



Unleash the Power of Your Network with One Platform Kit (onePK)

Comprehensive. Extensible. Any Platform.

Ken Hook, Sr Product Manager, Cisco ONE Strategy Team

www.cisco.com/go/one

February 2013

We'll get started a few minutes past the top of the hour.

Note: you may not hear any audio until we get started.

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Cisco ONE/N1K Public Webinars, 1H 2013

Date/Time	Topic
Thur, Feb 21st at 0900 PST	Cisco Open Network Environment (Cisco ONE) – Next Phase of Network Programmability and SDN
Thur, Feb 28th at 0900 PST	Cisco One Platform Kit (onePK): Technical Deep Dive and key use cases
Wed, Mar 6th at 0900 PST	Nexus 1000V for Hyper-V with Microsoft SCVMM integration
Wed, Mar 13th at 0900 PST	Cisco ONE controller: Technical Deep Dive and key use cases
Wed, Mar 20th at 0900 PST	5000 Seat VDI Reference Architecture: Cisco UCS & Nexus 1000V, Citrix XenDesktop, and EMC VNX
Wed, Mar 27th at 0900 PST	Nexus 1000V v2.2 for vSphere: More scale, Multicast-less VXLAN, VXLAN Gateway
Wed, April 3rd at 0900 PST	Cloud Services Router (CSR 1000V): Technical deep dive and key use cases
Wed, April 10th at 0900 PST	Cloud Security with ASA 1000V and Virtual Security Gateway v2.1 (VSG)
Wed, April 17th at 0900 PST	Secure Hybrid Cloud solution with Nexus 1000V InterCloud & VNMC InterCloud
Wed, April 24th at 0900 PST	Nexus 1100 for Cloud Network Services: New Services & Ecosystem
Wed, May 1st at 0900 PST	Cloud Networking Services: vNAM and vWAAS
Wed, May 8th at 0900 PST	Virtualized Multiservice Data Center (VMDC) solution with Cloud Networking Services
Wed, May 15th at 0900 PST	Nexus 1000V for KVM (with OpenStack and VXLAN)

Register and view recordings/presentations here:

www.cisco.com/go/1000vcommunity

Speaker & Panelists Introduction

Speaker



Ken Hook

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Panelists



David Lin

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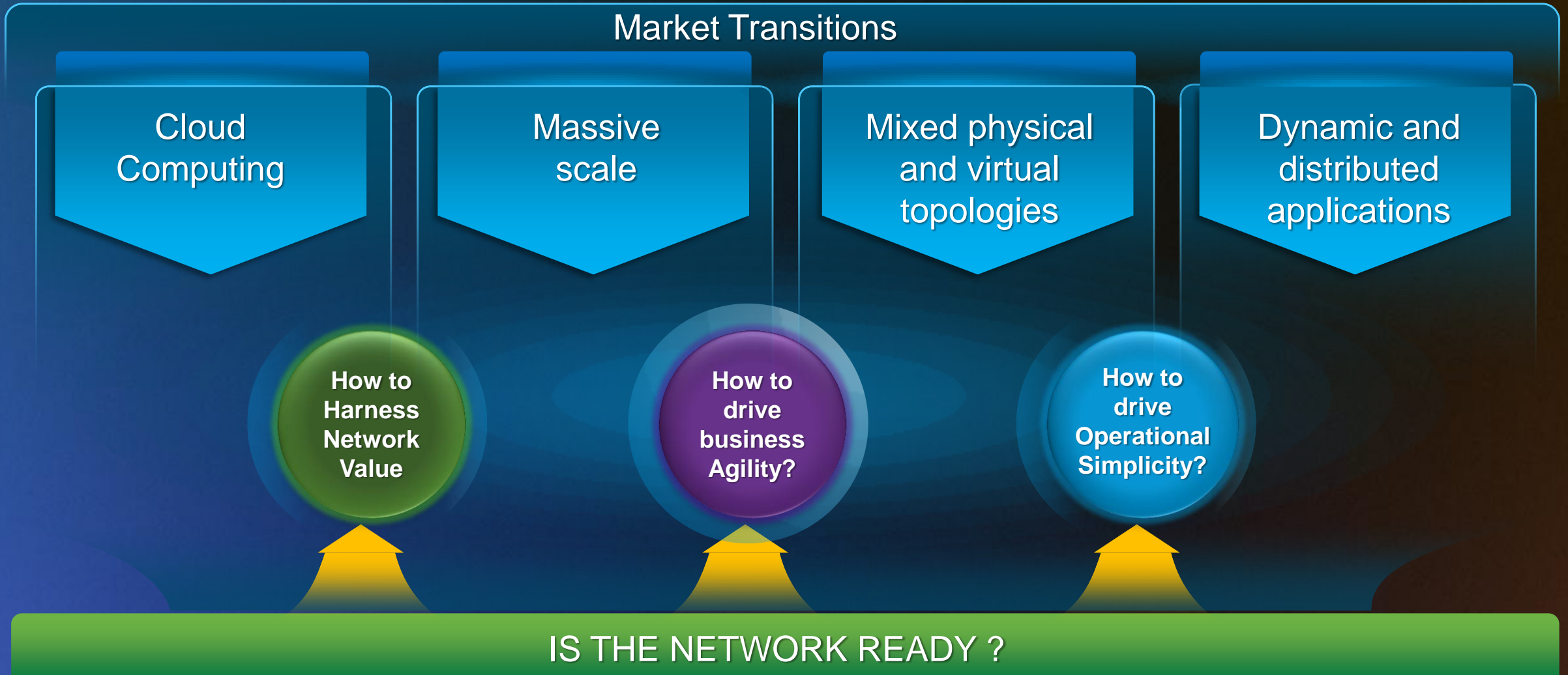
Shelly Cadora

Technical Marketing Engineer
NOSTG Technical Marketing
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Agenda

- Network Programmability and Software Defined Networking Trends
- Cisco One Platform Kit (onePK) Overview
- onePK Examples and Use Cases
- Summary and Q&A

Market Transitions Driving Greater Demands on the Network



Customer Insights



Research/Academia

- Experimental OpenFlow/SDN components for production networks

➤ Network “Slicing”



Massively Scalable Data Center

- Customize with Programmatic APIs to provide deep insight into network traffic

➤ Network flow management



Cloud

- Automated provisioning and programmable overlay

➤ Scalable Multi-tenancy”



Service Providers

- Policy-based control and analytics to optimize and monetize service delivery

➤ Agile service delivery



Enterprise

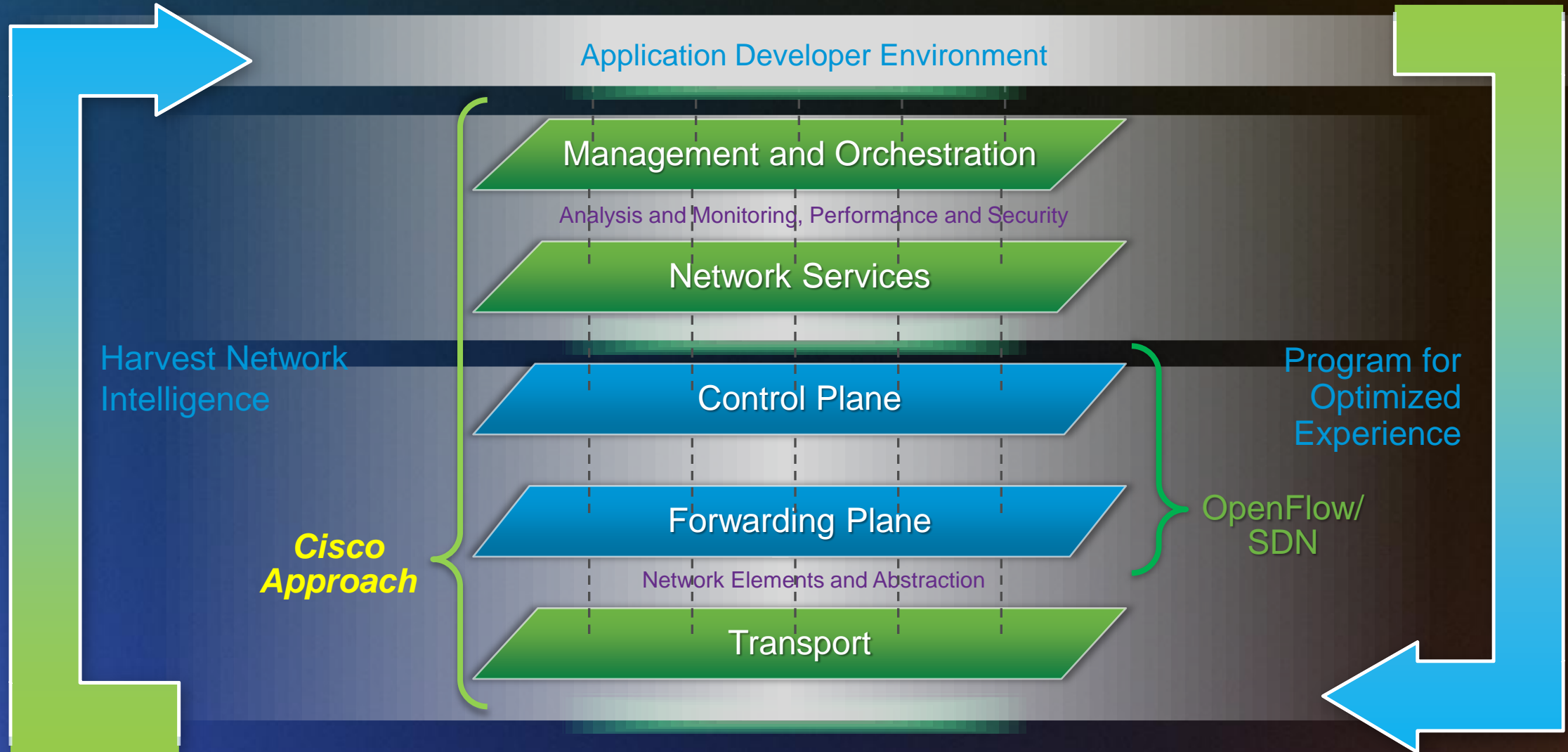
- Virtualization of workloads, VDI, Orchestration of security profiles

