Cisco IT's Journey to the Cloud(s)

The Future of Infrastructure is Software-Defined and Data-driven

Benny Van De Voorde, Cisco IT, Principal Architect
Koen Denecker, Cisco IT, VP Cloud Infra & Platform Services

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Agenda

1 Inside Cisco IT

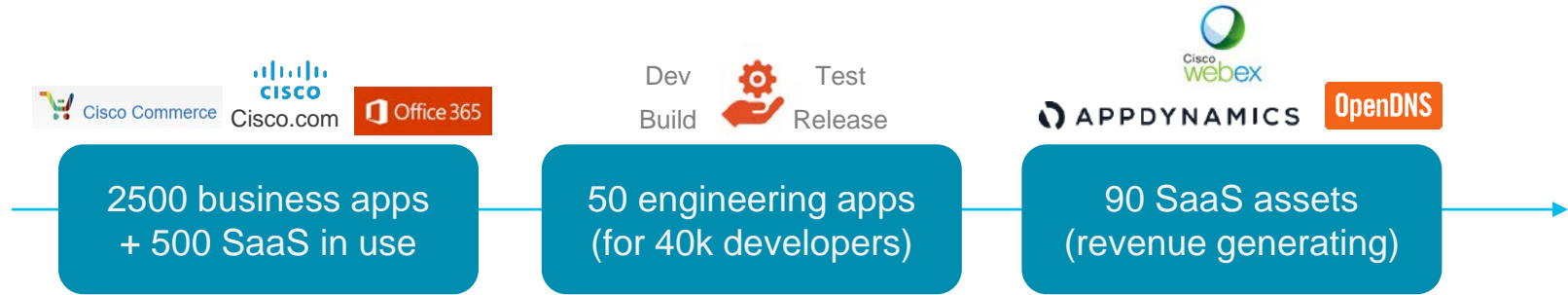2 Infrastructure choices and Operating models
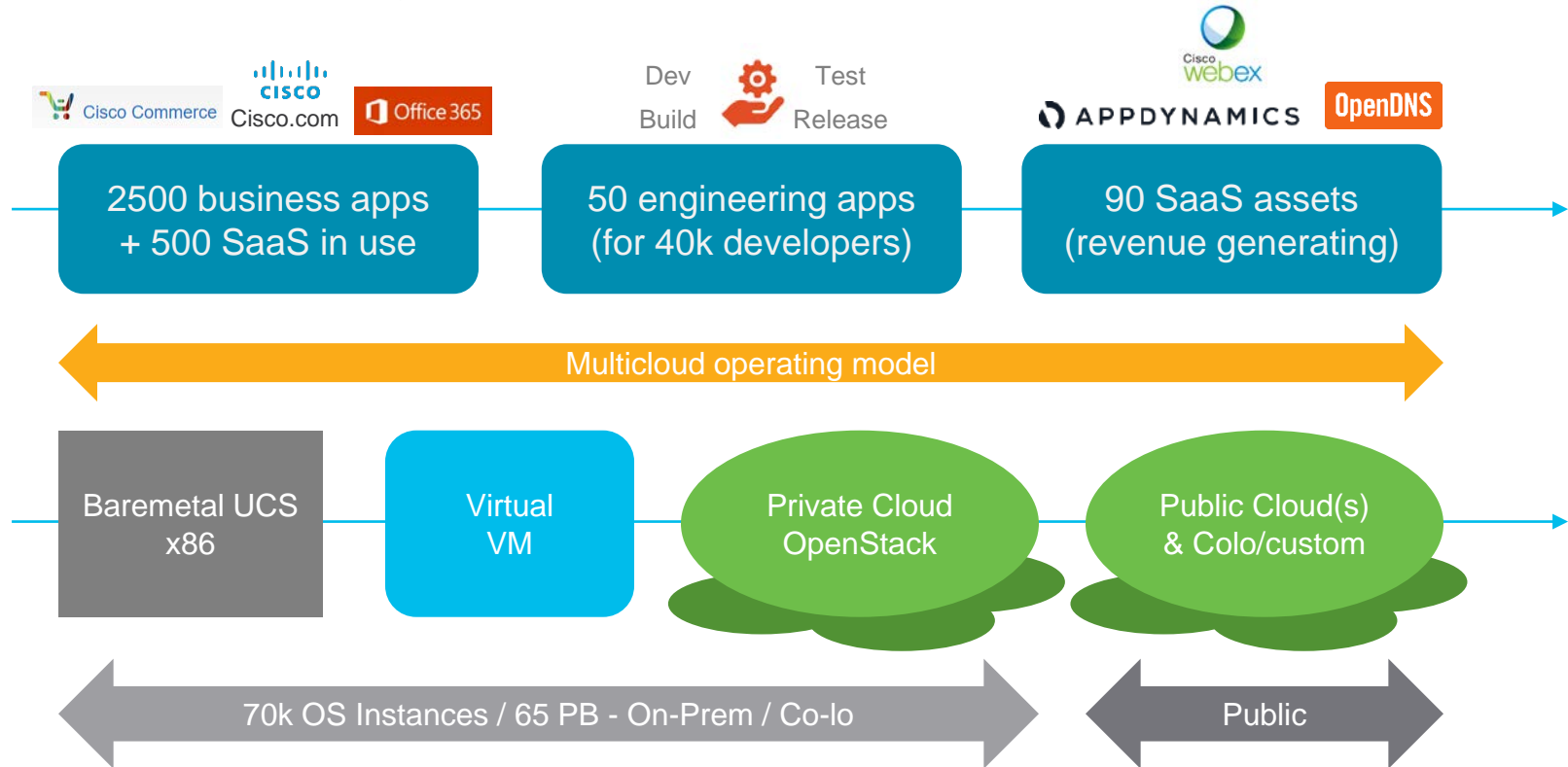
3 Demo – SDx & Data insights
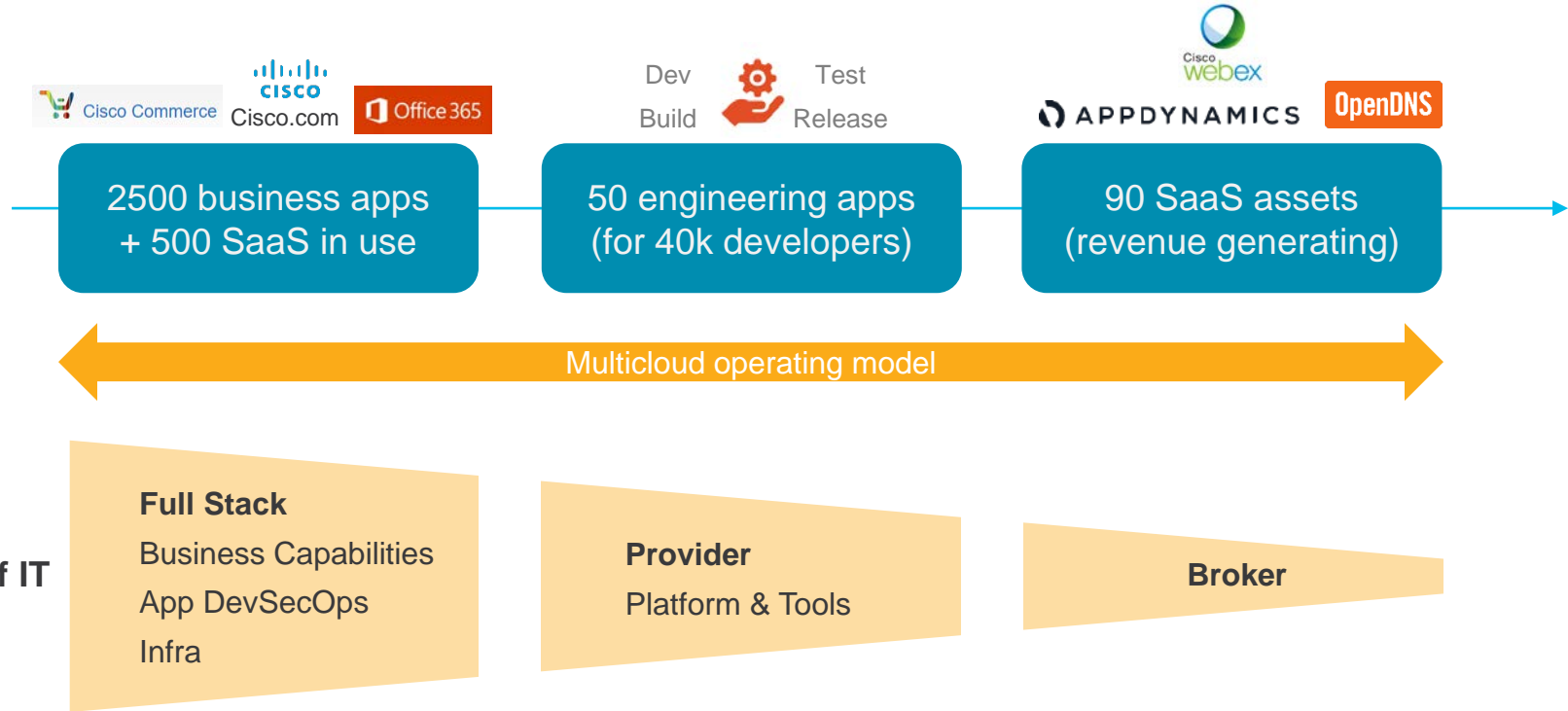
4 Multicloud

