ROLE OF NETWORK VIRTUALIZATION AND SOFTWARE DEFINED SECURITY IN MULTICLOUD

ANIKET DAPTARI & RANJINI RAJENDRAN

CONTRAIL TEAM

NXTWORK2017
JUNIPER CUSTOMER SUMMIT

LEGAL DISCLAIMER

This statement of direction sets forth Juniper Networks' current intention and is subject to change at any time without notice. No purchases are contingent upon Juniper Networks delivering any feature or functionality depicted in this presentation.

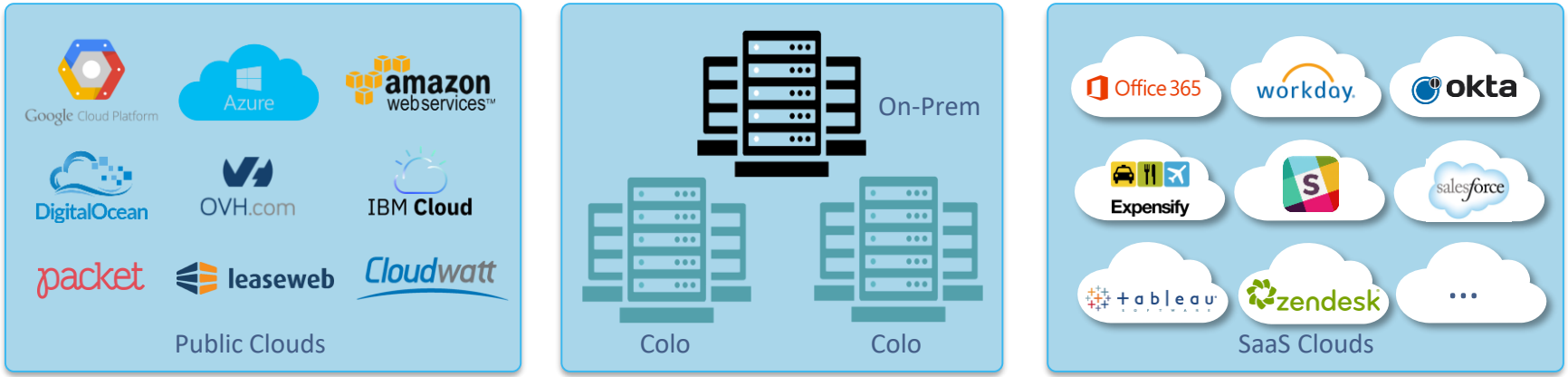
This presentation contains proprietary roadmap information and should not be discussed or shared without a signed non-disclosure agreement (NDA).

AGENDA

1. MULTICLOUD – WHAT, WHY & CHALLENGES
2. CONTRAIL – ENABLING MULTICLOUD
3. CONSISTENT MULTICLOUD SECURITY
4. CONSISTENT (SECURE) MULTICLOUD CONNECTIVITY

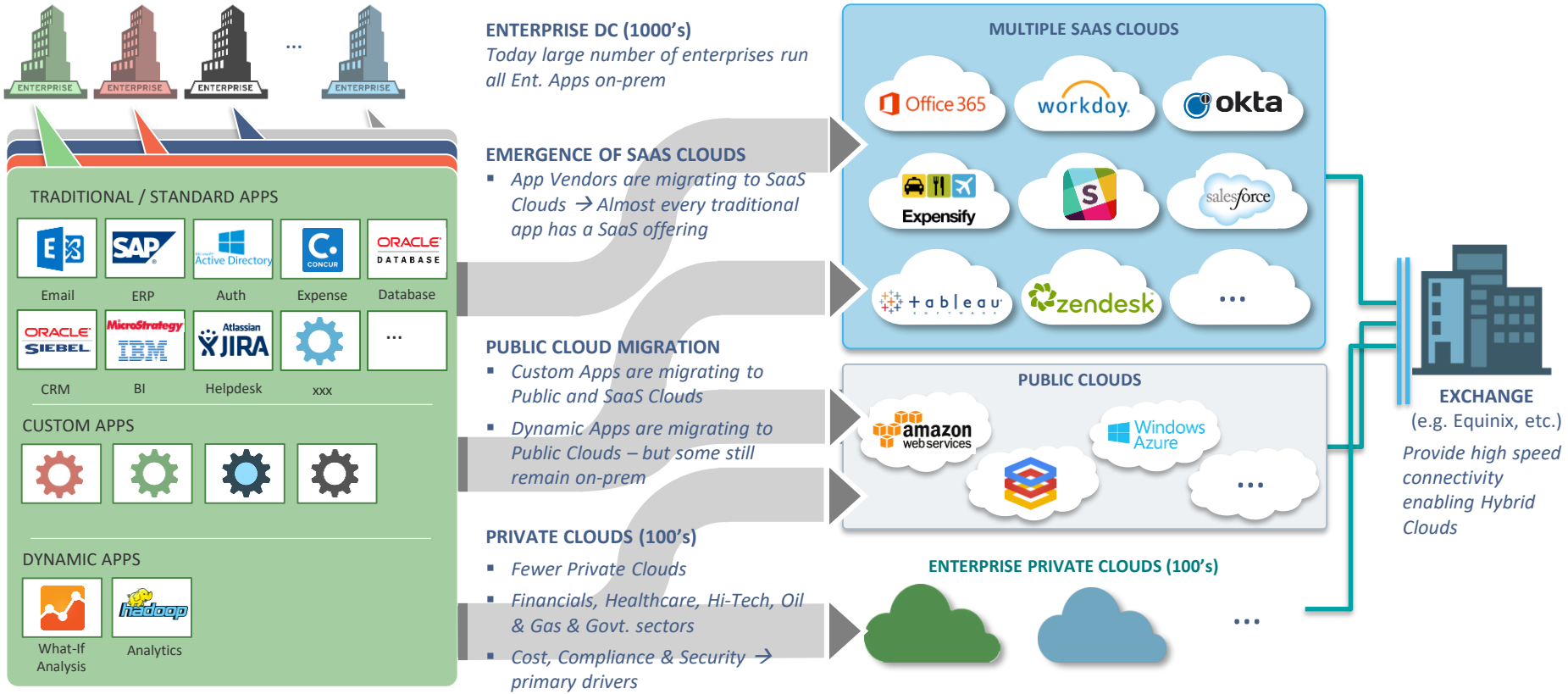

MULTICLOUD TRENDS AND
CHALLENGES

What is Multicloud?

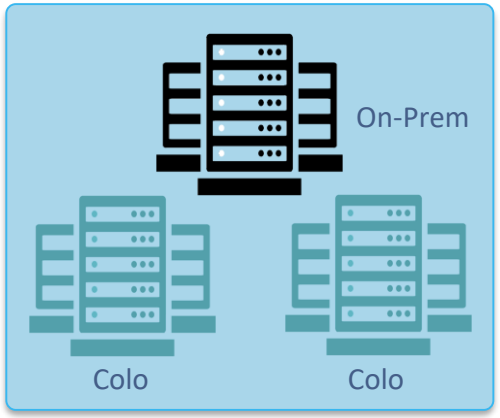


INFRASTRUCTURE/APPS IN ANY COMBINATION OF PUBLIC, PRIVATE (ON-PREM/COLO), or SaaS ENVIRONMENTS

How Enterprises are Leveraging Multicloud



Why Multicloud?



