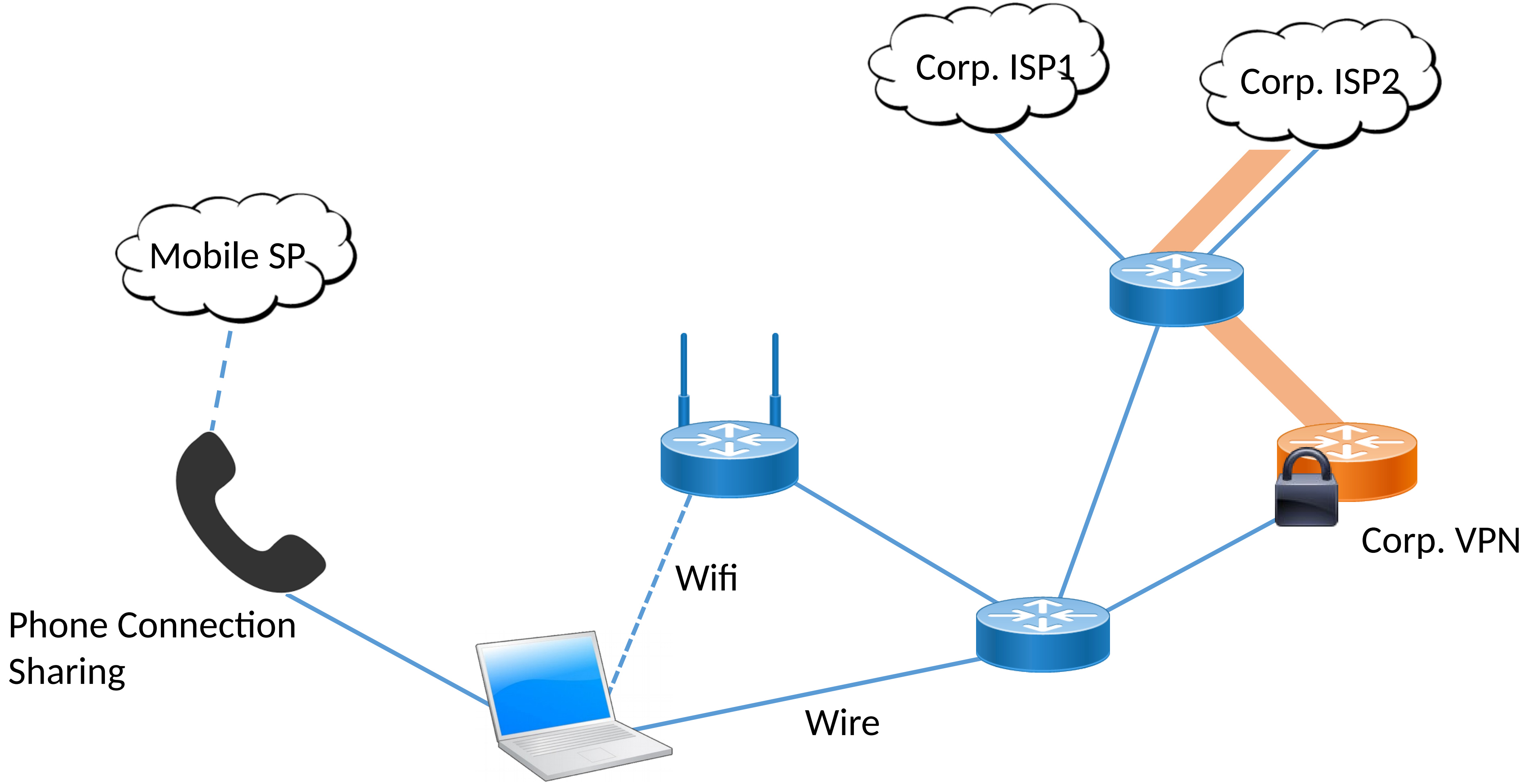
Discovering Provisioning Domain Names and Data

