CISCO NETWORKING ACADEMY

Career Advantage Webinars
Cloud Computing Series

Welcome to Today's Session, Open Stack–what is it? Connecting ACI to Open Stack (3rd session of the series)

- Session 1: What is the Cloud? How will it affect my network & I?
- Session 2: Security in the Cloud
- On Demand version of all 3 sessions & ppt.'s can be found here:
  bit.ly/cloudwebinars

Next Session:

- Networking & the Hidden Job Market

  3 February, 2016 – 7:00 A.M. PST, Register Here

  "I owe every job I've ever had to networking" – NYSE President. The majority of job openings are never advertised, but filled by word of mouth…That's why networking is a great way to find a job. Unfortunately, many job seekers are hesitant to take advantage of networking because they're afraid of being seen as pushy, annoying, or self-serving. But networking isn't about using other people or aggressively promoting yourself—it's about building relationships. Join this session to learn how to add people to your network, expand your sphere of influence, and uncover your hidden job market.

Upcoming Sessions

- How to Communicate Effectively With Body Language

  3 February, 2016 – 9:00 PM PST, Register Here

- Browse all previous Mapping Your Path to Success on-demand sessions here

Internet of Everything Webinar Series

TOPIC
IoE & Healthcare

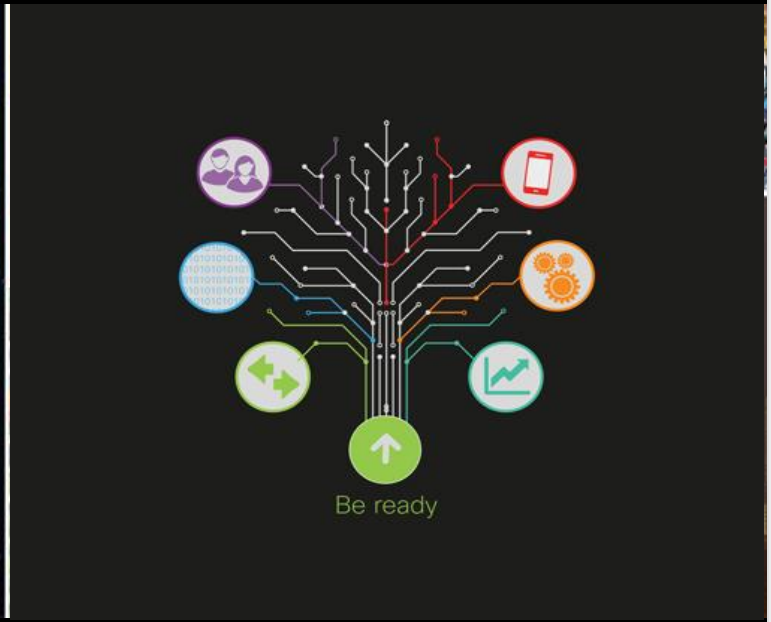
DATE
9 February, 9:00 AM PST

Register Here

TOPIC
IoE Sports & Entertainment

DATE
23 February, 7:00 AM PST

Register Here



Computer Networking: Beyond Routing & Switching On-Demand Webinar Series

- Session 1: *Network Security & Cybersecurity*
- Session 2: *Intro to Data Centers*
- Session 3: *Going Wireless – Wireless Communications and Technologies*

