



# Transforming Business with Software Powered Networks

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# Introduction

- Key market trends and drivers
- The evolution to “software powered networks”
- Harnessing network value
- Cisco ONE
- Adaptable network architectures
- Use case examples
- Close

# Key Market Trends & Drivers

# Data Is the New Currency

people will be living in cities in 2020

of world's energy savings and up to 40% of energy savings are not captured today

## Smarter logistics

027

**€27 billion**  
in the EU

6500

of emissions can be saved in 2020 through ICT-enabled energy efficiency

# €600 billion

Smart grid creates  
**50%**  
more jobs than the average  
infrastructure project

South Korea's  
**Green New Deal**  
and low carbon strategy create over 500,000 jobs

## Smart grid initiatives

have created over 12,000 jobs in Silicon Valley

**5billion**  
people have **mobile**  
**phones** today

more than  
**50%** of web  
connections  
will be mobile  
by 2013

<https://www.congress.gov/115/legislation/115/1000/115-1000>  
 Search.gov records show no laws for Silver Valley, AZ listed

## Big Data Market: Growth to \$16.9B

Only 5% of  
Digital Information is  
Currently Being Used\*

1/3 of data will go through the **cloud**

**700 Days of Constant Video** Will Traverse Internet **Every Second**

We Store 92% of this  
New Information

# 50 Billion Connected Things

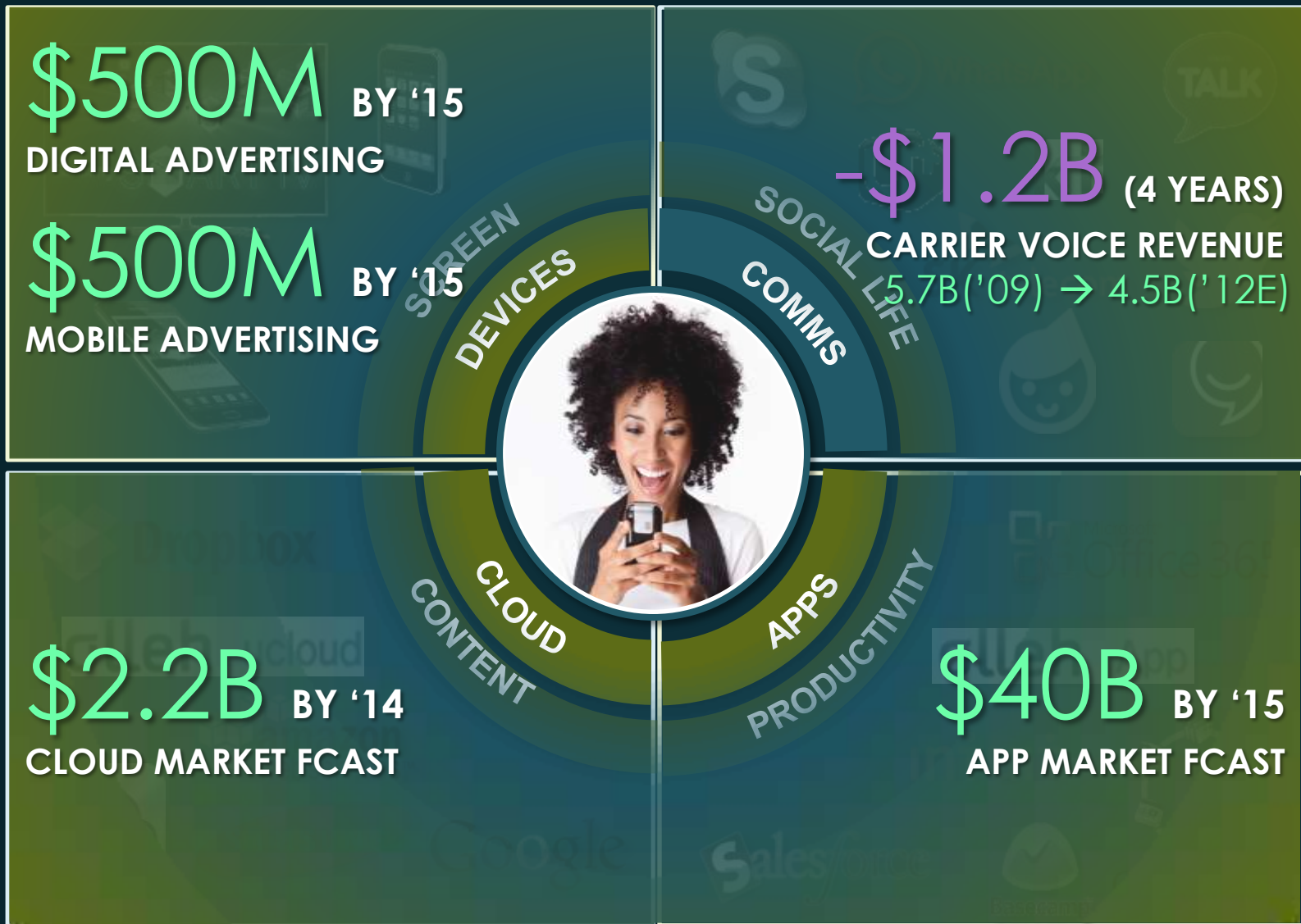
**> 1 Zettabyte of Unique Information Created In Just 3 Years**

A diagram illustrating the hierarchy of data storage units. At the top, the number 1,200,000,000,000,000,000,000 is displayed. Below it, a series of blue dots are connected by lines to labels for storage units: Zettabyte, Exabyte, Petabyte, Terabyte, Gigabyte, Megabyte, Kilobyte, and Byte. The Zettabyte label is highlighted in yellow.

**Equivalent to:** 125 million years of your favorite 1-hour TV show

\*The Economist 2010. Being used means understandable/treatable by a device  
Source: IDC, Cisco IBSG2012, Cisco VNI, Economist, Apple, Facebook, Google

# And it is no different in Korea !



# Key Business and Technology Trends

Cloud



Video



Mobility



Data Deluge



How to  
Harness  
Network  
Value?

How to Drive  
Business  
Agility?

How to Drive  
Operational  
Simplicity?

**IS THE NETWORK READY?**

# The Evolution To Software Powered Networks



# Evolution to Software Powered Networks

Preserve  
What's Working

- Resiliency
- Scale
- Rich Feature-Set



Evolve for Emerging  
Requirements

- Cross Domain Operational Simplicity
- Deep Multi-Layer Programmability
- Bi-Directional Application Awareness

## Bringing the Network to Applications



# Enterprise and SP – One and the same

Evolve for Emerging Requirements

Service Providers

Enterprise

- **Cross Domain Operational Simplicity**
- **Deep Multi-Layer Programmability**
- **Bi-Directional Application Awareness**

