INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2022-2024

SG11-TD785/GEN

STUDY GROUP 11

Original: English

Question(s): 4/11 Geneva,10-20 October 2023

TD

Source: Editors

Title: Output – initial draft baseline text of Recommendation ITU-T Q.SFCO: Signalling requirements and data models for service function chaining orchestration based on SRv6 (Geneva, 10-20 October 2023)

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Abstract: This document is the initial draft baseline text of Recommendation ITU-T Q.SFCO "Signalling requirements and data models for service function chaining orchestration based on SRv6". This document includes the results of discussion in the Q4/SG11 meeting which was held on 10-20 October 2023.

This document is the output document for draft Recommendation ITU-T Q.SFCO"Signalling requirements and data models for service function chaining orchestration based on SRv6" based on SG11-C283 and the meeting discussion in the Q4/SG11 meeting in Geneva held on 10-20 October 2023.

The following table shows discussion results for input documents.

Document Number	**Source**	**Title**	**Meeting results**
SG11-C283	China Unicom, China Telecom	Propose to initial a new work item for Signalling requirements for service identification in service aware network	Agreement with modification

Table Content

Draft new Recommendation ITU-T Q. SFCO

Signalling requirements and data models for service function chaining orchestration based on SRv6

1. Scope

This draft provides the signalling requirements of service function chaining orchestration and management layer interface for cloud network collaboration. The signalling is to support the network controller and the cloud controller to configure and manage the service function chaining based on the requirements of cloud network collaborative service orchestration. This document focuses on signalling requirements and data models of interfaces between network controller and service orchestrator, and between cloud controller and service orchestrator.

2. References

The following ITU-T Recommendations and other references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.3300] Recommendation ITU-T Y.3300 (2014), Framework of software-defined networking.

3. Definitions

3.1 Terms defined elsewhere

<TBD>

3.2 Terms defined in this Recommendation

<TBD>

4. Abbreviations and acronyms

<TBD>

5. Conventions

<TBD>

6. Background and motivations

With the development of network and business, more and more value-added service need to be deployed and dynamically adjusted on demand, such as network security services, including FW, WAF, DPI, etc. Initially, various services can be deployed in the central cloud resource pool or user network edge. With the continuous improvement of network performance requirements such as network quality and request delay, the increasing demand for flexible increase and decrease of service functions, and the development of edge computing technology, operators deploy security

service functions on several edge nodes as required. Edge nodes collaborate through the network and use SFC technology to connect service functions, meeting users' demand for flexible scheduling of service functions, further shortening response time, optimizing resource layout, and improving network efficiency.

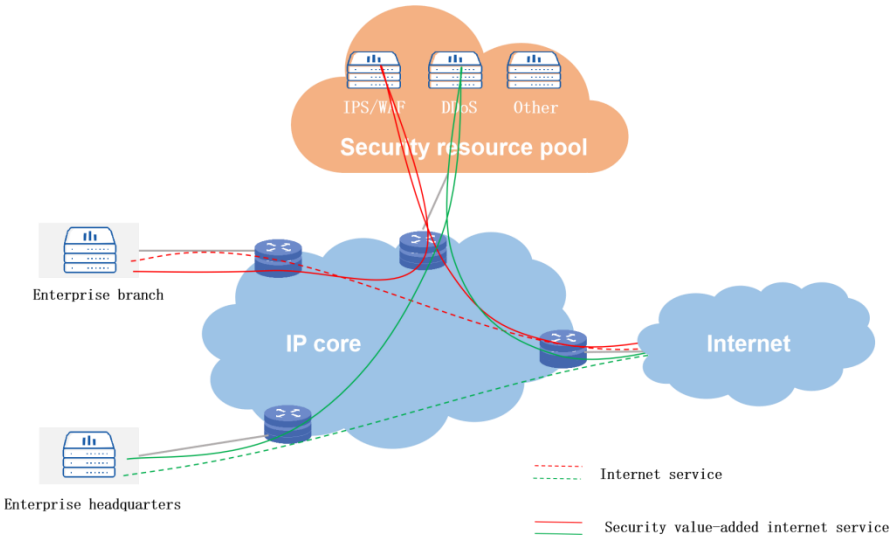

Figure 6-1: Secure value-added internet service scenario

The technical requirements defined in this draft can be applied to enterprise internet service overlay security attack and defence scenarios which is described in figure 6-1. The security attack and defence capabilities required by internet service are concatenated and arranged in a SRv6 based SFC manner. Stacking is carried out at the enterprise internet service to achieve integrated provision of security service capabilities in secure value-added internet service scenarios.

