Making
Default Address Selection
More ~~Robust~~ FoolProof

draft-linkova-6man-default-addr-selection-update-00

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When Does a Host Stop Using an Address?

- **Preferred lifetime expired**

- **An RA received containing a PIO with Preferred Lifetime = 0**

- **The host network interface status changed**

# Why Does a Host Stop Using an Address?

- **Host moved to another L2 domain (e.g. VLAN)**

- **IPv6 Subnet assigned to the L2 domain changed**

  - **e.g. subnet renumbering**

What Should Happen?

- **L2 domain change:**

  - **Network interface status change (up/down)**

- **Subnet renumbering**

  - **RAs sent containing a PIO with Preferred Lifetime = 0 (address deprecation)**

What Happens Sometimes?

- Network change is not detected

- Network interface stays up

- RAs are not sent or not received
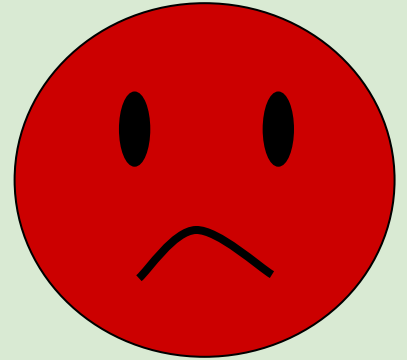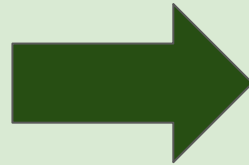
Failure Scenario #1: Automation

Interface FOO
ip address 2001:db8::1/64

Interface FOO
ip address 2001:db8:1::1/64

Interface FOO
ip address 2001:db8::1/64

configuration push

configuration rollback

broken v6 connectivity

broken v6 connectivity

Automation Is the New Black!

Failure Scenario #2: Unreliable RAs

Interface FOO
ip address 2001:db8::1/64

Interface FOO
ip address 2001:db8::1/64
Preferred lifetime 0

Interface FOO
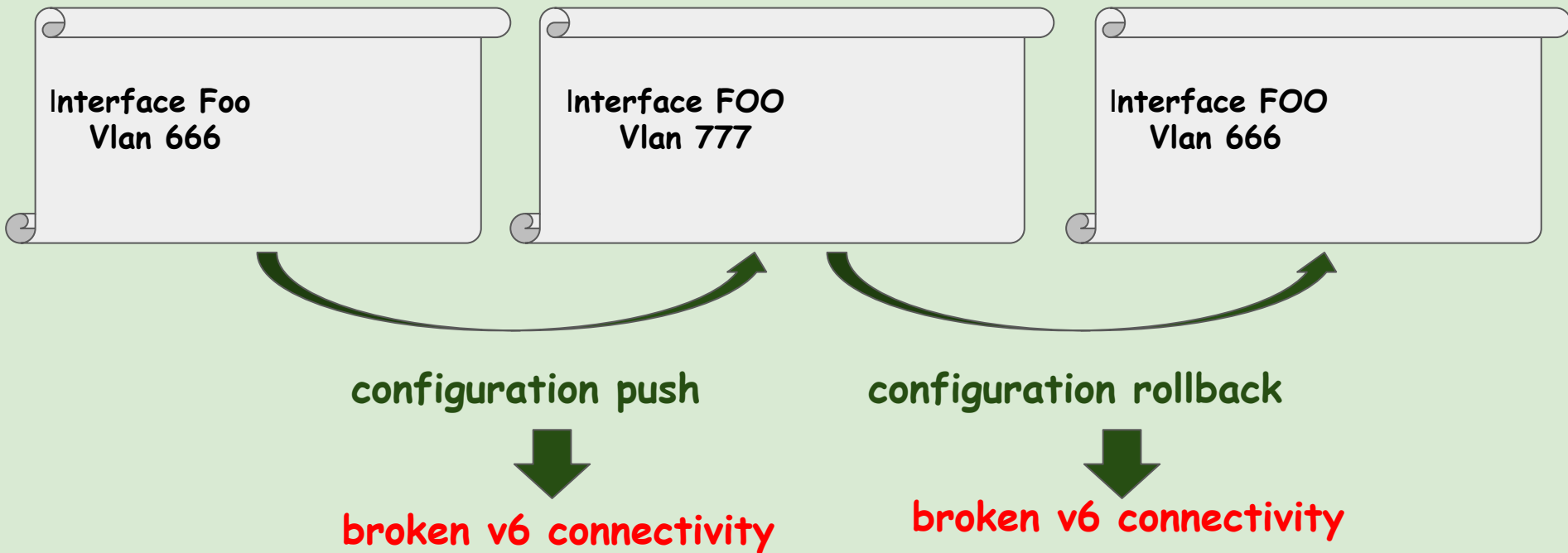ip address 2001:db8:1::1/64