draft-ietf-intarea-provisioning-domains-00

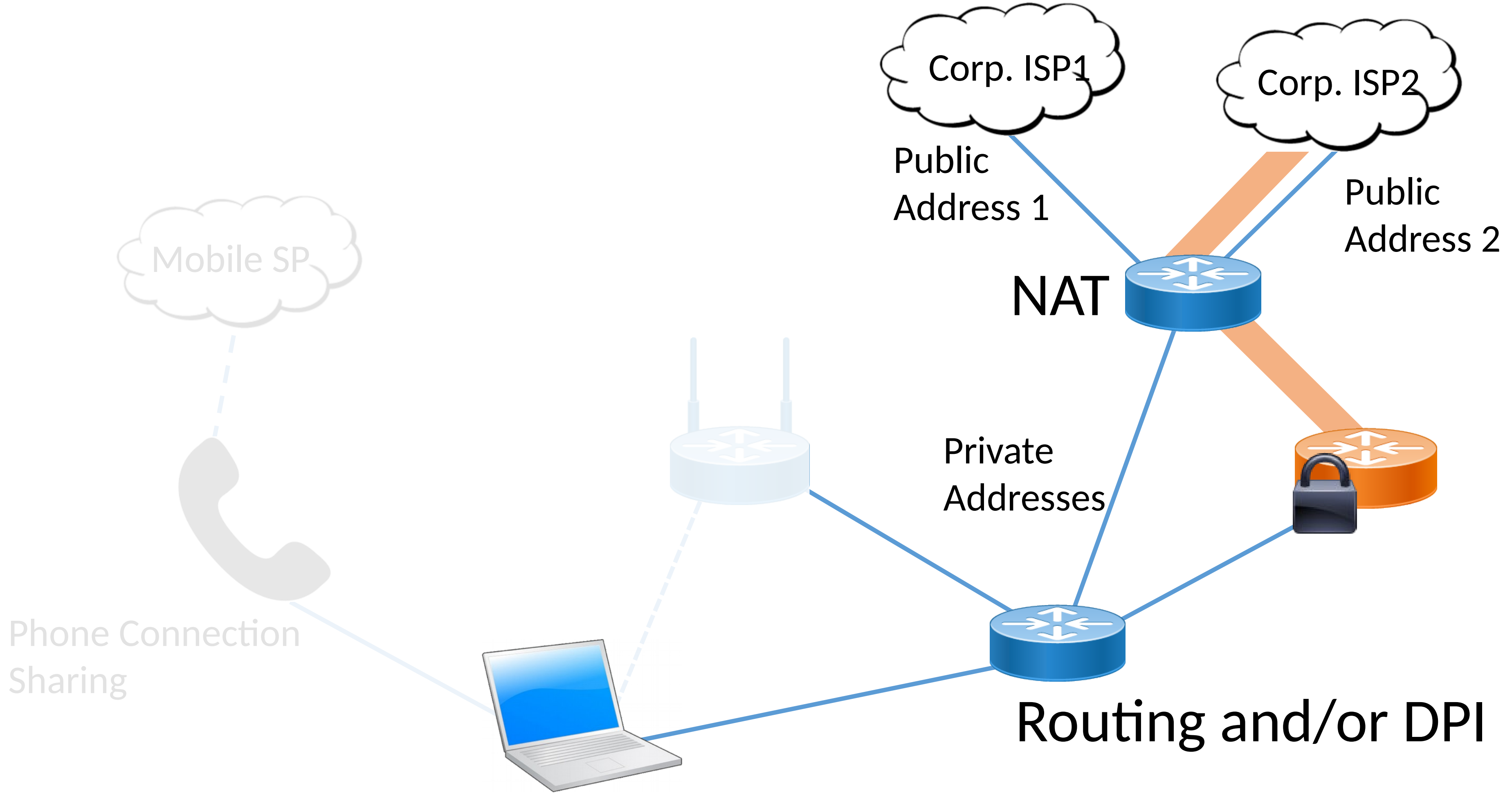
P. Pfister, **E. Vyncke,** T. Pauly, D. Schinazi, M. Keane

