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1. Introduction

Application-aware Networking (APN) is introduced in [[I-D.li-apn-framework](#)] and [[I-D.li-apn-problem-statement-usecases](#)]. APN conveys an attribute along with data packets into the network and make the network aware of data flow requirements at different granularity levels. Such an attribute is acquired, constructed as a structured value, and then encapsulated in the packets. Such a structured value is treated as an opaque object in the network, to which the network operator applies policies in various nodes/service functions along the path, providing corresponding services.

[[I-D.li-apn-header](#)] defines the application-aware networking (APN) header which can be used in different data planes to carry the APN attribute. This document defines the encapsulation of the APN header in the IPv6 data plane.

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC 2119](#) [[RFC2119](#)] [RFC 8174](#) [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

- o D: 1 bit. When it is set, it indicates the Destination Address verification is disabled due to use of a reduced segment list.
- o RESERVED: 15 bits. MUST be 0 on transmission and ignored on receipt.
- o APN Header: It carries the APN header as specified in [[I-D.li-apn-header](#)]. A variable-length field.

7. Implementation Status

Huawei:

Huawei hardware platforms supports APN with current status as follows:

- o Huawei ATN with VRPV8 shipping code.
- o Huawei CX600 with VRPV8 shipping code.
- o Huawei NE40E with VRPV8 shipping code.
- o Huawei ME60 with VRPV8 shipping code.
- o Huawei NE5000E with VRPV8 shipping code.
- o Huawei NE9000 with VRPV8 shipping code.
- o Huawei NE8000 with VRPV8 shipping code.

Tshinghua University:

- o Linux

BUPT (Beijing University of Posts and Telecommunications):

- o P4

8. IANA Considerations

IANA is requested to assign two code points as below.

8.1. IPv6 Header Option

IANA is requested to assign an IPv6 Header Option as follows:

Hex Value	Binary Value	Description	Reference
	act chg rest		
0x13	00 0 10011	Application-aware Networking	[this document]

8.2. SRH TLV Type

IANA is requested to assign an SRH TLV Type from the range of type values for TLVs that do not change en route (2-127) as follows:

Value	Description	Reference
0x13	Application-aware Networking	[this document]

9. Security Considerations

The Security Considerations are described in [\[I-D.li-apn-problem-statement-usecases\]](#).

10. References

10.1. Normative References

[I-D.li-apn-framework] Li, Z., Peng, S., Voyer, D., Li, C., Liu, P., Cao, C., and G. S. Mishra, "Application-aware Networking (APN) Framework", Work in Progress, Internet-Draft, draft-li-apn-framework-07, 3 April 2023, <<https://datatracker.ietf.org/doc/html/draft-li-apn-framework-07>>.

[I-D.li-apn-header] Li, Z., Peng, S., and S. Zhang, "Application-aware Networking (APN) Header", Work in Progress, Internet-Draft, draft-li-apn-header-04, 12 April 2023, <<https://datatracker.ietf.org/doc/html/draft-li-apn-header-04>>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/

RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

[RFC8200] Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", STD 86, RFC 8200, DOI 10.17487/RFC8200, July 2017, <<https://www.rfc-editor.org/info/rfc8200>>.

[RFC8754] Filsfils, C., Ed., Dukes, D., Ed., Previdi, S., Leddy, J., Matsushima, S., and D. Voyer, "IPv6 Segment Routing Header (SRH)", RFC 8754, DOI 10.17487/RFC8754, March 2020, <<https://www.rfc-editor.org/info/rfc8754>>.

10.2. Informative References

[I-D.li-apn-problem-statement-usecases]

Li, Z., Peng, S., Voyer, D., Xie, C., Liu, P., Qin, Z., and G. S. Mishra, "Problem Statement and Use Cases of Application-aware Networking (APN)", Work in Progress, Internet-Draft, draft-li-apn-problem-statement-usecases-08, 3 April 2023, <<https://datatracker.ietf.org/doc/html/draft-li-apn-problem-statement-usecases-08>>.

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