Verification of NFV Services : Problem Statement and Challenges

draft-shin-nfvrg-service-verification-03

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Motivation

- NFV relocates network functions from dedicated hardware appliances to generic servers, so they can run in software. However, incomplete and/or inconsistent configuration of VNF and FGs (aka, service chain) may lead to verification issues.

- Properties to be checked on NFV services
  - **Dependencies of network service components in NFV**
  - **Invariant and error check in VNF FGs (e.g., infinite loop, confliction of properties or interference between VNFs, consistent ordering of FGs, etc.)**
  - **Load balancing among VNF instances**
  - **Policy and state consistency on NFV services**
  - **Performance**
  - **Security**

Changes since IETF92

- Address most of the comments from last meeting
  - **Mainly related to the scope (e.g., static vs. dynamic changes) and verification framework options/issues**
  - **-02 and -03**
- Verification framework section removed
  - **Many variations and too early to fix architectural aspects**
- Properties section revised
  - **Adding some additional text explaining examples (thanks Ramki)**
- Open source related issues (e.g., consistency of distributed state, Intent and compiling, etc.)
- A new co-author added
  - **Ramki Krishnan**
- And many editorial updates

Open source related issues

- Consistency of distributed state (management)
  - **Open Daylight, ONOS**
  - **RAFT algorithm is used for distribution and replication**
  - **No "one-size-fits-all" solution for control plane data consistency**
- Intent or policy-based languages and compiling
  - **Intent allows for a descriptive way to get what is desired from the infrastructu re**
  - **A Intent compiler translates and compiles it into low level instructions (e.g., SDN controller/OpenStack primitives) for network service components.**
  - **Error checking or debugging are critical for reliable Intent-based service com position.**

Next step

- Deal with the ongoing validation of the life cycle, composition of VNF, etc.
- Contribute to a project related to verification or correctness/ consistency checker in Open Daylight