Communicating Proxy Configurations in Provisioning Domains

draft-pauly-intarea-proxy-config-pvd-00

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Use cases

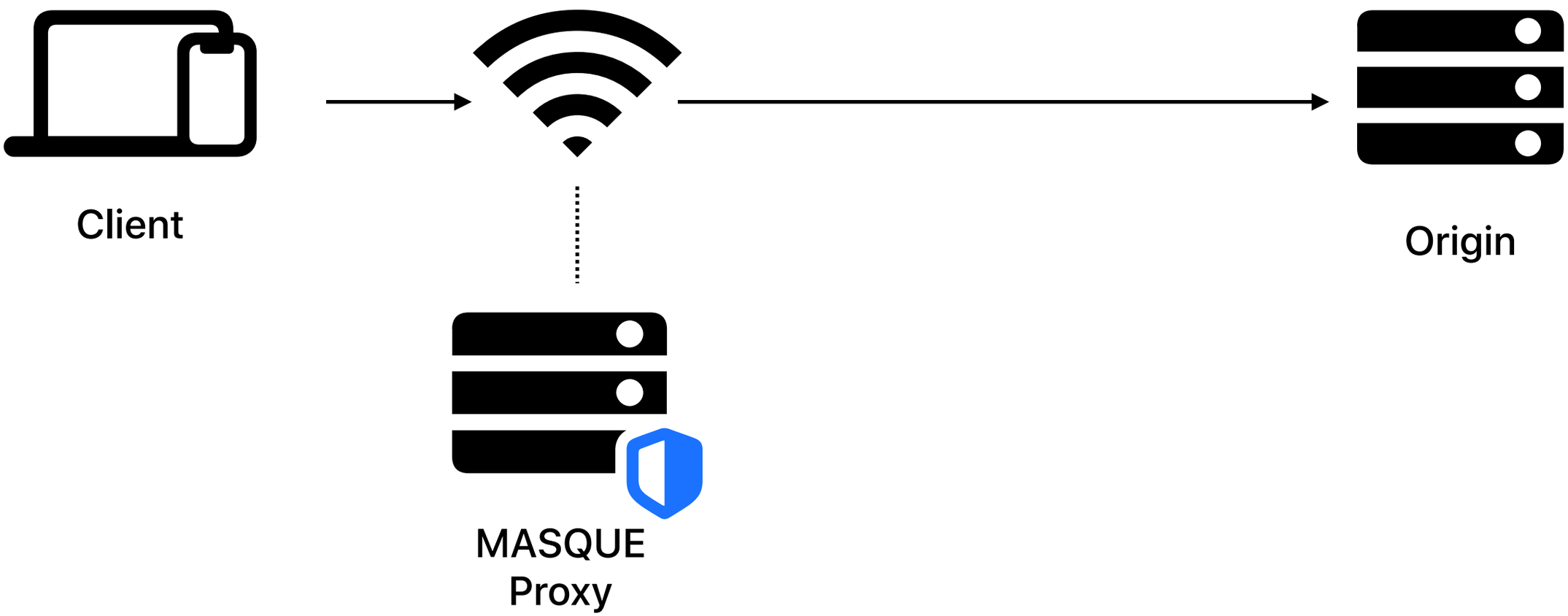
Network-provided proxy discovery

Related proxy discovery

Proxy applicability discovery (split DNS, etc)