ECONOMICS, BUYER LEVERAGE, ARBITRAGE

DIFFERENT TEAMS, DIFFERENT CLOUDS

CLOUD BURSTING

PREVENTION OF VENDOR LOCK-IN

HIGH AVAILABILITY, RESILIENCY, DISASTER RECOVERY

Infrastructure Mistakes Your Company Must Not Make

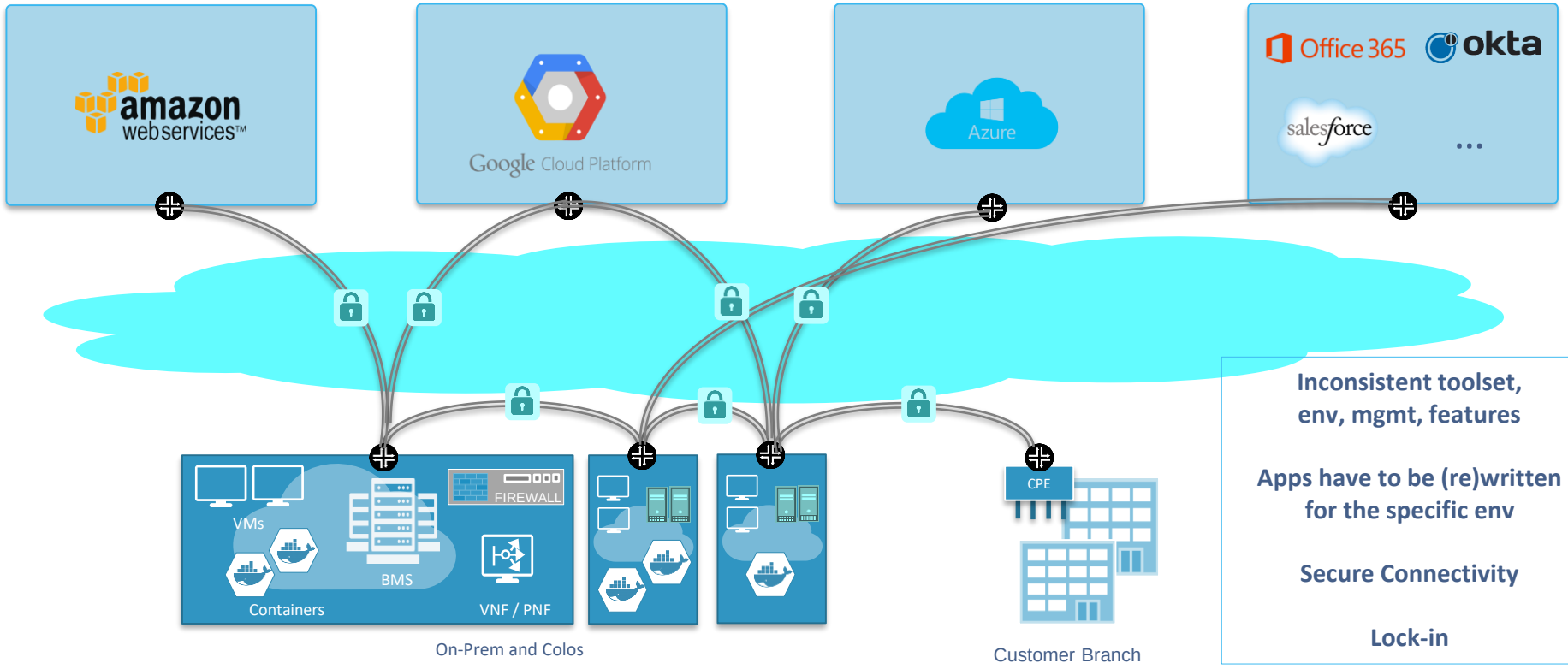
THEY LAND THEMSELVES IN CLOUD JAIL

THEY GET SUCKED IN BY “HIPSTER TOOLS”

THEY DON’T DESIGN FOR MONITORABILTIY

Source: http://firstround.com/review/the-three-infrastructure-mistakes-your-company-must-not-make/ - Avi Freedman

Challenges with Multicloud?



Inconsistent toolset, env, mgmt, features

Apps have to be (re)written for the specific env

Secure Connectivity

Lock-in


CONTRAIL
ENABLING MULTICLOUD

CONTRAIL: GOALS & OBJECTIVES

Users
(Developers, Net Ops, CISO, …)

VISION

Provide Connectivity, Security, and Manageability for:

1. Users ← to → Apps
2. Apps ← to → Apps

Apps
(running in any environments)

box workday. Custom Apps …

Manageability & Operations

Security Policy & Visualization

Connectivity

CPE
Remote Branch Office

IP Fabric
VMs
Containers
BMS
FIREWALL
Multi-site DC / Private Cloud (VMs, BMS, Containers, VNFs)

Telco POPs

Google Cloud Platform
amazon web services
Azure
Public Cloud (VPC's)

