*Fast Innovation requires Fast IT*

Cisco Connect

# Trends and Data Centre Innovation

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# Agenda

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- Application trends
- Current data centre trends
- IT Cloud integration
- Automation and orchestration

# Application Trends

# Application History

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**Monolithic (1980-1990)**

- Mega-scale “single” compute needed to deal with app scale
- [illegible]
- [illegible]

* C[illegible]

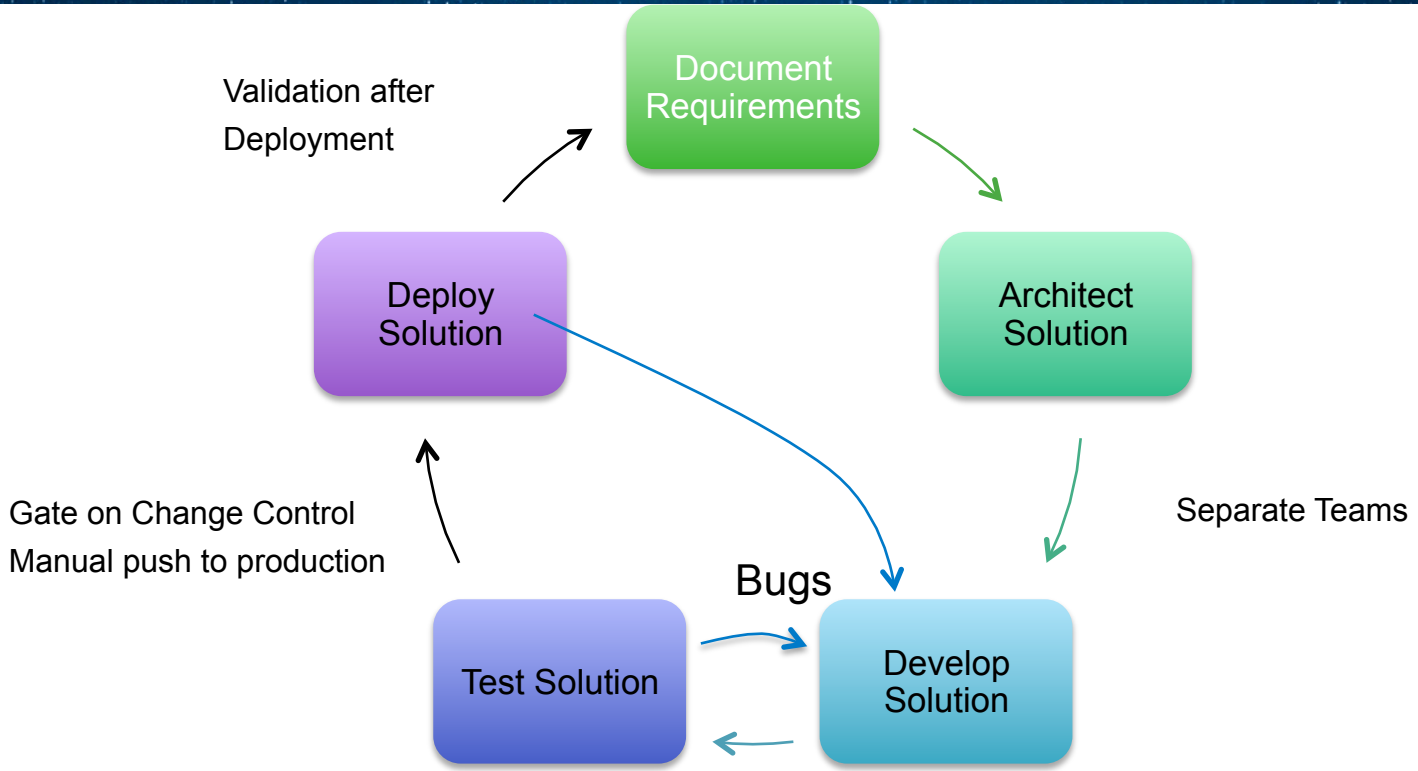
**Distributed (1990-2010)**

- Application broken into scalable units
- Development still waterfall, with complex management and staging required for component upgrades
- [illegible]
- [illegible]

