# **Conditional Router Advertisements**

for

# Enterprise PA Multihoming

draft-ietf-v6ops-conditional-ras

<u>Jen Linkova,</u> RIPE76, Marseille, May 2018

### Enterprise Multihoming: Requirements

- Using Provider-aggregatable address space
- No BGP
- No NAT
- No changes on hosts

### Problems with IPv6 PA Multihoming

Q: How to send packets to the correct uplink?

**Q**: How to implement policies?

Q: How to react to links failure/recovery?

## Selecting the Uplink

Various Solutions Available/Being Developed

- Good Old Policy Based Routing
- Source-Address Dependent Routing
- IPv6 Segment Routing

etc...

### Mutihomed Hosts: Work Being Done

- Multiple Provisioning Domains (mPVD)
  - Work in progress, takes a while to deploy
- MultiPath Transport (MPTCP, QUIC etc)
  - Other protocols?
  - Systems w/o multipath transport support?

## Limiting the Scope

- Two uplinks used for Internet access (primary/backup or active/active)
  - No "walled gardens" etc
- Simple network topologies
  - so even policy based routing would work...



## Problems to Solve: Signalling Events to Hosts

<u>Uplink failure:</u>

Addresses from that ISP prefix SHOULD NOT be used <u>Uplink recovery:</u>

Addresses from that ISP prefix can be used again

Primary/Backup uplinks:

Addresses from the backup ISP SHOULD NOT be used if the primary uplink is up.

#### Existing Mechanism: SLAAC

"Addresses in the prefix can be used"

Preferred addresses (preferred lifetime > 0)

"Addresses in the prefix should not be used"

Deprecated addresses (preferred lifetime == 0)



#### <u>Uplink failure:</u>

Send RA with PIO preferred\_lifetime = 0

<u>Uplink recovery:</u>

Send RA with PIO preferred\_lifetime > 0

Primary/Backup uplinks:

Backup prefix preferred\_lifetime = 0 if the primary uplink is up

Backup prefix preferred\_lifetime > 0 if the primary uplink is down

### **Proposed Approach**

- Router Advertisement fields values set conditionally
- Network events trigger new RAs being sent



#### **Potential Triggers**

- Interface state
- Route presence
- Smth else...

#### Fields to Be Updated

- PIO Preferred Lifetime
- RDNSS Lifetime
- Router Lifetime

# Example Scenarios



















## et cetera, et cetera...

#### **Connection Preservation:**

- Uplink failure:
  - connections interrupted (like IPv4 NAT)
- Uplink recovery:
  - <u>connections are NOT interrupted (unlike IPv4 NAT)</u>

#### Not Something New

IPv6 CPE L-13 requirement (RFC7084):

- Explicit prefix invalidation
- Homenet routers deprecate prefixes

# **Deploying Right Now**

While we are awaiting for vendors to implement it...

We can still use it!

Example: JunOS event policies/even scripts

# **QUESTIONS?**