➤ Private Cloud Automation

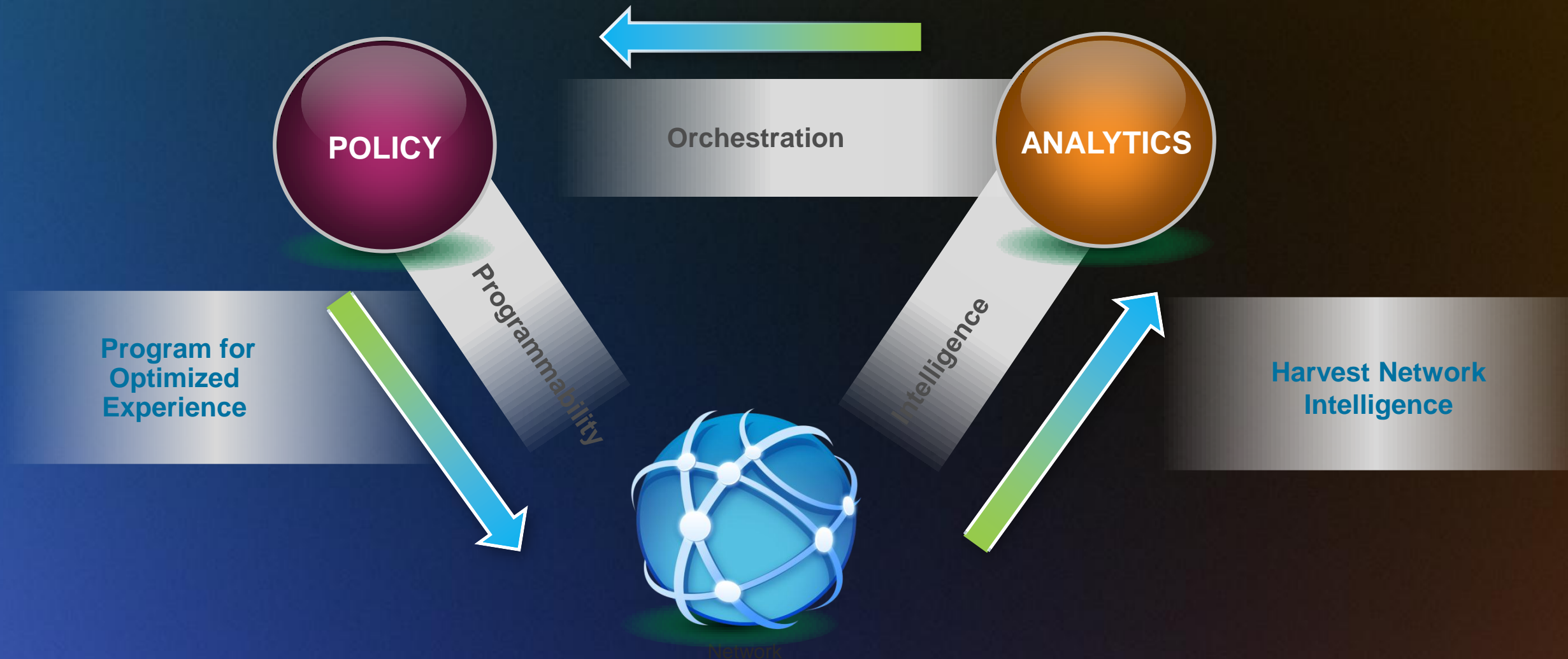
Diverse Functionality Required Across Segments

Programmability at multiple layers of the network

Flexibility in deriving abstractions



Cisco's Approach Enables Programmability... + Provides Hooks to Harvest Network Intelligence, To Inform Policy



Evolution of the Intelligent Network

Preserve What's Working

- Resiliency
- Scale and Security
- Rich feature-set



Evolve for Emerging Requirements

- Operational Simplicity
- Programmability
- Application aware

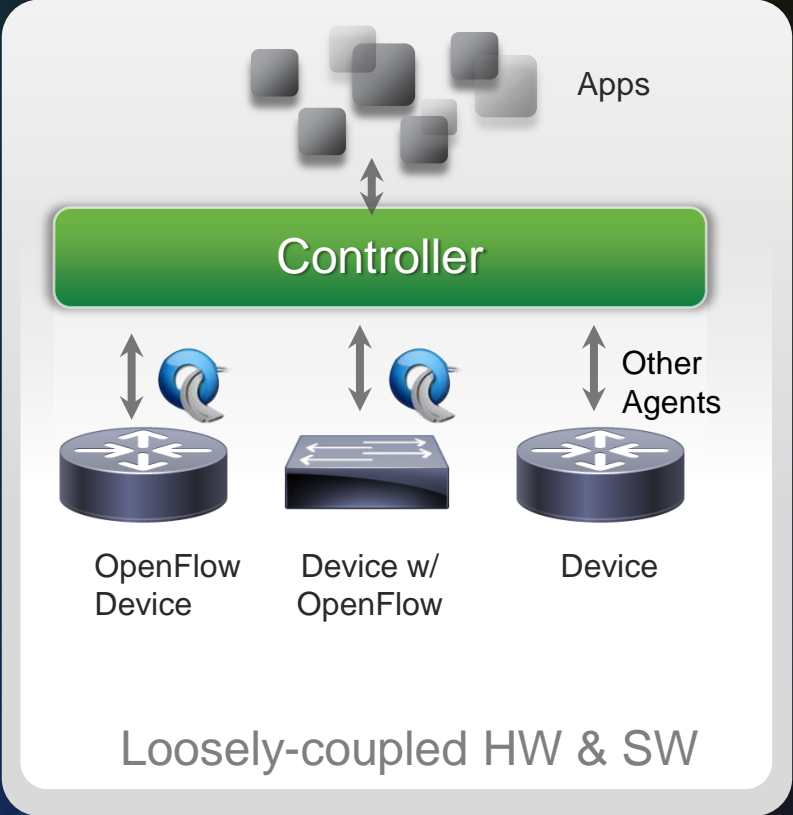
Evolve the Network for the Next Wave of Application Requirements

