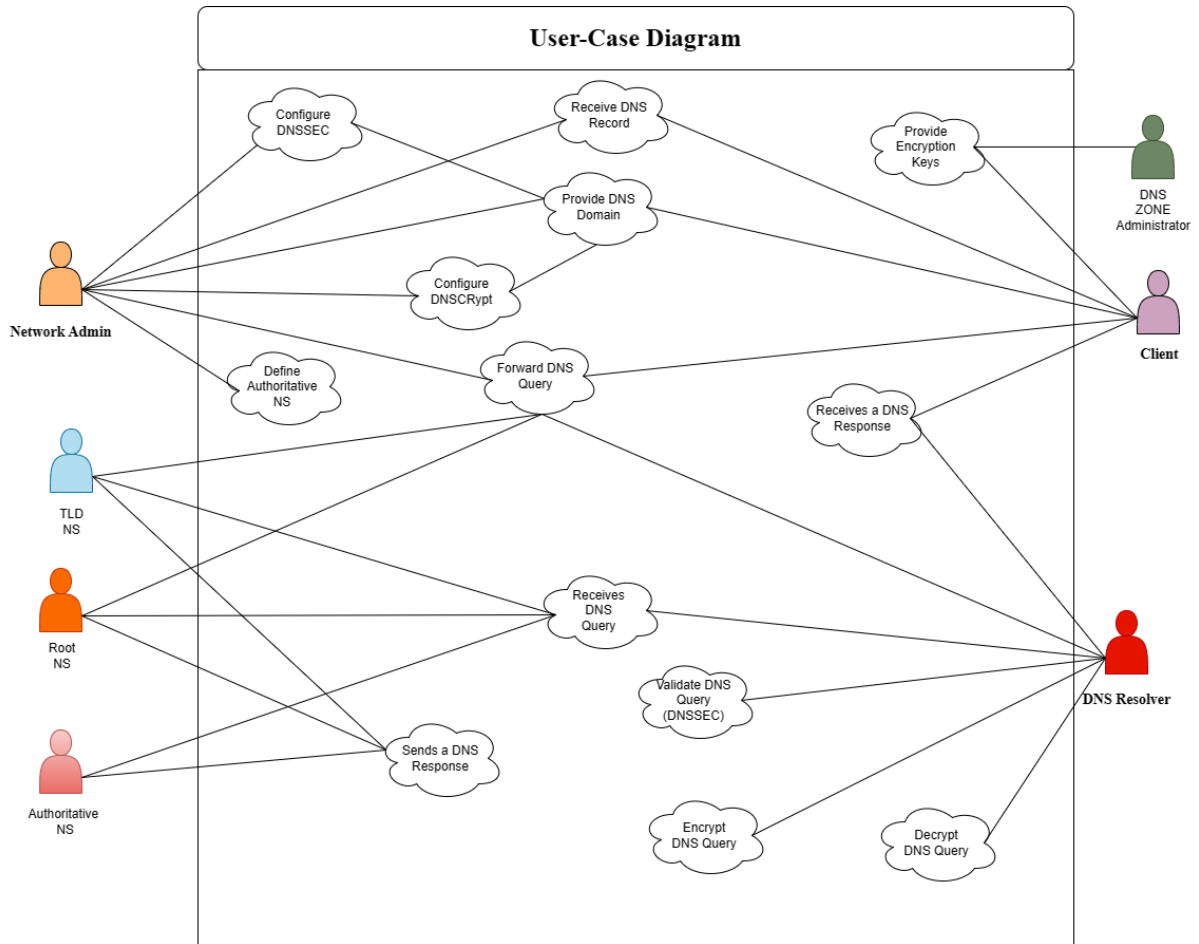# Chapter 4: System Analysis and Design

System Diagrams

