

Advertising SaaS Path Performance Metric using BGP

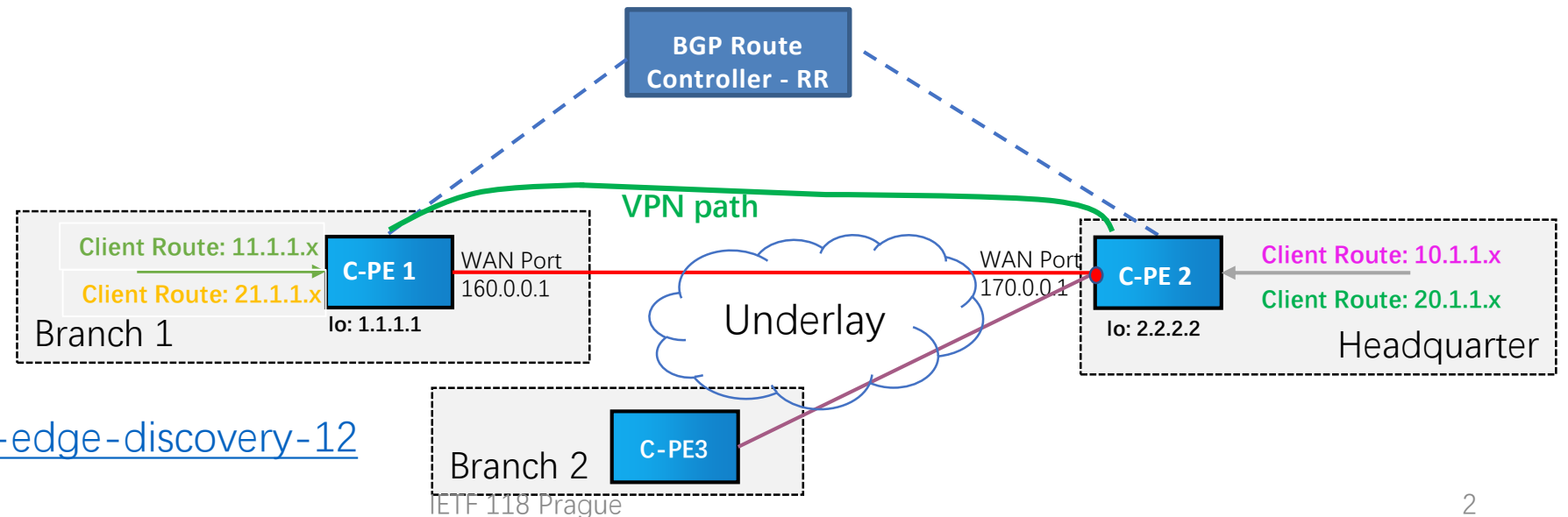
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IETF 118

