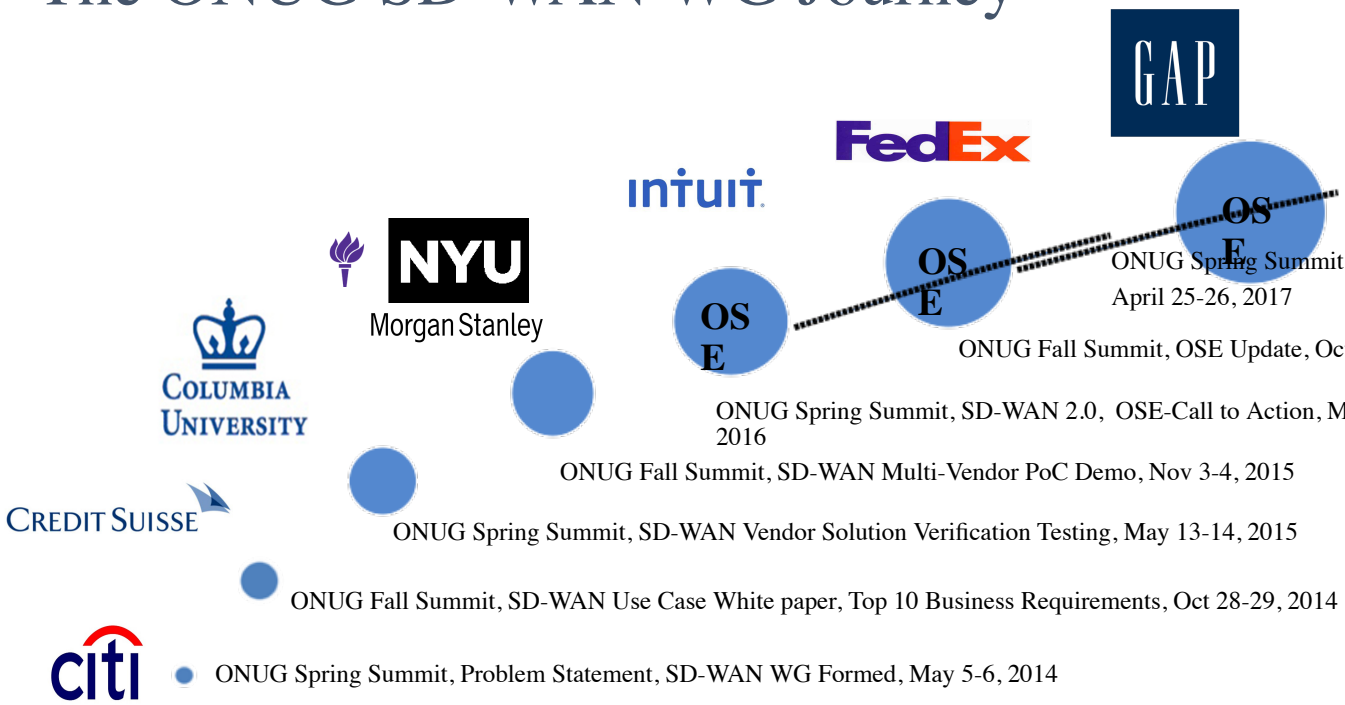
Open SD-WAN Exchange WG Update

Conrad Menezes, Bank of America
Snehal Patel, GAP
Steve Wood, Cisco

Open Networking USER GROUP
ONUG Spring 2017 HOSTED BY Gap Inc.

