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**IPv6 evolution technical requirements-Part 10: enhanced VPN
(VPN+) for supporting IP network slicing**

IPv6演进技术要求 第10部分：支持IP网络切片的增强型虚拟专用网（VPN+）

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is part 10 of GB/T 44887 Technical Requirements for IPv6 Evolution. GB/T 44887 has published the following part.

Part 5: Virtual Private Network (VPN) based on IPv6 Segment Routing (SRv6);- Part 10.Enhanced Virtual Private Network (VPN) supporting IP network slicing; - Part 11.IPv6 flow detection technology. - Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

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Introduction

According to the Notice on Accelerating the Large-Scale Deployment and Application of Internet Protocol Version 6 (IPv6), in order to accelerate the improvement of government application China has formulated a series of IPv6 standards to create and expand industry integrated applications, promote the large-scale deployment of IPv6 and standardize innovative application results.

Among them, GB/T 44887 "Technical Requirements for IPv6 Evolution" is a standard formulated to regulate the national IPv6 deployment and is intended to be divided into the following parts.

Part 1: Reference Architecture. The purpose is to define the application scenarios of IPv6 evolution technology in operators and industry fields, as well as the Deployment in business and industry networks.

Part 2: IP bearer network based on IPv6 segment routing (SRv6). The purpose is to specify the overall IP bearer network based on SRv6.

Architecture, SRv6-based device layer technical requirements, and SRv6-based control layer technical requirements.

Part 3: IPv6 Segment Routing Header (SRH). The purpose is to specify the format of the IPv6 Segment Routing Header (SRH).

and technical requirements for SRH processing at the node.

Part 4: Network programming based on IPv6 segment routing (SRv6). The purpose is to specify the data plane based on SRv6 network programming.

plane, control plane, and management plane.

Part 5: Virtual Private Network (VPN) based on IPv6 Segment Routing (SRv6).

The processing flow and protocol messages of the VPN network include the implementation of Layer 3 services and Layer 2 services.

Part 6: IPv6 Segment Routing (SRv6) Policy. The purpose is to define the technology used to support SRv6 policy.

Development, design and testing of network equipment.

Part 7: Service chain based on IPv6 segment routing (SRv6). The purpose is to specify the data plane technical requirements of service chain based on SRv6.

Requirements and technical requirements for the service chain control plane based on SRv6.

Part 8: Header compression based on IPv6 Segment Routing (SRv6). The purpose is to specify the header compression applicable to supporting SRv6-based packets.

Development, design and testing of network equipment with header compression.

Part 9: Network Fault Protection Based on IPv6 Segment Routing (SRv6). The purpose is to specify the common network fault protection applicable to SRv6 networking.

Network failure scenarios, including SRv6 BE node/link failure, SRv6 Policy intermediate node/end node failure, micro-ring and SRv6 Policy failure scenarios, etc.

Part 10: Enhanced Virtual Private Network (VPN) supporting IP network slicing. The purpose is to specify enhanced virtual private The technical architecture of VPN, VPN technical requirements, and VPN implementation process based on SR.

Part 11: IPv6 flow detection technology. The purpose is to specify the data plane flow information applicable to multi-type service carrying scenarios.

Automated quality measurement, as well as development, testing and deployment of IP network equipment flow detection functions.

Technical Requirements for IPv6 Evolution Part 10: Support for IP Enhanced VPN for Network Slicing (VPN)

1 Scope

This document specifies the technical architecture of the enhanced virtual private network (VPN), VPN technical requirements, and SR-based VPN implementation process.

This document is applicable to the development, testing and application of network equipment that supports enhanced virtual private networks (VPN).

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Enhanced virtual private network; VPN

A network service that is formed by integrating new network technologies and functions based on traditional virtual private networks (VPNs).

Note. Enhanced VPN can provide enhanced isolation features to isolate resources of different user networks, thereby reducing the load variation of a user network.

The change will not affect the business of other users.

3.2 IP network slice

An IP network is a logically isolated virtual network provided for specific users or services.

Note. IP network slicing meets the differentiated connection and service quality assurance requirements of different users and services through dedicated or shared network resources.

3.3 Segment routing

Source routing technology applied to MPLS or IPv6 networks to implement service path customization.

Note. In an MPLS network, a segment is encoded as an MPLS label. In an IPv6 network, a segment is encoded in the IPv6 address format.

The Segment Routing Header indicates the forwarding path.

4 Abbreviations

The following abbreviations apply to this document.

BGP?LS. Border Gateway Protocol?Link State DetNet. Deterministic Networking FlexE. Flexible Ethernet technology (Flex Ethernet) IGP. Interior Gateway Protocol MPLS. Multi-Protocol Label Switching MPLS?TE. Multi?Protocol Label Switching?Traffic Engineering