Workgroup: Network Working Group
Internet-Draft:
draft-zhang-dyncast-computing-aware-sdwan-
usecase-01
Published: 7 September 2022
Intended Status: Standards Track
Expires: 11 March 2023
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Use Cases for Computing-aware Software-Defined Wide Area Network(SD-WAN)

Abstract

SD-WAN is aware of the computing power of applications deployed in the multiple sites of enterprise and can perform the routing policy according to such information. This is defined as the computing-aware SD-WAN.This document describes the use cases for computing-aware Software-Defined Wide Area Network(SD-WAN).

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].

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

SD-WAN provides organizations or enterprises with centralized control over multiple sites which are network endpoints including branch offices, headquarters, data centers, clouds, and more. A enterprise may deploy their services and applications in different locations to achieve optimal performance. The traffic sent by a host will take the shortest WAN path to the closest server. However, the closet server MAY NOT be the best choice with lowest cost of network and computing resources for the host. If the path computation element can consider the computing dimension information in path computation, the best path with lowest cost can be provided.

The computing related information can be the number of vCPUs of the VM running the application/services, CPU utilization rate, usage of memory, etc.

The SD-WAN can be aware of the computing resource of applications deployed in the multiple sites and can perform the routing policy according to the information is defined as the computing-aware SD-WAN.

This document describe the use case of computing-aware SD-WAN.

2. Use Cases of Computing-aware SD-WAN

2.1. Computing-aware SD-WAN for Enterprise Cloudification

Many enterprises are performing the cloud migration to migrate the applications from data centers to the clouds, including public, private, and hybrid clouds. The clouds resources can be from the same provider or multiple cloud providers which have some benefits including disaster recovery, load balancing, avoiding vendor lock-in.

In such cloudification deployments SD-WAN provides enterprises with centralized control over Customer-Premises Equipments(CPEs) in branch offices and the cloudified CPEs(vCPEs) in the clouds.The CPEs connect the clients in branch offices and the application servers in clouds. The same application server in different clouds is called an application instance. Different application instances have different computing resource.

SD-WAN is aware of the computing resource of applications deployed in the clouds by vCPEs, and selects the application instance for the client to visit according to computing power and the network state of WAN.

Figure 1 below illustrates Computing-aware SD-WAN for Enterprise Cloudification.

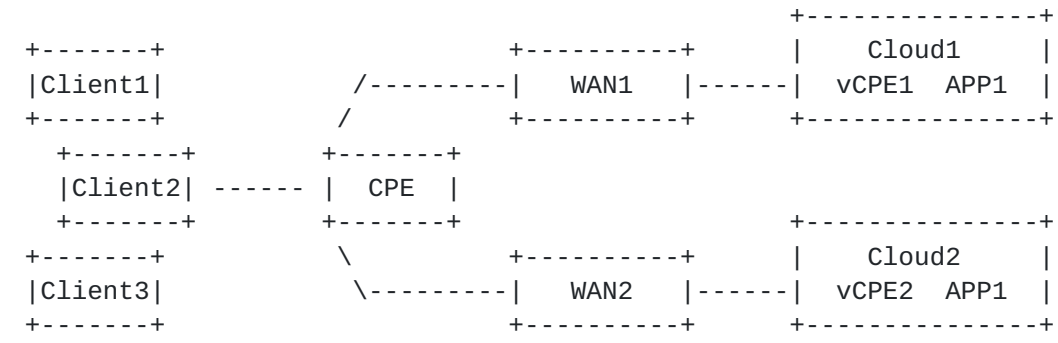

Figure 1: Illustration of Computing-aware SD-WAN for Enterprise Cloudification

The current computing load status of the application APP1 in cloud1 and cloud2 is as follows: each application uses 6 vCPUs. The load of application in cloud1 is 50%. The load of application in cloud2 is 20%. The computing resource of APP1 are collected by vCPE1 and vCPE2 respectively. Client1 and Client2 are visiting APP1 in cloud1. WAN1 and WAN2 have the same network states. Considering lightly loaded application SD-WAN selects APP1 in cloud2 for the client3 in branch office. The traffic of client3 follows the path: Client3 -> CPE -> WAN1 -> Cloud2 vCPE1 -> Cloud2 APP1

3. Security Considerations

TBD

4. IANA Considerations

There are no IANA considerations in this document.

5. Normative References

[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>.

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