All recordings and presentations can be found here

Cisco Networking Academy
Mind Wide Open

OpenStack–what is it? Connecting ACI to OpenStack

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Technical Leader

Desh Shukla
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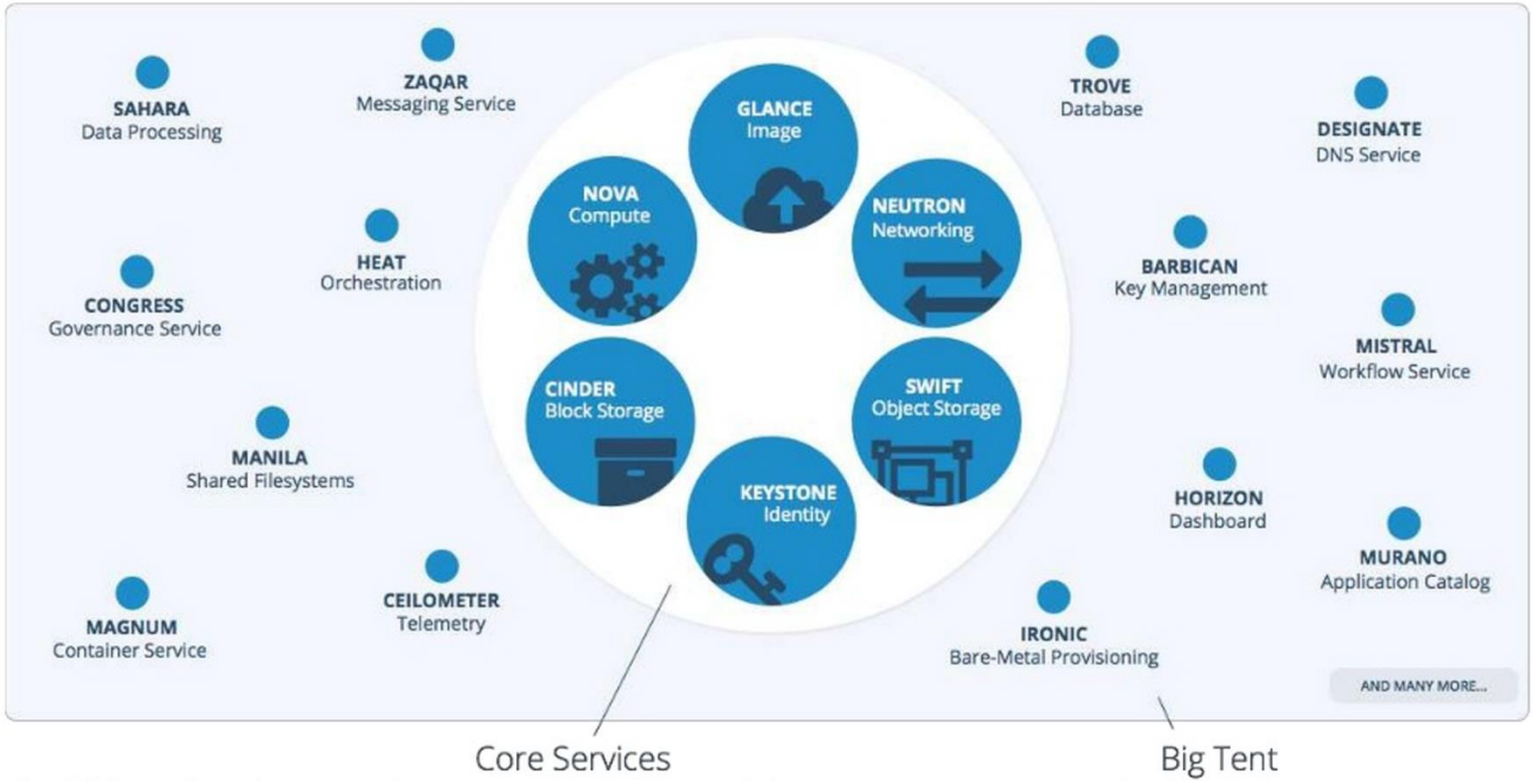
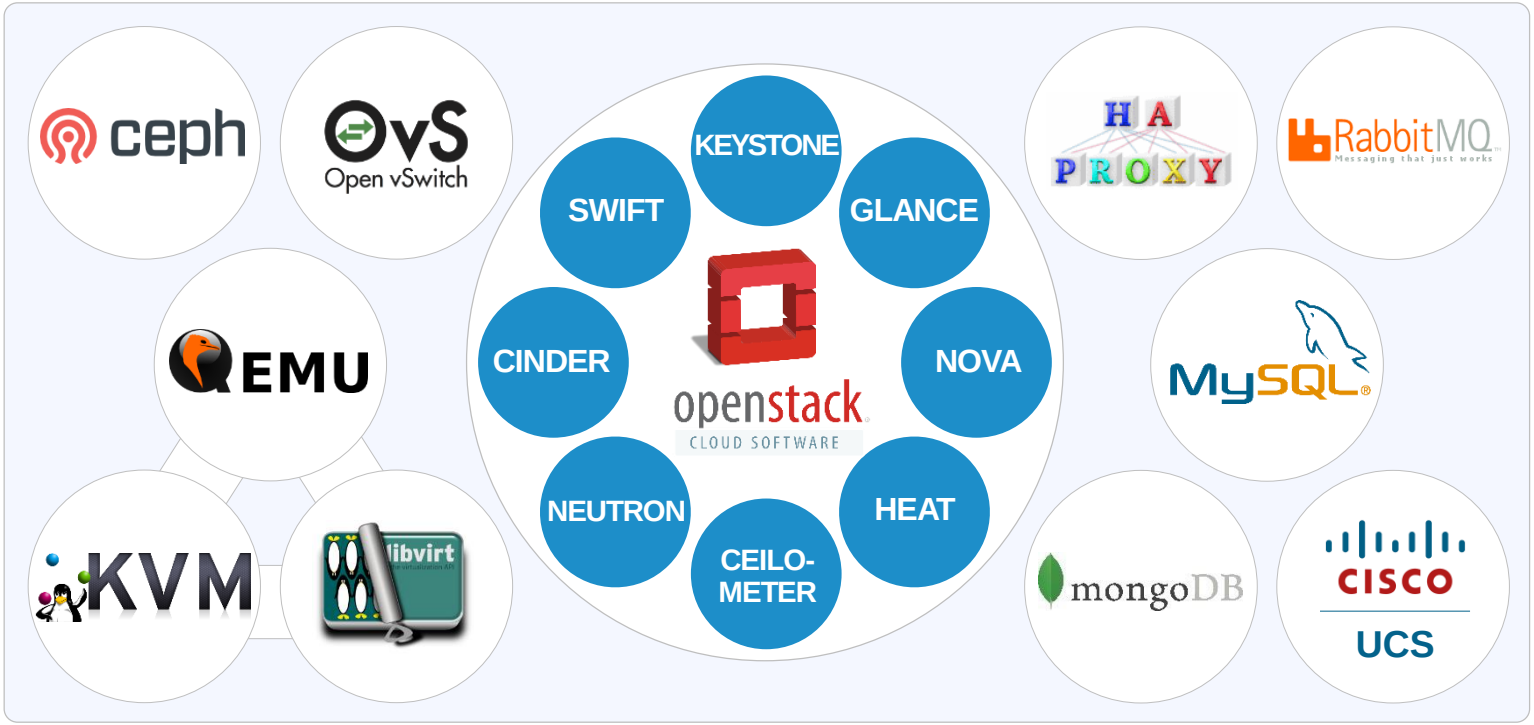
January 26th, 2016

OpenStack is a free and open-source software platform for cloud computing, mostly deployed as an infrastructure-as-a-service (IaaS). The software platform consists of inter-related components that control hardware pools of processing, storage, and networking resources throughout a data center

The “big tent” and “core services”



