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IPv6 evolution technical requirements - Part 3: IPv6 segment routing header (SRH)

IPv6 演进技术要求 第3部分：IPv6段路由报文头（SRH）

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents". Drafting.

This document is Part 3 of GB/T 44887 "Technical Requirements for IPv6 Evolution". GB/T 44887 has published the following parts.

- Part 1: Reference Architecture;

- Part 2: IP Bearer Networks Based on IPv6 Segment Routing (SRv6);

- Part 3: IPv6 Segment Routing Header (SRH);

- Part 4: Network Programming Based on IPv6 Segment Routing (SRv6);

- Part 5: Virtual Private Networks (VPNs) Based on IPv6 Segment Routing (SRv6);

- Part 6: IPv6 Segment Routing (SRv6) Policy;

- Part 7: Service Chaining Based on IPv6 Segment Routing (SRv6);

- Part 8: Packet Header Compression Based on IPv6 Segment Routing (SRv6);

- Part 9: Network Fault Protection Based on IPv6 Segment Routing (SRv6);

- Part 10.Enhanced Virtual Private Networks (VPNs) Supporting IP Network Slicing;

- Part 11.IPv6 Flow Detection Technology.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

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

This document is under the jurisdiction of the National Telecommunications Standardization Technical Committee (SAC/TC485).

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Limited Liability Company, Huawei Technologies Co., Ltd., China Academy of Information and Communications Technology, ZTE Corporation, H3C Technologies Co., Ltd., China Information and Communication Technology Group Co., Ltd.

The main drafters of this document are: Wu Youming, Gong Xia, Zhu Yongqing, Cheng Weiqiang, Pang Ran, Yang Bing, Peng Shuping, Zhang Lei, Liu Yao, Wan Xiaolan, and Yin Yongsheng.

Liu Mingxing, Liu Qiuyue, Zhang Zheng, and Wang Junfang.

Introduction

According to the "Notice on Accelerating the Large-Scale Deployment and Application of Internet Protocol Version 6 (IPv6)," in order to accelerate the transformation of government applications, To expand industry integration and application, and to promote the standardization of large-scale IPv6 deployment and application innovations, China has formulated a series of IPv6 standards.

In China, GB/T 44887 "Technical Requirements for IPv6 Evolution" is a standard developed to regulate the deployment of IPv6 in China, and it is proposed to consist of eleven parts.

- Part 1: Reference Architecture. The purpose is to define the application scenarios of IPv6 evolution technology in the operator and industry sectors, and in...

Deployment in carrier and industry networks.

- Part 2: IP Bearer Networks Based on IPv6 Segment Routing (SRv6). The purpose is to define IP bearer networks based on SRv6.

Overall 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 define the format of the IPv6 segment routing header (SRH), and...

SRH's technical requirements for node processing.

- Part 4: Network Programming Based on IPv6 Segment Routing (SRv6). The purpose is to define the data platform for SRv6 network programming.

Surface, control plane, management plane.

- Part 5: Virtual Private Networks (VPNs) Based on IPv6 Segment Routing (SRv6). The purpose is to define SRv6-based VPNs.

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

- Part 6: IPv6 Segment Routing (SRv6) Policy. The purpose is to specify policies to support SRv6-based policy technologies.

The development, design, and testing of network equipment, etc.

- Part 7: Service Chaining Based on IPv6 Segment Routing (SRv6). The purpose is to define the data plane technology for service chains based on SRv6.

Requirements, technical requirements for the business chain control plane based on SRv6.

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

Development, design, and testing of network devices with compressed headers.

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

Network failure scenarios include SRv6BE node/link failure, SRv6Policy intermediate/tail node failure, micro-loops, and...

SRv6Policy fault scenarios, etc.

- Part 10.Enhanced Virtual Private Networks (VPNs) Supporting IP Network Slicing. The

purpose is to define enhanced virtual private networks (VPNs).

The technical architecture of VPN, VPN technical requirements, and the VPN implementation process based on SR.

- Part 11.IPv6 Flow-Based Inspection Technology. The purpose is to specify data plane flow-based inspection technologies applicable to various service carrying scenarios.

The development, testing, and deployment of automated quality measurement of information, as well as the flow detection function of IP network devices.

IPv6 Evolution Technical Requirements Part 3: IPv6 Segment Routing Header (SRH)

1 Scope

This document specifies the format of the IPv6 segment routing header (SRH) and the technical requirements for SRH node processing.

This document applies to the development, design, and testing of network devices that support SRv6 functionality.

2 Normative references

GB/T 44887.1-2025

3 Terms and Definitions

The terms and definitions defined in GB/T 44887.1-2025, as well as the following terms and definitions, apply to this document.

3.1 segment identifier

This indicates the specific segment within the segmented routing domain.

Note. In SRv6, the SID consists of three parts. Locator, Function, and Argument, encoded in the form of an IPv6 address.

The SID list is represented as < S1,S2,S3> and is used to indicate the packet forwarding path.

3.2 segmentlist

Multiple segments are combined into an ordered list of segments, guiding the data packet through a specified path to the network nodes to execute the expected commands. Instructions and operations.

Note. This ordered list of segments is called a segment list, or SID list. Each segment in the segment list is an instruction used to complete the entire process. A part or segment of a