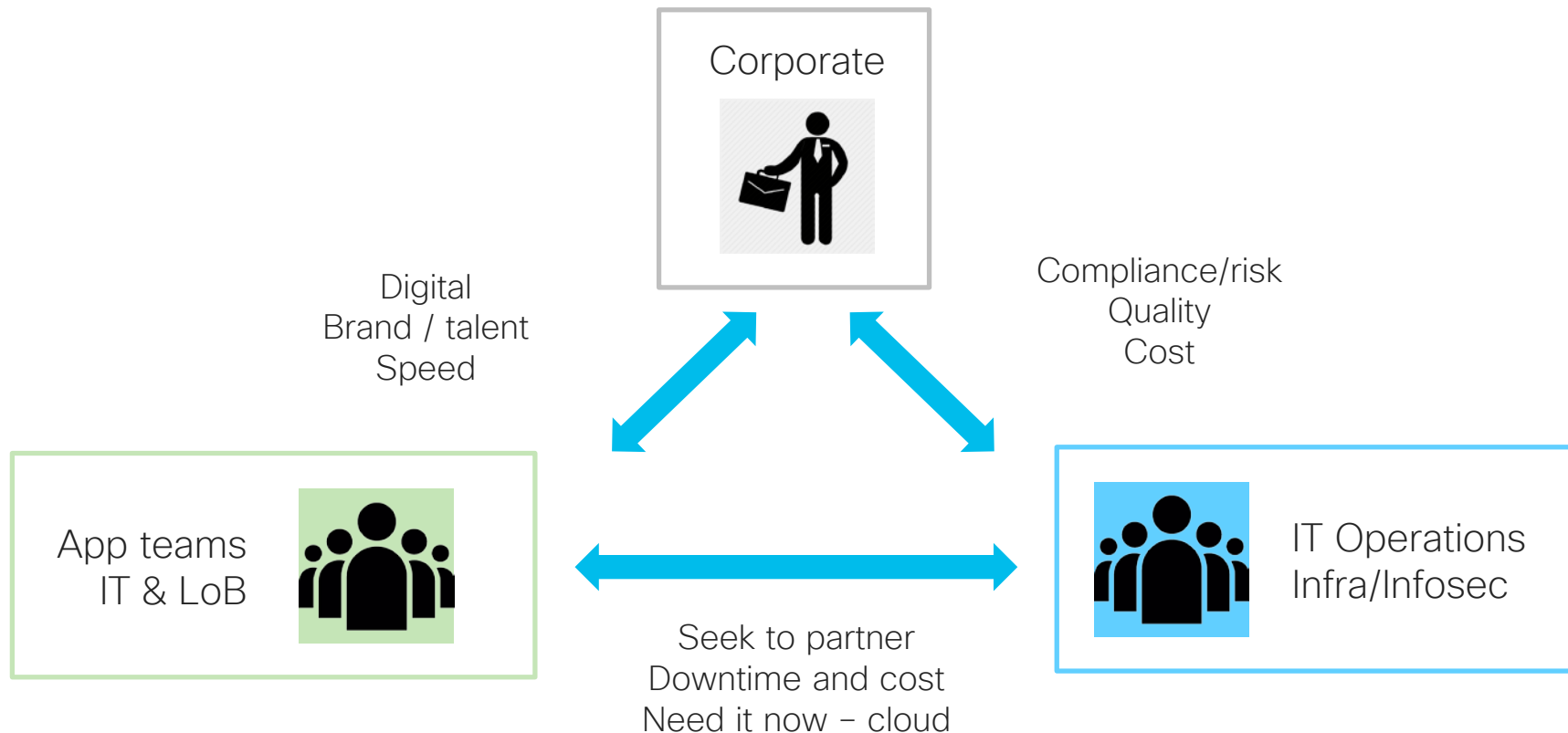Inside Cisco IT: some data points

Cisco: A spectrum of workloads …

2500 business apps + 500 SaaS in use

50 engineering apps (for 40k developers)

Dev   Test
Build   Release

90 SaaS assets (revenue generating)

.. across many "clouds"

2500 business apps + 500 SaaS in use

50 engineering apps (for 40k developers)

90 SaaS assets (revenue generating)

Dev · Test · Build · Release

Multicloud operating model

Baremetal UCS x86

Virtual VM

Private Cloud OpenStack

Public Cloud(s) & Colo/custom

70k OS Instances / 65 PB - On-Prem / Co-lo

Public

The Operating Model is Evolving

Cisco Commerce — CISCO Cisco.com — Office 365

Dev Build — Test Release

Cisco webex — APPDYNAMICS — OpenDNS

2500 business apps + 500 SaaS in use	50 engineering apps (for 40k developers)	90 SaaS assets (revenue generating)

Multicloud operating model

Role of IT varies

Full Stack
Business Capabilities
App DevSecOps
Infra

Provider
Platform & Tools

Broker

Challenges as the World goes Digital

Corporate

Digital
Brand / talent
Speed

Compliance/risk
Quality
Cost

App teams
IT & LoB

IT Operations
Infra/Infosec

Seek to partner
Downtime and cost
Need it now – cloud

Where do we go from here?