OpenStack Architecture



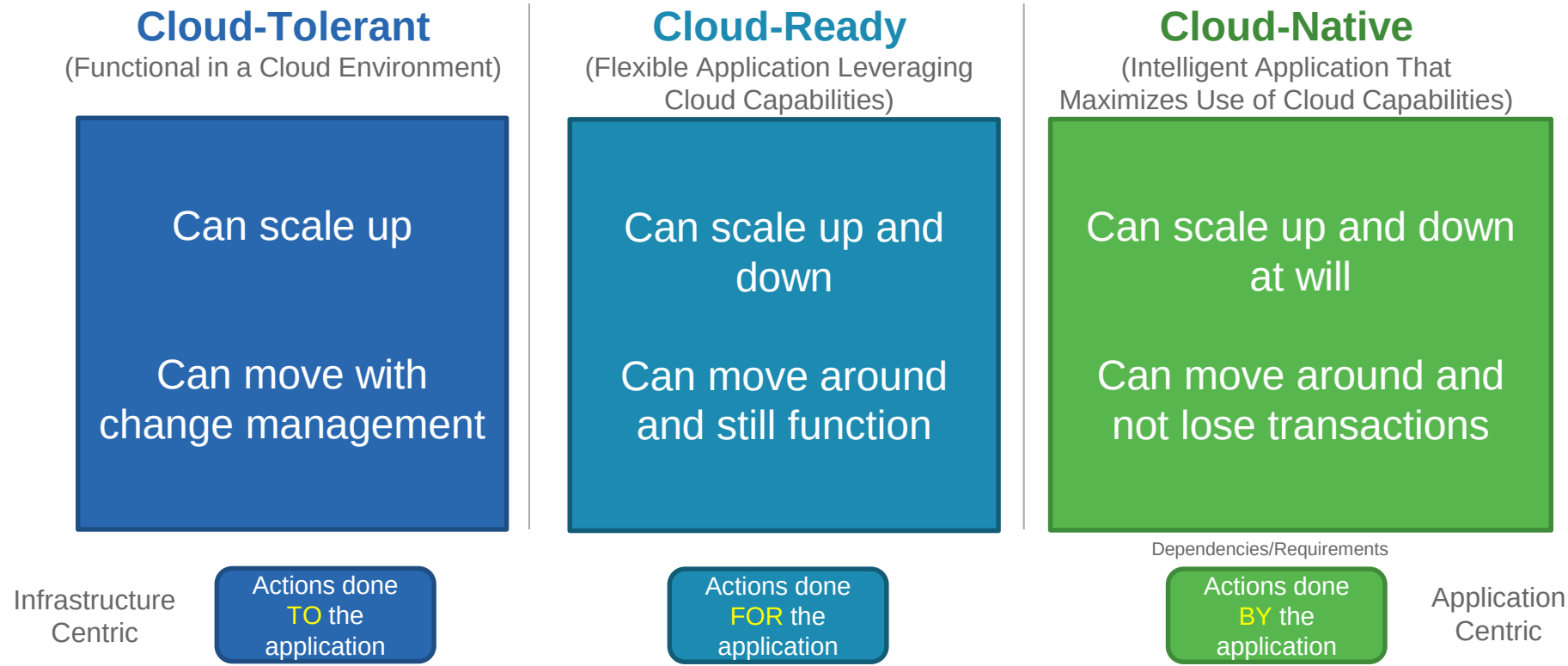
Programmable Infrastructure

- Provides an automated interface for:
  - Provisioning
  - Deployment
  - Configuration and Sizing
  - Scaling
  - Geo-distribution
  - Resiliency
  - Request routing
  - Access Control
- Enables cloud-native applications

Programmable infrastructure enables an application to intelligently maximize capabilities of the Cloud to achieve outcomes that exceed the capabilities of the platform(s) on which it operates.

Cloud-Native Applications

Leverage Cloud Capabilities to Build Fast, Highly Available, Agile, and Portable Services

