# DoHoT or Donion aka "DoHoT 2 Handle"

Performance of Anonymous DNS Queries

Jonathan, Tom, Tor, Alfred

# Introduction

#### **Anonymous Queries**

- Proxy between Client and Resolver
  - Oblivious DNS
  - Oblivious DNS-over-HTTPS (ODoH)
  - DNS-over-HTTPS-over-Tor (DoHoT)

Goal: change configurations and compare performance

- Identify parameters
- Create containers for protocols
- Measure latency: DNSHACKATHON-{random}.se

# Introduction

#### **Anonymous Queries**

- Proxy between Client and Resolver
  - Oblivious DNS
  - Oblivious DNS-over-HTTPS (ODoH)
  - DNS-over-HTTPS-over-Tor (DoHoT)

Goal: change configurations and compare performance

- Identify parameters
- Create containers for protocols
- Measure latency: DNSHACKATHON-{random}.se

#### **Default DoHoT:** Client $\rightarrow$ Entry $\rightarrow$ Middle $\rightarrow$ Exit $\rightarrow$ DoH Resolver

```
Idea 1: Client \rightarrow Nearby Entry \rightarrow Nearby Exit \rightarrow DoH/DoT Resolver
```

**Idea 2:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit Resolver

- Normal DNS (Do53)
- DNS-over-HTTPS (DoH)
- DNS-over-TLS (DoT)

- DNS-over-Tor (DoTor)
- DNS-over-Tor (DoTor)
- DoH-over-Tor (DoHoT)
- ▶ DoT-over-Tor (DoToT)

**Default DoHoT:** Client  $\rightarrow$  Entry  $\rightarrow$  Middle  $\rightarrow$  Exit  $\rightarrow$  DoH Resolver

**Idea 1:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit  $\rightarrow$  DoH/DoT Resolver

**Idea 2:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit Resolver

- Normal DNS (Do53)
- DNS-over-HTTPS (DoH)
- ▶ DNS-over-TLS (DoT)

- DNS-over-Tor (DoTor)
- DNS-over-Tor (DoTor)
- ▶ DoH-over-Tor (DoHoT)
- ▶ DoT-over-Tor (DoToT)

- **Default DoHoT:** Client  $\rightarrow$  Entry  $\rightarrow$  Middle  $\rightarrow$  Exit  $\rightarrow$  DoH Resolver
- **Idea 1:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit  $\rightarrow$  DoH/DoT Resolver
- **Idea 2:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit Resolver

- Normal DNS (Do53)
- DNS-over-HTTPS (DoH)
- ▶ DNS-over-TLS (DoT)

- DNS-over-Tor (DoTor)
- DNS-over-Tor (DoTor)
- ▶ DoH-over-Tor (DoHoT)
- ▶ DoT-over-Tor (DoToT)

- **Default DoHoT:** Client  $\rightarrow$  Entry  $\rightarrow$  Middle  $\rightarrow$  Exit  $\rightarrow$  DoH Resolver
- **Idea 1:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit  $\rightarrow$  DoH/DoT Resolver
- **Idea 2:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit Resolver

- Normal DNS (Do53)
- DNS-over-HTTPS (DoH)
- DNS-over-TLS (DoT)

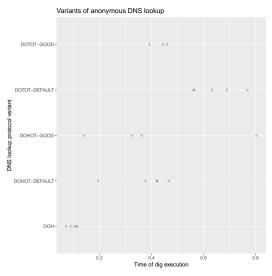
- DNS-over-Tor (DoTor)
- DNS-over-Tor (DoTor)
- DoH-over-Tor (DoHoT)
- DoT-over-Tor (DoToT)

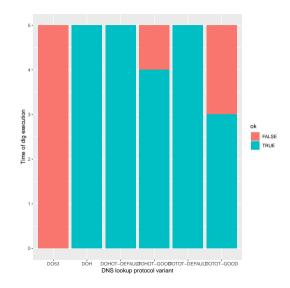
- **Default DoHoT:** Client  $\rightarrow$  Entry  $\rightarrow$  Middle  $\rightarrow$  Exit  $\rightarrow$  DoH Resolver
- **Idea 1:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit  $\rightarrow$  DoH/DoT Resolver
- **Idea 2:** Client  $\rightarrow$  Nearby Entry  $\rightarrow$  Nearby Exit Resolver

- Normal DNS (Do53)
- DNS-over-HTTPS (DoH)
- DNS-over-TLS (DoT)

- DNS-over-Tor (DoTor)
- DNS-over-Tor (DoTor)
- DoH-over-Tor (DoHoT)
- ▶ DoT-over-Tor (DoToT)

# Measurement





# **Artifacts**

https://github.com/DNS-Hackathon/DoHot-or-Donion

- Docker Containers for Protocols
- ▶ Performance Measurement Interface