The ONUG SD-WAN WG Journey



ONUG Spring Summit, OSE Update, April 25-26, 2017

ONUG Fall Summit, OSE Update, Oct 24-25, 2016

ONUG Spring Summit, SD-WAN 2.0, OSE-Call to Action, May 10-11, 2016

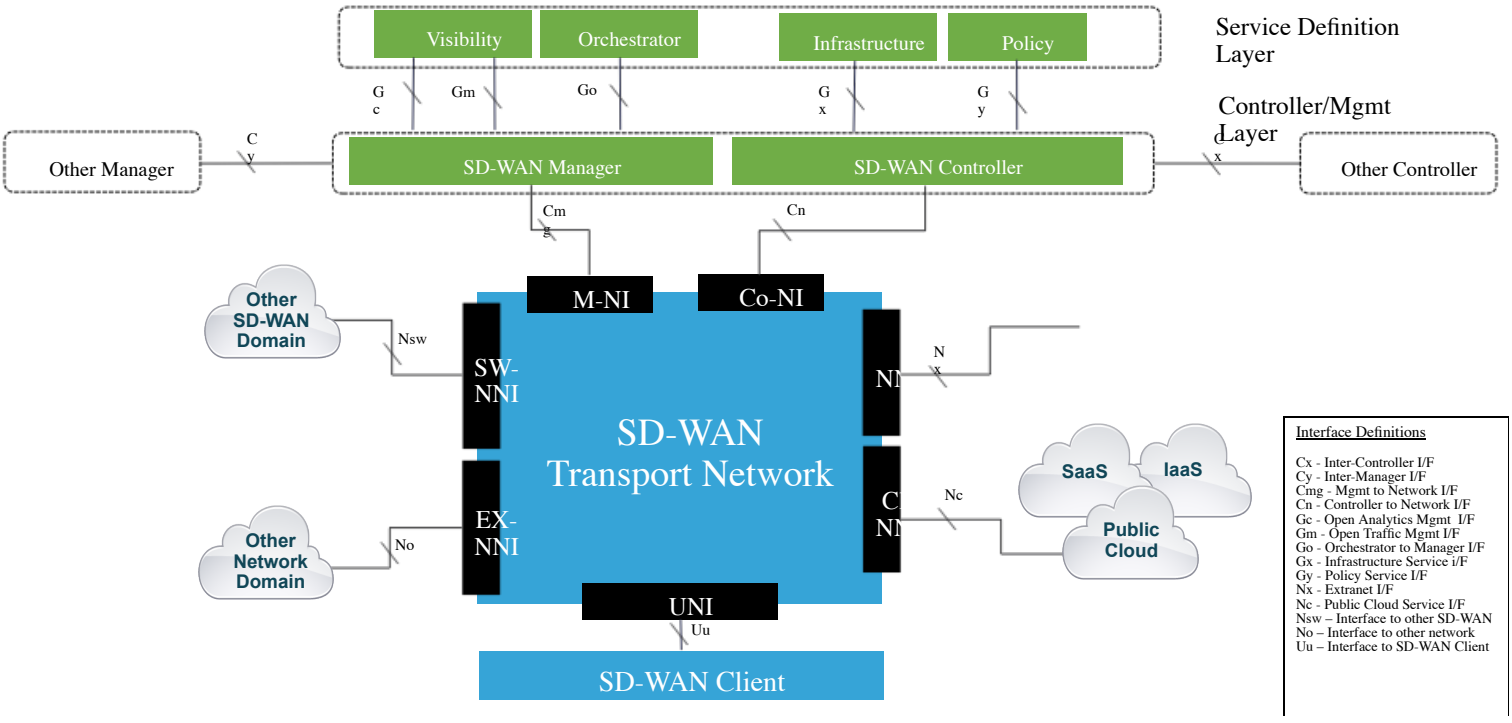
ONUG Fall Summit, SD-WAN Multi-Vendor PoC Demo, Nov 3-4, 2015

ONUG Spring Summit, SD-WAN Vendor Solution Verification Testing, May 13-14, 2015

ONUG Fall Summit, SD-WAN Use Case White paper, Top 10 Business Requirements, Oct 28-29, 2014