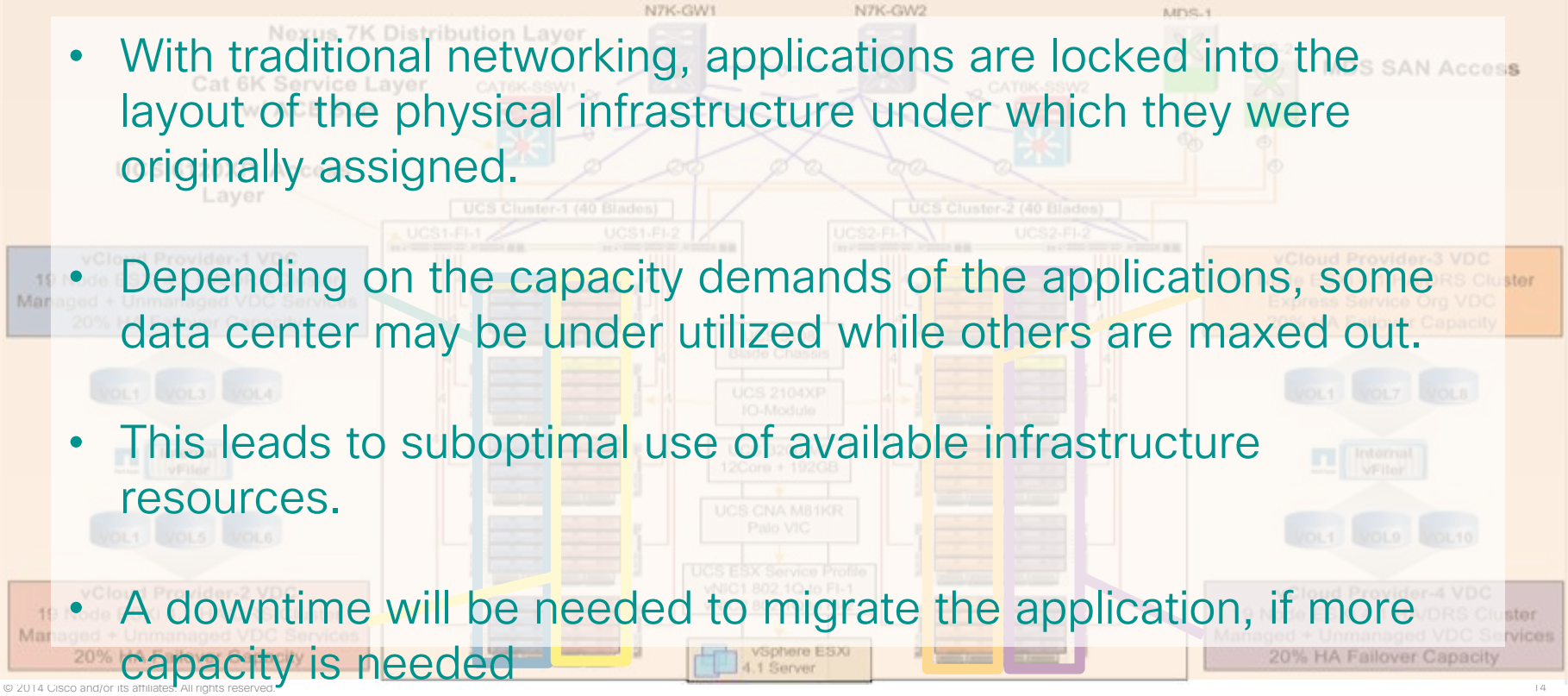


ACI – Next generation datacenter networking

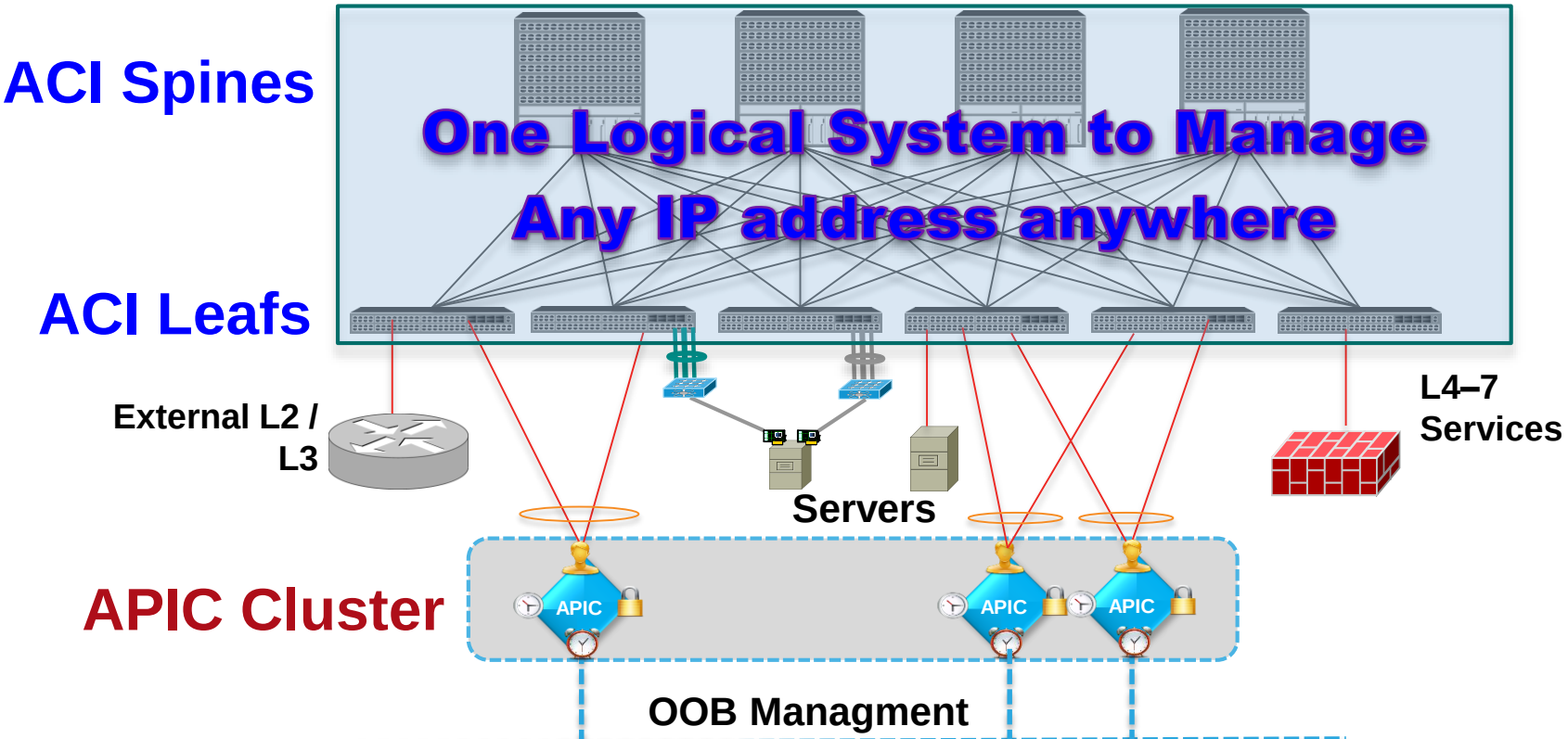
Cisco® Application Centric Infrastructure (ACI) is an innovative architecture that radically simplifies, optimizes, and accelerates the entire application deployment lifecycle.