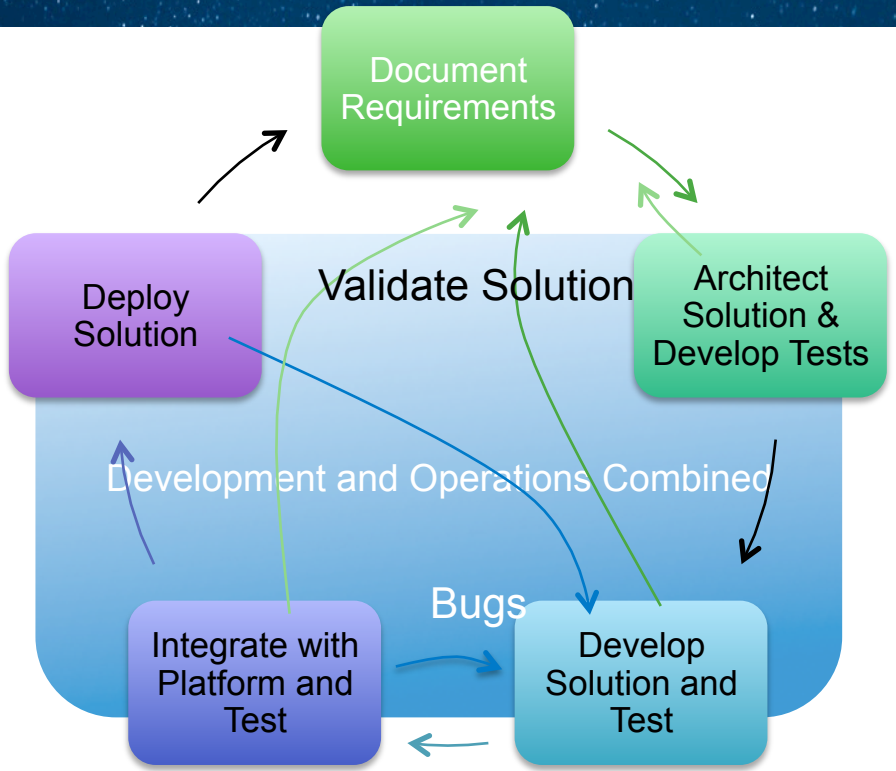
**WebScale (2010-Present)**

- Applications broken into smaller easy-to-replace units with managed APIs for interaction
- “Agile” development with Continuous Integration (embedded test) and Continuous Deployment (embedded operations)
- Distributed security, either in the app or at the network edge
- Current super-scale web services and rapidly developed super-custom apps

# Application Development-Waterfall



# A Change to Application Development-Agile




Deployment:

Push based on successful test

# The Effects of Changing Application and Business Needs on DevOps

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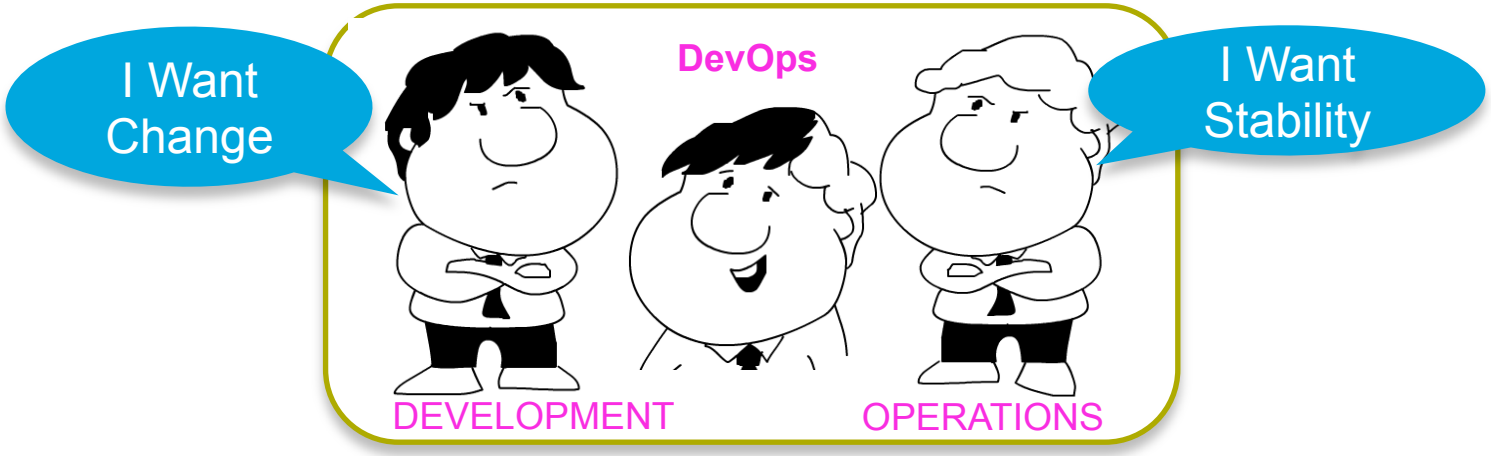
**Global enterprises, on an average, are planning on adding 46 new applications in 2013 IDC**