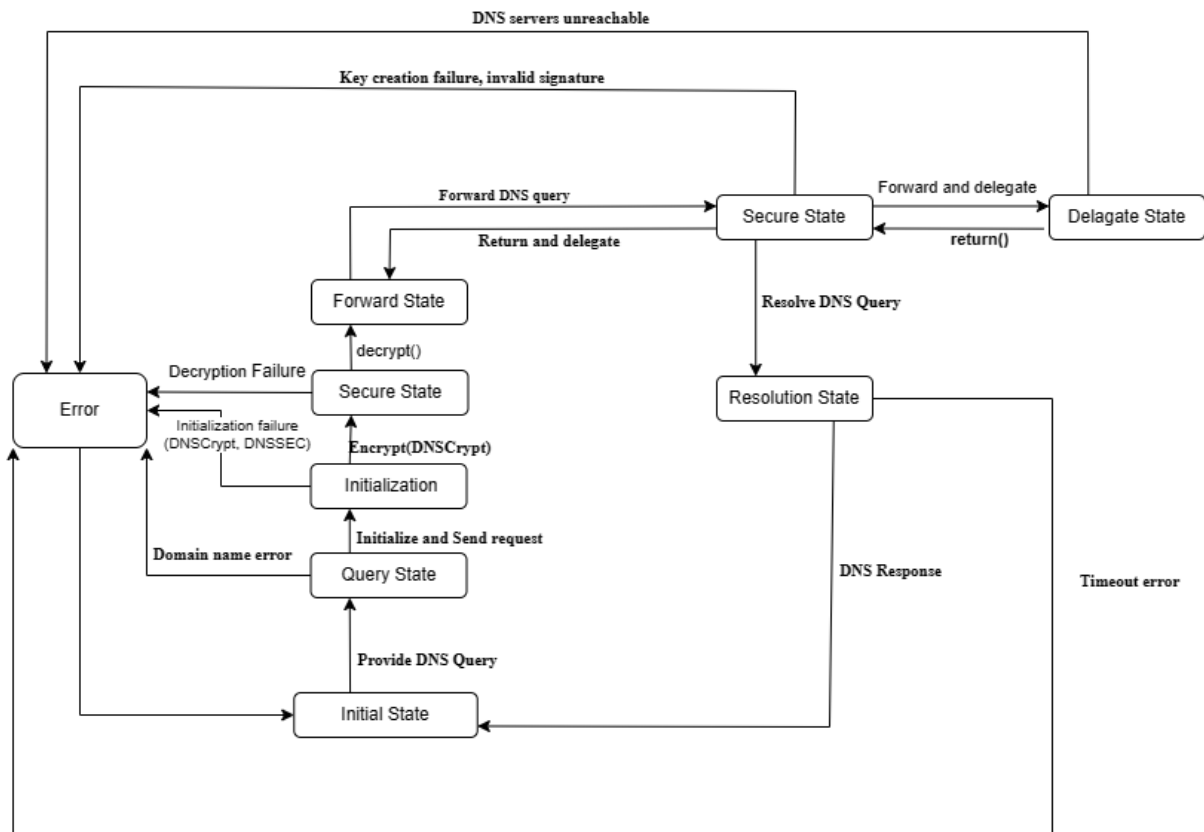### 1. User-Case Diagram

2. Sequence Diagram