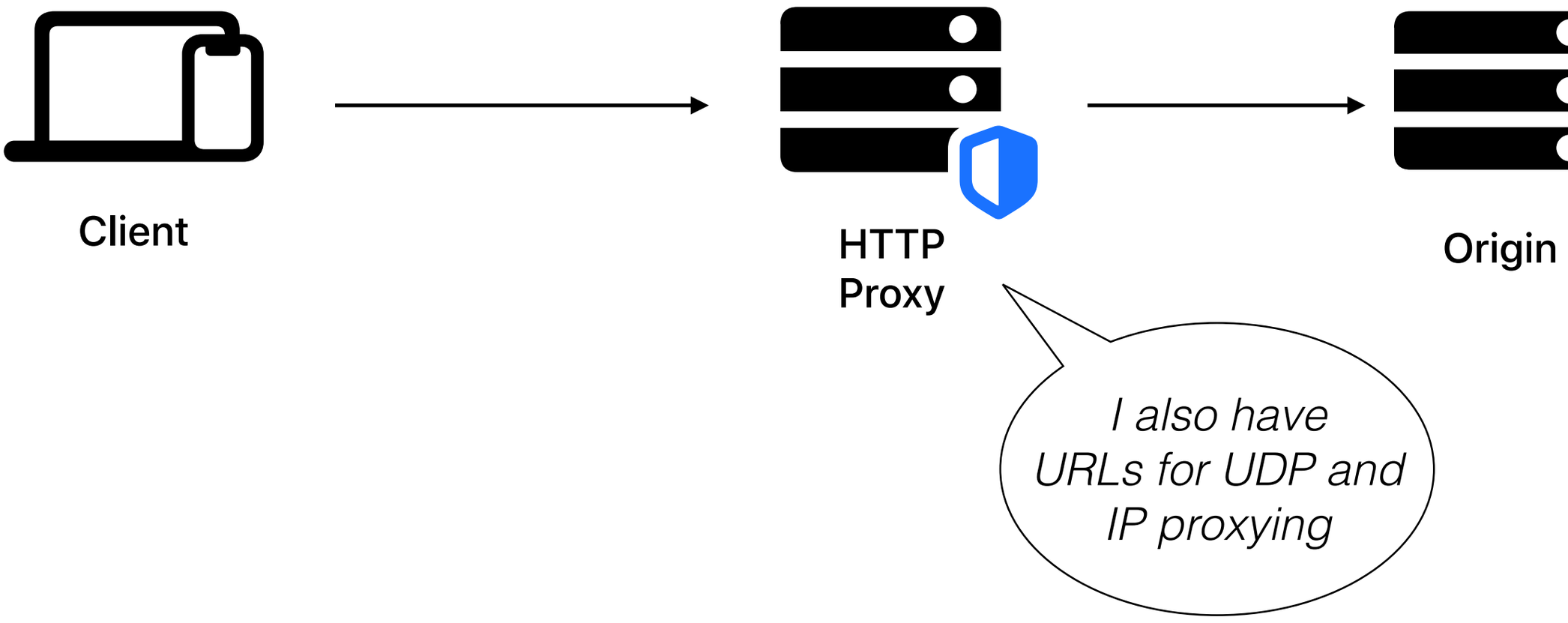
Network-provided proxy discovery

Network (ISP, carrier) provides a proxy that can assist in mobility (AT-SSS) or privacy (act as a first-hop Private Relay proxy)