Empower the
DevSecOps teams:
API ⇔ Data

Value for
tomorrow

Stuck in
the present

Choice of Infra Platforms

Automation & Visibility (SDx ⇔ Data)
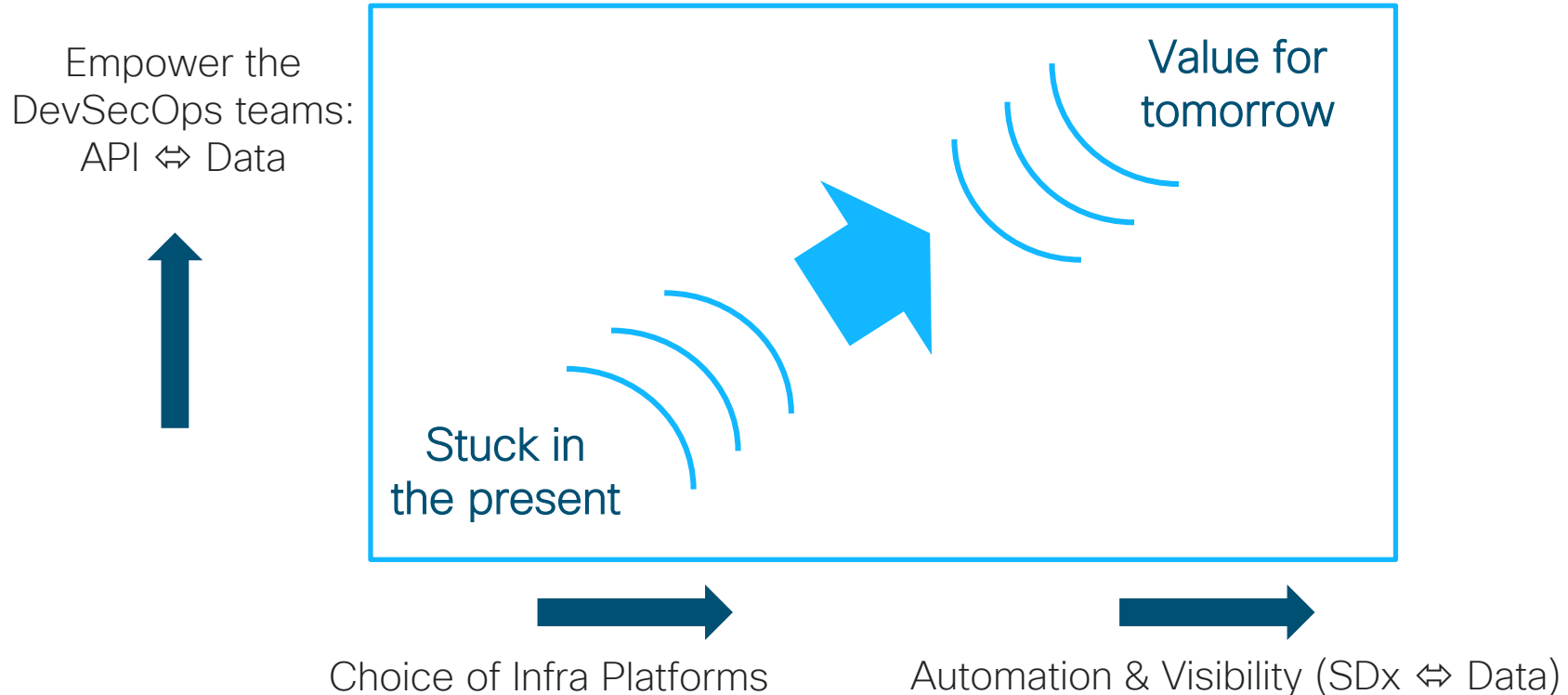
Bringing it all Together

Automation
SDx

Operating
Models

Infra
Platforms

Pervasive
Security

Insightful
Data
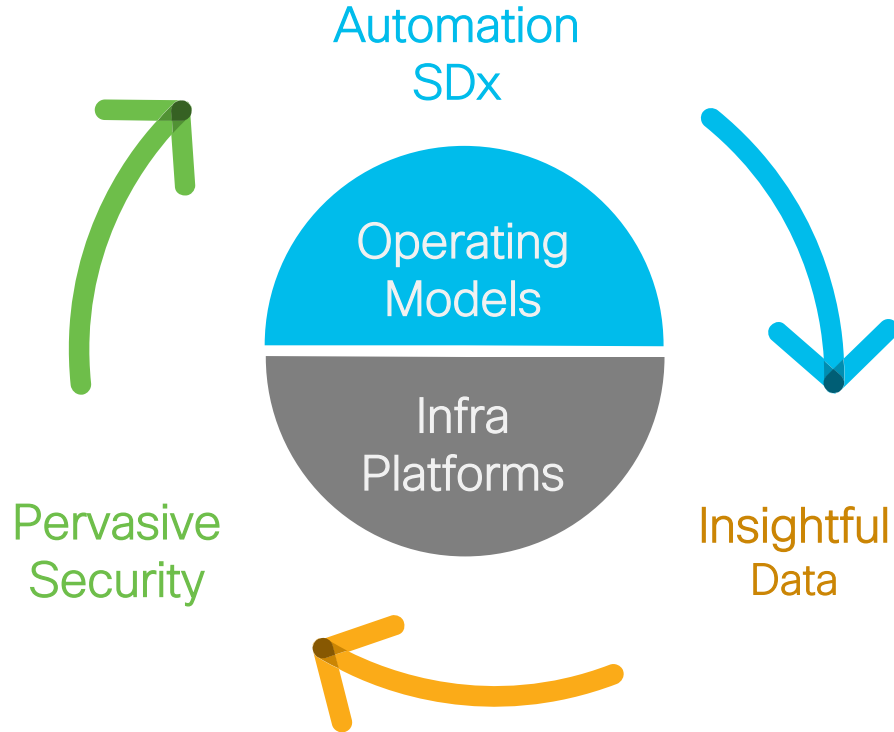
Infrastructure Choice

Supporting multiple operating models

Infrastructure Evolution .. Before

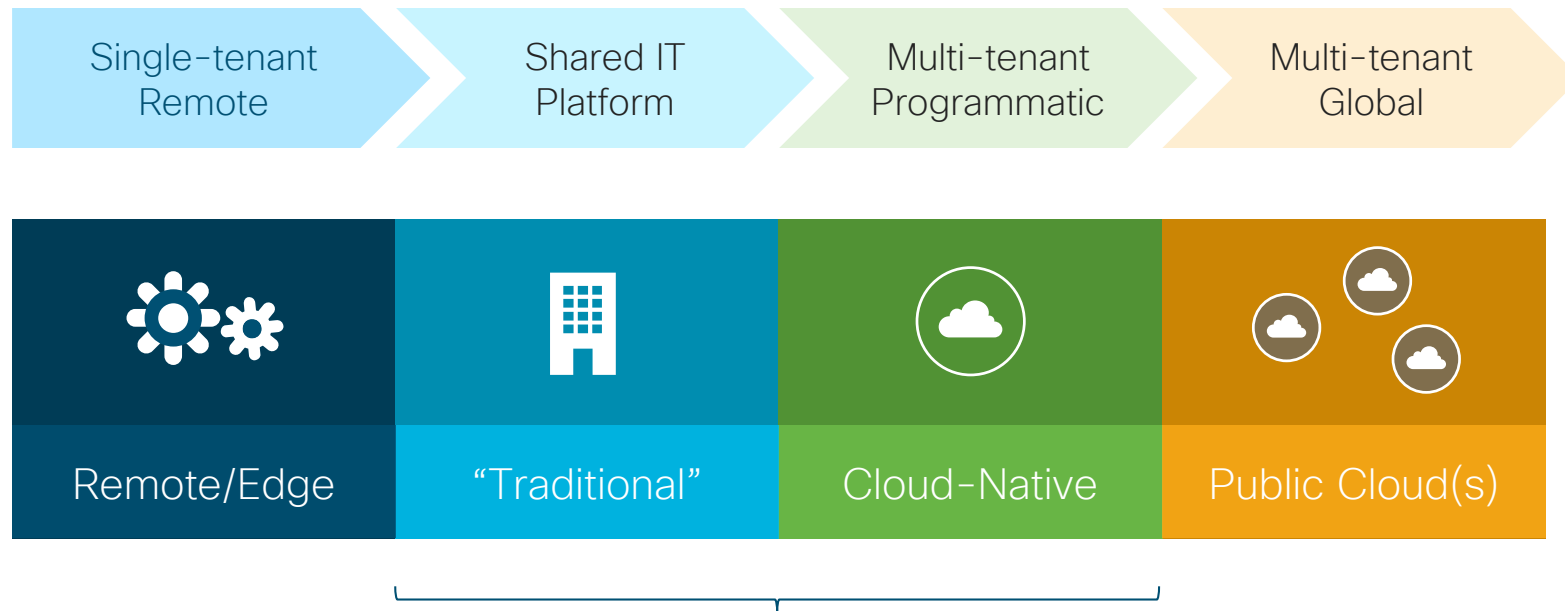"Traditional"

