Name-Based Service Function Forwarder (nSFF) component within SFC framework

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IETF-102, SFC WG, July 2018

Recap

- In draft "<u>draft-purkayastha-sfc-service-indirection-02</u>", a new Service Function, **called SRR**, was described to handle dynamic chaining at the level of '*named transactions*'

  - Forwarding decision made in SRR, when a service request is received, using name based identification of Service End Points (e.g., using URLs as address scheme)

- Received feedback at IETF 101 to consider **integration with SFF** rather than exposing explicit service function

Main Idea

Integrating the SRR function into the SFF is reflected by extending three main SFC concepts:

- Extend Service Function Path to include 'name-based interactions' ->Definition of **nSFP**

- Extend Network Locator Maps to include 'name-based next hops' -> Definition of **nNLM**

- Extend Service Function Forwarder to act on such name-based information -> Definition of **nSFF** operations

Backward-compatible to current SFC architecture!

(No changes to the functionalities of SFC nodes and NSH protocol)

Name based Service Function Path (nSFP)

- The realization of "Name based SFP" through extended SFF operations is illustrated using HTTP transactions.

    - URIs are being used to name for a Service Function along the nSFP.

    - Note: SFP operation is not restricted to HTTP (as the protocol) and URIs (as next hop identifier within the SFP).

    - Other identifiers such as an IP address itself can also be used and are interpreted as a 'name' in the nSFP.

SERVICE LAYER

`192.168.x.x -> www.foo.com -> www.foo2.com -> www.fooN.com`

Underlay Network
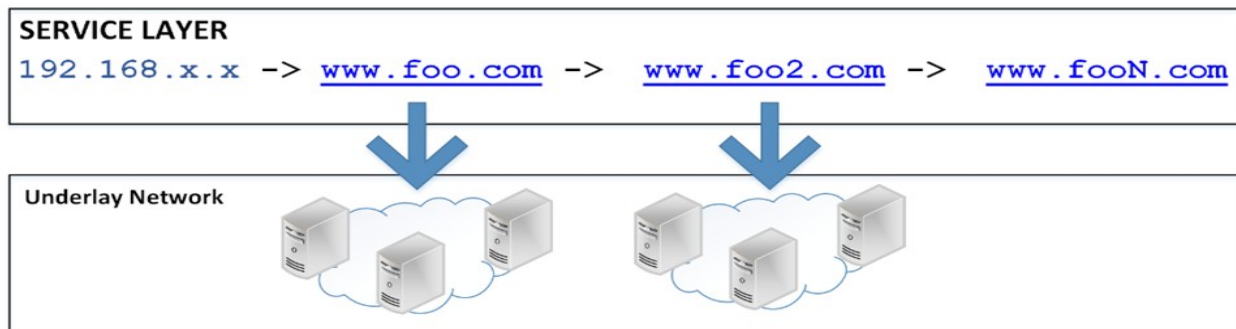
Name based Network Locator Map (nNLM)

- Network locator map is extended with the ability to consider "**name relations**" based on URIs as well as high-level transport protocols such as HTTP for packet forwarding.

```
+---------------------------------------------------------------+
| SPI | SI | Next hop(s)                       | Transport |
+---------------------------------------------------------------+
| 10  | 255 | 192.0.2.1                        | VXLAN-gpe |
| 10  | 254 | 198.51.100.10                    | GRE       |
| 10  | 253 | www.foo.com                      | HTTP      |
| 40  | 251 | 198.51.100.15                    | GRE       |
| 50  | 200 | 01:23:45:67:89:ab                | Ethernet  |
| 15  | 212 | Null (end of path)               | None      |
+---------------------------------------------------------------+
```

Name-based Service Function Forwarder (nSFF)

Operational Steps
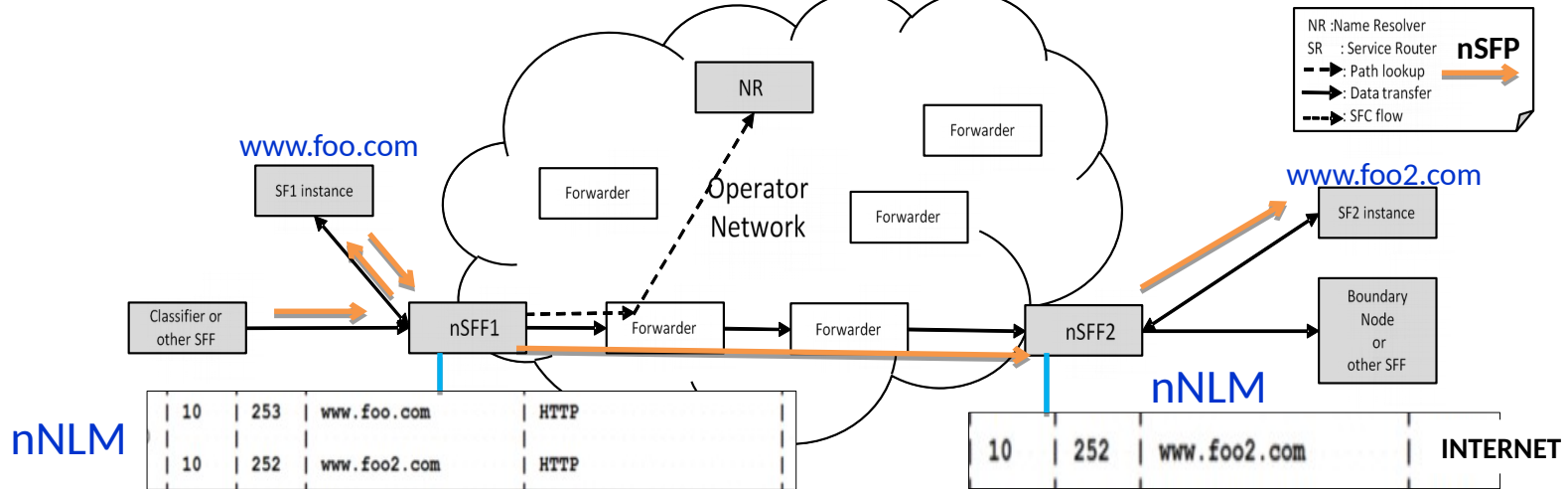
1. Packet from Classifier @nSFF1, process NSH header to identify next SF by mapping NSH information to appropriate entry in its nNLM (www.foo.com)-> **forwards to SF1**

2. Packet from SF1, retrieve next hop information from nNLM (www.foo2.com),

    -> Since SF not being locally available, nSFF1 consults the Name Resolver (NR) to determine the suitable routing/forwarding information towards the identified nSFF serving the next hop
    -> **forwards to nSFF2**

3. Packet from Nsff1 @nSFF2, process NSH header to identify next SF my mapping NSH information to appropriate entry in its nNLM (www.foo2.com) **-> forwards to SF2**

Next steps

- Collect feedback from the WG
  - On the validity of this extension to SFC, i.e., its scope within the SFC WG, and this solution

- We implemented a first version of this solution in H2020 projects POINT & RIFE, now deployed at city scale in H2020 FLAME project for trials in 2018
  - We will work on aligning this solution fully with this draft