Adaptive DNS Resolver Discovery

draft-pauly-add-resolver-discovery

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ADD
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Motivating use cases

Discovery mechanism

Additional information mechanism

Use Cases

1. Upgrade a resolver from Do53 to DoH/DoT

2. Discover a designated DoH/DoT resolver for a set of domains

Use Cases

Resolver Upgrade

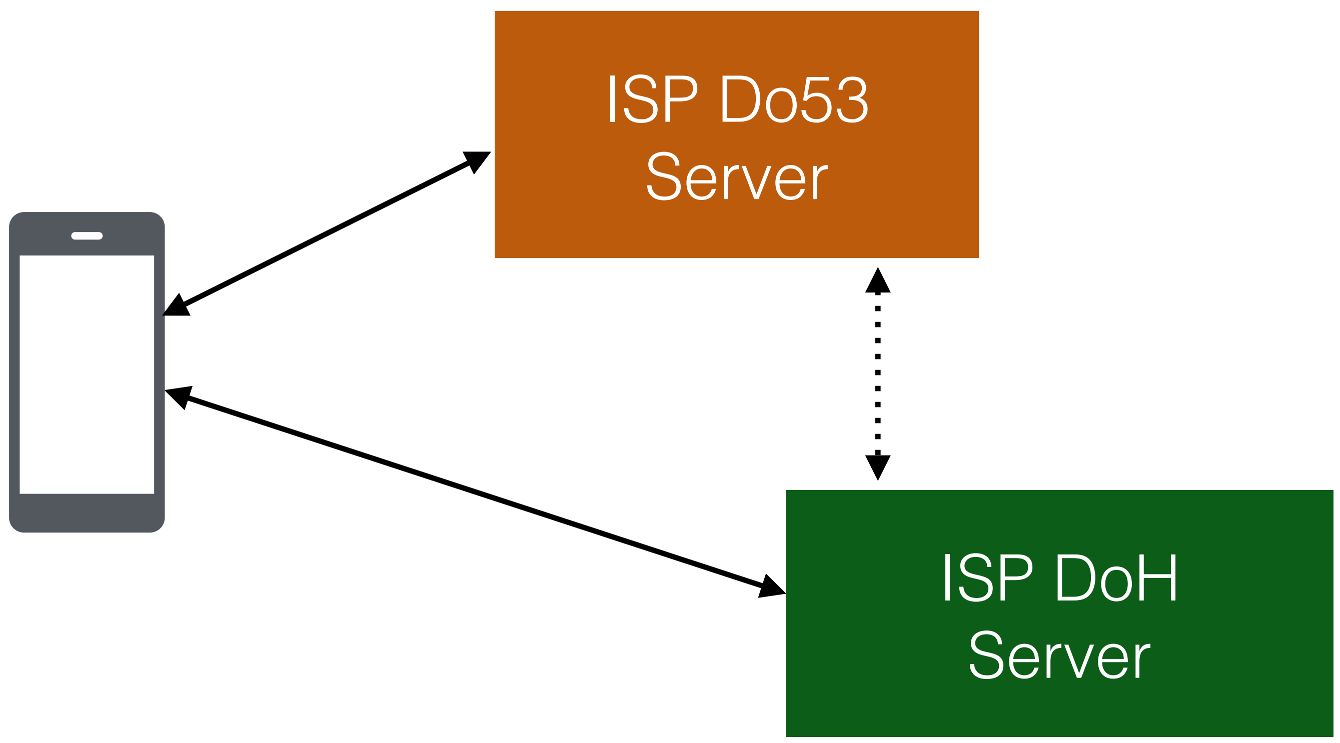
Move from Do53 to DoT/DoH for a resolver either locally provisioned or user-selected

Secure upgrade only

- RFC 7858 (DoT) already has opportunistic
- Validating resolver certificate and relationship to the original Do53 resolver is a minimum