- ACI
- UCS/VM
- SAN & NAS

Infrastructure Evolution.. After

Remote/Edge	"Traditional"	Cloud-Native	Public Cloud(s)
• Hyperflex	• ACI • UCS/VM • SAN & NAS	• OpenStack • Kubernetes • SD: ACI/UCS	• AWS • GCP • Azure

Supporting Multiple Operating Models

Single-tenant Remote	Shared IT Platform	Multi-tenant Programmatic	Multi-tenant Global

Remote/Edge	"Traditional"	Cloud-Native	Public Cloud(s)

On-prem for data gravity, proximity/integration, risk/security, cost

Infrastructure Evolution.. One Foundation

Remote/Edge	"Traditional"	Cloud-Native	Public Cloud(s)
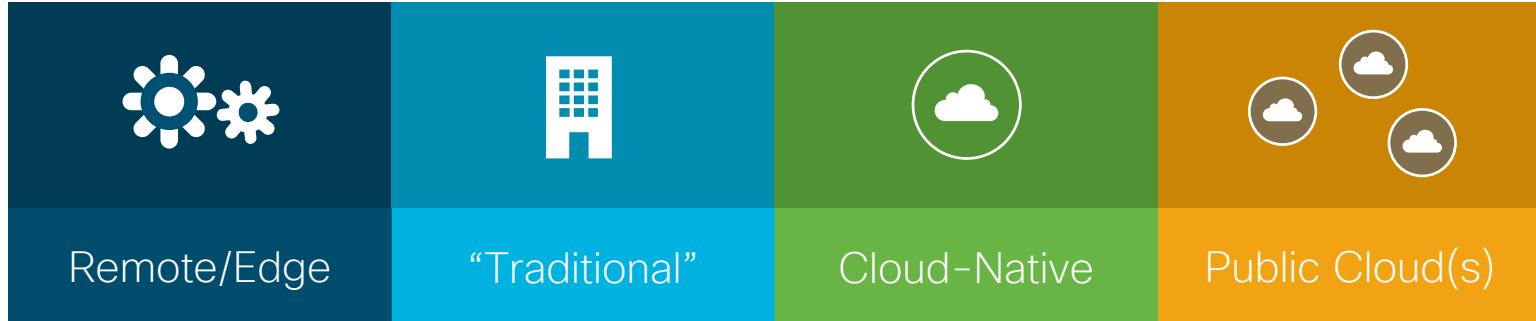
One foundation:

Experience + SDx + Insightful Data + Pervasive Security

A Quick Demo

Automated provisioning through Infra-as-Code

A Quick Demo

Day-0: Onboard

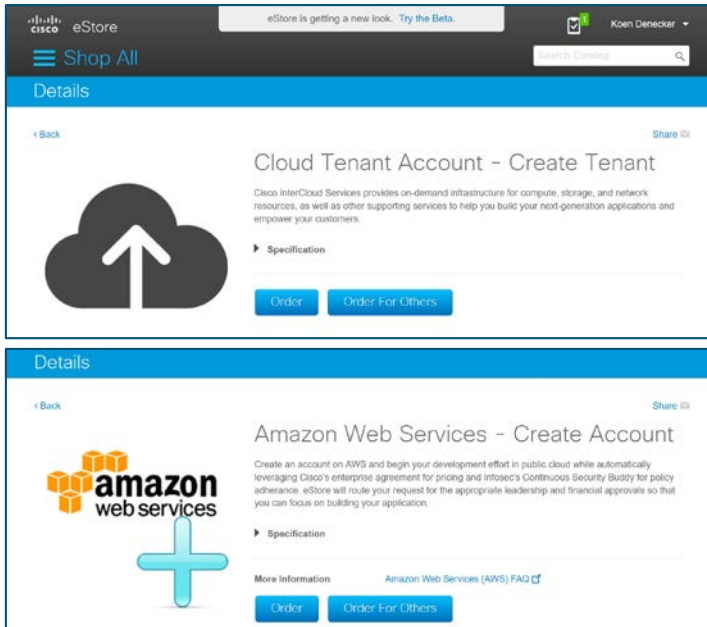Day-1: Provision

Day-2: Manage & Operate

Day-0: Onboarding

Day-0: Onboard	Day-1: Provision	Day-2: Manage & Operate

On-prem

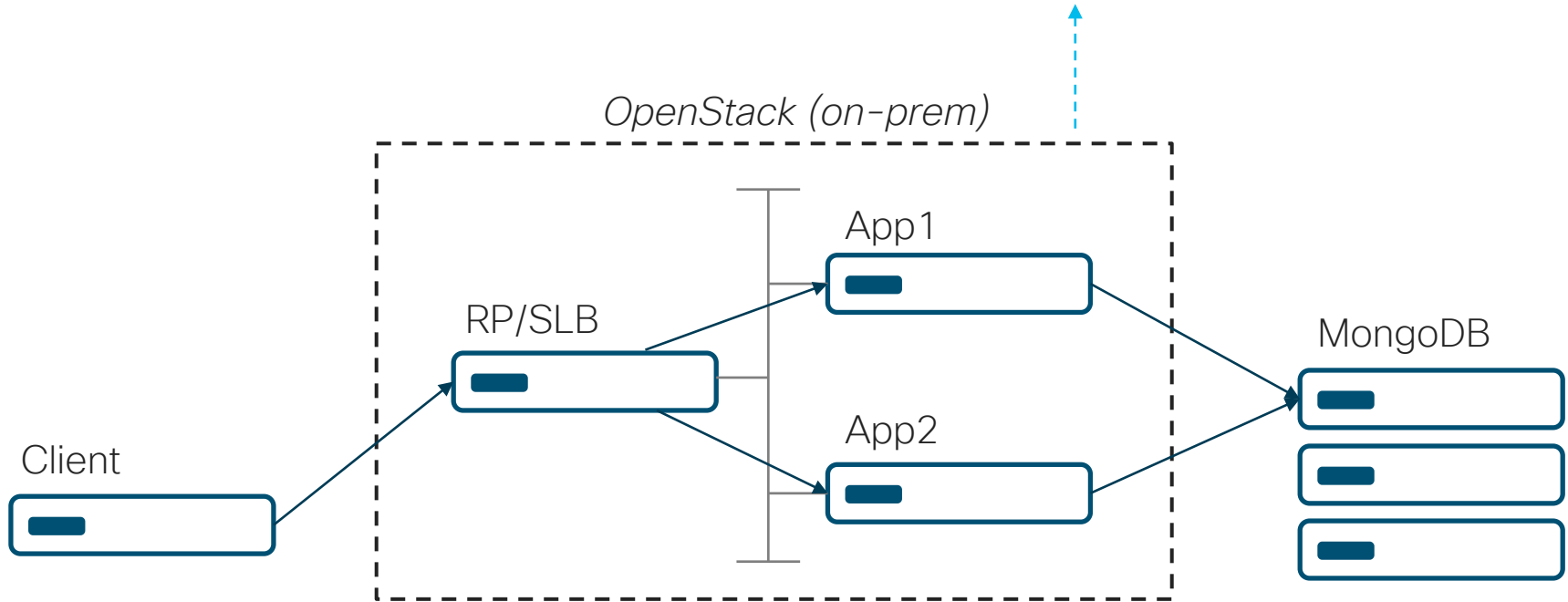Public

Multicloud onboarding

- Service catalog
- Project/account creation
- Billing integration
- Operational "hooks" for visibility and security

