

**prop-087: IPv6 address  
allocation for deployment  
purposes**

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# Introduction

- Propose to add alternative criteria for receiving a larger than /32 initial IPv6 allocation during the initial IPv6 deployment phase.
  - Under this proposal, a network can justify more than a /32 if the network is using deployment protocol described in a RFC.

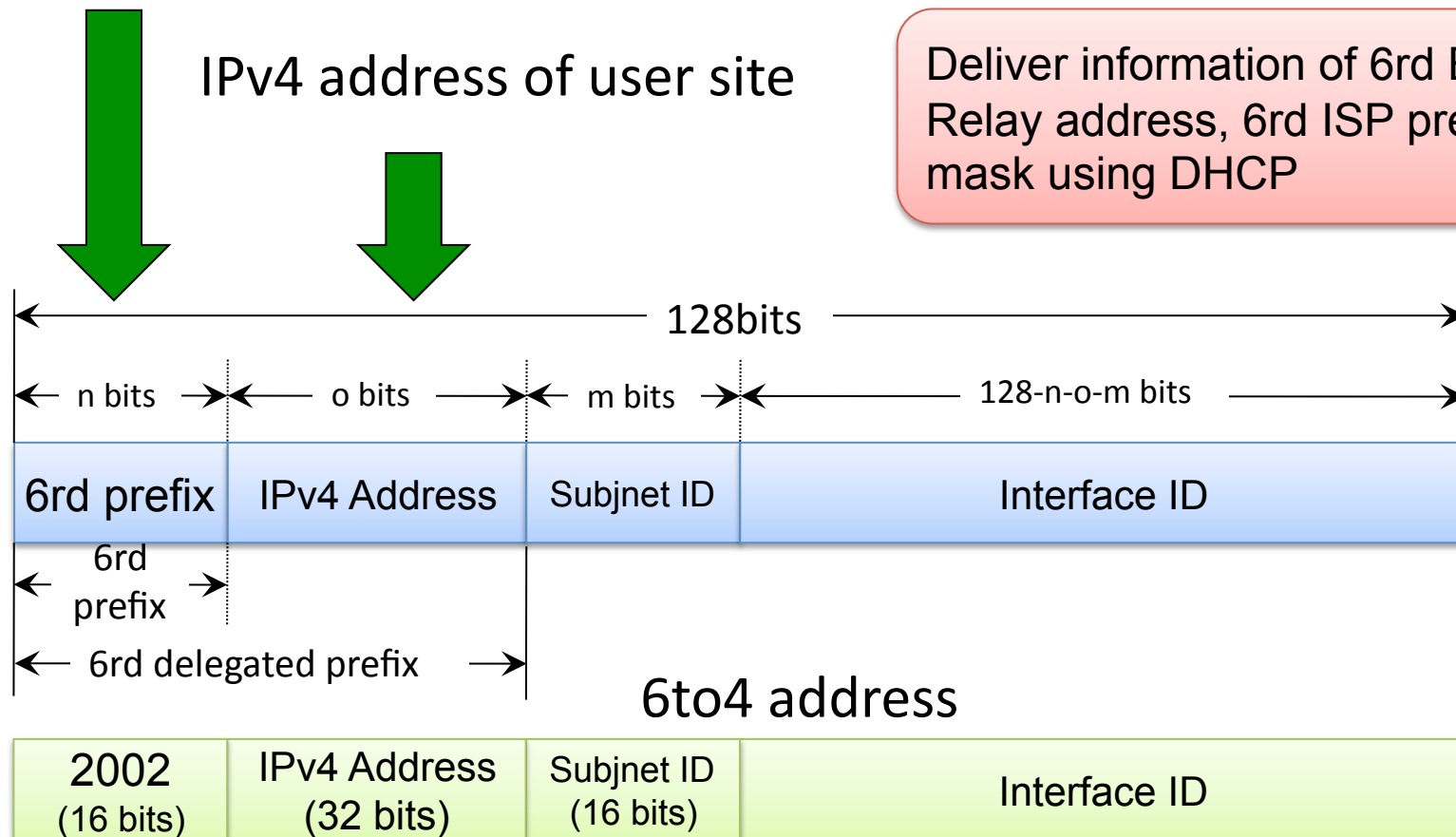
# Current problem

- Current IPv6 address allocation policy is basically based on number of subscribers and user assignment size
- In some cases, need other criteria
  - e.g. "6rd" protocol (RFC5969) case
    - Parameter is:
      - User assignment size
      - Number of IPv4 address bits to encode in IPv6 headers