Based on the above scenario of service function chaining, it’s necessary to establish a unified signalling specification and data models, which is used to define interface requirement analysis and parameter design between network controller, cloud controller and service orchestrator.

7. Architecture of service function chaining orchestration

7.1 Architecture of service function chaining orchestration

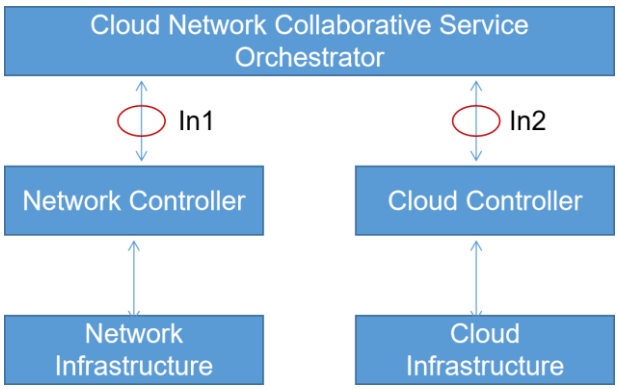

Figure 7-1: Overall Architecture of service function chaining orchestration

Cloud network collaboration is a collaborative work mode based on cloud computing and network technology, which connects users, devices, and cloud services through the network, enabling users and devices to efficiently share cloud data, files, applications, and resources, and work together in real-time, achieving cross regional, cross organizational, and cross platform collaborative cooperation, improving work efficiency and enterprise competitiveness.

From the perspective of user, network resources and Cloud resources are uniformly defined and arranged to form a unified and elastic resource supply architecture. As shown in Figure 7-1, through service orchestrator, network controller and cloud controller, network resource and cloud resource information is obtained, appropraite resource pool is selected and service path is established.

7.2 Interface reference model

In1 interface: The interface between the network controller and the service orchestrator, which is the northbound interface of the network controller. The service orchestrator obtains network element information and link information from the network controller through this interface for service path orchestration, and distributes the orchestrated service path information to the network controller. The network controller completes routing calculations based on the obtained service path information and feeds back the results to the service orchestrator.

In2 interface: The interface between the cloud controller and the service orchestrator, which is the northbound interface of the cloud controller. Through this interface, the service orchestrator can obtain cloud resource information, service information, and interconnection information between cloud resource pools and hosting networks from the cloud controller. The cloud controller configures and schedules cloud resources and services based on the service selection and service path orchestration information issued by the service orchestrator and feeds back the results to the service orchestrator.

According to the above interface, the network controller and cloud controller send network routing information or cloud resource information to the infrastructure. In this way, network infrastructure and cloud infrastructure can be configured and managed according to the service requirements of the service function chaining.

8. Data models

This chapter mainly describes interface design and data models according to the interface described in Chapter 7.

<TBD>

9. Interface requirements

This chapter mainly describes interface requirments according to the interface described in Chapter 7.

<TBD>

10. Signalling procedure for service function orchestration

10.1 Overview

This chapter mainly describes the business interaction process in the technical architecture of service function chaining based on SRv6, so as to describe signalling processes described in this chapter distinguish between SRv6 aware mode and SRv6 unaware mode.

10.2 Process of creating a service function chaining

The process of creating a service function chaining in SRv6 aware mode.

The process of creating a service function chaining of SRv6 aware mode is as shown in Figure 9-1. This process needs to be carried out after the pre-connection initialization process of the resource pool is completed.