Sequence Diagram
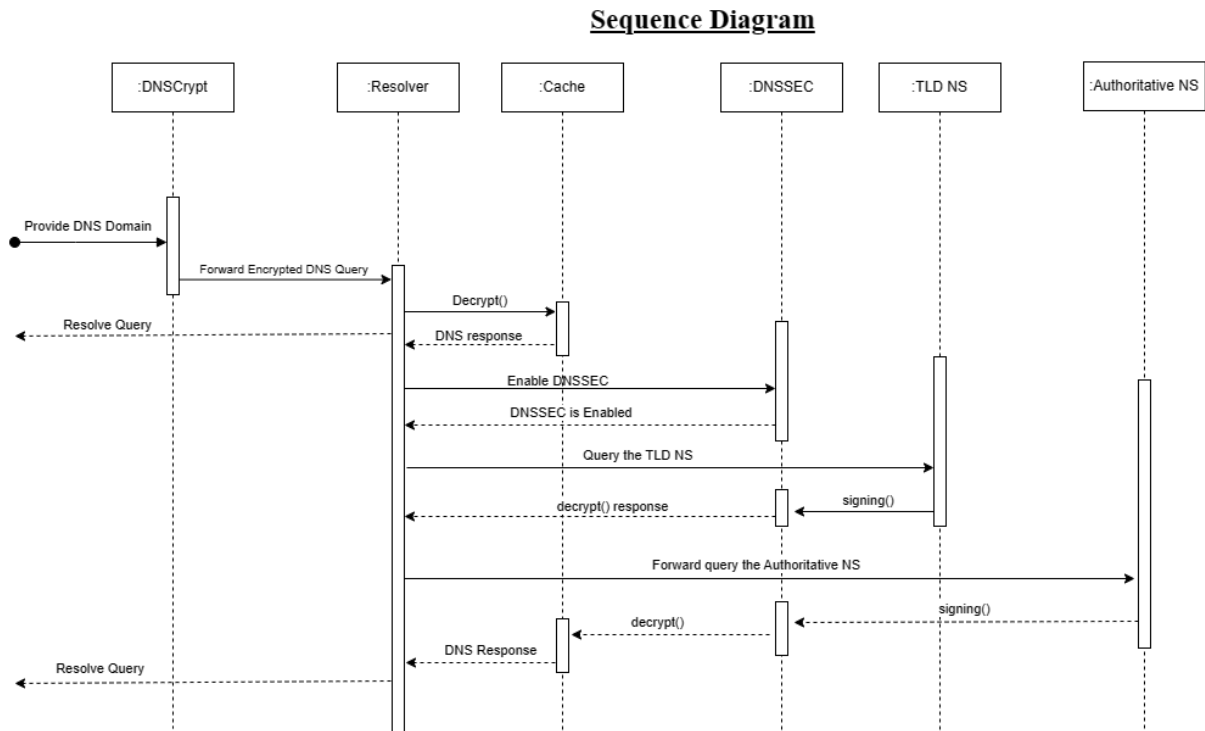
3. Finite State Machine Diagrams