Background

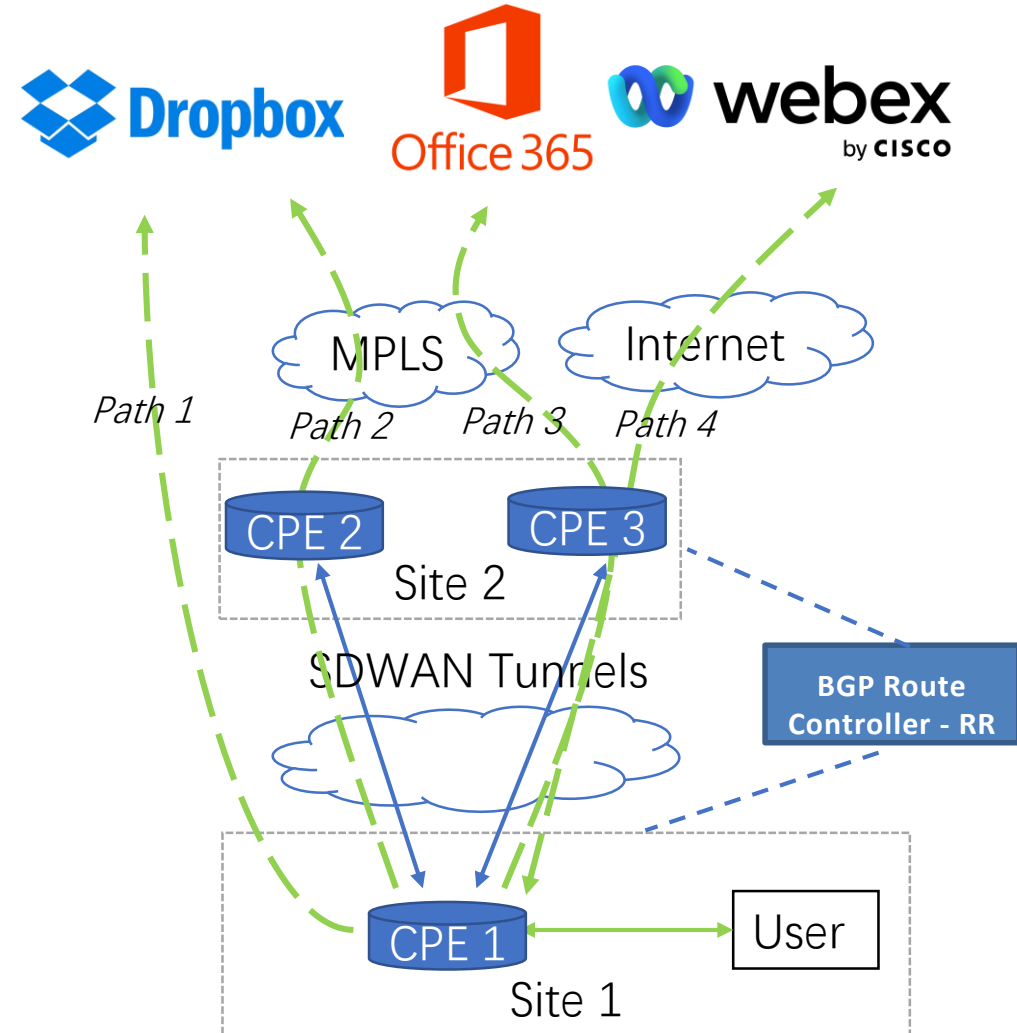
- SDWAN tunnel is used to connect the branch and headquarter of the enterprise: IPSec over L3VPN Path.
- Enterprise are using more and more SaaS applications such as Office 365/Dropbox
- SaaS app is usually deployed in cloud for better scalability.



[draft-ietf-idr-sdwan-edge-discovery-12](#)

Same SaaS App, accessible from multiple sites

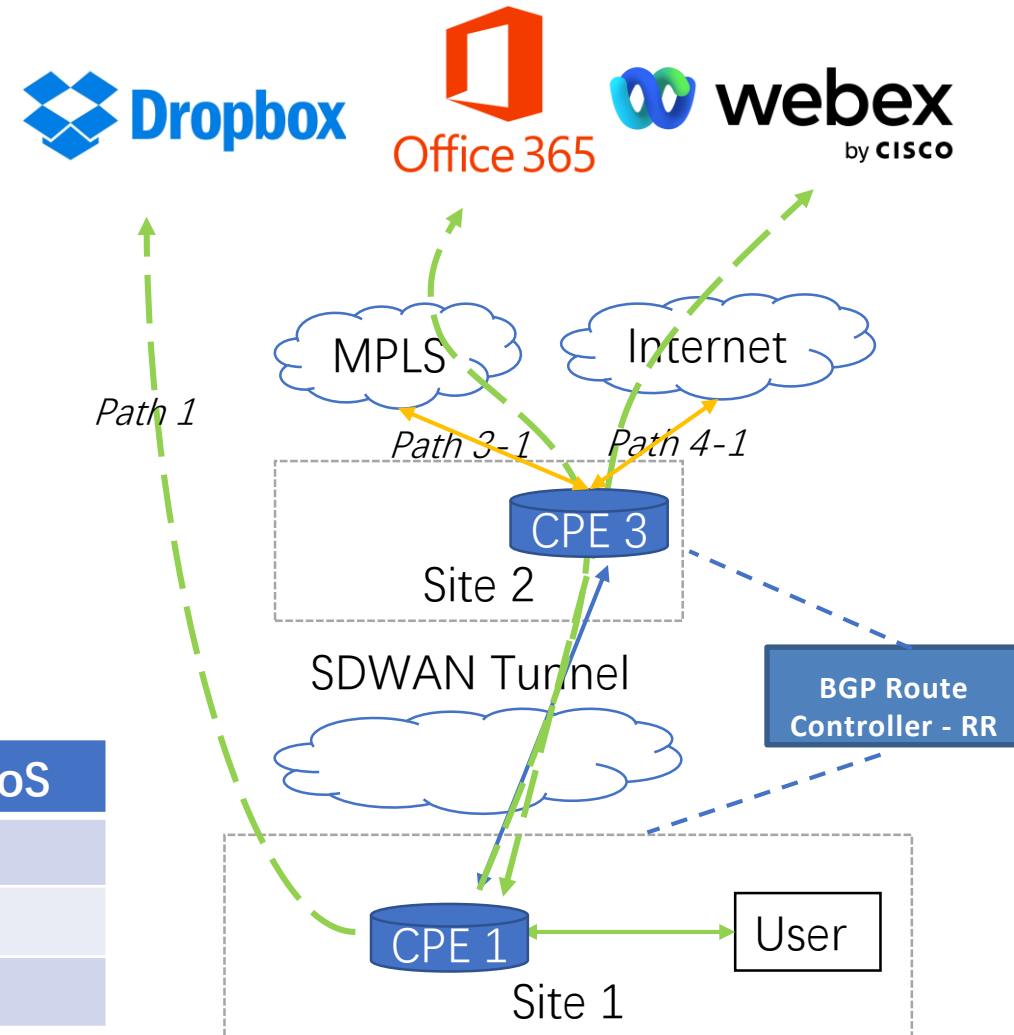
- SaaS app in the cloud can be accessed from multiple sites using different path
- For a user in site 1, multiple path can be used to access the same SaaS app
 1. Direct Internet Access to SaaS
 2. CPE1 – Tunnel – CPE2 – MPLS – SaaS
 3. CPE1 – Tunnel – CPE3 – MPLS – SaaS
 4. CPE1 – Tunnel – CPE3 – Internet – SaaS
- Problem: Which path is the best?