Use Cases

Resolver Upgrade



Use Cases

Designated Discovery

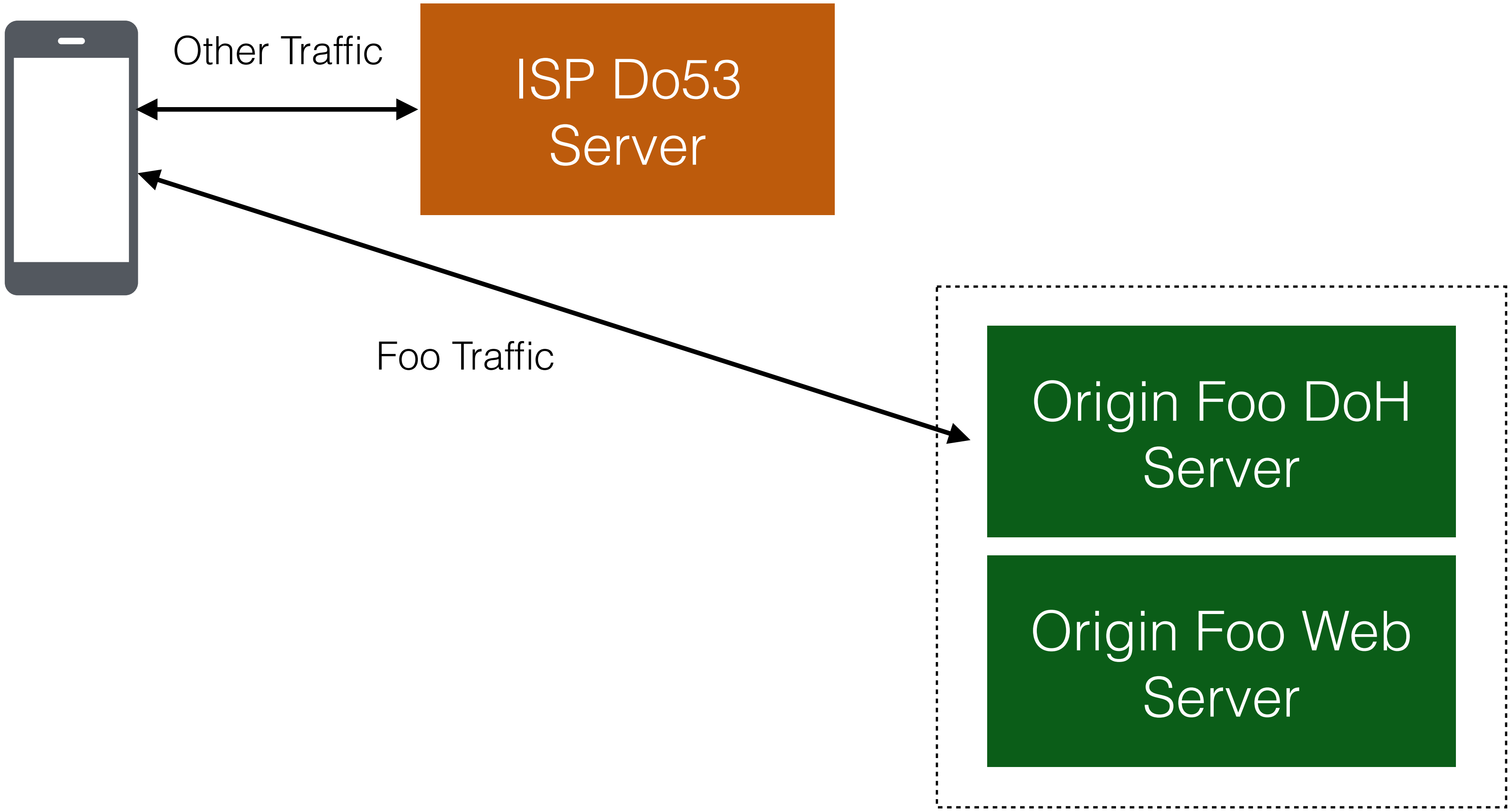
Trusted designation for a zone hierarchy

Split DNS view solves many problems for both improved access and privacy

- Locally-hosted content
- Private names
- Identifying authorities for public content

