IETF 114 – 6lo

Reliability Considerations of Native Short Addressing

draft-li-nsa-reliability

IETF 114 – Philadelphia

Since IETF 113

Reliability Considerations of Native Short Addressing

draft-li-nsa-reliability-00

Status | IESG evaluation record | IESG writeups | Email expansions | History

Versions:

00

New document: draft-li-nsa-reliability-00.txt
June 2022

Main Content

Table of Contents

1. Introduction and Problem Statement 2
2. Requirements Notation 3
3. Potential Solution Approaches 3
  3.1. Multi-Address Approach 3
    3.1.1. Topology building 4
    3.1.2. Link Failures 7
    3.1.3. Node Failures 11
    3.1.4. Nodes Forwarding Procedure 13
  3.2. Single-Address Approach 15
    3.2.1. Link Failure 17
    3.2.2. Node Failure 19
    3.2.3. Node Forwarding Procedure 19
4. Links/Nodes Failure Detection and Recovery 21
5. Robustness 22
6. Security Considerations 22
7. IANA Considerations 22
8. References 22
  8.1. Normative References 22
  8.2. Informative References 23
Authors' Addresses 24

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

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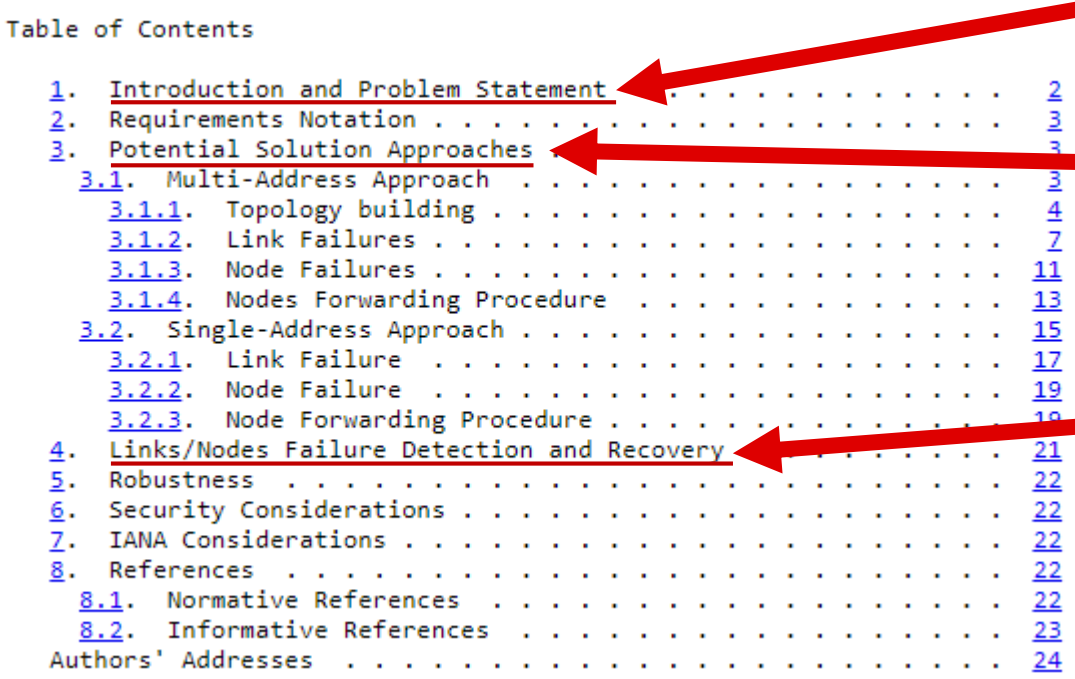

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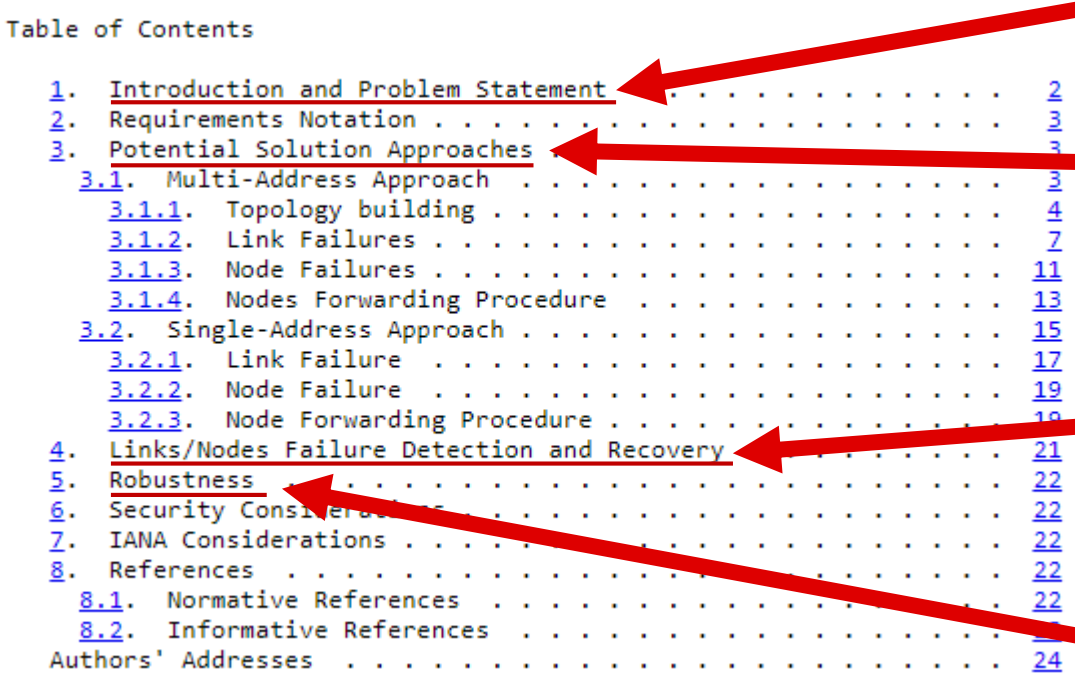

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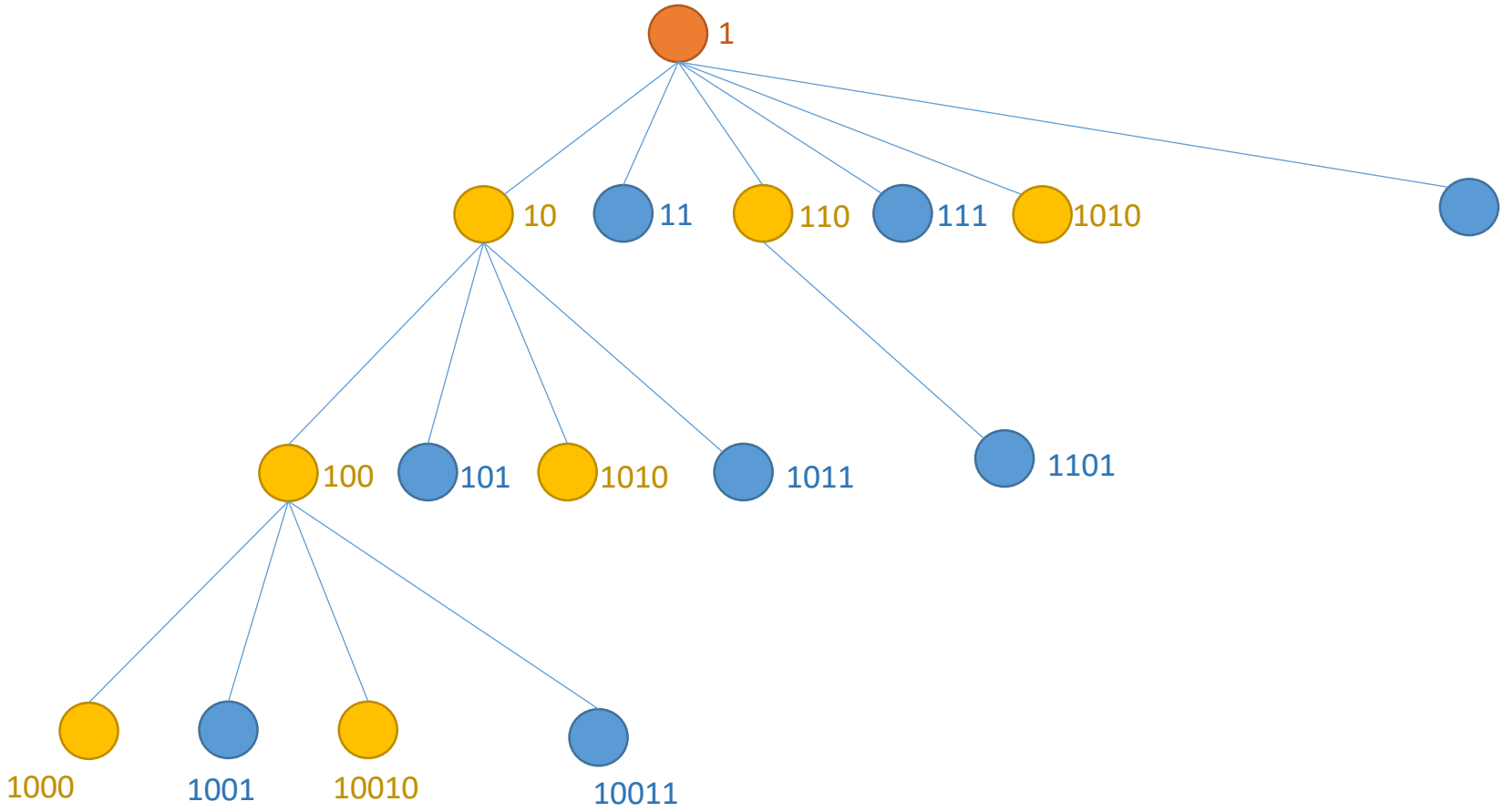
Solutions