ONUG Spring Summit, Problem Statement, SD-WAN WG Formed, May 5-6, 2014

Architecture Framework



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

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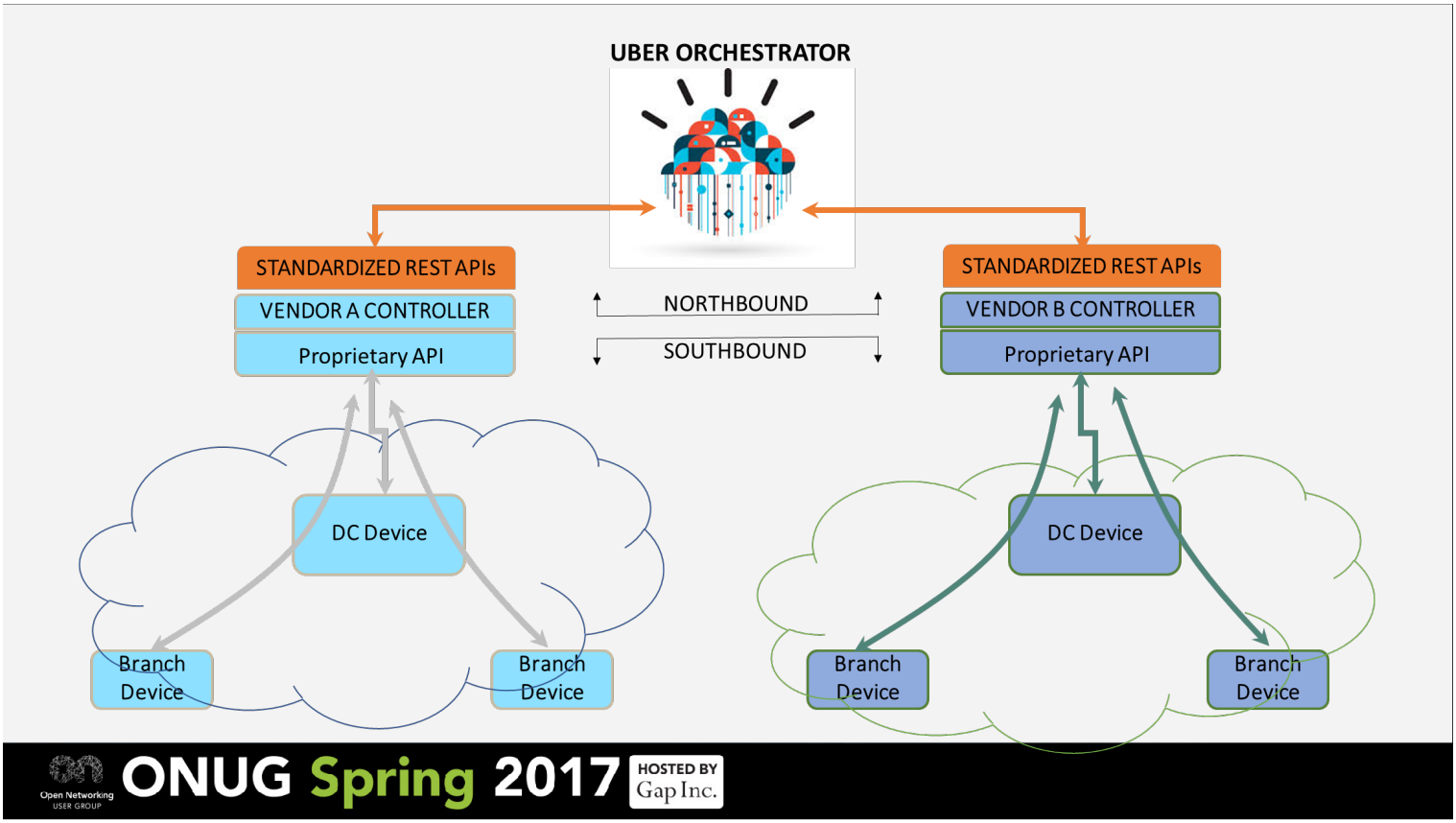

UBER ORCHESTRATOR
STANDARDIZED REST APIs
VENDOR A CONTROLLER
Proprietary API
NORTHBOUND
SOUTHBOUND
STANDARDIZED REST APIs
VENDOR B CONTROLLER
Proprietary API
DC Device
Branch Device
Branch Device
DC Device
Branch Device
Branch Device

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

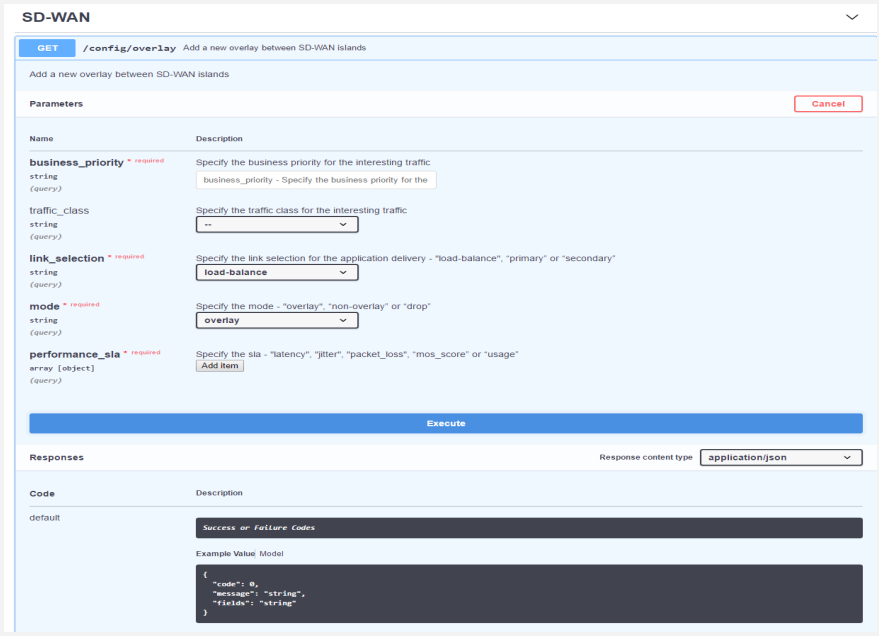
- Matches on Traffic Class 'Expedited Forwarding'
- Matches on Business Priority 'Mission Critical'
- &
- Selects 'Load-Balance' for Link-Selection
- Selects delivery Mode 'Overlay'
- &
- Monitors SLA for 'Latency' && 'Packet Loss'