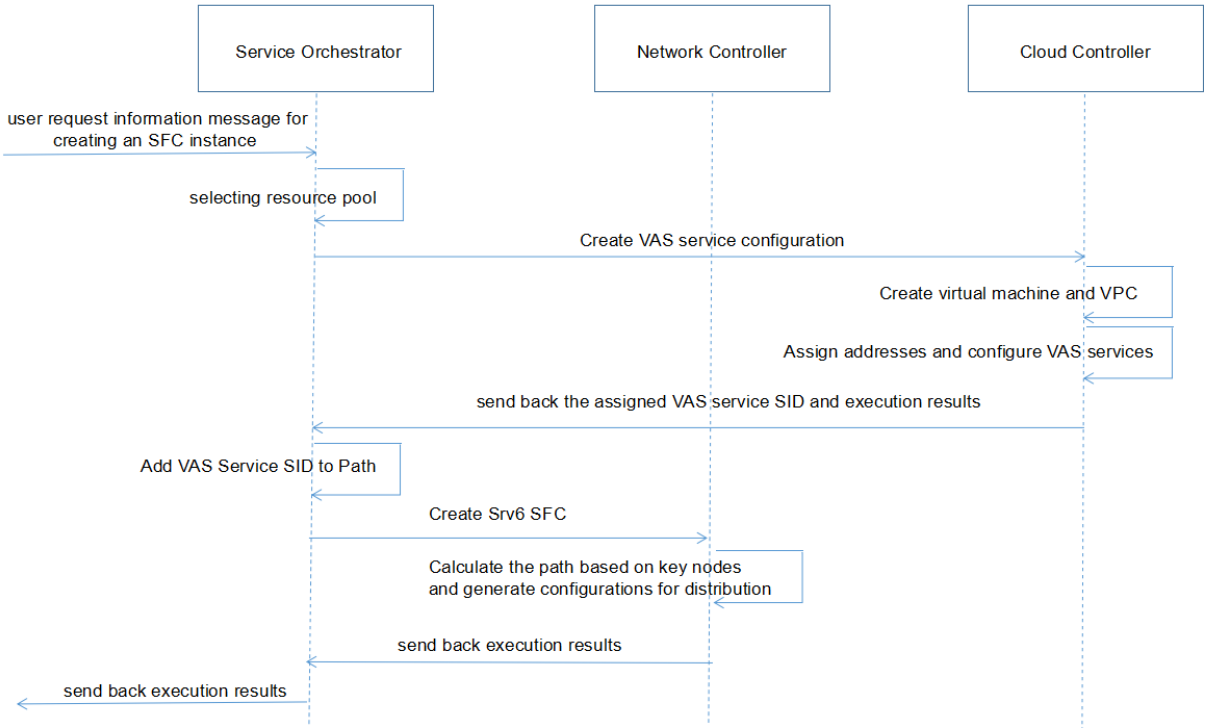

Figure 10-1 process for creating a service function chaining of SRv6 aware mode

The process of creating a service function chaining in SRv6 unaware mode.

<TBD>

10.3 Process of querying a service function chaining

Querying service function chaining refers to querying all service function chaining instances or specific service function chaining instances based on user requests.
The service orchestrator is responsible for storing the service path information of service function chaining, including the source network node, the network node connecting to VAS, and the destination network node.
If it's required to query the detailed information of VAS information, the Cloud controller will provide feedback on the query results to the service orchestrator.
The process of querying service function chaining is shown in Figure 9-2. The querying process of SRv6 aware mode and SRv6 unaware mode is the same.