- 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

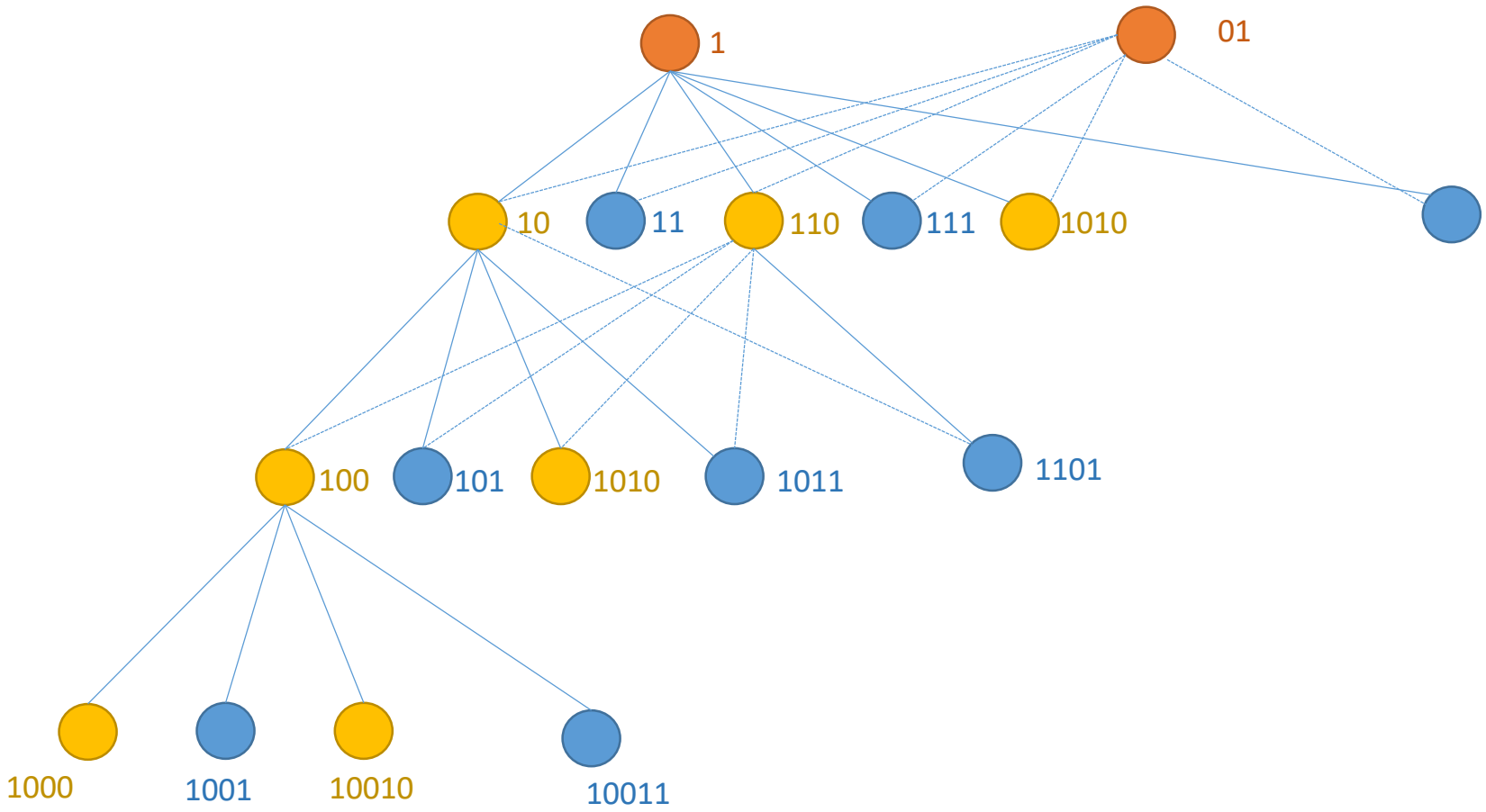
Multi-address: Link Failure



Leaf Node

Forwarder Node

Multi-address: Link Failure



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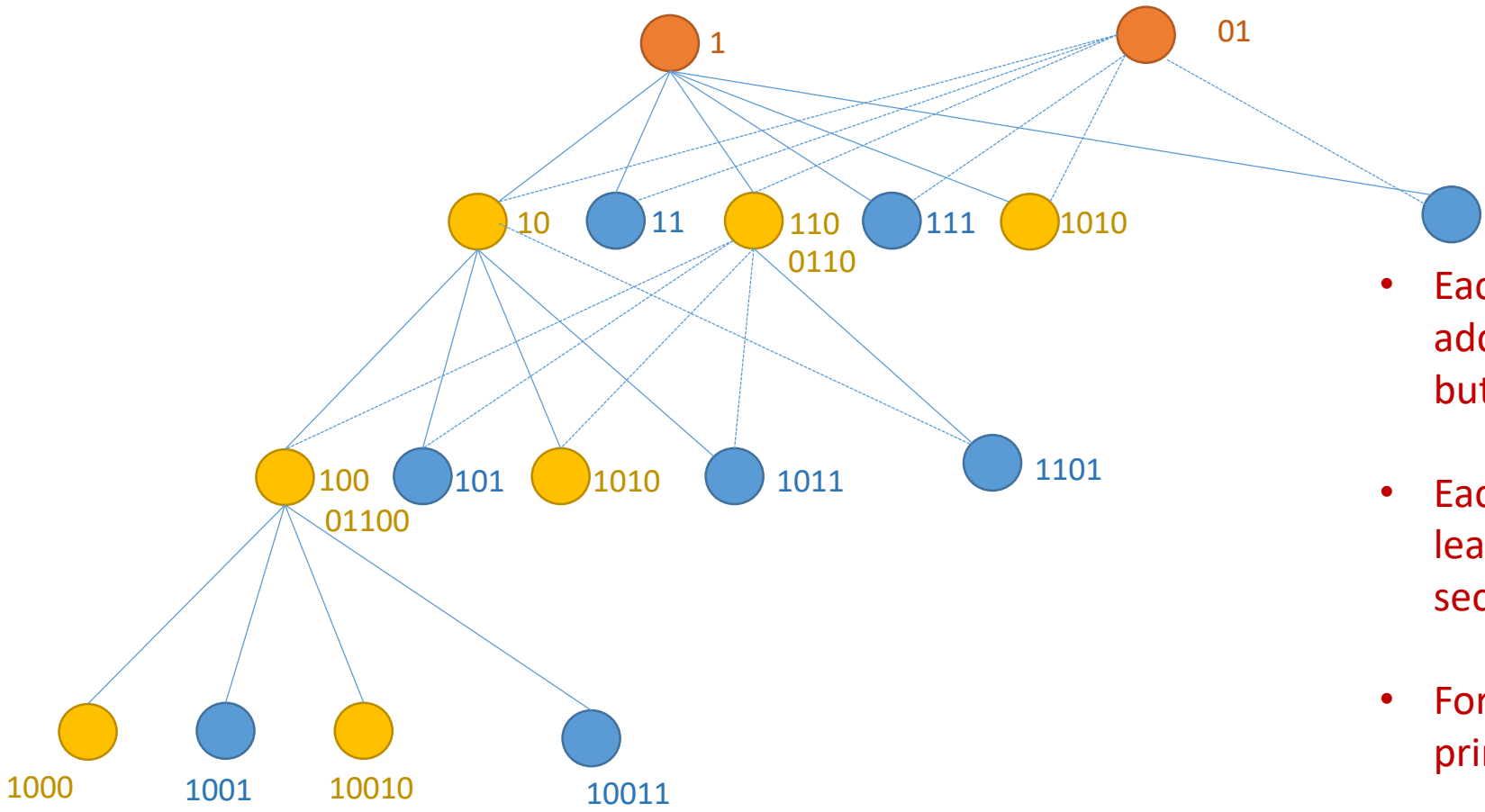

- Each node in the NSA only has two addresses built using the same AF but different roots (1 and 01)
- Each node except the root has at least 2 parents (primary and secondary)
- Forwarding done following only primary address (and topology)
- Each node maintains a redirect table if something has to be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

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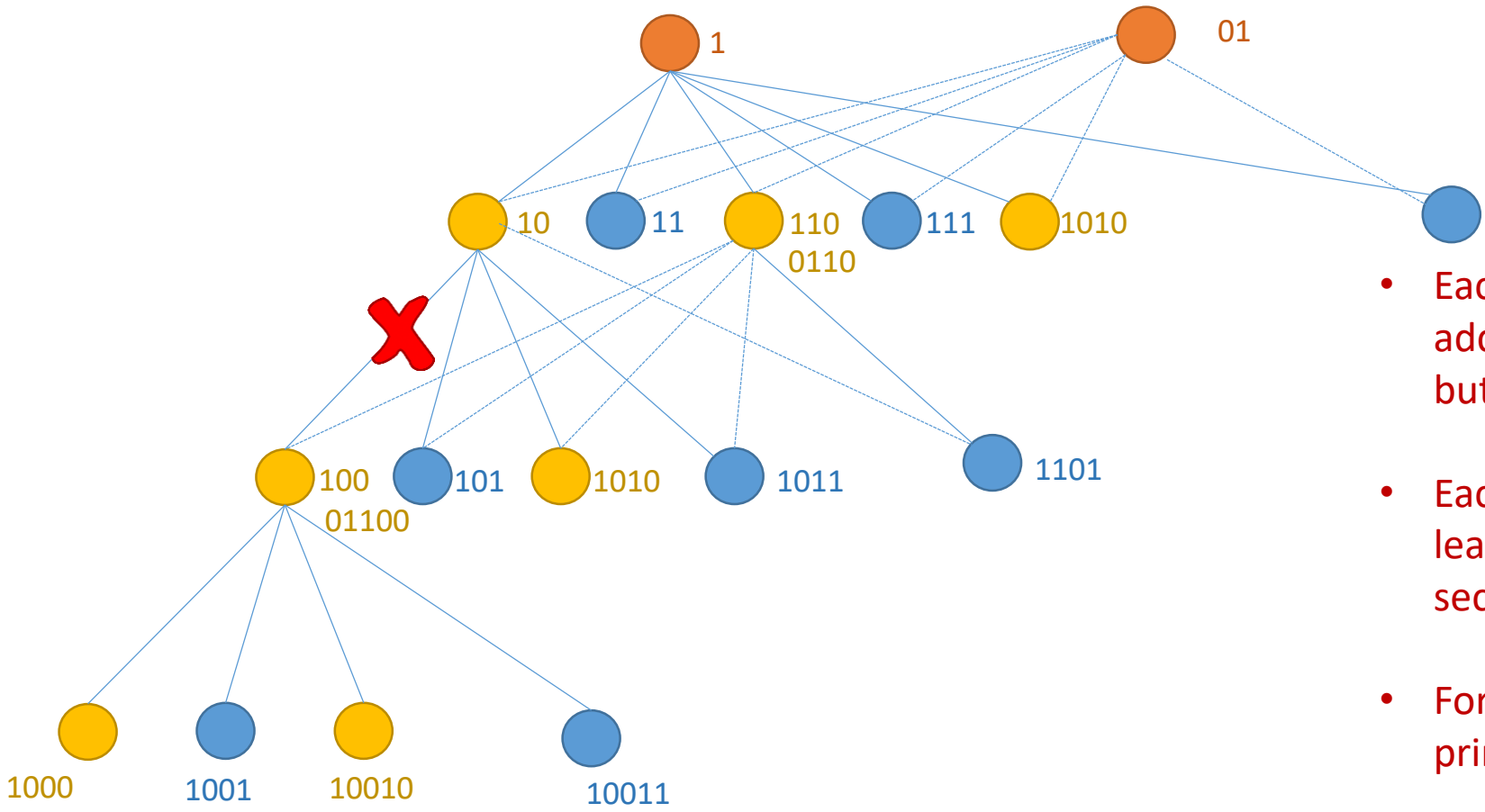