Evolution Demands Flexibility

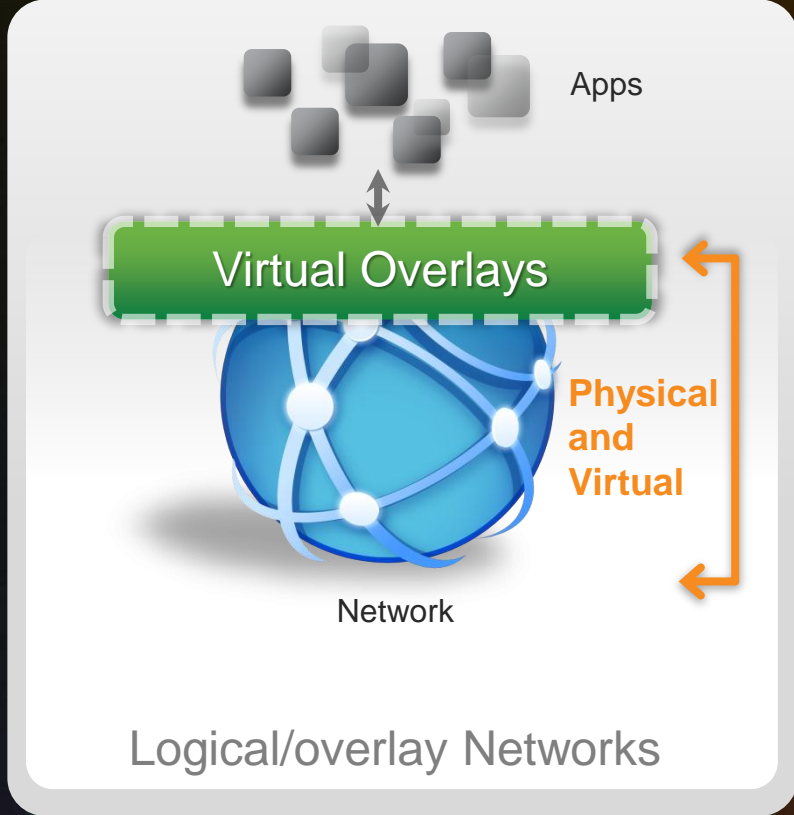
Approach 1



Approach 2

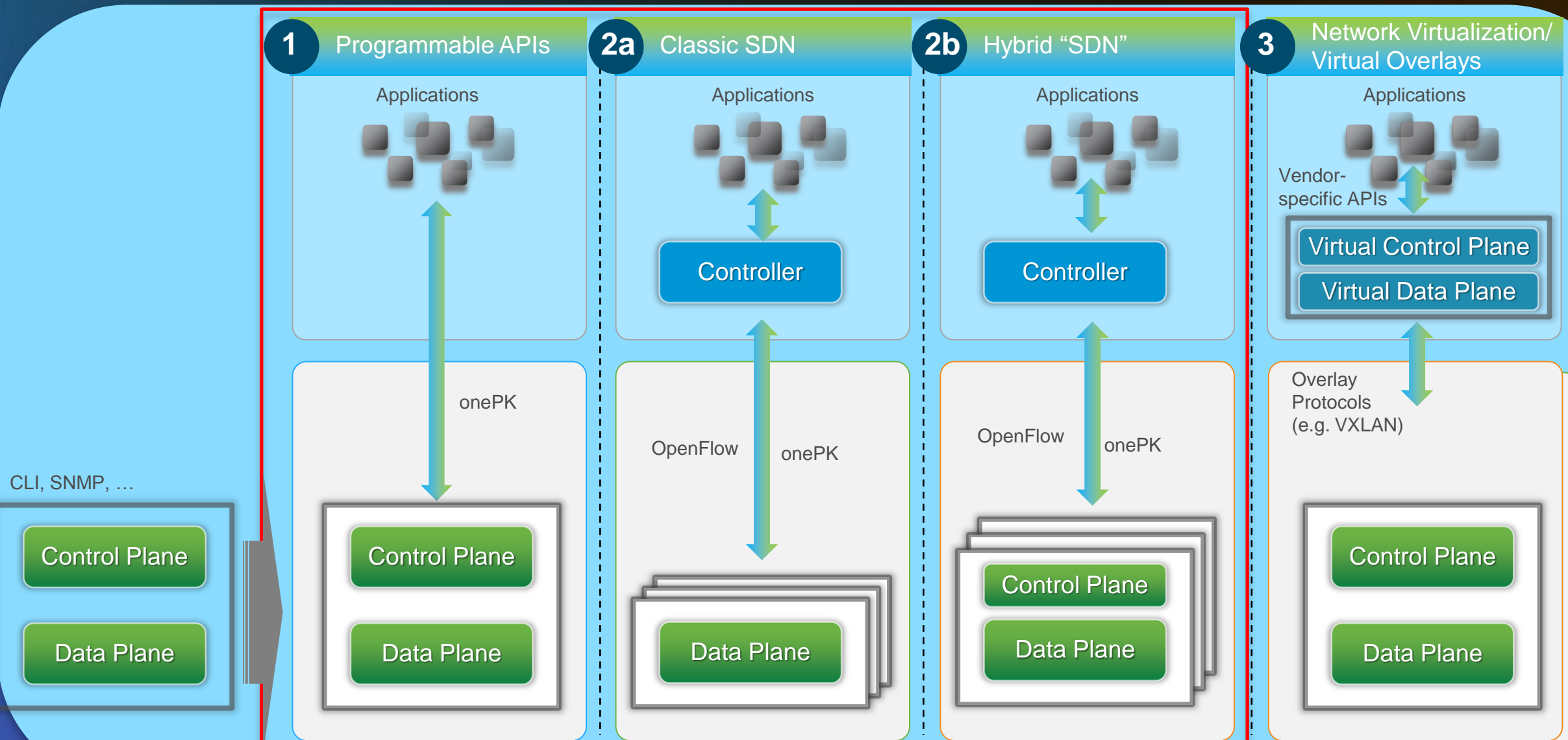


Approach 3



Cisco Approach: Flexibility to Choose—The Power of “AND”

Network Programmability Models



onePK enables Network Programmability across multiple models

Cisco Innovations



onePK Developer Kit

- Complete developer's kit for multiple Cisco Platforms, Servers, Blades
- Rapidly develop test and deploy Applications.
- Phased availability across IOS, IOS-XR and NX-OS platforms

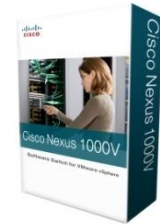
Programmatic APIs



Controllers + Agent Support

- Engage with universities & research for campus slicing use case
- OpenFlow experimental support on select Cisco platforms
- Controller SW for experimentation on production networks

Controllers and Agents



Overlay Network Solutions

- Multi-hypervisor support on Nexus 1000V (incl. OpenSource hypervisor)
- OpenStack and REST APIs on N1KV for rapid tenant provisioning
- VXLAN-VLAN gateway (for bridging traditional environments)
- Virtual or Physical Network Services

Virtual Overlays

Introducing onePK: Get Your Build On.

(One Platform Kit)

BUILD, AUTOMATE, IMPROVE

SPEED & FASTER ADAPTABILITY

EXTEND TO NEW BUSINESS PLATFORMS

REVENUE & COST SAVINGS

SIMPLICITY, INTEGRATION &
THE POWER OF CHOICE

C, JAVA, REST, Python Development

API Presentation



OnePK

API Infrastructure

(IOS)

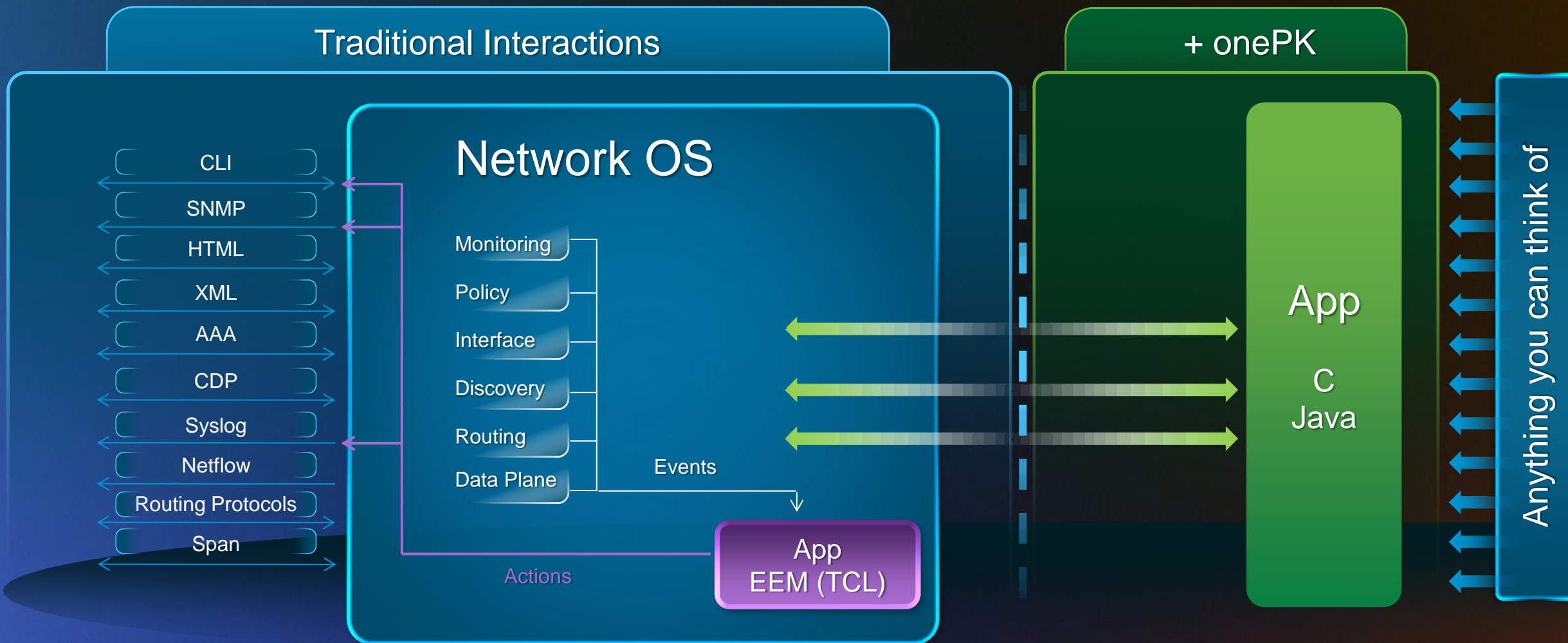
(NX-OS)

(IOS-XR)