# “6rd” (RFC5969) Addressing

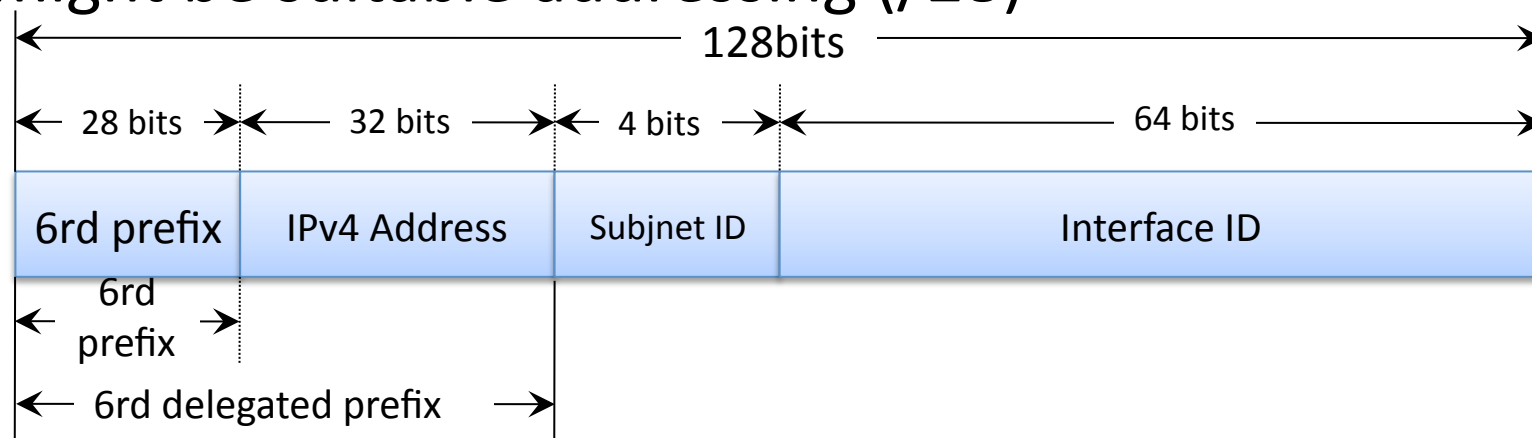
- Encode IPv4 address of user site in IPv6 address (similar to 6to4)

IPv6 address prefix of organizations



# “6rd” implementation

- In 6rd, encoding 32 bits IPv4 address and having 4 bits subnet ID field (considering DNS reverse delegation) might be suitable addressing (/28)



In this case, under current policy, ISPs have to justify to have 43,665,787 users.

P	56-P	Total /56s	Threshold	Util%
29	27	134,217,728	43,665,787	32.5%

(The HD-ratio table is on <http://www.apnic.net/policy/ipv6-address-policy#7>)

If ISPs have a plan to assign /48 to each customer, they have to justify 170,569 = 43,665,787/256 IPv6 users.

# Proposal 1/2

- Define two phases:
  1. IPv6 deployment phase (now until 2013)
  2. After the deployment phase
- IPv6 deployment phase:
  - networks using an IPv6 deployment protocol specified in an Standard track RFC are eligible for initial allocations larger than a /32.

# Proposal 2/2

- After the deployment phase:
  - networks that have received an allocation with this criteria must demonstrate the usage of that address space.
    - If the network can justify continued use of the larger than /32 address allocation by demonstrating it is in accordance with the HD-Ratio based utilization policy, the network may keep the entire address block.
    - If the network cannot demonstrate that it is in accordance with the HD-Ratio based utilization policy, it will need to return the excess portion of its address block to APNIC.

# Other RIRs

- ARIN has two related draft policies under discussion:
  - 2010-9: IPv6 for 6rd
    - [https://www.arin.net/policy/proposals/2010\\_9.html](https://www.arin.net/policy/proposals/2010_9.html)
  - 2010-12: IPv6 Subsequent Allocation
    - [https://www.arin.net/policy/proposals/2010\\_12.html](https://www.arin.net/policy/proposals/2010_12.html)
- RIPE has discussed the possibility of a proposal for a policy for 6rd, but no formal proposal has been made to date.
- There has been no similar discussion in AfriNIC or LACNIC.