Hosts and networks are multi-homed

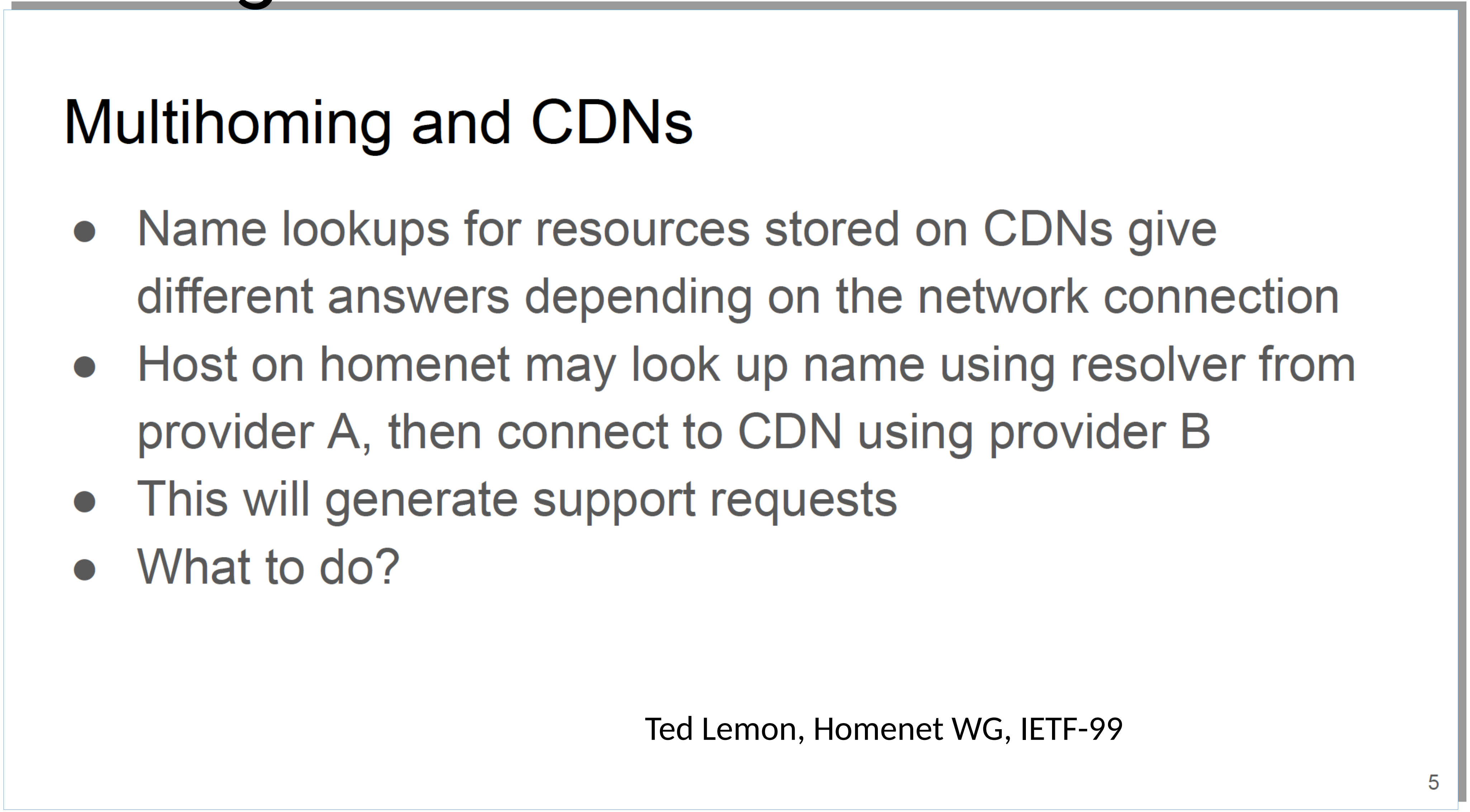
Just a few examples…



Multi-Homing, the legacy way…



Bundling IP address & DNS resolver



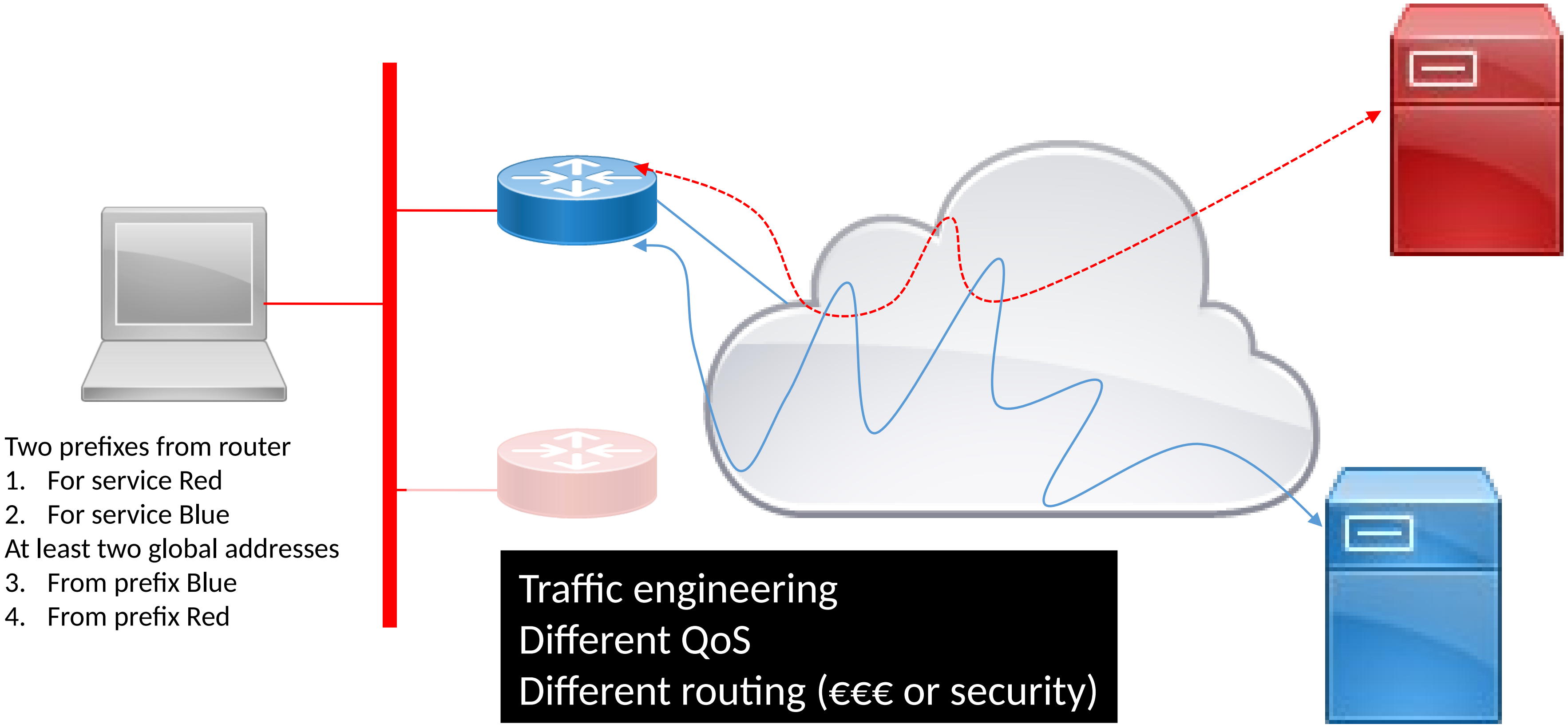
Multihoming and CDNs

- Name lookups for resources stored on CDNs give different answers depending on the network connection
- Host on homenet may look up name using resolver from provider A, then connect to CDN using provider B
- This will generate support requests
- What to do?