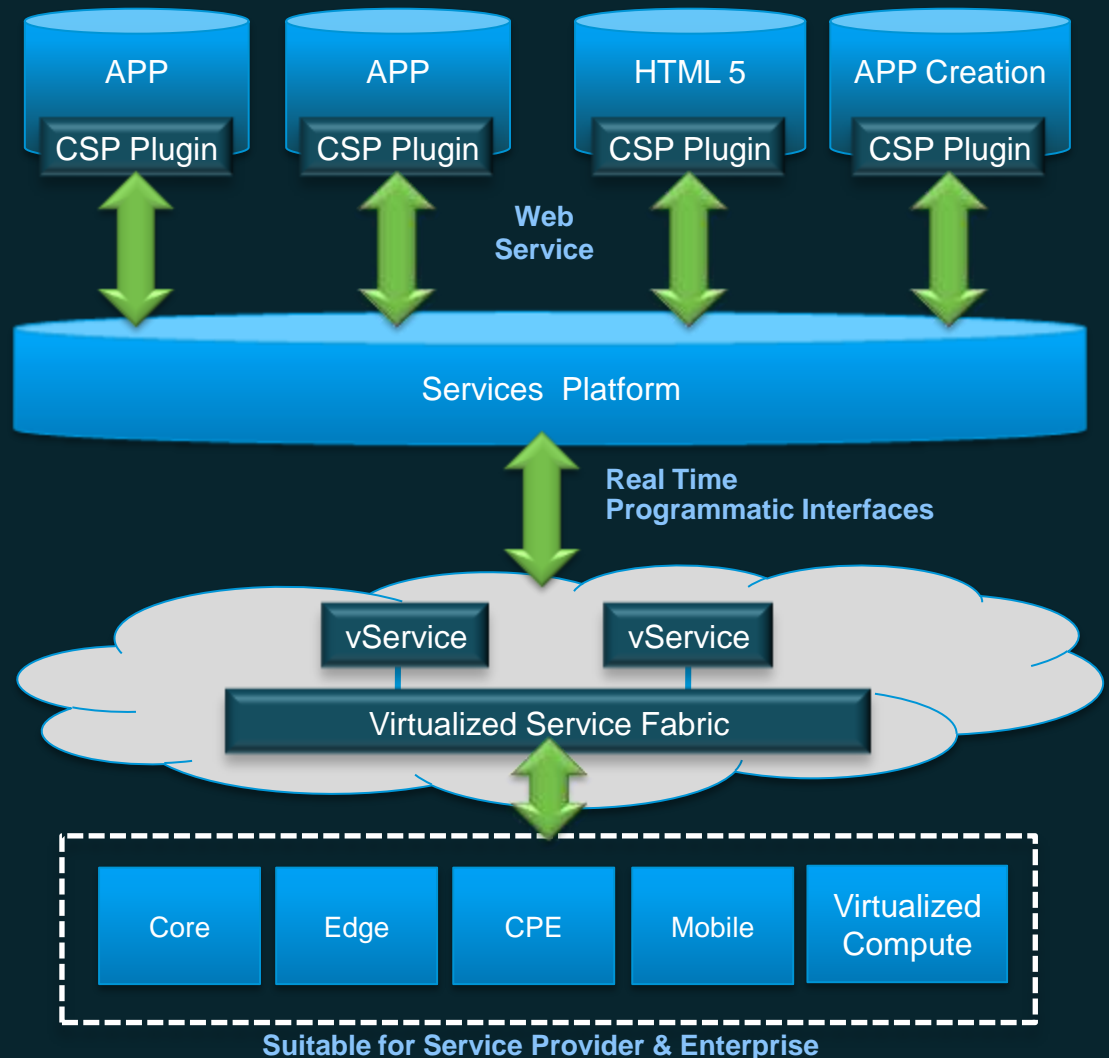


**SDN = The future tool of choice**

# Desired State—Mask Network Complexity

## Facilitate Application Development and Delivery

- Network programming interface (NPI)
- Build into large HTML5 environment
- Network services plug-ins
- Maximized developer pool
- Holistic network view



# One Size Does Not Fit All



## Service Providers

Policy-Based Control, Analytics, and Service Assurance

➤ **Business Agility**



## Data Center

Simplified Automated Workload Provisioning

➤ **Secure XaaS Multi-Tenancy**



## Enterprise

Secure Optimization of Virtual Resource Pools

➤ **Private Cloud Automation**



## Academia

Dynamically Partition Research Environments

➤ **Network "Slicing"**

**Diverse Requirements  
Across Multiple Segments**

# Harnessing Network Value

# Diverse Requirements

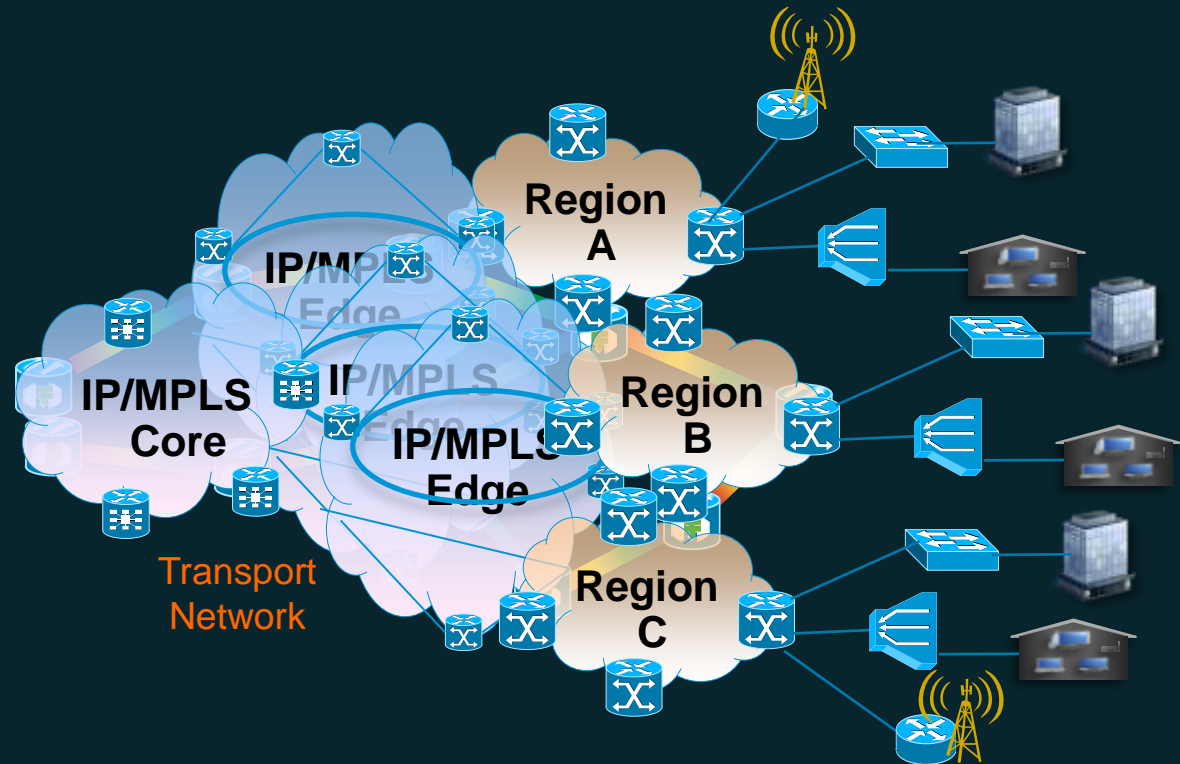
## Data Center-Enterprise / SP

- Meshed symmetric topologies
- Unconstrained bandwidth
- Simplified abstraction models



