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Usage scenarios of Application-aware Networking (APN) for SD-WAN
draft-yang-apn-sd-wan-usecase-00

Abstract

This document describes the usage of Application-aware Networking (APN) in SD-WAN scenarios. In these scenarios, APN is able to identify a particular application, steer its traffic flows along explicit path across the network, and provide SLA guaranteed network services such as low latency and high reliability.

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

As more and more applications are moved to the cloud, the traditional WAN architecture starts facing challenges. Software-defined Wide Area Network (SD-WAN) provides a cloud-friendly way of interconnecting branch offices and applications in the cloud over any combination of transport services such as MPLS and 4G LTE, which is able to optimising application performance with low costs.

Application-aware Networking (APN) is introduced in [[I-D.li-apn-framework](#)] and [[I-D.li-apn-problem-statement-usecases](#)]. APN conveys application information such as application/user/flow identifiers and SLA/service requirements along data packets into network [[I-D.li-6man-app-aware-ipv6-network](#)] and make the network aware of applications and their requirements, so to provide corresponding network services and guarantee their SLA requirements. The ever-emerging network services such as network slicing and iOAM can be further enhanced with the application awareness in the network enabled by APN.

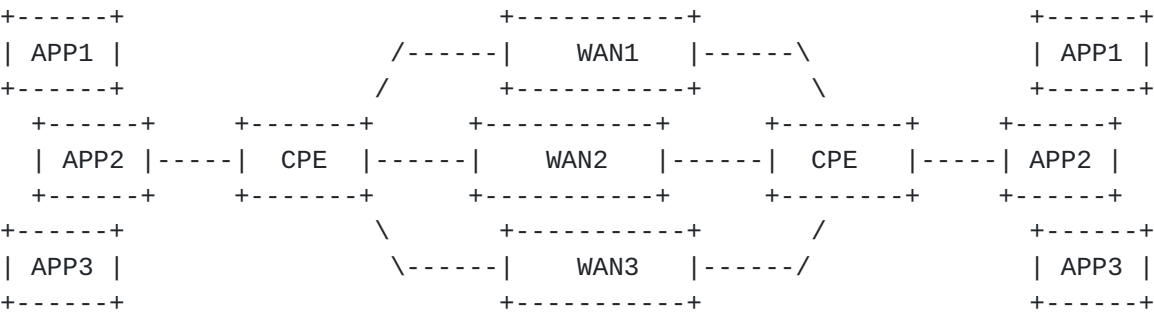
This document describes the usage scenarios of APN for SD-WAN.

2. Usage Scenarios of APN for SD-WAN

This section describes the scenarios that can use APN to meet the fine-granularity service operations in SD-WAN.

2.1. APN for Traffic Steering into Dedicated WAN

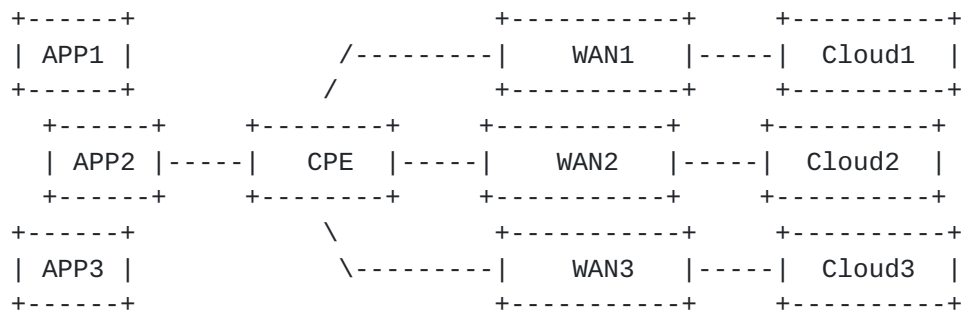
In CPE, different applications can be recognized and their traffic flows can be steered into different WANs that can guarantee their corresponding SLA requirements.