Write Once, Run Anywhere

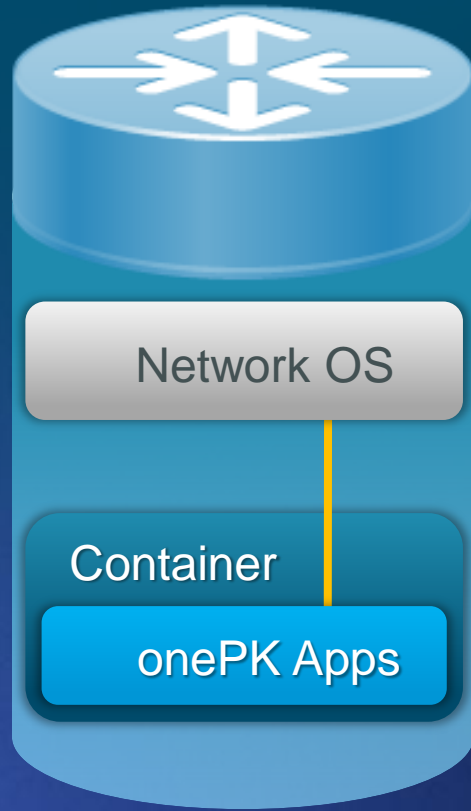
One Platform Kit (onePK)

Enhanced Interactions with the Network Operating System

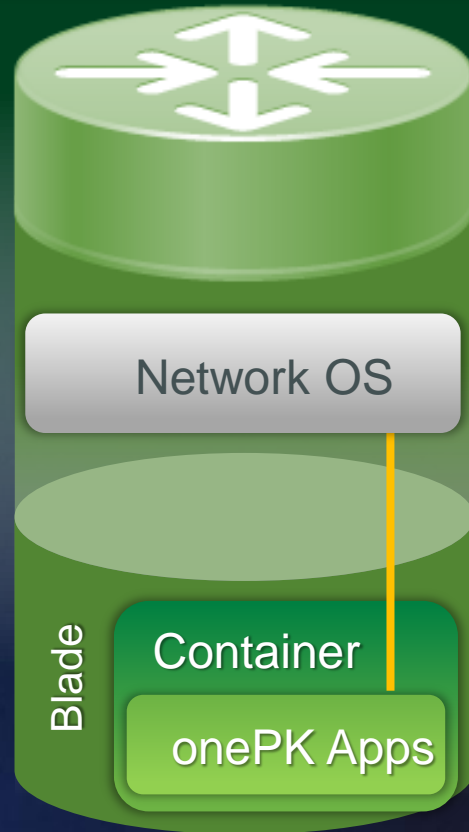


onePK Application Hosting Options

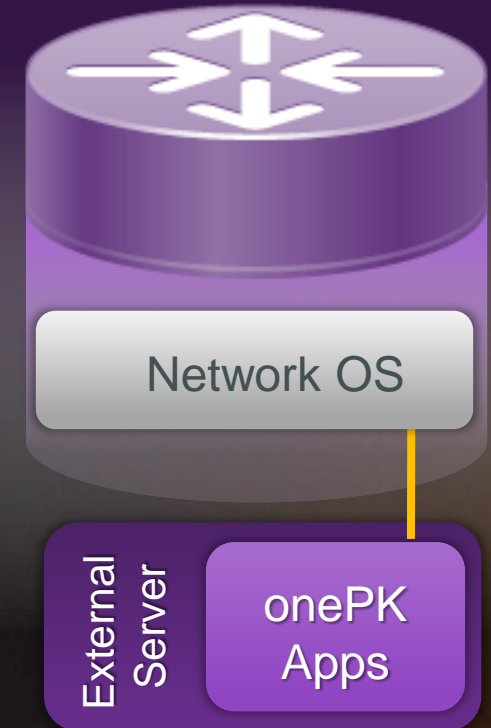
Process Hosting



Blade Hosting



End-Point Hosting



Write Once, Run Anywhere

Unleash the Power of Your Network



Flexible development environment to:

- Reach into your network and extract the information you need.
- Directly manipulate flows and modify packets in real-time.
- Create customized services that seamlessly integrate into your network.
- Optimize routine operational tasks with improved automation.

Build, Automate, Extend, Scale... with Control.

- **BUILD, AUTOMATE, IMPROVE:** New or Improve Existing Applications & Services
- **SPEED & FASTER ADAPTABILITY:** Network flexibility for rapidly changing business needs
- **EXTEND WITH CONTROL:** Utilize data and analytics on network traffic to empower new business systems.
- **REVENUE & COST SAVINGS:** Monetization of new applications or services. Create services faster with code that you can write once and run anywhere.
- **SIMPLICITY, INTEGRATION & THE POWER OF CHOICE:**
 - Utilize with tools of choice.
 - Choose your implementation and compiler.
 - Run it on servers, services blades, or on the system processor.

Cisco Routers & Switches

On The Server or On the Blade

Virtual Environments And More Coming Soon

onePK for Rapid Application Development

Developer Environment

- Language of Choice
- Programmatic Interfaces
- Rich Data Delivery via APIs

Comprehensive Service Sets

Better Apps; New Services
Monetization Opportunity

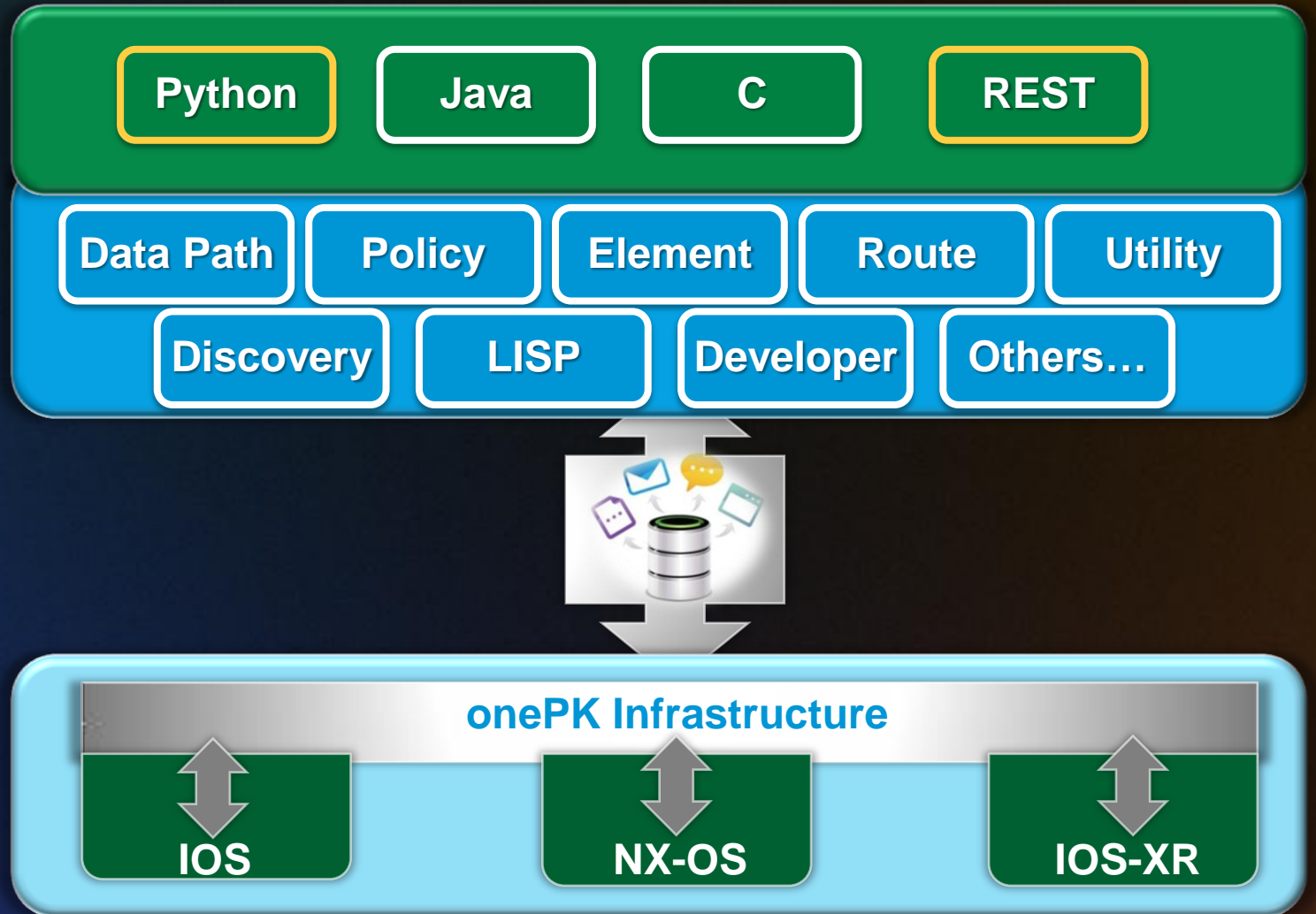


Deploy:

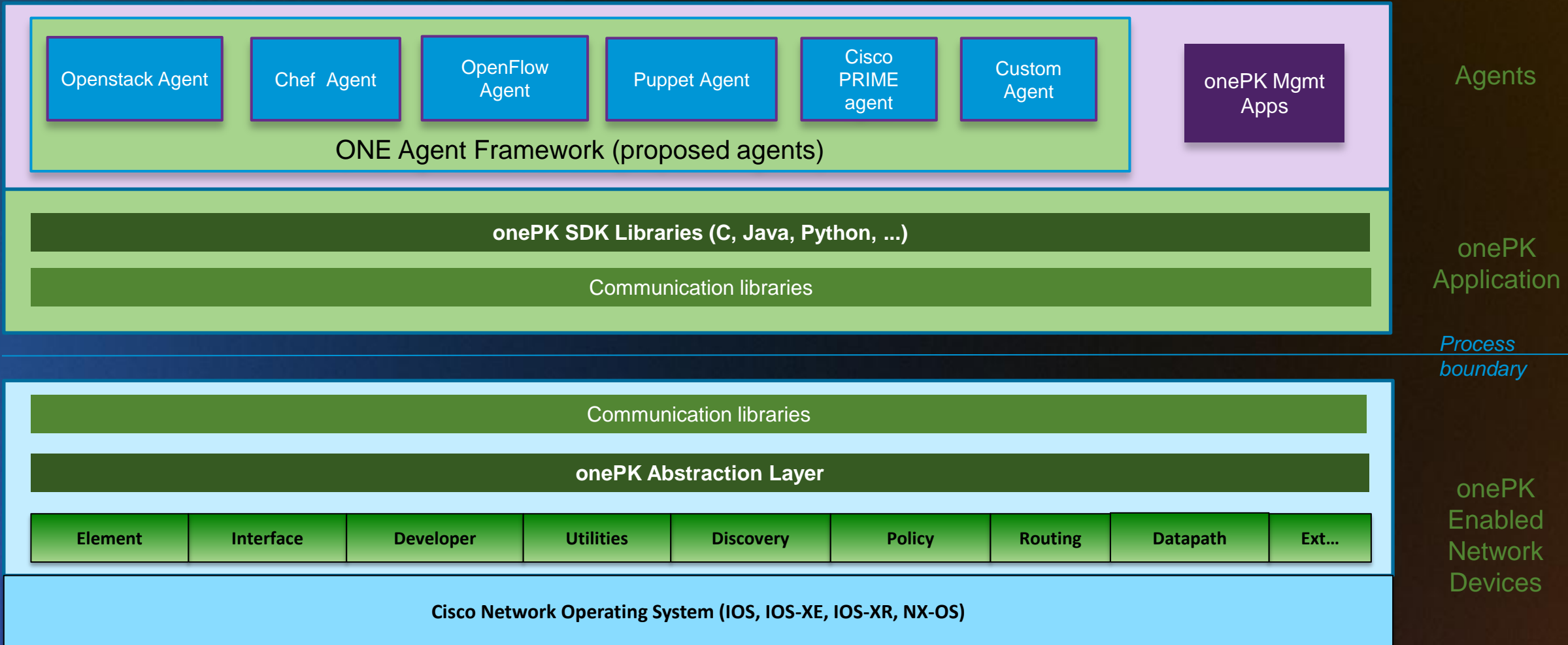
- On a Service Blade
- On an External Server
- Directly on the Device

Network Data

Control, Extend, Scale

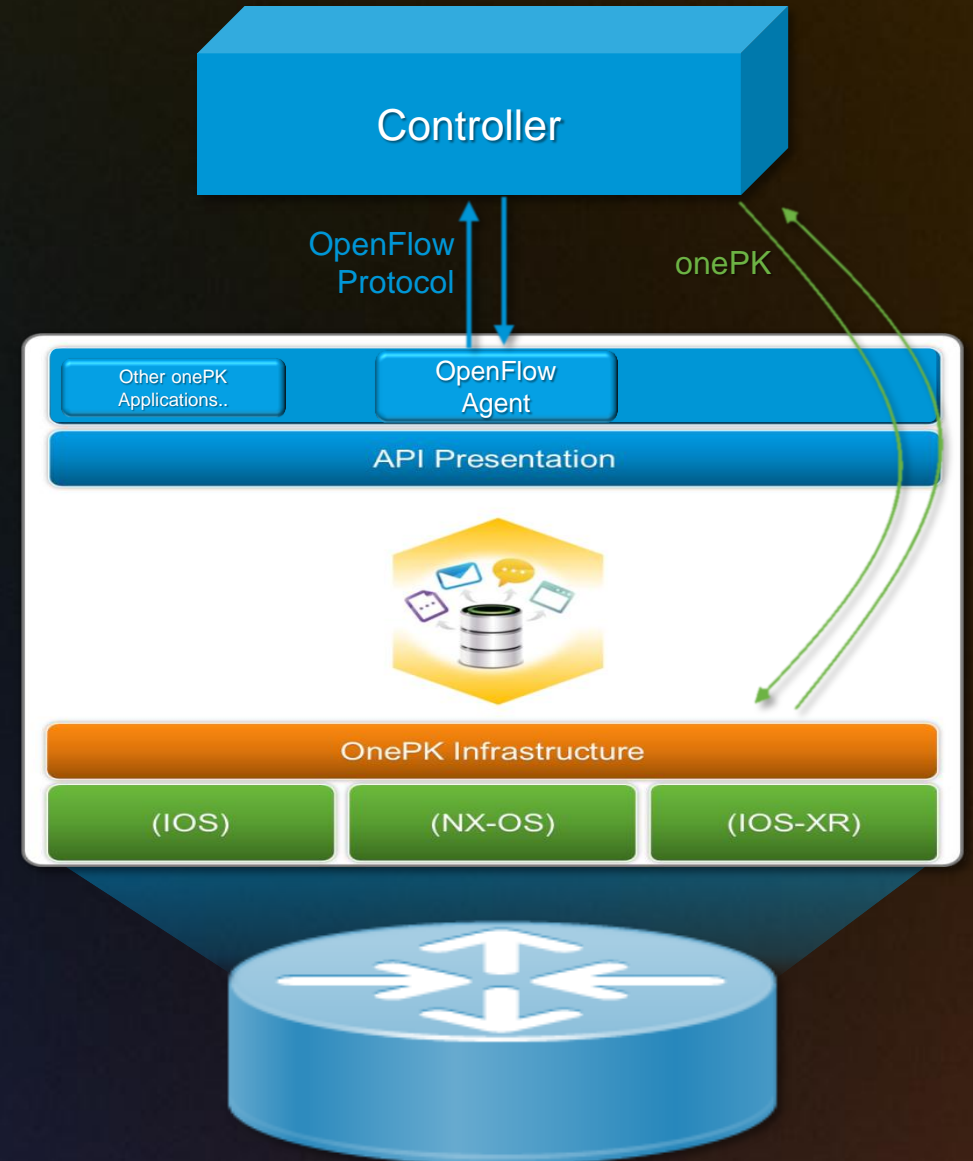


Agent Architecture on onePK



onePK and OpenFlow

- onePK is Cisco's cross-OS programmability tool kit for innovative applications that expand the capability of our platforms
- OpenFlow is an industry-standard flow-control protocol sponsored by the ONF, that Cisco supports
- The Cisco ONE Controller gives users a network-wide view, leveraging onePK and OpenFlow on each network node
- Together, these three innovative new products give users or developer partners that ability to optimize the network operation for their particular application
- onePK and OpenFlow will be available on a wide variety of Cisco Platforms