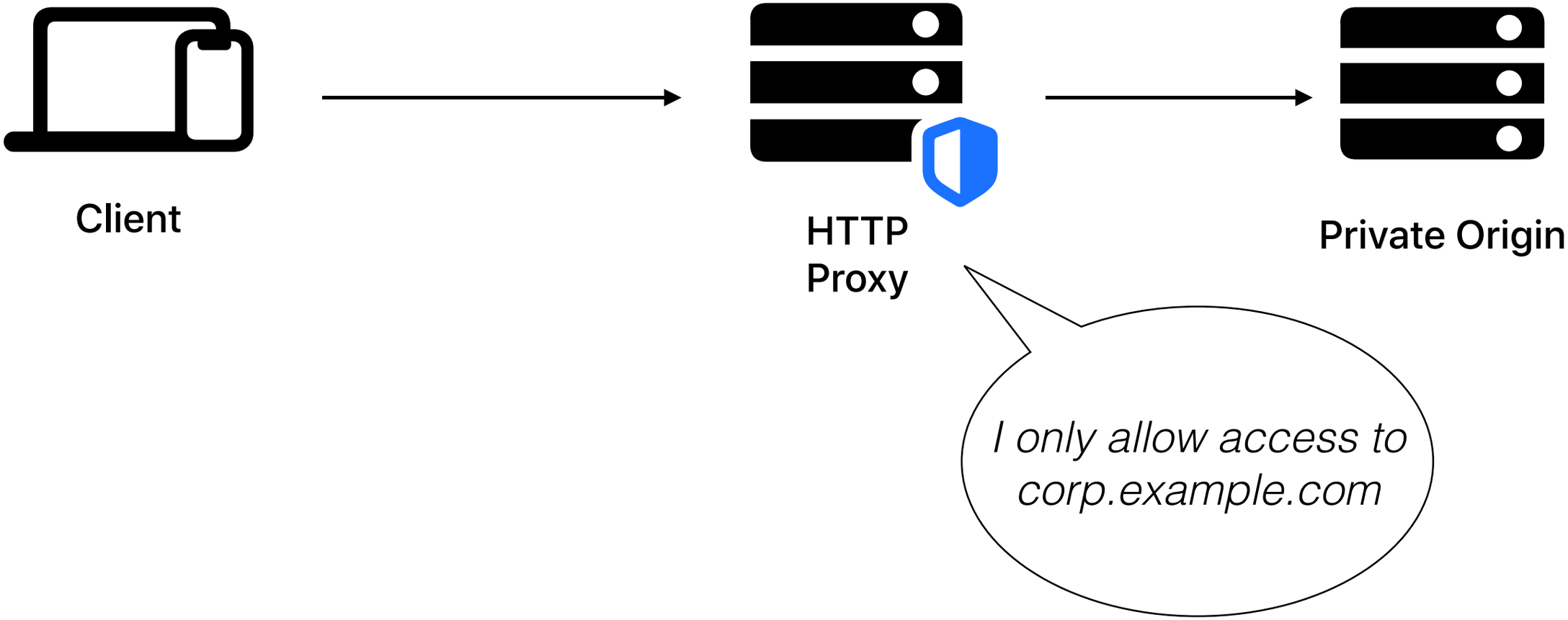
Related proxy discovery

Client knows about CONNECT support, but proxy also supports CONNECT-UDP and CONNECT-IP



Proxy applicability discovery (split DNS, etc)

A proxy only allows access to certain hosts, or from certain users (not an "open" proxy)



Existing alternatives

WPAD and PAC fill similar roles

- Not actually IETF standards
- Requires running javascript parsing, with many possible security pitfalls
- Would need to be significantly extended to know about new proxy types that use URLs

Let's not do this, please!

So what is a Provisioning Domain,
and how can it help?

PvDs

Defined by MIF and INTAREA

RFC 7556 defines Provisioning Domains (PvDs) as *"consistent sets of network configuration information"*

RFC 8801 defines PvD discovery & additional data

- IPv6 RA advertisement
- JSON info fetched over HTTP

But what *is* a PvD?

Your home Wi-Fi uplink over a particular ISP

A carrier network configuration

A VPN configuration

...

A proxy configuration too!

PvDs for proxies

This document discusses two mechanisms

1. Enumerating proxy URLs related to a PvD

2. Fetching a PvD configuration from an HTTP-based proxy

Proxy list in PvD JSON

The "proxies" key is an array of URLs

```
{
  "identifier": "company.example.org.",
  "expires": "2023-06-23T06:00:00Z",
  "prefixes": ["2001:db8:cafe::/48"],
  "proxies": ["https://proxy.example.org","https://proxy.example.org/
masque{?target_host,target_port}"]
}
```

Type of proxy here is implicit in the URL (scheme and URI template variables imply SOCKS vs HTTP CONNECT vs CONNECT-UDP)

❓ Should we define more formal types, as a more complex dictionary format?

Fetching the PvD for a proxy

Since each proxy has its own conceptual PvD, it can use the PvD additional information to indicate related DNS zones, or even other proxies.

With a proxy URL of `https://proxy.example.org/masque{?target_host,target_port}`:

```
:method = GET
:scheme = https
:authority = proxy.example.org
:path = /masque
accept = application/pvd+json
```

With a proxy URL of `https://proxy.example.org`:

```
:method = GET
:scheme = https
:authority = proxy.example.org
:path = /
accept = application/pvd+json
```

Split DNS zones

Existing DNS zones key can indicate that this proxy only serves specific domains, providing a remote-access VPN configuration

```
:status = 200
content-type = application/pvd+json
content-length = 135
```

```
{
  "identifier": "proxy.example.org.",
  "expires": "2023-06-23T06:00:00Z",
  "prefixes": [],
  "dnsZones": ["internal.example.org"]
}
```

❓ What other attributes would make sense to add here?

Next steps

Adopt this in INTAREA?

- Would it fit better elsewhere (HTTP, etc)? INTAREA is where PvDs was developed, and also was the home for previous SOCKS discussions.

Interop testing!