Finite State Machine Diagram

4. System Flowchart

System Flowchart
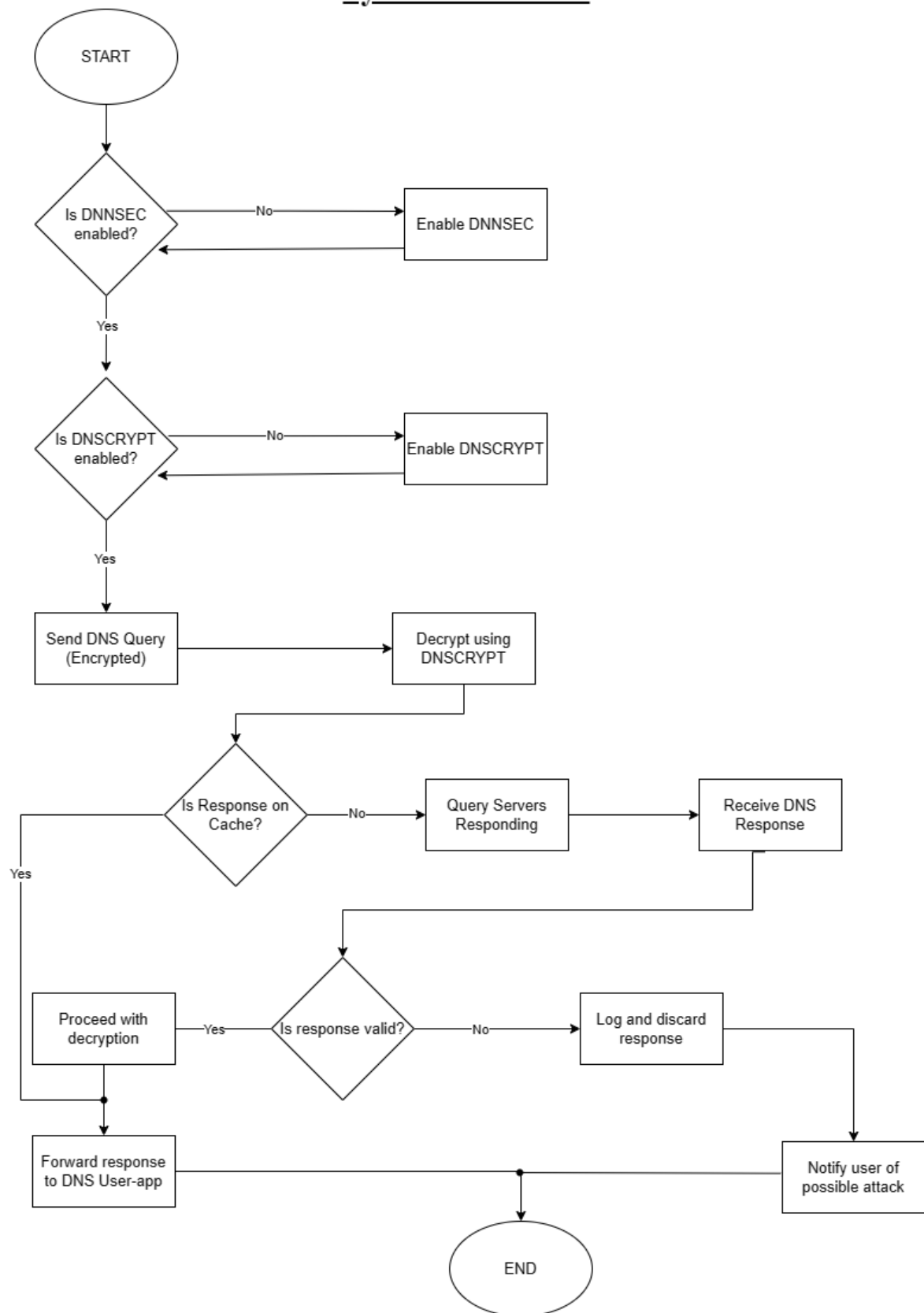
5. Network Topology

Network Topology

Internet

Client Device
IP Address:
192.168.0.100
Subnet: 192.168.9/24

DNSCrypt Proxy
IP Address:
192.168.0.201
Subnet:192.168.0.0/24

Attacker Network
IP Address:
192.168.1.0 - 192.168.1.255
Subnet:192.168.1.0/24

DNS Resolver — 192.168.0.200/24

DNSSEC Validator
IP Address:
192.168.0.202
Subnet:192.168.0/24

Root NS
IP Address:
10.0.0.1/24
Subnet:10.0.0.0/24

TLD NS
IP Address:
10.0.0.2/24
Subnet:10.0.0.0/24

Authoritative NS
IP Address:
10.0.0.3 - 10.0.0.12
Subnet:10.0.0.0/24

6. System Architecture

System Architecture

Web Server

HTTP
Request

(9) (10)

HTTP
Response

Internet User

(DNSCRYPT)

Key:

NS - Name Server
Q - Question
A - Answer
Blue - DNSEC
Green - DNSCRYPT

(1)

Q: www.belair.com?

🔒 **A: 192.168.0.6**

(8)

(DNSCRYPT)

(Root Signature)

.com NS Public Key is: E2DR...

(6)

(2)

(Signature)

Recursive Name Server

Q: www.belair.com

(4)

Q: www.belair.com

Q: www.belair.com?

A: ask belair.com name server

belair.com NS Public Key is: 8TI0...

(.com Signature)

(5)

(7)

(3)

belair.com Name Server

TLD
.com Name server

Root Name Server

DNS ZONE C

DNS ZONE B

DNS ZONE A