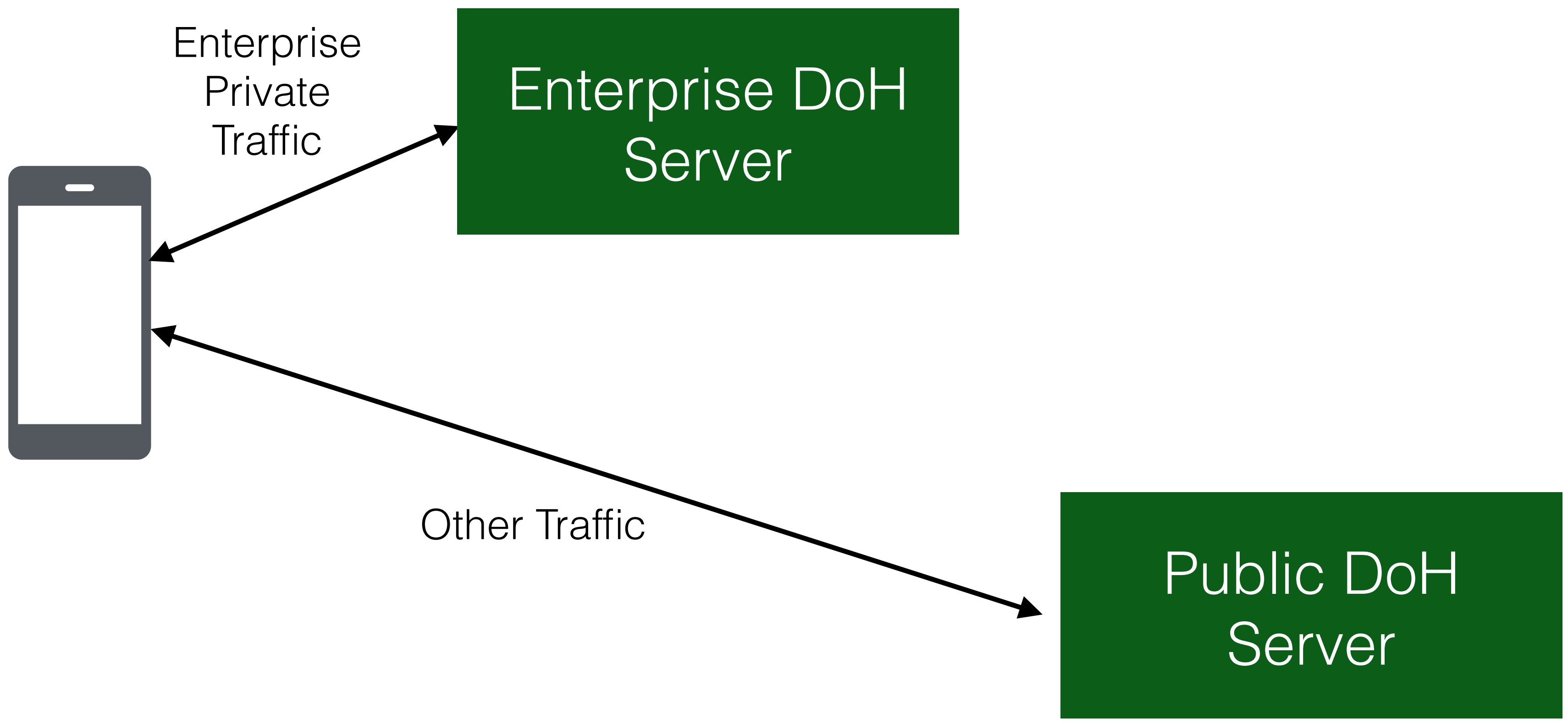
Use Cases

Designated Discovery - Public Origins



Use Cases

Designated Discovery - Enterprise Private Names



Discovery Mechanism

Requirements

Discovery based in the DNS

Common semantics for upgrade and designation

Upgrade should use a special-use query to resolver

Domain-based designation should occur along with normal name resolution queries

Discovery Mechanism

Why SVCB?

SVCB/HTTPS

- has a clear extension mechanism
- already will be sent for ECH, ALPN, etc.
- can address multi-DNS deployment concerns

CNAME and TXT aren’t already sent for every name, and don’t have strong semantics or extensibility

Using a hint in https:// headers is detached from the DNS, may run into multi-CDN issues

Additional Information Mechanism

Requirements

Some deterministic way to query properties of a DoH or DoT server

Properties should be an extensible dictionary

- Something like JSON works

Additional Information Mechanism

Why PvD?

Here there be bikesheds!

PvD is one existing JSON media type + registry that describes properties for using networks and DNS

> Allows a local network to directly advertise the same JSON content about split-DNS using RAs

Using a .well-known is one way to have a deterministic GET request, easy to add alongside existing DoH servers

Takeaways

✓ Resolver discovery should use DNS records

✓ SVCB/HTTPS records seem cleanest

✓ JSON-style resolver information

Next steps

Currently being used in iOS/macOS betas

Refine and consolidate approach

Good approach to adopt as a starting place?