Proposal: Advertising Path Metric between SDWAN CPEs

- Each CPE measures the path performance metric to the SaaS app independently. E.g, CPE3 measures the RTT of access SaaS app through MPLS(path3-1) and internet (path 4-1), CPE 1 measure Path 1
- Advertise the result to other CPE through BGP
- Each CPE pick the path with highest quality, CPE 1 compare the path performance and pick the best one.

App	Path	Delay	Loss	Jitter	Bandwidth	F QoS
App 1	1	150	1	40	10	75
App 1	3-1	80	1	20	14	85
App 1	4-1	65	0	30	31	90



SaaS Path Performance Route (Key)

- Key: Identify a specific path to a specific SaaS application
- New type of BGP SDWAN NLRI:
 - Path
 - Site ID: Unique ID of SDWAN Site
 - Path Index type and value: indicate the path
 - Type 1: 4-byte Local index
 - Type 2: 3-byte MPLS Label
 - Type 3: 16-byte SRv6 SID
 - SD-WAN-Node-ID: Node's IPv4/v6 address
 - App
 - APP ID: SaaS Application ID. IP of a SaaS app may vary in different locations.
 - App Req: App requirement of path quality
 - 1: default
 - 2: Medium
 - 3: High

```
+-----+
| Route Type = 2 | 2 octets
+-----+
| Length        | 2 octets
+-----+
| Site ID       | 4 octets
+-----+
| APP ID        | 4 octets
+-----+
| APP Req       | 1 octet
+-----+
| Path Index Type | 1 octet
+-----+
| Path Index Value | 3 or 4 or 16 octets
+-----+
| SD-WAN-Node-ID | 4 or 16 octets
+-----+
```

SaaS Path Performance Metrics (Value)

- Metrics includes:
 - Delay, Loss, Jitter, Bandwidth
 - Path Status: 6 levels, Best/Good/Acceptable/Minor Issue/Bad Quality/Down
 - Path QoS: Aggregate value based on above metrics
 - SaaS App name
 - SaaS App domain name
- Two options of Encapsulation:
 - Metadata Path Attribute defined in [draft-ietf-idr-5g-edge-service-metadata-12](#)
 - Tunnel Encapsulation Attribute

Discussion about APP ID

- IP address and domain name can not identify an SaaS app uniquely because:
 - IP of an SaaS app varies based on locations
 - Domain name is reused by many different SaaS apps
- SaaS app name and domain name is still useful for ops and management though.
- Assigned by controller? Registry?

Feedback and comments are welcomed

- Thoughts on APP ID?
- What path metric is useful? Path metric combining function?
- Encapsulation: Metadata Path Attribute vs Tunnel Attribute
- Question and comments?