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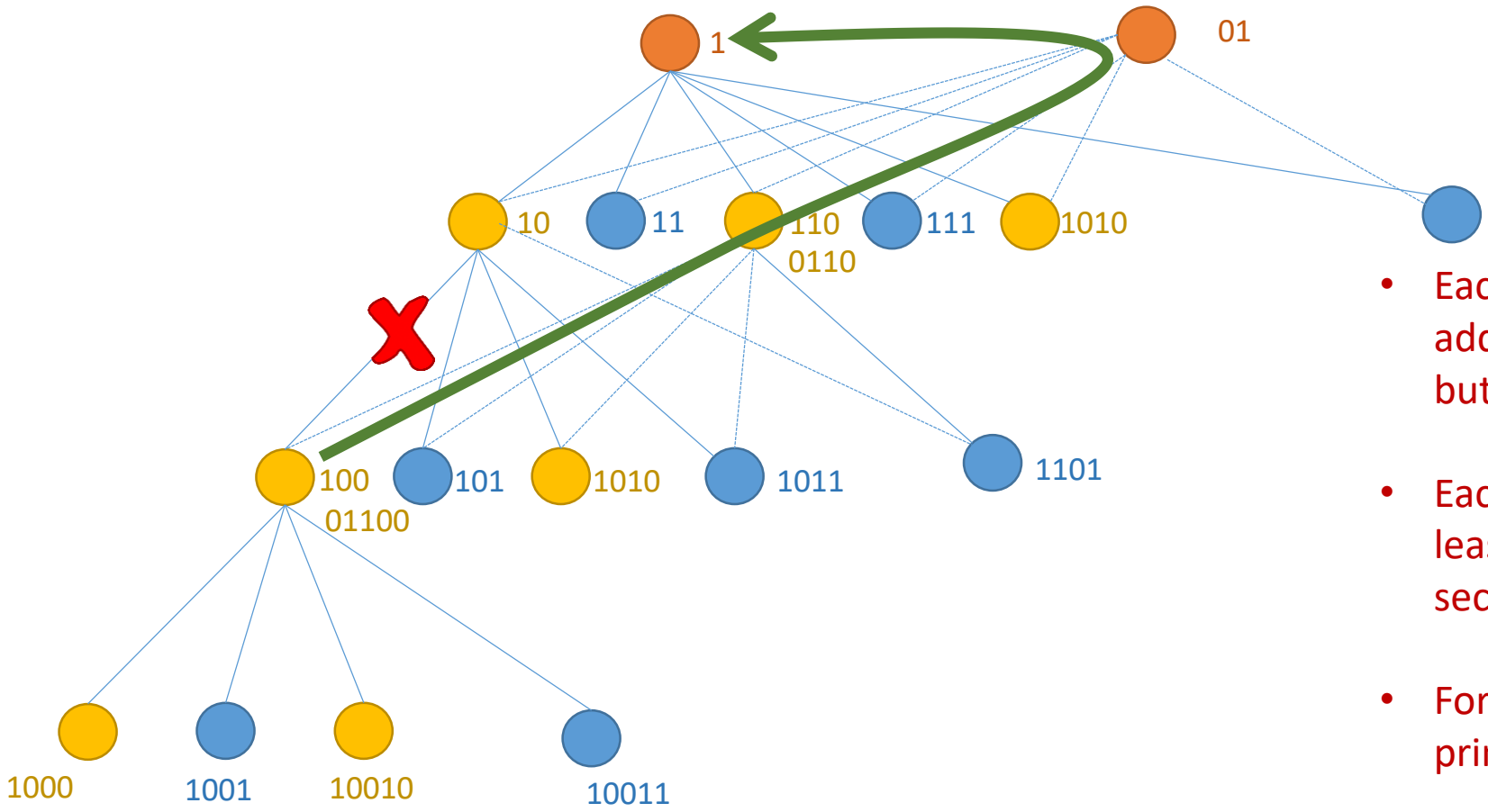

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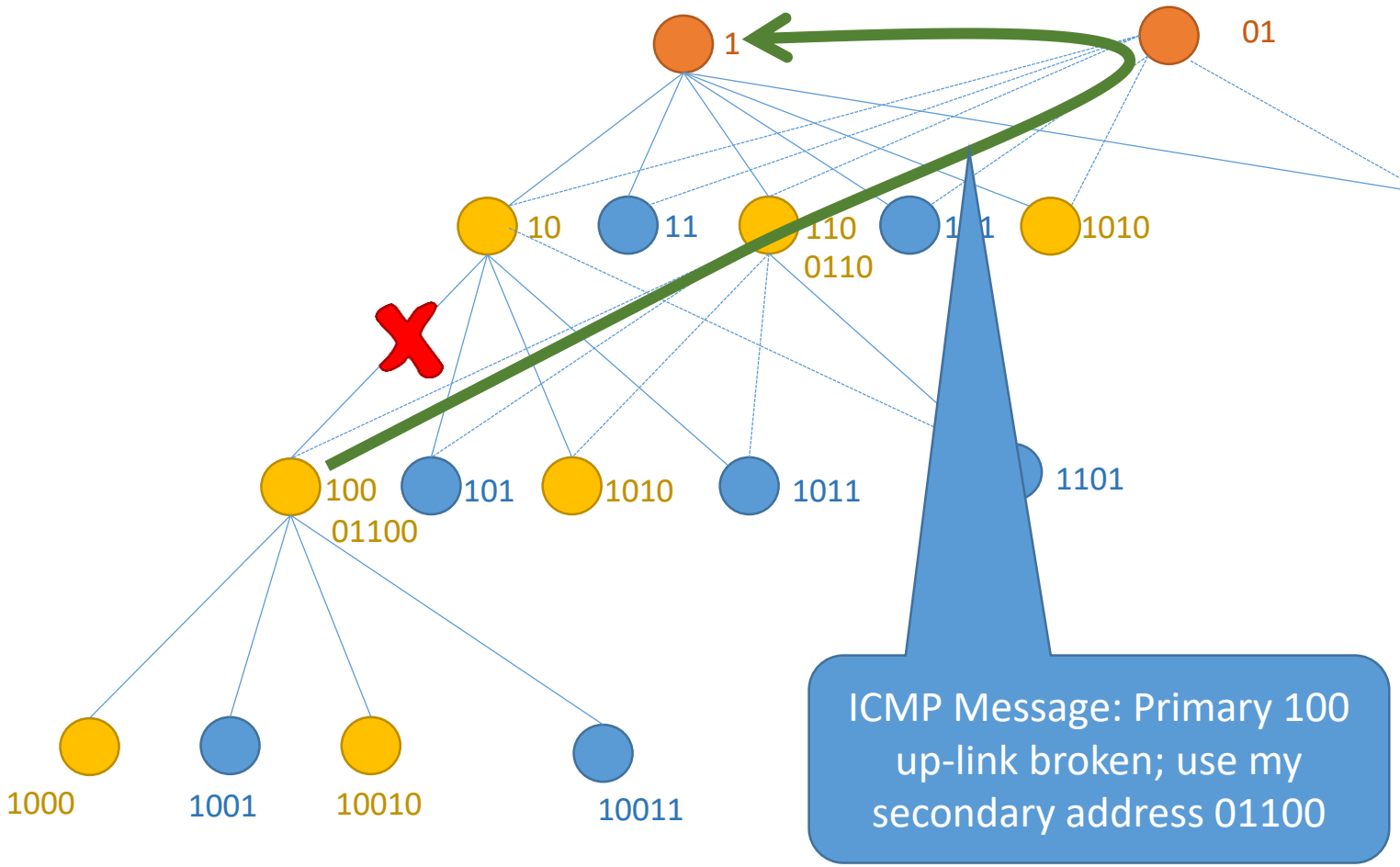

