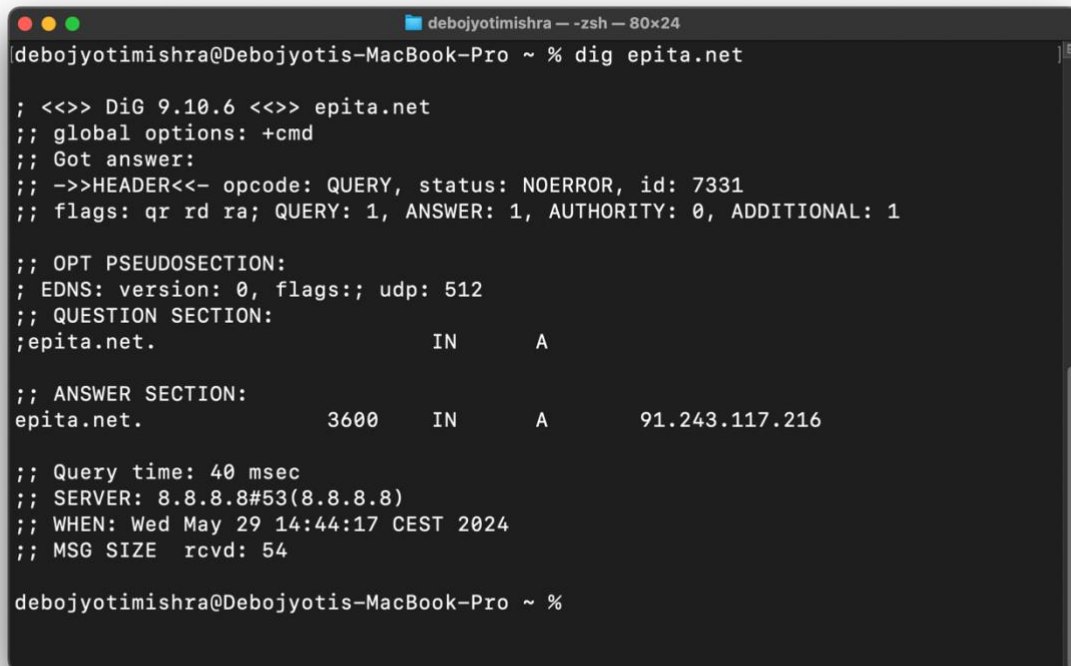


## Exercise 15 (a)

DIG

A terminal window titled 'debojyotimishra - zsh - 80x24' showing the output of the 'dig epita.net' command. The output includes header information, question section, answer section, and query details.

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % dig epita.net

; <<>> DiG 9.10.6 <<>> epita.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7331
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;epita.net.                IN      A

;; ANSWER SECTION:
epita.net.                 3600    IN      A      91.243.117.216

;; Query time: 40 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Wed May 29 14:44:17 CEST 2024
;; MSG SIZE rcvd: 54

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

// Sources:

// <https://www.hostinger.fr/tutoriels/comment-utiliser-la-commande-dig-sous-linux>

// <https://www.ibm.com/docs/en/aix/7.2?topic=d-dig-command>

The dig command shows DNS lookups and the answers returned from the queried name servers.

We can see some informations in the header:

- Opcode: type of the command (in this case is QUERY)
- Status: NOERROR (meaning that there is no error in the querying process)
- ID: 43349
- Answer 1: Only 1 answer is returned

Besides, further informations is provided:

- Question section: show list of queried domain (epita.net) and type of command (A)
- Answer section: show ip address of the queried domain (91.243.117.216)

Query time, server, date time and size is also provided

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % dig @1.1.1.1 epita.net

; <<>> DiG 9.10.6 <<>> @1.1.1.1 epita.net
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45952
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;epita.net.                IN      A

;; ANSWER SECTION:
epita.net.                 3600    IN      A      91.243.117.216

;; Query time: 13 msec
;; SERVER: 1.1.1.1#53(1.1.1.1)
;; WHEN: Wed May 29 14:44:39 CEST 2024
;; MSG SIZE rcvd: 54

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

Dig @1.1.1.1 epita.net command queries the domain name at IP 1.1.1.1.