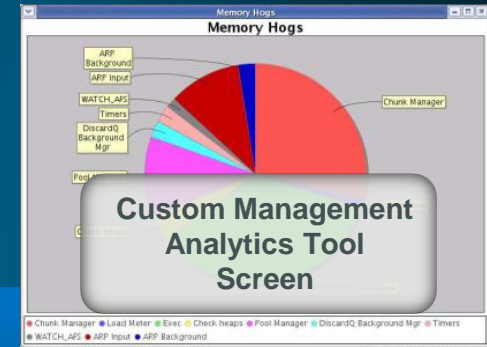
onePK

Custom Management Application

Network Operations Center



Network Operator



onePK Enables Custom Management Application

Network

Switch with onePK and App

Custom Management Agent

Switch with onePK and App

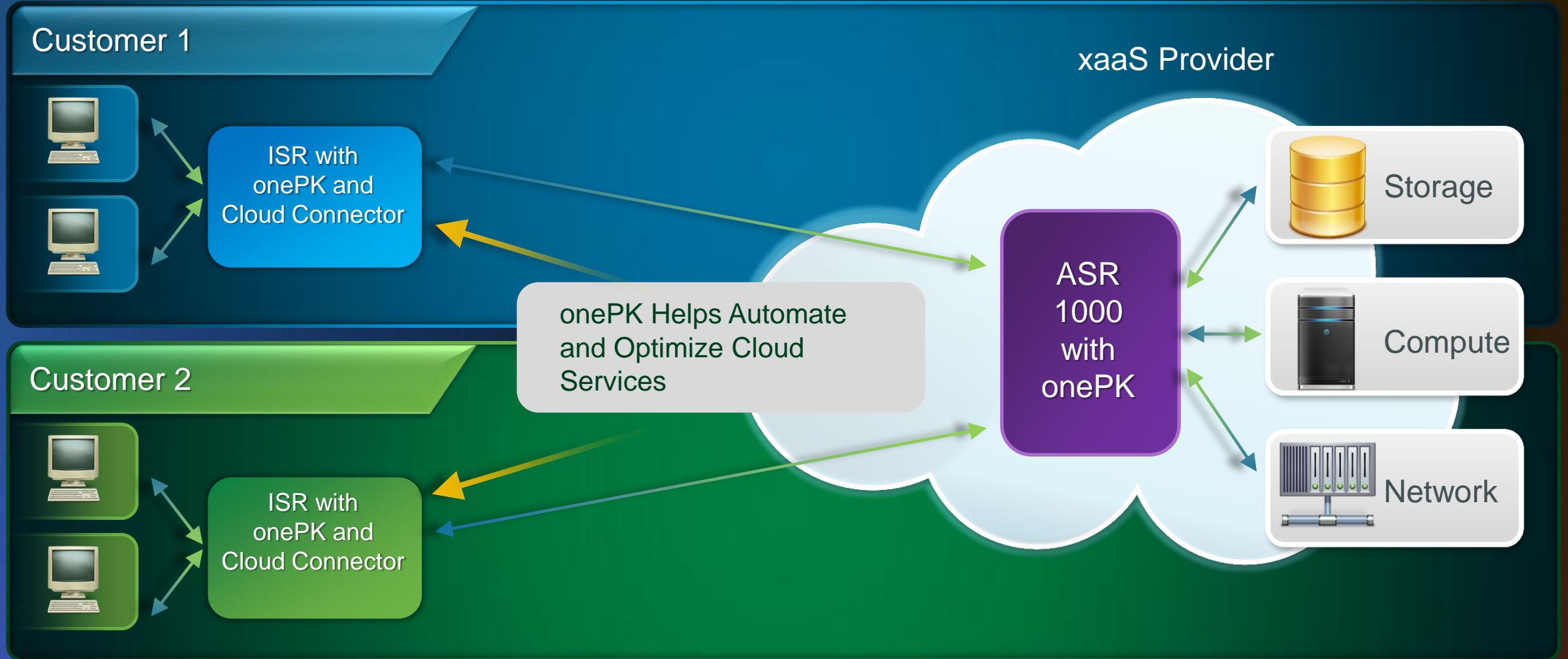
Custom Management Agent

Router with onePK and App

Custom Management Agent

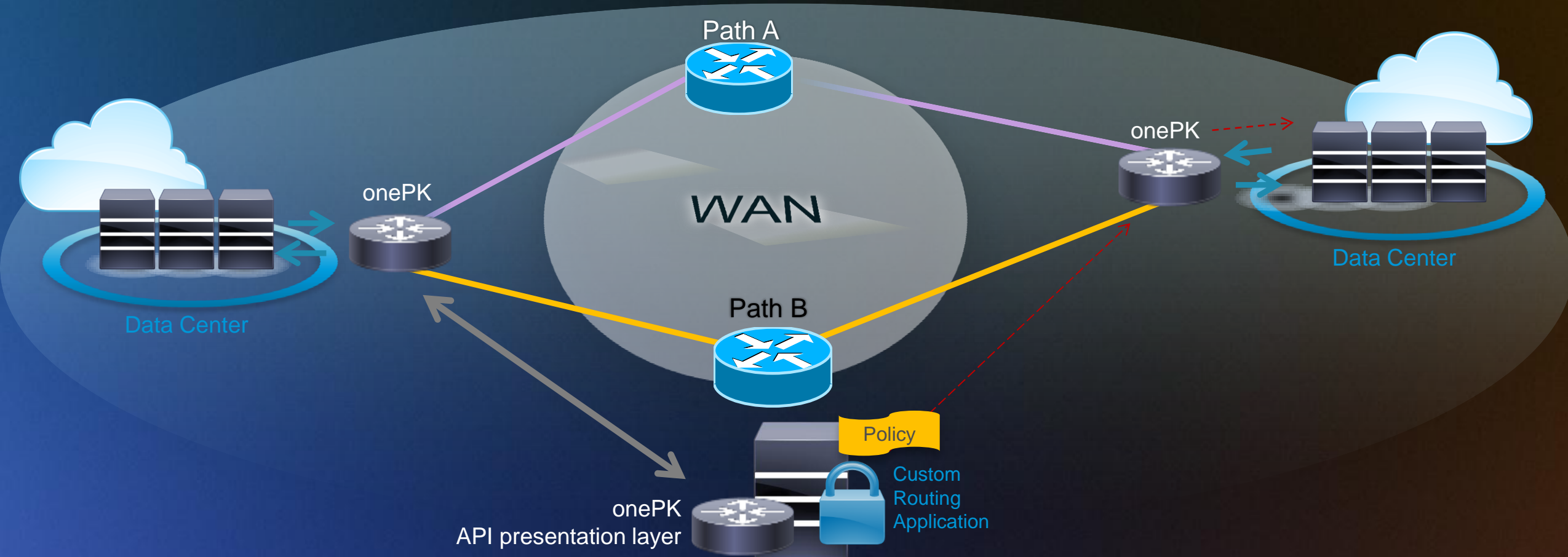
onePK

Cloud Services Automation



Custom Routing with onePK

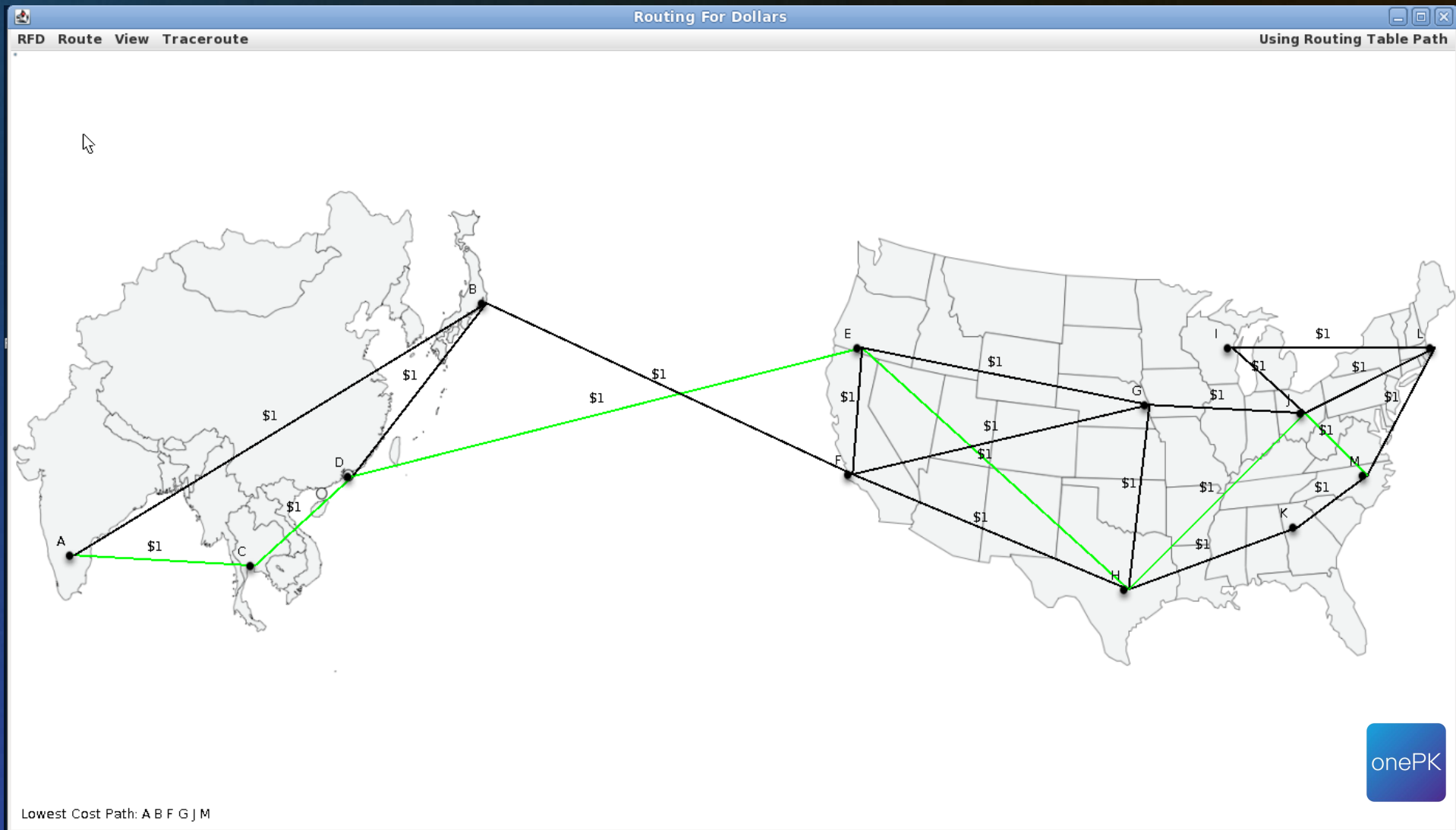
Data Center Traffic Forwarding Based on a Custom Algorithm