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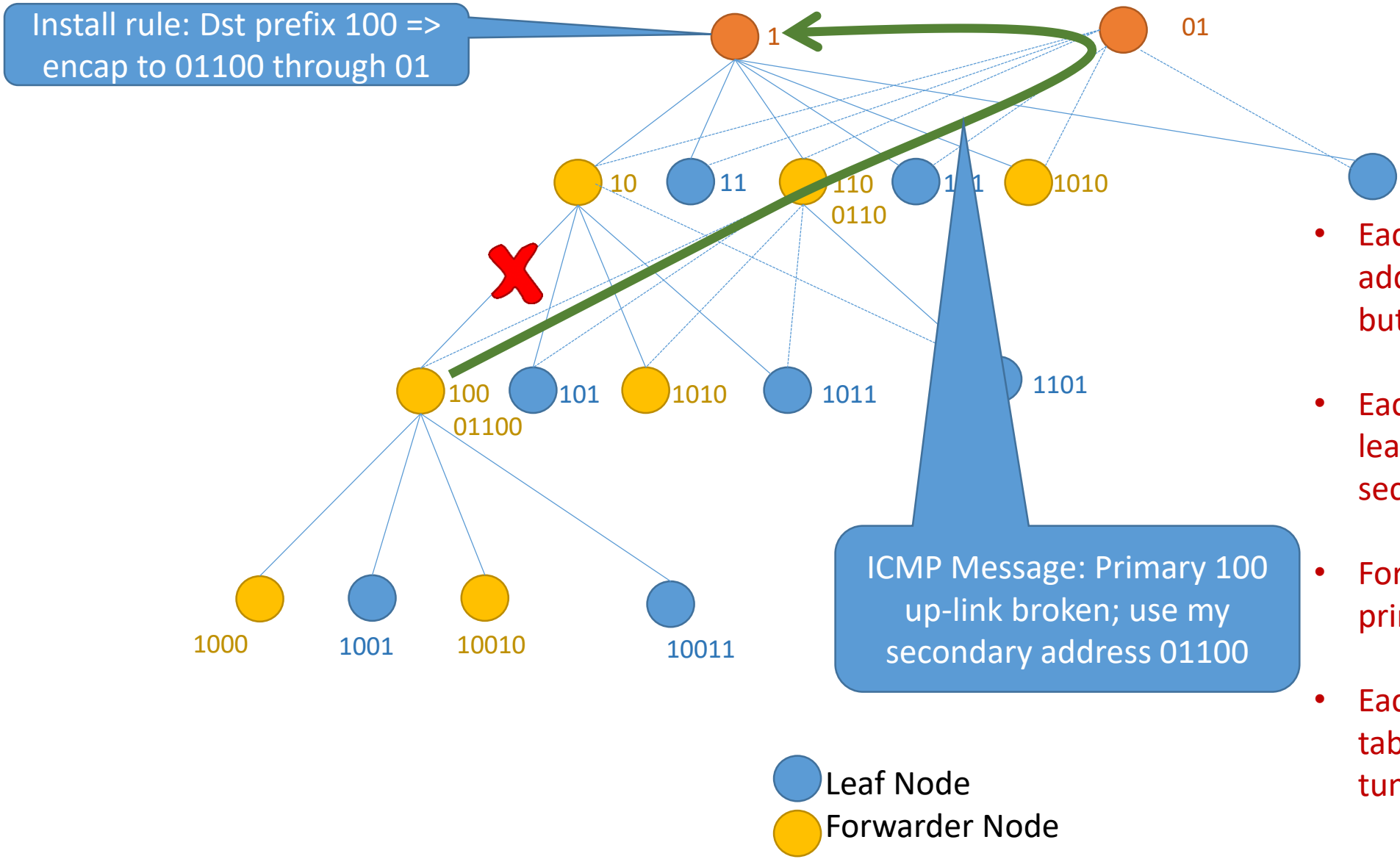

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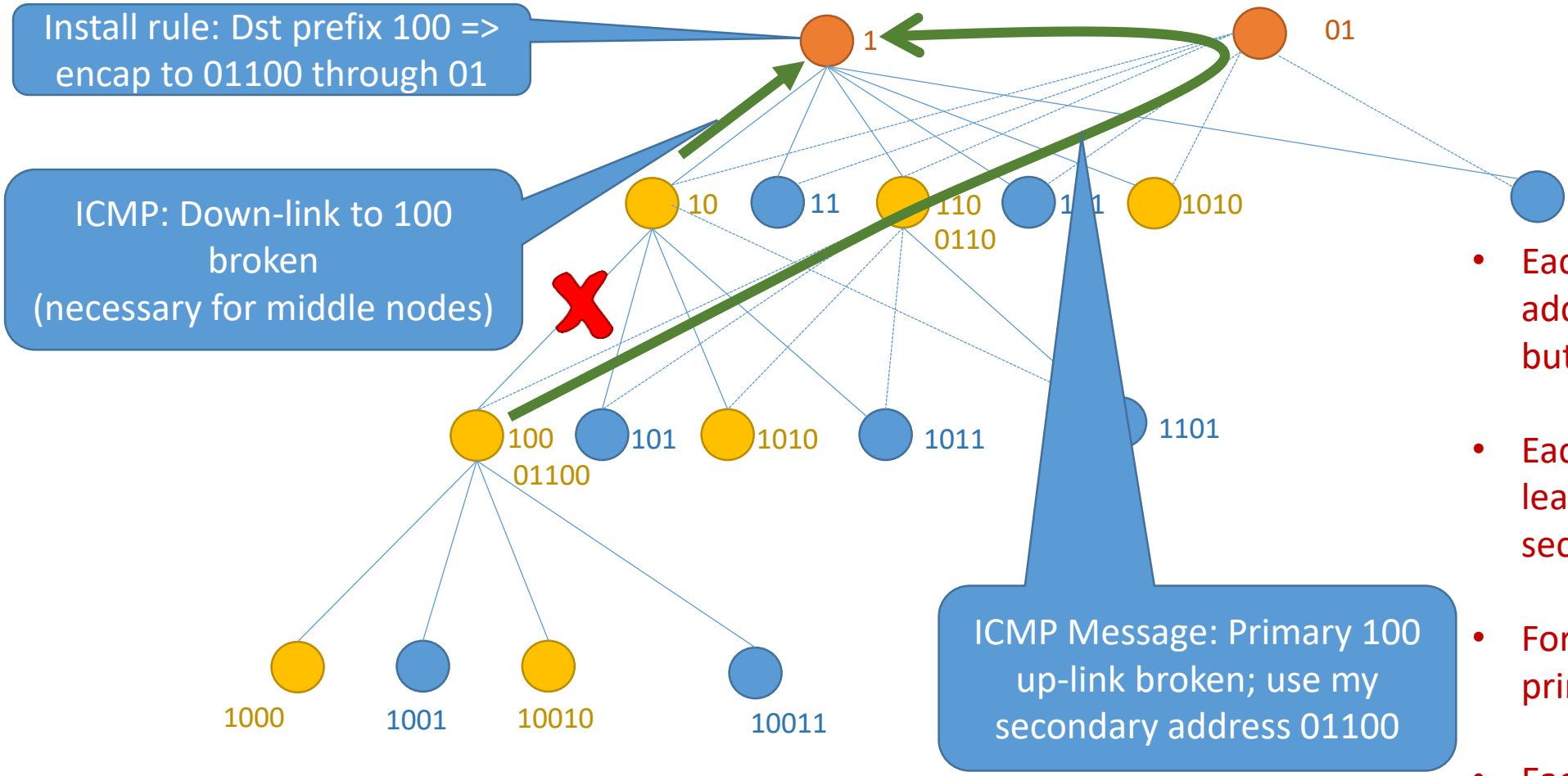

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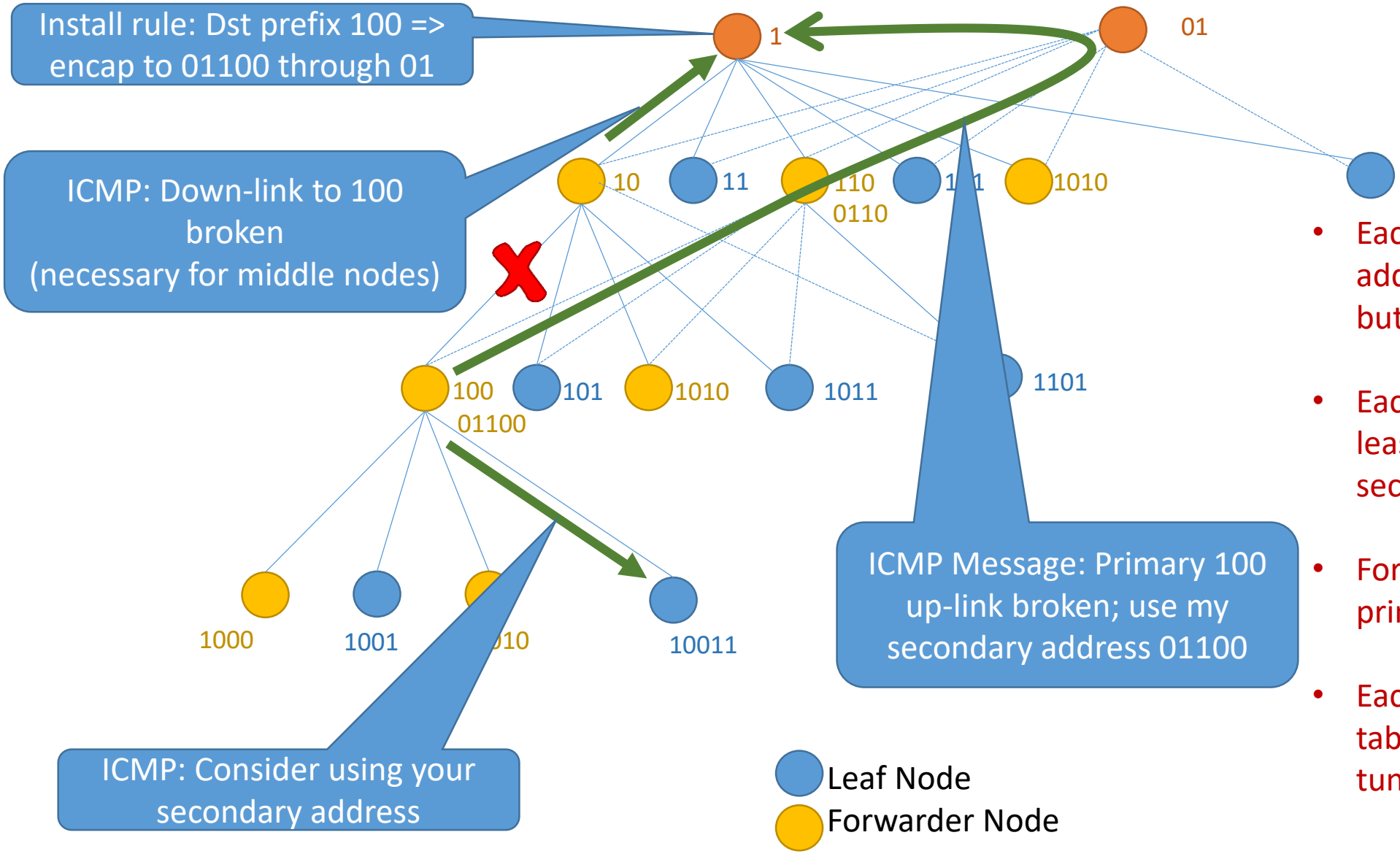

