



*TOMORROW
starts here.*

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Integration of Hypervisors and L4-7 Services into an ACI Fabric

BRKACI-2006

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#clmel

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“ This session provides a technical introduction to how the ACI fabric handles single and multi-hypervisor environments, how the ACI controller provides integration into different VMMs for a single point of management for virtual network management as well as how the fabric integrates and automates both virtual and physical L4-L7 services...”

BRKACI-2006 ABSTRACT

Agenda

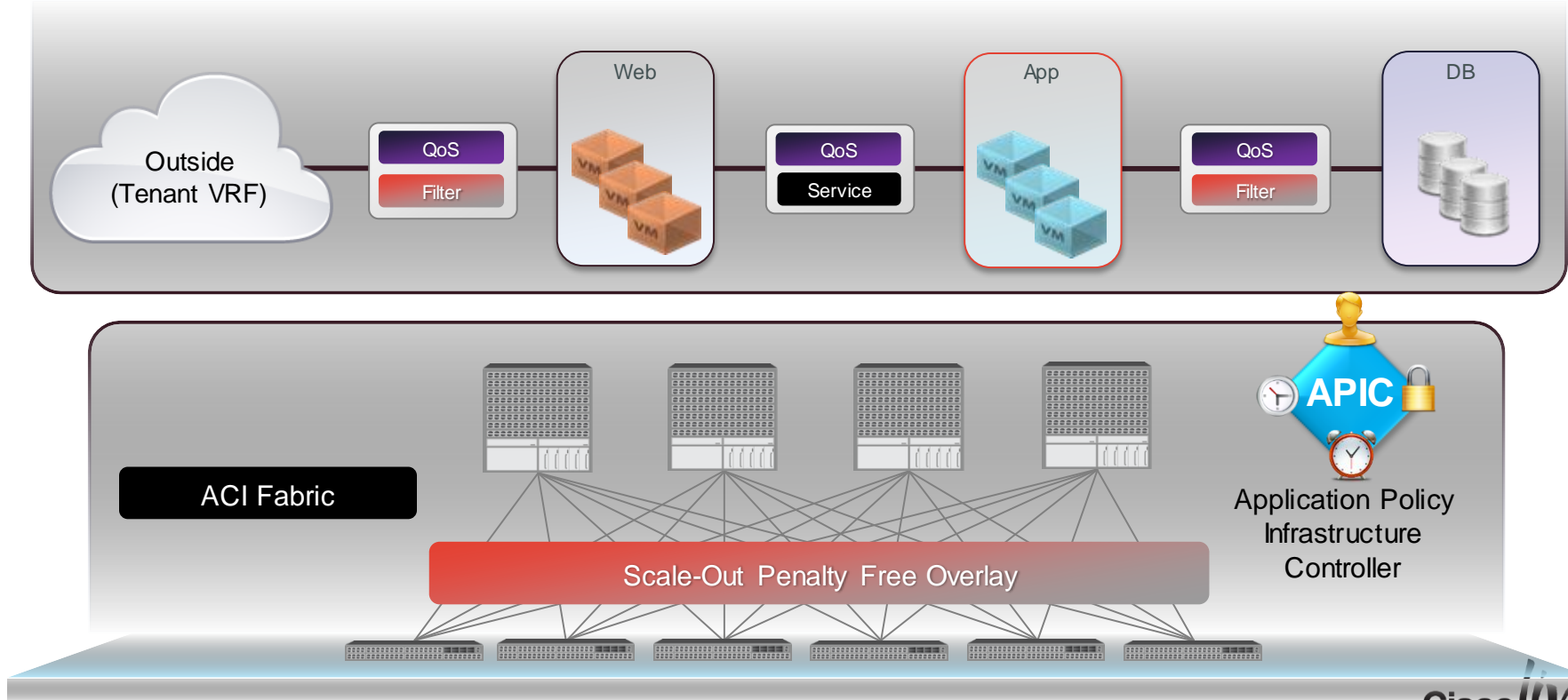
- Introduction to ACI
- Review of ACI Policy Model
- Hypervisor Integration
- Layer 4-7 Services Integration
- Conclusion

A long-exposure photograph of a city street at night. The foreground is filled with vibrant, multi-colored light trails from moving vehicles, creating a sense of motion. In the background, a pedestrian bridge spans the street, and modern buildings with illuminated windows and signage line the skyline. The overall scene is a dynamic urban landscape.

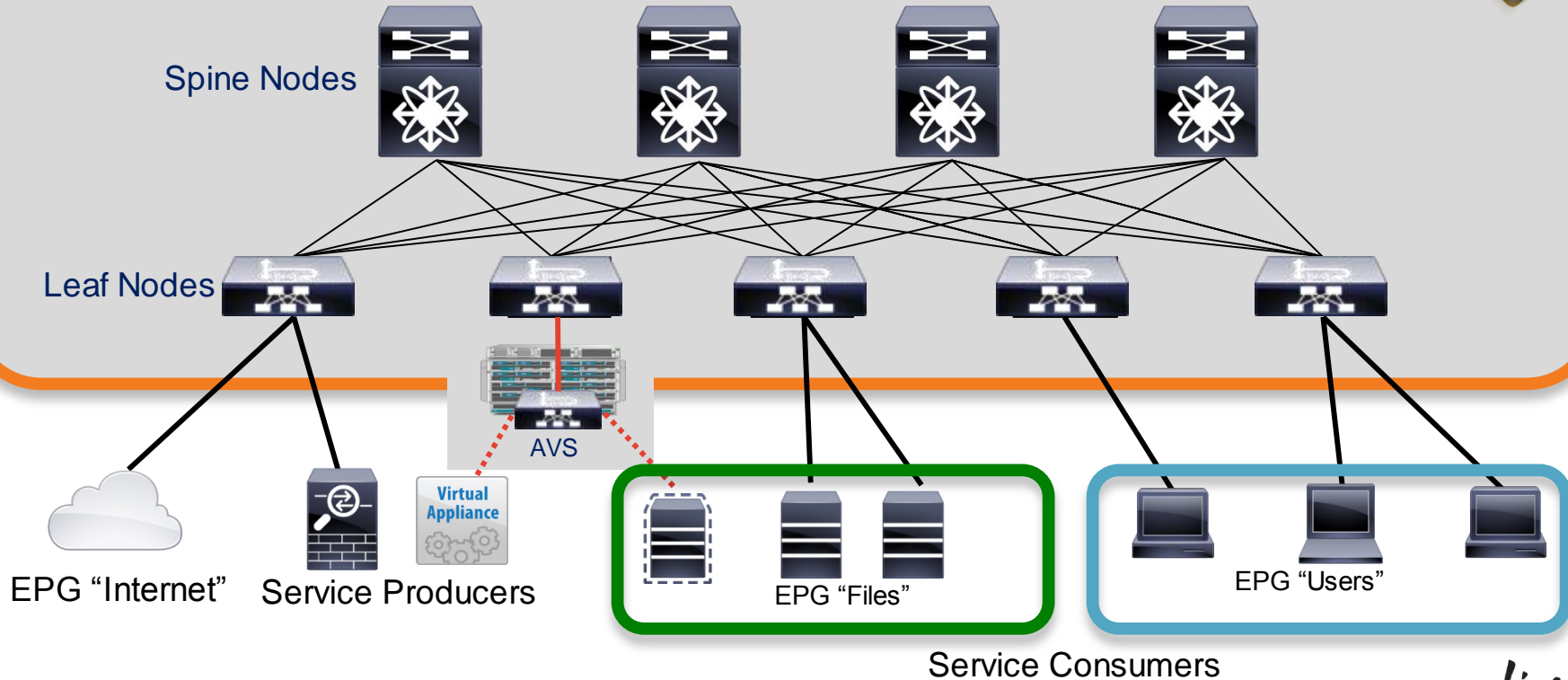
Introduction to ACI

Cisco ACI

Logical Network Provisioning of Stateless Hardware



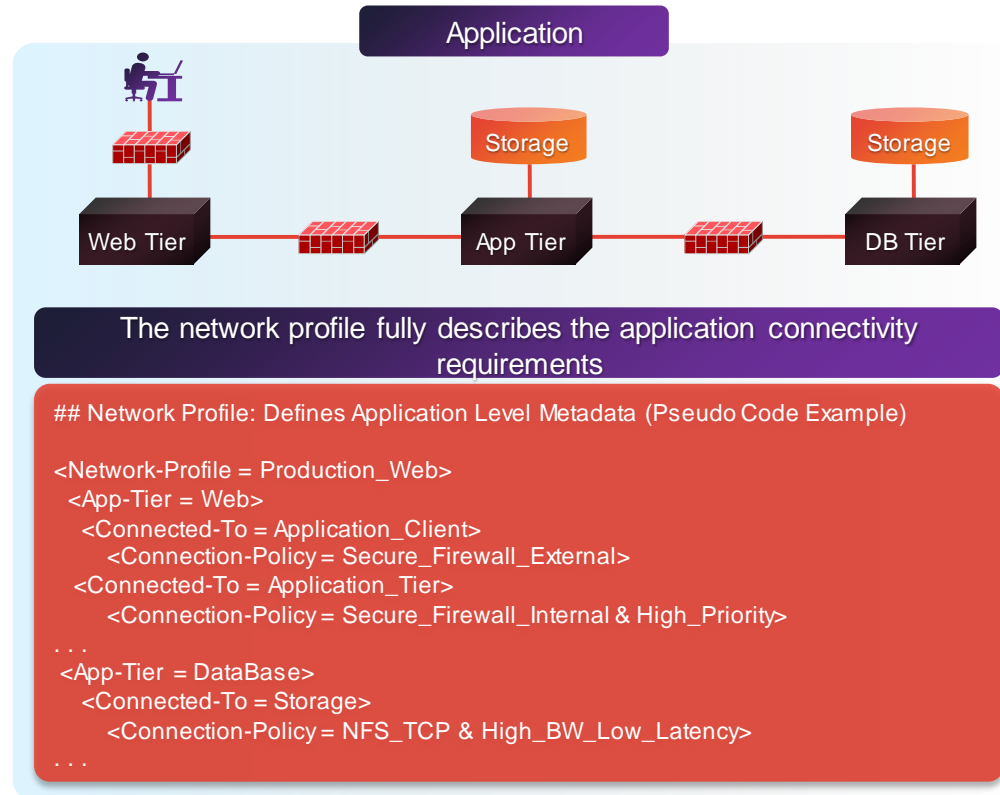
ACI Nomenclature



ACI Network Profile

Policy-Based Fabric Management

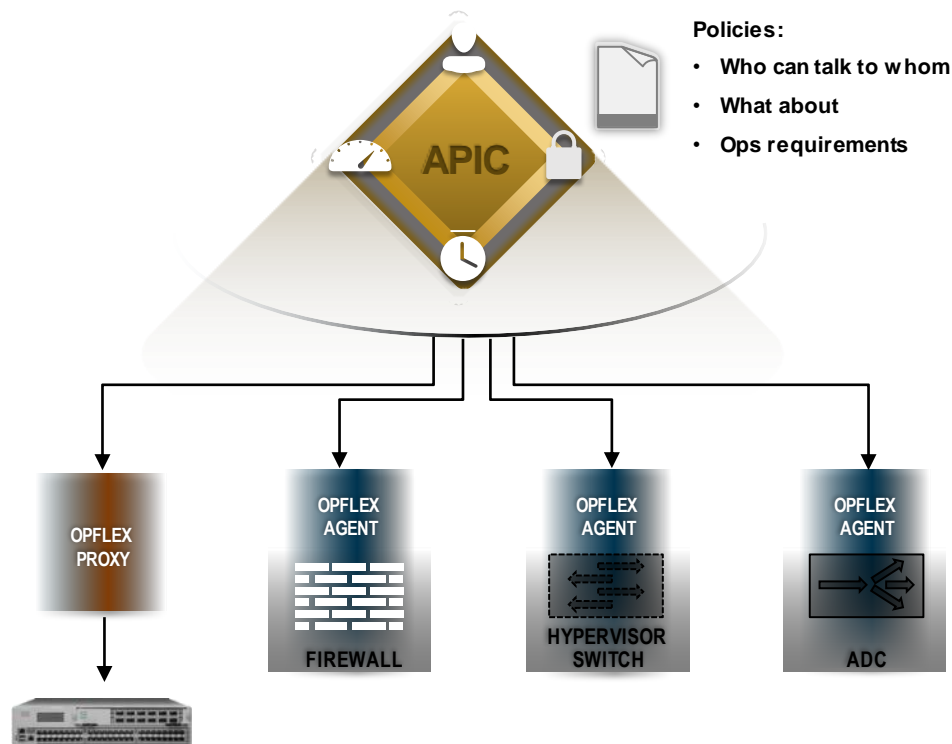
- Extend the principle of Cisco UCS[®] Manager service profiles to the entire fabric
- Network profile: stateless definition of application requirements
 - Application tiers
 - Connectivity policies
 - Layer 4 – 7 services
 - XML/JSON schema
- Fully abstracted from the infrastructure implementation
 - Removes dependencies of the infrastructure
 - Portable across different data centre fabrics



Opflex: AN OPEN, Extensible Policy Protocol

OPFLEX WAS DESIGNED TO OFFER:

1. Abstract policies rather than device-specific configuration
2. Flexible, extensible definition of using XML / JSON
3. Support for any device including virtual switches, physical switches, network services with strong interoperability across vendors
4. Open, standardised API with an open source reference implementation

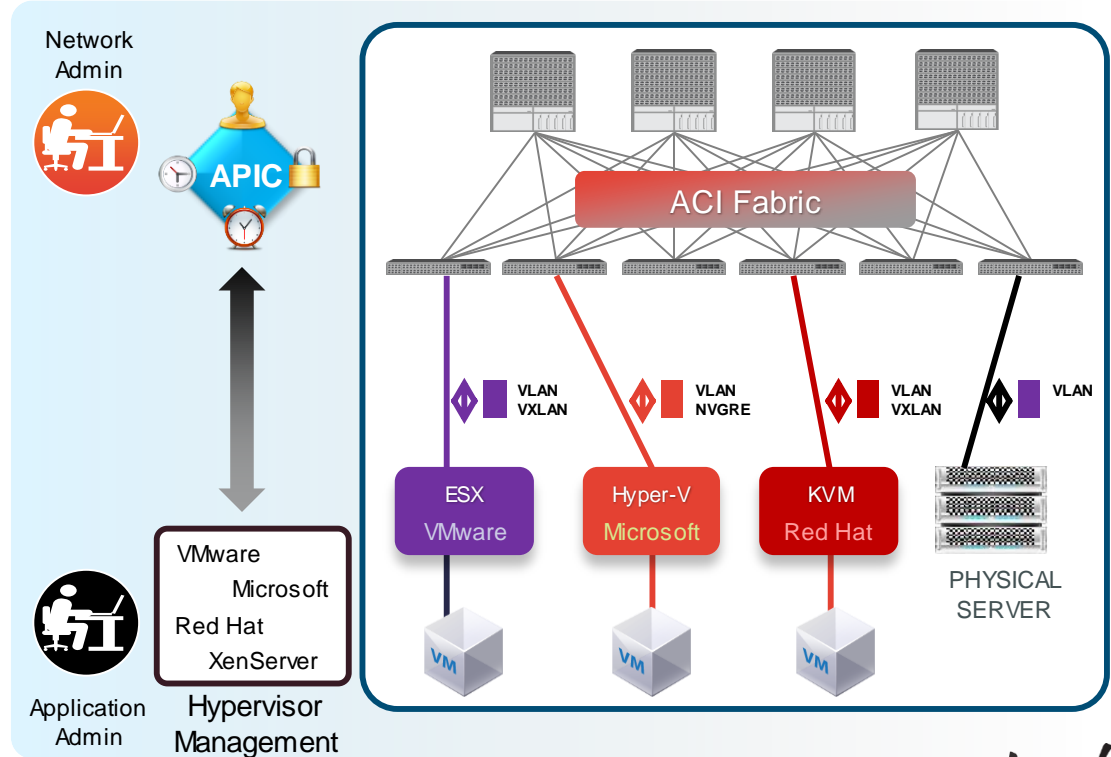


Multi-Hypervisor-Ready Fabric

Virtual Integration



- Integrated gateway for VLAN, VxLAN, and NVGRE networks from virtual to physical
- Normalisation for NVGRE, VXLAN, and VLAN networks
- Customer not restricted by a choice of hypervisor
- Fabric is ready for multi-hypervisor