# Benefits/disadvantages

- Advantages:
  - This proposed policy makes it easier to implement IPv6 networks. For example, new deployment protocols such as "6rd" can be implemented easily with this proposal.
- Disadvantages:
  - Some deployment protocols might need larger IPv6 address blocks than those that defined in current criteria and it might waste of IPv6 address.

# Implementation

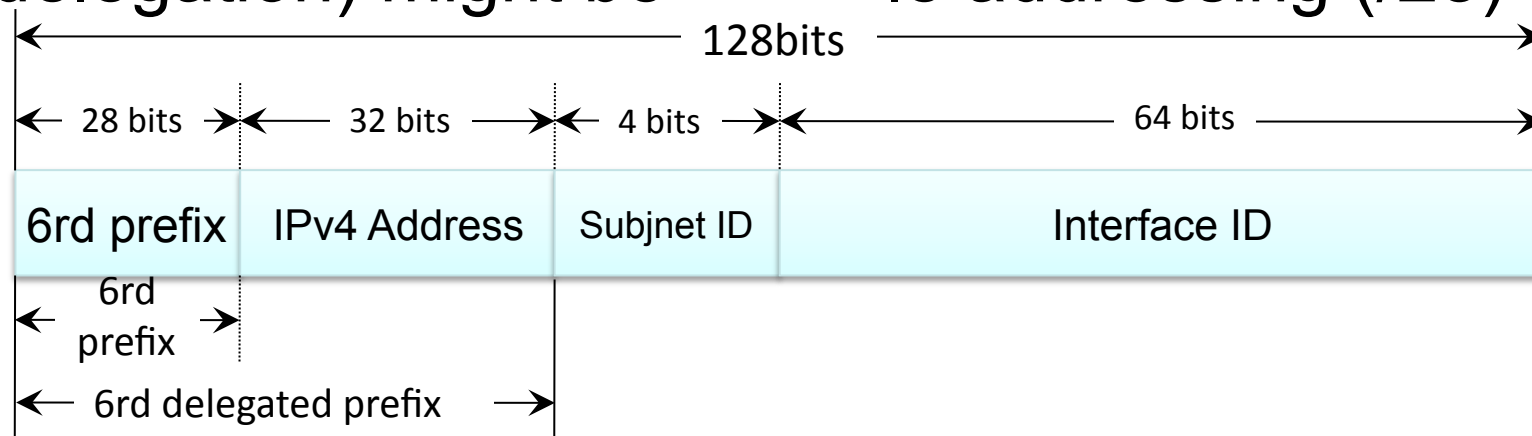
- Add this new criteria into “IPv6 address allocation and assignment policy” document
- Impact to NIRs:
  - NIRs can select to implement this proposal or not.

# Discussion on ML

- Mainly suggestions about 6rd addressing
  - Encode less than IPv4 32 bits by creating multiple 6rd domains with respect to each allocated blocks
  - Assign another unique address (e.g. 10.0.0.0/8) and use this address for 6rd.
- Issues of returning address