- (1 server found): We are a querying a domain name at a specific IP address so it shows the number of server found (in this case 1)

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % dig AAAA epita.net

; <<>> DiG 9.10.6 <<>> AAAA epita.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 46254
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;epita.net.                IN      AAAA

;; AUTHORITY SECTION:
epita.net.                1800    IN      SOA     designate.openstack.cri.epita.fr
. hostmaster.cri.epita.fr. 1704397909 3508 600 86400 3600

;; Query time: 16 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Wed May 29 14:45:26 CEST 2024
;; MSG SIZE rcvd: 117

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % dig CNAME epita.net

; <<>> DiG 9.10.6 <<>> CNAME epita.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 21300
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

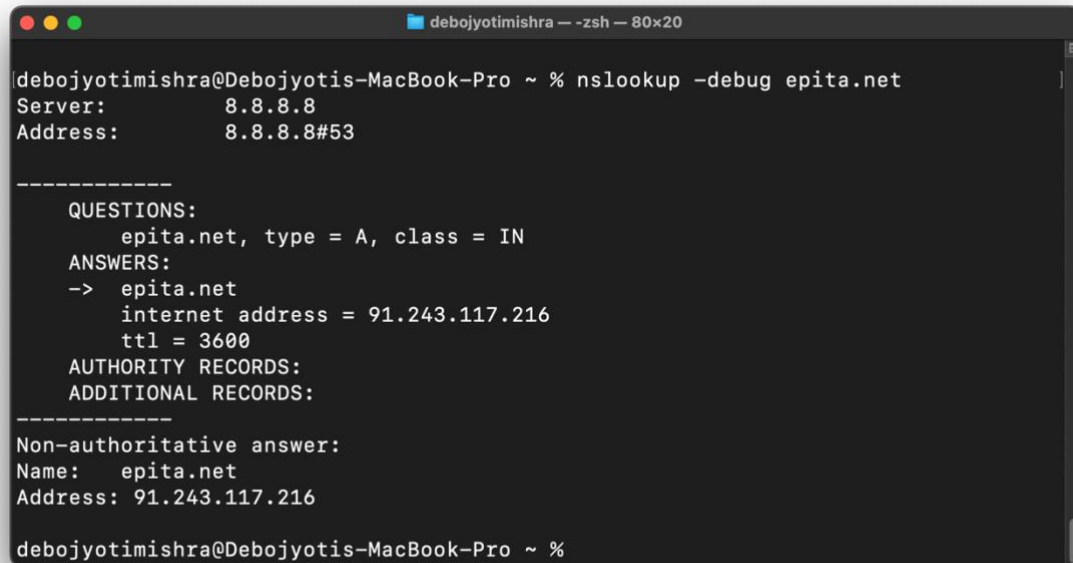
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;epita.net.                IN      CNAME

;; AUTHORITY SECTION:
epita.net.                1800    IN      SOA     designate.openstack.cri.epita.fr
. hostmaster.cri.epita.fr. 1704397909 3508 600 86400 3600

;; Query time: 29 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Wed May 29 14:45:42 CEST 2024
;; MSG SIZE rcvd: 117

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

## NSLOOKUP

A terminal window titled 'debojyotimishra — zsh — 80x20' showing the output of the 'nslookup -debug epita.net' command. The output includes the DNS server (8.8.8.8), the query details (epita.net, type A, class IN), the resolved IP address (91.243.117.216), and the TTL (3600).

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % nslookup -debug epita.net
Server:      8.8.8.8
Address:     8.8.8.8#53

-----
QUESTIONS:
  epita.net, type = A, class = IN
ANSWERS:
-> epita.net
  internet address = 91.243.117.216
  ttl = 3600
AUTHORITY RECORDS:
ADDITIONAL RECORDS:
-----
Non-authoritative answer:
Name:   epita.net
Address: 91.243.117.216

