Challenging Scenarios and Problems in Internet Addressing

IETF 110 – Online

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2021.03.12
Context of this Draft

• **Internet Addressing** is the core method to direct packets within the global Internet communication system.

• However, large parts of the overall communication system occur in **limited domains** (RFC 8799).

• Within those limited domains, requirements, node behaviors, address semantics, and packet forwarding may be significantly different from the Internet addressing paradigm.

• This often requires **additional adaptation technologies** to realize the distinguishing requirements of the specific scenarios.
Objective of this Draft

Particularly:

• Provide **examples** that the existing Internet addressing structure itself is a potential hindrance in solving key problems for service provisioning in some scenarios

• Revolve around following **question**: 

  > Should limited domains purely rely on IP addresses and therefore deal with the complexity of translating any semantic mismatch themselves, or should flexibility for supporting those limited domains be a key focus for an evolved Internet addressing?

Generally:

• **Stimulate discussions** and **considerations** on the emerging needs for **evolving addressing** beyond the current objectives or paradigm.

• Goal is **NOT** to propose/promote solutions to the problems portrayed!
Where Do We Want to Go With This?

Scenarios
- Communication in Constrained Environments (IoT)
- Communication within Dynamically Changing Topologies
- Communication among Moving Endpoints
- Communication Across Services
- Steering Communication Traffic
- Communication with built-in security
- Communication in Alternative Forwarding Architectures

Existing Solutions
- 6LowPAN
- Nemo, DMM
- Mobile IP
- SFC, DYNCAST
- VLAN, SRv6
- CGA, HIP
- ICN over IP

Issues when utilizing these solutions
- Limiting Alternative Address Semantics
- Hampering Security
- Complicating Traffic Engineering
- Hampering Efficiency
  - Header Proportion
  - Compression Energy consumption
  - Introducing Path Stretch
  - Repetitive encapsulation

Challenges
- …

Gap Analysis
- …

Possible v01 Draft (or separate document?)
- …

Addressing as it is

Bearing these issues With current methodology

* The **GREEN COLOR ARROWS** indicate working with the wider Internet community to gather the best insights and arguments to move forward
Our Questions to You

- Is a discussion required on the emerging needs for addressing at large, with the possibility to re-think and evolve the addressing in the Internet?

- Are there contributors to this discussion who would want to work with us to push the discussion and associated material further?
THANKS!

Questions / Comments?