**"IT is perceived by CEO's as the single greatest barrier to change" Gartner**




**"…70% of IT budgets on maintenance, 30 to 35% for new investments." Forrester, Research Study**

**"Only 30% of IT Projects are deemed successful.." Gartner, Standish Group**

# Application Requirements in a Nut Shell

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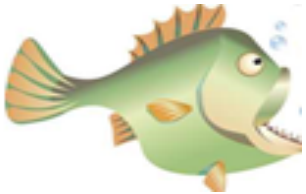
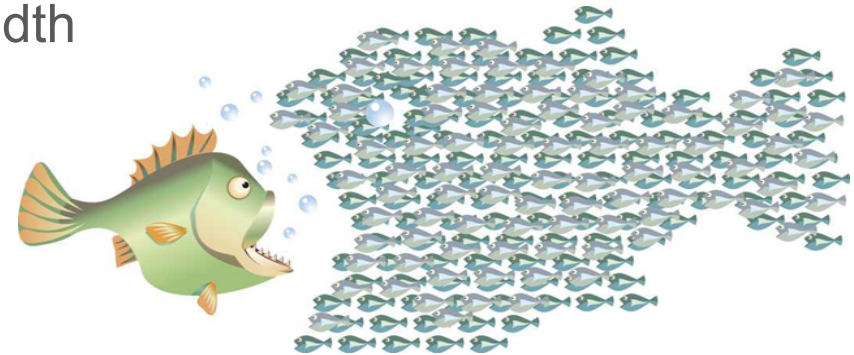
- Need for elasticity for workload mobility
- High availability within the infrastructure and hypervisor
- No application silos in the data center
- Further visibility into the virtual infrastructure
- Higher More Efficient Bandwidth





# More Data. Faster Data. Complex Data.

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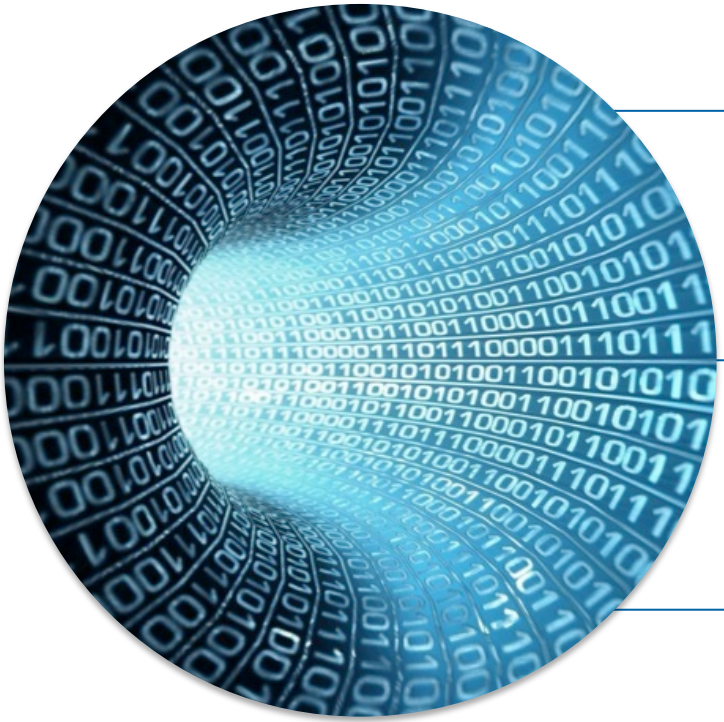