Sample WebApp

APPDYNAMICS

CiscoTetration Analytics™

OpenStack (on-prem)

App1

RP/SLB

App2

MongoDB

Client

Day-1: Provisioning – CI/CD Pipeline

| Day-0: Onboard | Day-1: Provision | Day-2: Manage & Operate |

| PLAN | DEVELOP | BUILD | INTEGRATE | RELEASE | MAINTAIN |

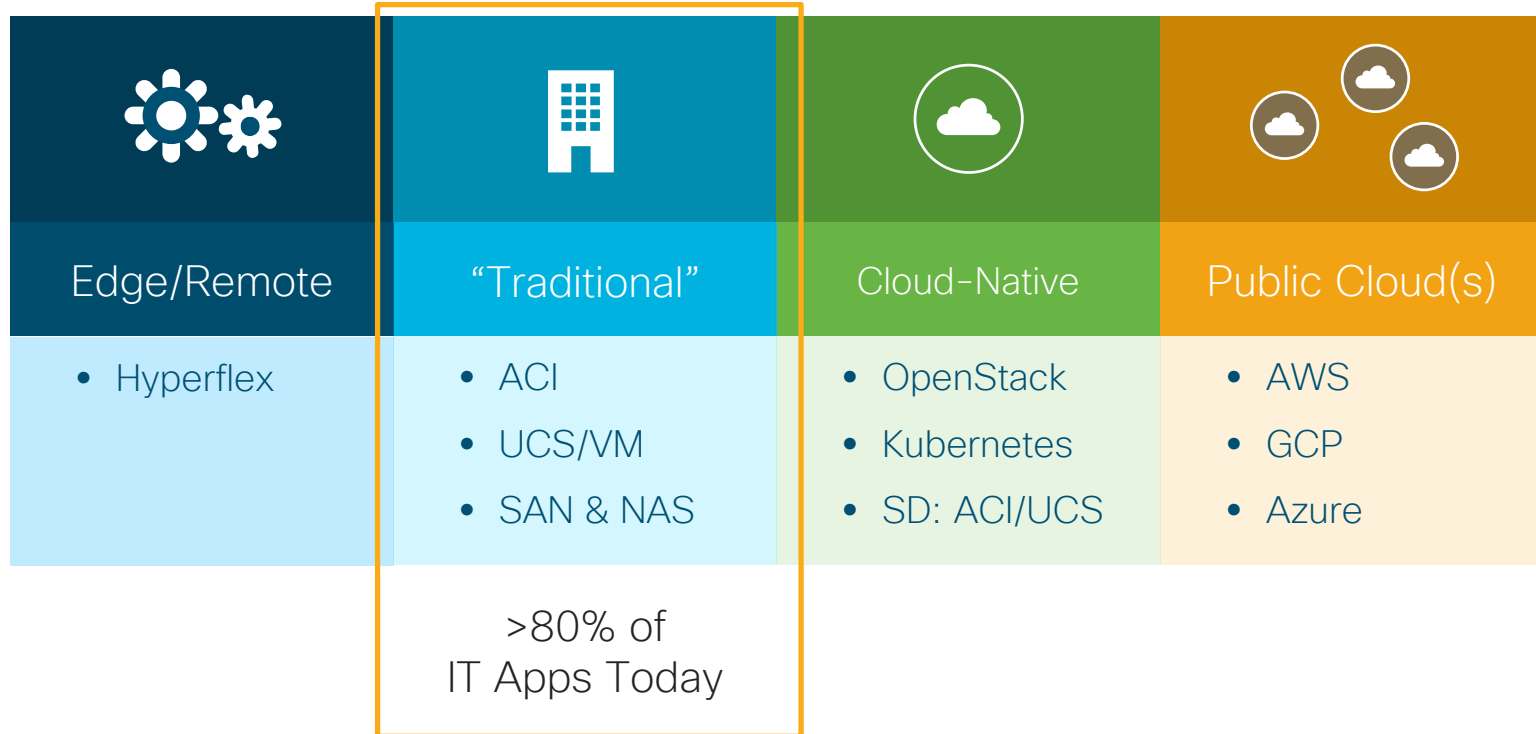Empower the developer
"Infra as code"

Ansible (or CloudCenter, Terraform, Heat, Tosca, ..)

- Network, SLB, tenant infra security
- Instances (VMs), secrets
- Application code (container)
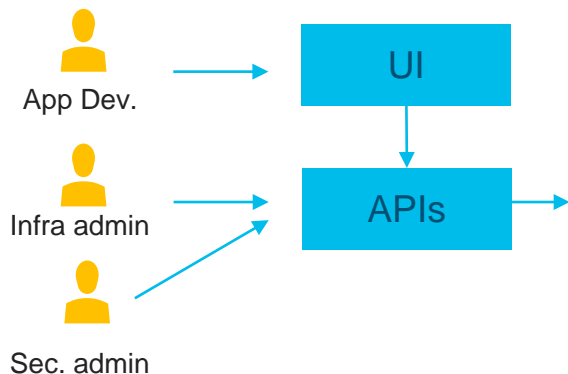- Day-2 service integration (AppD, Tetration, ..)

<Switch to demo: provision>

Infrastructure Evolution

Edge/Remote	"Traditional"	Cloud-Native	Public Cloud(s)
• Hyperflex	• ACI • UCS/VM • SAN & NAS	• OpenStack • Kubernetes • SD: ACI/UCS	• AWS • GCP • Azure
	>80% of IT Apps Today		

Infrastructure for Traditional Applications

Operating Model

App Dev.

Infra admin

Sec. admin

UI

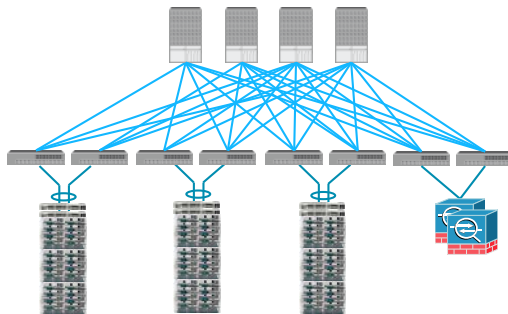APIs

transform to software defined
controlled infrastructure
controlled changes
managed consumption
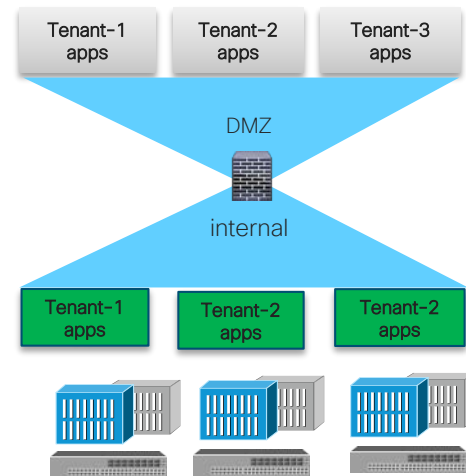
Single Physical Topology

Cisco Components

- Cisco ACI: 9508, 9396PX, 93180YC-EX
- Cisco APIC
- Cisco UCS: B420m3, B200m4, B200m3
- Cisco UCS Fabric Interconnect
- Cisco AVS (AVE)
- Cisco UCS-Manager, UCS-Director (?)
- Cisco ASA

Others:
- Central Storage: Block and NFS
- Mainly virtual compute (VMs)

Virtual Segmentation

Tenant-1 apps

Tenant-2 apps

Tenant-3 apps

DMZ

internal

Tenant-1 apps

Tenant-2 apps

Tenant-2 apps

shared IaaS layers
(compute, storage, network)