THE INTERNET of THINGS

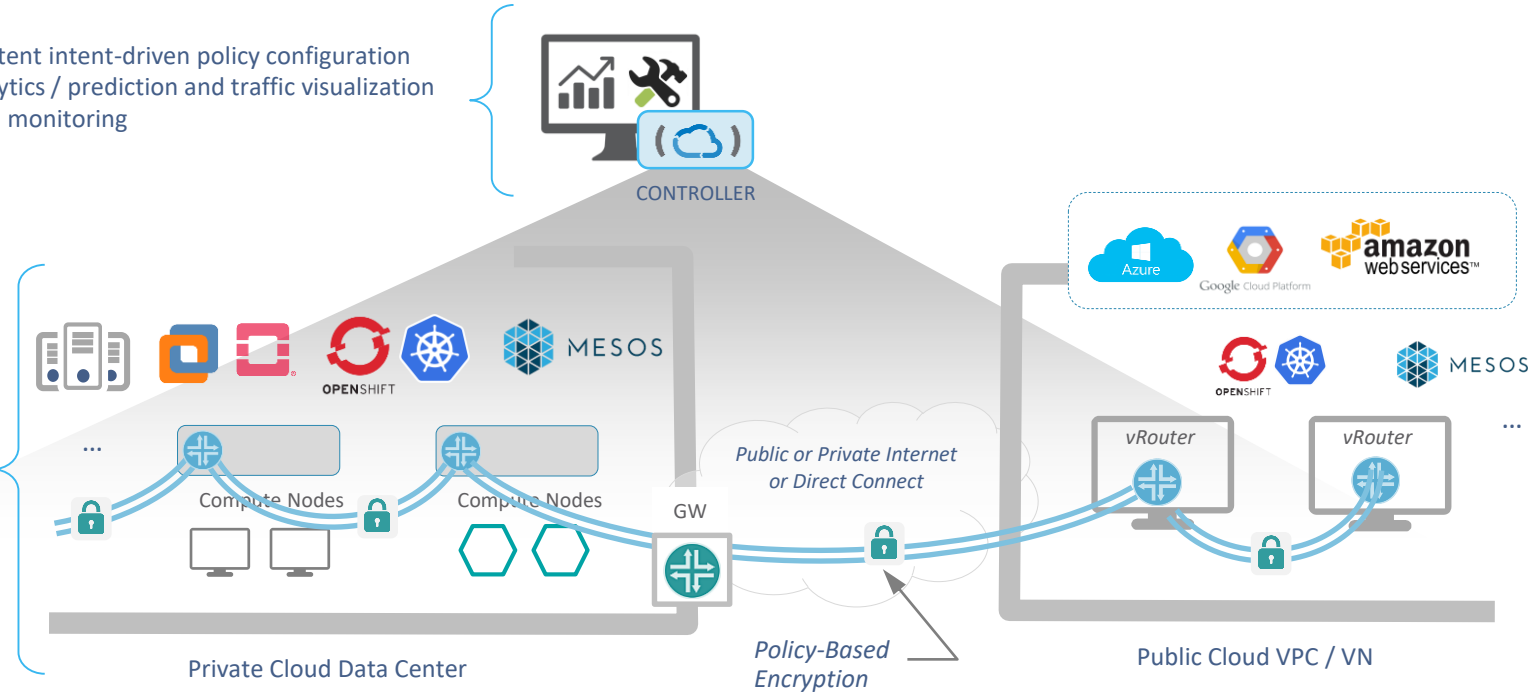
ENABLING MULTICLOUD CONNECTIVITY & SECURITY

Contrail connects multiple environments & provides a single resource pool, applies consistent policies across the different environments, and provides management and analytics on the entire environment.

Contrail Security → Consistent intent-driven policy configuration with detailed security analytics / prediction and traffic visualization along with compliance and monitoring

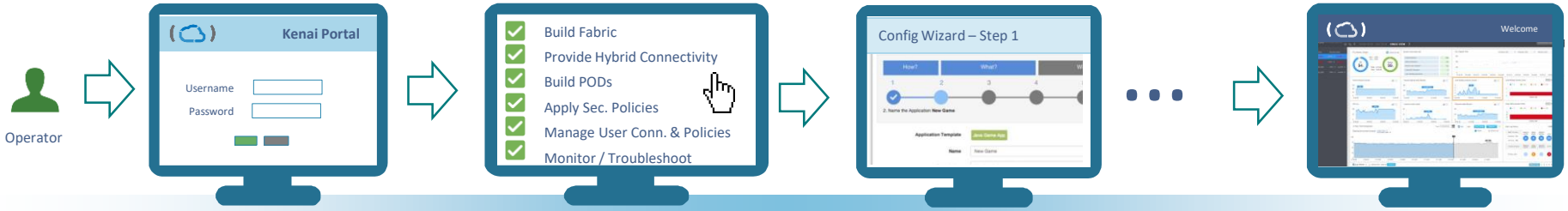
Contrail Security → Distributed enforcement of policies at L4 and L7

Contrail Networking → Interconnects multiple heterogeneous environments



Note: View this in presentation mode

OPERATOR WORKFLOW



JUNIPER SERVICES

Services can run in the Cloud or on-prem

Device Manager	*Server Manager*	*EMS*	*AWS Manager*	*Hybrid Connectivity*	*OpenStack POD*	*OpenShift POD*	*Policies*	*Users*	*VNFs*	*Analytics*	*...*

Any-2-Any Low-latency Connectivity between multiple environments over the Internet / Private Backbone / Direct Connect, etc.

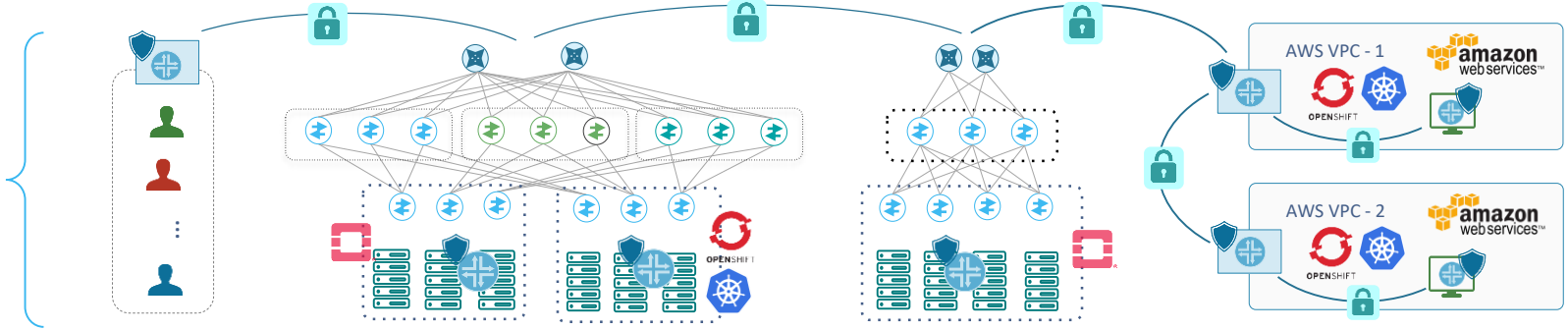
BOT
On customer Premise
Managed by customer

- or -

Managed
On customer Premise
Managed by Juniper

- and / or -

SaaS
On Juniper Cloud
Managed by Juniper



EVOLUTION OF CONTRAIL

INCREASING LEVELS OF INTEGRATION

Contrail Networking → **Contrail Cloud** → **Contrail Security**

Cloud Networking

- Network Virtualization
- Virtualized Network Services
- Multiple Orchestration Support
  - Openstack, VMware ESXi, vCenter, K8,Openshift