Infrastructure Design w/o ACI faces Vertical Lock-In

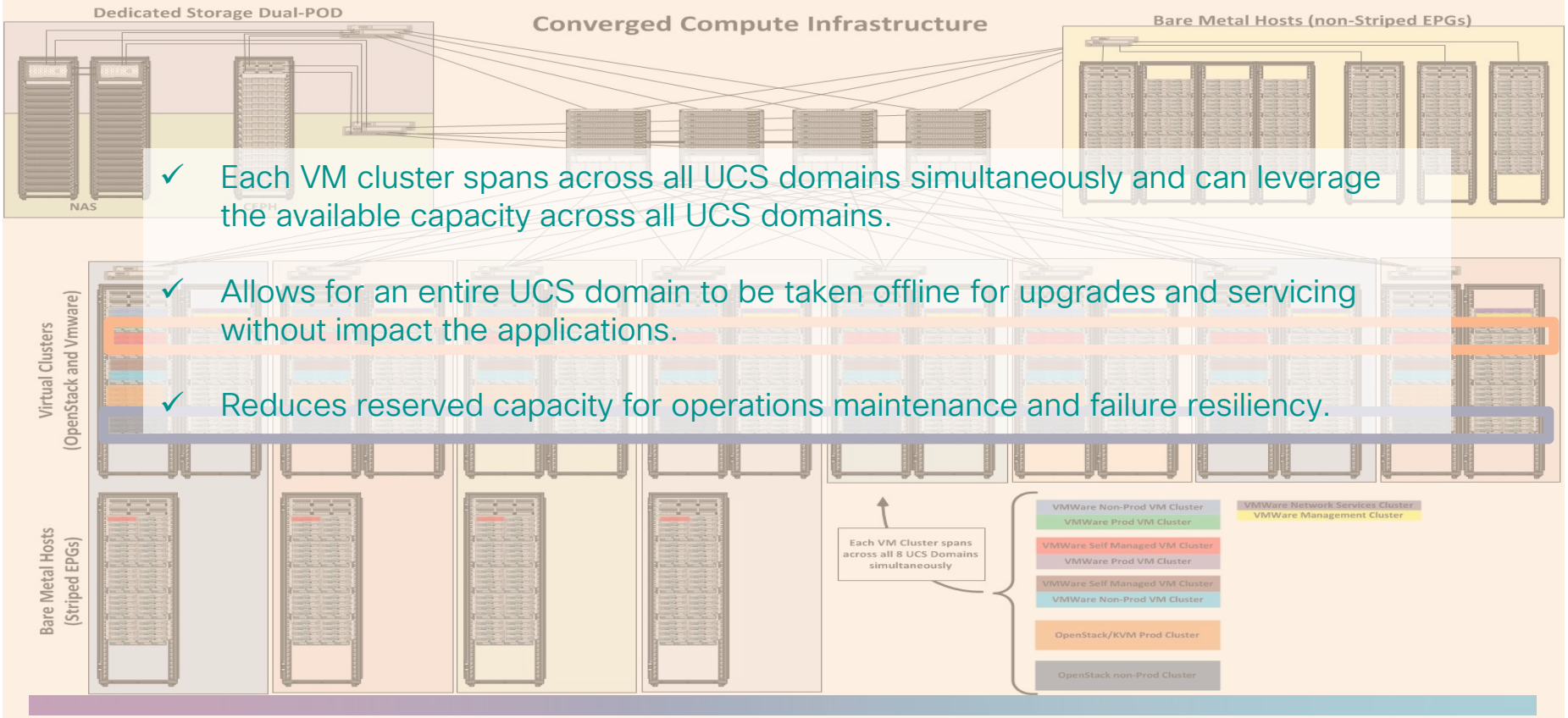
- With traditional networking, applications are locked into the layout of the physical infrastructure under which they were originally assigned.
- Depending on the capacity demands of the applications, some data center may be under utilized while others are maxed out.
- This leads to suboptimal use of available infrastructure resources.
- A downtime will be needed to migrate the application, if more capacity is needed



Network topology (spine and leaf)