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

### The Output:

- Server: 8.8.8.8 (Google DNS server)
- Address: 8.8.8.8#53 (IP address and port of the DNS server)
- Questions: Indicates the DNS query for epita.net of type A (Address record), class IN (Internet).
- Answers: Provides the resolved IP address for epita.net.
- Address: 91.243.117.216 (IP address associated with the domain)
- TTL: 3600 (Time to Live [in seconds] for the DNS record)

```
debojyotimishra@Debojyotis-MacBook-Pro ~ % nslookup epita.net
Server:      8.8.8.8
Address:     8.8.8.8#53

Non-authoritative answer:
Name:   epita.net
Address: 91.243.117.216

debojyotimishra@Debojyotis-MacBook-Pro ~ % nslookup epita.net 1.1.1.1
Server:      1.1.1.1
Address:     1.1.1.1#53

Non-authoritative answer:
Name:   epita.net
Address: 91.243.117.216

debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

### The Output:

- For 'nslookup epita.net':
  - Server: 8.8.8.8 (Google DNS server)
  - Address: 8.8.8.8#53 (IP address and port of the DNS server)
  - Non-authoritative answer: Provides the resolved IP address for epita.net.
  - Name: epita.net, gives the domain name
  - Address: 91.243.117.216 (IP Address associated with the domain)
- For 'nslookup epita.net 1.1.1.1'
  - Server: 1.1.1.1 (Cloudflare's public DNS server)
  - Address: 1.1.1.1#53 (IP address and port of the DNS server)
  - Non-authoritative answer: Gives the resolved IP address for epita.net.

## HOST

```
debojyotimishra -- zsh -- 80x20
AUTHORITY RECORDS:
ADDITIONAL RECORDS:
-----
Non-authoritative answer:
Name:   epita.net
Address: 91.243.117.216

debojyotimishra@Debojyotis-MacBook-Pro ~ % host -a epita.fr
Trying "epita.fr"
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 23036
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;epita.fr.                IN      ANY

;; ANSWER SECTION:
epita.fr.                 3600    IN      HINFO   "RFC8482" ""