Cloud Orchestration

- Server Management
- Distributed & Scale-out Storage
- Compute Orchestration

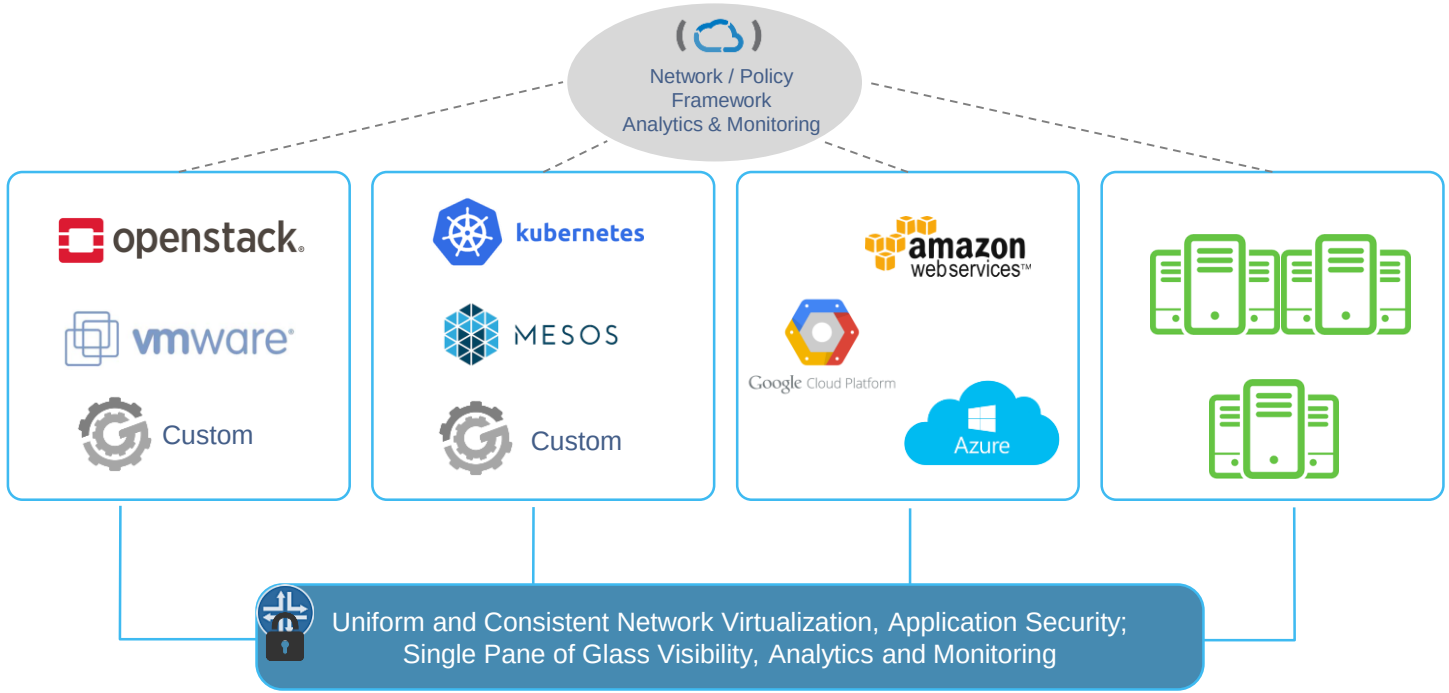
+ Contrail Networking

Contrail Security

- Multi Dimensional Intent-Driven Policy Framework across heterogeneous workloads
- standards based connectivity across hybrid clouds – AWS, GCE, Azure, etc
- Policy based secure routing, connectivity and data path encryption

KEY TAKEAWAY

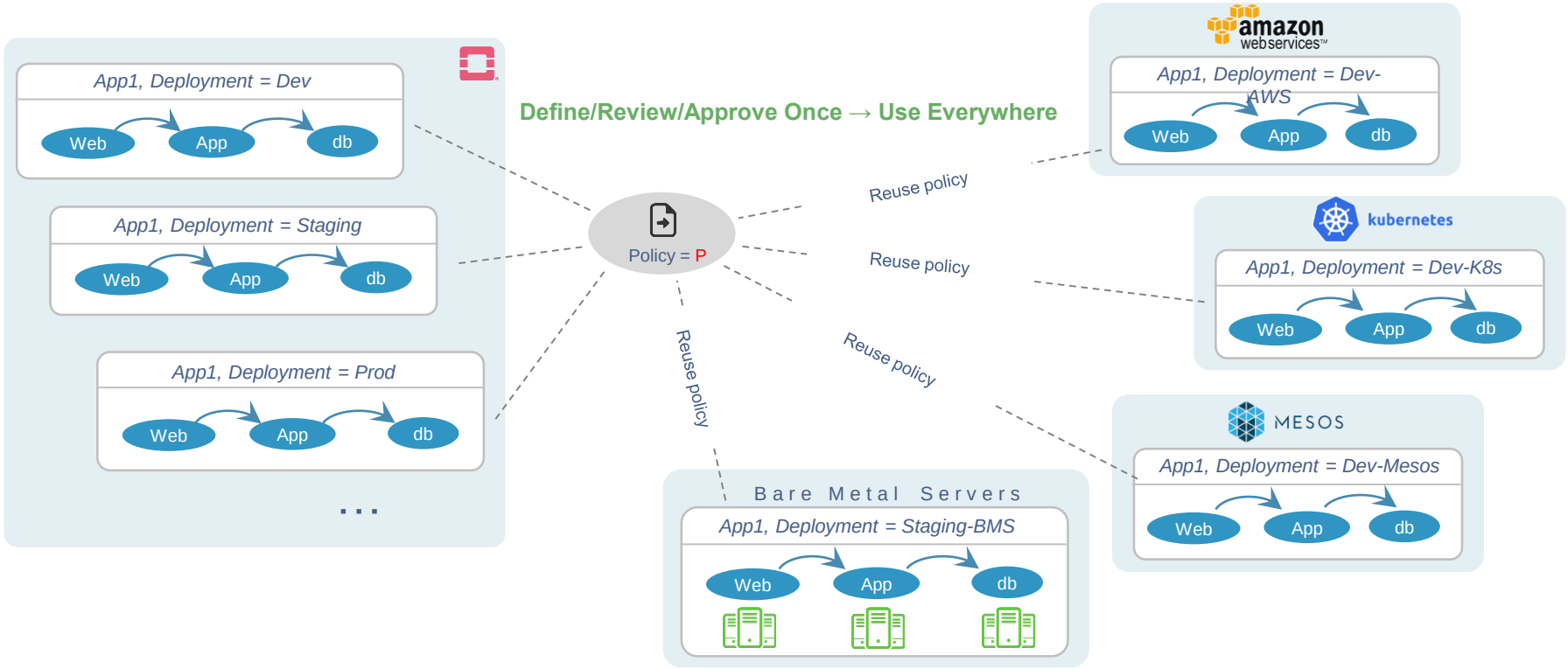
App Discovery, Tag based Policy & Visualization across heterogeneous and distributed environments (ESXi & KVM VMs, K8s / containers, bare-metal servers, Public Cloud, etc.)




CONSISTENT MULTICLOUD SECURITY

PROBLEM STATEMENT

Reuse of policies across multiple clouds and with multiple orchestrators

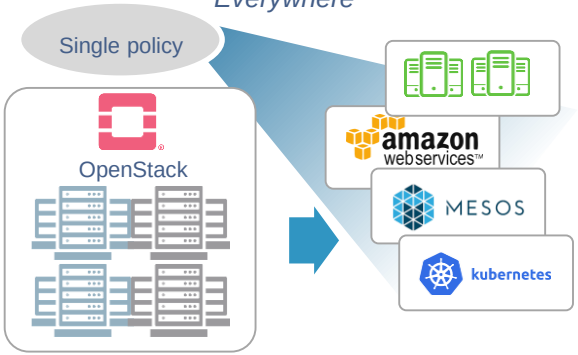


CONTRAIL SECURITY KEY CAPABILITIES

Consistent Intent-Driven Policy

Security Admin

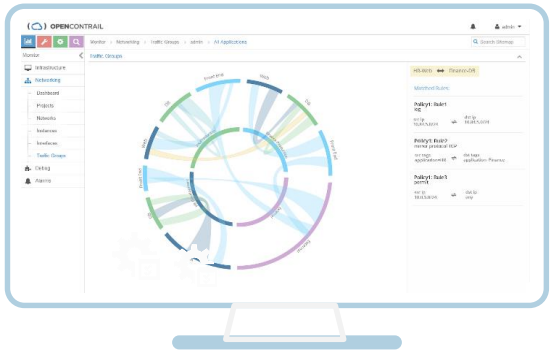
No Policy Rewrite …
Define Once → Enforce Everywhere



- *How to extend the same set of policies to Mesos, AWS, Kubernetes, Bare Metal Servers → without policy rule explosion*