Intermediate configuration push   **Final configuration push**

Multicast RA lost → **broken v6 connectivity!**

Failure Scenario #3: Automation

Interface Foo
Vlan 666

Interface FOO
Vlan 777

Interface FOO
Vlan 666

configuration push

configuration rollback

broken v6 connectivity

broken v6 connectivity

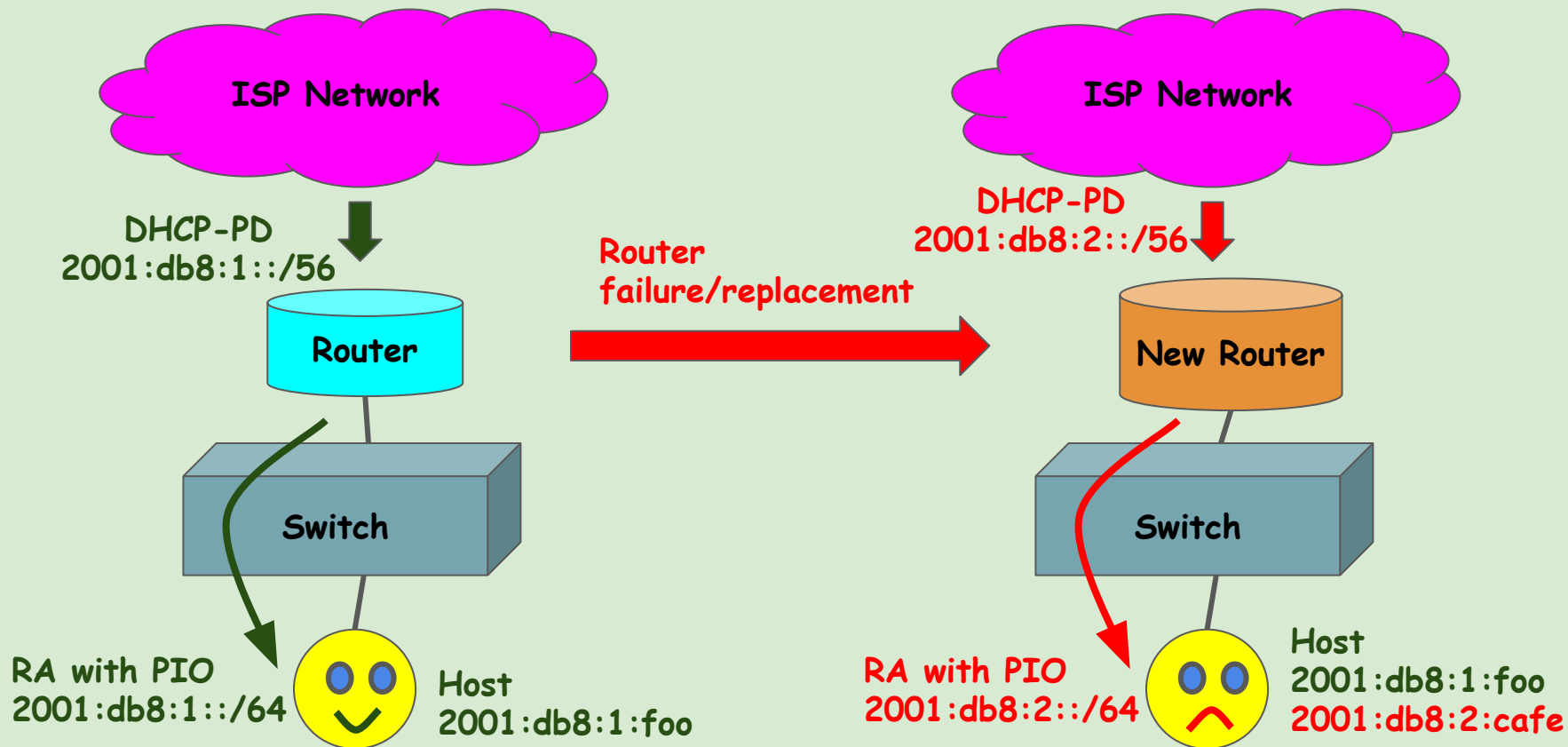**(*) Related: 801.x supplicant not clearing IPv6 stack state after re-authentication**

Failure Scenario #4: DHCP-PD

ISP Network

DHCP-PD
2001:db8:1::/56

Router

Switch

RA with PIO
2001:db8:1::/64

Host
2001:db8:1:foo

Router
failure/replacement

ISP Network

DHCP-PD
2001:db8:2::/56

New Router

Switch

RA with PIO
2001:db8:2::/64

Host
2001:db8:1:foo
2001:db8:2:cafe

Rule 5.5: A New Hope?

Source Address Selection Rule 5.5:

Prefer addresses in a prefix advertised by the next-hop.

Yes but…

- Rule 5.5 is applicable if the host tracks next-hop/prefix pairs
- Sometimes the first-hop LLA does not change (VRRP)
- Does not help with renumbering & lost RA scenarios

Proposed Solution

Update the source address selection with a new, second-to-last rule:

Use the address preferred lifetime as tie-breaker

RFC6724 Old Text

Rule 8: Use longest matching prefix.

….

[examples skipped]

Rule 8 MAY be superseded if the implementation has other means of choosing among source addresses.

RFC6724 Proposed New Text

Rule 8: Use the address from the most recently refreshed prefix.

If SA's PIO was received more recently than SB's POI, then prefer SA. Similarly, if SB's POI was received more recently than SA's POI, then prefer SB. If the implementation does not keep track of when the particular POI was received, then the addresses preferred lifetime SHOULD be considered instead: if preferred lifetime(SA) > preferred lifetime(SB), then prefer SA. Similarly, if preferred lifetime(SB) > preferred lifetime(SA), then prefer SB.

Rule 9: Use longest matching prefix.

Rules 8 and 9 MAY be superseded if the implementation has other means of choosing among source addresses.

NEXT STEPS?