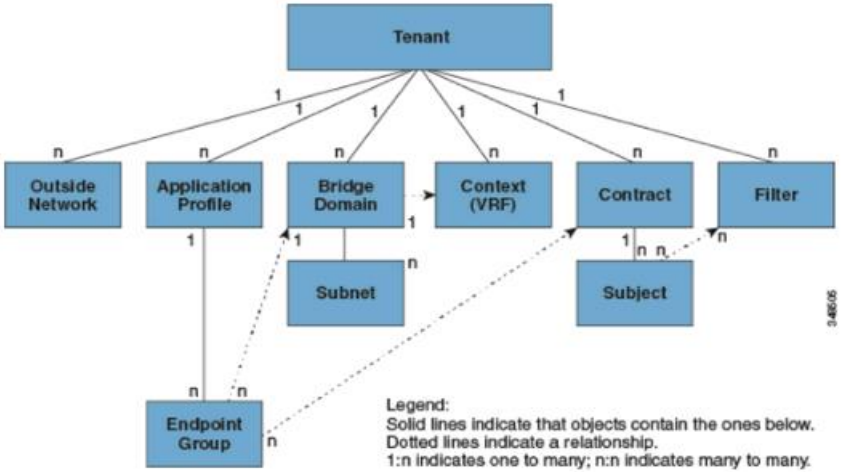


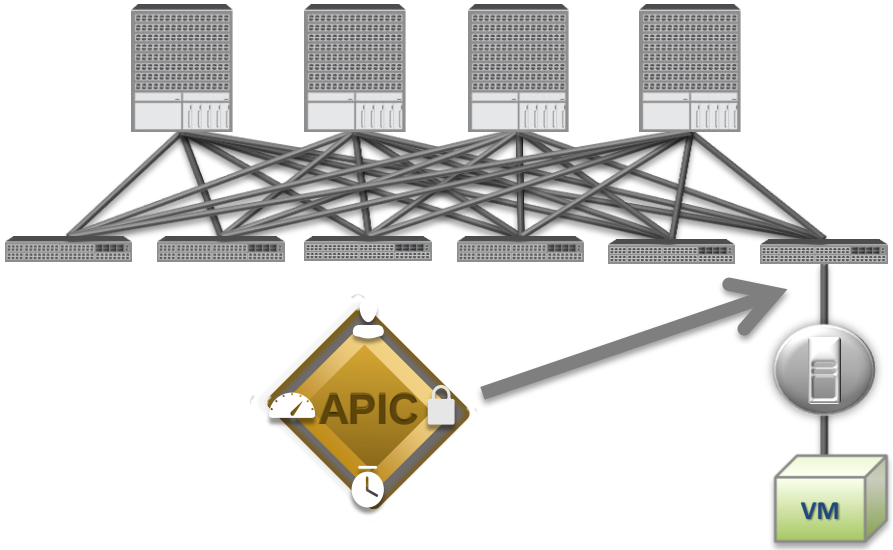
Infrastructure Design w/ ACI Allows for Horizontal Scaling



- ✓ Each VM cluster spans across all UCS domains simultaneously and can leverage the available capacity across all UCS domains.
- ✓ Allows for an entire UCS domain to be taken offline for upgrades and servicing without impact the applications.
- ✓ Reduces reserved capacity for operations maintenance and failure resiliency.

Policy engine





- Solid lines indicate that an object contains the one(s) below
- Dotted lines indicate a relationship
- 1:n indicates one to many
- n:n indicates many to many

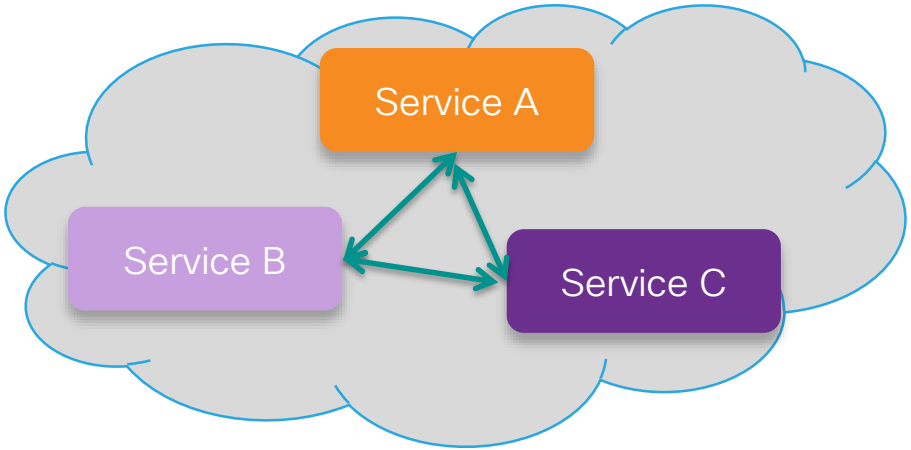
- **APIC manages pushing of policy to leaf enforcement point when EPs connect**

OpenStack with ACI

Accelerating application deployment

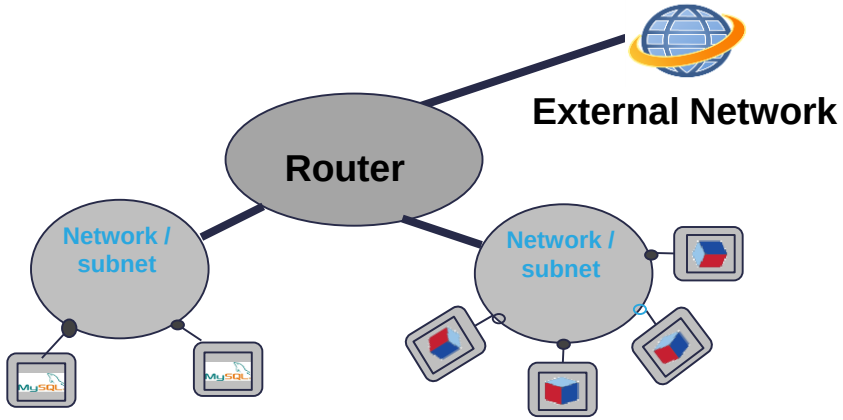
What's Wrong with OpenStack Networking Today?

Cloud Application Model



- No broadcast / multicast
- Resilient / Fault Tolerant
- Scalable Tiers
- Dependencies between loosely coupled services
- Don't care about IP addresses

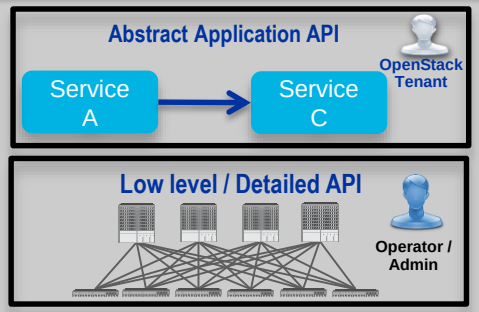
Neutron Model



- L2 / Broadcast is the base API!
- Network / routers / subnets
- Based on existing networking models
- No concept of dependency mapping

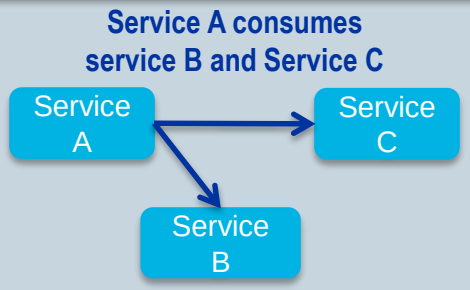
Where Can We Do Better

Separation of Concerns



- Separate application requirements from low level APIs
- Separate tenant from operator