Traffic Steering into WAN

2.2. APN for Traffic Steering into Particular Cloud

In the multi-cloud scenario, a CPE can be deployed by an enterprise as its gateway to access different clouds. In the CPE (e.g. an universal CPE, called uCPE), different applications can be recogonized and steered into the corresponding cloud where the application servers are running through the corresponding WANs.



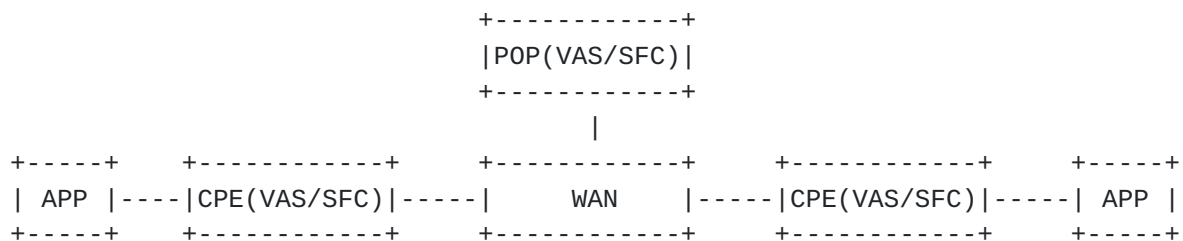
Traffic Steering into Cloud

2.3. APN for Value-added Service Provisioning in SD-WAN

APN can facilitate the value-added service provisioning in SD-WAN, either at the CPE or the POP.

At the CPE, network security and application acceleration services can be provided. With APN, certain malicious applications can be recognized and blocked, while the traffic from the applications that require acceleration can be steered through the acceleration service.

At the POP, value-added service can be provisioned for certain applications according to the application information carried in their packets.

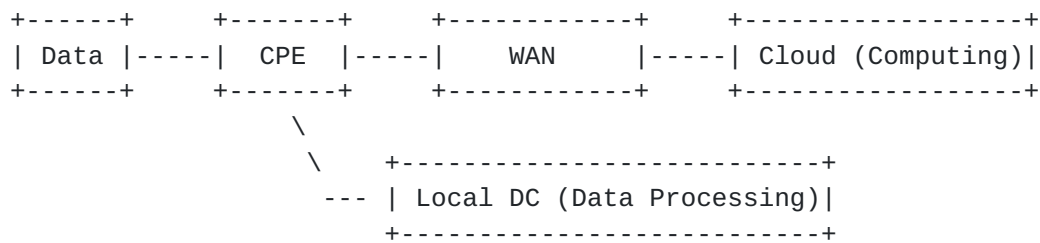


VAS Provisioning

2.4. APN for Data Processing in SD-WAN

In enterprise, usually important data is kept locally and it is preferred to be processed locally, while other data can be processed with the complex processing capabilities in the cloud.

With APN, the traffic can be steered according to the localization characteristics of the data, either being processed locally or in the cloud.



Data Processing

3. Business Model of APN enhanced SD-WAN

With the digital transformation, the network infrastructure and cloud-based applications are emerging as an integrated service of network operators to provide a complete solution to customer. As an overlay technology, SD-WAN is able to simplify the network and make it more service-focused, which has become the de facto option for the Enterprise WAN Edge. With SD-WAN, the network is not just a pipe any more, and network becomes application aware. It enables the network service providers to reshape their network to provide more complex products to meet customers' various requirements.

When SD-WAN is integrated with APN, service providers are able to provide network services together with cloud services in a fine-granularity SaaS-like model. The latest functionalities can be delivered via cloud. Customers benefit from the pay-for-use model in per application granularity and have the agility to adjust the level of functionality, capability, and capacity. According to the application-aware information carried by the important applications, corresponding paths/WANs can be selected, the SLA can be guaranteed, and value-added services can be provisioned.

4. Security Considerations

The security consideration can refer to [[I-D.li-apn-framework](#)] .

5. IANA Considerations

There are no IANA considerations in this document.

6. Normative References

[I-D.li-6man-app-aware-ipv6-network]

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[I-D.li-apn-framework]

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