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Data-driven Accounting in Application-aware IPv6 Networking
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Abstract

This document introduces a new usecase of Application-aware IPv6 Networking to enable data-driven accounting.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

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[1.](#) Introduction

Application-aware IPv6 Networking is a kind of self-identified mechanism per packet. In the mechanism of APN6 [[I-D.li-apn6-problem-statement-usecases](#)], an IPv6 packet can carry the APP ID information and SLA requirements of the traffic in its Extension Headers. Therefore, the network equipment can analyze them in each packet and handle the packet accordingly.

In this mechanism, different user traffic can get different treatments so that the network resource can be used more efficiently. As the emergence of various new services with various requirements, the same treatment for all traffic cannot continue to be sustainable in future.

Current usecases in APN6 only mention different treatments of the traffic, but do not mention the way to account, which is essential for the operator. If the operators can charge for APN services properly, the APN technologies will be adopted more quickly.

This document introduces the usecase and the general process about the data-driven accounting in APN6.

[2.](#) Current Mechanism in APN6

As shown in Figure 1, the APN framework [[I-D.li-apn-framework](#)] includes App (Client and Server), App-aware Edge, App-aware-process Head-End, App-aware-process Mid-Point, and App-aware-process End-Point.

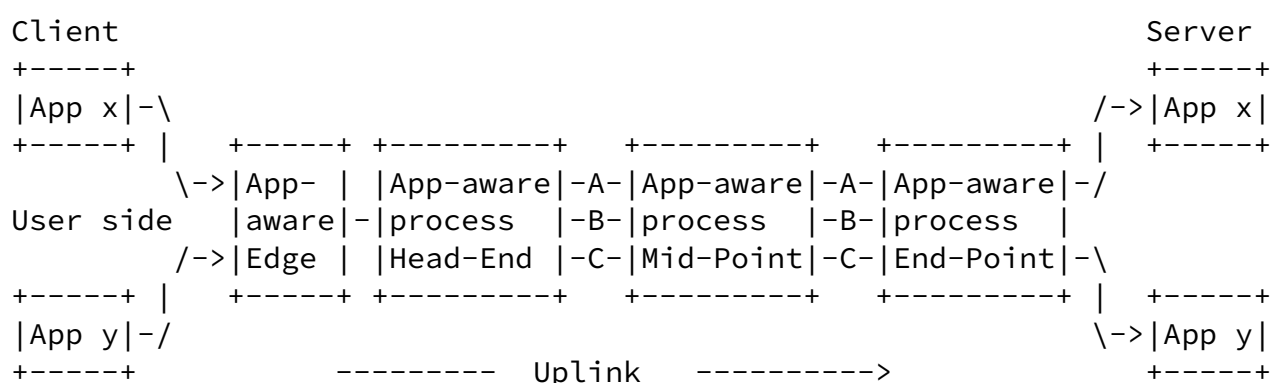


Figure 1: Framework and Key Components in APN6

The data-driven process of APN6 is described below.

The APP or the APP-aware Edge will generate an APN packet which carries the application characteristic information in the encapsulation. The information may include application-aware identification, such as SLA level, application ID, user ID, flow ID, etc., and network performance requirements, such as bandwidth, latency, jitter, packet loss ratio, etc. The former is recorded in the Application-aware ID Options, and the latter is recorded in the Service-Para Options defined in the [[I-D.li-apn-framework](#)].

App-aware-process Head-End can read that information and steer the packet into a given policy which satisfies the application requirements. It is supposed that a set of paths, tunnels or SR policies, exist between the App-aware-process Head-End and the App-aware-process End-Point. App-aware-process Head-End can find one existing path or establish a new one for the traffic.

3. Data-driven Accounting Usecase

In the APN architecture, a client can send both normal IPv6 packets and APN encapsulated packets simultaneously, which may trigger

complicated accounting/charging mechanisms.

As the treatment of the APN packets may be various according to multiple factors, such as the time of accessing the network, the network conditions, etc., a flexible accounting mechanism is needed. In addition, it is better that the accounting mechanism can support negotiations between the client and the accounting point.

For example, a user occasionally needs to transfer an import file or attend an important meeting, they can use this APN-based data-driven mechanism to trigger a better network service and pay a reasonable amount of money.

[4.](#) General Process of the Data-driven Accounting

The general process of data-driven accounting is described as below.

Firstly, the client inform the the accounting point, which is normally also the gateway of the client, about the requirement of the traffic, and optionally including the cost the user can offer.

Secondly, the network provide the service accordingly.

Thirdly, the client can do the accounting itself, and occasionally send a specific APN packet to the accounting point to align the accounting information.

Fourthly, the network confirm the accounting information received from the client, and make a decision about further treatment of the traffic.

Finally, the client may terminate the service and the accounting.

As the client and the accounting point can negotiate by using this APN mechanism, a more flexible accounting mechanism is enabled. In this mechanism, the client can participate the accounting, and the accounting point needs to confirm the legality of the APN accounting packets. Therefore, the APN accounting packet should include accounting information of the flow and the signature of the client for the packet.

The accounting point can notify the client about an SRv6 Accounting

Function before the service accessing. In this case, the accounting information and the signature can be carried in the SRv6 SID list or some other places of the SRH.

[5.](#) IANA Considerations

TBD.

[6.](#) Security Considerations

TBD.

[7.](#) Acknowledgements

TBD.

[8.](#) References

[8.1.](#) Normative References

[I-D.li-apn-framework]

Li, Z., Peng, S., Voyer, D., Li, C., Geng, L., Cao, C., Ebisawa, K., Previdi, S., and J. Guichard, "Application-aware Networking (APN) Framework", [draft-li-apn-framework-01](#) (work in progress), September 2020.

[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>>.

[8.2.](#) Informative References

[I-D.li-apn6-problem-statement-usecases]

Li, Z., Peng, S., Voyer, D., Xie, C., Liu, P., Liu, C., Ebisawa, K., Previdi, S., and J. Guichard, "Problem Statement and Use Cases of Application-aware IPv6 Networking (APN6)", [draft-li-apn6-problem-statement-](#)

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