Dependency Mapping



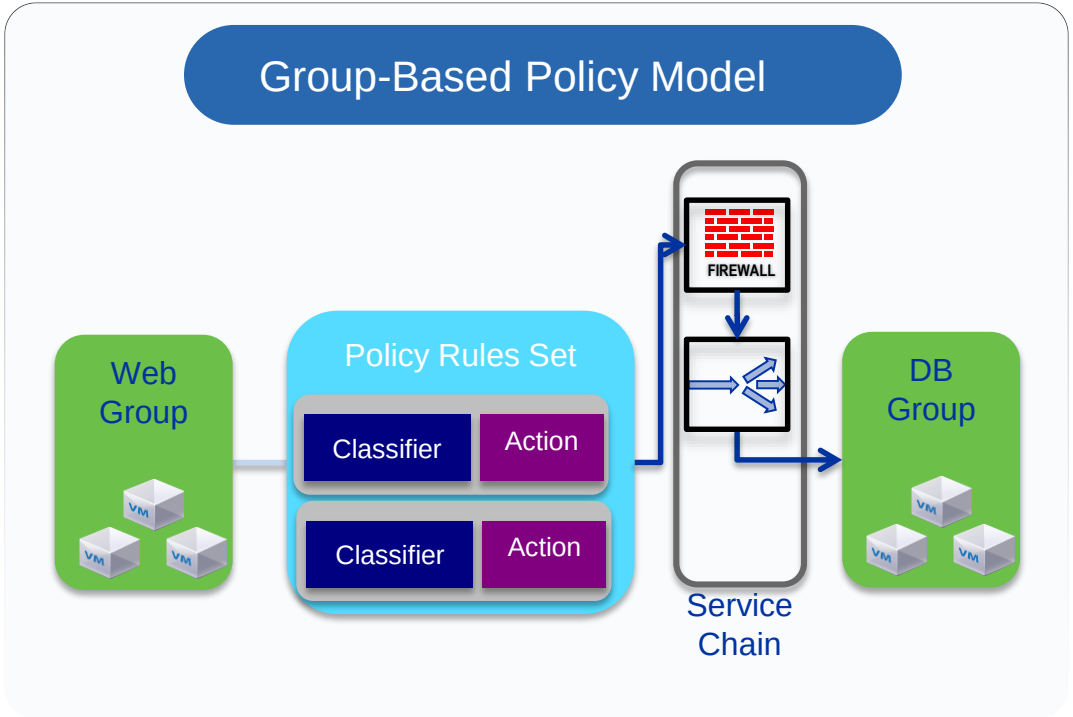
- Build self-documenting dependency maps of tiers of an application

Enable Network Services

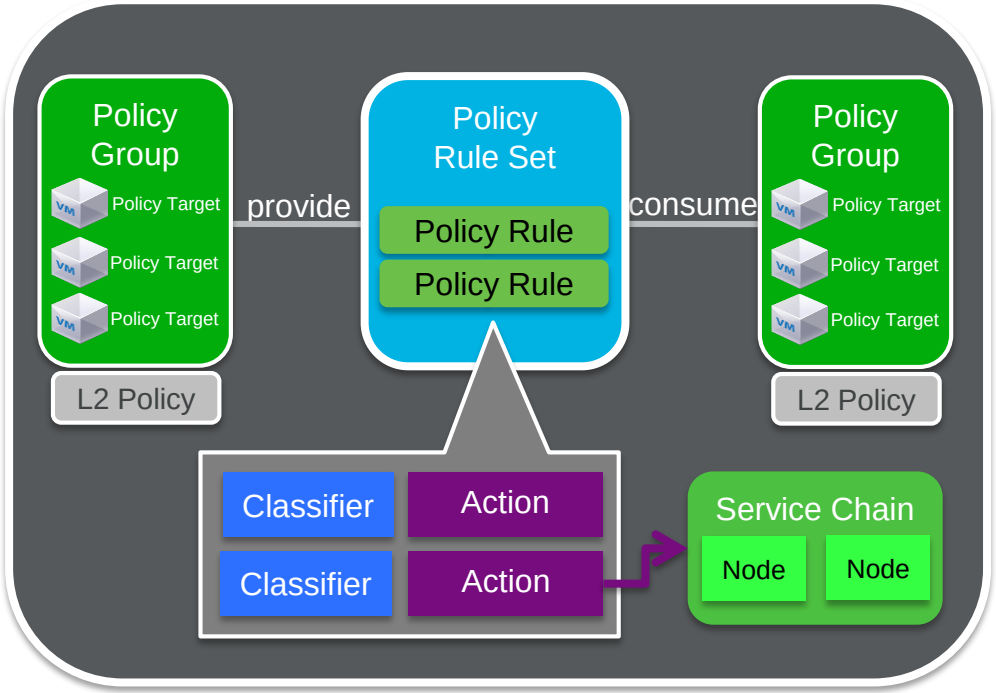
- Define network service chains between tiers of an application *without* low level configuration

Group-Based Policy for OpenStack

- A 100% open source, Apache-licensed
- Interface for capturing application intent, including network service requirements
- Model inspired by APIC but available for any hardware / software platform
- Networking today, plans to cover compute, storage
- Growing number of contributors and ecosystem partners



Group Based Policy Model



Policy Group: Set of endpoints with the same properties. Often a tier of an application.

Policy RuleSet: Set of Classifier / Actions describing how Policy Groups communicate.

Policy Classifier: Traffic filter including protocol, port and direction.