## Service Provider

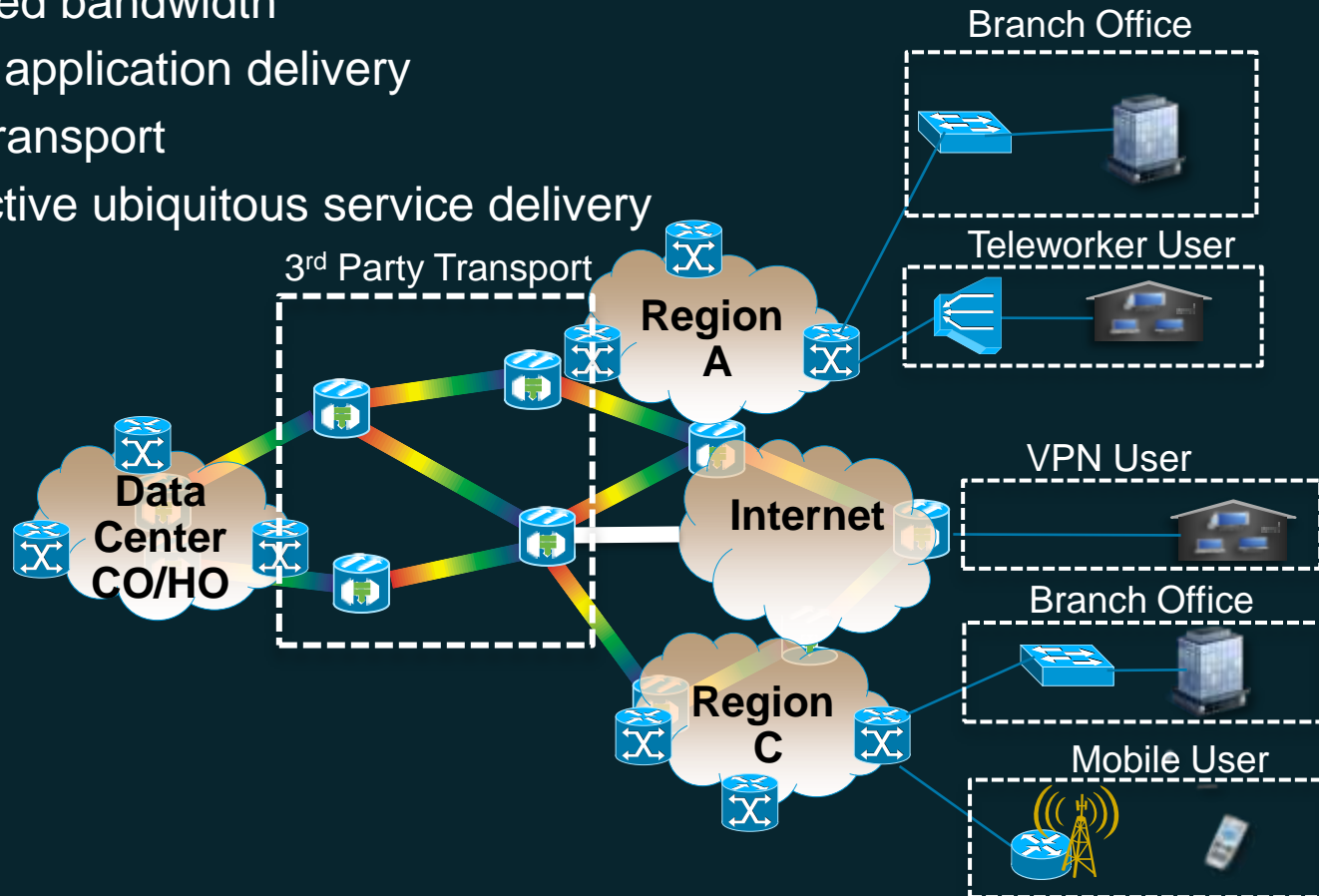
- Hierarchical topologies
- Constrained bandwidth
- Load and utilization driven
- Subscriber and service abstractions



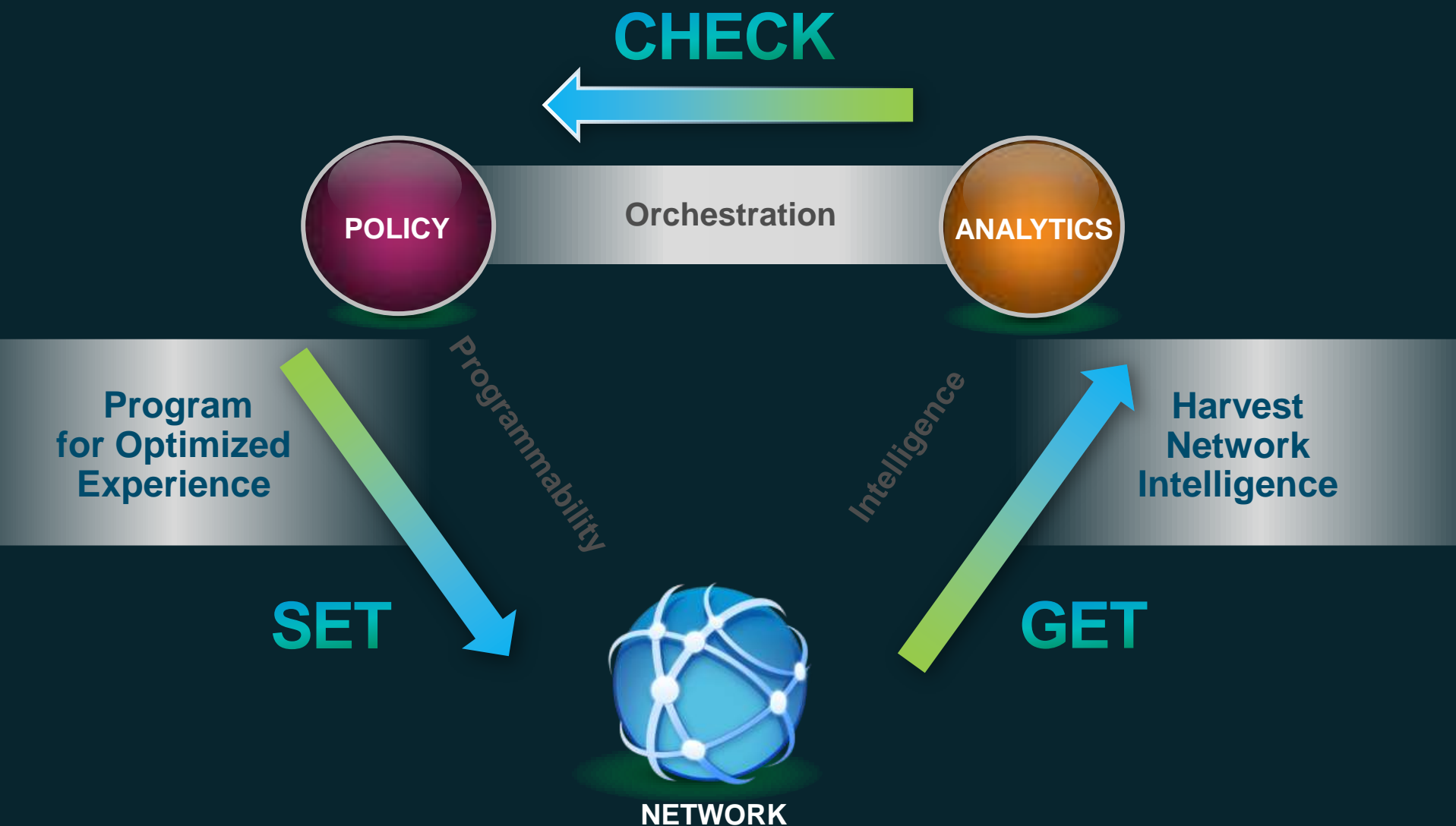
# Diverse Requirements

## Enterprise

- Multiple types of access
- Constrained bandwidth
- Driven by application delivery
- 3<sup>rd</sup> party transport
- Cost effective ubiquitous service delivery



