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IPv6 evolution technical requirements - Part 6: Segment routing over IPv6 (SRv6) policy

IPv6 演进技术要求 第6部分：IPv6段路由(SRv6)策略

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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 6 of GB/T 44887 "Technical Requirements for IPv6 Evolution". GB/T 44887 has already 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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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 formulated to standardize the national IPv6 deployment and 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 define SRv6 policies, SRv6 policy routing, and SRv6 policy...

The technical requirements for protection are used to support the development, design, and testing of network devices based on SRv6 policy technology.

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

The requirements for control plane technology are used to support the development, design, and testing of network devices based on SRv6 header compression.

- Part 8: Packet Header Compression Based on IPv6 Segment Routing (SRv6). The purpose is to define the segment identifier structure for SRv6 header compression.

Requirements such as structure, data plane forwarding, control plane protocol extension, cross-domain deployment, and protection are designed to support SRv6-based packets.

The development, design, and testing of header-compressed network devices.

- Part 9: Network Fault Protection Based on IPv6 Segment Routing (SRv6). The purpose is to specify SRv6BE links/nodes, SRv6 specifies intermediate nodes, SRv6 tail nodes, micro-loop prevention, and SRv6 end-to-end technologies for SRv6 network fault protection.

Seeking the development, testing, and application of devices with network protection functions in SRv6 networking scenarios, specifically for node/link failures and other fault conditions. Deployment, 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 6: IPv6 Segment Routing (SRv6) Policy

1 Scope

This document specifies the technical requirements for SRv6 strategies, SRv6 strategy traffic redirection, and SRv6 strategy protection.

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

2 Normative references

GB/T 44887.1

GB/T 44887.4-2025

3 Terms and Definitions

The terms and definitions defined in GB/T 44887.1 and the following terms and definitions apply to this document.

3.1 Segment identifier; SID

Identifier for a specific segment within a segmented routing domain.

Note. In SRv6, a 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 The following abbreviations apply to this document

The application of segmented routing networks provides topology-independent fault protection capabilities in IGP networks, while also providing protection routes.

The path is consistent with the path after IGP convergence, which is a fast rerouting technology that reduces service interruption.

4 Abbreviations

The following abbreviations apply to this document.