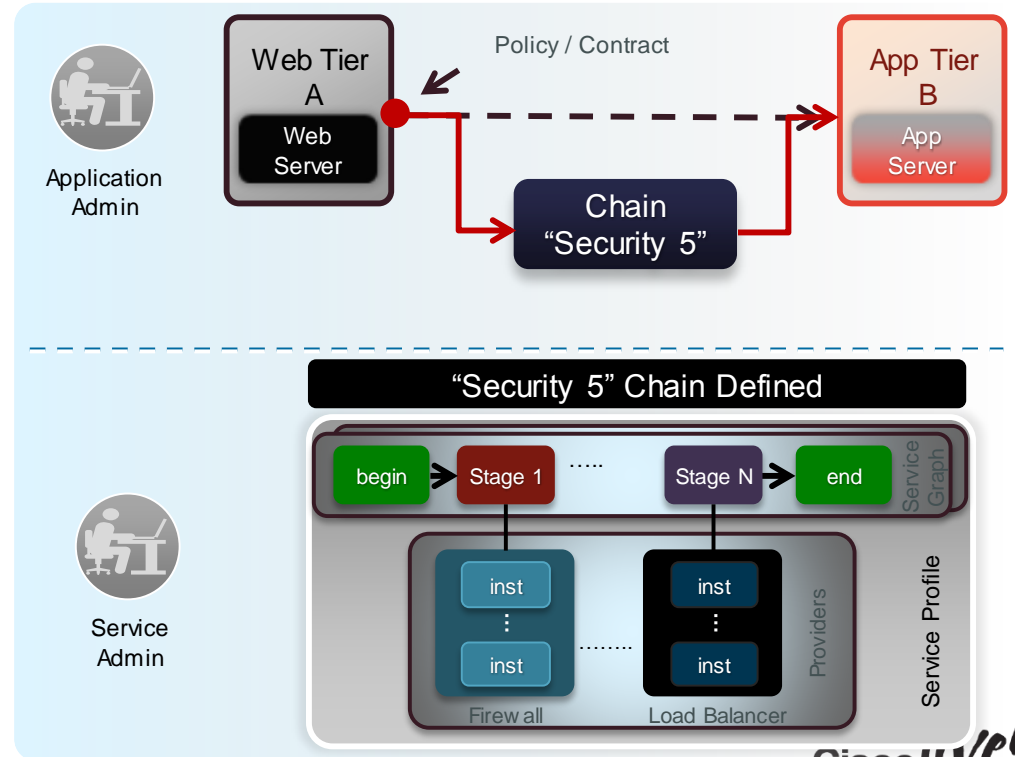


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ACI Layer 4 - 7 Service Integration

Centralised, Automated, And Supports Existing Model

- Elastic service insertion architecture for physical and virtual services
- Helps enable administrative separation between application tier policy and service definition
- APIC as central point of network control with policy coordination
- Automation of service bring-up/tear-down through programmable interface
- Supports existing operational model when integrated with existing services
- Service enforcement guaranteed, regardless of endpoint location

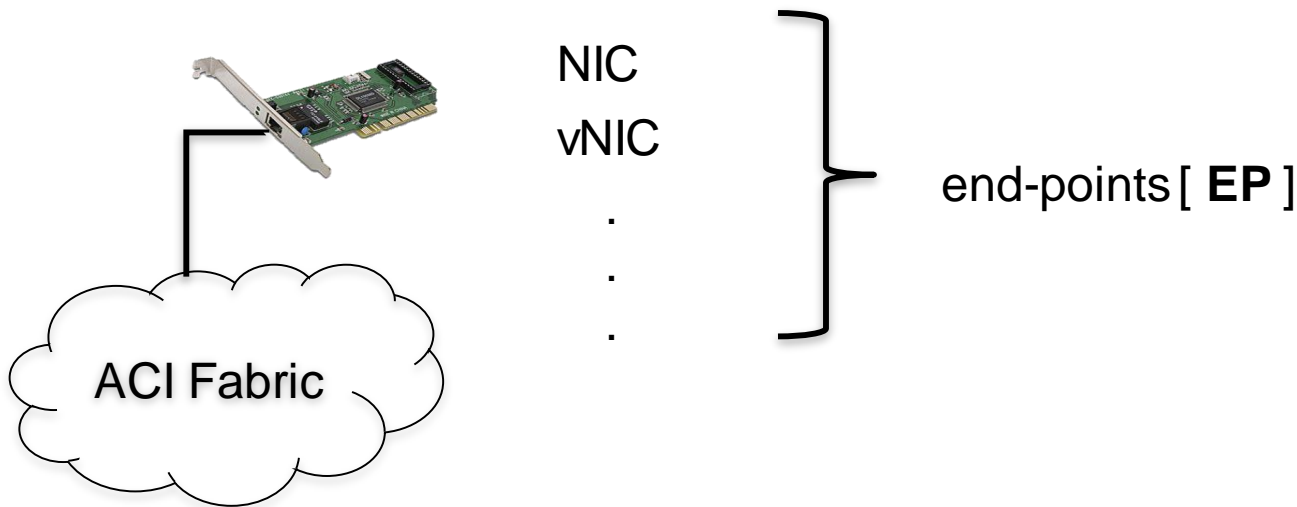


A long-exposure photograph of a city street at night. The foreground is filled with vibrant, multi-colored light trails from moving vehicles, creating a sense of motion. In the background, a pedestrian bridge spans the street, and tall buildings with lit windows and signage line the street. The overall scene is a dynamic urban environment.

Review of the ACI Policy Model

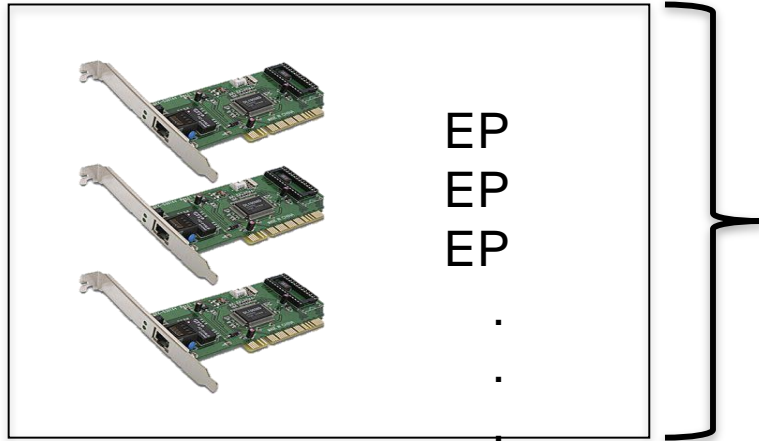
End-points

- Things that connect to the fabric and use it to interface with other things
- A compute, storage or service instance attaching to a fabric



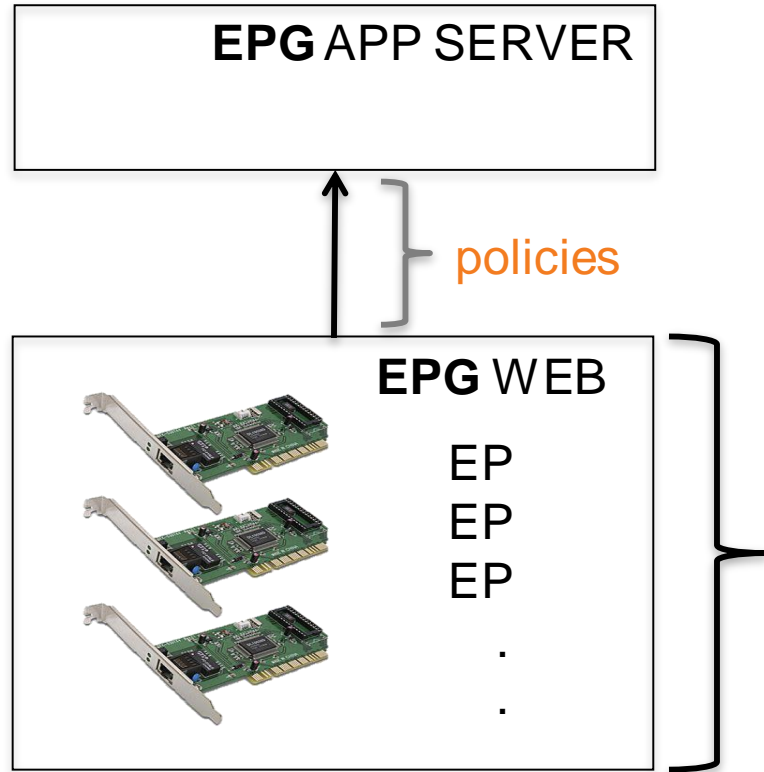
End-points

- Things that connect to the fabric and use it to interface with other things
- A compute, storage or service instance attaching to a fabric



A collection of end-points with identical network behaviour form a ... ***End Point Group (EPG)***

End-point Groups (EPGs)



Allows to specify rules and policies on groups of physical or virtual end-points without understanding of specific identifiers and regardless of physical location.

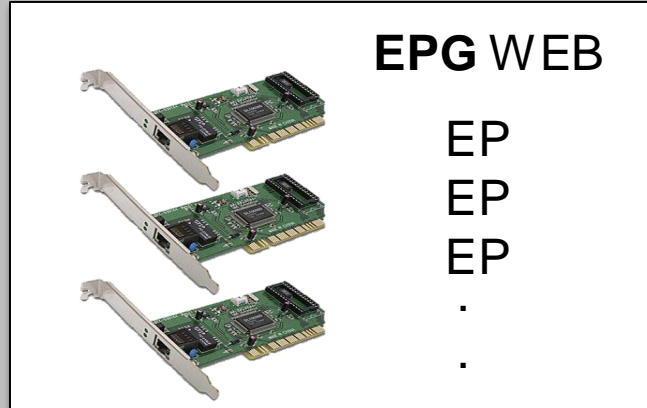
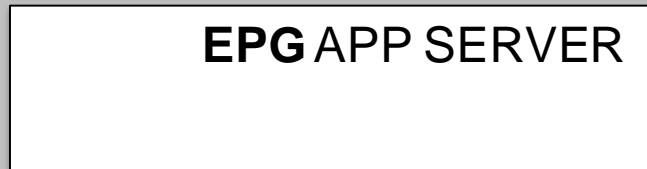
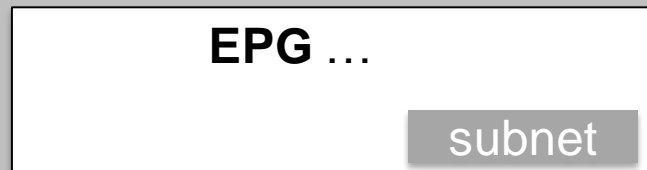
Can flexibly map into

- application tier of multi-tier app
- segmentation construct (ala VLAN)
- a security construct
- ESX port group, SCVMM VMNetwork
- ...

... end-point group [*EPG*]

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Tenant L3, L2 Isolation



network profile

Tenant

outside

BD

subnet

subnet

BD

With or
without
flooding
semantics

L3 context

(isolated tenant VRF)

self-contained
tenant definition
representable as a
recursive
structured text
document

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A long-exposure photograph of a city street at night. The foreground is filled with vibrant, multi-colored light trails from moving vehicles, creating a sense of motion. In the background, a pedestrian bridge spans the street, and tall buildings with lit windows and signage line the street. The overall scene is a dynamic urban environment.

Integration with Multiple Hypervisors

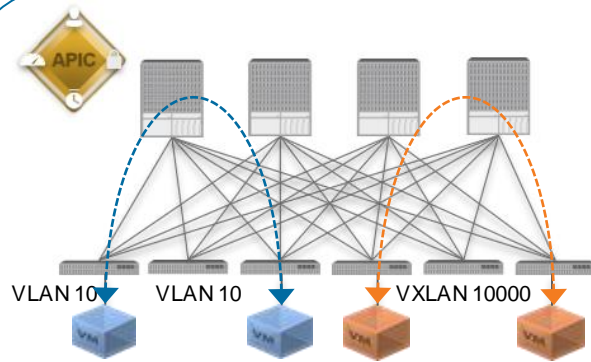
Hypervisor Integration Agenda

- Hypervisor Integration Overview
- VMWare vCenter Integration
- Microsoft SCVMM & Azure Pack Integration
- OpenStack Integration

Hypervisor Interaction with ACI

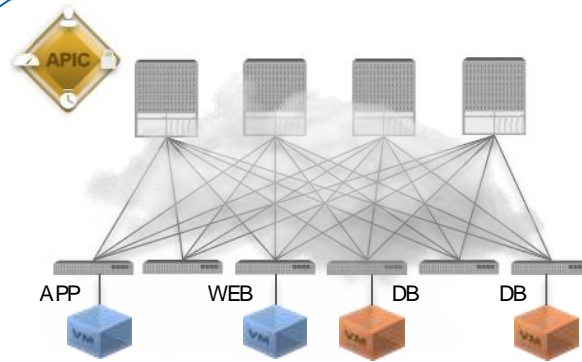
Two modes of Operation

Non-Integrated Mode



- ACI Fabric as an IP-Ethernet Transport
- Encapsulations manually allocated
- Separate Policy domains for Physical and Virtual

Integrated Mode

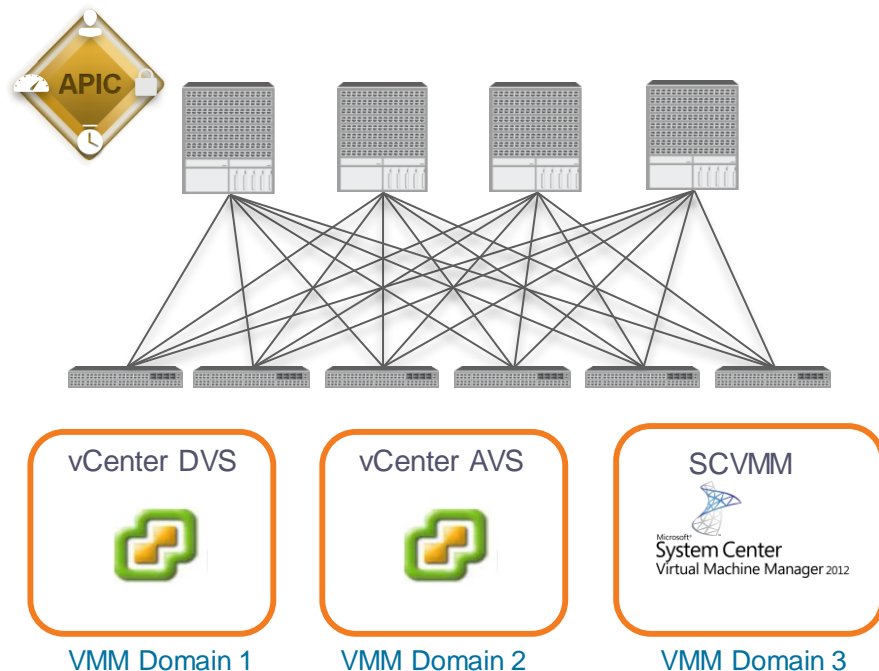


- ACI Fabric as a Policy Authority
- Encapsulations Normalised and dynamically provisioned
- Integrated Policy domains across Physical and Virtual

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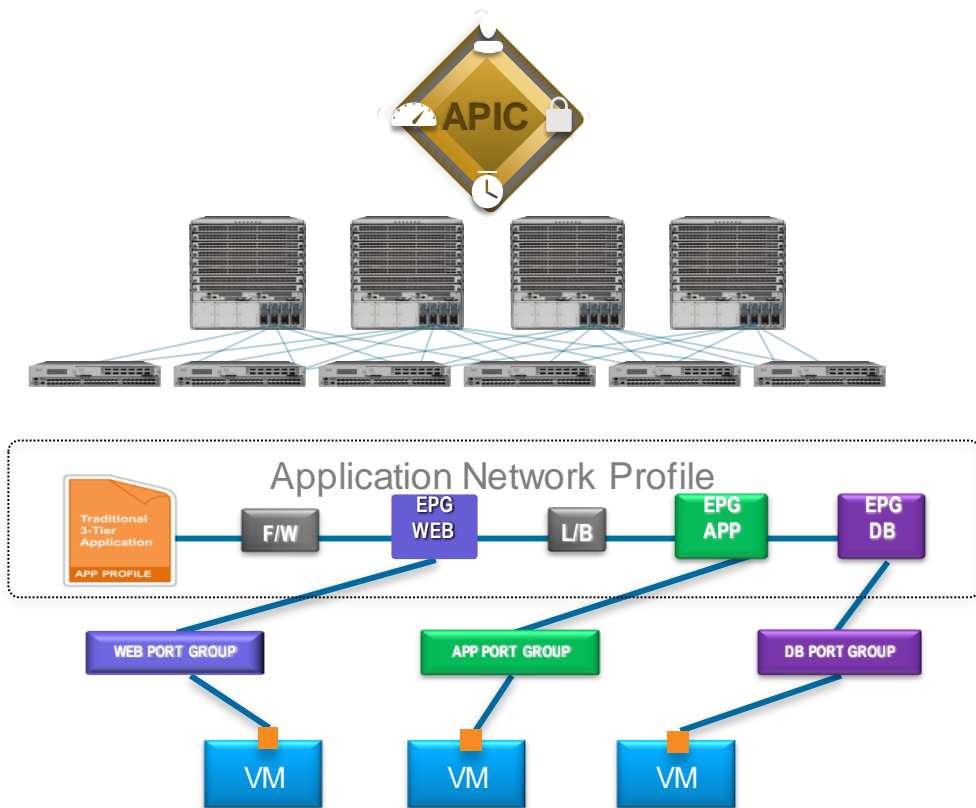
Hypervisor Integration with ACI