**Unique Data Forwarding Algorithm Highly Optimized
for the Network Operator's Application**

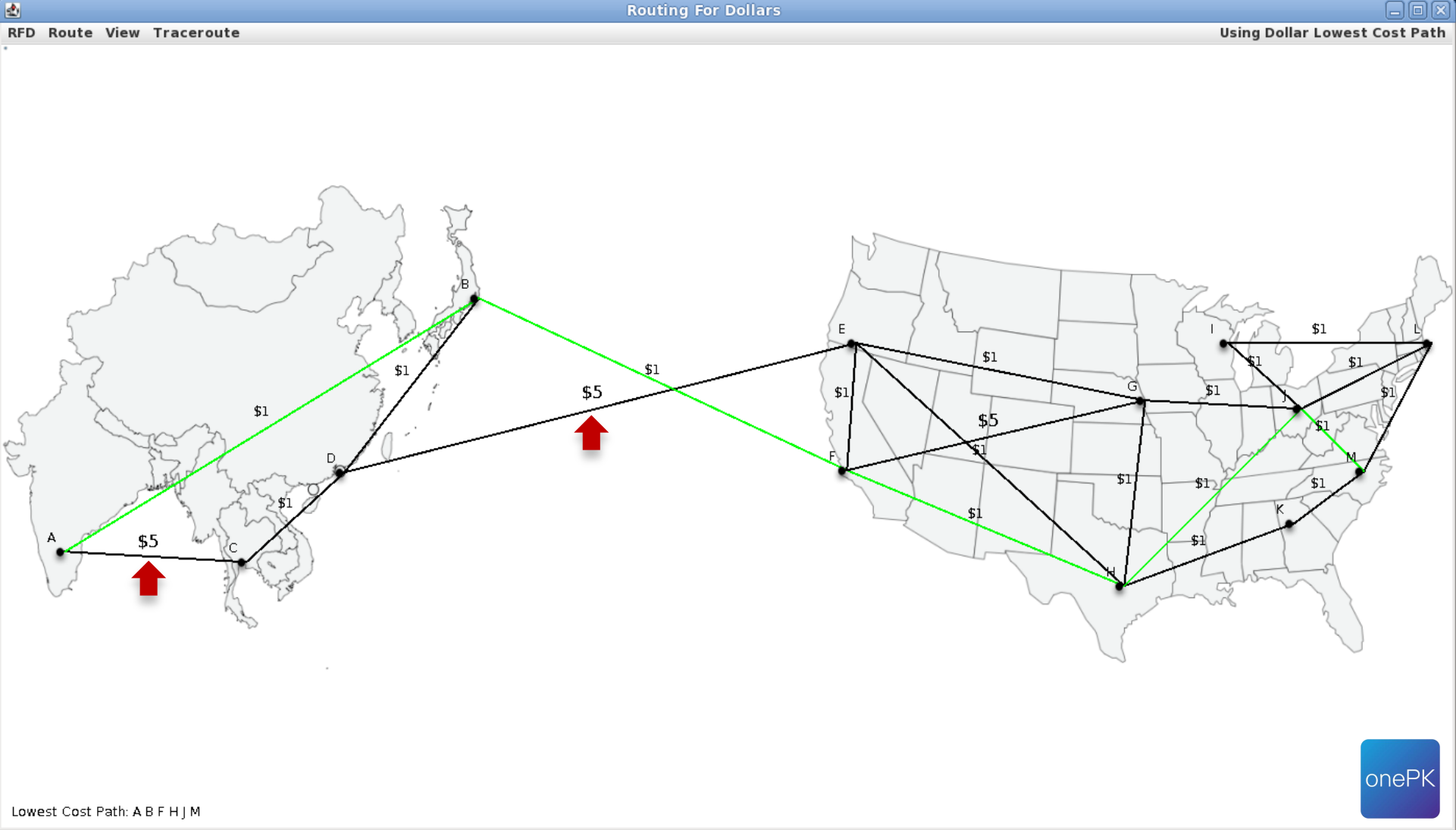
Custom Routing

Initial Setup: Default routing using EIGRP



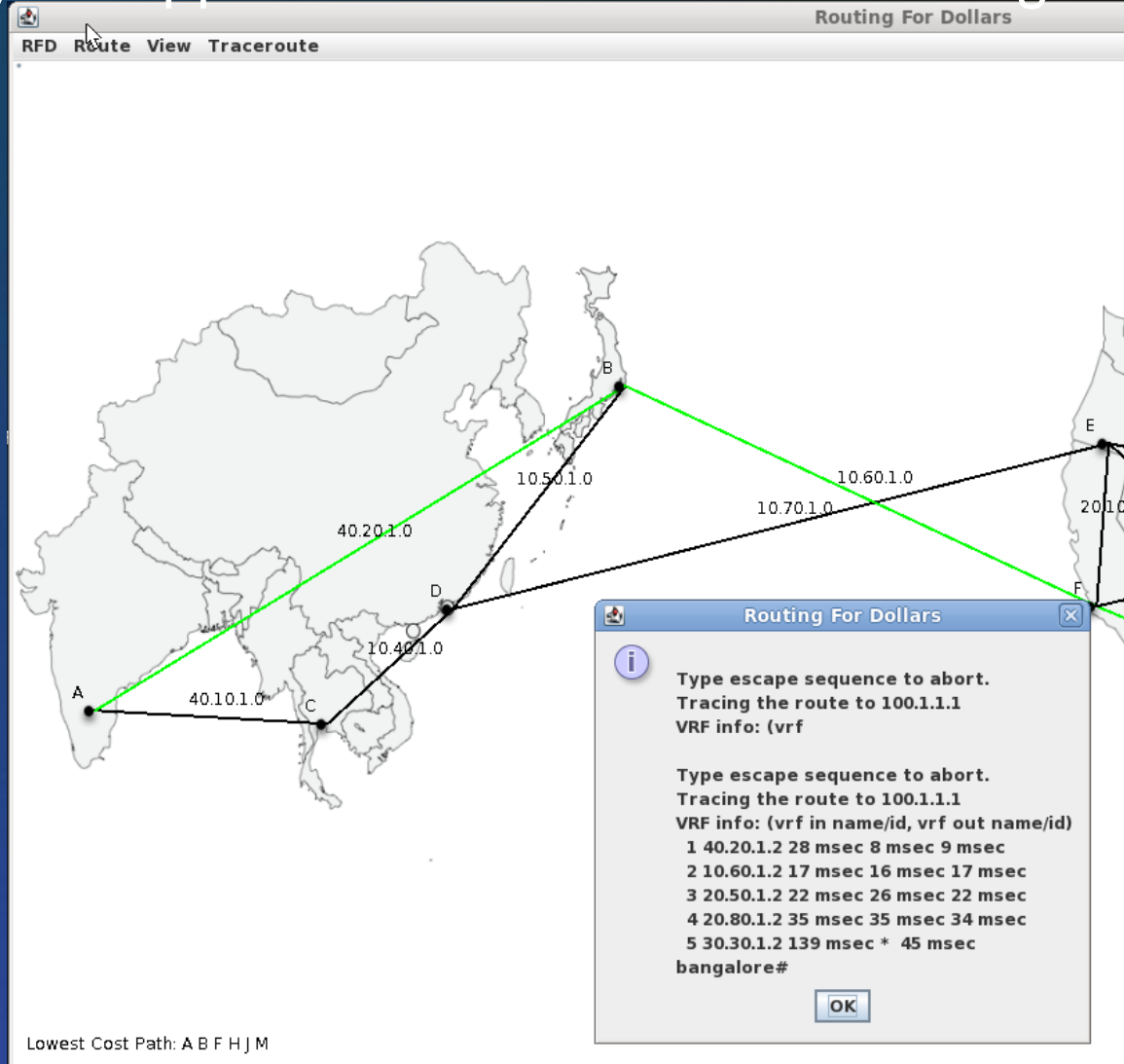
Custom Routing

Routing for Dollars: Application driven routes installed in network



Custom Routing

Tracing the application installed route – using the developer and element services