**Volume** (Capacity)

- Continually collect as much data as possible

**Velocity** (Time)

- Accelerate the writing and reading of application workload data

**Variety** (Type)

- Understand different sources and formats together

# Rapid Time To Value Is Key In Today's Competitive Climate

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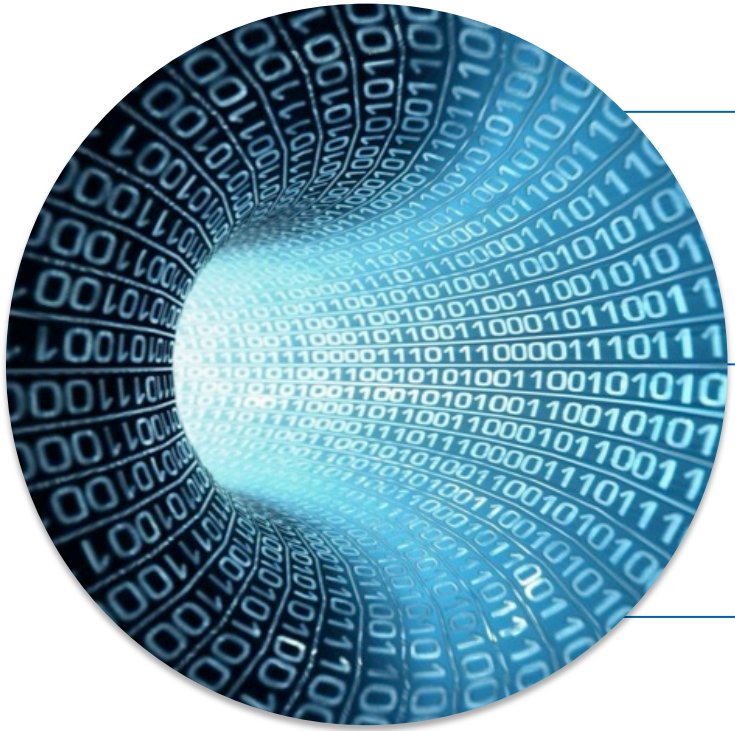

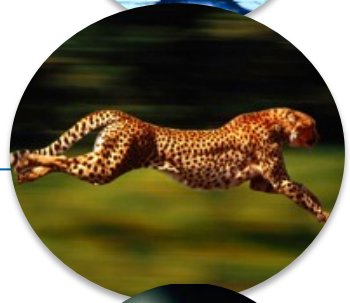

MORE DATA

MANIPULATED FASTER

QUICKER DECISIONS

# Current Data Centre Trends

# Data Centre Agility is key for today's Pace of IT

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## Technology Transitions

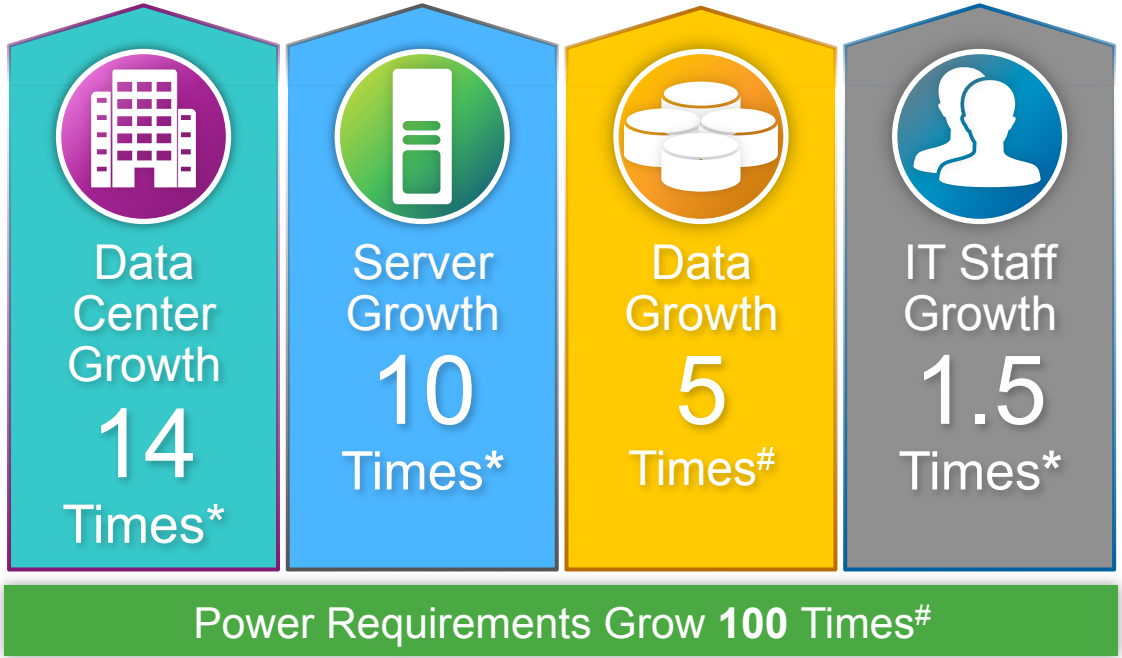
- Mobility / Video
- Cloud
- New Apps
- Big Data
- Internet of Everything