Control Channel - VMM Domains



- Relationship is formed between APIC and Virtual Machine Manager (VMM)
- Multiple VMMs likely on a single ACI Fabric
- Each VMM and associated Virtual hosts are grouped within APIC
- Called VMM Domain
- There is 1:1 relationship between a Virtual Switch and VMM Domain

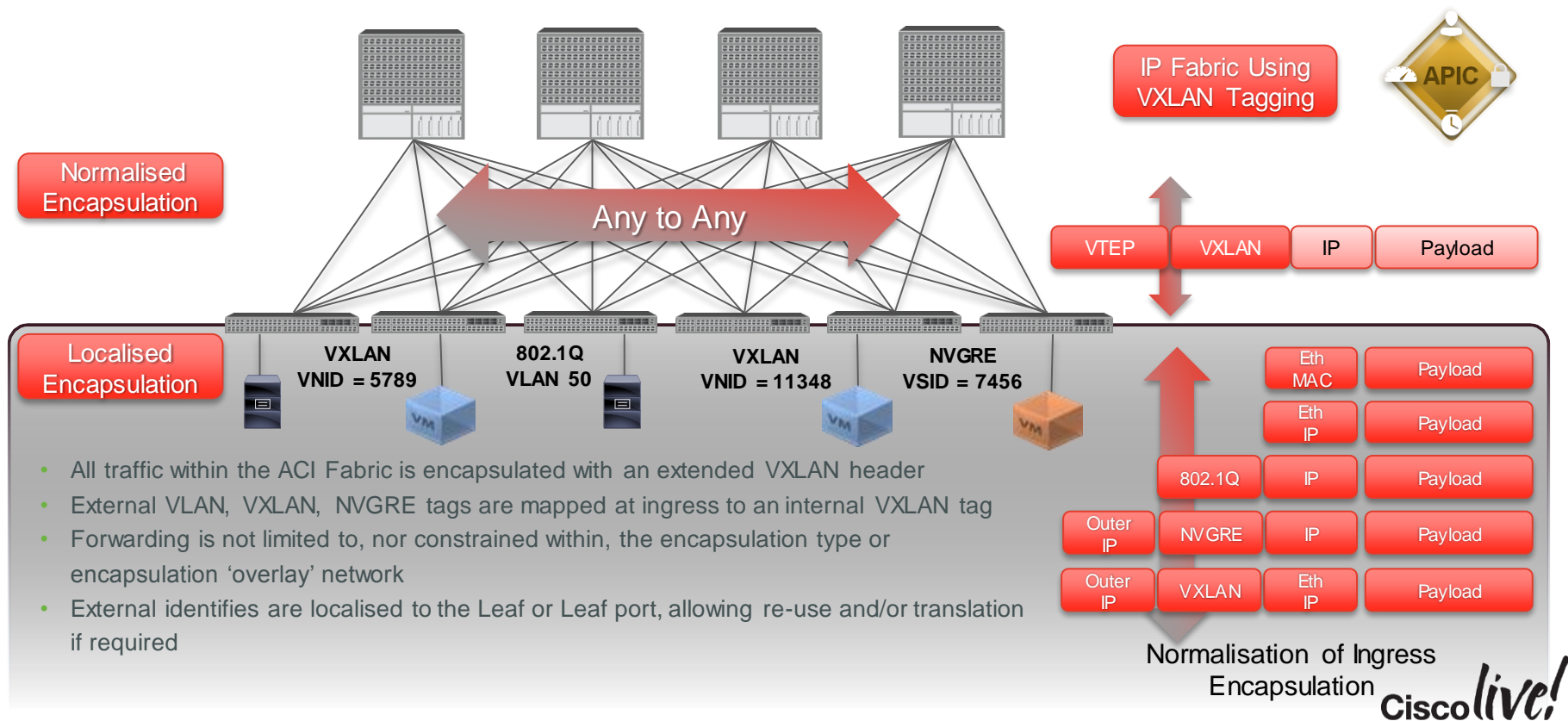
Hypervisor Integration with ACI



- ACI Fabric implements policy on Virtual Networks by mapping Endpoints to EPGs
- Endpoints in a Virtualised environment are represented as the vNICs
- VMM applies network configuration by placement of vNICs into Port Groups or VM Networks
- EPGs are exposed to the VMM as a 1:1 mapping to Port Groups or VM Networks

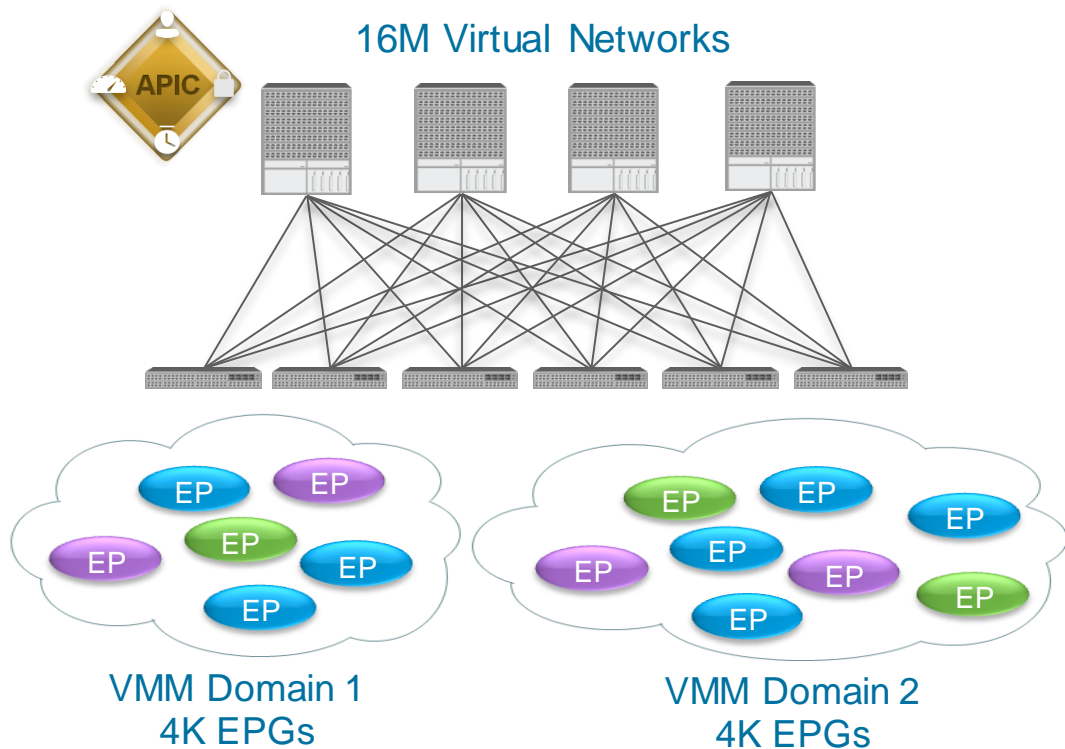
ACI Fabric – Integrated Overlay

Data Path - Encapsulation Normalisation



Hypervisor Integration with ACI

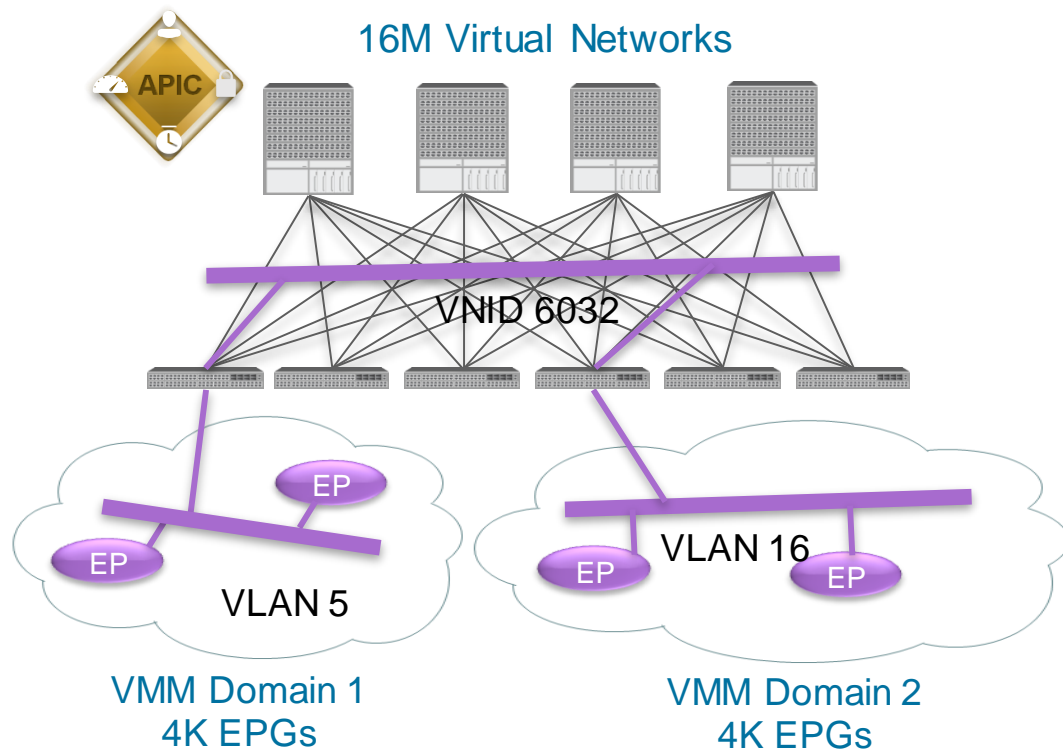
VMM Domains & VLAN Encapsulation



- VLAN ID only gives 4K EPGs (12 bits)
- Scale by creating **pockets** of 4K EPGs
- Map EPGs to VMM Domain based on scope of live migration
- Place VM anywhere
- Live migrate within VMM domain

Hypervisor Integration with ACI

VMM Domains & VLAN Encapsulation

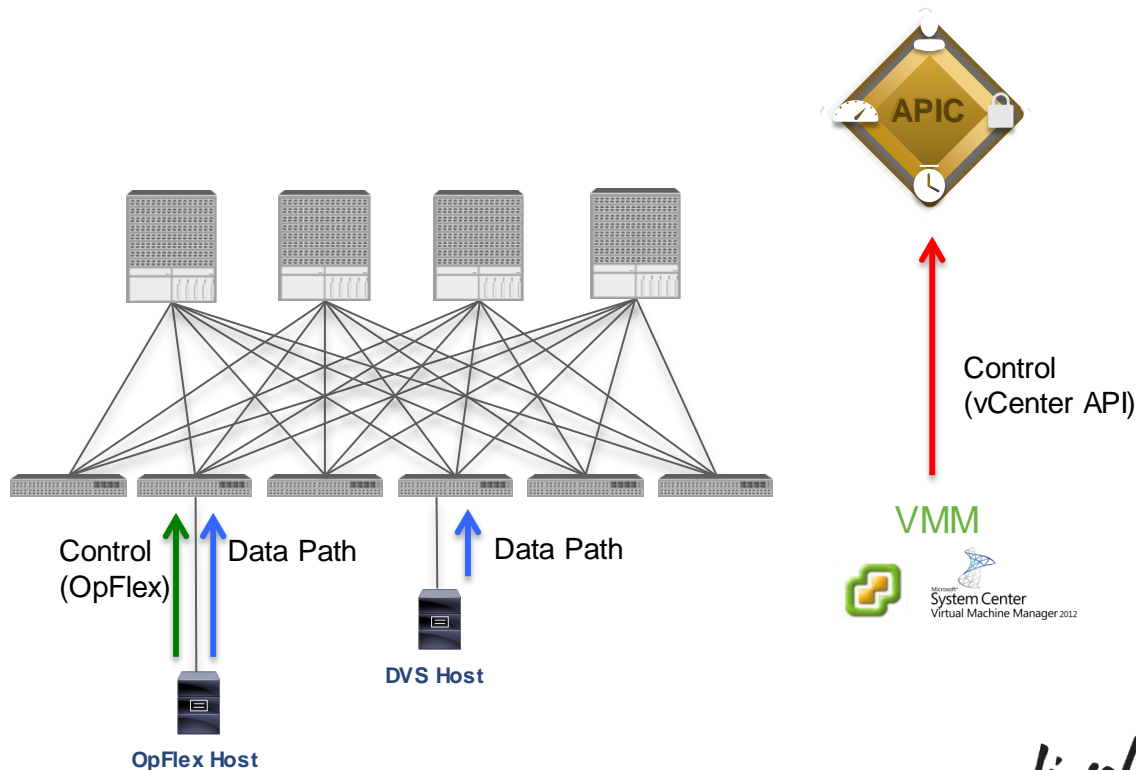


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- Live migrate within VMM domain

Hypervisor Integration with ACI

Endpoint Discovery

- Virtual Endpoints are discovered for reachability & policy purposes via 2 methods:
- Control Plane Learning:
 - Out-of-Band Handshake: vCenter APIs
 - Inband Handshake: OpFlex-enabled Host (AVS, Hyper-V, etc.)
- Data Path Learning: Distributed switch learning
- LLDP used to resolve Virtual host ID to attached port on leaf node (non-OpFlex Hosts)



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VMWare Integration

Three Different Options

Distributed Virtual Switch (DVS)



- Encapsulations: VLAN
- Installation: Native
- VM discovery: LLDP
- Software/Licenses: vCenter with Enterprise+ License

vCenter + vShield



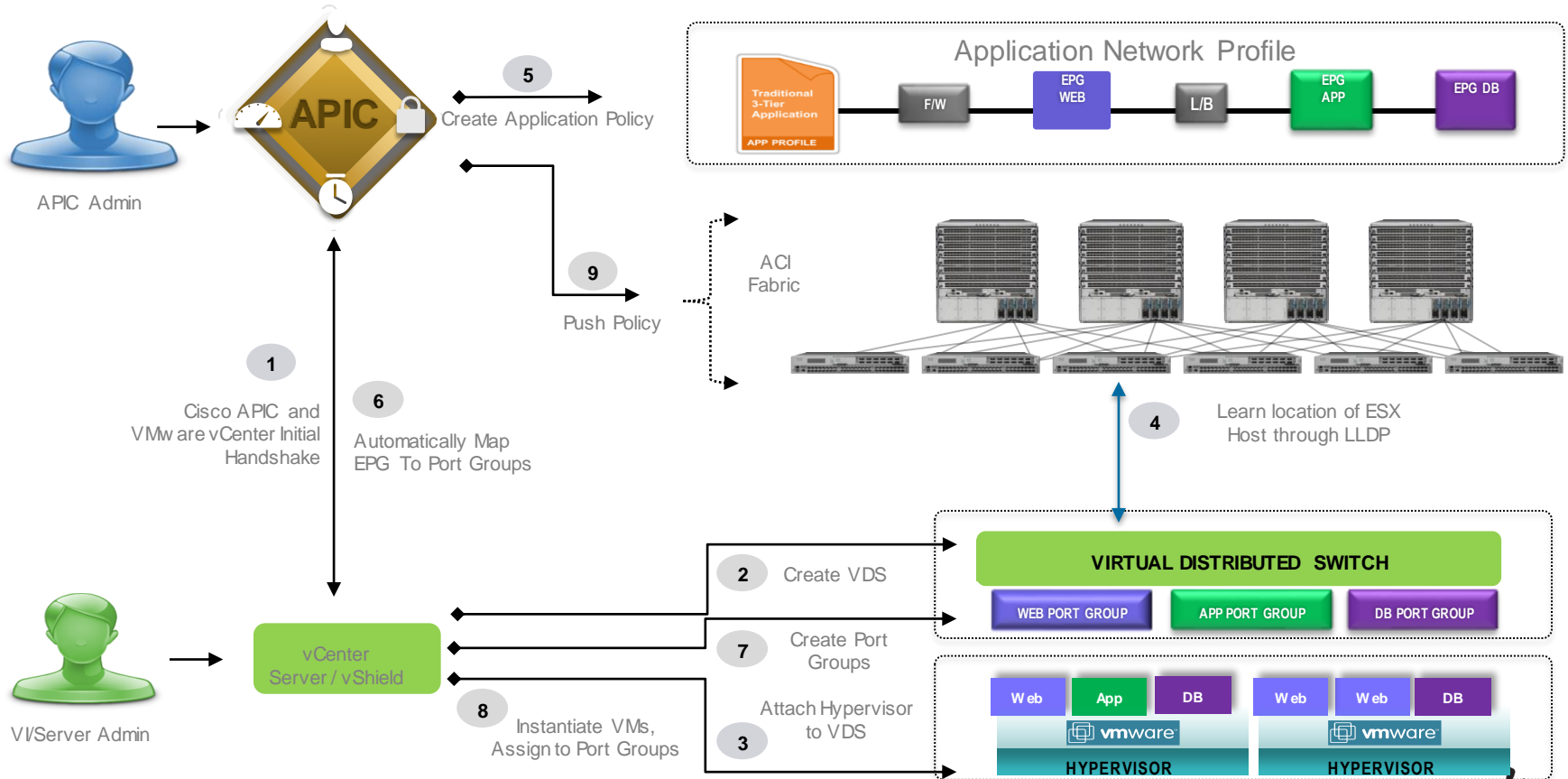
- Encapsulations: VLAN, VXLAN
- Installation: Native
- VM discovery: LLDP
- Software/Licenses: vCenter with Enterprise+ License, vShield Manager with vShield License