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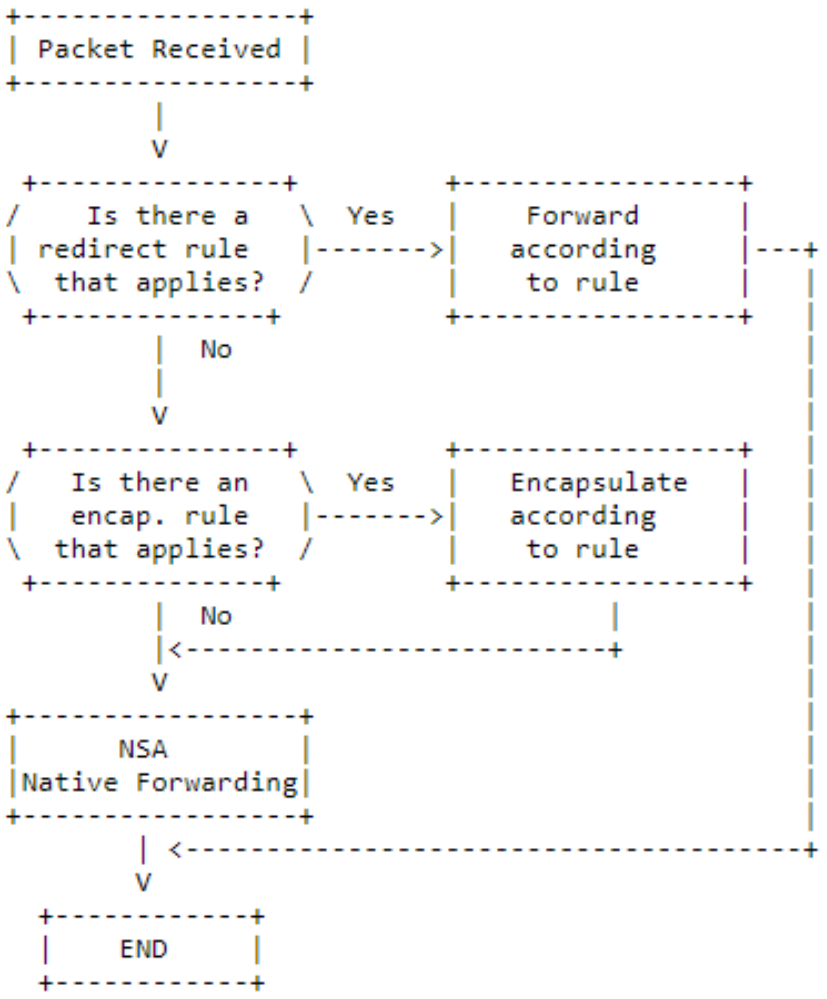
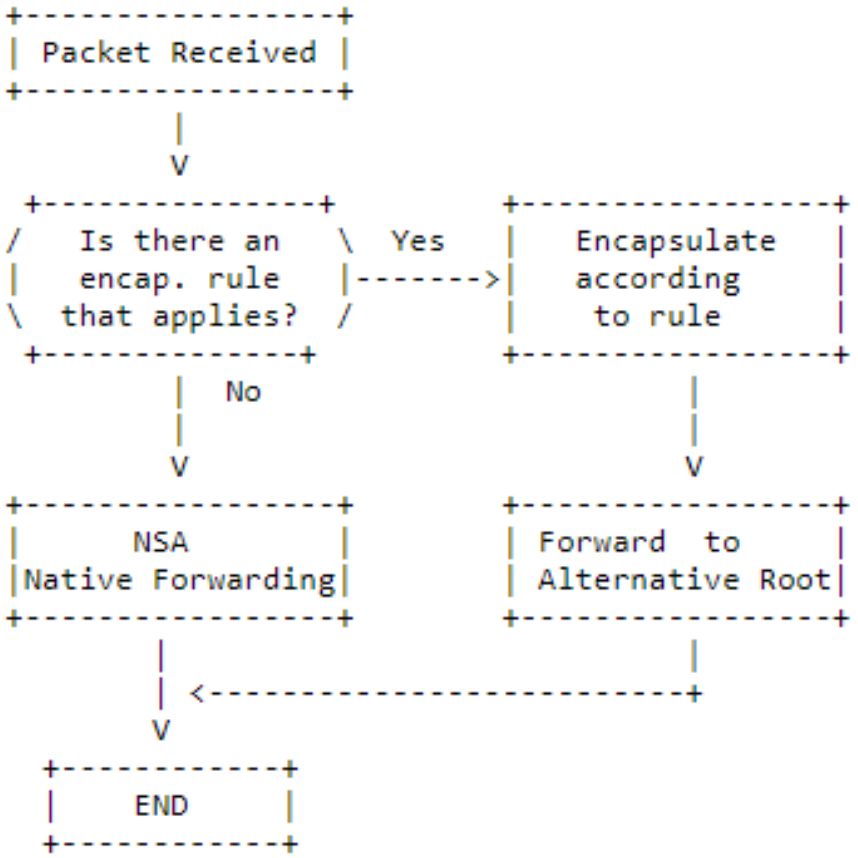
Multi-Address: Forwarding Operation

