

IETF 115 – 6lo

Reliability Considerations of Path-Aware Semantic Addressing

draft-li-6lo-pasa-reliability

IETF 115 – London

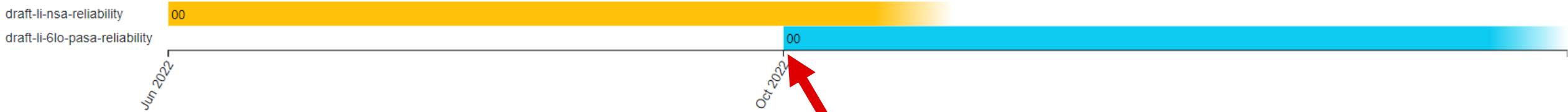
Since IETF 114

Reliability Considerations of Path-Aware Semantic Addressing draft-li-6lo-pasa-reliability-00

Status IESG evaluation record IESG writeups Email expansions History

Versions:

00



New document: draft-li-6lo-pasa-reliability-00.txt
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Main Content

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Main points:

- A general introduction to the problem
- Possible solutions classes
 - See rest of the presentation
- Some considerations about failure detection and recovery
- Some considerations about robustness

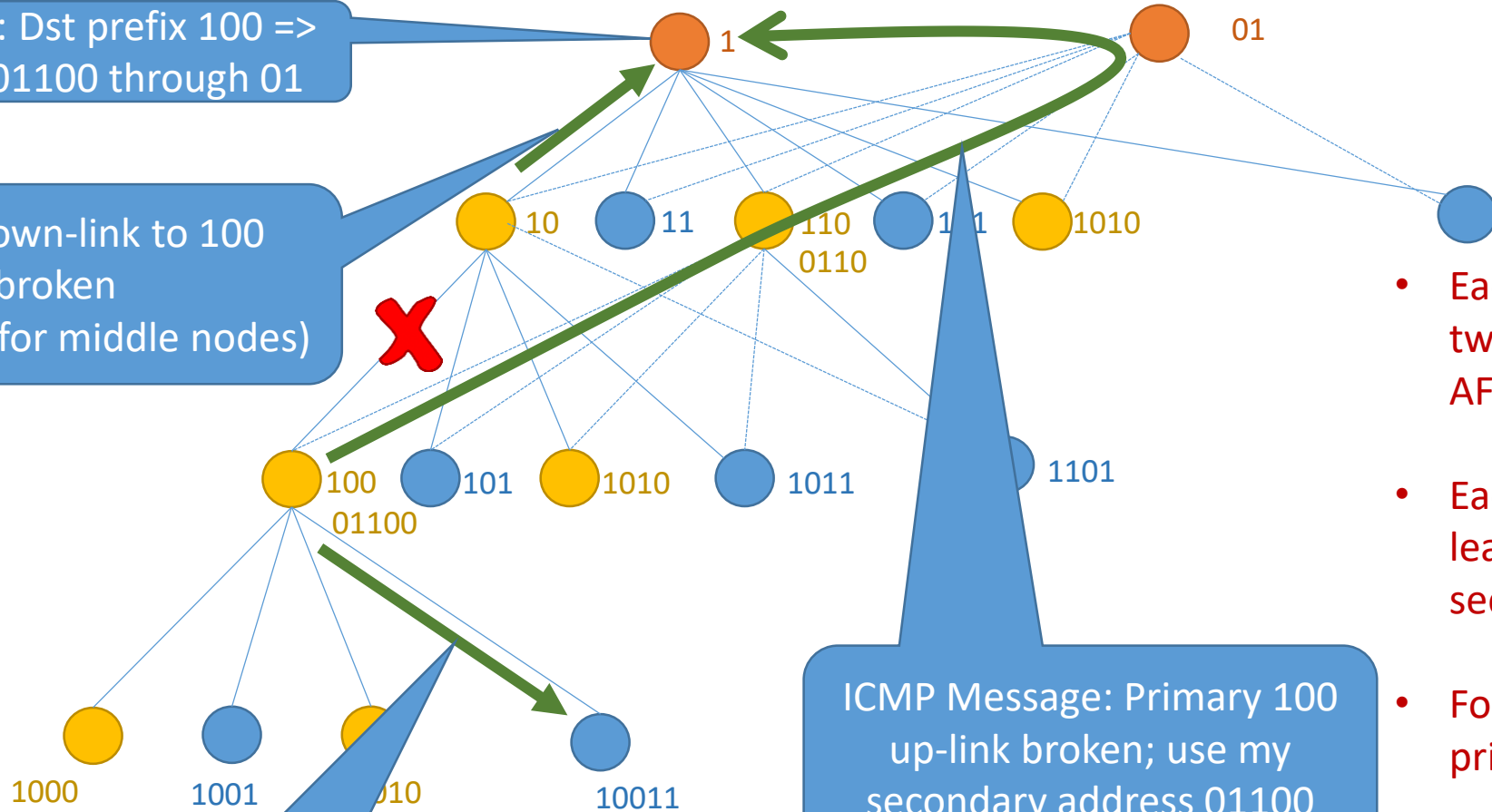
Solutions

- **Pre-requisite**
 - Presence of redundant links
 - Some not actively used
 - Active links forming a tree