Application Virtual Switch (AVS)



- Encapsulations: VLAN, VXLAN
- Installation: VIB through VUM or Console
- VM discovery: OpFlex
- Software/Licenses: vCenter with Enterprise+ License

ACI Hypervisor Integration – VMware DVS/vShield



ACI Hypervisor Integration – VMware DVS

CREATE VCENTER DOMAIN



Specify vCenter domain users and controllers

Name:

Virtual Switch: ☒ VMWare vSphere Distributed Switch
☐ Cisco AVS

Associated Attachable Entity Profile:

VLAN Pool:

vCenter Credentials:

Profile Name	Username	Description
vmwareAdmin	root	

vCenter/vShield:

Name	IP	Type	Stats Collection
vCenter	192.168.20.3	vCenter	Enabled

Name of VMM Domain

Type of vSwitch (DVS or AVS)

Associated Attachable Entity Profile (AEP)

VLAN Pool

vCenter Administrator Credentials

vCenter server information

ACI Hypervisor Integration – VMware DVS

The screenshot displays the Cisco ACI management interface. The top navigation bar includes tabs for SYSTEM, TENANTS, FABRIC, VM NETWORKING (selected), L4-L7 SERVICES, and ADMIN. The left sidebar shows the 'Inventory' tree with a hierarchy: Quick Start > VMware > vmware-avs > vmware-dvs. The main content area is titled 'Domain - vmware-dvs' and shows the 'PROPERTIES' section for the 'vmware-dvs' object. Below the properties, a table lists the controllers.

Domain - vmware-dvs

PROPERTIES

Name: **vmware-dvs**

Controllers:

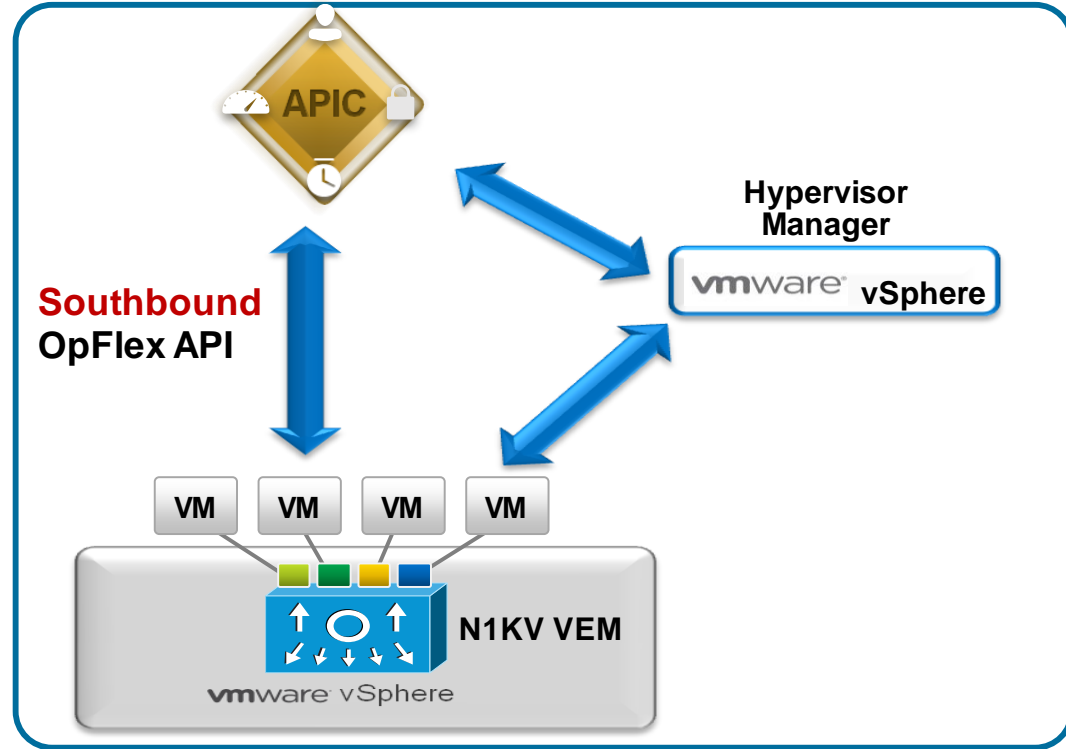
NAME	STATE	MODEL	SERIAL	REVISION	HYPERVISORS	VIRTUAL MACHINES
vCenter	Online	VMware vCenter Server 5.1.0 bu...	C974564D-08...	5.1.0	3	6

PAGE 1 OF 1 | ITEMS PER PAGE: 15 | DISPLAYING OBJECTS 1 - 1 OF 1

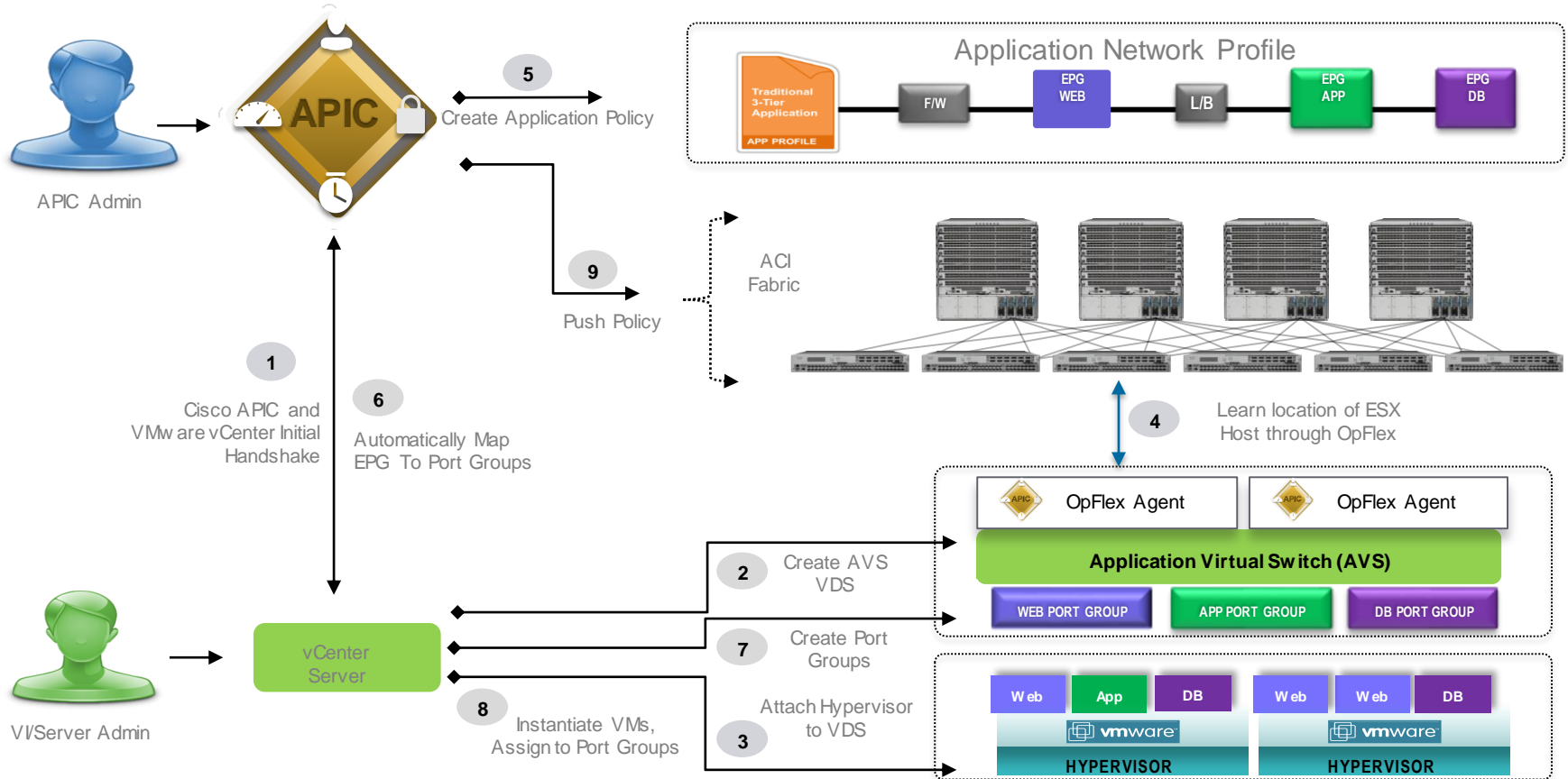
Application Virtual Switch (AVS)

Integration Overview

- OpFlex Control protocol
 - Control channel
 - VM attach/detach, link state notifications
- VEM extension to the fabric
- vSphere 5.0 and above
- BPDU Filter/BPDU Guard
- SPAN/ERSPAN
- Port level stats collection
- Remote Virtual Leaf Support (future)



ACI Hypervisor Integration – AVS



ACI Hypervisor Integration – VMware DVS

CREATE VCENTER DOMAIN



Specify vCenter domain users and controllers

Name:

Virtual Switch: ☐ VMWare vSphere Distributed Switch
☒ Cisco AVS

Switching Preference: ☒ Fex Enable
☐ Fex Disable

Associated Attachable Entity Profile:

VXLAN Pool:

Multicast Address:

vCenter Credentials:

Profile Name	Username	Description
vmwareAdmin	root	

vCenter:

Name	IP	Type	Stats Collection
vCenter	192.168.30.3	vCenter	Disabled

Name of VMM Domain

Type of vSwitch (DVS or AVS)

Switching mode (FEX or Normal)

Associated Attachable Entity Profile (AEP)

VXLAN Pool

Multicast Pool

vCenter Administrator Credentials

vCenter server information

ACI Hypervisor Integration – VMware

The screenshot displays the vSphere Client interface within a Windows 7 environment. The left-hand pane shows the inventory tree with the following structure:

- localhost
 - DC1
 - DC2
 - DC3
 - DC3|vmware-avs
 - DC3|vmware-avs
 - uplink
 - Coke|www.Coke.com|DB
 - Coke|www.Coke.com|WEB
 - vtep
 - DC3|vmware-dvs
 - DC3|vmware-dvs-DVUplinks-684
 - Coke|www.Coke.com|DB
 - Coke|www.Coke.com|WEB
 - DC3|vmware-vshield
 - DC3|vmware-vshield
 - DC3|vmware-vshie-DVUplinks-687
 - Coke|www.Coke.com|APP
 - vxx-dvs-687-virtualwire-6-sid-8394309-
 - vxx-vmknickPg-dvs-687-4094-57c29b34-
 - VM Network

The right-hand pane is titled "DC3|vmware-vshield" and shows the "Configuration" tab. It contains the following text:

What is a vSphere Distributed Switch?

A vSphere Distributed Switch acts as a single virtual switch across all associated hosts. This allows virtual machines to maintain consistent network configuration as they migrate across hosts.

Distributed virtual networking configuration consists of three parts. The first part takes place at the datacenter level, where vSphere Distributed Switches are created, and hosts and distributed port groups are added to vSphere Distributed Switches. The second part takes place at the host level, where host ports and networking services are associated with vSphere Distributed Switches either through individual host networking configuration or using host profiles. The third part takes place at the virtual machine level, where virtual machine NICs are connected to distributed port groups either through individual virtual machine NIC configuration or by migrating virtual machine networking from the vSphere Distributed Switch itself.

Below the text is a diagram illustrating the vSphere Distributed Switch architecture. It shows three server racks connected to a central switch labeled "vSphere Distributed Switch". The switch has multiple ports, and a blue globe icon is positioned on one of the ports.

At the bottom of the interface, there is a "Recent Tasks" section with a table. The table has columns for Name, Target, Status, Details, Initiated by, vCenter Server, Requested Start Time, Start Time, and Completed Time. The table is currently empty.

The bottom of the screenshot shows the Windows 7 taskbar with various application icons and the system clock displaying 2:22 PM on 5/5/2014.

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Microsoft Interaction with ACI

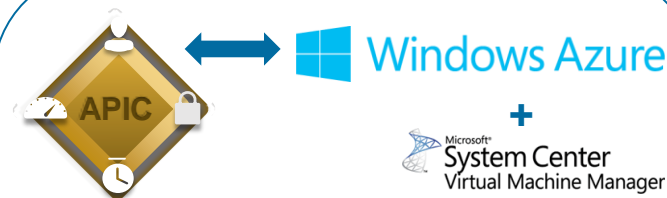
Two modes of Operation

Integration with SCVMM



- Policy Management: Through APIC
- Software / License: Windows Server with HyperV, SCVMM
- VM Discovery: OpFlex
- Encapsulations: VLAN, NVGRE (Future)
- Plugin Installation: Manual

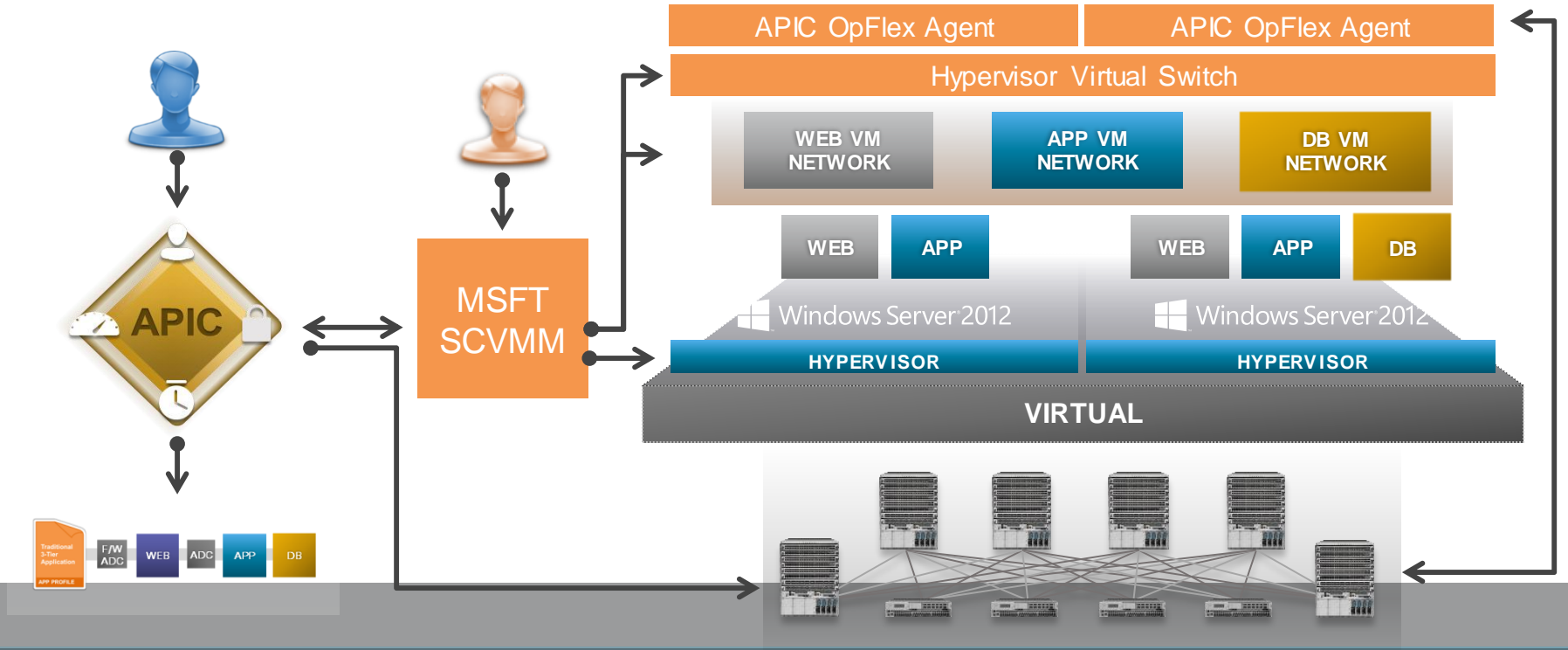
Integration with Azure Pack



- Superset of SCVMM
- Policy Management: Through APIC or through Azure Pack
- Software / License: Windows Server with HyperV, SCVMM, Azure Pack (free)
- VM Discovery: OpFlex
- Encapsulations: VLAN, NVGRE (Future)
- Plugin Installation: Integrated

