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Contact:	Cancan Huang China Telecom P.R.China	Tel: +86 20 38639366 Fax: +86 20 38639489 Email: huangcanc@chinatelecom.cn
Contact:	Ying Cheng China Unicom P.R.China	Tel: +86-10-66259394 Fax: +86-10-66259154 Email:chengying10@chinaunicom.cn
Contact:	Zhiruo Liu CAICT,MIIT China	Tel: +86 10 62300069 Fax: ++86 10 62300094 E-mail: liuzhiruo@caict.ac.cn
Contact:	Yongqing Zhu China Telecom China	Tel: +86 20 38639581 Fax: +86 13316097158 E-mail: zhuyq8@chinatelecom.cn

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Abstract:	This document is the initial output of draft Supplement Q.Suppl.pSFC "Signaling requirements for parallel SFC packet processing". It includes the discussion results in the Q4/11 meeting held by Virtual, 17-26 March 2021.

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The following table shows discussion results for contributions.

Document Number	Source	Title	Meeting results
C0590	China Telecom China Unicom Ministry of Industry and Information Technology (MIIT) China	Output - baseline text for a new work item Supplement Q.Suppl.pSFC "Signaling requirements for parallel SFC packet processing" (virtual, 17-26 March 2021)	Accepted with modifications for initiating a new Supplement

Draft Supplement ITU-T Q.Suppl.pSFC

Signaling requirements for parallel SFC packet processing

Summary

This supplement describes the signaling requirements of parallel SFC packet processing. This supplement focuses on the signalling among the controller and SFs(Service Function).

Keywords

parallel packet processing; SFC;

Introduction

Table of Contents

Draft Supplement ITU-T Q.Suppl.pSFC

Signaling requirements for parallel SFC packet processing

1 Scope

The scope of this Supplement consists of:

(1) Overview for parallel SFC packet processing;

(2) Interface pSFC reference model;

(3) Signalling requirements for interfaces pSFC.

2 References
IETF RFC 7665 "Service Function Chaining (SFC) Architecture"

3 Definitions
3.1 Terms defined elsewhere

SFC   Service Function Chaining
3.2 Terms defined in this Supplement

4 Abbreviations and acronyms

5 Conventions

6 Overview

6.1 The necessities of parallel SFC packet processing

To provide complex services, the notion of Service Function Chain (SFC) is introduced, which is an ordered set of Virtual Network Functions (VNFs) connected by logical links.

However, the service chain latency may grow linearly with the length of the chain, which may be unacceptable for some applications that work under tight latency constraints. For example, applications such as algorithmic stock trading and self-driving car, require ultra-low (a few microseconds) latency from SFs.

Several efforts have been proposed to address this problem. To achieve lower latency, most of the works choose to schedule traffic dynamically. Moreover, some efforts are devoted to enhance the performance of SFC by accelerating individual SF or packet delivery acceleration (e.g. DPDK). Nevertheless, sequential composition of VNFs limits the performance ceiling of these works.

A closer look into service chain shows that some SFs share no dependency and could work in parallel. For example, in the service chain shown in Figure 1, the CGN SF only modify the packet headers without modifying payloads. Therefore, as shown in the service graph in Figure 2, we could send traffic into the CGN and the Firewall simultaneously, pick the both output and resemble them. In this way, the equivalent chain length is three and could bring a theoretical latency reduction by 25%.
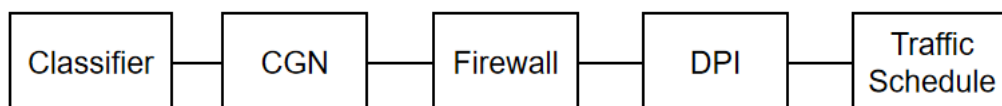
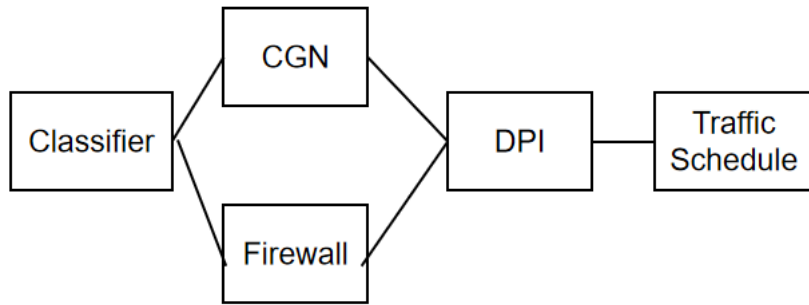Figure 1 Traditional sequential ordered SFC

Figure 2 Parallel SFC

In conclusion, parallel SFC packet processing is necessary, but currently there are no related studies in ITU-T and other SDO. So it is essential to study the signaling requirements of SFC packet processing.

7 Interface pSFC reference model

The reference model of interface pSFC is shown as below:
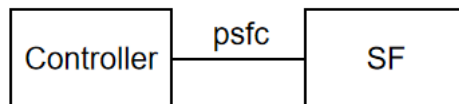

Figure 7-1 The reference model of interface pSFC

The interface pSFC is among centralized controller and SF.

8 Signalling procedure of interface pSFC

9 Signalling requirements of interface pSFC

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