**IETF – INTAREA WG**

# Internet Addressing - Problem Statement and Gap Analysis

## IETF 112 – Online

**2021.11.09**

# CONTENT

**Part 1: Recap and Updates on these 2 drafts**

Part 2: Feedbacks from the related Side Meeting

# RECAP: Problem Statement

- Provides **example scenarios** that the existing **Internet addressing** place is a potential hindrance for Internet service provisioning

  - Constrained devices

  - Dynamically changing topology

  - Traffic steering

  - … …

- Identifies the **issues** behind **Internet addressing** in these scenarios:

  - **Efficiency:** <u>Energy consumptions</u> for large encapsulation overhead [**Constrained devices**]

  - **Effectiveness:** <u>Frequently</u> routing protocol <u>updates</u> [**changing topology**]

  - **Complexity:** <u>Dynamically</u> <u>update</u> policy table (binding policies to IP addresses), and <u>Dynamically</u> <u>distribute</u> policy table to action node [**Traffic steering**]

  - … …

# **RECAP:** Gap Analysis

- Investigate the properties of Internet Addressing

    - **Fixed Address length** through 32/128 bit length

    - **Ambiguous Address Semantic** with explicit locator and implicit identifier

    - **Limited Address Semantic Support** with mainly prefix-based only semantics

- Investigate extensions that patch the **Addressing Properties** on those **Challenge Scenarios**

    - Extensions themselves are **explicitly proof** for **the potential gaps**

    - Identify the **gaps that filled** by these extensions according to their **methodologies**.

- Investigate the **residual gaps** left by the extensions and **new issues** introduced by them

    - **Complexity and Efficiency** [residual gaps]**:** Repetitive/Re- encapsulation, Path Stretch, …

    - **Extensibility** [new issues]**:** dramatically increase the **complexity** and **Fragility** for scenarios with **multi**-extension **co**-existence.

# Updates

- Problem Statement-02: https://tools.ietf.org/rfcdiff?url1=https://www.ietf.org/archive/id/draft-jia-intarea-scenarios-problems-addressing-01.txt&url2=https://www.ietf.org/archive/id/draft-jia-intarea-scenarios-problems-addressing-02.txt

  - **Shaping** the scenarios descriptions to make it intensively **focus** on Internet **addressing**

  - **Simplify** the *problem statement* section into a more explicit and clear conclusion


- Gap Analysis-01: https://tools.ietf.org/rfcdiff?url1=https://www.ietf.org/archive/id/draft-jia-intarea-internet-addressing-gap-analysis-00.txt&url2=https://www.ietf.org/archive/id/draft-jia-intarea-internet-addressing-gap-analysis-01.txt

  - **Update** the extensions to properties

  - **Simplify** the *Conclusion* section to make it more straightforward and clear

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# SIDEMEETING: Summary

**Purpose**: Jumpstart a **wider discussion** that can be carried over to the mailing list to follow up

- Focus on problems and gaps and whether architectural approach may help

- An **experiment** to discuss drafts beyond list, with insights from **panelists** and **community** at large
  - **Huge amount** of exchange (**142** messages), possibly worth weeks or even months of email exchange
  - Still going through messages to deflect **discussions onto list**
  - -> Discussion experiment **successful** but may not scale to every -00 draft, but still...


**Metadata**:

- Time: Nov 8th, 2021 (Monday) at 18.00-19:00 UTC [1 hour]

- Attendance Number: 64 (61 Webex + 3 Youtube live stream)

- Panelists: Dino Farinacci, Robert Moskowitz, Michael Richardson, Dirk Kutscher, Nirmala Shenoy, Laurent Toutain

- Agenda: Introduction (15min) + Open Discussion (45min +20min)

- Material at https://github.com/Iannone-Luigi/Addresing

- YouTube video of meeting: **https://www.youtube.com/watch?v=vwtoCvluREA**

# SIDEMEETING: Key Insights

- Lots of discussion and **viewpoints**, so topic seems to be of interest
    - *-> Funnel that discussion in the way forward*


- There seems to be a **larger architectural discussion** looming, where (revisiting the) addressing may just be the outcome
    - We will **continue to drive** the addressing discussions with current drafts
    - We will also attempt to capture the larger architectural points in **possible future material**
    - *-> Need to determine where to have that discussion and what other outcomes there could be*


- **Past concepts**, such as the OSI model or variable length addressing, seem to have had concepts that made a lot of sense in preventing some of the issues we see today in Internet addressing
    - What are they? Can we tease them out? What are their impact?
    - *-> Enrich gap analysis draft beyond currently listed extensions to IP*


- Replacing IP is not the aim but **evolving IP** in the light of existing deployments

# SIDEMEETING: Selected Exchanges During the Meeting

- **On addresses and identifiers**
    - "we have to make apps do less with the network, have less knowledge about addresses" (Dino Farinacci)
    - "URLs find services, it is what you want not where to get it - have to redefine what "where" really means anymore" (Dino Farinacci)
- **On privacy**
    - "and for privacy, you make addresses (EIDs) ephemeral" (Dino Farinacci) "or don't require them" (Dirk Kutscher)
    - "I need to secure my C2 so that someone cannot take control of my UA. But I cannot effectively hide that my UA is up in the sky over you…" (Robert Moskowitz)
- **On security**
    - "But I would really like to point out that security is the #1 challenge facing Internet today, not the speed." (Lixia Zahng)
    - "@lixia, and it is a problem because all our packets flow to 6 big boys" (Dino Farinacci)
- **On future use cases**
    - "lets talk about new features we want in the network" (Dino Farinacci)
    - "I would take CDNs (and hyperscaler edge-to-cloud systems) as examples of relevant use cases that could be served better." (Dirk Kutscher)

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Chat messages are available on https://github.com/Iannone-Luigi/Addresing for all to view in more detail
- Will go through them thoroughly to deflect more discussion onto INT-area list

# SIDEMEETING Take-away & Conclusion

- **Volume** of discussion was positive
  - Lots of chat messages, lively discussion, going over time to continue

- Enough **content** of discussion to create follow-on threads on list
  - Will go through meeting material to create those threads

- Identified rich set of **contributors** having views on addressing and larger issues
  - Looking into adding contributors as co-authors

- Reflect community input into **revised PS and GA drafts**
  - May also look into adding statements as contributions into revised drafts

## Contributors welcome to join in this effort!

# Internet Addressing - Worth Thinking? **YES!**

**THANKS!**

**QUESTIONS? / COMMENTS?**

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