 - All nodes have a secondary parent
 - Except root node
 - Alternative parent is connected through a non actively used link
- **Multi-Address:**
 - using multiple addresses per node, one for each alternative parent (logically creating multiple topologies)
- **Single-Address:**
 - using one single address per node, store the addresses of alternative parents/children

Multi-address: Link Failure

Install rule: Dst prefix 100 => encap to 01100 through 01

ICMP: Down-link to 100 broken (necessary for middle nodes)



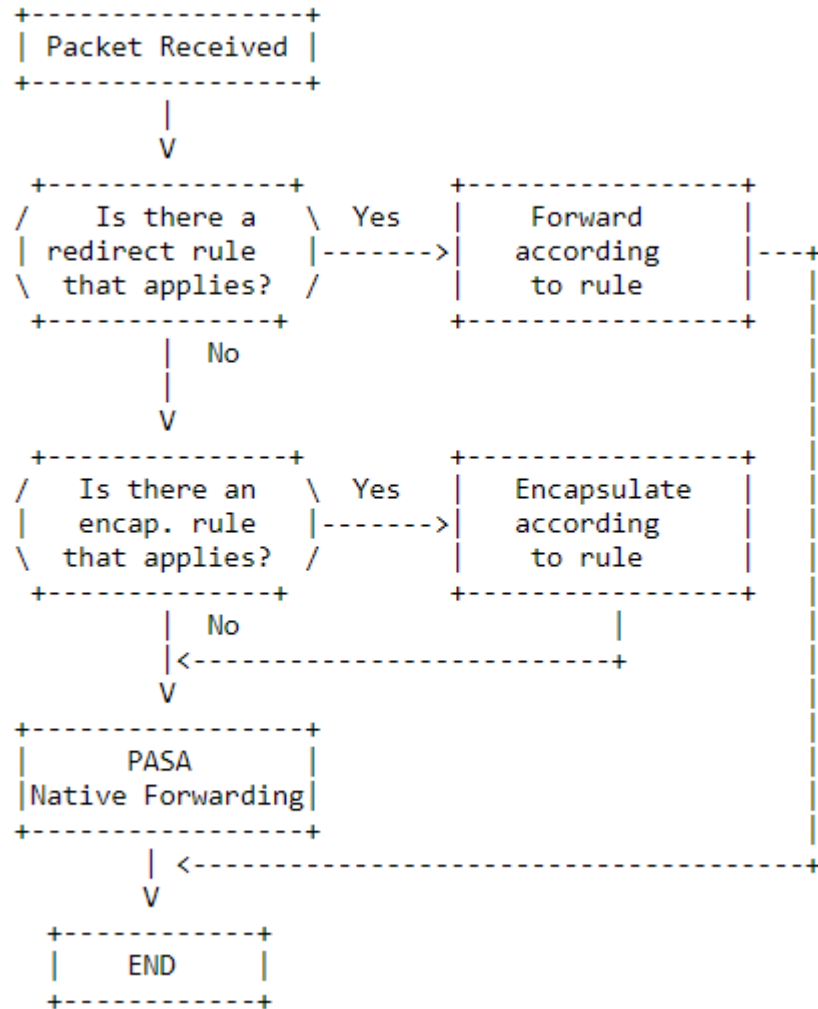
- Each node in the PASA only has two addresses built using the same AF but different roots (1 and 01)
- Each node except the root has at least 2 parents (primary and secondary)
- Forwarding done following only primary address (and topology)
- Each node maintains a redirect table if something has to be tunneled via secondary topology

