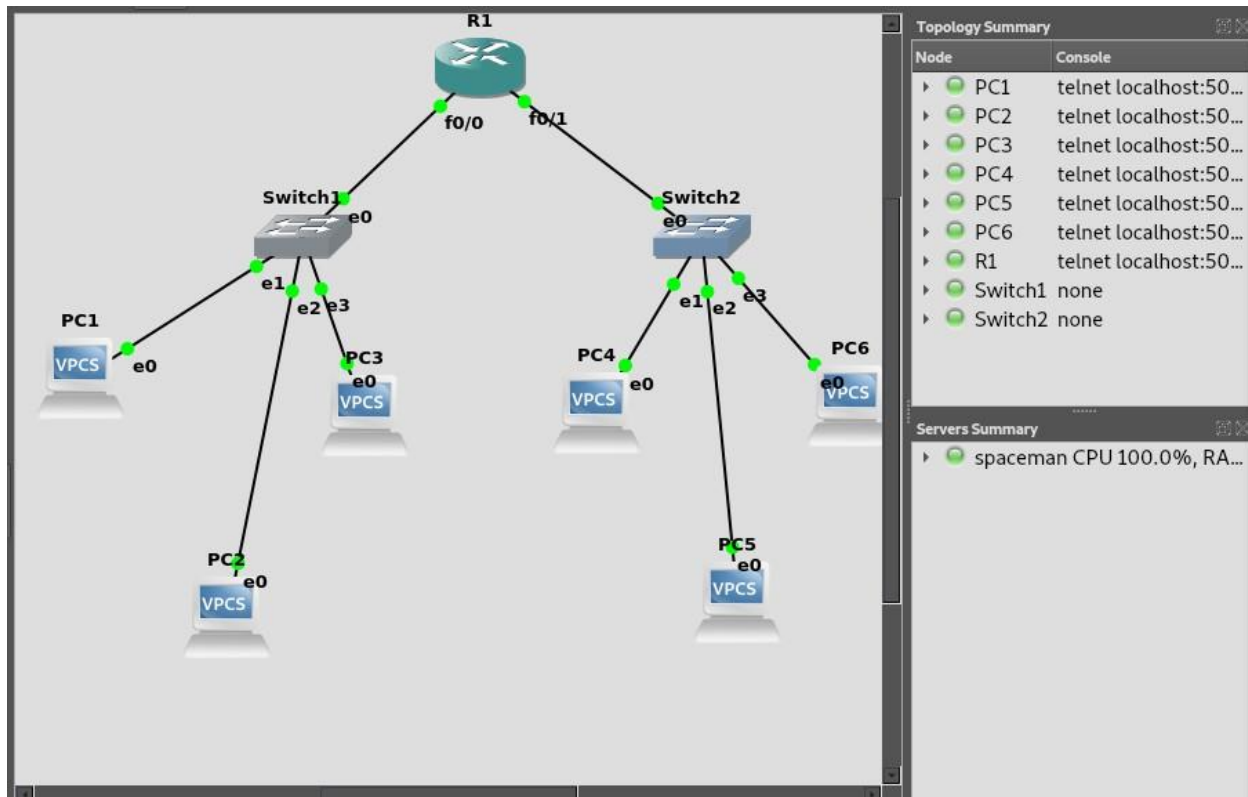
- Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface -, id 0
- Ethernet II, Src: c4:01:07:68:00:00 (c4:01:07:68:00:00), Dst: c4:01:07:68:00:00 (c4:01:07:68:00:00)
- Configuration Test Protocol (loopback)
- Data (40 bytes)

The packet bytes pane shows the raw data in hexadecimal and ASCII:

```
0000  c4 01 07 68 00 00 c4 01 07 68 00 00 90 00 00 00  ...h...h...
0010  01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0030  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
```

The status bar at the bottom indicates: Ready to load or capture | Packets: 72 - Displayed: 72 (100.0%) | Profile: Default

**Ques 2.** Configure the topology shown below DNS Server and DNS Client. Test the setup. Analyse the Interaction.



```
R1(config)#ip dns server
R1(config)#ip host loopback.R1.com 2.2.2.2
R1(config)#interface loopback 1
R1(config-if)#i
*Mar 1 00:31:15.739: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
R1(config-if)#ip address 2.2.2.2 255.255.255.255
R1(config-if)#end
R1#
*Mar 1 00:31:31.583: %SYS-5-CONFIG_I: Configured from console by console
R1#ping loopback.R1.com

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip host pp.PC2.com 10.0.0.4
R1(config)#end
R1#
*Mar 1 00:33:08.943: %SYS-5-CONFIG_I: Configured from console by console
```



```

R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dns server
R1(config)#ip host loopback.R1.com 2.2.2.2
R1(config)#interface loopback 1
R1(config-if)#ip address 2.2.2.2 255.255.255.255
R1(config-if)#end
R1#
*Mar  1 00:37:14.547: %SYS-5-CONFIG_I: Configured from console by console
R1#ping loopback.R1.com
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip host pp.PC2.com 10.0.0.4
R1(config)#end
R1#pin
*Mar  1 00:37:46.831: %SYS-5-CONFIG_I: Configured from console by console

```

```

R1#sh ip int brief

```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	10.10.10.1	YES	manual	up	up
Serial0/0	unassigned	YES	unset	administratively down	down
FastEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/1	unassigned	YES	unset	administratively down	down
Serial0/2	unassigned	YES	unset	administratively down	down
FastEthernet1/0	unassigned	YES	unset	administratively down	down
Serial2/0	unassigned	YES	unset	administratively down	down
Serial2/1	unassigned	YES	unset	administratively down	down
Serial2/2	unassigned	YES	unset	administratively down	down
Serial2/3	unassigned	YES	unset	administratively down	down
Loopback1	2.2.2.2	YES	manual	up	up

```

R1#

```

```
PC1> ping 10.0.0.4
```

```
10.0.0.4 icmp_seq=1 timeout
```

```
10.0.0.4 icmp_seq=2 timeout
```

```
10.0.0.4 icmp_seq=3 timeout
```

```
10.0.0.4 icmp_seq=4 timeout
```

```
10.0.0.4 icmp_seq=5 timeout
```

```
PC2> ip dns
```

```
PC2> ping loopback.R1.com  
Cannot resolve loopback.R1.com
```

```
PC2> ip dns 10.0.0.1
```

```
PC2> ping loopback.R1.com  
Cannot resolve loopback.R1.com
```

```
PC2> ip 10.0.0.4  
Checking for duplicate address...  
ip 10.0.0.4 255.255.255.0
```

```
PC2> ip 10.0.0.4 255.255.255.0 10.0.0.1  
Checking for duplicate address...  
ip PC2 : 10.0.0.4 255.255.255.0 gateway 10.0.0.1
```

```
PC2> ip dns
```