Identifying the Application of interest

Choosing the Application delivery mechanism

Monitoring SLAs for ensuring Application delivery

API Example to Provision Path Services



Reachability & Segmentation Update

Toshal Dudhwala, Nuage Networks

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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

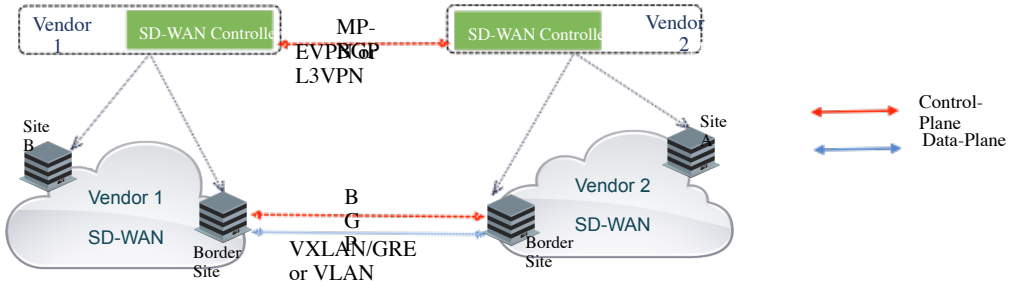
Recommendation(s)

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.

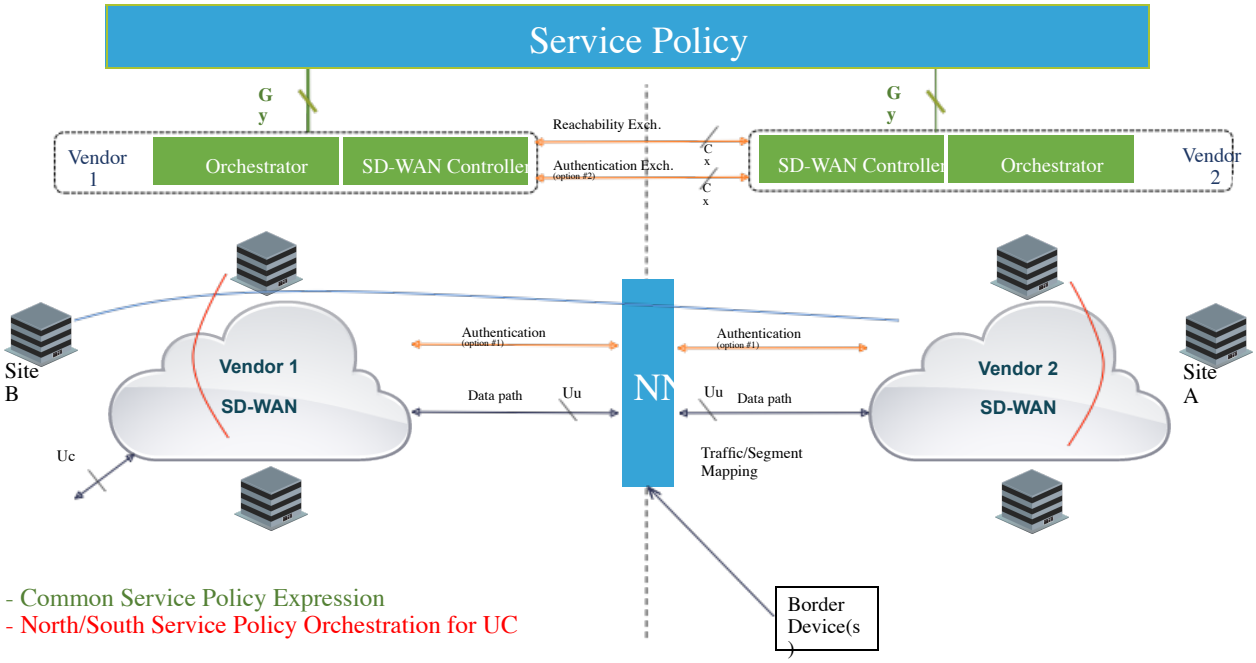
OR

- To vote via web use pollev.com/onug17 …wait for the questions and respond with a click.

