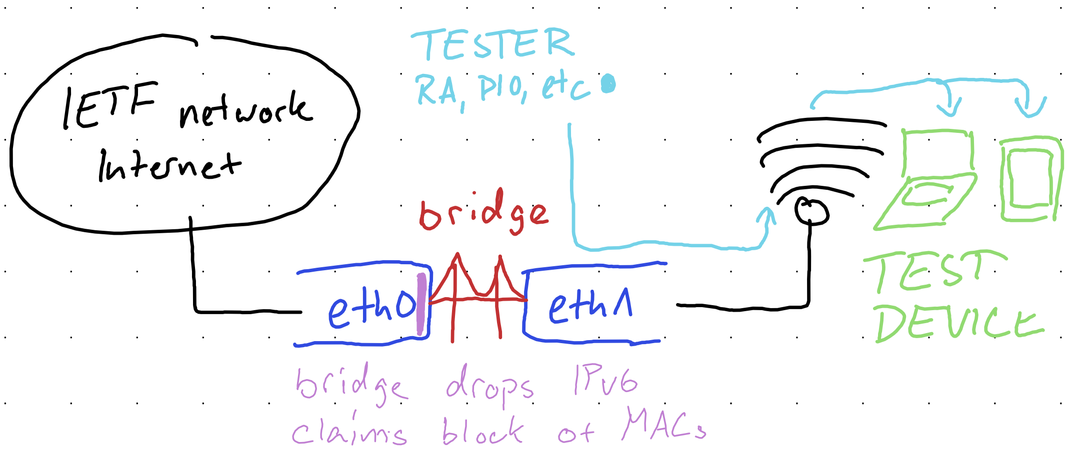
RFC6725 rule 5.5 & RFC8028 testing

IETF123 Hackathon - David Lamparter, Jen Linkova

RFC6724 rule 5.5: prefer sources from same router
RFC8028: keep using router matching source



Test outline/goals:

- send RAs (& PIO & RIO) from multiple fake routers
- check what source address and what router is used for various destination addresses
- deprecate things, observe how existing & new connections are affected

Methodology: Python asyncio web server reachable via IPv4, tells clients to connect via JavaScript, generates variety of test RAs

Test #	MacOS	ChromeOS	Android	Linux kernel ICMPv6	Linux + 5.5 patch kernel ICMPv6	Linux with NetworkManager 1.46.0-1u2.2	Windows
	native	native	native	native	native	native	native
1.1	Pass	Fail	Fail	Fail	Pass	ECMP	Pass
1.2	Bug found	Fail	Fail	Fail	Fail	ECMP	Pass
1.3	Pass				Pass	ECMP	Pass
1.3 RFC8028	Fail				Pass		
1.4	Pass	Fail	Fail	Fail	Pass		Pass
1.5	Pass	Fail	Fail	Fail	Pass		Pass
1.6a							Pass
1.7a							
1.6	Pass			Bug found	Bug found		
1.7	Pass						
					RIOs disabled by default!		
2.1	Pass				Pass		
2.1 RFC8028	Fail				Pass		
2.2	Pass						

Code on GitHub: https://github.com/eqvinox/rule5p5-tests
Test plan & results: TBD

Takeaways

- confirmed Windows does rule 5.5
  - no data on RFC8028 yet (out of time)

- macOS pretty good, fails in RFC8028 edge cases
  - also found a bug(?) in RA withdrawal handling / switch to other router

- Linux (= ChromeOS = Android) has no rule 5.5 support
  - NUD behavior is… “not understood”
    - NetworkManager does NetworkManager things

- Linux w/ 5.5 patch works mostly
  - edge case with “unowned” prefixes
  - full RFC8028

⇒ rule 5.5 probably usable on most platforms, not “exotic”!
⇒ longer presentation in 6man, Tuesday 14:30