Ted Lemon, Homenet WG, IETF-99

5

Service Selection



Two prefixes from router

1. For service Red
2. For service Blue

At least two global addresses

3. From prefix Blue
4. From prefix Red

Traffic engineering
Different QoS
Different routing (€€€ or security)

The purpose of this draft is to:

1. Identify Provisioning Domains (PvDs).

[RFC7556] *Provisioning Domains (PvDs) are consistent sets of network properties that can be implicit, or advertised explicitly.*

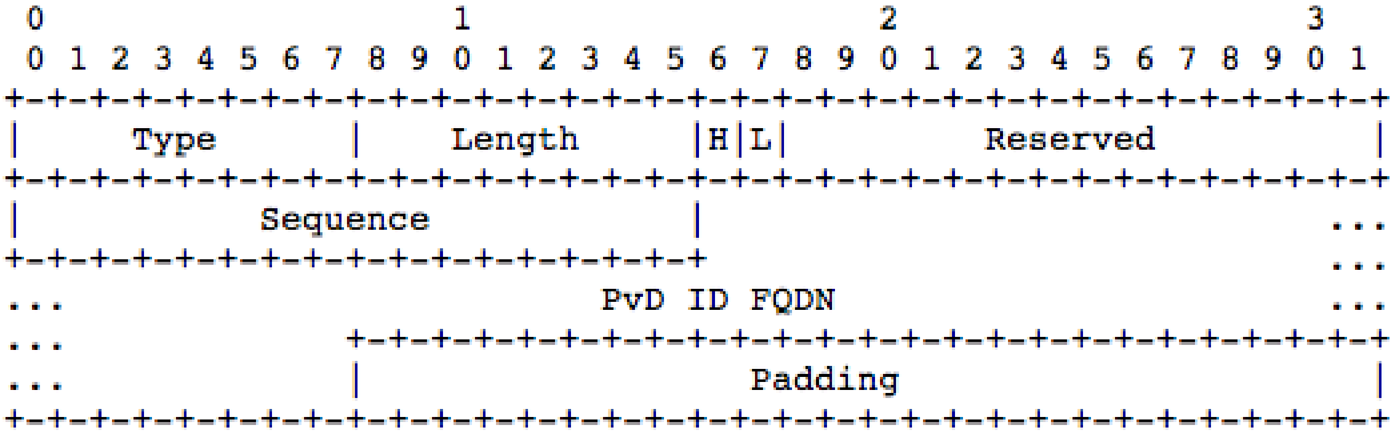
Differentiate provisioning domains by using FQDN identifiers.