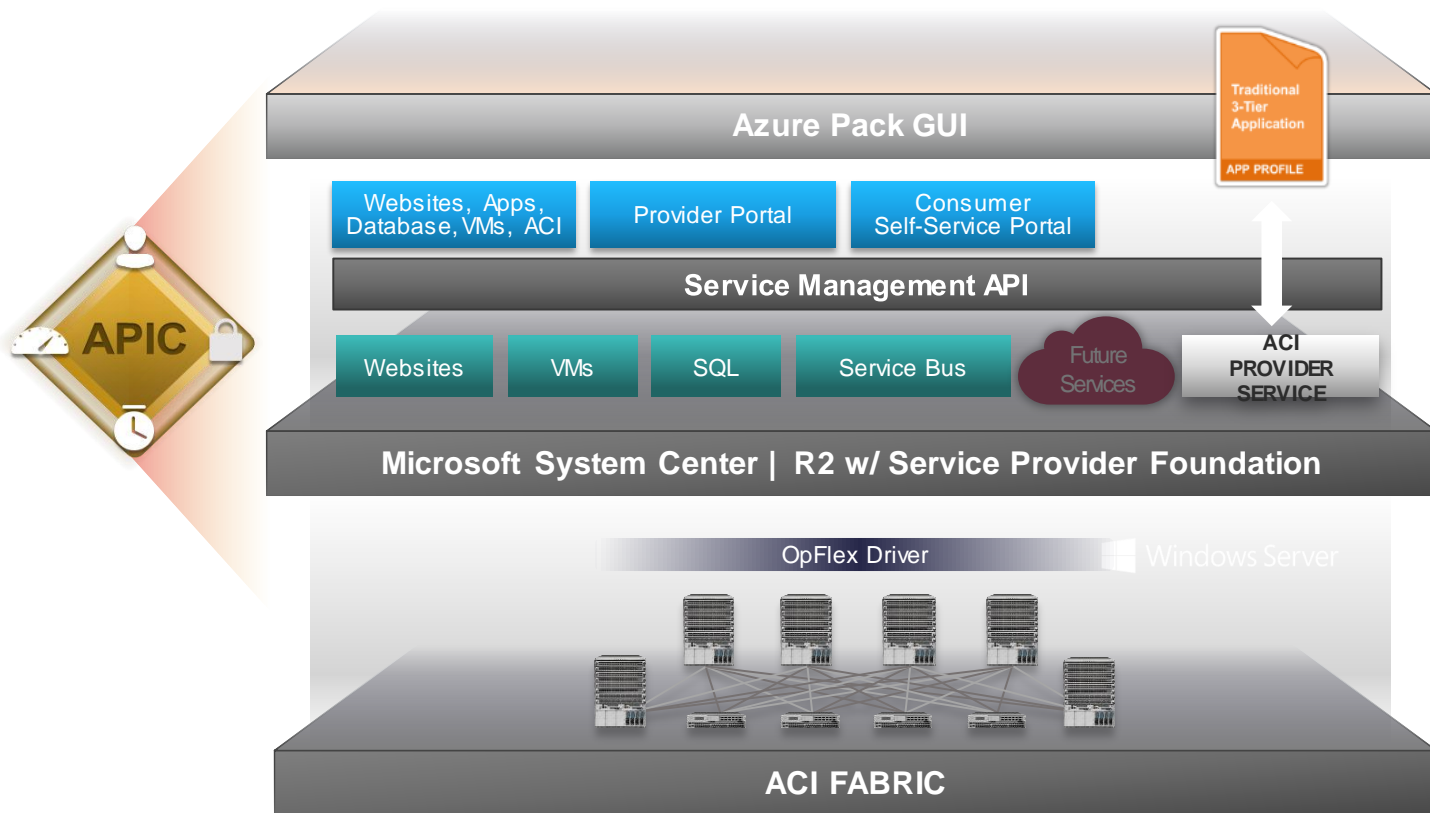
ACI Hypervisor Integration—MSFT SCVMM

Q2 CY 15



Cisco ACI: Microsoft Azure Pack Integration

Q2 CY 15



Policy Management:
APIC / Azure Pack

VM Discovery:
OpFlex

Encapsulation:
VLAN in Q2 CY15

(VXLAN, NVGRE in future)

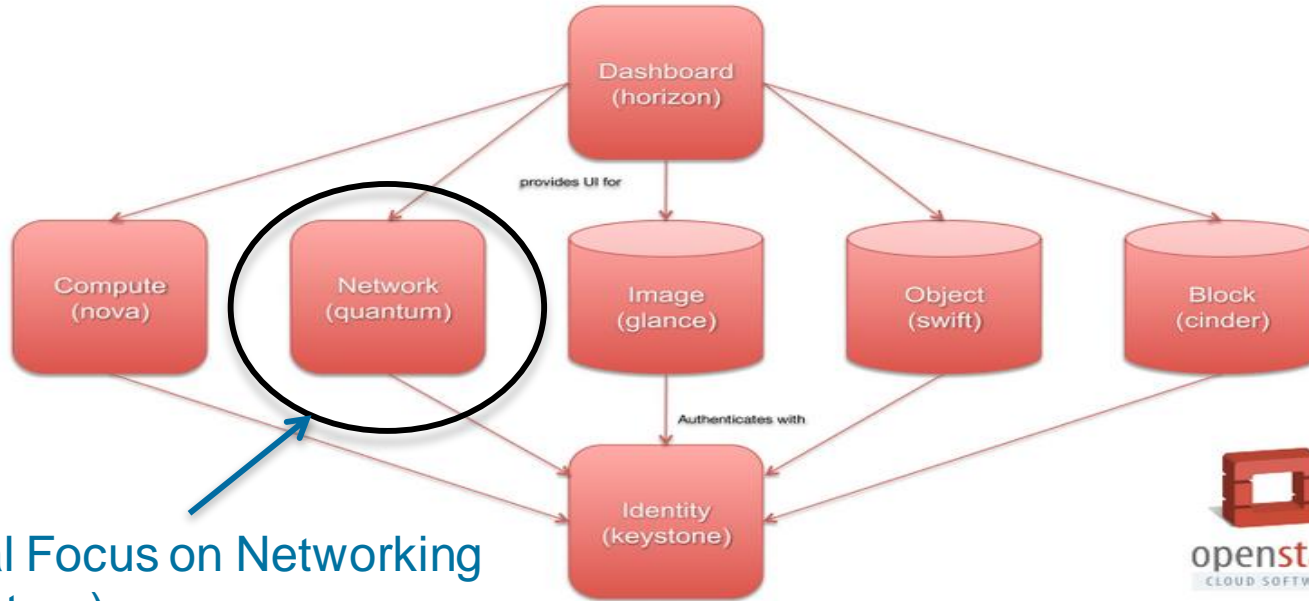
Zero touch network

Service Insertion
(Physical/ Virtual)

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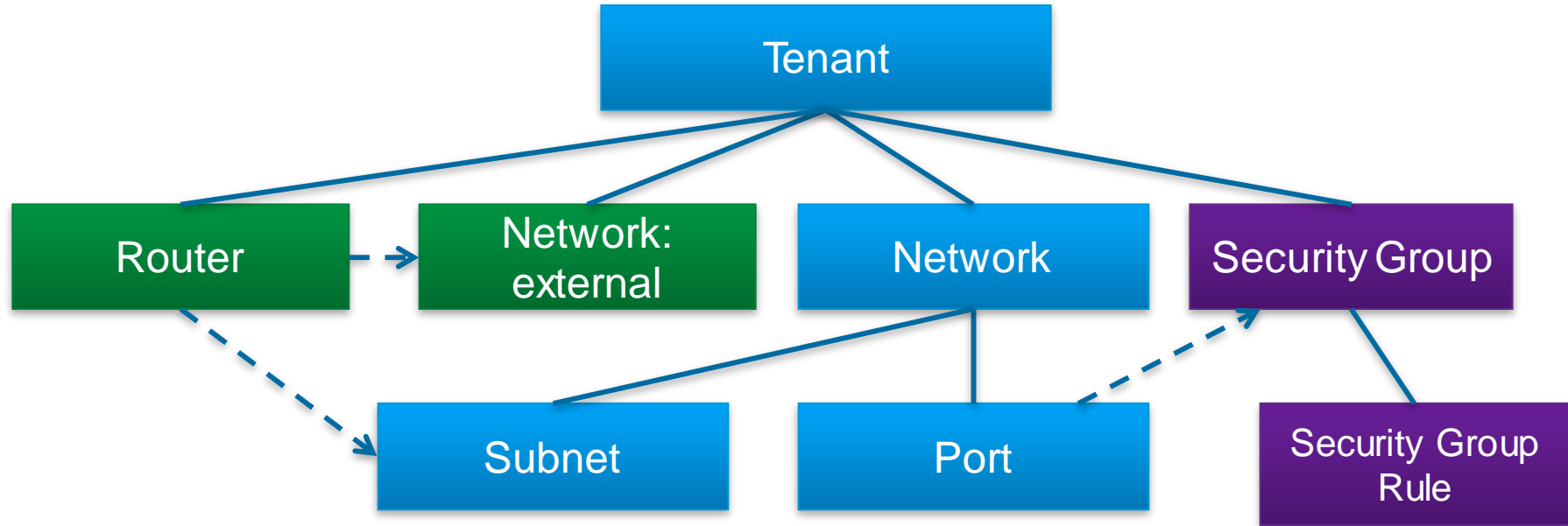
OpenStack Components



Initial Focus on Networking
(Neutron)



OpenStack Neutron Networking Model

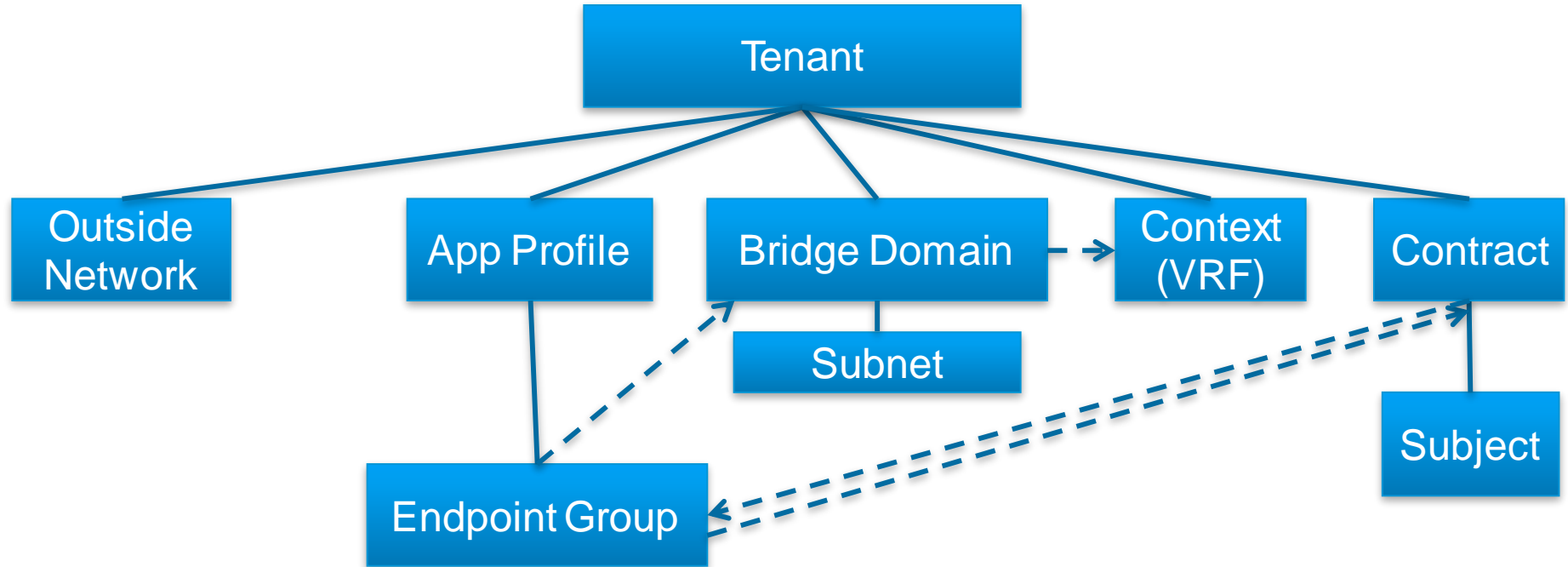


L3 + External
Net Extension

Core API

Sec Grp
Extension

Cisco ACI Model

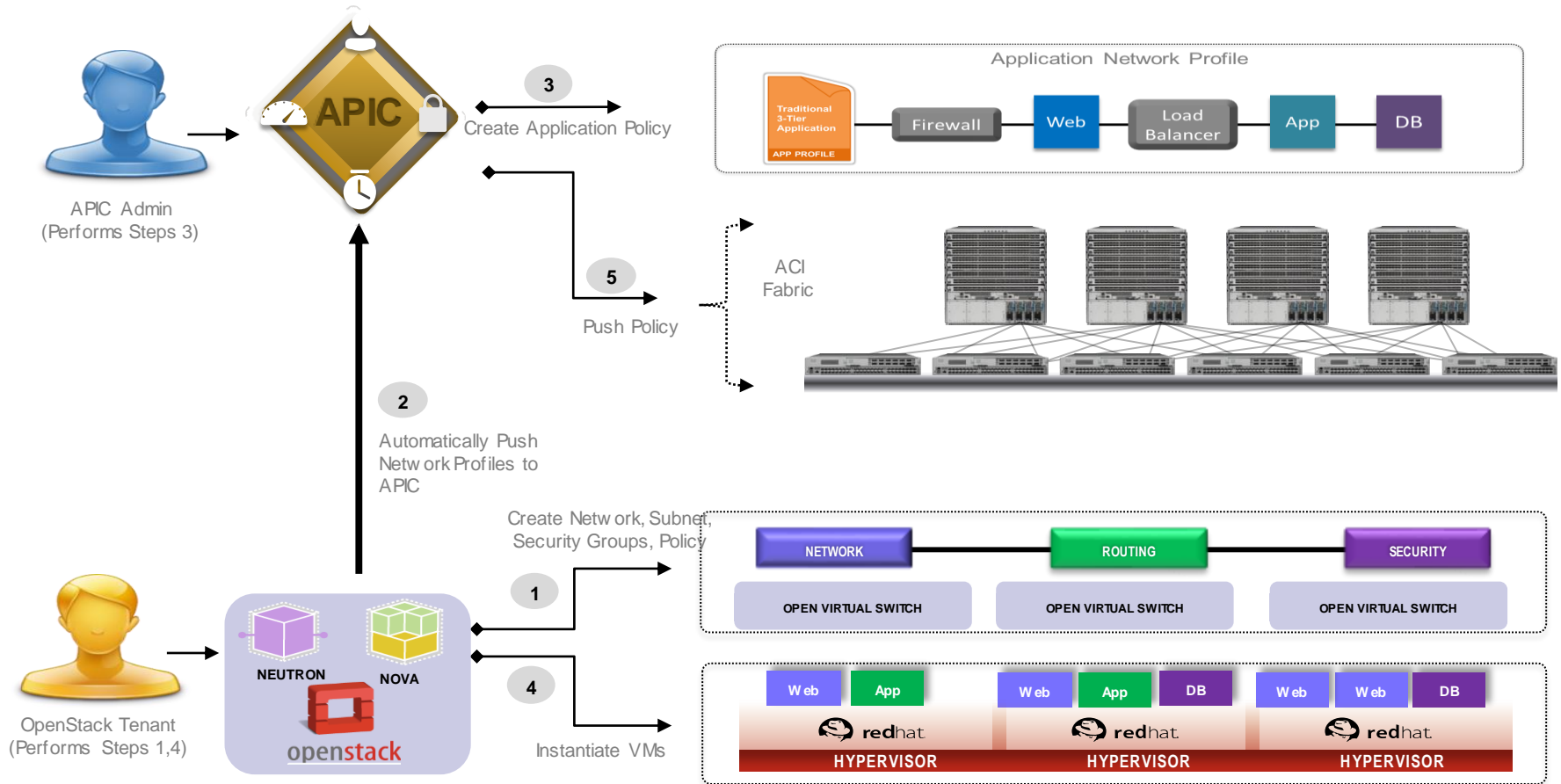


Cisco OpenStack ACI Model

Neutron API Mapping

OpenStack	ACI
Tenant	Tenant
No Equivalent	Application Profile
Network	EPG + Bridge Domain
Subnet	Subnet
Security Group	Handled by Host
Security Group Rule	Handled by Host
Router	L3 Context
Network:External	L3 Outside