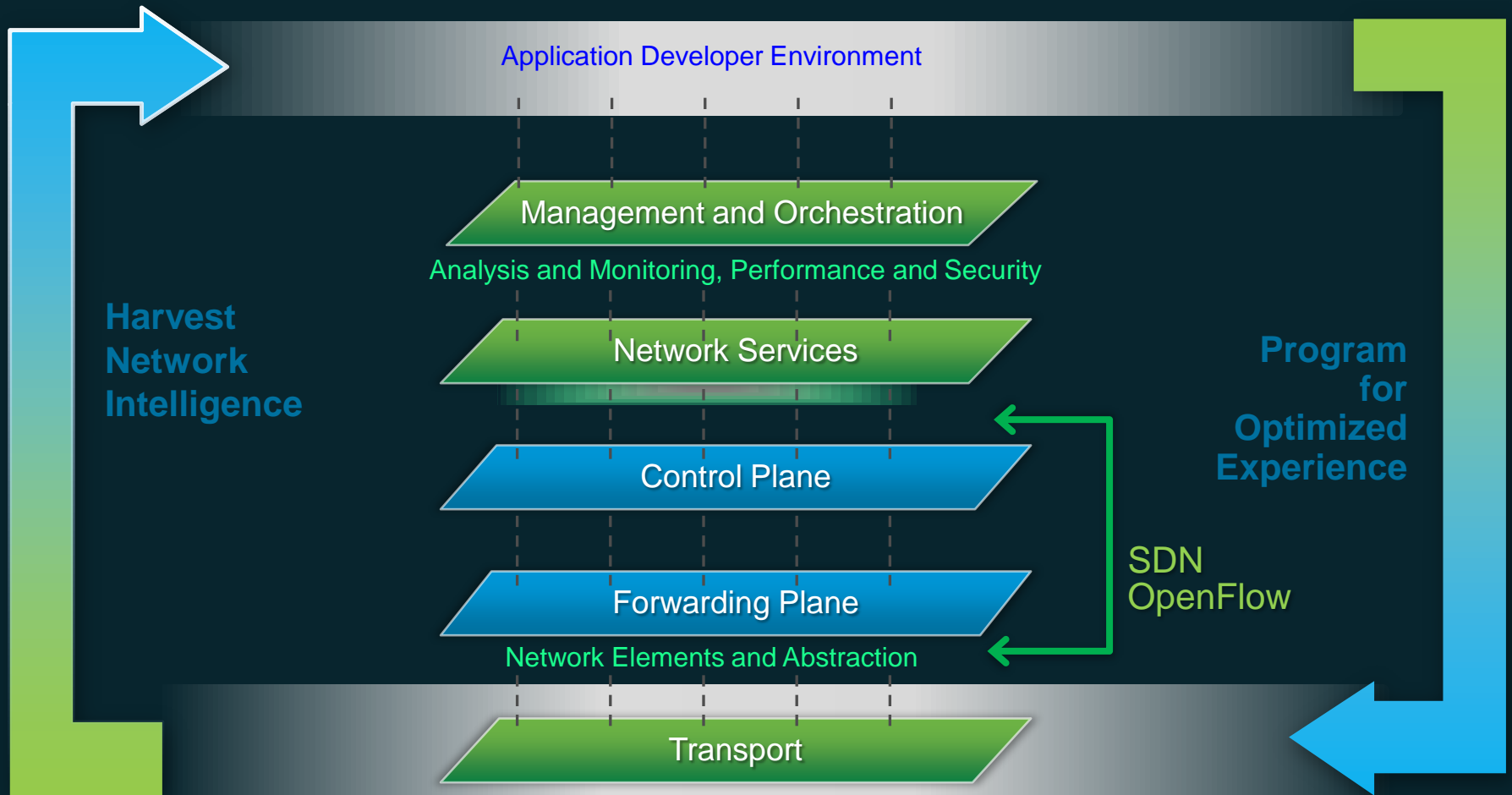
# Harness Network Value





# Programmability at Multiple Layers of the Network

Thinking Beyond Current Definition...



# In Summary..

Preserve  
What's Working

- Resiliency
- Scale
- Rich Feature-Set



Evolve for Emerging  
Requirements

- Cross Domain Operational Simplicity
- Deep Multi-Layer Programmability
- Bi-Directional Application Awareness

## Bringing the Network to Applications



# Cisco ONE

# Cisco Open Network Environment Announced Building Blocks

## Platform APIs

### onePK

Comprehensive  
Developer Kit  
IOS, IOS-XR and  
NX-OS

## Controllers & Agents

### SDN Controller Software

### OpenFlow Agent

## Overlay Virtual Networks

### Nexus 1000V OpenStack REST API

Multi-Hypervisors  
VXLAN Gateway  
Services Chaining



Industry's broadest approach for Network Programmability

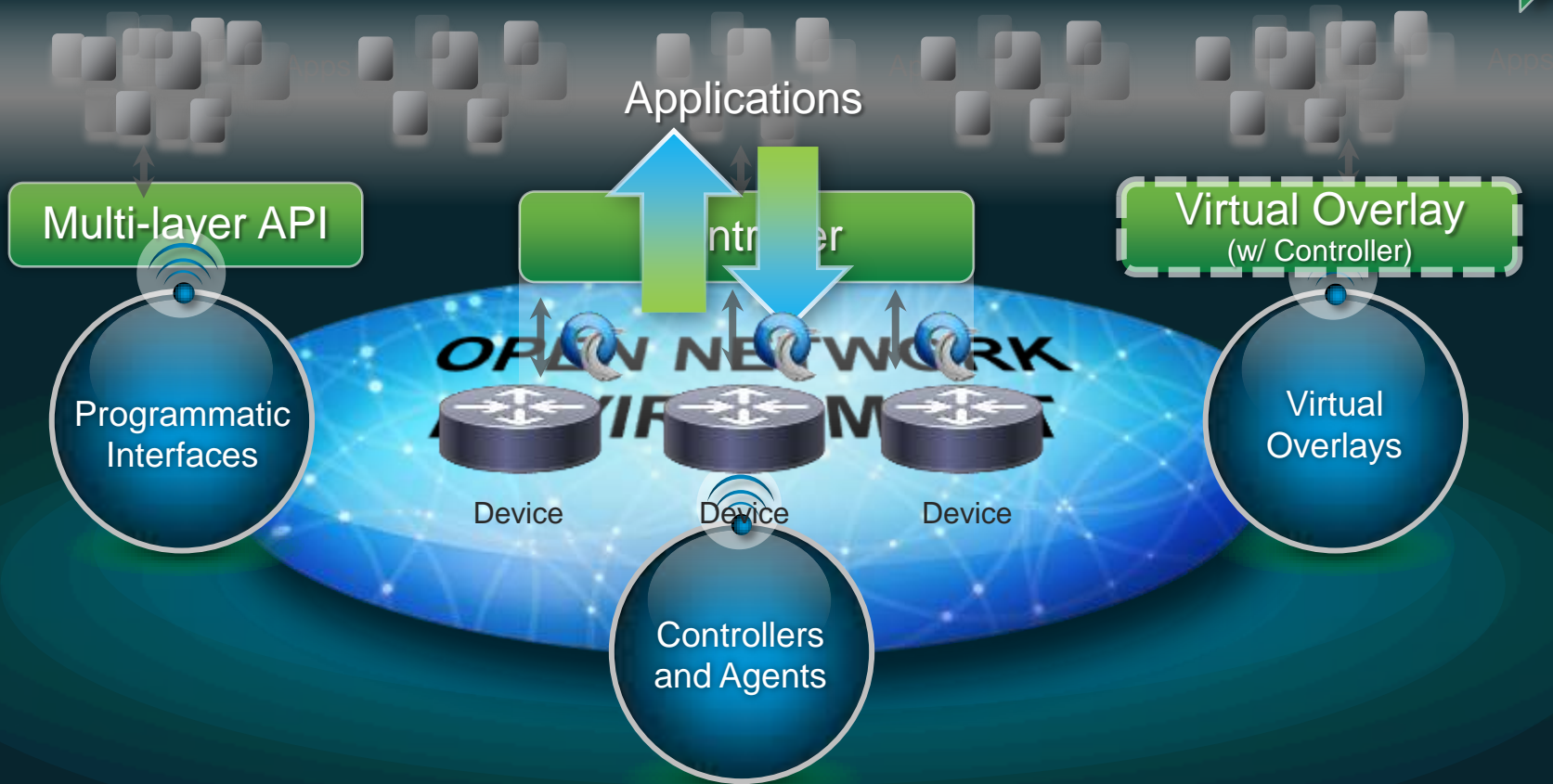
# Announced June 2012: Cisco Open Network Environment