ICMP: Consider using your secondary address

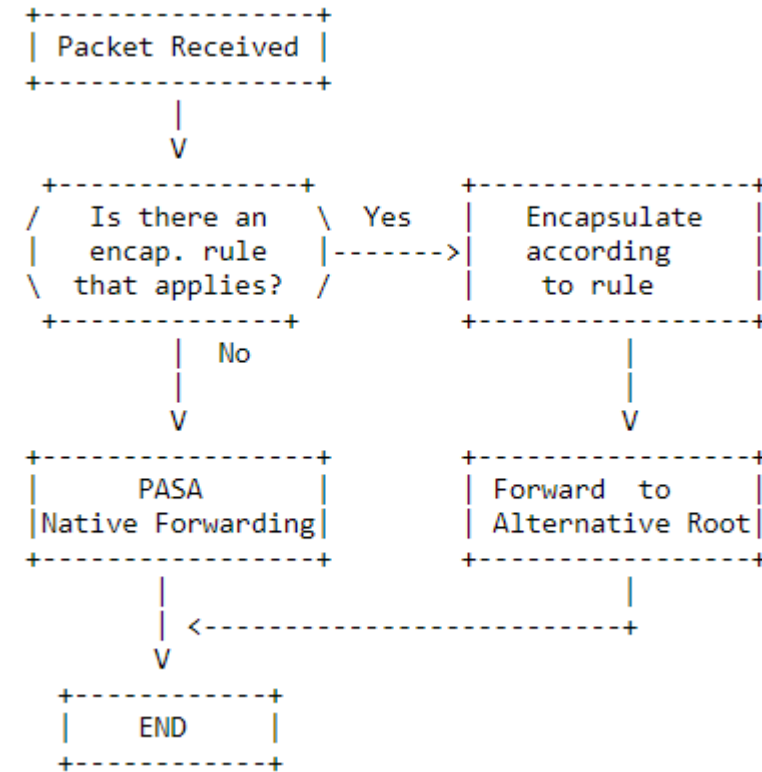
● Leaf Node
● Forwarder Node

Multi-Address: Forwarding Operation

Forwarder Nodes



Root Nodes

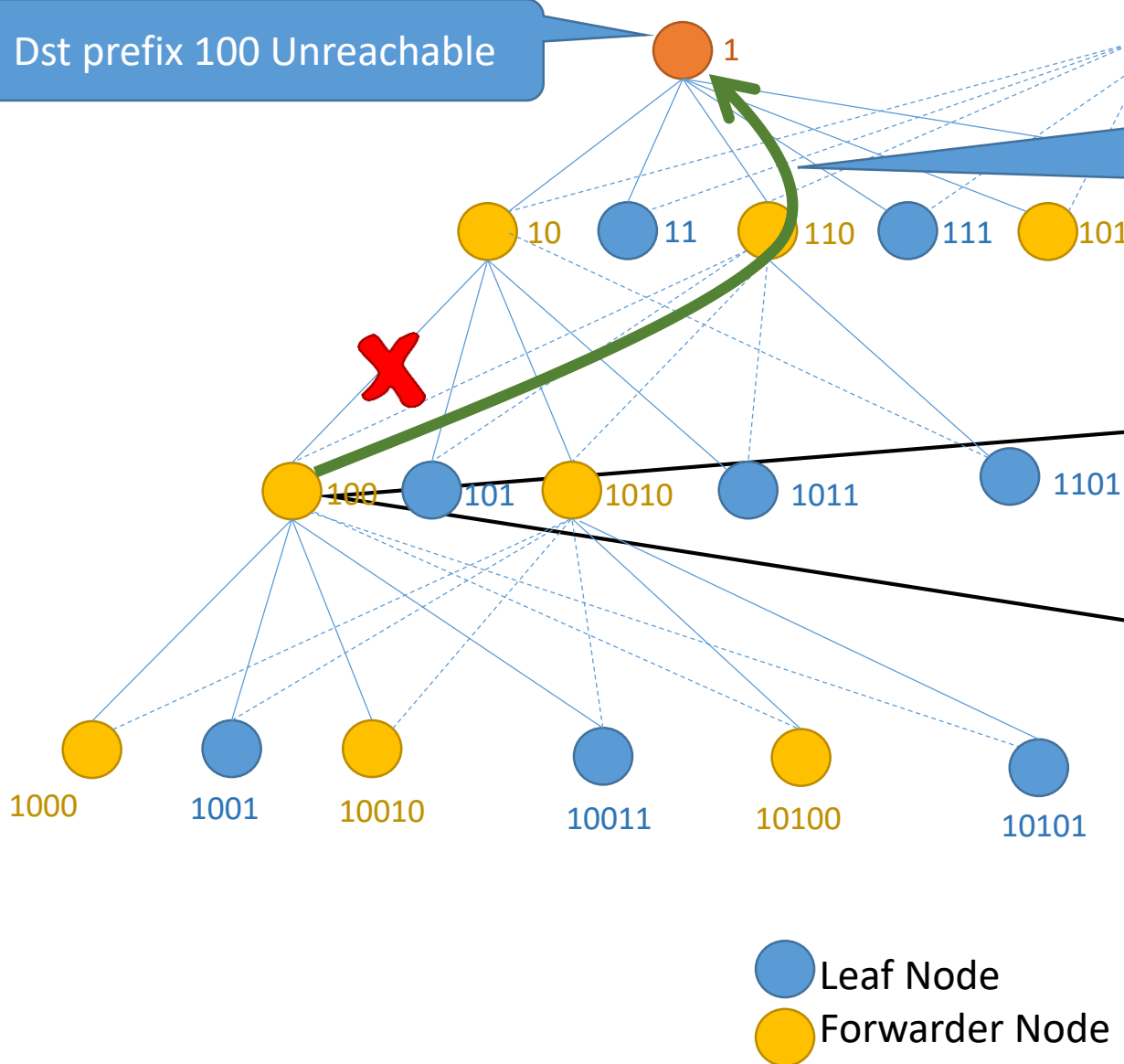


Single Address: Link Failure