Metro DC Pair

Metro-based Virtual DC (MVDC) Architecture

RTP, NC
Non-Production +
Repurpose-based DR
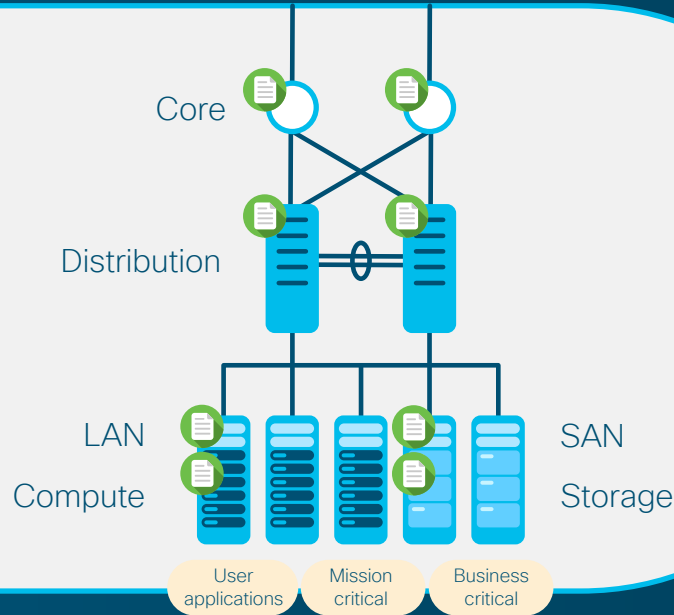
Tier-II, RTP

2x Tier-III Texas

Richardson, TX

Allen, TX

Active-active DC Pair to support mission-critical production services

Modernizing the IT Infrastructure Platform

Enterprise Data Center

Core

Distribution

LAN
Compute

SAN
Storage

User applications

Mission critical

Business critical

✔ <u>Performance/scale</u>: ACI/N9k, UCS big data, all-flash, scaling

✔ <u>Deep Automation</u>: SDx (SRE), cloud managed, proactive assurance, integration

✔ <u>Pervasive security</u>: deep visibility, contain, admin credentials, patch automation

Hyperflex (HCI) at the Remote DC
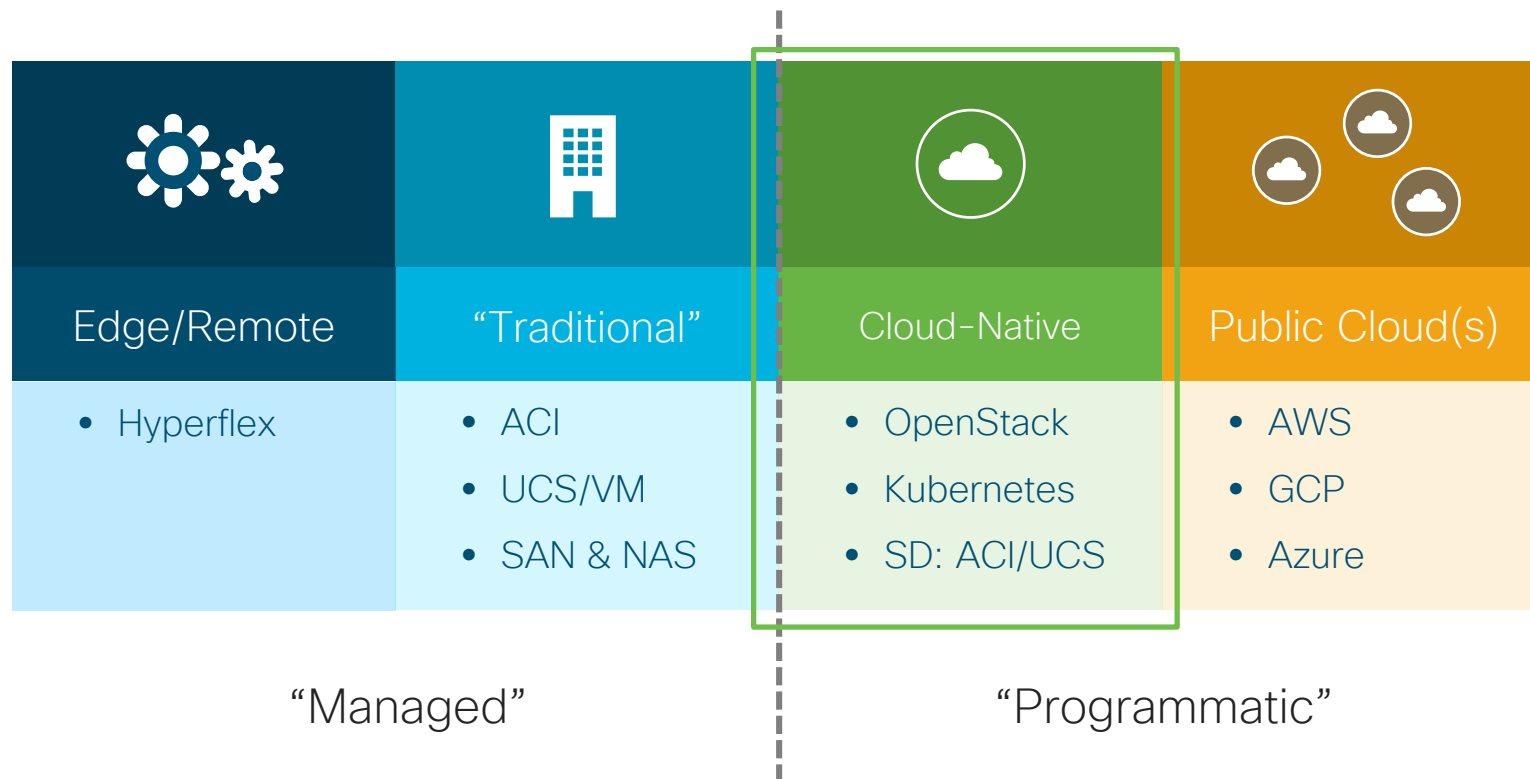

Use case: Manufacturing Sites

Key requirements:
- Small footprint (<100-1k VM/BM, 5-6 TB, 1-2 DB)
- Remote: easy install and resilient
- Cost effective
- Scalable to n (~100) sites

Solution:
- Cisco Hyperflex (HCI)
- No need for dedicated storage
- Built-in automation and HA, re-use of management tools
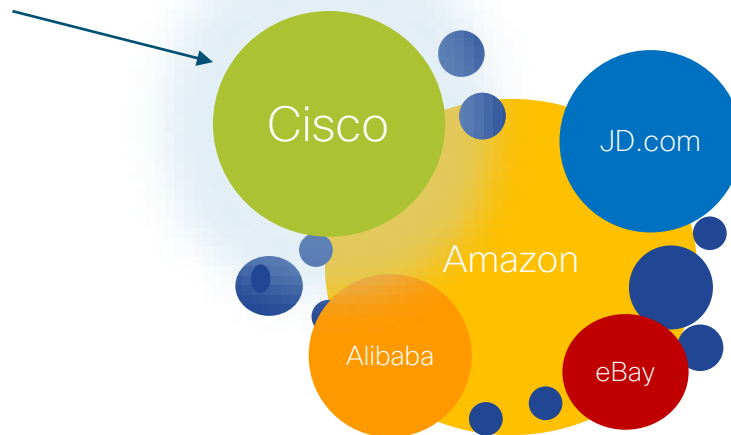- "Simple" ☺

Infrastructure Evolution.. After

Edge/Remote	"Traditional"	Cloud-Native	Public Cloud(s)
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"Managed"