Industry's Most Comprehensive Portfolio

Hardware + Software

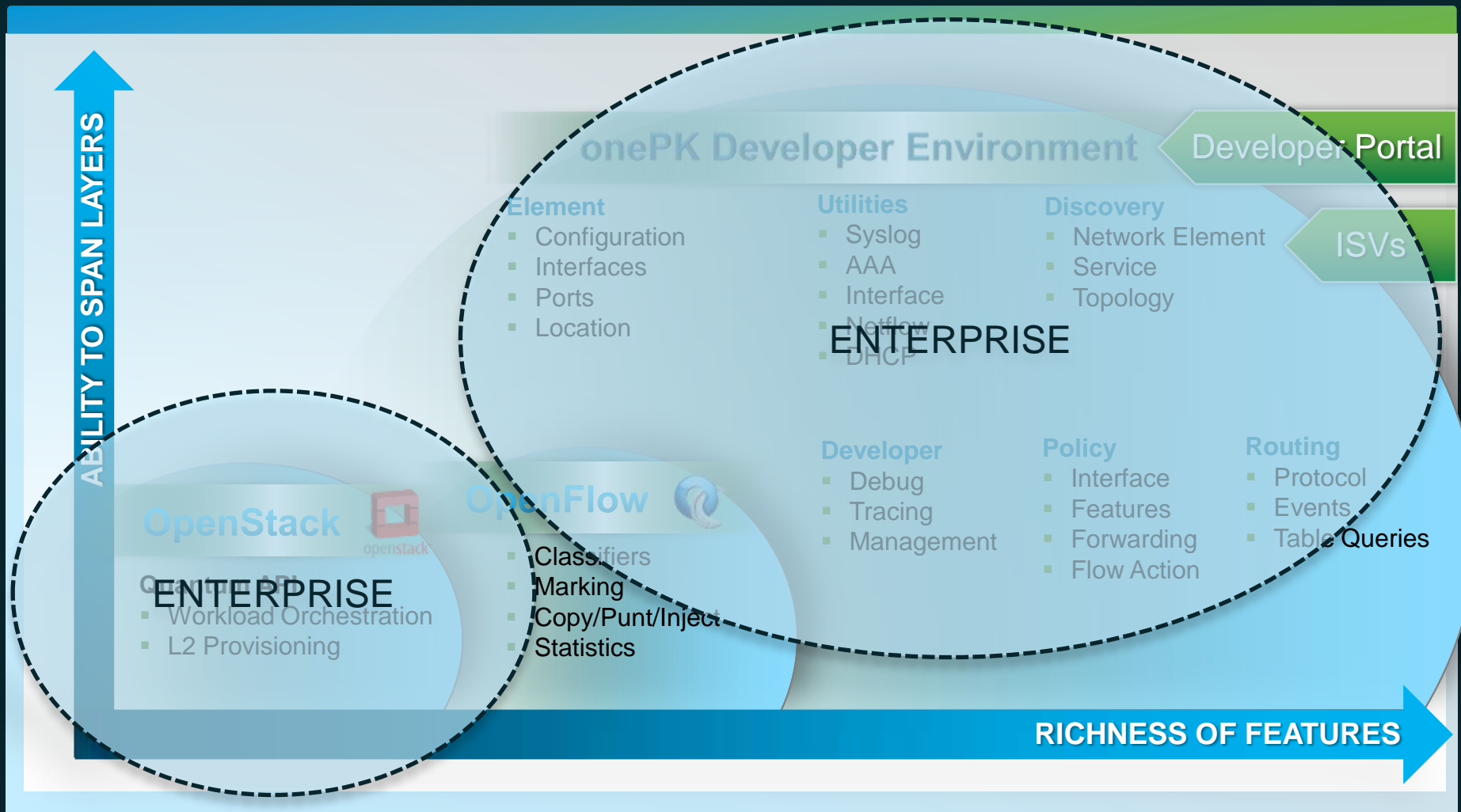
Physical + Virtual

Network + Compute



# Providing a Comprehensive Environment

## Flexibility to Choose—Protocols, APIs and Developer Environments



# Adaptable Network Architectures



# Adaptable Network Architecture

## Key Design Tenets



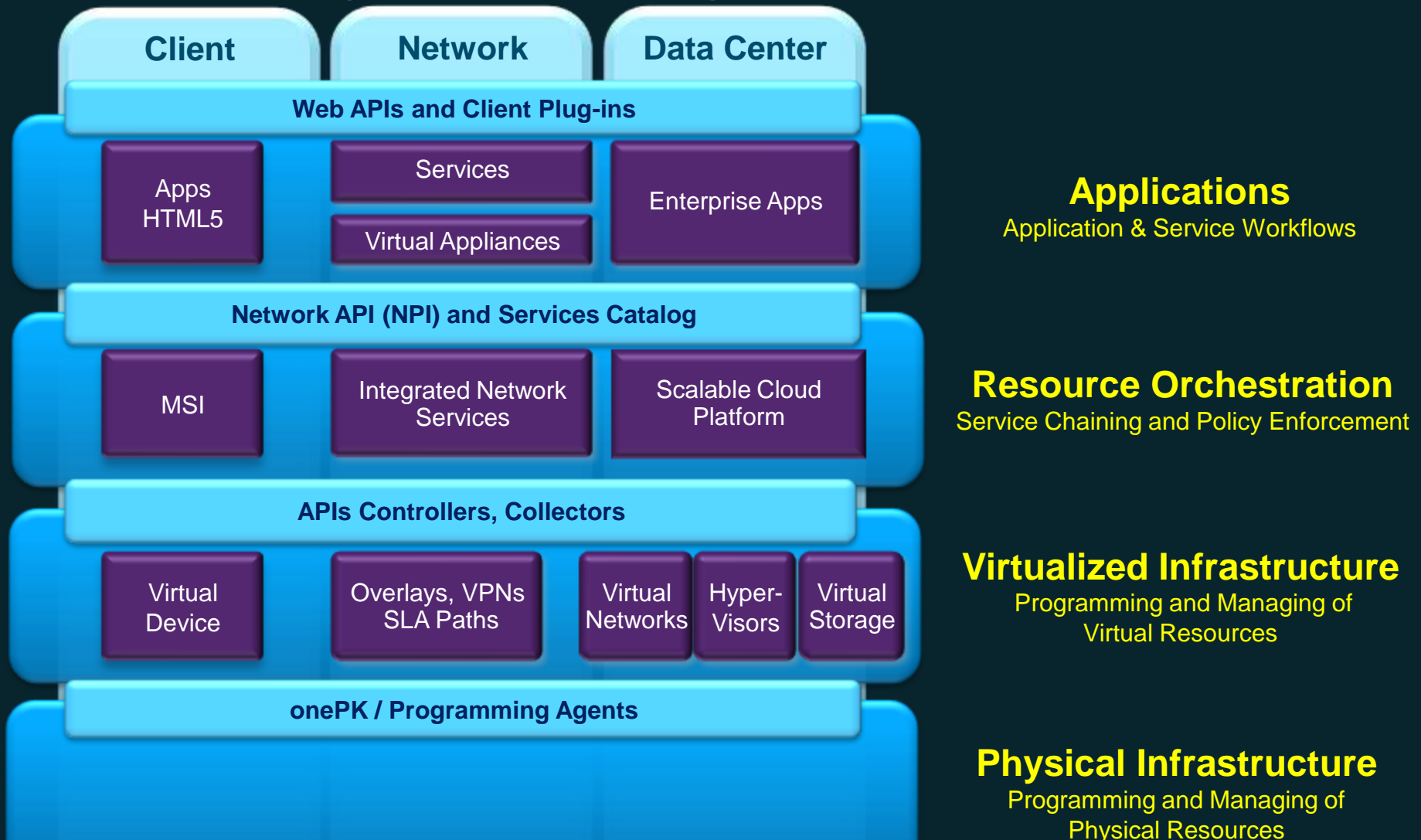
