Optimizing External Kubernetes Traffic with Cloud Native SD-WAN

The Bridge Between the DevOps and NetOps Worlds

Lori Jakab
FOSDEM '21
Agenda

- SD-WAN and Kubernetes
- Cloud Native SD-WAN
  - Architecture
  - Example
- Demo
Agenda

• SD-WAN and Kubernetes
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SD-WAN (Software Defined Wide Area Network)

Any Deployment
- Management & Analytics
- On-premise | Cloud | Multi-tenant
- Automation | Network Insights | Machine Learning | AI
- Open | Programmable | Scalable

Any Service
- Multicloud Optimization
- Multi-Layer Security
- Analytics
- Voice
- Multi-Domain IBN Policy

Any Transport
- Satellite
- Internet
- MPLS
- 5G/ LTE
- SDCI*

Any Location
- Branch
- Colocation
- Cloud
- Remote Work

* Software Defined Cloud Interconnect
Kubernetes
SD-WAN and Kubernetes Today: Ships in the Night
CNWAN: Making SD-WAN Kubernetes Aware
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CNWAN Architecture
CNWAN Architecture

Service
Kubernetes

YAML

SD-WAN Controller

Metadata as an Annotation

NetOps

DevOps
CNWAN Architecture

NetOps

SD-WAN Controller

Kubernetes

CNWAN Operator

Service

YAML

Metadata as an Annotation

DevOps
CNWAN Architecture

- Service
- Kubernetes
- YAML
- CNWAN Operator
- Service Registry
- Metadata as an Annotation

NetOps

SD-WAN Controller

Kubernetes

DevOps
CNWAN Architecture

- CNWAN Reader
- Service Registry
- CNWAN Operator
- Service with IP:Port and Metadata
- Metadata as an Annotation
- SD-WAN Controller
- Kubernetes
- YAML
- NetOps
- DevOps
CNWAN Architecture

- **CNWAN Reader**
- **CNWAN Adaptor**
- **Service Registry**
- **CNWAN Operator**
- **Kubernetes**
- **YAML**
- **SD-WAN Controller**
- **DevOps**
- **NetOps**

- **IP:Port with Metadata**
- **Metadata as an Annotation**
CNWAN Architecture

- IP:Port with Metadata
- Metadata to Policy Mapping
- Policy
- SD-WAN Controller
- CNWAN Reader
- CNWAN Adaptor
- Service Registry
- CNWAN Operator
- Service with IP:Port and Metadata
- Metadata as an Annotation
- NetOps
- DevOps
- Kubernetes
- YAML
CNWAN Architecture

- **Service Registry**
  - **Service with IP:Port and Metadata**
  - **CNWAN Operator**
    - **Metadata as an Annotation**
    - **YAML**
    - **Kubernetes**

- **CNWAN Reader**
  - **IP:Port with Metadata**
  - **Metadata to Policy Mapping**

- **CNWAN Adaptor**
  - **IP:Port for Policy**
  - **CNWAN Adaptation Layer**

- **SD-WAN Controller**
  - **NetOps**
  - **DevOps**

- **CNWAN Architecture**
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Video Conf App with CNWAN

SD-WAN Controller

CNWAN Adaptor

CNWAN Reader

Service Registry

CNWAN Operator

Voice
Video
Slides
Chat

Video Conf. App
Video Conf App with CNWAN

NetOps

User

SD-WAN Controller

CNWAN Adaptor
- Real Time
- Streaming
- File Transfer
- Best Effort

CNWAN Reader

DevOps

Service Registry

CNWAN Operator

Voice
Video
Slides
Chat

Video Conf. App
Video Conf App with CNWAN

SD-WAN Controller
- Latency
- Bandwidth
- Min. Drops
- ON

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Press

DevOps

Video Conf. App
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Demo Topology

- User Host
- SD-WAN Router
- Internet
- Branch
- Cloud
- Google Service Directory
- SD-WAN Router w/ video service
- Cisco vManage
- CNWAN Adaptor
- CNWAN Reader
- Impedance VM
- CNWAN Operator
- K8s cluster
- Public-internet
- Business-internet
Learn more:
github.com/CloudNativeSDWAN

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