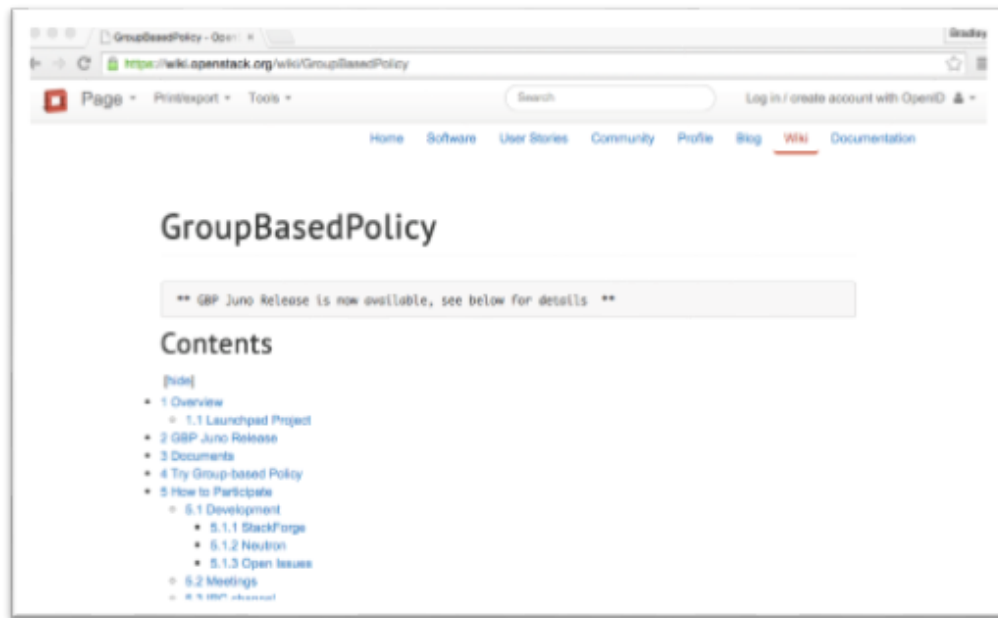
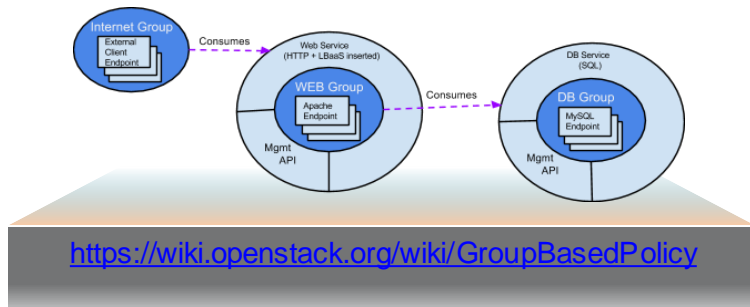
ACI OpenStack Integration – Phase 1



Group-Based Policy in OpenStack

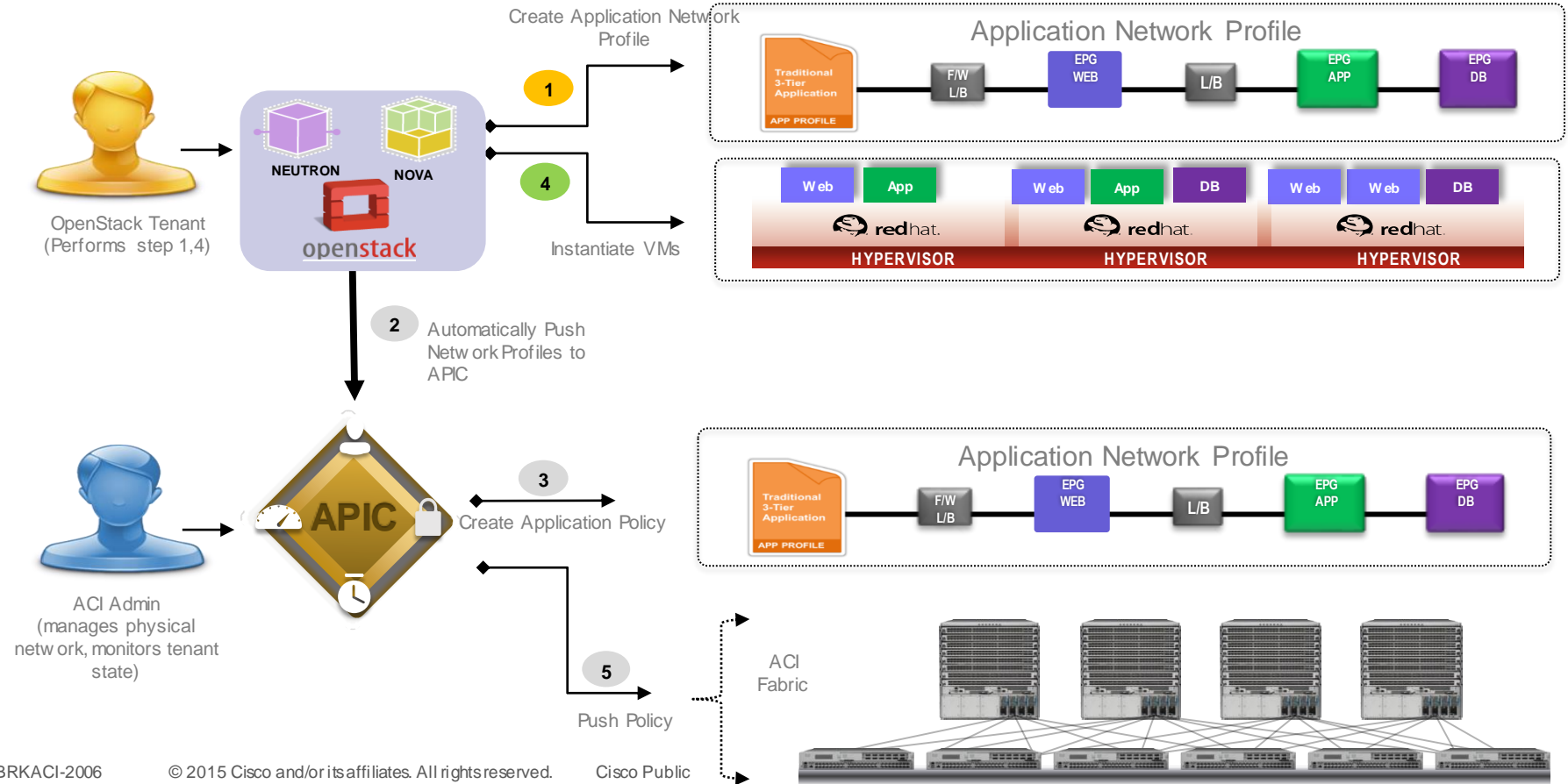
GBP release 2014.2 “Juno”

- Messy mapping ACI to current OpenStack component
 - Endpoint groups (ports + security groups)
 - Contracts (security groups + security group rules)
- Goal: Introduce ACI model into OpenStack
- Starting with groups and group-based policies



<https://wiki.openstack.org/wiki/GroupBasedPolicy>

ACI OpenStack Integration – Phase 2



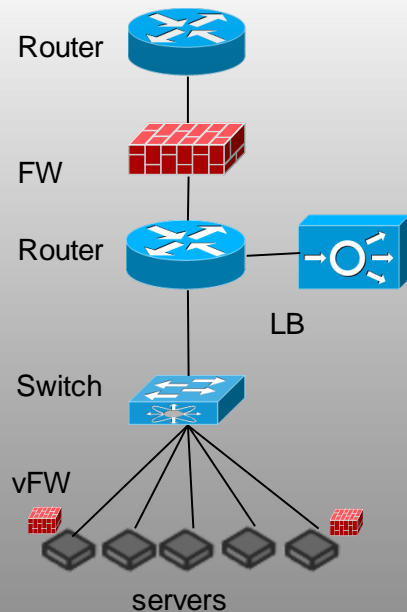
A long-exposure photograph of a city street at night. The foreground is filled with vibrant, multi-colored light trails from moving vehicles, creating a sense of motion. In the background, a modern city skyline is visible with illuminated buildings and a pedestrian bridge crossing the street. The overall scene is a blend of urban architecture and dynamic light patterns.

Layer 4-7 Services Integration

Agenda

- Challenges with Network Service Insertion
- Goals of ACI Services Insertion and Automation
- Key concepts and building blocks
- Services Insertion Configuration Wizard

Challenges with Network Service Insertion



Service Insertion In traditional Networks

Configure Network to insert Firewall

Configure firewall network parameters

Configure firewall rules as required by the application

Configure Load Balancer Network Parameters

Configure Router to steer traffic to/from Load Balancer

Configure Load Balancer as required by the application

Service insertion takes days

Network configuration is time consuming and error prone

Difficult to track configuration on services

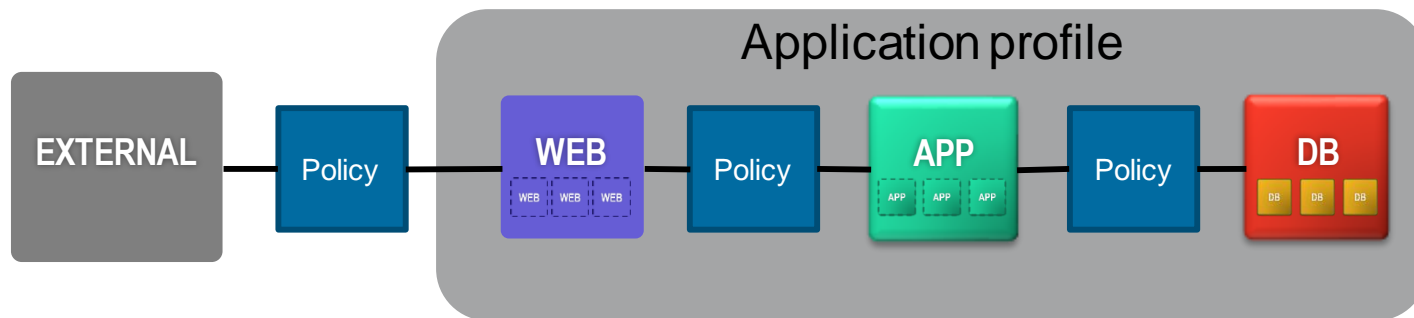
Goals of ACI Service Insertion and Automation

Configure and Manage VLAN allocation for service insertion

Configure the network to redirect traffic through service device

Configure network and service function parameters on service device

APIC Application Profile

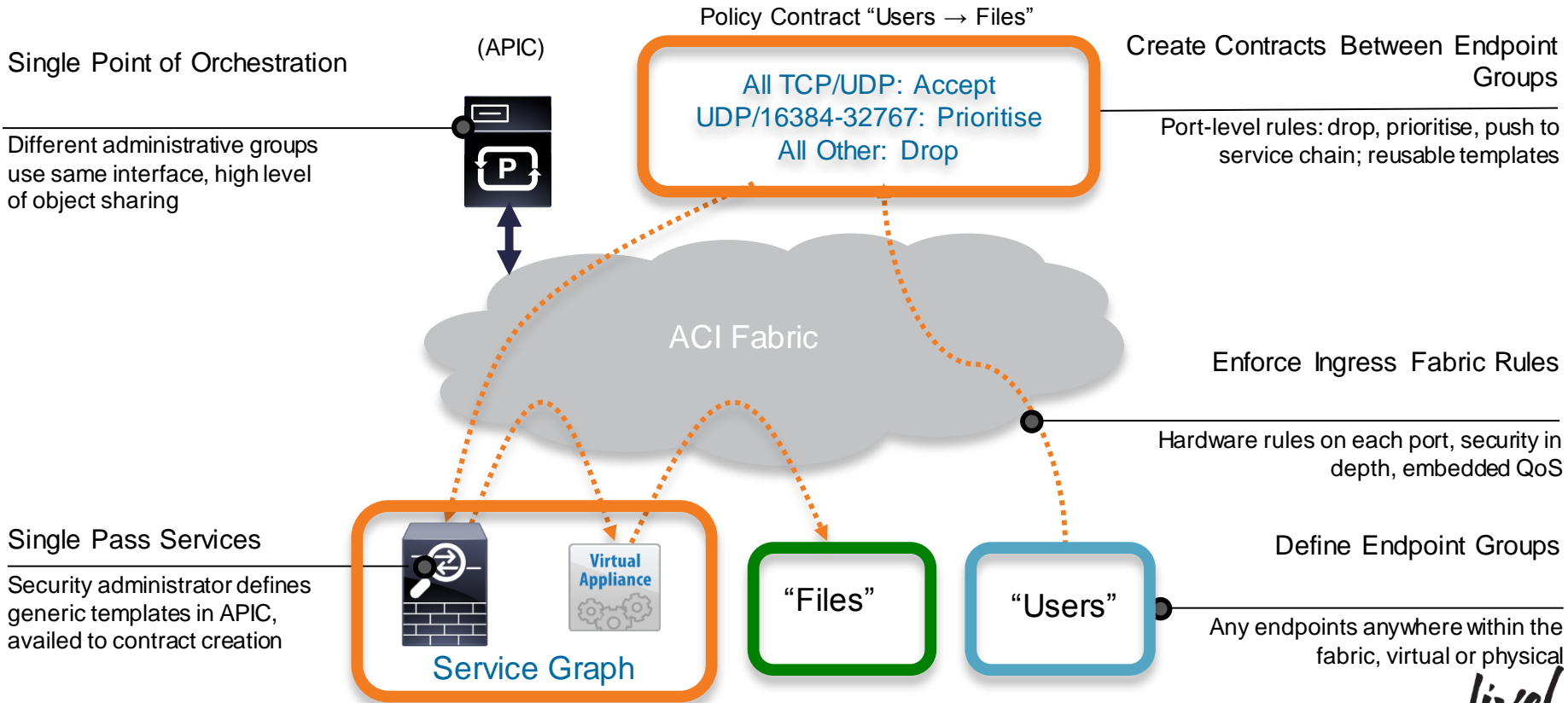


APIC Policy Model

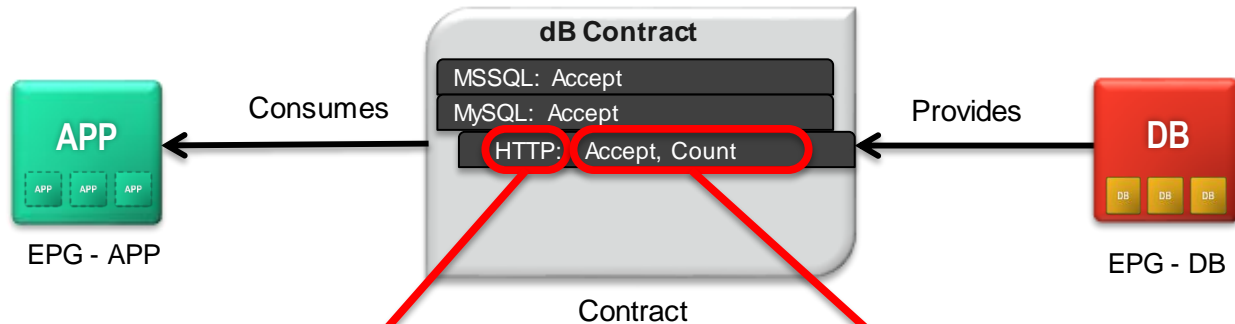
Endpoint Group (EPG): Collection of similar End Points identifying a particular Application Tier. Endpoint could represent VMs, VNICs , IP, DNS name etc

Application Profile: Collection of Endpoint Groups and the policies that define way Endpoint group communicate with each other