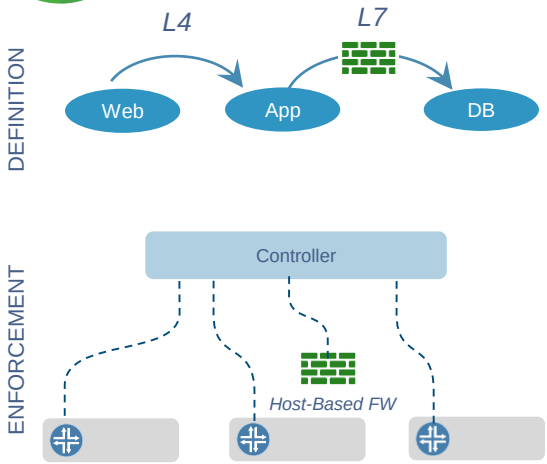
Application Policy Config & Flow Visualization

Discover Inter- and Intra-application traffic flows with/without enforcing policies



- *Offer visualization, analytics, and orchestration for security configurations*
- *Provide reporting, troubleshooting and compliance*

Multiple Enforcement Points



- *L4 Enforcement at the vRouter (Kernel, DPDK, vCenter, Smart NIC)*
- *L7 enforcement at the L7 Firewall*

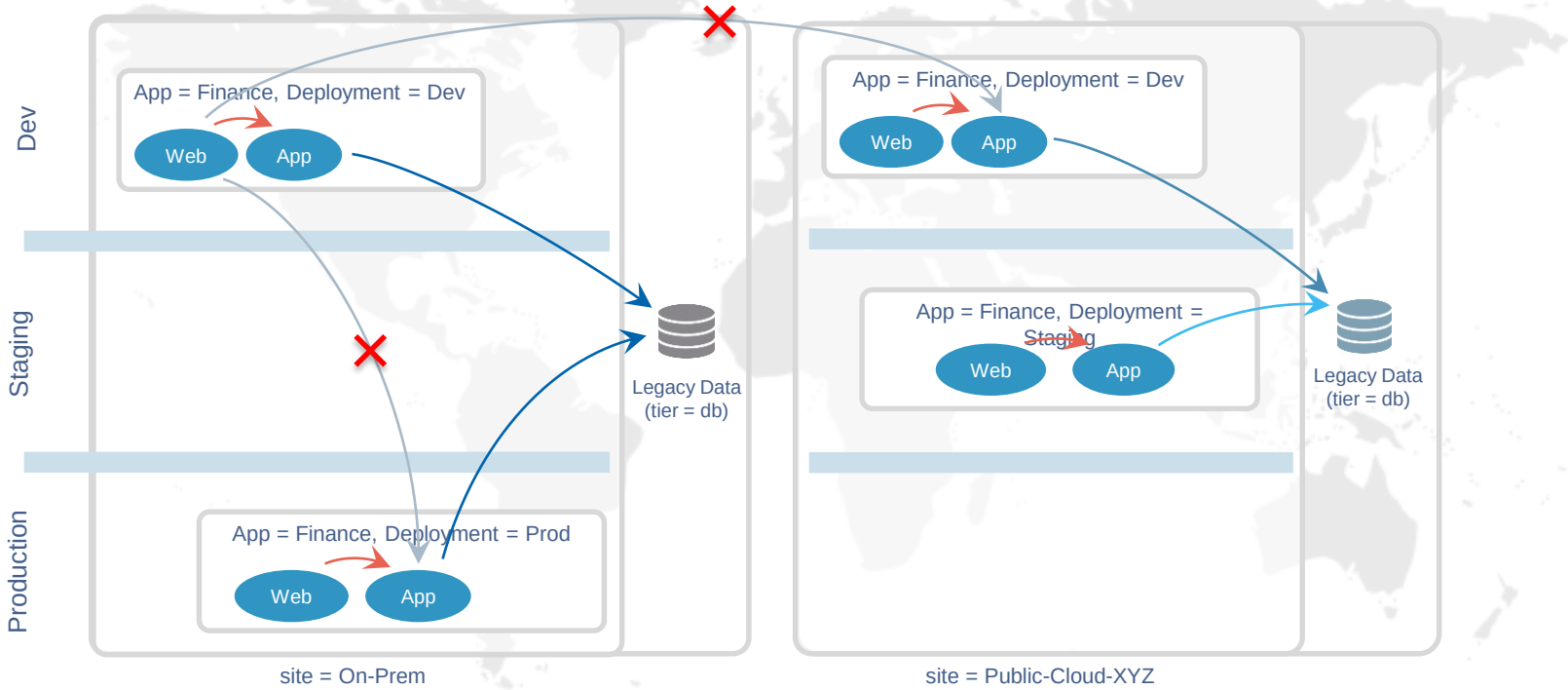
USE-CASE SCENARIO – POLICY FRAMEWORK

Defn

Enforcement

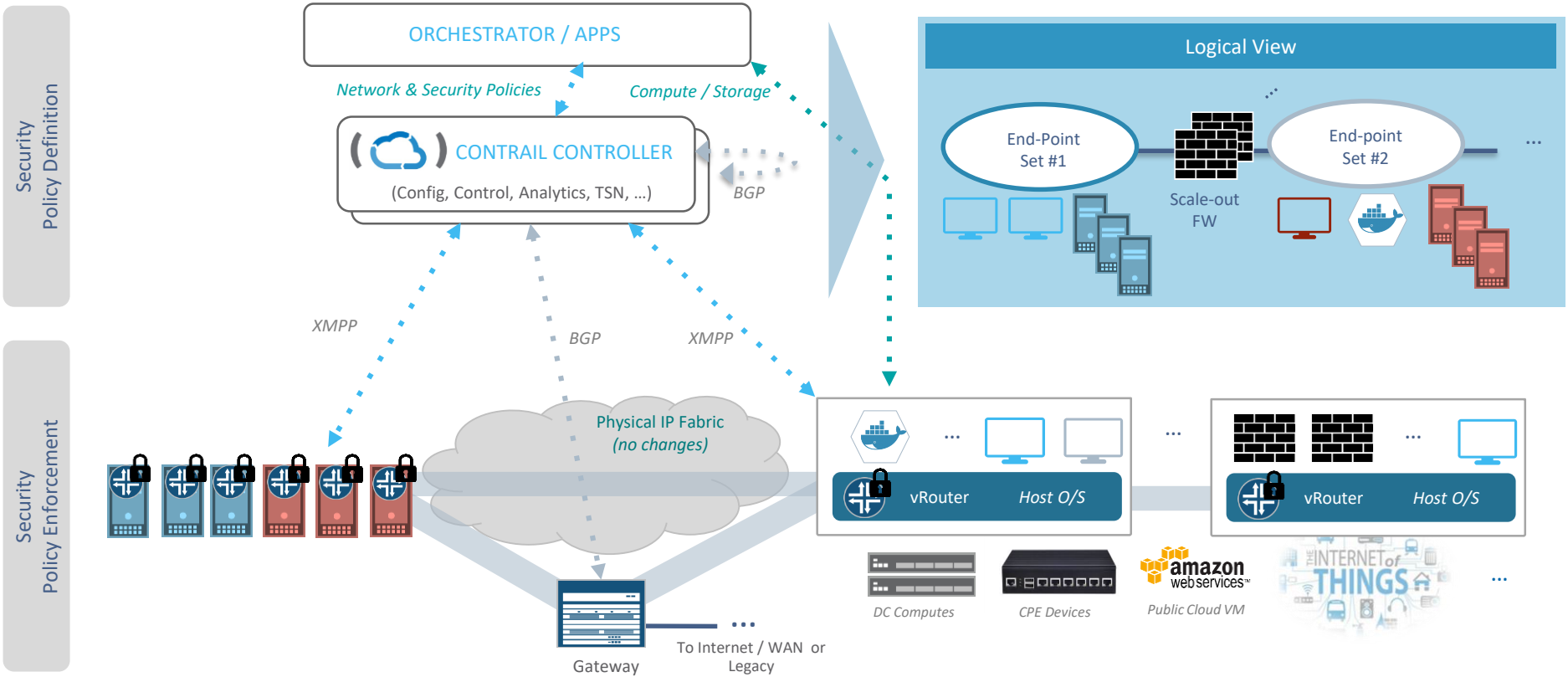
1 allow https-traffic tier=web > tier=app match deployment && site