"Programmatic"
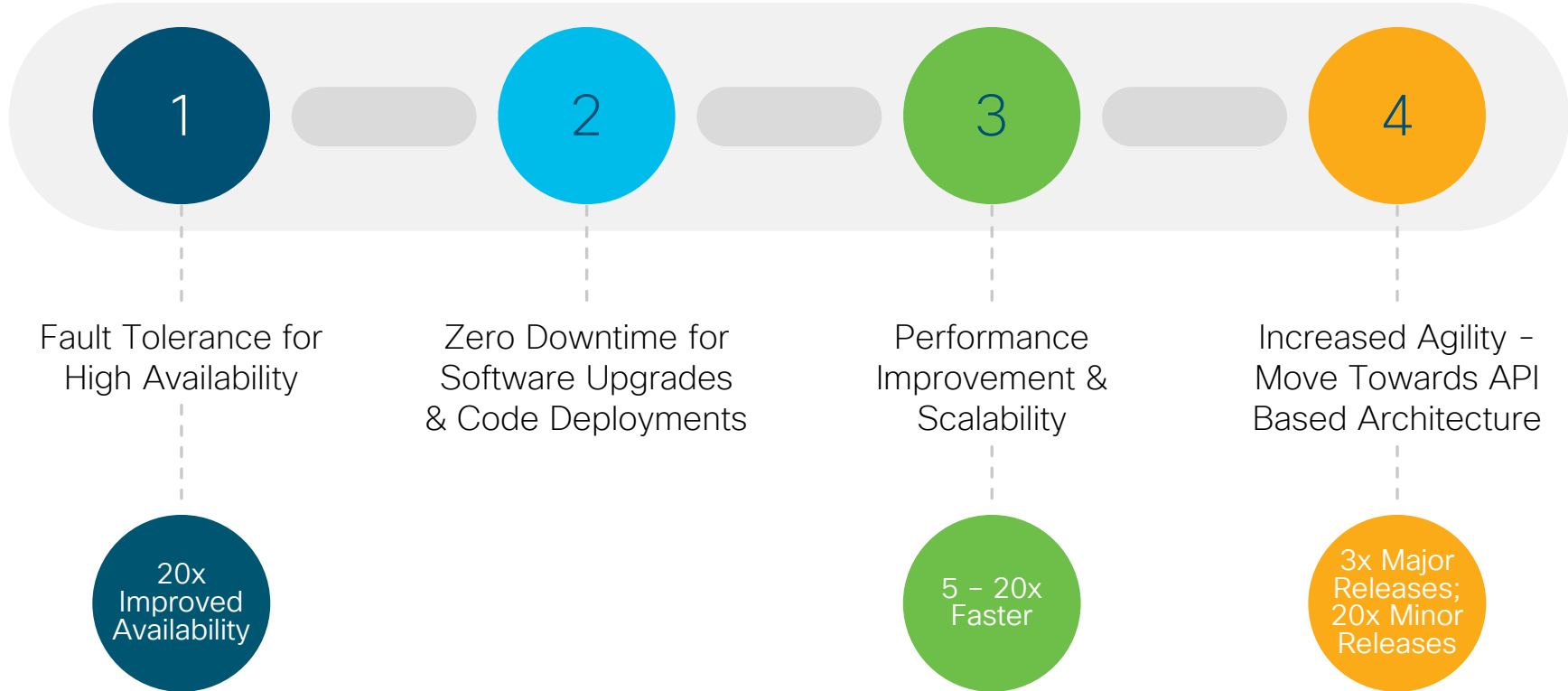
Cloud–Native Proofpoint: Commerce Renewals

Total Cisco eCommerce Sales:
$12B quarterly revenue

Commerce Renewals:
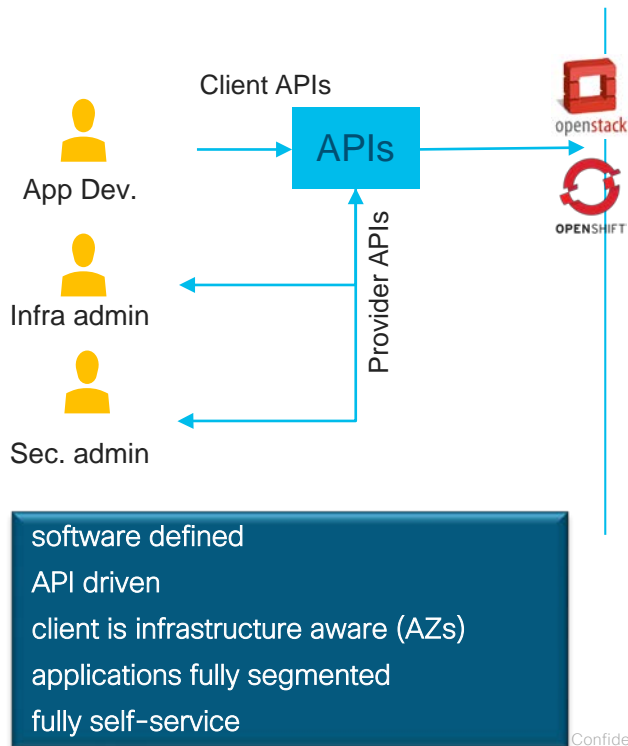25% and growing

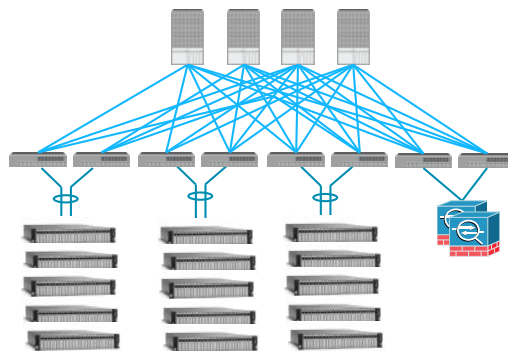Bubble size: quarterly eCommerce revenue

Why Cloud Native?

1 — Fault Tolerance for High Availability — 20x Improved Availability

2 — Zero Downtime for Software Upgrades & Code Deployments

3 — Performance Improvement & Scalability — 5 – 20x Faster

4 — Increased Agility – Move Towards API Based Architecture — 3x Major Releases; 20x Minor Releases

Infrastructure for Cloud Native

Operating Model

Client APIs

App Dev.

Infra admin

Sec. admin

Provider APIs

APIs

- software defined
- API driven
- client is infrastructure aware (AZs)
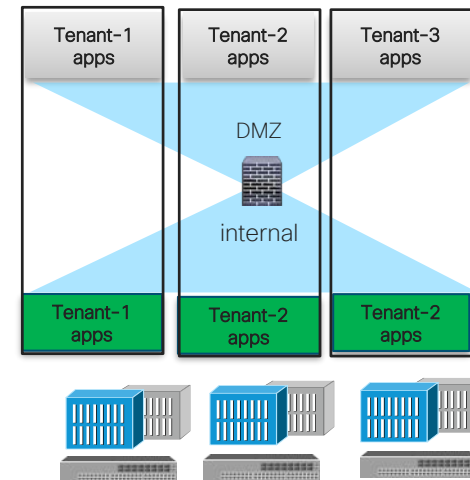- applications fully segmented
- fully self-service

Single Physical Topology

Cisco Components

- Cisco ACI: 9508, 9396PX, 93180YC-EX
- Cisco APIC
- Cisco UCS: C-Series
- Cisco ASA
- Cisco AIM Openstack Plugin

Others:

- Storage: Local, NFS, Block
- Mainly virtual compute (VMs)