ACI Communication Abstraction



Application Policy



Filter

Named collection of L4 port ranges

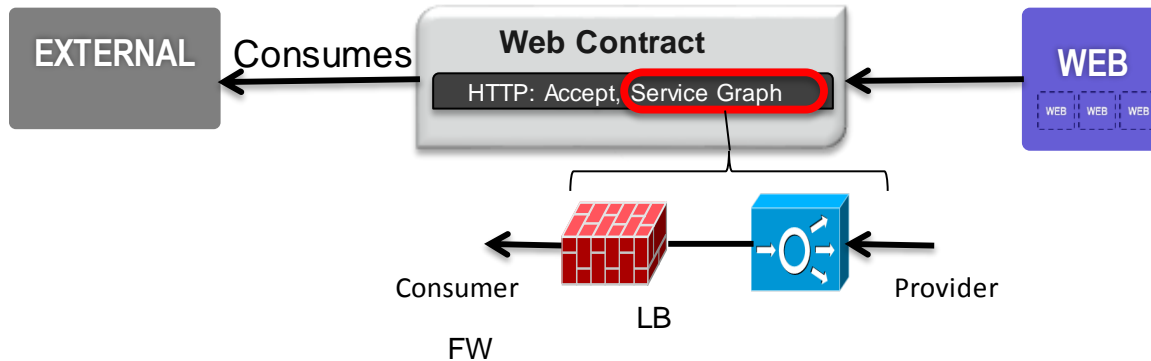
- HTTP = [80, 443]
- MSSQL = [1433-1434]
- MySQL = [3306, 25565]
- DNS = [53, 953, 1337, 5353]

Action

What action or actions to take on packet

- **Accept**
- **Service Insert**
- Count
- Copy (future sw release)

Network Service Insertion



Contract provides a mechanism to add Network Services through associating a Service Graph

A Service Graph identifies a set of network service functions required by an application

APIC configures network service functions on devices like firewall, Load Balancers through a device packages

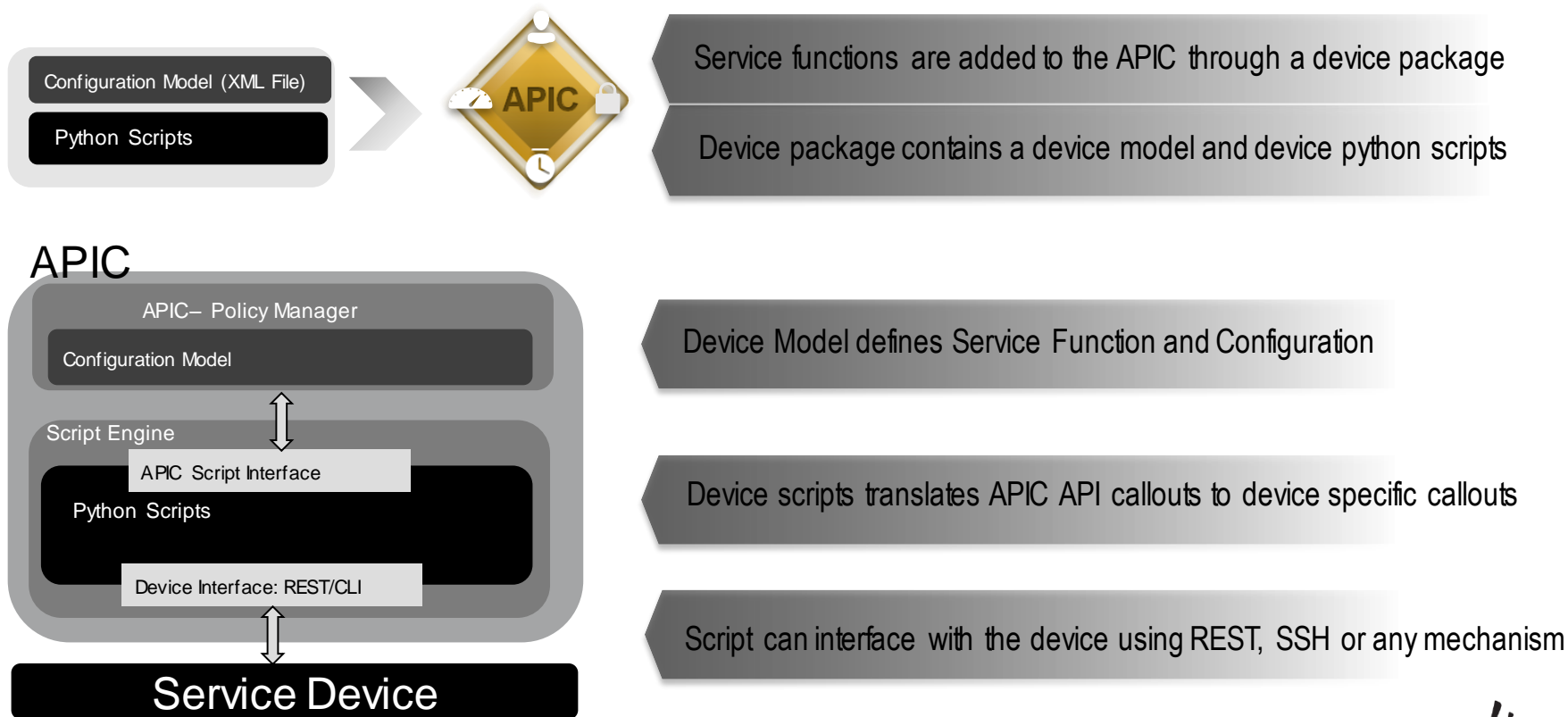
A device package can be uploaded on APIC at run time

Adding new network service support through device package does not require APIC reboot

Key Concepts in Service Insertion

- **Concrete Device**: it represents a service device, e.g. one load balancer, or one firewall
- **Logical Device**: represents a cluster of 2 devices that operate in active/standby mode for instance.
- **Service Graph**: defines a sequence of “functions” connected: e.g. a firewall from Checkpoint followed by a load balancing from “F5”.
- **Logical Device Context**: specifies upon which criteria a specific device in the inventory should be used to render a service graph
- **Device Package**:
 - defines things such as how to label “connectors” for a function, and how to translate “names” from ACI to the specific device.
 - E.g. a load balancer “function” has predefined connectors called:
 - “external”
 - “internal”
 - “management”.

Service Insertion Architecture



Device Package Example

The screenshot displays the Cisco ISE GUI. The top navigation bar includes tabs for SYSTEM, TENANTS, FABRIC, VM NETWORKING, L4-L7 SERVICES, and ADMIN. The left sidebar shows a tree view under 'Packages' with 'Device Types' expanded. A blue rounded rectangle highlights the list of functions for 'Citrix-NetScaler-1.0'. An arrow points to the 'Abs Function Profiles' link at the bottom of this list. The main area, titled 'Device Types', contains a table with the following data:

VENDOR	MODEL	VERSION	FUNCTIONS
Citrix	NetScaler	1.0	AAA, ApplicationFirewall, CacheRedirection, Compression, ContentAccelerator,...

Device Information Extracted Out of Device Package

The screenshot shows the Cisco ICSA interface for the L4-L7 Service Device Type - Acme-ADC-1.0. The left sidebar shows the navigation tree with 'L4-L7 Service Device Types' expanded, and 'Acme-ADC-1.0' selected. The main content area displays the 'PROPERTIES' section for this device type. The properties include:

- Vendor: **Acme**
- Model: **ADC**
- Version: **1.0**
- Capabilities: **GoTo**
- Package Name: **AcmeSample.py**
- Logging Level: **DEBUG: Zero level del**
- Interface Labels:

NAME
inside
mgmt
outside

Three orange callout boxes highlight specific information:

- Functions (Or Services) provided by the Service Device**
SLB, SSL, Responder
- Vendor Info, Software Version Info and Model Info of Service Device**
- Info on how many interfaces types the appliance has (Inside, Outside and Mgmt for e.g.)**

Register Service Devices with APIC

Configure Management IP address on the device

Create username/password for APIC to manage the device

Attach the management interface to appropriate interface/port-group

Register the device with APIC – Provide IP address and Login credentials

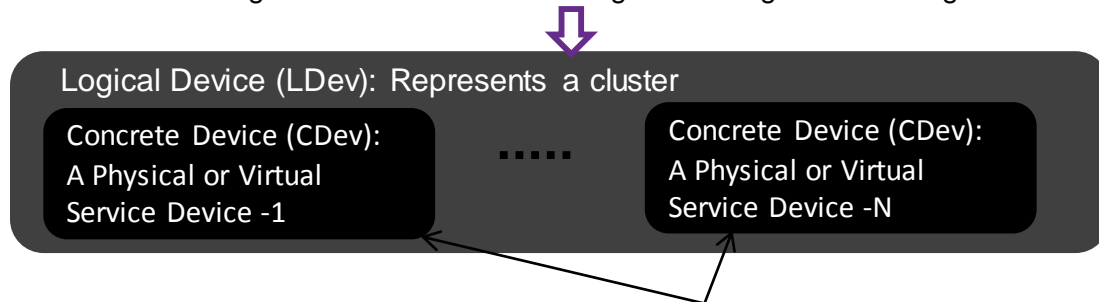
Device Cluster

Devices on APIC are registered as a cluster

Cluster can contain one or more physical or virtual devices

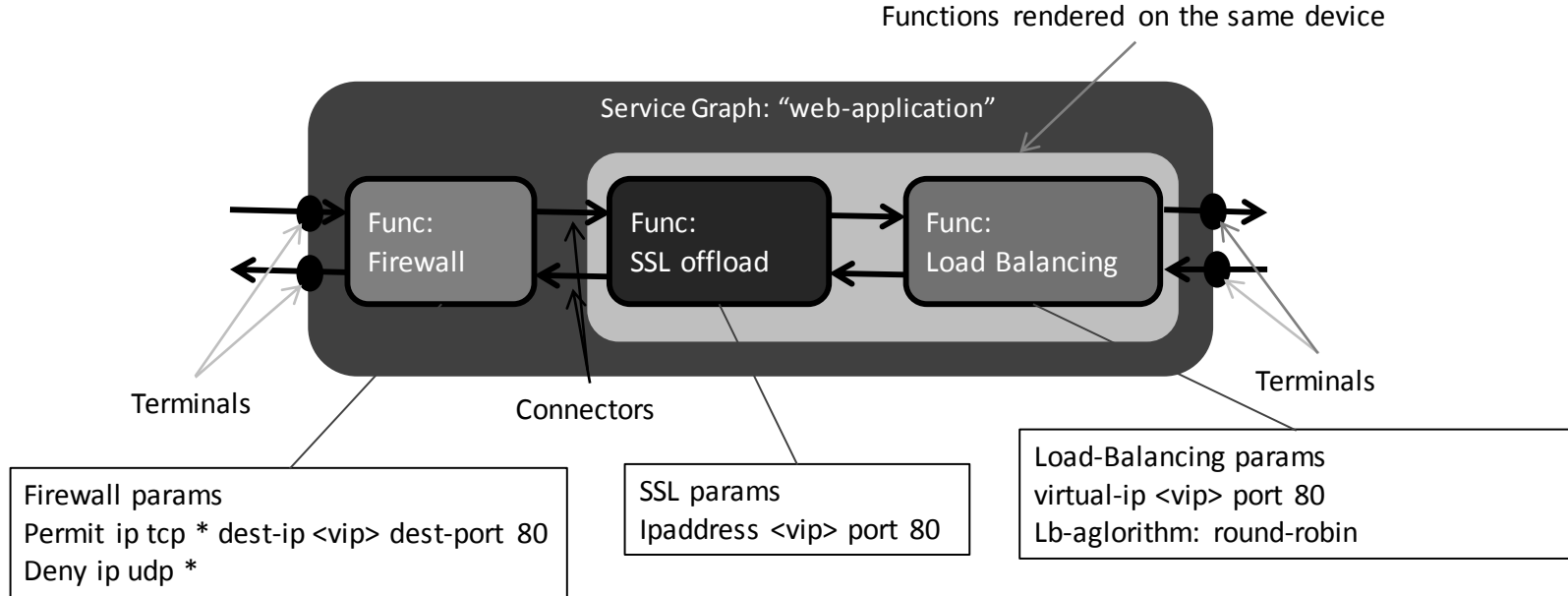
Devices within the cluster can be deployed in Active-Active or Active-Standby mode

APIC configures Service Function using Cluster Mgmt IP and Login Credentials



APIC can configure device specific feature ike (Port-channel configuration etc) using device's IP address and login credentials

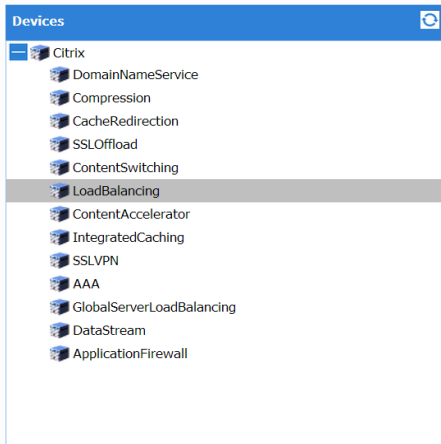
Service Function Graph



Create Service Graph

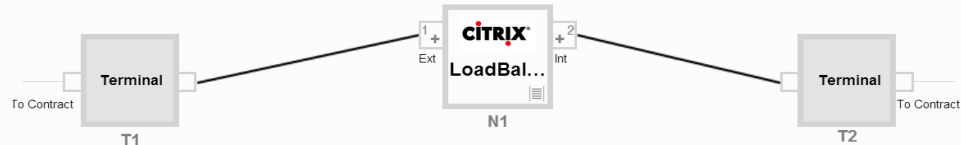
CREATE L4-L7 SERVICE GRAPH

Drag tree node to create L4-L7 service nodes



Name:

Description:

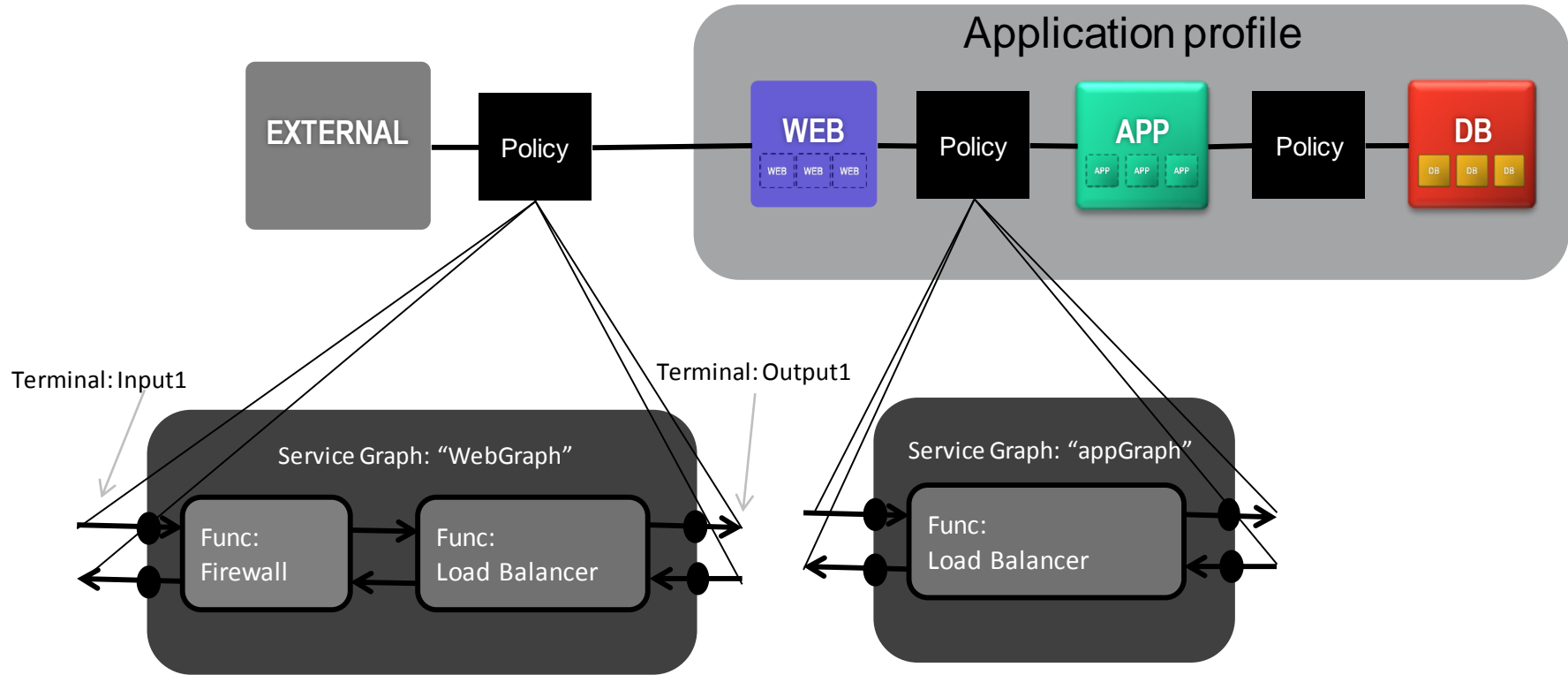


Configure Function Parameters

The screenshot displays the Cisco ISE GUI for configuring a function node. On the left, a navigation tree shows the hierarchy: Tenant coke > L4-L7 Services > Service Graphs > appGraph > Function Node - LoadBalancing. The main panel is titled 'FUNCTION NODE - LoadBalancing' and includes tabs for POLICY, OPERATIONAL, VISIBILITY, FAULTS, and RECORDS. The 'POLICY' tab is active, showing the 'PROPERTIES' section with the name 'LoadBalancing' and function type 'GoTo' (selected over 'GoThrough'). Below this is the 'CONFIG PARAMETERS' section, which contains a table of parameters.