Forwarder Nodes

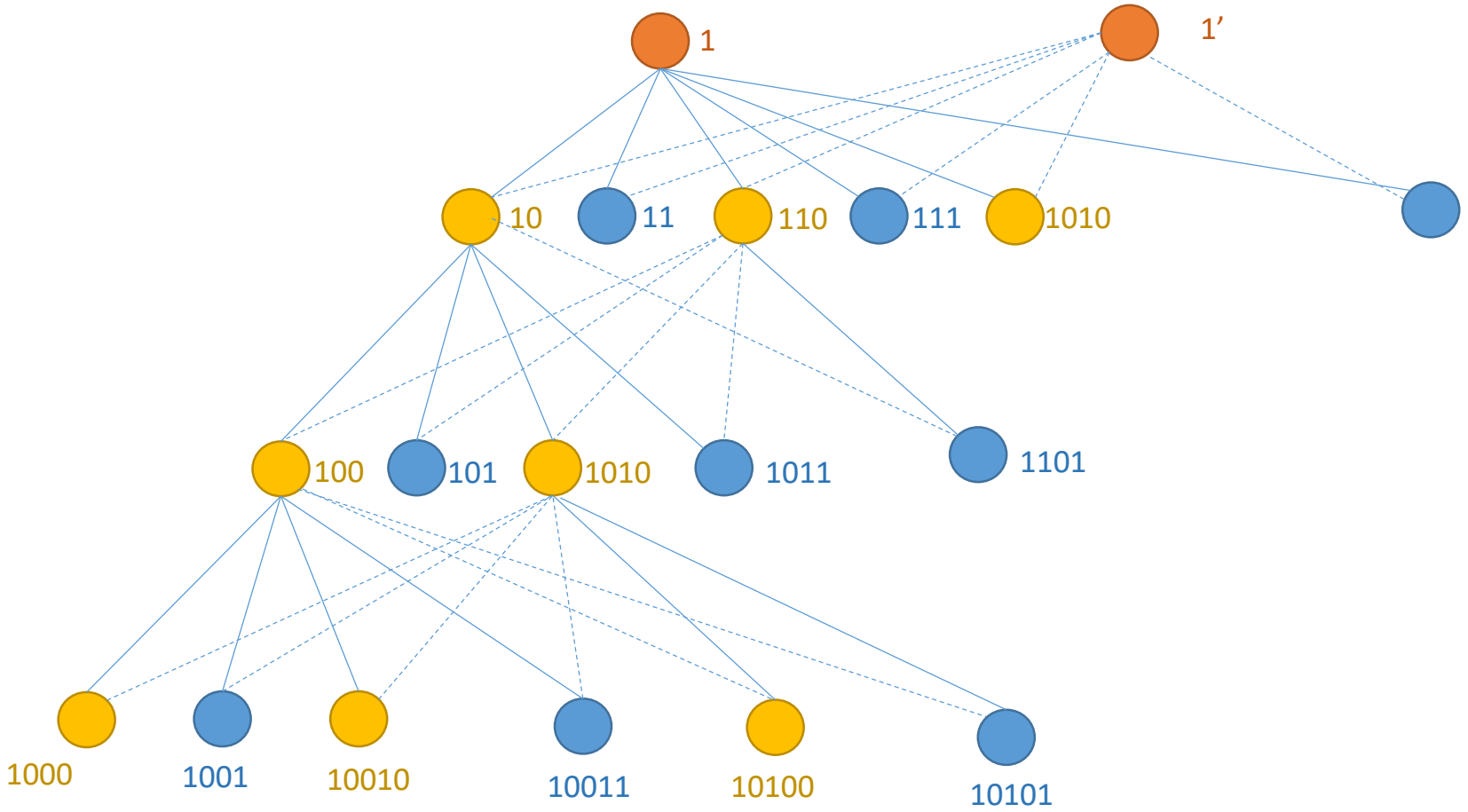


Root Nodes



Single Address: Link Failure

- **Locally store alternative parents/children**



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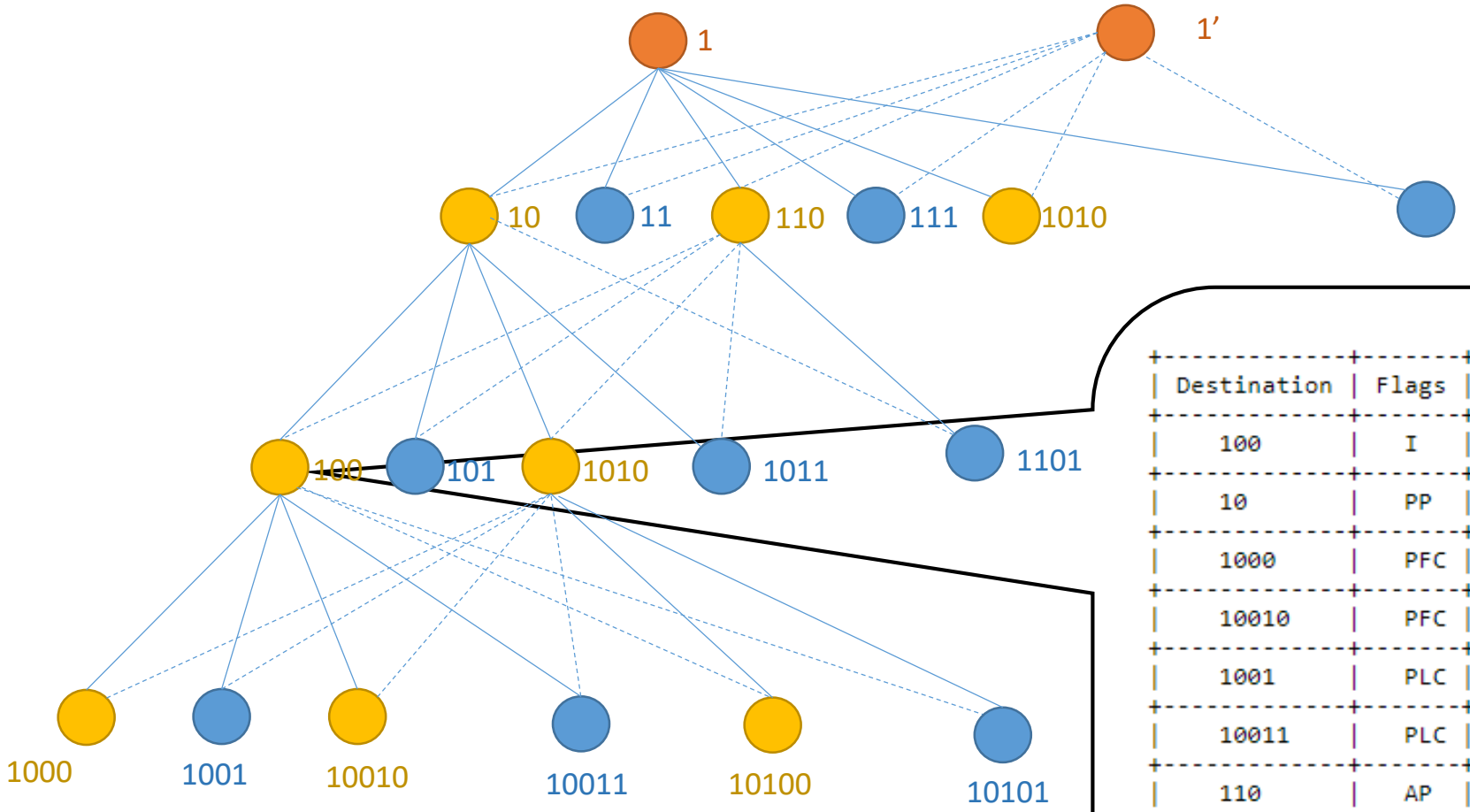

Destination	Flags	
100	I	I = Current Node
10	PP	PP = Primary Parent
1000	PFC	PFC = Primary Forwarder Child
10010	PFC	
1001	PLC	PLC = Primary Leaf Child
10011	PLC	
110	AP	AP = Alternative Parent
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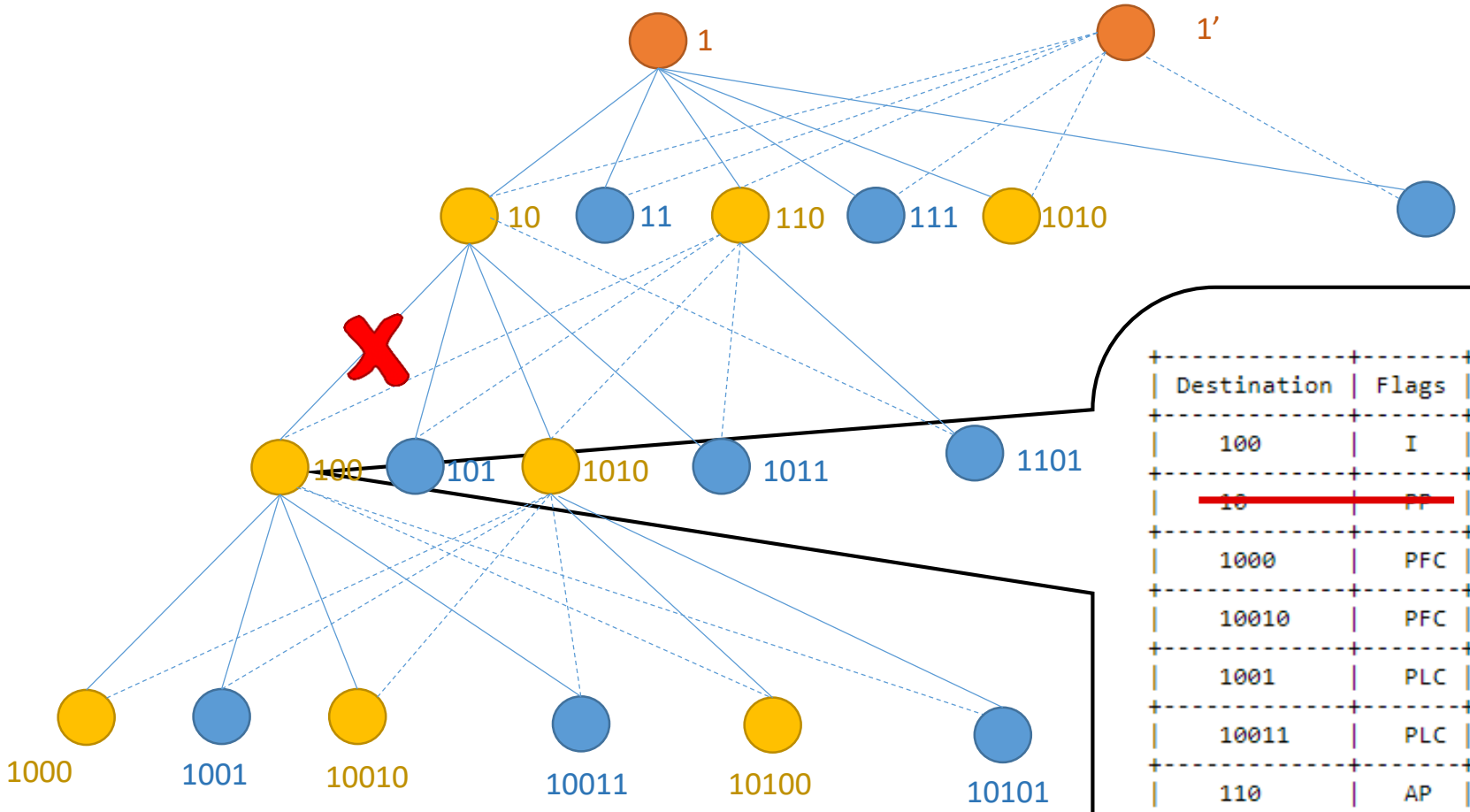

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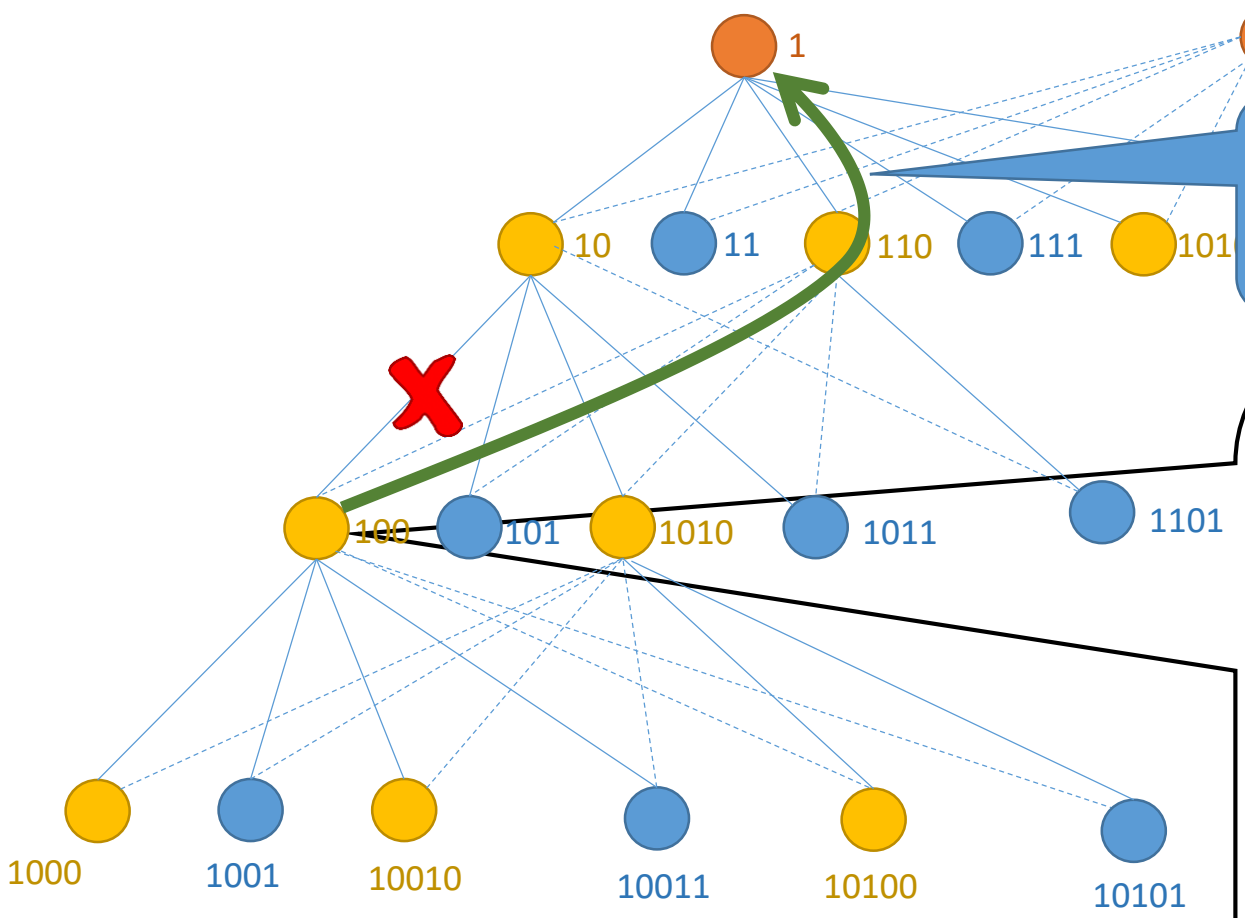