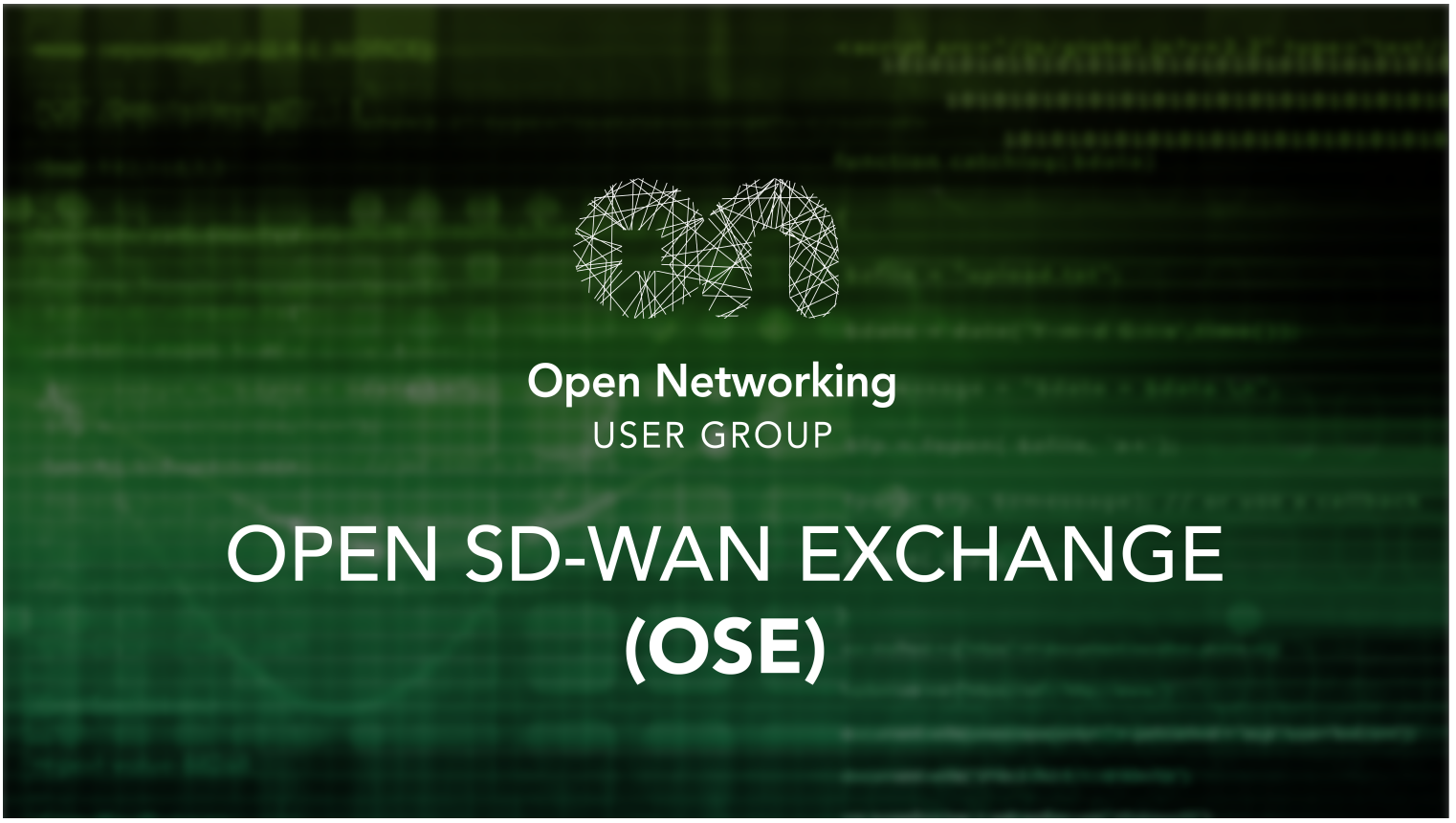
SD-WAN Service Definitions & Interworking Areas

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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(OSE)