Virtual Segmentation

Tenant-1 apps	Tenant-2 apps	Tenant-3 apps
	DMZ	
	internal	
Tenant-1 apps	Tenant-2 apps	Tenant-2 apps

shared IaaS layers
(compute, storage, network)
Availability Zones
Regions
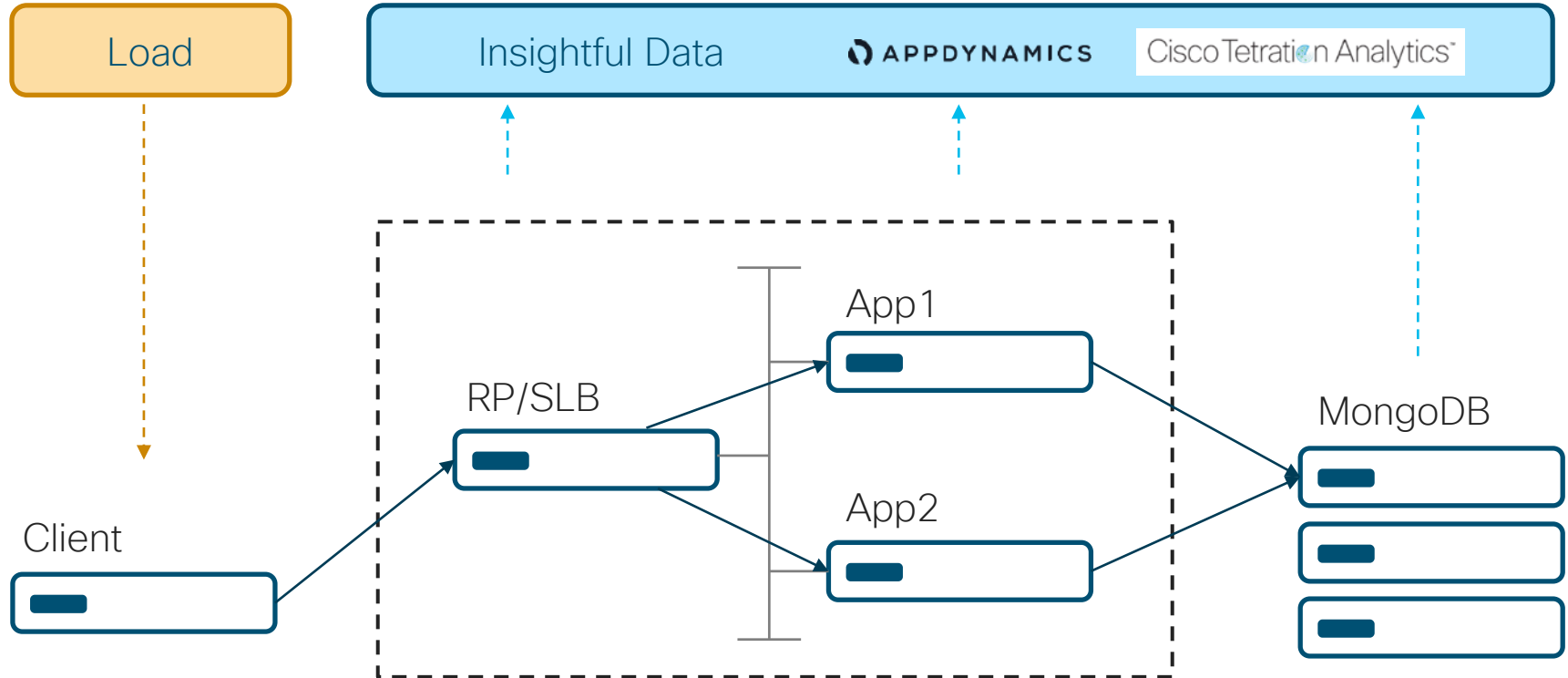Full application segmentation

Multi-Region Resiliency
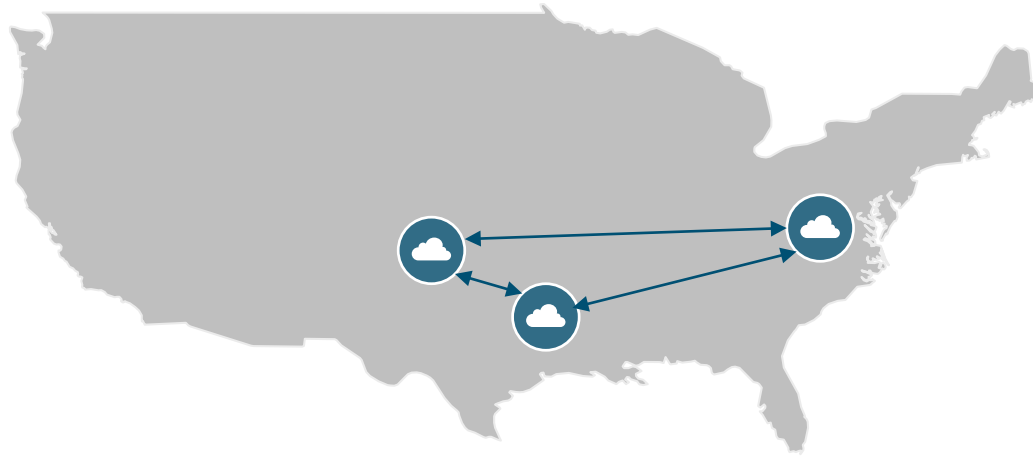
- Active-active-active
- Shared-nothing architecture
- Ruthless standardization through SDx

Demo Cont'd

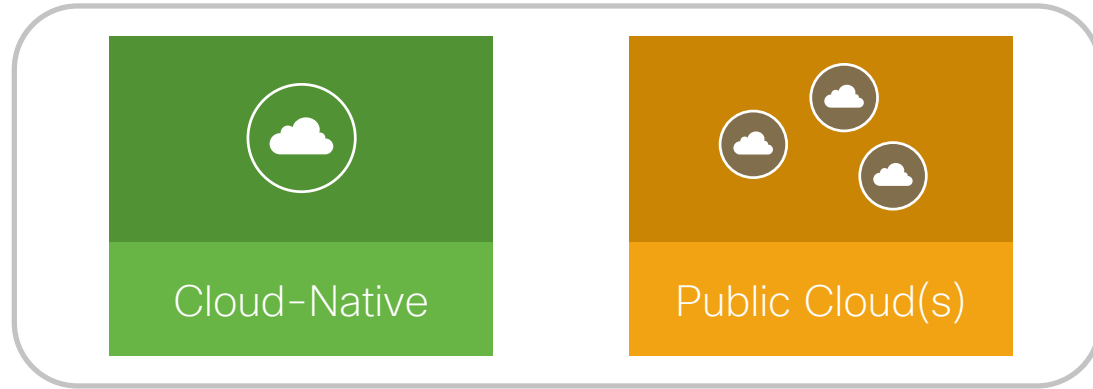Day-2 – Insightful data to manage & operate

Demo Cont'd: Insightful Data

<Switch to demo: Insightful Data>

Multicloud

"Multicloud is the new Data Center"
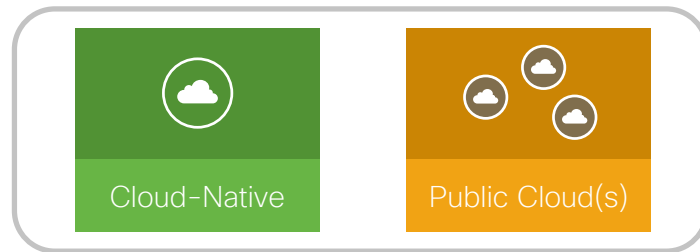The next iteration of the Cloud Operating Model

Multicloud – Top of Mind

Cloud-Native

Public Cloud(s)

- Who decides/enables/provides/controls what?
- How do we manage risk (security, compliance, lock-in)?
- How do we optimize cost?

Choosing a cloud has to be a business decision, not a technology decision

Multicloud – The Next Operating Model

Cloud-Native

Public Cloud(s)

Manage	CD/Runtime	Network	Security	Operate
Onboarding Cost management	Cisco Container Platform* Cloud DBs	CSR SAE: Secure Agile Exchange Portable policy	Security Buddy Deep Analytics (Tetration)	Right-sizing App perf mgmt (AppDynamics)

Not exhaustive

* In progress / not GA yet

In Summary

Automation
SDx

Operating
Models

Multicloud

Infra
Platforms

Pervasive
Security

Insightful
Data