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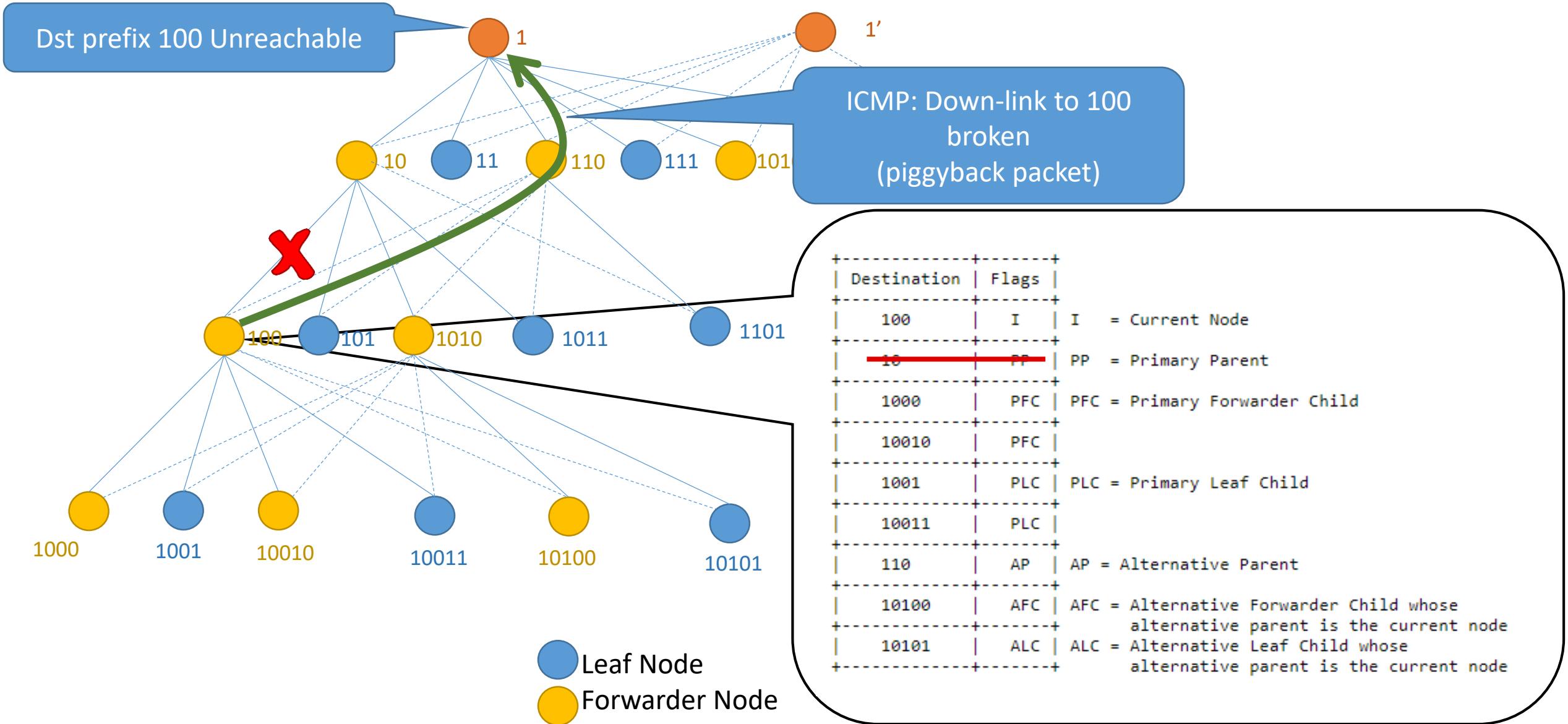

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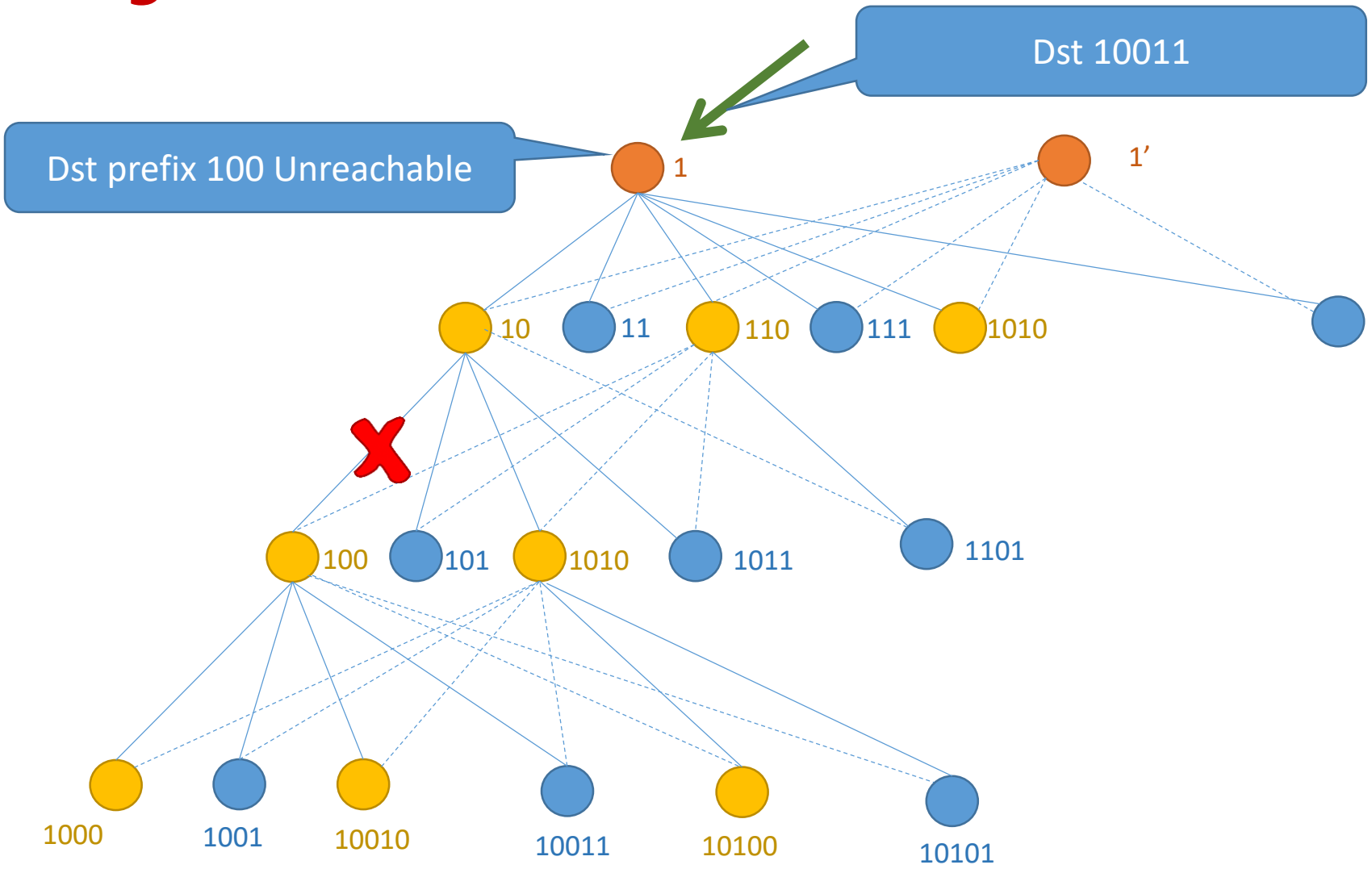

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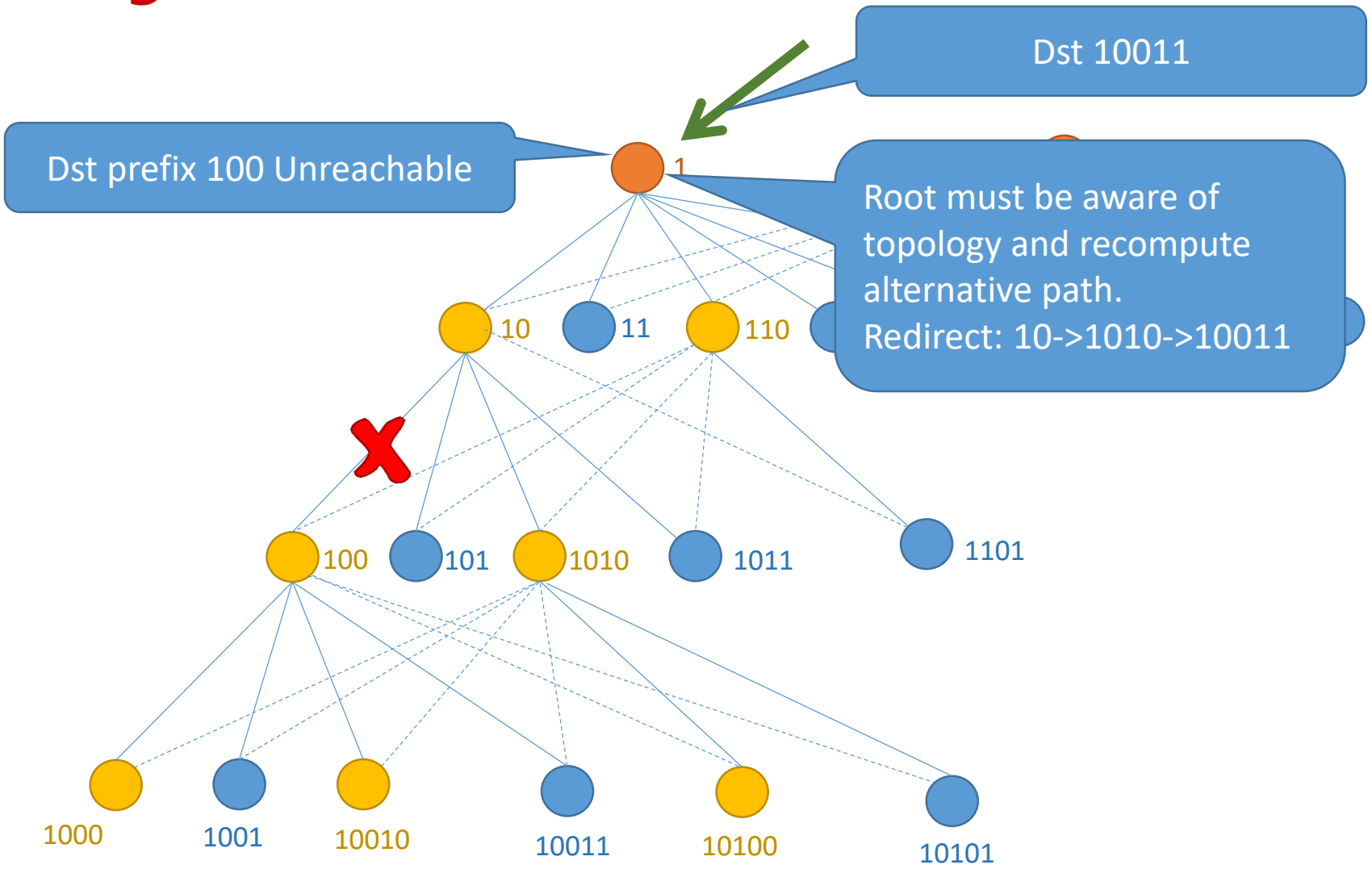