## Network at the Centre of the Changing Role of IT

- Growth & Productivity Opportunities
- New Business Models
- User Experience & Expectations
- Globalization
- Security & Regulatory Compliance

## Business Implications

# Data Center Growth




- Application Consistency
- Simplification
- Agility
- Efficiency and Scale
- Business Alignment

Source: * 2012 IDC Digital Universe Study By 2020 and # Gartner

# Evolution to Intelligent Infrastructure

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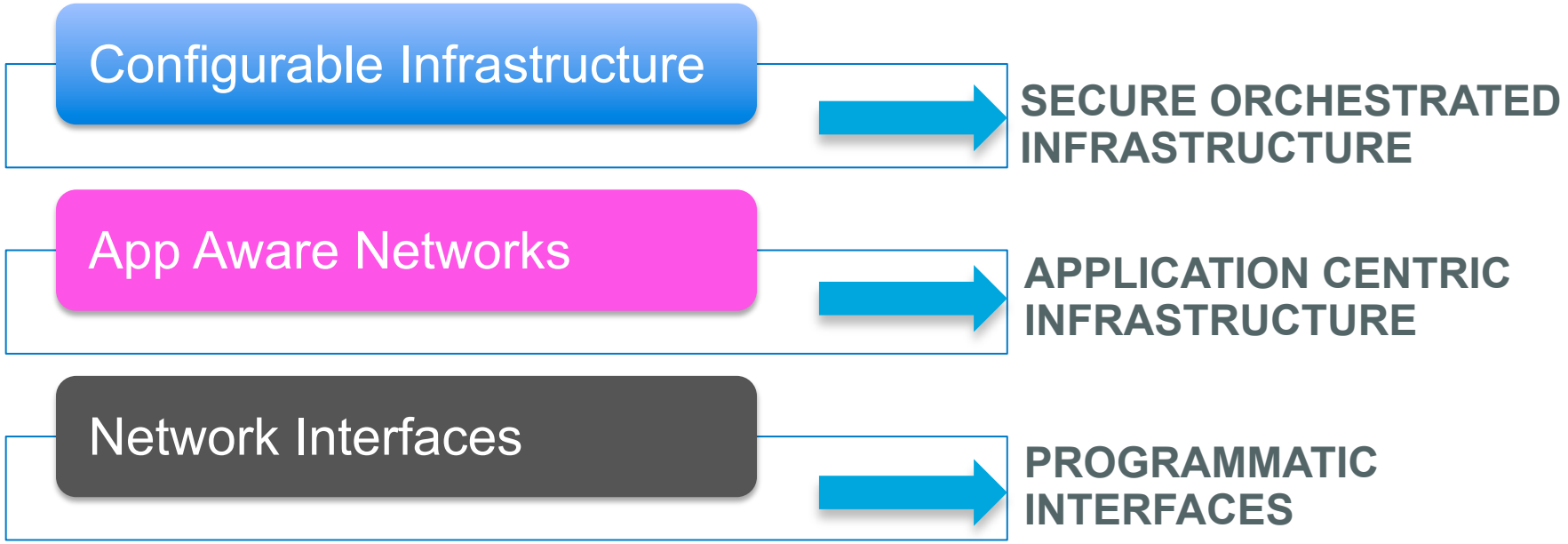