Policy Action: Behavior to take as a result of a match. Supported actions include “allow” and “redirect”

Service Chains: Set of ordered network services between Groups.

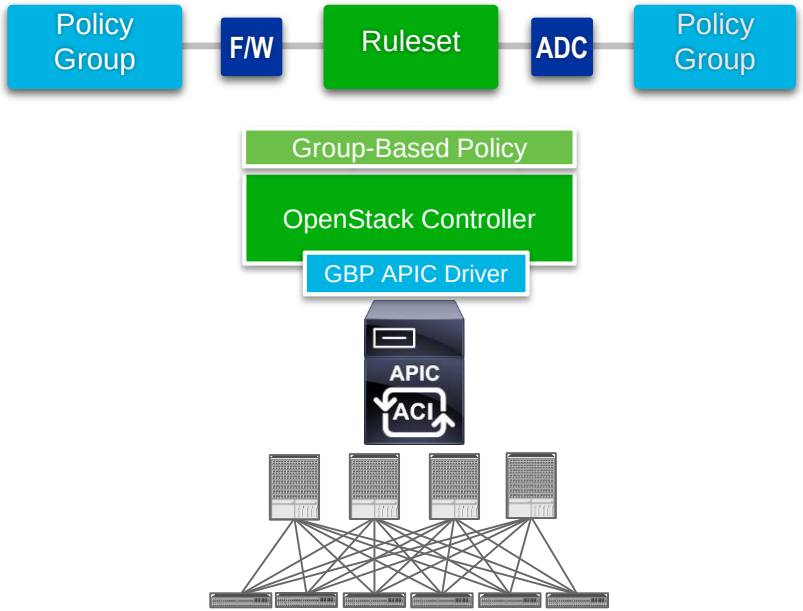
L2 Policy: Specifies the boundaries of a switching domain. Broadcast is an optional parameter

L3 Policy: An isolated address space containing L2 Policies / Subnets

Group-Based Policy Driver for ACI

GBP APIC Driver

- Group-Based Policy API: Policy Groups, Rulesets, L2 / L3 policies
- GBP APIC driver maps policies directly to APIC / ACI
- L2, L3, and security policies enforced in ACI fabric
- Supported on Juno and later releases



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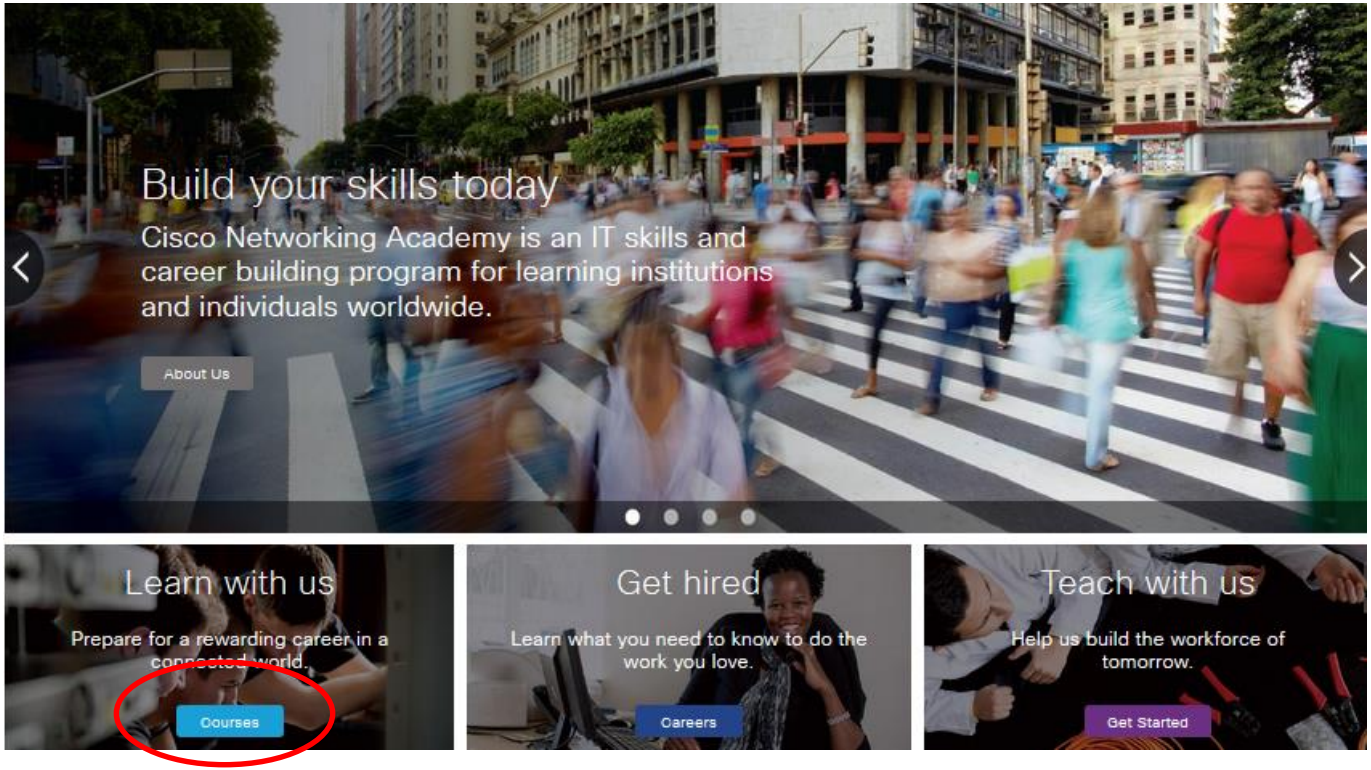

TOMORROW starts here.