FOLDER/PARAM	NAME	VALUE	CONTAINED BY	TERMINAL
lbserver	lbserver		epg	
lbserver_service_binding	lbService2		epg	
lbserver_service_binding	lbService1		epg	
ipv46	ipv46	20.20.20.200	epg	
name	webVirtualServer	webVirtualServer	epg	
servicetype	serviceTypeTCP	tcp	epg	
port	port	22	epg	
service	webservice1		epg	
ip	ip	30.10.10.101	epg	

Service Insertion

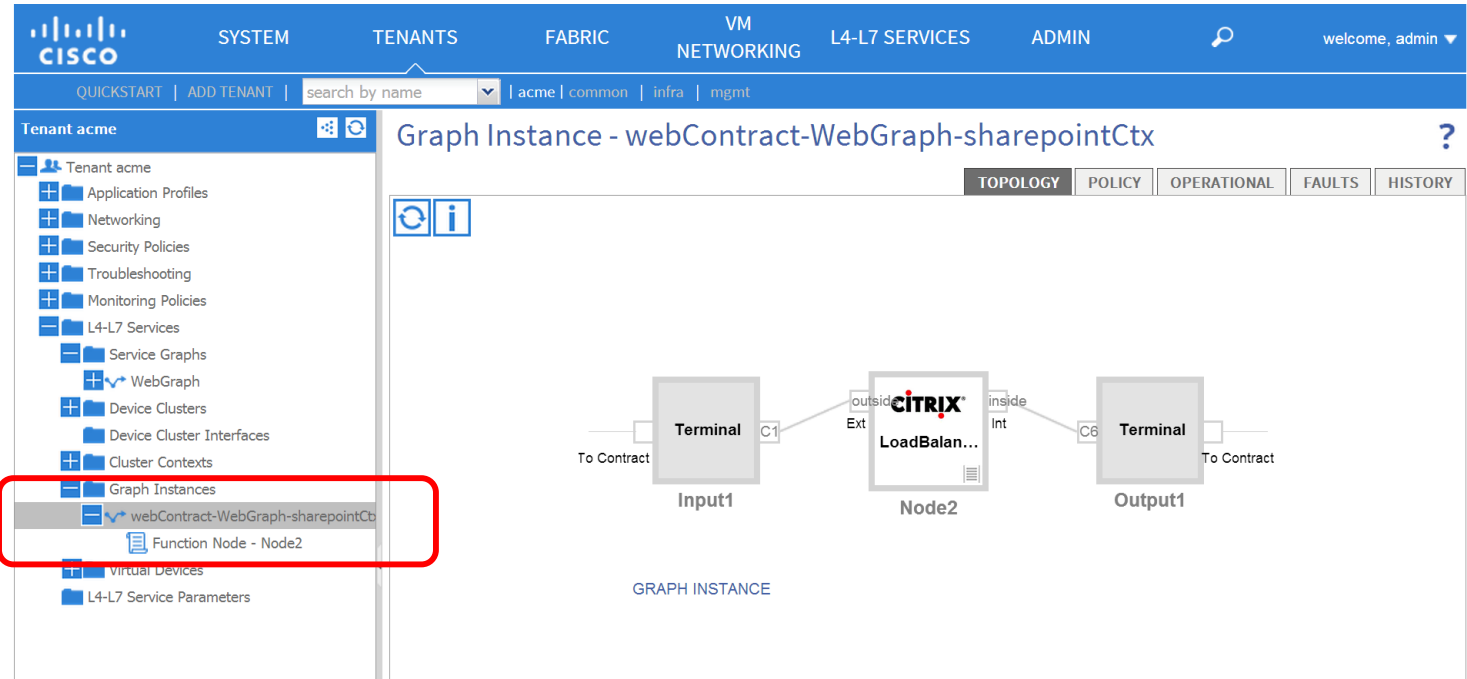


Associate Graph to a Contract

The screenshot displays the Cisco ICM configuration interface for a contract subject named 'http'. The left sidebar shows the 'Tenant acme' tree with various application EPGs and contracts. The main panel is titled 'Contract Subject - http' and includes tabs for 'POLICY', 'OPERATIONAL', 'FAULTS', and 'HISTORY'. The 'GENERAL' tab is active, showing the 'PROPERTY' section. The 'Service Graph' dropdown is highlighted with a red box, indicating the association of the 'WebGraph/Input1' service graph to the contract. Below the property section, a table lists the contract details.

NAME	DESCRIPTION	STATE
http		formed

Example Graph



Services Insertion Configuration Wizard

Three step process and each can be re-used

- 1 Create L4-L7 Service Devices
- 2 Create L4-L7 Service Graph Template
- 3 Apply L4-L7 Service Graph Template to EPGs

Create a L4-7 Service Devices – Single Device

CREATE L4-L7 DEVICES

STEP 1 > GENERAL

1. GENERAL 2. DEVICE CONFIGURATION

Please select device package and enter connectivity information.

GENERAL

Name:

Device Package:

Model:

Mode: ☒ Single Node ☐ HA Cluster

CONNECTIVITY

Physical Domain:

APIC to Device Management Connectivity: ☒ Out-Of-Band ☐ In-Band

CREDENTIALS

Username:

Password:

Confirm Password:

Device 1

Management IP Address:

Management Port:

Physical Interfaces:

Name	Connects To	Direction
------	-------------	-----------

< PREVIOUS NEXT > CANCEL

Device Management IP Address and port

Name of the device

Specify Device Package to manage this Cluster

Model of the device

Policy domain

Login Credentials to manage the device and connectivity information

Create a L4-7 Service Devices - HA

This shows how Wizard will look if you select HA Cluster

CREATE L4-L7 DEVICES

STEP 1 > GENERAL

1. GENERAL2. DEVICE CONFIGURATION

Please select device package and enter connectivity information.

GENERAL

Name:

Device Package:

select an option

Model:

Mode:

☐ Single Node

☒ HA Cluster

CONNECTIVITY

Physical Domain:

select an option

APSC to Device Management Connectivity:

☒ Out-Of-Band

☐ In-Band

CREDENTIALS

Username:

Password:

Confirm Password:

Device 1

Management IP Address:

Management Port:

enter or select val

Physical Interfaces:

Name	Connects To	Direction
------	-------------	-----------

Device 2

Management IP Address:

Management Port:

enter or select val

Physical Interfaces:

Name	Connects To	Direction
------	-------------	-----------

Cluster

Management IP Address:

Management Port:

enter or select val

< PREVIOUS

NEXT >

CANCEL

Create a L4-7 Service Devices – Device Package

List of device package that APIC has will be shown here

CREATE L4-L7 DEVICES

STEP 1 > GENERAL

1. GENERAL2. DEVICE CONFIGURATION

Please select device package and enter connectivity information.

GENERAL

Name:

Device Package:

select an option

Model: CISCO-ASA-1.0.1.43

Mode:

design: none

☒ HA Cluster

CONNECTIVITY

Physical Domain:

select an option

APIC to Device Management Connectivity:

☒ Out-Of-Band

☐ In-Band

CREDENTIALS

Username:

Password:

Confirm Password:

Device 1

Management IP Address:

Management Port:

enter or select val

Physical Interfaces:

Name	Connects To	Direction
------	-------------	-----------

Device 2

Management IP Address:

Management Port:

enter or select val

Physical Interfaces:

Name	Connects To	Direction
------	-------------	-----------

Cluster

Management IP Address:

Management Port:

enter or select val

< PREVIOUS

NEXT >

CANCEL

Create a L4-7 Service Devices – Model (Citrix)

Associated interfaces on the device
to interface labels

Single device or cluster / HA

CREATE L4-L7 DEVICES

STEP 1 > GENERAL

1. GENERAL2. DEVICE CONFIGURATION

Please select device package and enter connectivity information.

GENERAL

Name:

Device Package: Citrix-NetScaler-10.5

Model: NS-9000

Mode: ☐ Single Node ☒ HA Cluster

CONNECTIVITY

Physical Domain:

APIC to Device Management Connectivity: ☒ Out-Of-Band ☐ In-Band

CREDENTIALS

Username:

Password:

Confirm Password:

Device 1

Management IP Address:

Management Port:

Name	Connects To	Direction
eth1.0		
eth1.2		
eth1.3		
eth1.4		
eth1.5		
eth1.6		

Device 2

Management IP Address:

Management Port:

Name	Connects To	Direction
eth1.0		
eth1.2		
eth1.3		
eth1.4		
eth1.5		
eth1.6		

Cluster

Management IP Address:

Management Port:

< PREVIOUS

NEXT >

CANCEL

Create a L4-7 Service Devices – Connectivity (Citrix)

Management
connectivity to
the device



CREATE L4-L7 DEVICES

STEP 1 > GENERAL

1. GENERAL2. DEVICE CONFIGURATION

Please select device package and enter connectivity information.

GENERAL

Name: dev11

Device Package: Citrix-NetScaler-10.5

Model: NS-9000

Mode: ☒ Single Node
☐ HA Cluster

CONNECTIVITY

Physical Domain: phys

APJC to Device Management Connectivity: ☒ Out-Of-Band
☐ In-Band

CREDENTIALS

Username: admin

Password: *****

Confirm Password: *****

Device 1

Management IP Address: 1.1.1.1Management Port: http

Physical Interfaces:

Name	Connects To	Direction
eth1.0		
eth1.2		
eth1.3		
eth1.4		
eth1.5		
eth1.6		

< PREVIOUS

NEXT >

CANCEL

ve!

Create a L4-7 Service Devices – Connectivity (Citrix)

Device Parameter that
is required.



CREATE L4-L7 DEVICES

STEP 2 > DEVICE CONFIGURATION

1. GENERAL2. DEVICE CONFIGURATION

Please enter values for device folder and parameters

Device 1

Features:

HighAvailability

License

All

BASIC PARAMETERSALL PARAMETERS

FOLDER/PARAM	NAME	VALUE
<input type="checkbox"/> Failover Peer Settings		
<input type="checkbox"/> Peer Unit ID		
<input type="checkbox"/> Peer IP Address		

< PREVIOUSFINISHCANCEL

Create a L4-7 Service Devices – Connectivity (Citrix)

CREATE L4-L7 DEVICES

STEP 2 > DEVICE CONFIGURATION

1. GENERAL 2. DEVICE CONFIGURATION

Please enter values for device folder and parameters

Device 1

Features:

- HighAvailability
- License
- All

BASIC PARAMETERS **ALL PARAMETERS**

FOLDER/PARAM	NAME	VALUE
<input type="checkbox"/> <input type="checkbox"/> Failover Peer Settings		
<input type="checkbox"/> Peer Unit ID		
<input type="checkbox"/> Peer IP Address		
<input type="checkbox"/> Failover Settings		
<input type="checkbox"/> Failover VLAN		
<input type="checkbox"/> Failover Interface		
<input type="checkbox"/> Management Access		
<input type="checkbox"/> Failover IP		
<input type="checkbox"/> Failover Subnet		

< PREVIOUS FINISH CANCEL

Shows all the parameters



Create a L4-7 Service Graph Template

Templates gives you option to choose simple Service Graph based on your requirement

CREATE L4-L7 SERVICE GRAPH TEMPLATE

Please enter new graph template information.

Graph Template

Name: graph1

Type:

- Single Node - Firewall in Transparent Mode
- Single Node - Firewall in Routed Mode
- Single Node - ADC in One-Arm Mode
- Single Node - ADC in Two-Arm Mode
- Two Nodes - Firewall in Transparent and ADC in One-Arm mode
- Two Nodes - Firewall in Routed and ADC in One-Arm mode
- Two Nodes - Firewall in Routed and ADC in Two-Arm mode
- Two Nodes - Firewall in Transparent and ADC in Two-Arm mode

SUBMIT CANCEL

Create a L4-7 Service Graph Template

Single Node ADC

Device Package gives you an option that you want to use for the particular Services Graph

Profile will give the service graph all the parameters that is needed. E.g. SSL

Users can also customise the profile. You can click on profile to see what parameters are available.

CREATE L4-L7 SERVICE GRAPH TEMPLATE

Please enter new graph template information.

Graph Template

Name: graph1

Type: Single Node - ADC in Two-Arm Mode

ADC

Device Package: Citrix-NetScaler-10.5/LoadBalancing

Profile: WebVServerProfile

SUBMIT CANCEL

Apply L4-L7 Service Graph Template to EPGs

EPG and Service Graph Template

If you uncheck "Allow All Traffic" i.e. IP Any any or you can create your own specific filter entries

The screenshot shows a web interface for applying a service graph template to EPGs. The title bar reads 'APPLY L4-L7 SERVICE GRAPH TEMPLATE TO EPGs'. Below the title bar, there are two tabs: '1. EPGs' (active) and '2. ADC'. The main content area is titled 'STEP 1 > EPGs' and contains the instruction: 'Please associate a graph template to consumer and provider EPGs.' The form is divided into two sections: 'EPG And Graph Template Information' and 'Contract Information'. In the 'EPG And Graph Template Information' section, there are three dropdown menus: 'Consumer EPG' (set to 'Jun/ap1/epg1'), 'Provider EPG' (set to 'Jun/ap1/epg2'), and 'Graph Template' (set to 'graph1'). In the 'Contract Information' section, there are two radio buttons for 'Contract': 'Create A New One' (selected) and 'Choose An Existing One'. Below this, there is a 'No Filter' section with a checkbox for 'Allow All Traffic' which is checked. At the bottom of the 'Contract Information' section, there is a text field for 'Contract Name' with the value 'ctrct1'. At the bottom right of the form, there are three buttons: '< PREVIOUS', 'NEXT >', and 'CANCEL'.

APPLY L4-L7 SERVICE GRAPH TEMPLATE TO EPGs

STEP 1 > EPGs

1. EPGs 2. ADC

Please associate a graph template to consumer and provider EPGs.

EPG And Graph Template Information

Consumer EPG: Jun/ap1/epg1

Provider EPG: Jun/ap1/epg2

Graph Template: graph1

Contract Information

Contract: ☒ Create A New One ☐ Choose An Existing One

No Filter: ☒ Allow All Traffic

Contract Name: ctrct1

< PREVIOUS NEXT > CANCEL

Apply L4-L7 Service Graph Template to EPGs

APPLY L4-L7 SERVICE GRAPH TEMPLATE TO EPGs

STEP 2 > ADC

1. EPGs2. ADC

Please check feature boxes to create or modify parameters of the selected feature.

Device Cluster Information

Device Cluster: dev1

Features and Parameters

Features:

Network

VirtualServer

ServiceGroup

Service

Monitor

TrafficPolicy

SLB

All

BASIC PARAMETERSALL PARAMETERS

FOLDER/PARAM	NAME	VALUE	APPLY TO SPECIFIC DEVICE
<input checked="" type="checkbox"/> Device Config	Device		
<input checked="" type="checkbox"/> Configure Network	network		
<input checked="" type="checkbox"/> Netscaler IP	vip		
<input checked="" type="checkbox"/> IP Address	ipaddress	192.168.0.10	
<input checked="" type="checkbox"/> Network Mask	netmask	255.255.255.0	
<input checked="" type="checkbox"/> TCP Profile	tcpprofile		
<input checked="" type="checkbox"/> Name	profilename	TCPProfile	
<input checked="" type="checkbox"/> Routing	Route		
<input checked="" type="checkbox"/> Default Gateway	gateway	10.10.10.1	
<input checked="" type="checkbox"/> Network Mask	netmask	255.255.255.0	
<input checked="" type="checkbox"/> Subnet	network	local1	
<input checked="" type="checkbox"/> VLAN	VLAN		
<input checked="" type="checkbox"/> ID	id	20	
<input checked="" type="checkbox"/> Function Config	Function		

A long-exposure photograph of a city street at night. The foreground is filled with vibrant, multi-colored light trails from moving vehicles, creating a sense of motion. In the background, a modern pedestrian bridge with blue lighting spans the street. Tall buildings with lit windows and storefronts line the street, and several flags are visible on poles to the left.

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