2 allow mysql-traffic tier=app > tier=db match site



CONTRAIL SECURITY ARCHITECTURE

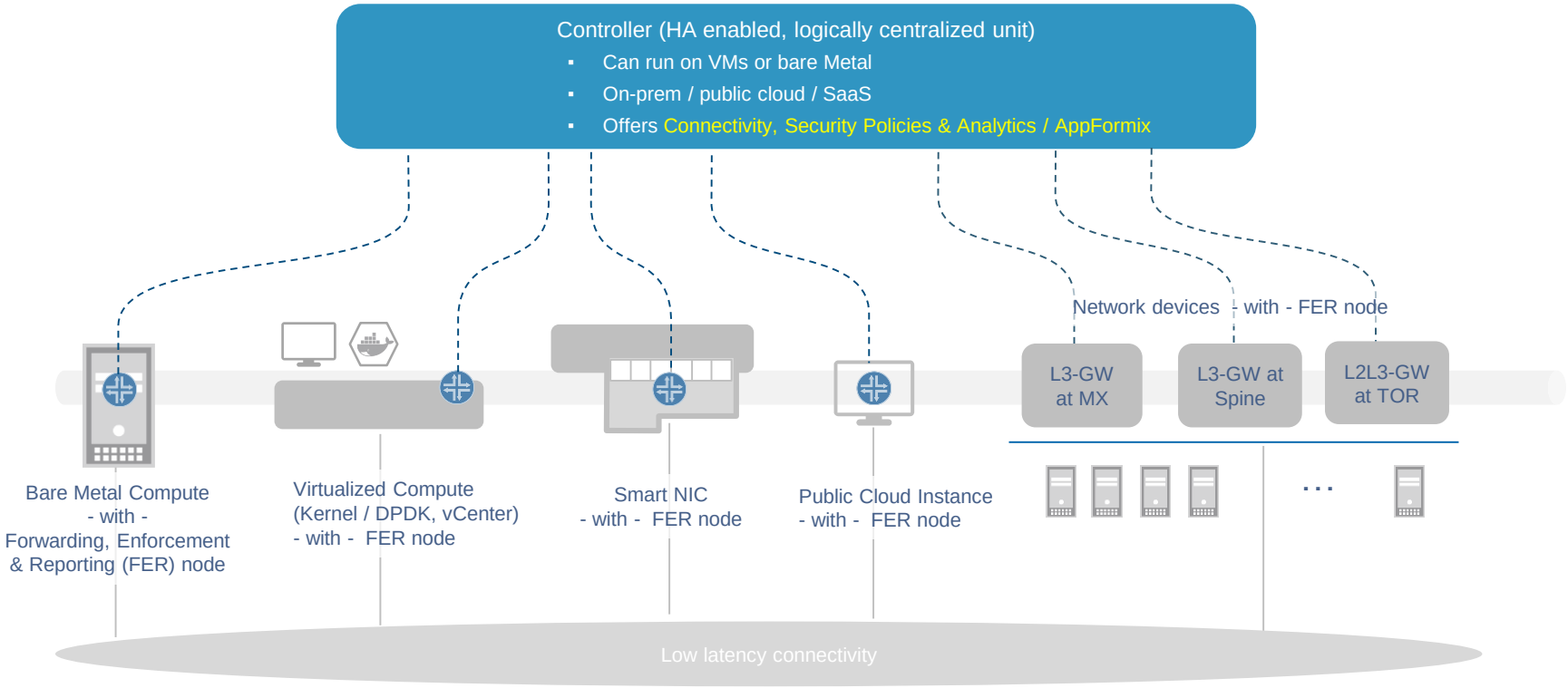
CONSISTENT INTENT-DRIVEN POLICY WITH DISTRIBUTED ENFORCEMENT



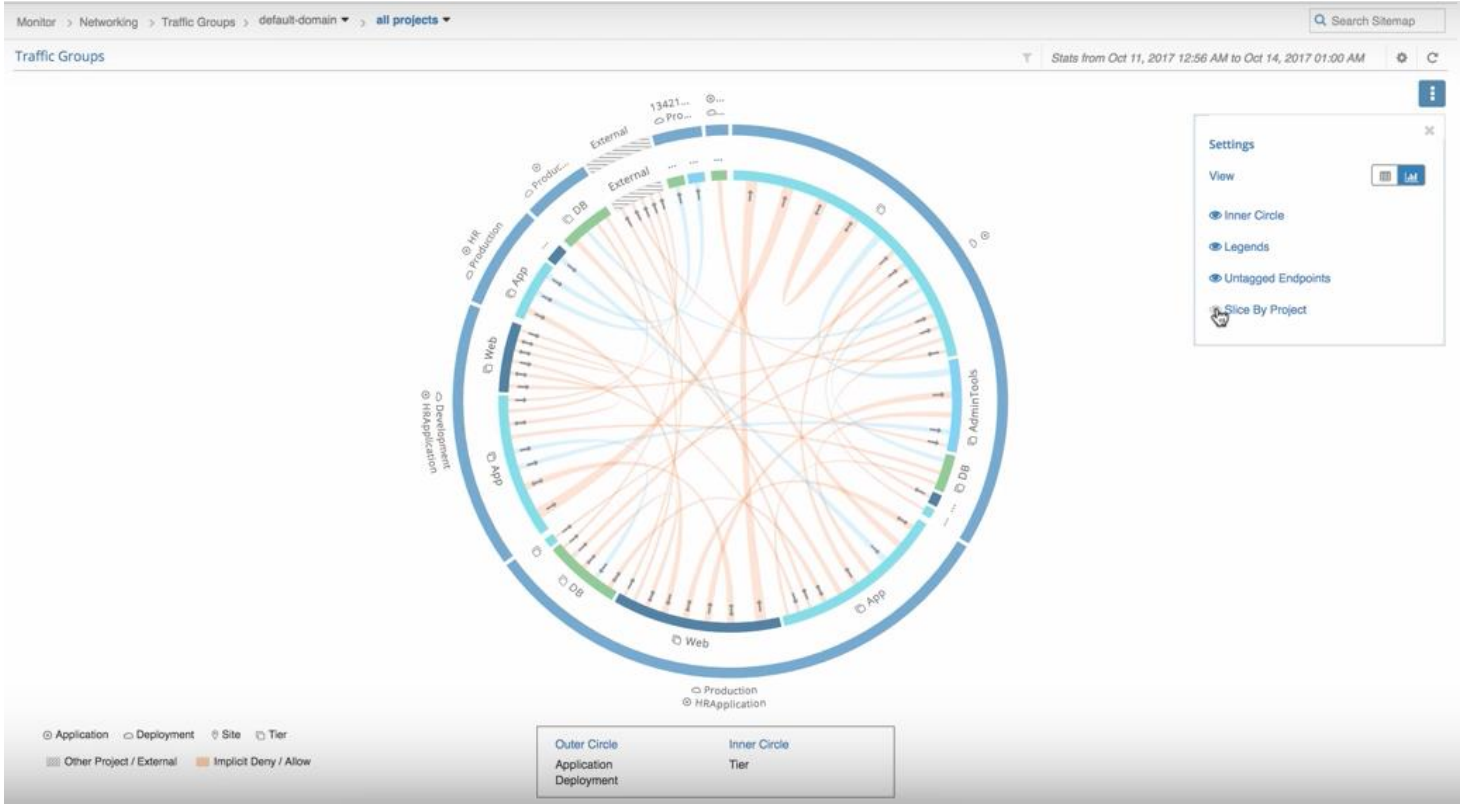
