Considerations for Benchmarking Service Function Chain
draft-kim-bmwg-sfc-benchmark-00

Abstract

   Service Function Chain(SFC) is a ordered set of service functions.
   Packets flow restrictively at the service functions according to the
   order. To enable a network service, operator composes the service
   function chain logically. Though SFC is efficient where network/
   service requirements are dynamically changing, the reliability of SFC
   should be guaranteed. This memo describes the considerations for
   benchmarking SFC reliability.

Requirements Language

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in RFC 2119 [RFC2119].

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Table of Contents

1. Introduction

   As Service Function Chain(SFC) is the ordered set of service
   functions. It is logically defined on demand of a service. To
   enable the service, SDN controller set flow rules at each physical/
   virtual switch which belongs to the SFC. SFC is efficient where the
   network/service requirements are keep changing dynamically. The
   number of physical/virtual switches which will accept the flow rules
   is differ from the size of the domain or service.

   As an operator perspective, at the stage of SFC creation,
   modification, and deletion, the reliability of SFC should always be
   guaranteed. To apply the change of the SFC, SDN controller will set
   flow rules at some switches and delete flow rules at other switches.
   For certain reasons such as the heavy traffic on the target switches
   which should accept new rules or the link failure between the target
   switches and the SDN controller, the new SFC may not be applied
   properly.

   This draft memo describes considerations for benchmarking Service
   Function Chain reliability.

2. Scope

   At the time of writing this memo, SFC standardization is now in
   progress. But operators and vendors are implementing SFC their own
   way. This memo does not target NSH enabled architecture and target
   general operation circumstances. The scope of SFC reliability
   benchmark is when the initial SFC is already provisioned and the
   traffic also flows over the certain SFCs, and SFC needs to be
   updated. Also, SFC is made over multi-domain network, which covers
   the whole country.

   This figure is an example of the network.

```
                                +----------------+
                                | SDN Controller |
                                +----------------+
                                    /        \
                                   /          \
                                  /            \
                                 /              \
               Domain A         /                \          Domain B
        +--------------------------------+
     +--------------------------------+
        |                          |
     |                            |
        |   +---------+    +----------+   |              |   +---------+
     +---------+    |
        |   | vSwitch |    | vSwitch  |   |              |   | pSwitch |      |
     vSwitch |    |
        |   +---------+    +----------+   |              |   +---------+
     +---------+    |
        |                          |
     |                            |
        |   +---------+    +----------+   |              |   +---------+
     +---------+    |
        |   | pSwitch |    | pSwitch  |   |              |   | vSwitch |      |
     pSwitch |    |
        |   +---------+    +----------+   |              |   +---------+
     +---------+    |
        |               ...         |
     |             ...              |
        +--------------------------------+
     +--------------------------------+
```

3. Considerations for Benchmarking SFC Reliability

This section defines and lists considerations which must be addressed
to benchmark the reliability of SFC

3.1. Configuration Parameters for Benchmarking Test

This section lists the parameters affecting the SFC reliability. To
apply new SFC, SDN controller set rules to the target switches.
Depending on the status of the swithes and the network, the new SFC
can be applied right as intended, or not. The right operation of SFC
as intended includes the right time of the operation activates.

o Types of Switches : Virtual switch or Physical switch

o The number of switches in target SFC domain

   * Depending on the composition of the target SFC, the number of
      switches which need to update their flow tables is different.

o The Usage of Flow table of the target switch

   * When the new SFC rule needs to setup, if the flow table entries
      are not enought and have to stored elsewhere,not TCAM, the
      usage of flow table can affect the reliability of SFC.

      + TCAM Usage

      + Flow table Entries

o The physical distances between the Controller and Switch

   * As the network grows broad, the delay is same as propagation
      delay. And this make SFC Activation time different.

o The traffic loads on the target switch

   * The limitaion of the CPU, when the target switch needs to
      process large amount of the traffic, the new SFC rules setup
      cannot be done in intended time.

3.2. Testing Parameter Benchmarking Test

   This section describes the testing parameter for Benchmark SFC
   Reliability. In terms of operation, the reliability of SFC is
   "operate the SFC in right time and at right path."

   Rule Activation Time

o The time interval from the new flow rule setup requests to the
   time when packets start to flow following the new matched rule.

   TBD

4. Security Considerations

   TBD.

5. IANA Considerations

   No IANA Action is requested at this time.

6. Normative References

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