***FASTER TIME to VALUE***

# DevOps – Development with Operations

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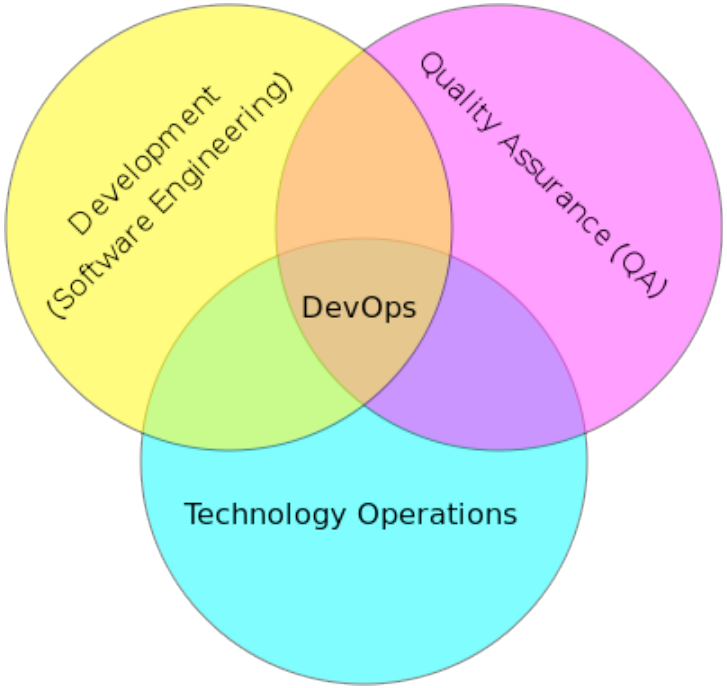
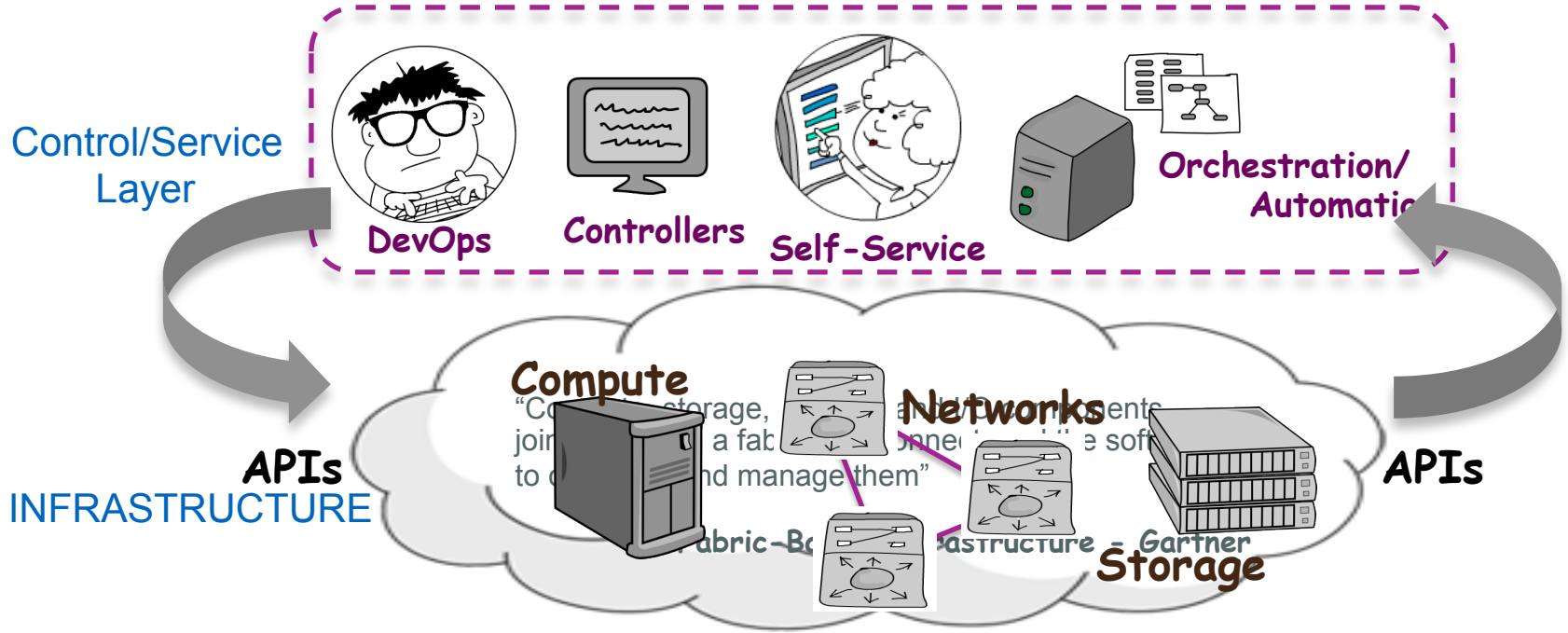
- Agile/Extreme/Lean/Etc. application development expect rapid turn from development->test->production
- Model for Deployment built into the development/test lifecycle
  - Unit test
  - Continuous Integration
- Move from semi-annual release to daily or weekly releases