**Masking  
Network  
Complexity**

**Open and  
Programmable**

**Consistent  
Operational  
Experience**

# Next Generation Internet Architecture

Adaptable, Programmable, Brings Network To Applications



Enabled By The Cisco Open Network Environment

# Next Generation Internet Architecture

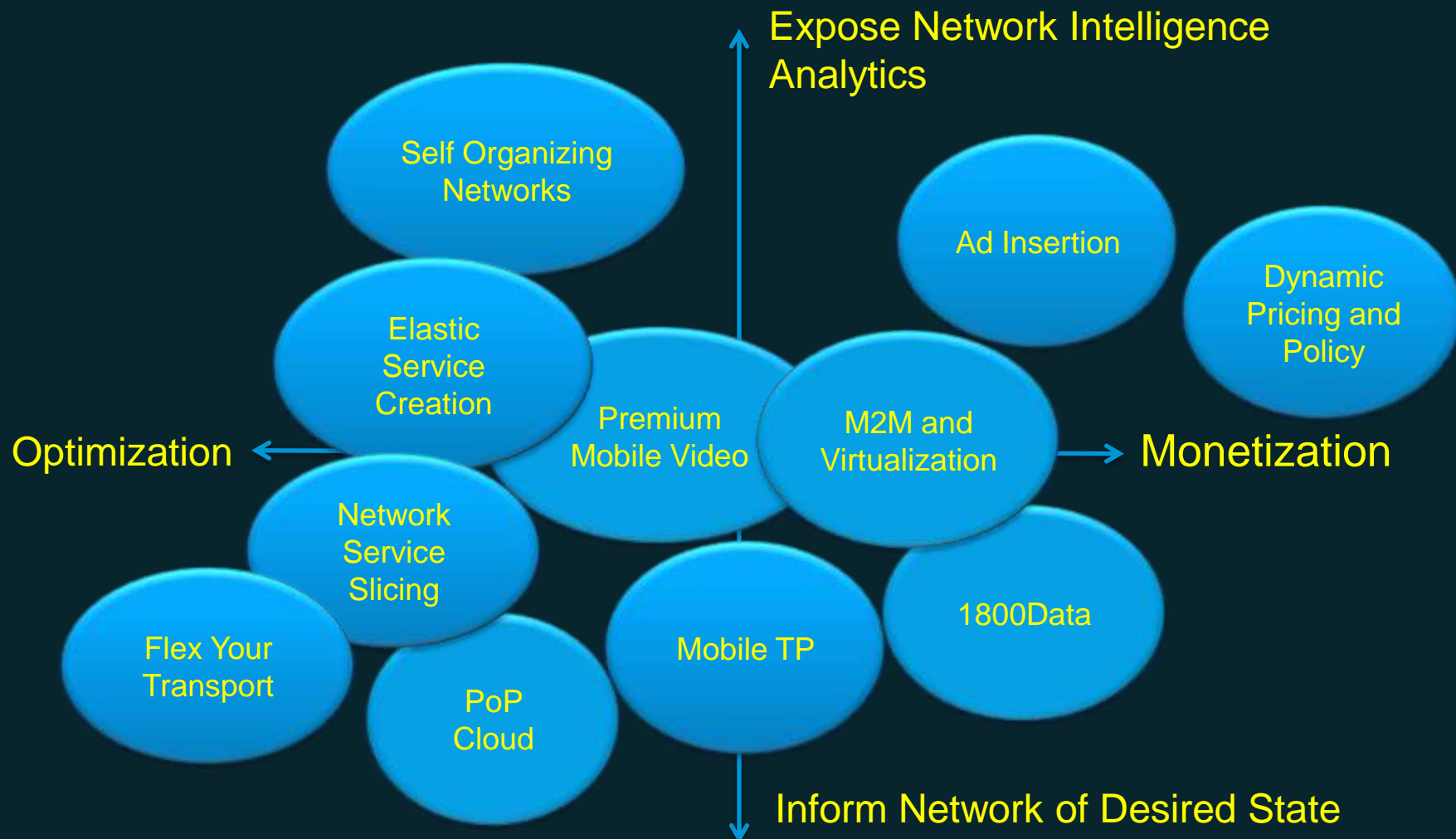
## Enabled with Cisco Open Network Environment