- Locally store alternative parents/children

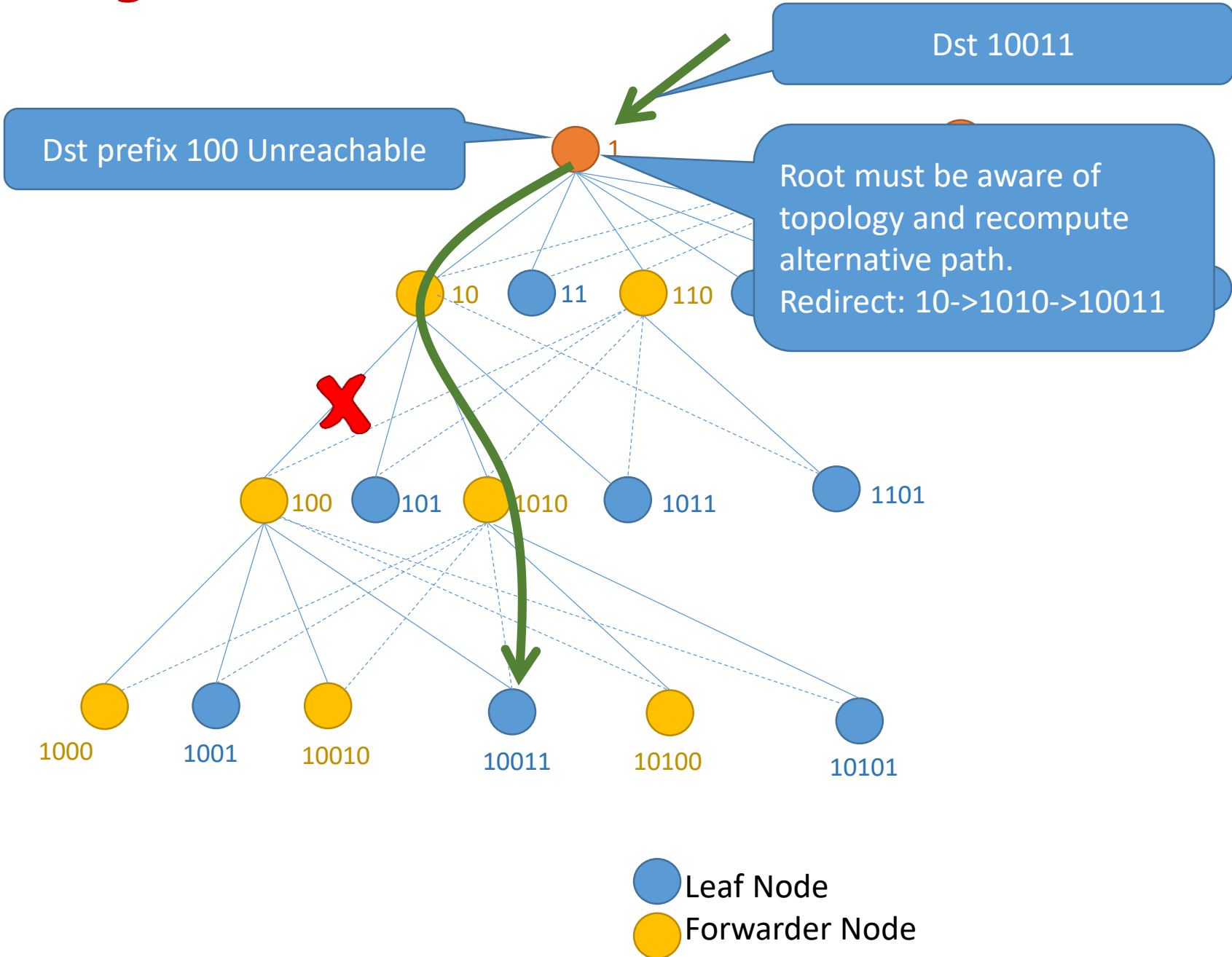
Dst prefix 100 Unreachable

ICMP: Down-link to 100 broken
(piggyback packet)



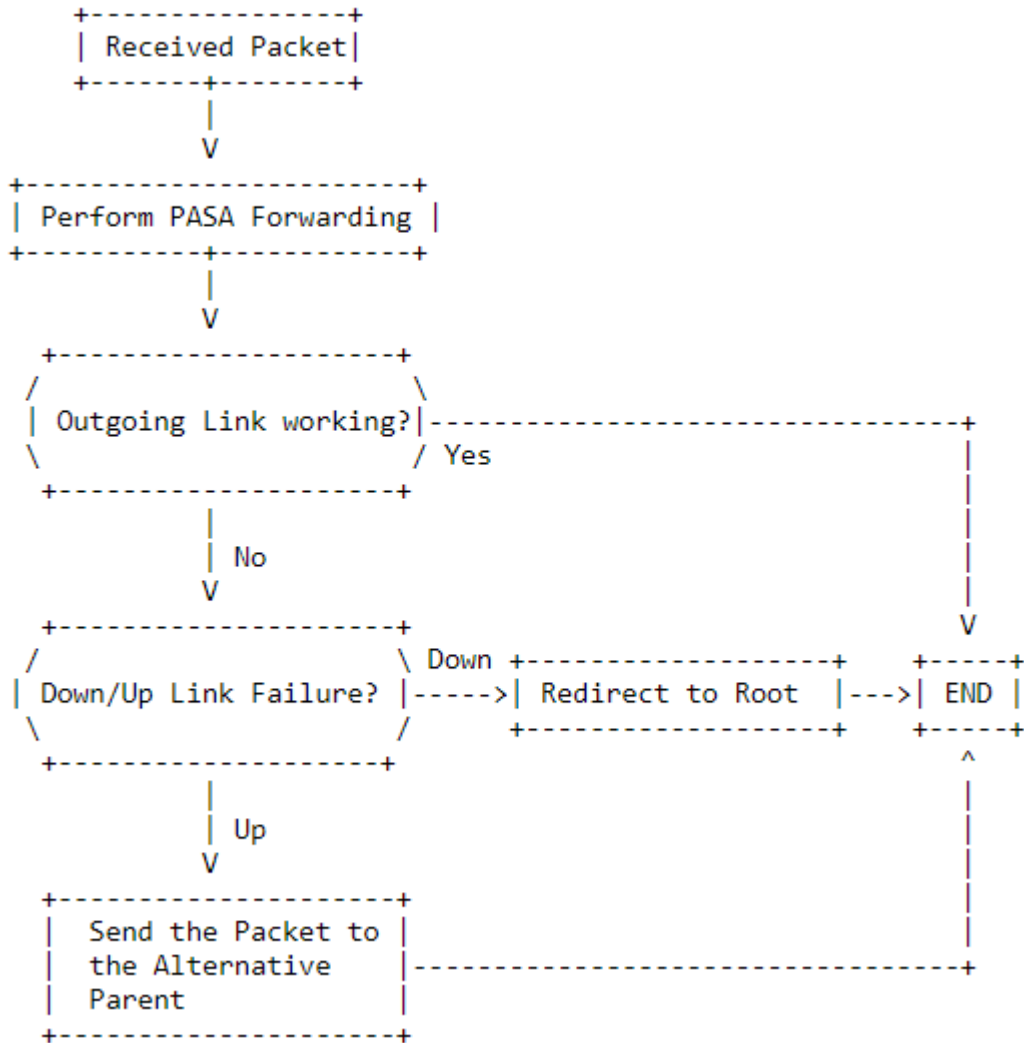
Destination	Flags	
100	I	I = Current Node
10	PP	PP = Primary Parent
1000	PFC	PFC = Primary Forwarder Child
10010	PFC	
1001	PLC	PLC = Primary Leaf Child
10011	PLC	
110	AP	AP = Alternative Parent
10100	AFC	AFC = Alternative Forwarder Child whose alternative parent is the current node
10101	ALC	ALC = Alternative Leaf Child whose alternative parent is the current node