Received 47 bytes from 8.8.8.8#53 in 20 ms
debojyotimishra@Debojyotis-MacBook-Pro ~ %
```

### Header:

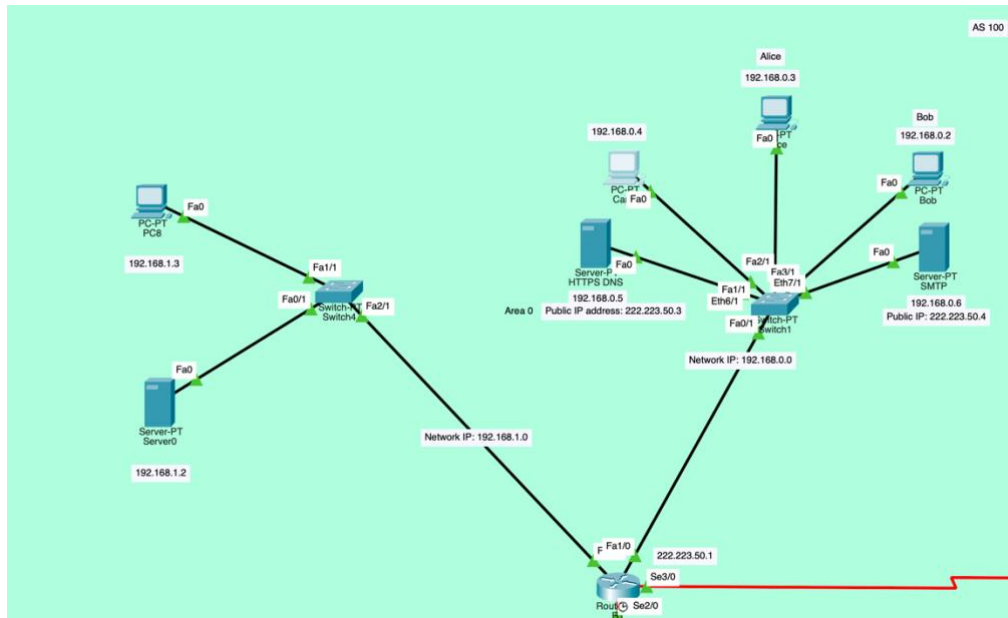
// Information Source: ChatGPT 4o

- opcode: QUERY
- status: NOERROR (indicating that the query was processed without errors)
- id: 23036 (identifier for the DNS query)
- flags: qr (query response), rd (recursion desired), ra (recursion available)
- QUERY: 1 (number of queries)
- ANSWER: 1 (number of answers)
- AUTHORITY: 0 (number of authority records)
- ADDITIONAL: 0 (number of additional records)

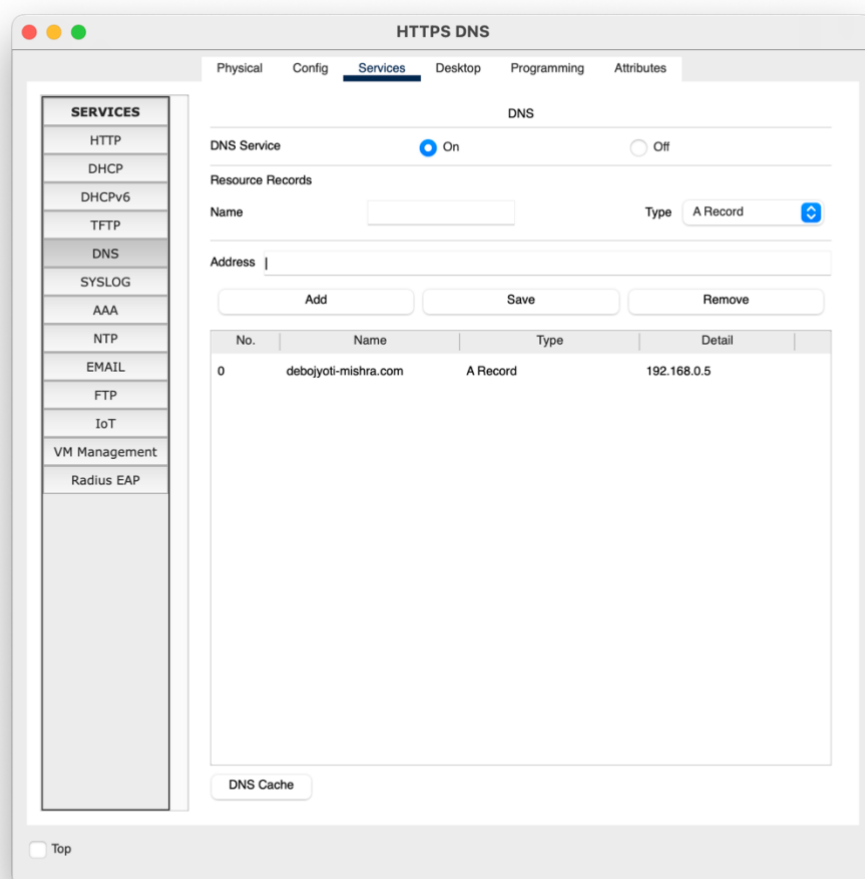
## Exercise 15 (b)

### 1. Configuring DNS service on the HTTPS server:

- Setup of AS100



- DNS setup on HTTPS-DNS Server







## 2. DNS Setup on end devices:

The screenshot shows a configuration window titled "Alice" with a sidebar on the left and a main configuration area on the right. The sidebar has two main sections: "GLOBAL" and "INTERFACE". Under "GLOBAL", there are "Settings" and "Algorithm Settings". Under "INTERFACE", there are "FastEthernet0" and "Bluetooth". The "FastEthernet0" option is selected. The main configuration area has tabs at the top: "Physical", "Config" (which is highlighted), "Desktop", "Programming", and "Attributes". The "Config" tab shows "Global Settings". In this section, the "Display Name" is "Alice". Under "Interfaces", "FastEthernet0" is selected. Below this, there are two sections for "Gateway/DNS". The first section is for IPv4, with "Static" selected (radio button) and "DHCP" unselected. The "Default Gateway" is set to "192.168.0.1" and the "DNS Server" is set to "192.168.0.5". The second section is for IPv6, with "Static" selected (radio button) and "Automatic" unselected. The "Default Gateway" and "DNS Server" fields are empty. At the bottom left of the window, there is a "Top" button.

**Alice**

Physical **Config** Desktop Programming Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**INTERFACE**

- FastEthernet0
- Bluetooth

**Global Settings**

Display Name: Alice

Interfaces: FastEthernet0

**Gateway/DNS IPv4**

☐ DHCP

☒ Static

Default Gateway: 192.168.0.1

DNS Server: 192.168.0.5

**Gateway/DNS IPv6**

☐ Automatic

☒ Static

Default Gateway:

DNS Server:

☐ Top

Bob

PhysicalConfigDesktopProgrammingAttributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display NameBob

InterfacesFastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway192.168.0.1

DNS Server192.168.0.5

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

Carol

PhysicalConfigDesktopProgrammingAttributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

Global Settings

Display NameCarol

InterfacesFastEthernet0

Gateway/DNS IPv4

DHCP

Static

Default Gateway192.168.0.1

DNS Server192.168.0.5

Gateway/DNS IPv6

Automatic

Static

Default Gateway

DNS Server

Top

Testing to check if configuration worked:

