

# Simple Failover Mechanism for Lightweight 4over6

draft-lee-softwire-lw4over6-failover-01

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# Background

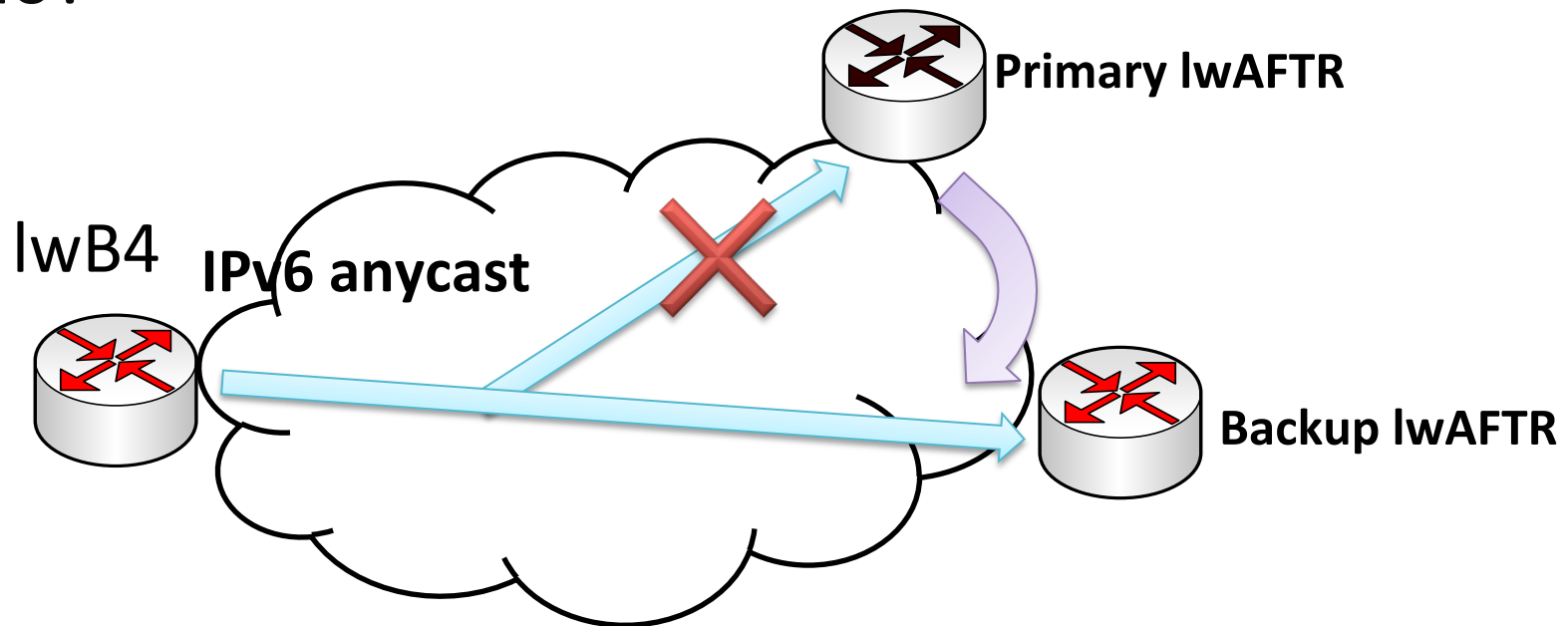
- lw4over6 is a softwire based IPv6 transition technology
- lw4over6 is a stateful technology
  - lwAFTR maintains a per-subscriber binding table
  - When the Primary lwAFTR fails, the Backup lwAFTR may not have the necessary state to provide softwire service for the lwB4.
- This draft discusses lw4over6 failover design.

# Use Case Assumptions

- A set of lwAFTRs using the same IPv6 Anycast address
- IPv4 provisioning used by lwB4 is dynamic (via dhcpv4 over dhcpv6 or pcp)
- Primary lwAFTR creates the dynamic binding upon successful lwB4 provisioning
- IPv4 address used by the lwB4
  - either static or dynamic
  - either full or port-restricted

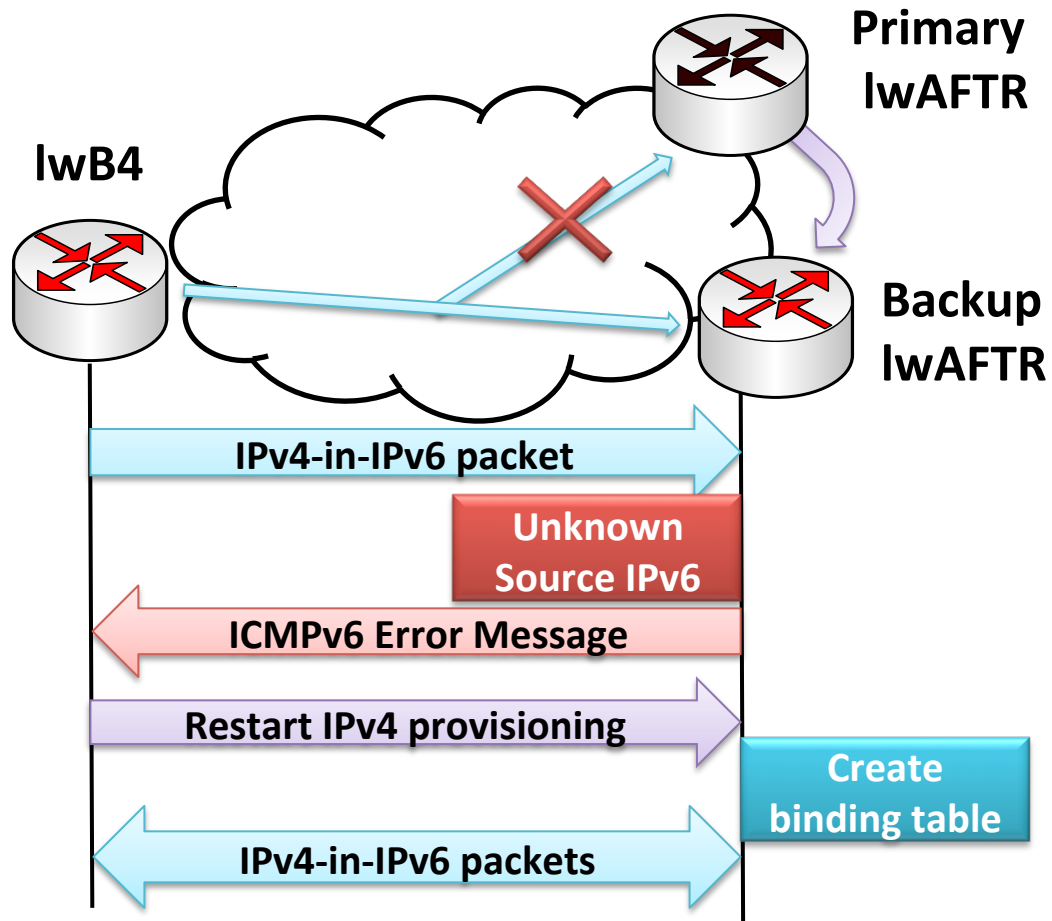
# Typical Failover Use Case

- Primary IwAFTR fails
- IwB4 continues to send packets to the anycast address
- Backup IwAFTR receives the packets, then what to do?