# Use Case Examples

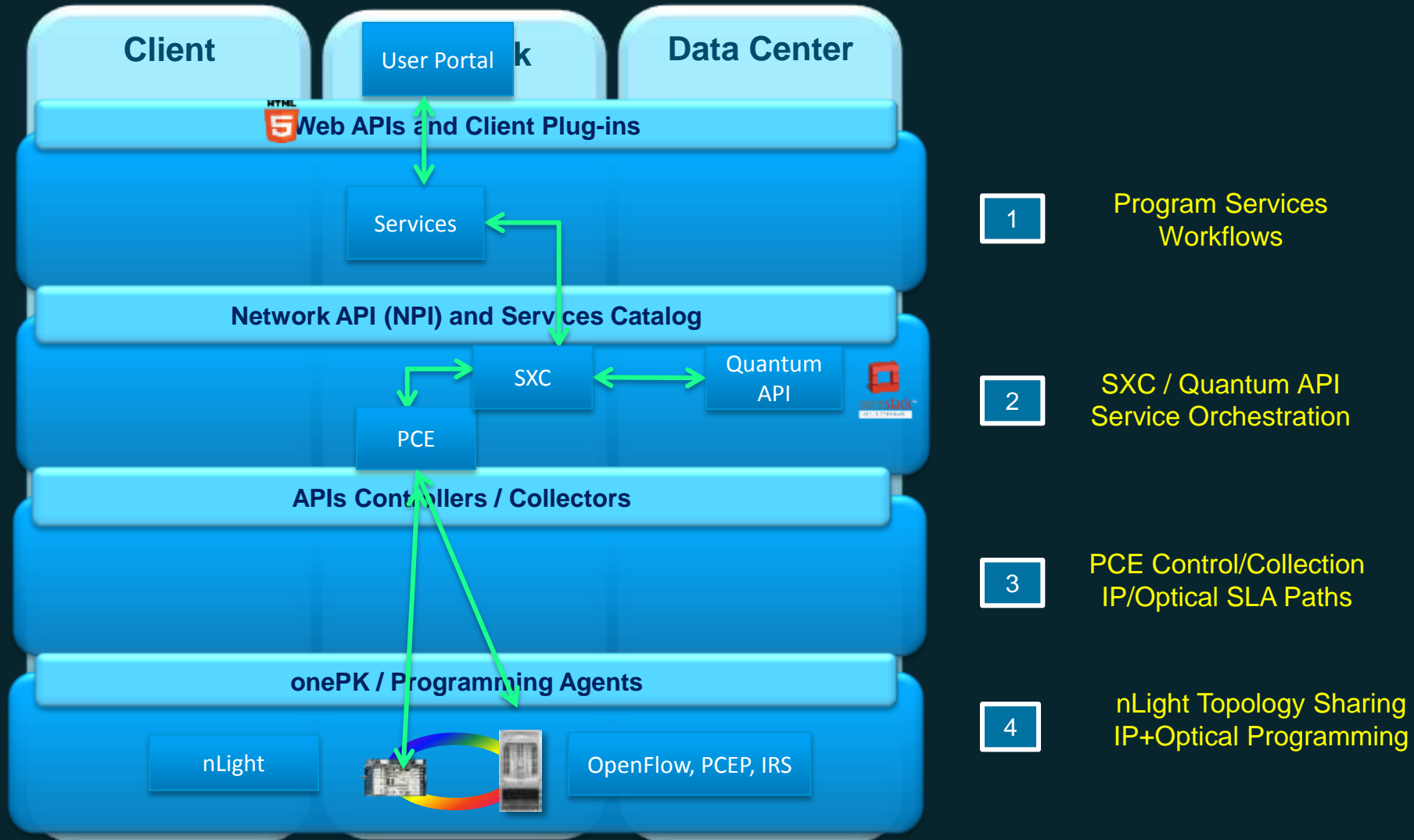
# Use Case Driven Evolution

## Example Customer-Driven Use Cases

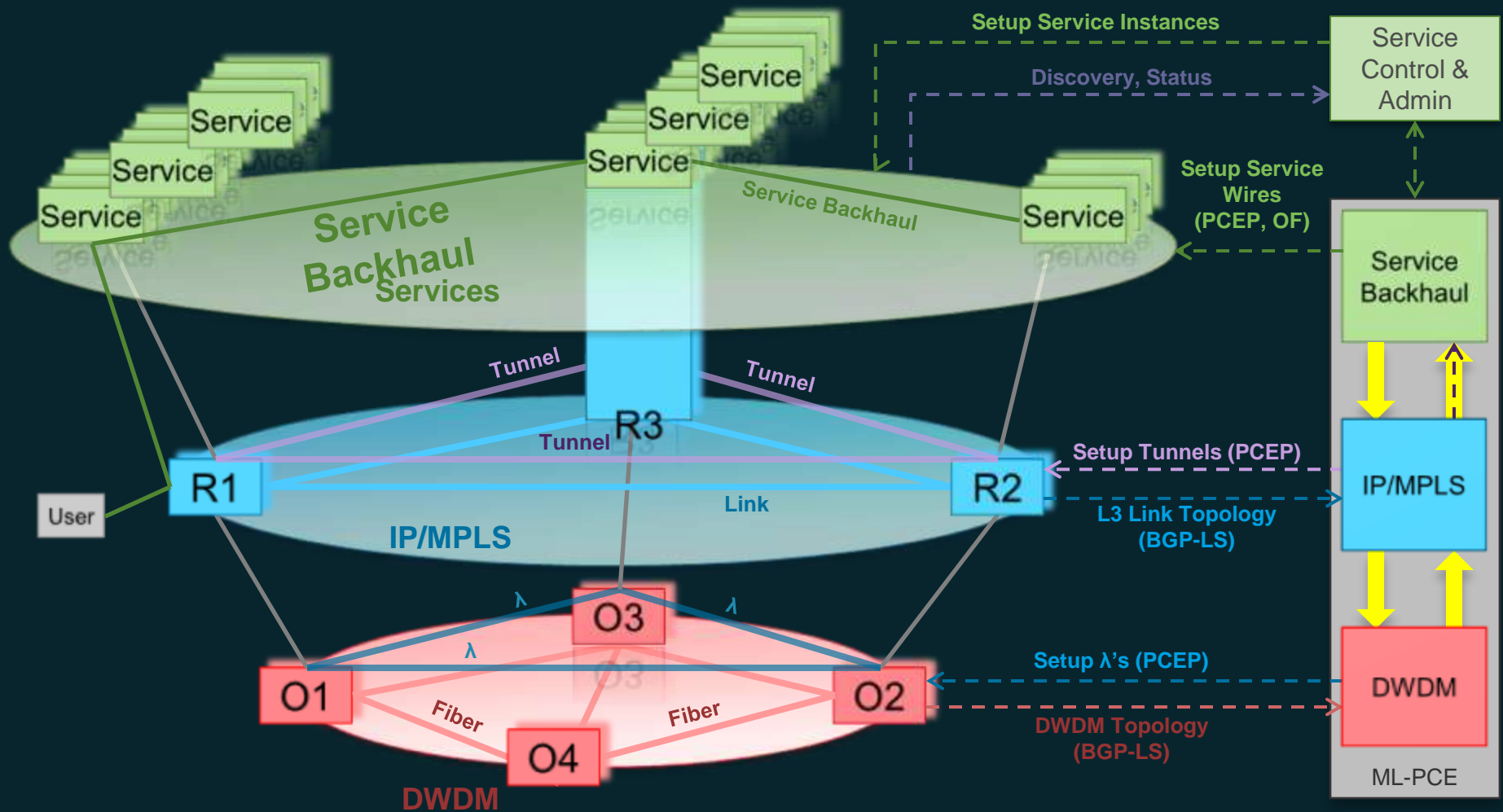


# Use Case : IP+Optical - Flex Your Transport

## Efficient Utilization of IP/Optical Resources



# Service Provider Multi-Layer Orchestration



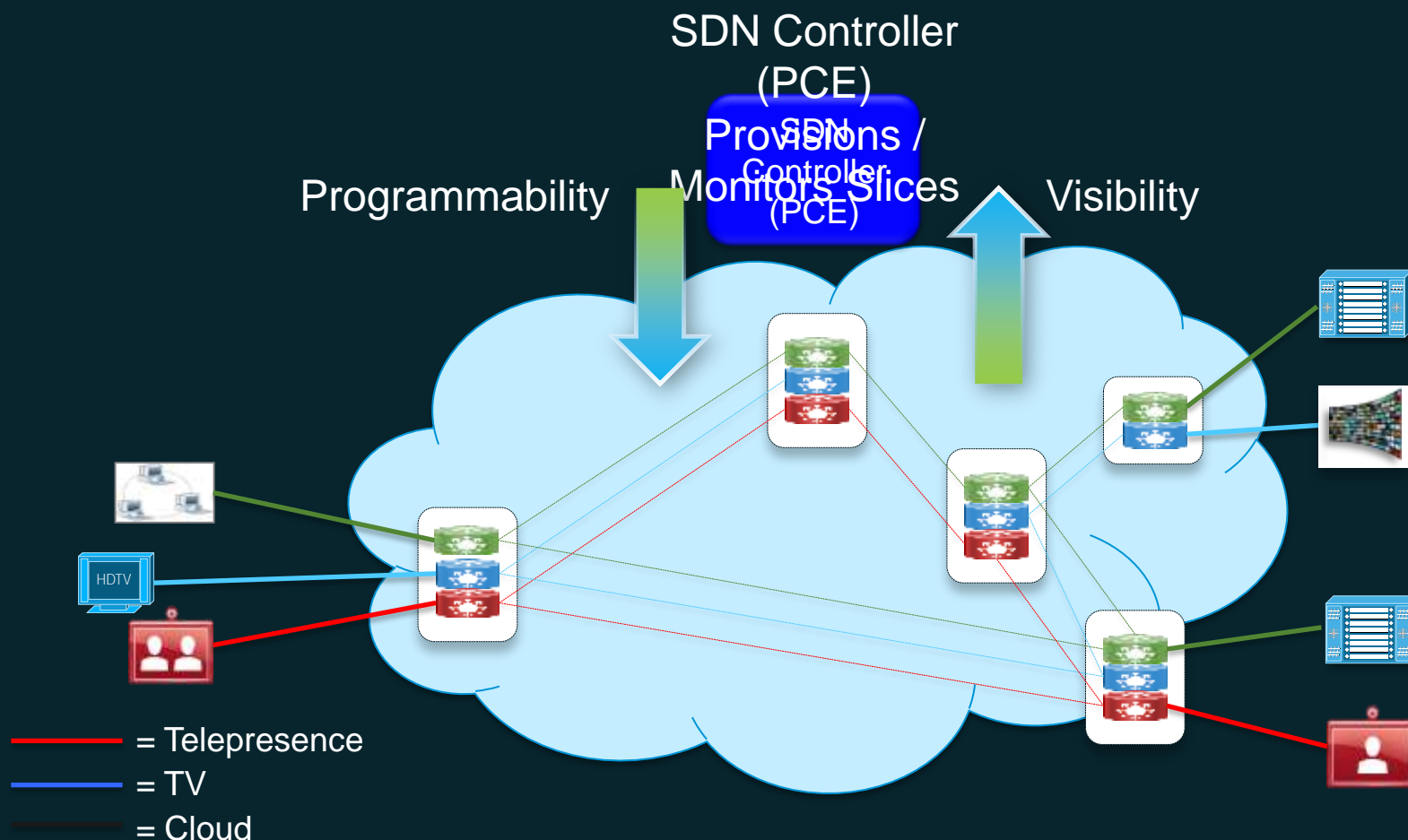


# Use Case: Network Slicing for Cloud Services

## Enables Per-Slice SLAs, Easier Management, Resource Optimization

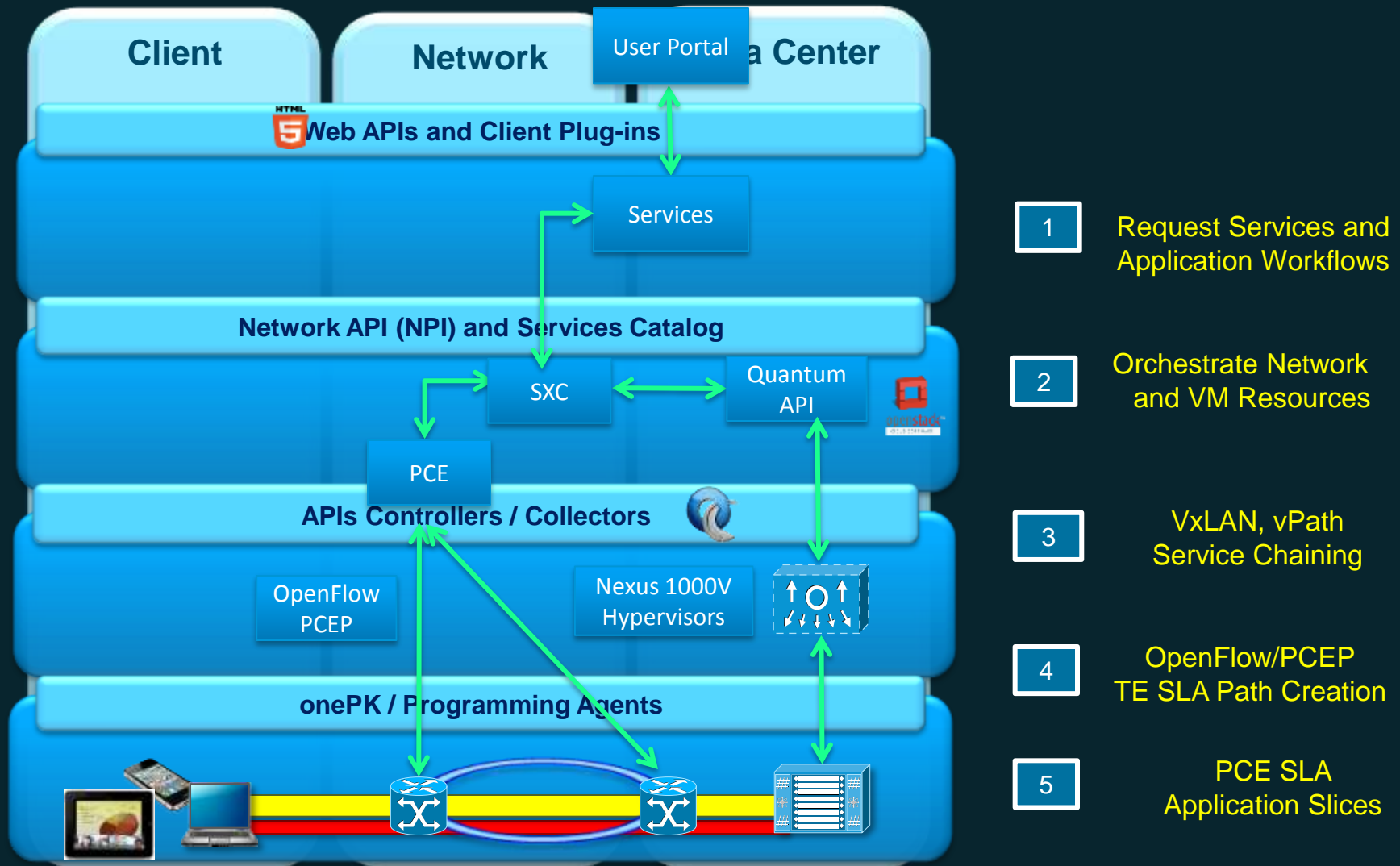
Leverage full network virtualization

Offer a virtual network (slice) of cloud based services ..”



# Use Case : Network Slicing Cloud Services

## Enable Per Slice SLA, Management, Resources



# Summary

# Cisco Point of View – A Summary

- Cisco Open Network Environment is a superset of software-defined networking
- Comprised of multi-layer Programmatic Interfaces, Agents, Controllers AND Network Overlay Virtualization
- Suitable for both Service Provider **AND** Enterprise
- Addressing Key Service Providers Pain Points:  
Increased agility, simplified operations, greater application awareness
- Evolutionary Use-case driven approach for investment protection
- Leading the industry standards by actively applying SDN concepts across various protocols and APIs, like OpenFlow and OpenStack

**Cisco ONE is Leading the Network Evolution**

Thank you.