MULTIPLE ENFORCEMENT POINTS

Definition

Enforcement

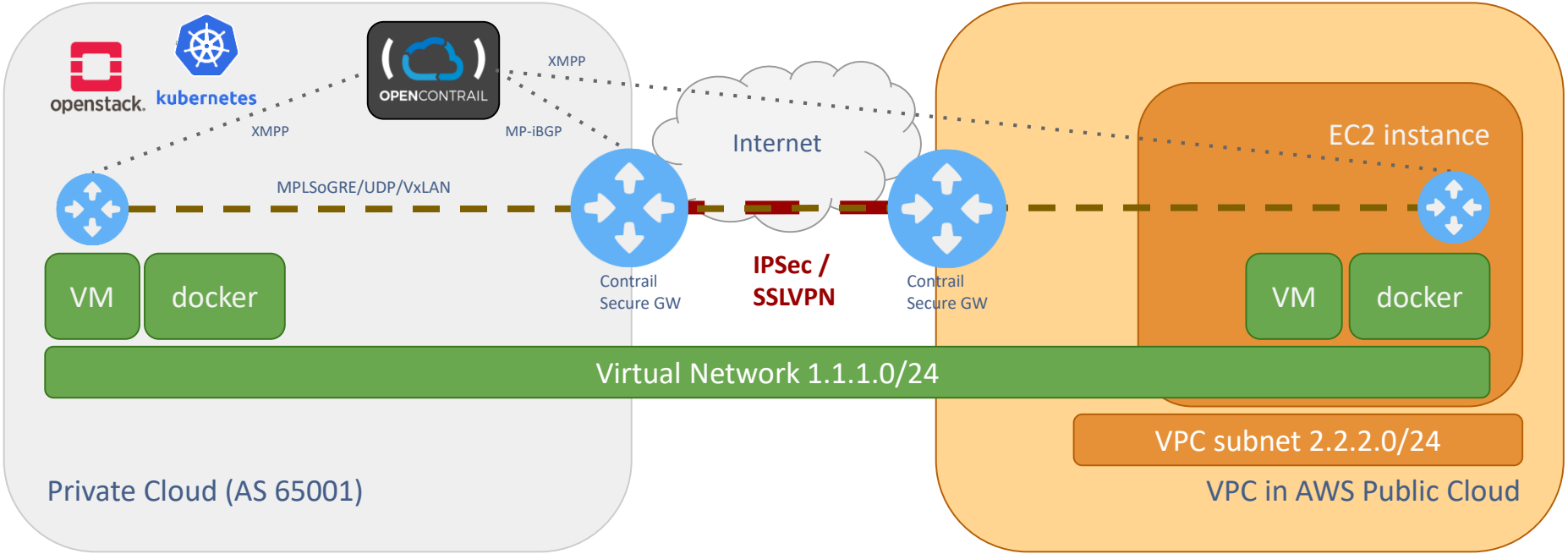


VISUALIZATION

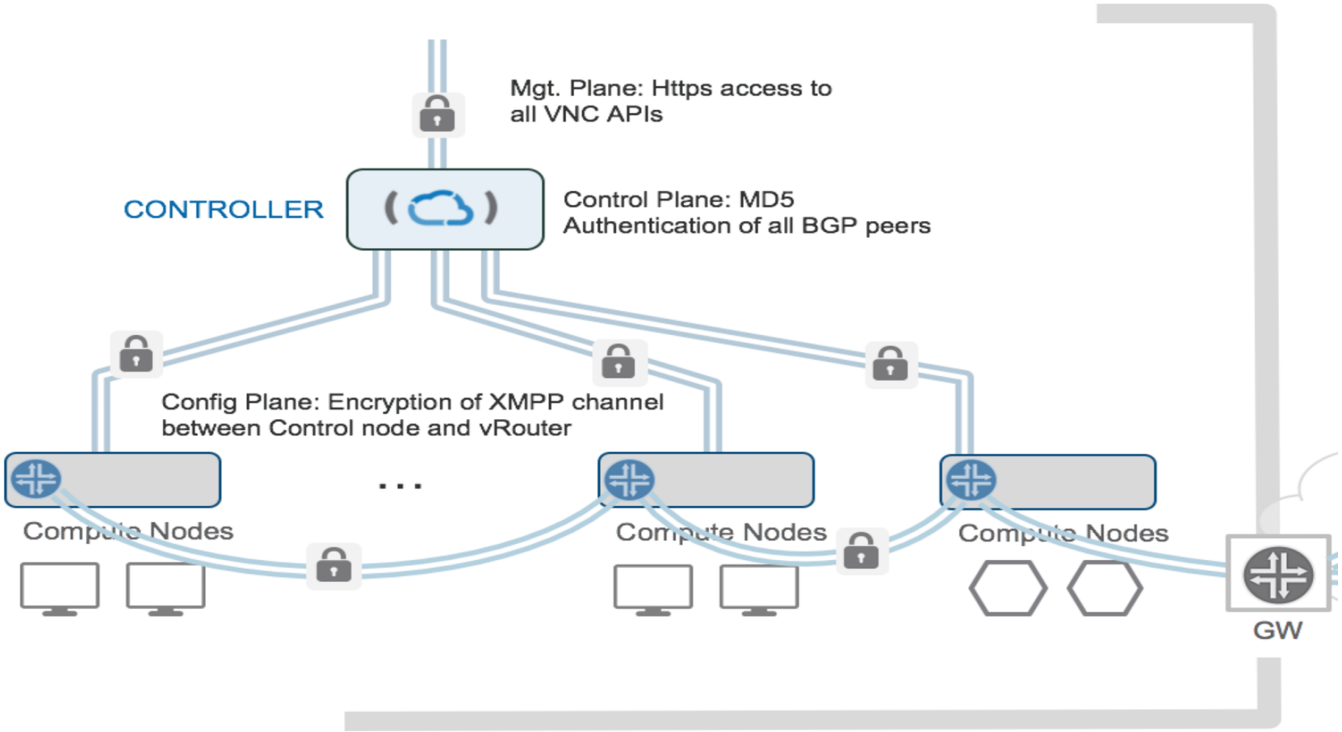



CONSISTENT (SECURE)
MULTICLOUD CONNECTIVITY

