

Multiple Provisioning Domains

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Motivation

- Many problems occur when a device is multiply connected
- Current IP stack and library implementations do not adequately address these problems
- Vendors with substantial motivation have not solved this problem
- The solution requires fundamental changes in the default architecture of IP stacks.
- We are the people who ought to be architecting this change

Define provisioning domain

- A single collection of configuration information...
 - Address and routing information
 - DNS resolver address
 - Other stack configuration
- ...that comes from a single provider
- May be more than one provisioning domain per link
 - Dual stack: two PDs
 - Device behind multihomed router

Illustrative examples

- Turn on VPN, printer goes away
- Turn on VPN, go to Pirate Bay, get fired
- Connect to captive portal hotspot, mobile data connection stops working
- Connect to LTE and Wifi, LTE is faster, Wifi adequate, next LTE bill is... surprising...
- Maastricht hotel, Wifi does port 80 and port 443 really fast, and nothing else, I have to choose
- Wifi and ethernet provide default route, only one works, stack picks the wrong one every time

Three or more related issues

- Sometimes we can get guidance from network
 - If the guidance is right, it can be helpful
- Sometimes guidance is wrong
 - VPN: “send me everything, even your printer traffic!”
 - Captive portal: “send me everything, so that I can pop up a login screen!”
 - Broken network: “send me everything, so that I can dump it in the bit bucket for you”

Related issues cont'd

- Sometimes guidance is helpful but insufficient
 - LTE: I am faster than your WiFi and can handle all your traffic
 - LTE: I am expensive and you shouldn't use me unless you have to, but I can't say when that is

Not a “selection” problem

- The traditional response has been to pick one and stick with it until something changes
- This works if both connections are equivalent, but one is always preferable
- That is frequently not the case

Not a “happy eyeballs” problem

- Happy eyeballs is interface-agnostic
- Sometimes you really do want to select an interface

Common underlying problem

- Everything is mixed together in the same bucket
- No way to say “use this provisioning domain”
- No way to say “try this provisioning domain”

Discussion