# We propose two mechanisms

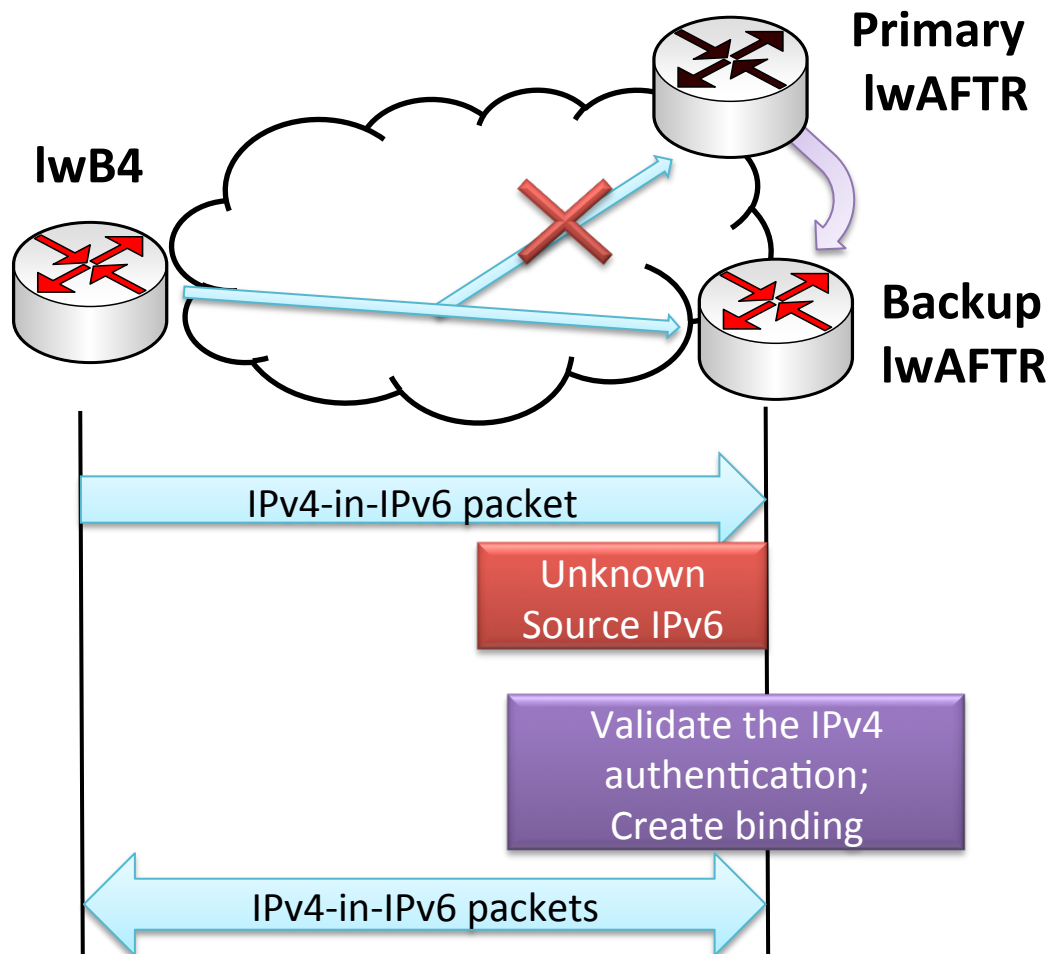
- ICMPv6 Trigger Failover



- Characteristics
  - Modify IwB4
  - Original connections would fail
  - IwAFTRs can advise different v4 prefixes
  - Comms not needed between IwAFTRs

# We propose two mechanisms

- Data Packet Trigger Failover



- Characteristics

- Not modify IwB4
- Original connections would not fail
- IwAFTRs advise the same v4 prefixe
- Require additional validation method(s)

# Comparison with two mechanisms

	Control Message Trigger	Data Packet Trigger
Address pool Configuration	Primary and Backup lwAFTR may use the same address pool or different IPv4 address pools	Primary and Backup lwAFTR must use the same IPv4 address pool
Impact on applications	PCP: No guarantee same public v4 addr; can not be used for external-initiated applications. DHCP: Can use same public v4 addr; also can be used for external-initiated applications.	Use the same public IPv4 address. It can also be used for external-initiated applications.
Implementation requirement	Implement the ICMP mechanism in lwB4 and lwAFTR	Require an interface between lwAFTR and the supporting system to check the validity of the binding.

# Next Step

- Comments?
- Any interest to continue the work?



# Backup: Some Considerations

- Backup IwAFTR Discovery
  - Use Anycast
  - Recommend to hash the outer v6 header for ECMP
  - IwAFTR must stop announcing the anycast addr when offline
- IwB4 IPv4 Prefix Announcement on IwAFTR Management
  - Dynamic IPv4 address
    - No special action. Each IwAFTR advertises its own IPv4 prefix. Different IPv4 prefixes
  - Static IPv4 address
    - Primary and Backup IwAFTRs will announce the same IPv4 prefix given that the Backup IwAFTR will use a lower matrix
- IwB4 Address Provisioning
  - DHCPv4 over DHCPv6
    - DHCP server: Centralized
    - IwAFTRs: DHCPv6 relay, unicast to DHCP server
  - PCP
    - PCP server: Collocate with IwAFTR
    - Use IPv4-in-IPv6 tunnel; hash on the outer IPv6 header if ECMP is used