Open SD-WAN Exchange WG Update

Conrad Menezes, Bank of America
Snehal Patel, GAP
Steve Wood, Cisco
The ONUG SD-WAN WG Journey
Deliverables for OSE Spring/Summer Term

- Service Specs and API definitions for Path service
- Architecture Spec
- Show API operation across vendor controllers (Controller correctly programmed)
- Show multi-vendor agg into a DC with common policy (Need Gap's help for this)
Active Work Areas – Spring Term

• Specifications Track
  • Team: Steve Wood (Cisco), Conrad Menezes (BofA), Snehal Patel (Gap), Michael Wynston (First Data)
  • Document Frameworks/Templates
  • Completion of Path Service Policy definition
  • Definition of Gy interface - proposals
  • Interface information formats - proposals
  • Document functional block definitions
  • Document interface functional definitions
  • Service and Architecture Specifications
  • Requirements/Objectives

• Task Forces
  • API Architecture & Formats
    – Anusha V (Silverpeak), Mahesh N (Citrix)
  • Reachability
    – Toshal Dudhwala (Nuage), Dogu Narin (Versa)
  • Path Control Service Definition
    – Steve Woo (Velocloud)
API Format
Anusha Vaidyanathan, Silver Peak
Mahesh Narayanan, Citrix
Marco Murgia, Citrix
API Format Proposal

Scope
- Configuration & Management only

Requirements
- Architecture
  - RESTful, Data format, Transport
- Security & Authentication
- Error Handling
API Example to Provision Path Services

**Business Intention**
Provision a policy, via standardized APIs, for Business Critical Applications traversing SD-WAN islands

**Business Rule**
Between SD-WAN islands, create an overlay tunnel, that
- Matches on Traffic Class ‘Expedited Forwarding’
- Matches on Business Priority ‘Mission Critical’
- Selects ‘Load-Balance’ for Link-Selection
- Selects delivery Mode ‘Overlay’
- Monitors SLA for ‘Latency’ && ‘Packet Loss’

Identifying the Application of interest

Choosing the Application delivery mechanism

Monitoring SLAs for ensuring Application delivery
API Example to Provision Path Services

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>business_priority</td>
<td>Specify the business priority for the interesting traffic</td>
</tr>
<tr>
<td>traffic_class</td>
<td>Specify the traffic class for the interesting traffic</td>
</tr>
<tr>
<td>link_selection</td>
<td>Specify the link selection for the application delivery, load-balancing, primary, or secondary</td>
</tr>
<tr>
<td>mode</td>
<td>Specify the mode: load-balancing, primary, or secondary</td>
</tr>
<tr>
<td>performance_ia</td>
<td>Specify the performance indicator: delay, jitter, loss, packet losses, or range</td>
</tr>
</tbody>
</table>

**Responses**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>success</td>
<td>Success or Failure Codes</td>
</tr>
</tbody>
</table>

Example JSON Response:
```json
{{
  "name": "example",
  "description": "This is an example",
  "payload": {{
    "param1": "value1",
    "param2": "value2"
  }}
}}
```
Requirements (re-cap)

**Control-Plane**
- A proven control-plane protocol that is known to scale, converge and extend
- A protocol that is standards based and implemented by several vendors
- Exchanges reachability information on a per tenant granularity
- Supports multiple encapsulation options for the data path with ability to signal the encapsulation choice(s) and traffic separation labels.
- Supports multiple paths to the destination based on cost, policy criteria, service SLAs, network state
- Supports information exchange between controllers and/or network node elements.
- Provides reachability information exchange to first facilitate L2 or L3 connectivity between SD-WAN islands.
- Supports control plane HA scenarios
- A protocol that is easily expandable

**Data-Plane**
- Proven data-plane encapsulation options that are implemented by multiple vendors and deployed in large or demanding networks today
- Support multi-tenancy with clear traffic separation mechanism per tenant
- Supports L2 and L3 traffic encapsulation and segmentation
- Direct encapsulation on the wire, tunnel encapsulation and encrypted tunnel encapsulation options
Recommendation(s)

**Control-Plane**
- MP-BGP EVPN or L3 VPN with appropriate attributes being leveraged to provide added dimensions for route selection and segmentation.
- Alternatively, Use of separate instances of BGP to be configured on a per VRF basis.

**Data-Plane**
- VXLAN or GRE encapsulation between SD-WAN islands. For added security IKE based IPSec can be used.
- Alternatively, Use of VLAN tagging to separate traffic between tenants.
Polling Questions
Participate in Polling

No need to register or download anything.

• Send a text message to 22333 …in the body of the message, type onug17 to join this session, after which you will be able to answer the questions as they come up.

OR

• To vote via web use pollev.com/onug17 …wait for the questions and respond with a click.
SD-WAN Service Definitions & Interworking Areas

1. Architecture Framework
2. Services Definitions -
3. Authentication between domains
4. Security (Confidentiality/Crypto)
5. Reachability/Route Exchange
6. Segmentation
7. Service mapping at exchange points
   • Eg. ensure that flow receives same Path Policy treatment across SD-WANs end-to-end
   • Eg. Ensure that traffic is mapped to a network segment with same access intent
   • Standard metadata exchange for traffic classifier and service policy
8. Cloud Services Access (vPC, SaaS, IaaS)
9. Service Chaining
10. Application Names mapping to Standard Traffic Classifiers - DSCP, Application ID, Cloud Applications
Interworking Model - Phase 1 Use Cases

**Usecase #1 - Common Service Policy Expression**
**Usecase #2 - North/South Service Policy Orchestration for UC #1**
**Usecase #3 - East/West connection interworking**
OPEN SD-WAN EXCHANGE (OSE)