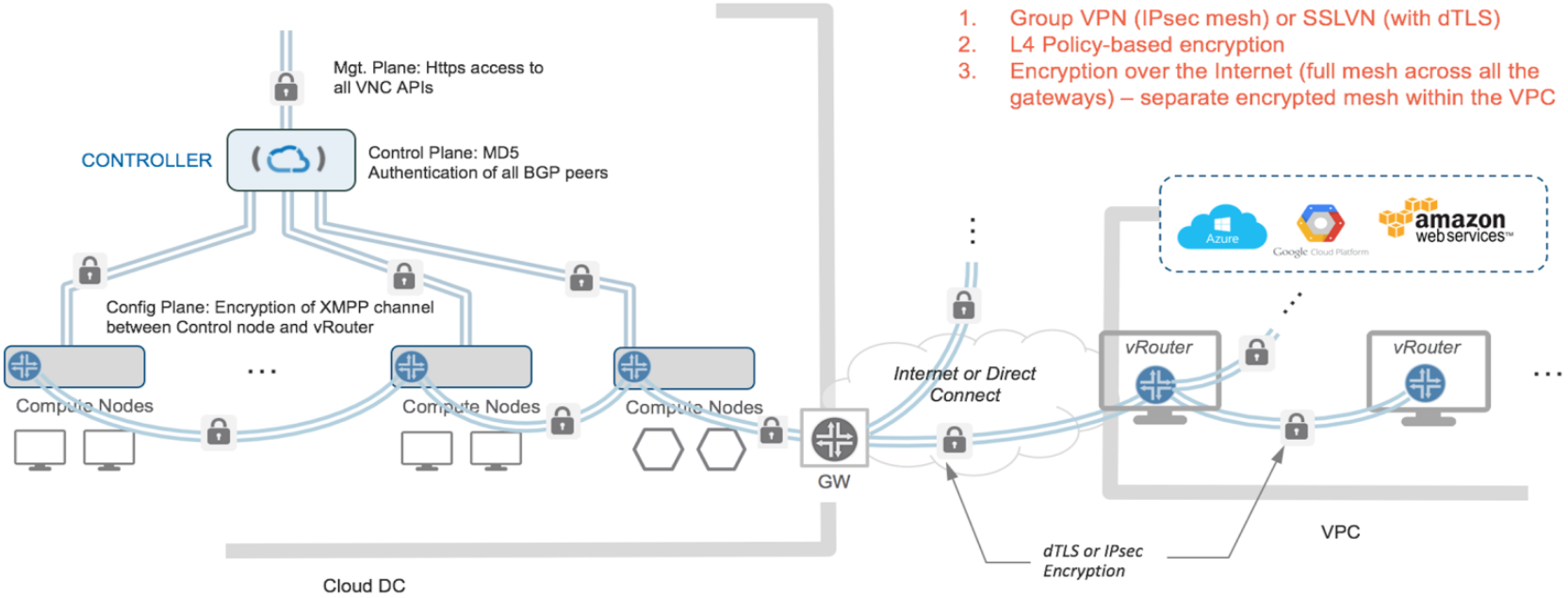
CONSISTENT MULTICLOUD NETWORKING



INTRA CLUSTER / CLOUD SECURITY

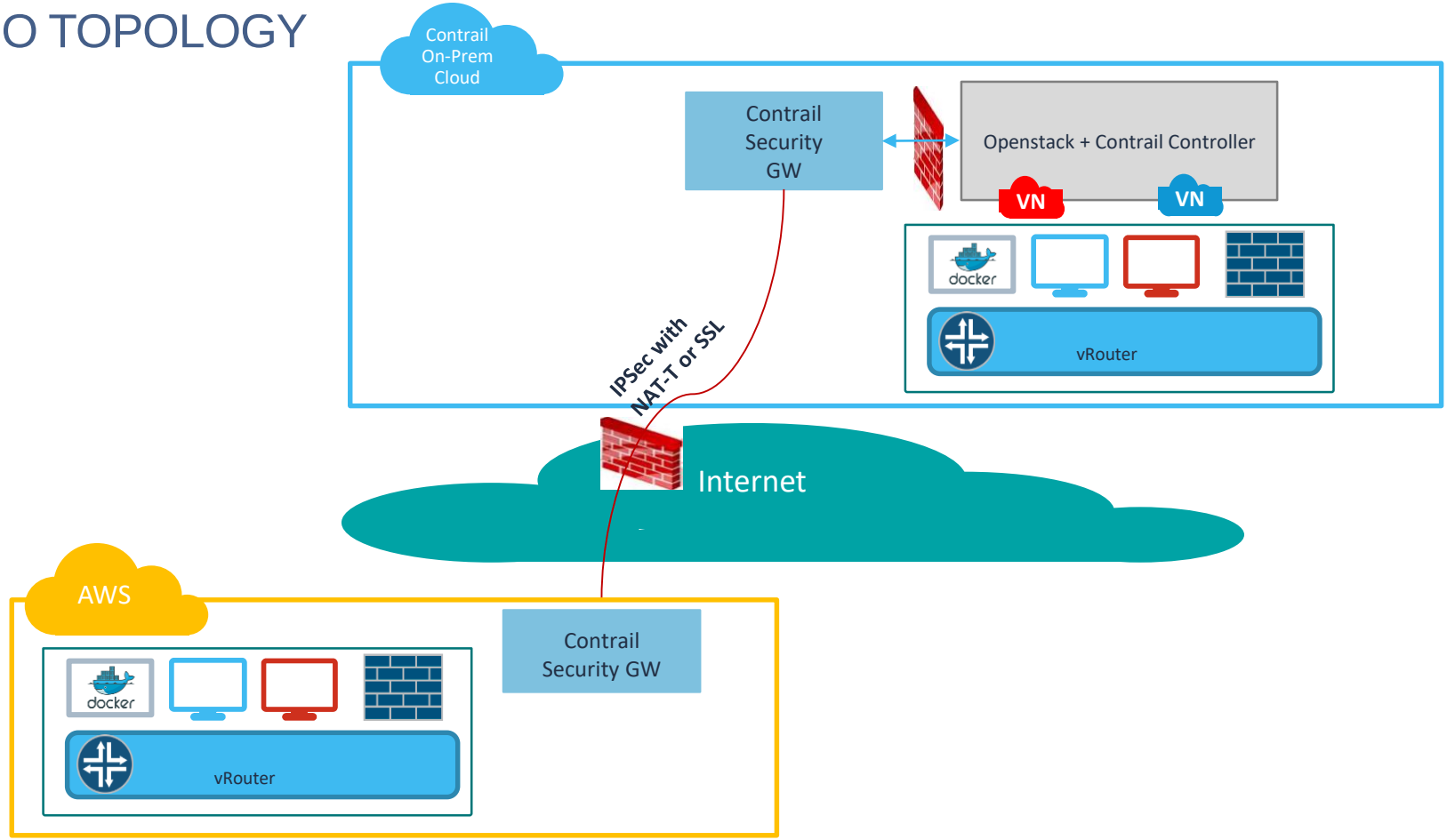


MULTICLOUD SECURITY




DEMO

DEMO TOPOLOGY



Thank you