2. Give PvD Additional Information.

Name, characteristics, captive portal, etc…

Step 1: Identify PvDs

With the PvD ID Router Advertisement Option



```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |H|L|         Reserved          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|           Sequence            |                             ...
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+                             ...
...                         PvD ID FQDN                       ...
...             +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
...             |                  Padding                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

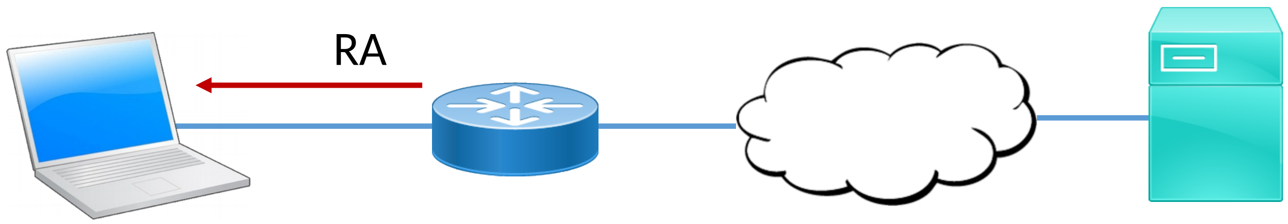
PvD ID Router Advertisements Option format

- At most **one occurrence in each RA**.
- **PvD ID is an FQDN** associated with options in the RA**.**
- **H bit** to indicate **Additional Information is available with HTTPS**.
- **L bit** to indicate the **PvD has DHCPv4 on the link**.
- Seq. number used for **push-based refresh**.

Step 1b: Identifying PvD (Cont.)

- Information in a RA without PvD ID is linked to an implicit PvD (identified by interface & link-local address of router)
- Option in RA can change of PvD when they are received in a RA with a different PvD ID
- DHCPv6 information MUST be associated to a PvD ID received on the same interface from the same link-local address

Step 2: Get the PvD Additional Data

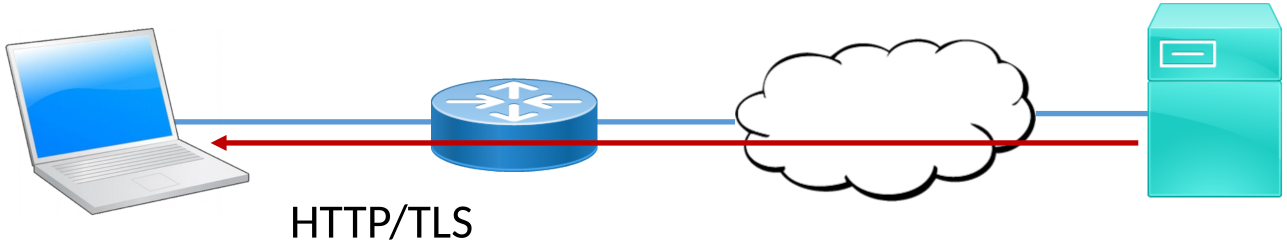


When the H bit is set:

GET https://<pvd-id>/.well-known/pvd

Using network configuration (source address, default route, DNS, etc...) **associated with the received PvD**.

Step 2: Get the PvD Additional Data



When the H bit is set:

GET https://<pvd-id>/.well-known/pvd

Using network configuration (source address, default route, DNS, etc…) **associated with the received PvD**.

Step 2: Get the PvD Additional Data

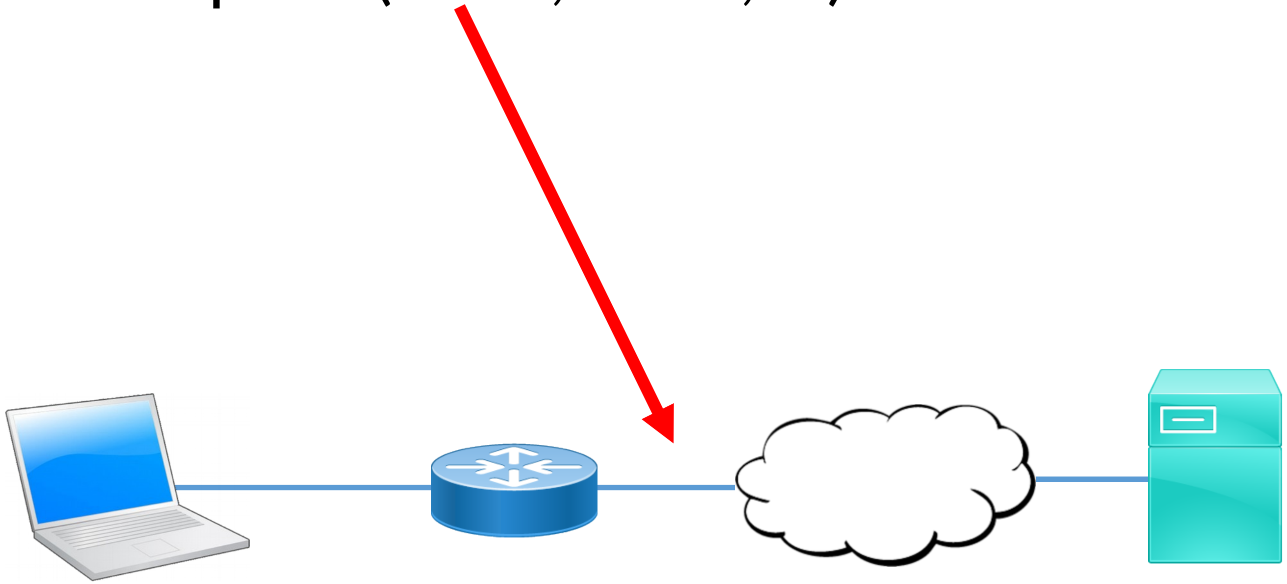
```
{
  "name": "Foo Wireless",
  "expires": "2017-07-23T06:00:00Z",
  "prefixes" : ["2001:db8:1::/48", "2001:db8:4::/48"],
  "localizedName": "Foo-Hôtel à Paris Wifi",
  "dnsZones": ["example.com","sub.example.com"];
  "characteristics": {
        "maxThroughput": { "down":200000, "up": 50000 },
        "minLatency": { "down": 0.1, "up": 1 }
  }
}
```

Some other examples (see also https://smart.mpvd.io/.well-known/pvd) :