Single Address: Link Failure

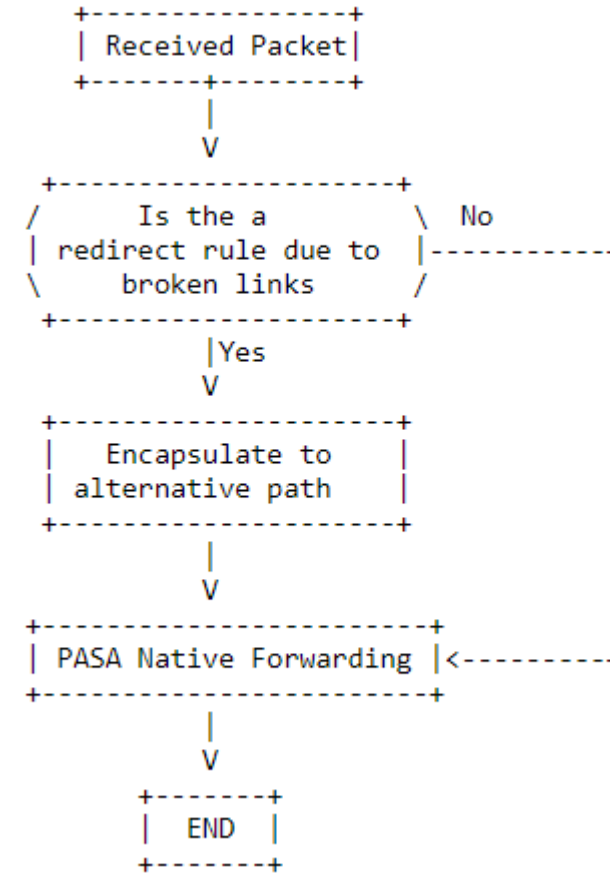


Single-Address: Forwarding Operation

Forwarder Nodes



Root Nodes



Multiple Addresses vs Single Address

Approach	Root State	Forwarder State	Robustness
Multiple Addresses	Low (redirect rule)	Low (redirect rule)	Lower for multiple failures (limited knowledge)
Single Address	High (topology)	Low (neighborhood)	Higher for multiple failures (root to find feasible path)

Any question/comment welcome!

THANKS!