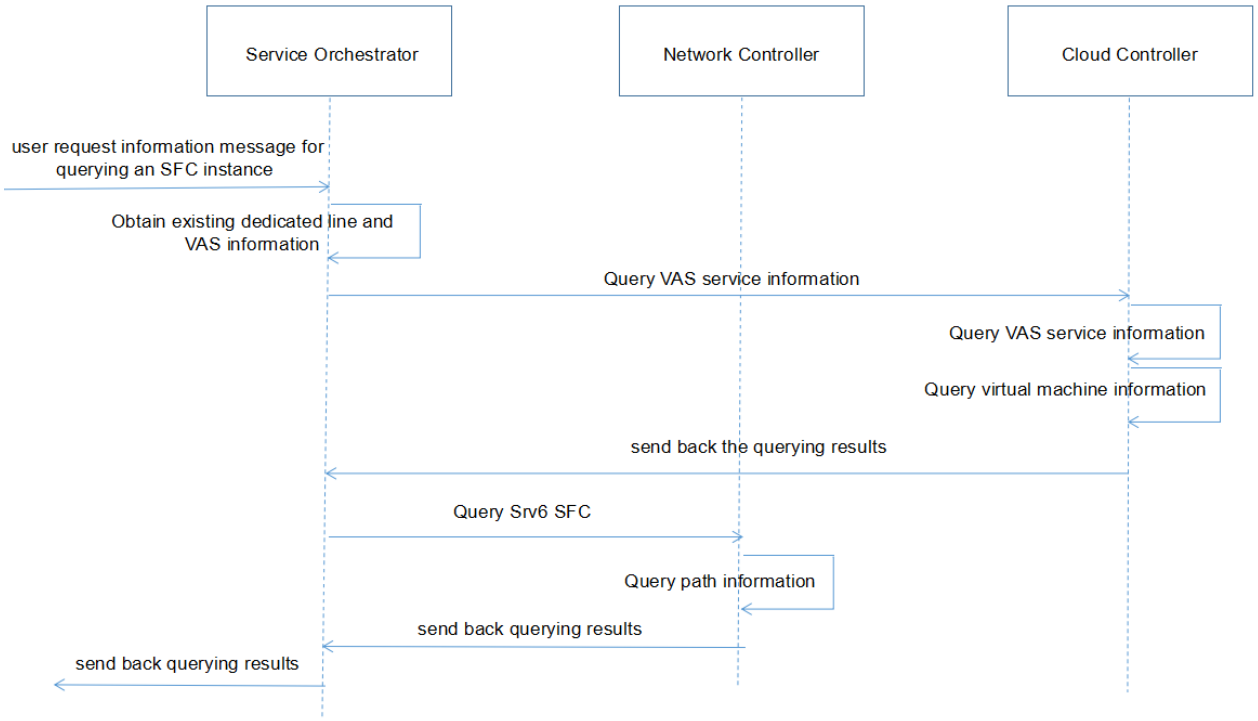

Figure 10-2 process for querying service function chaining

10.4 Process of deleting a service function chaining

Deleting service function chaining is to unbind the VAS service with the user's service based on their deletion request. Simultaneously delete VAS services and resources are deleted.

The process of deleting a service function chaining in SRv6 aware mode.

The process for deleting a service function chaining of SRv6 aware mode is as shown in Figure 9-3.

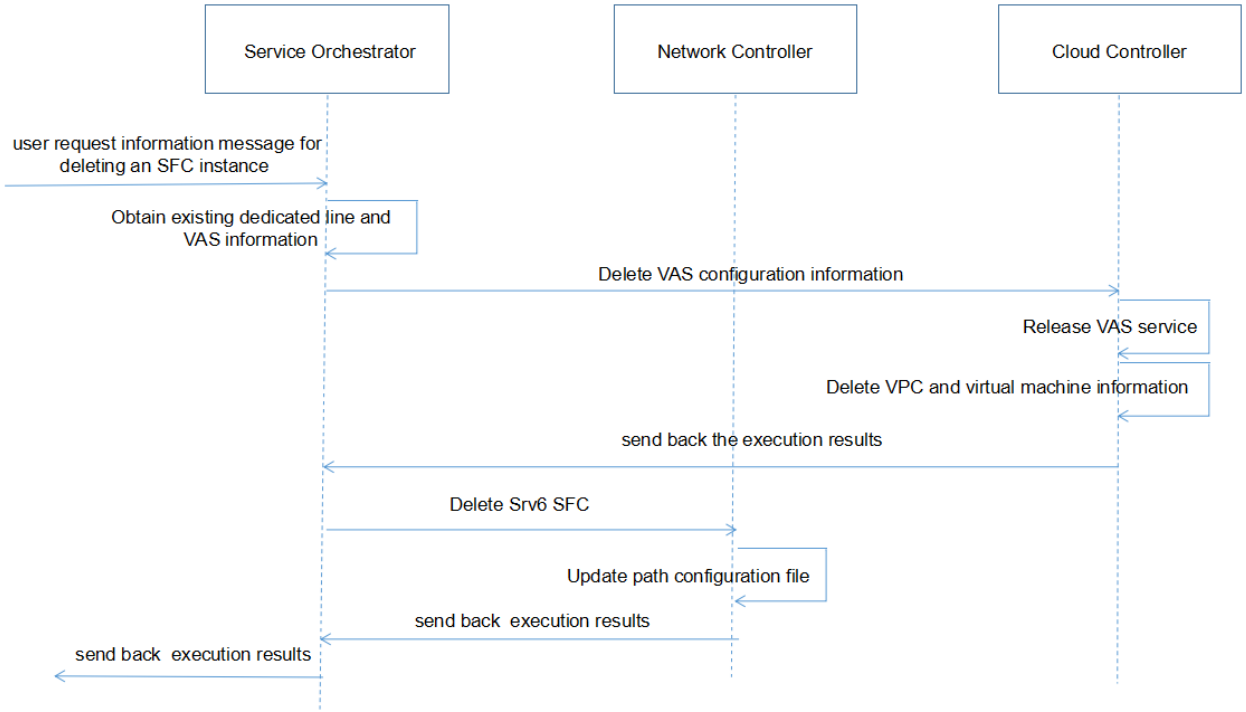

Figure 10-3 process for creating a service function chaining of SRv6 aware mode

The process of deleting a service function chaining in SRv6 unaware mode.