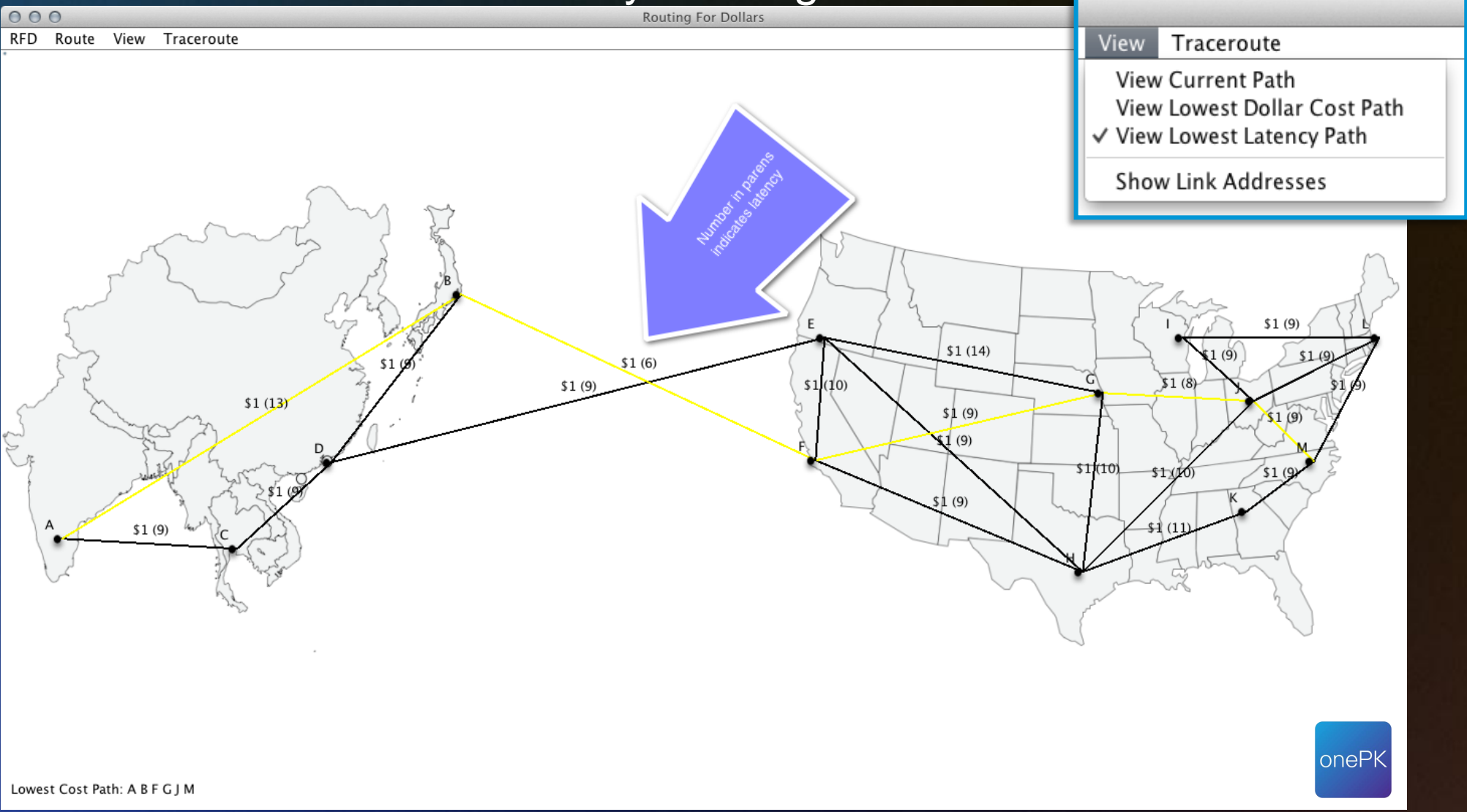
```
bangalore#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
A - application route
+ - replicated route, % - next hop override
```

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C 10.1.1.0/24 is directly connected, Ethernet0/0
L 10.1.1.4/32 is directly connected, Ethernet0/0
D 10.40.1.0/24 [90/2681856] via 40.10.1.2, 2w1d, Serial2/0
D 10.50.1.0/24 [90/3193856] via 40.10.1.2, 2w1d, Serial2/0
D 10.60.1.0/24 [90/3705856] via 40.10.1.2, 2w1d, Serial2/0
D 10.70.1.0/24 [90/3193856] via 40.10.1.2, 2w1d, Serial2/0
D 20.0.0.0/24 is subnetted, 10 subnets
D 20.10.1.0 [90/3705856] via 40.10.1.2, 2w1d, Serial2/0
D 20.20.1.0 [90/4729856] via 40.10.1.2, 2w1d, Serial2/0
D 20.30.1.0 [90/3705856] via 40.10.1.2, 2w1d, Serial2/0
D 20.40.1.0 [90/4217856] via 40.10.1.2, 2w1d, Serial2/0
D 20.50.1.0 [90/4217856] via 40.10.1.2, 2w1d, Serial2/0
D 20.60.1.0 [90/4217856] via 40.10.1.2, 2w1d, Serial2/0
D 20.70.1.0 [90/4729856] via 40.10.1.2, 2w1d, Serial2/0
D 20.80.1.0 [90/4217856] via 40.10.1.2, 2w1d, Serial2/0
D 20.90.1.0 [90/6265856] via 40.10.1.2, 2w1d, Serial2/0
D 20.100.1.0 [90/4729856] via 40.10.1.2, 2w1d, Serial2/0
D 30.0.0.0/24 is subnetted, 5 subnets
D 30.10.1.0 [90/5241856] via 40.10.1.2, 2w1d, Serial2/0
D 30.20.1.0 [90/4729856] via 40.10.1.2, 2w1d, Serial2/0
D 30.30.1.0 [90/4729856] via 40.10.1.2, 2w1d, Serial2/0
D 30.40.1.0 [90/5241856] via 40.10.1.2, 2w1d, Serial2/0
D 30.50.1.0 [90/5241856] via 40.10.1.2, 2w1d, Serial2/0
D 40.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C 40.10.1.0/24 is directly connected, Serial2/0
L 40.10.1.1/32 is directly connected, Serial2/0
C 40.20.1.0/24 is directly connected, Serial2/3
L 40.20.1.1/32 is directly connected, Serial2/3
D 100.0.0.0/24 is subnetted, 1 subnets
A 100.1.1.0 is directly connected, 00:01:56, Serial2/3
bangalore#
```

Custom Routing – Another Example

Alternate Metrics: Measured Link Delay – Using EEM/IPSLA Service Set



Lowest Cost Path: A B F G J M



onePK Enables New Operational Models

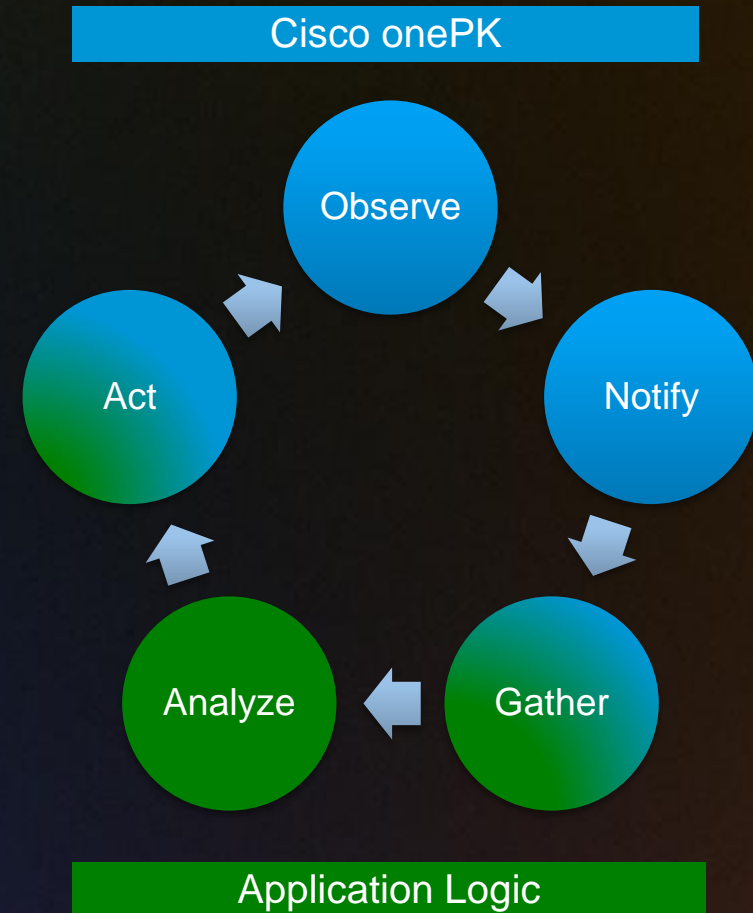
Using onePK, Applications can now understand and react to changing network conditions

onePK enables applications to
Gather, Analyze, Receive Requests
Make Decisions, Interact with Network Devices

onePK enables Network Devices to
Act, Observe, Notify
Applications can delegate rules to network to
enable the network to take local decisions

Examples

- Auto fix on MTU mismatch
- Backup interface manipulation
- Dynamically apply policy as needed
- Provision new network services to meet demand



Get Involved

Early Trials. Demos. Forums. More.

<http://www.cisco.com/go/onepk>

<http://developer.cisco.com/web/getyourbuildon>

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Thank you.