```
noInternet : true,
metered : true,
captivePortalURL : "https://captive.org/foo.html”
```

Step 2b: Additional Data Describing the Network

- Cost of the network access
- Performance of the first uplink (ADSL, FTTH, …)
- Captive portal
- Walled garden
- …



Implementation status

Linux - https://github.com/IPv6-mPvD

- pvdd: A Daemon to manage PvD IDs and Additional Data
- Linux Kernel patch for RA processing
- iproute tool patch to display PvD IDs
- Wireshark dissector
- RADVD and ODHCPD sending PvD ID

Implemented in on commercial vendor router

neat

A New, Evolutive API and Transport-Layer Architecture for the Internet: https://www.neat-project.org/

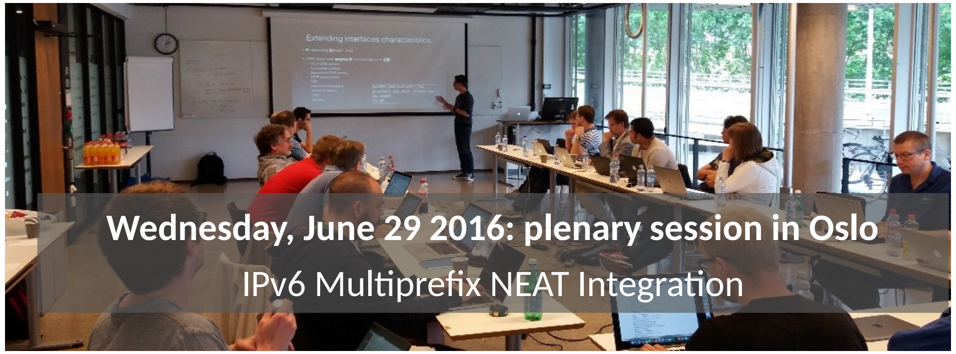
European H-2020 project

10 partners (Cisco, Mozilla, EMC, Celerway…)

Provisioning Domain (information about a prefix)
via DNS draft-stenberg-mif-mpvd-dns-00 (old)

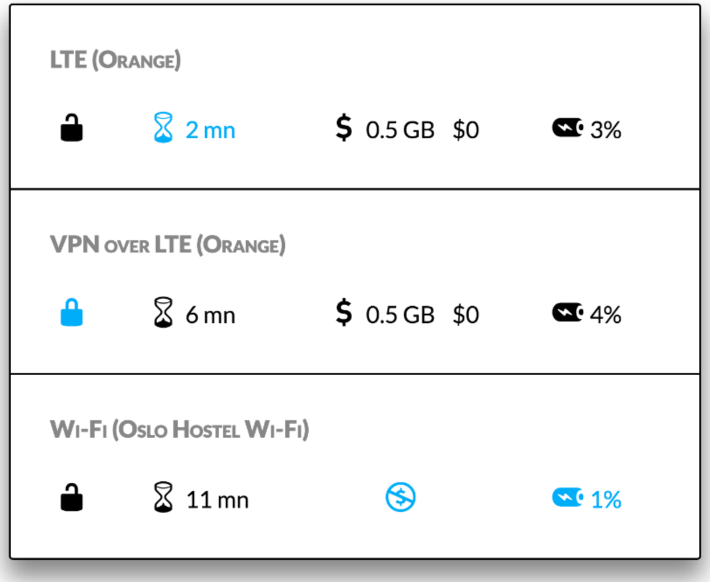
Integration to NEAT code:
https://github.com/NEAT-project/neat/pull/80

Asking the user to choose with relevant criteria and simple UI



Wednesday, June 29 2016: plenary session in Oslo

IPv6 Multiprefix NEAT Integration



LTE (Orange)

🔒 ⌛ 2 mn $ 0.5 GB $0 🔋 3%

VPN over LTE (Orange)

🔒 ⌛ 6 mn $ 0.5 GB $0 🔋 4%

Wi-Fi (Oslo Hostel Wi-Fi)

🔒 ⌛ 11 mn ⊘ 🔋 1%