<TBD>

10.5 Process of modifying a service function chaining

Modifying service function chaining refers to updating the service chaining based on user's requirements. Modifying service function chaining mainly includes modifying the path information of service function chaining instances, adding new VAS services, exiting existing VAS services, etc.

The process of modifying a service function chaining in SRv6 aware mode.

The process for modifying a service function chaining of SRv6 aware mode is as shown in Figure 9-4.

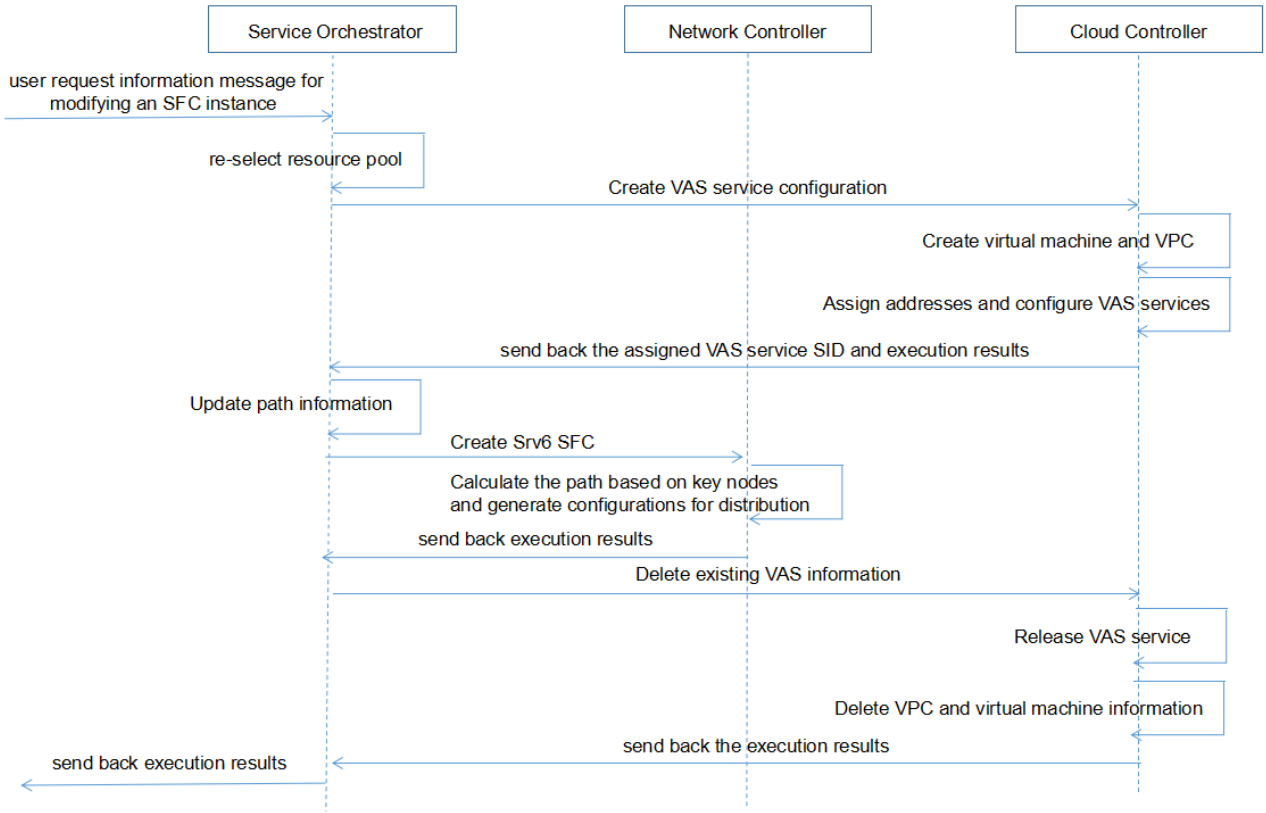

Figure 10-4 process for modifying a service function chaining of SRv6 aware mode

The process of modifying a service function chaining in SRv6 unaware mode.

<TBD>

11. Signalling requirements for Interface

<TBD>

Bibliography

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