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


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Recap

• 5G SBA Use Case illustrates, in distributed data centers (virtualized) service end points are created/recreated frequently
  • Requires the SFC framework to reconfigure the existing chain
  • Reconfiguration, using information of the new relationships, cause overhead in many components, such as Orchestrator

• Rev 00 of the draft, proposes to
  • lift the chaining relationship from Layer 2 and 3 information to that of service function ‘names’
  • extend major concepts of SFCs based on such named relations
    • nSFP : Name based Service Function Path
    • nNLM: Name based Network Locator Map
    • nSFF: Name based SFF which extends SFF operations to act on such name based information
Main Idea

• Extend relationships between SFs from L2/L3 to names, expressed through e.g., URIs

• Extend SFC concepts with name relation in mind
  – nSFP: Extended Service Function Path to include ‘name-based interactions’
  – nNLM: Extended Network Locator Maps to include ‘name-based next hops’
  – nSFF: Extended Service Function Forwarder operation to act on such name-based information
  – NR (Name Resolver): capable of identifying the execution end points, where a “named SF” is running.
Main Idea

• The extended operations in nSFF is only invoked when the next hop in the NLM is described as a name, e.g. URI

• If the next hop information is described as L2/L3 identifier, then normal SFF operations are executed.

• This will be clarified in the next update of the draft.
Deployment/Trial examples

- Demonstration of the 5G SBA Use Case at NGMN Forum April 2018, jointly with DT
- Shows control plane executed as HTTP-based services

- Flame platform: Validation through Urban Scale Trials & Experiments
- Focus on media scenarios, e.g., VR, AR, MR
- Ecosystem partners
  - 5 operator infrastructures
  - 25+ customer trials
Main Comments Addressed in Update

- Description of operations in the nSFF, between nSFF and NR to forward to remote SF, specifically considering
  - Avoid delay in forwarding by saving forwarding information previously obtained
  - Avoid staleness of forwarding information by periodically updating the saved information
nSFF Operation details

• The detailed operations described in the draft include:
  – Forwarding between nSFFs and nSFF-NR.
  – Service Function (SF) Registration
  – Forwarding to a local SF
  – Forwarding to a remote SF
    • Remote SF Discovery
    • Maintaining Forwarding Information at Local nSFF
    • Updating Forwarding Information at nSFF
Minimize latency of forwarding

- The discovery operation of remote SF may introduce latency in forwarding at nSFF
- To minimize latency in discovery, the following steps are executed
  - Response to a discovery request is saved in nSFF
  - Any future forwarding request to the same remote SF is resolved locally
- First time requests, which cannot be resolved locally, may still experience certain latency
  - Could be resolved through pre-population as described in draft on optimized chaining (see https://datatracker.ietf.org/doc/draft-khalili-sfc-optimized-chaining/)
Avoid staleness of forwarding information

• NR maintains a table of discovery requests
• It maps discovered (hash of) FQDN to the nSFF_id that requested it and the pathID that is being calculated for remote nSFF forwarding
• Information at NR is updated
  – If an SF is not reachable
  – A new SF has become available
  – SF is unreachable as link has gone down
• May lead to re-discovery at nSFF for remote SF whose pathID has been updated
Future work

• Defining transport protocol between nSFF-nSFF and nSFF-NR
• Handling HTTP responses
• Security (TLS handling)
• Addressing nits identified by readers
Next steps

• Collect feedback from the WG
  • On the **general validity** of this extension to SFC, i.e., its scope within the SFC WG
  • On this **solution** specifically

• We will work on aligning solutions, being deployed for trials, fully with this draft
  – Contribute to work in NGMN SBA WG on performance evaluation of message routing (which could be realized via nSFF)