# “6rd” implementation

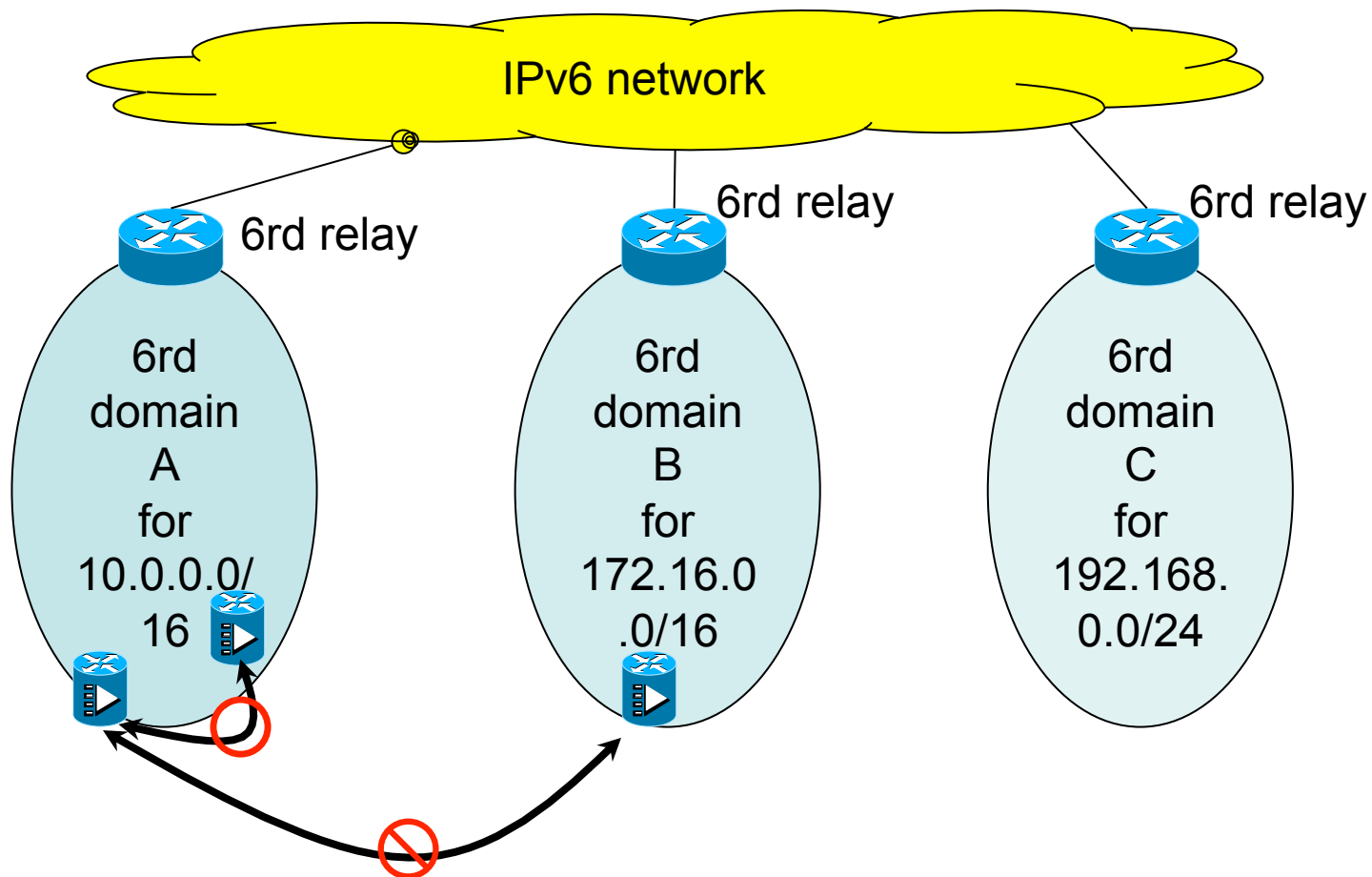
- In 6rd, encoding 32 bits IPv4 address and having 4 bits subnet ID field (considering DNS reverse delegation) might be suitable addressing (/28)



- Encoding less than 32 bits by managing multiple 6rd domains is possible, but:
  - Complexify network operation
  - Vitate site-to-site communication function of 6rd

# 6rd with multiple domain

- Complexify network operation
  - have to manage multiple network domains (and relays)
- Vitiating site-to-site communication function of 6rd



# Member's IPv4 address blocks

- Allocation statistics
  - 4,947 have only one entry (no subsequent allocation)
  - 1,864 have more than one entry
- Of the 1,864 multiple entry cases:
  - 547 have resources under only one /8
  - 1,317 have more than one parent /8
- Of the 1,317 multiple parent /8 entities:
  - 709 have 2 different parent /8
  - 255 have 3 different parent /8
  - ...
  - 1 have 37 different parent /8

Please Refer below mail for more detail  
From: Sanjaya <sanjaya@apnic.net>  
To: sig-policy@lists.apnic.net  
Date: Thu, 19 Aug 2010 15:59:40 +1000

# Discussion at OPM in Japan

- I proposed '6rd address allocation policy' at last JPOPM, but it did not reach consensus. Main objections are:
  - Creating a policy specific for one protocol is not good
  - Should not create a policy if it is possible to implement with some operational effort
  - /28 for 6rd is quite waste of address space

# Summary

- Propose to add alternative criteria for receiving a larger than /32 initial IPv6 allocation during the initial IPv6 deployment phase
  - In IPv6 deployment phase:
    - networks using an IPv6 deployment protocol specified in an Standard track RFC are eligible for initial allocations larger than a /32