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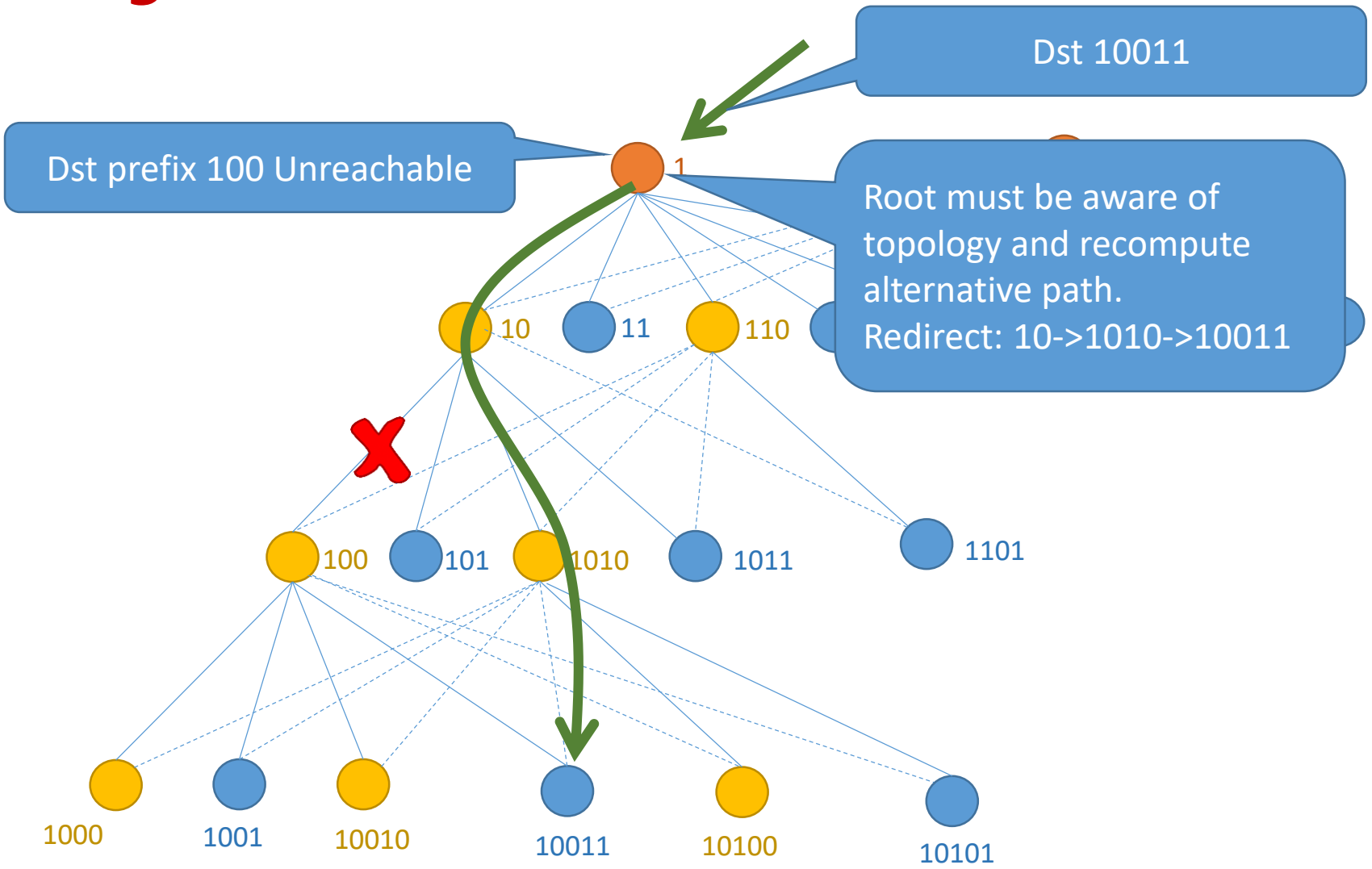

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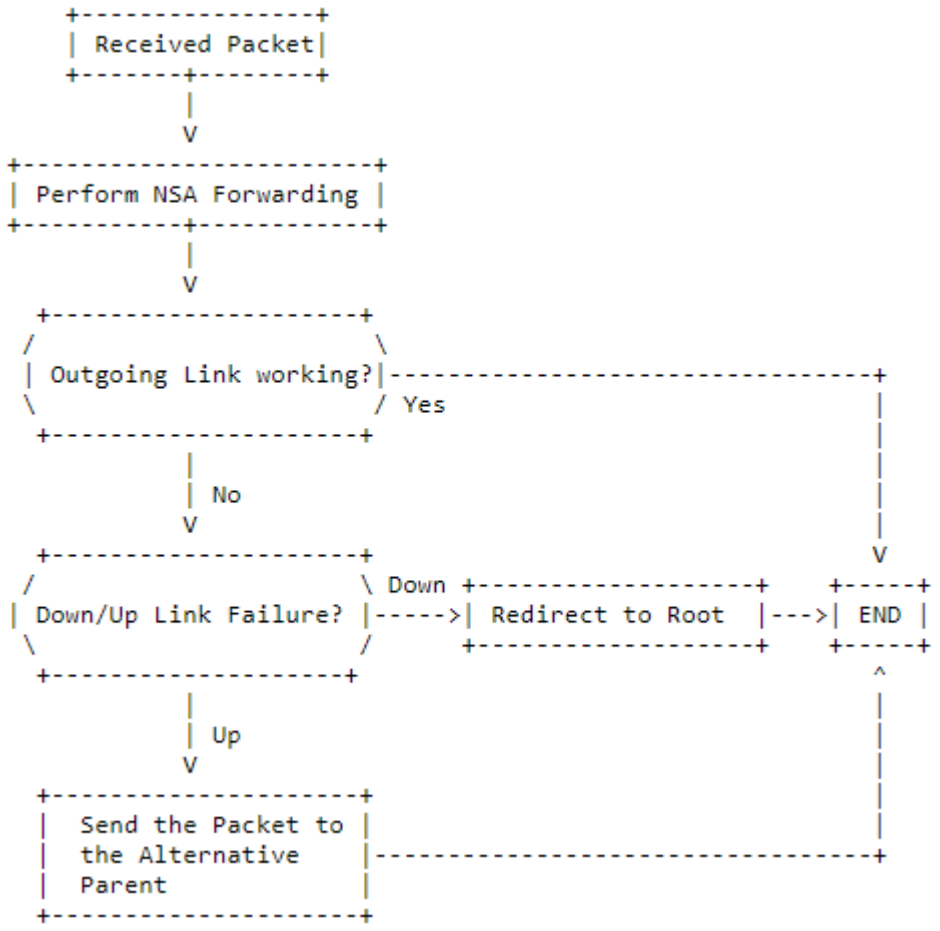

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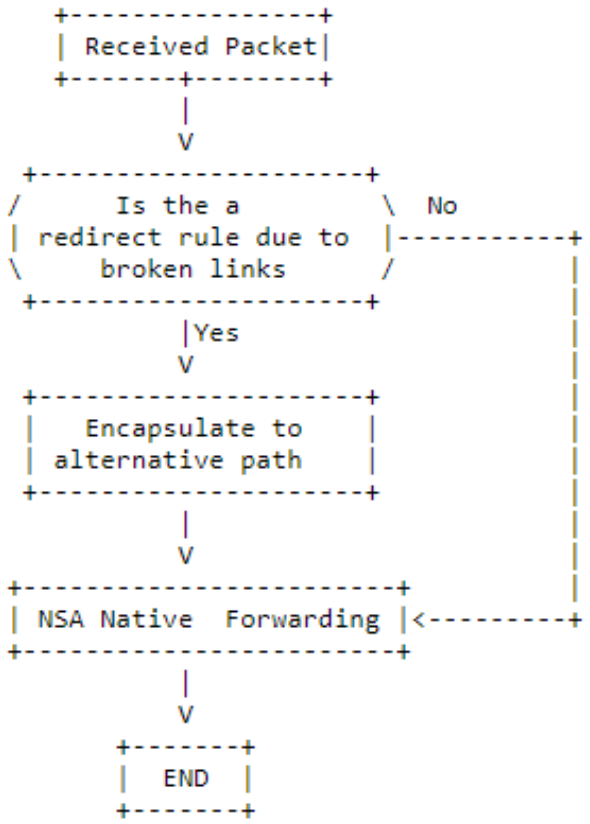

Multiple Addresses vs Single Address

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!