# The Need for Converged Infrastructure



# KEY REQUIREMENTS

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## Key Requirements of Todays Data Centre

### Simplified Provisioning

Dynamic workloads

Centralized Management

Physical/Virtual agnostic

### Dynamic Scaling

Dynamic

On-Demand

Physical + Virtual

Location independent

### Centralized Management

Centralized policy for network & security

### Automated Policy Management

Dynamic ACL insertion / removal

### Open Architecture

Hypervisor agnostic

vSwitch compatible

Programmable

Multi-tenant & App aware

# IT Cloud Integration

# Cloud Defined

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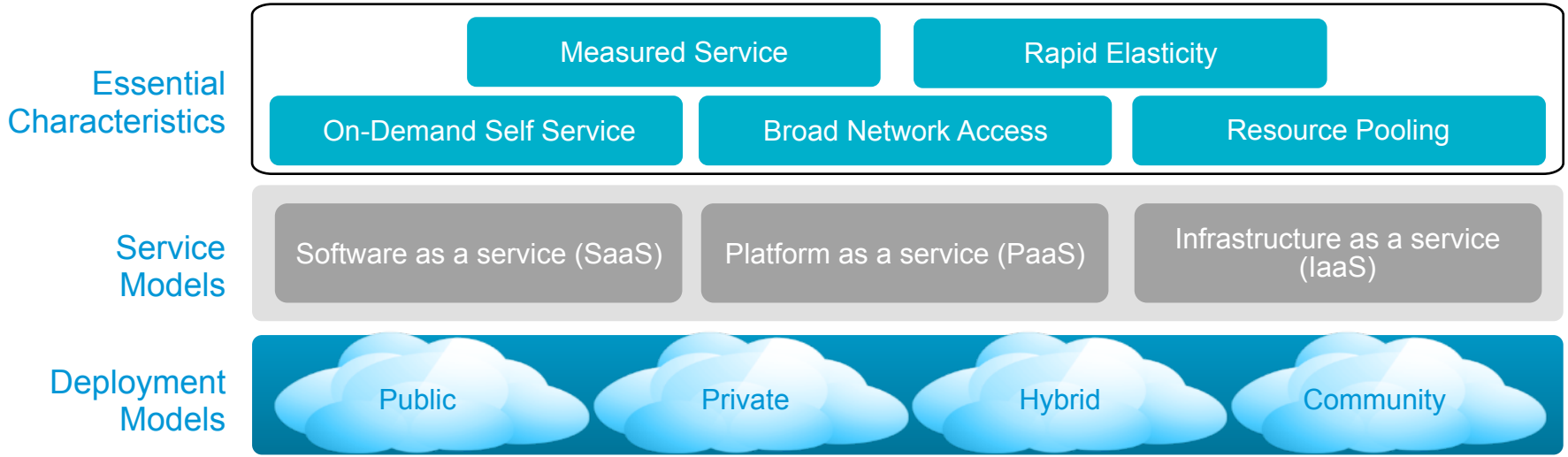
IT resources and services that are abstracted from the underlying infrastructure  provided “on-demand” and “at scale” in a multi-tenant environment



# Why Hybrid Clouds? It's All About the Workload

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- Fixed workloads
- Control and compliance

- Choice to build and rent across providers
- Workload portability
- Consistent security

- Elastic workloads
- Quick ramp

# Changing Role of IT – Provide Cloud Ready Services

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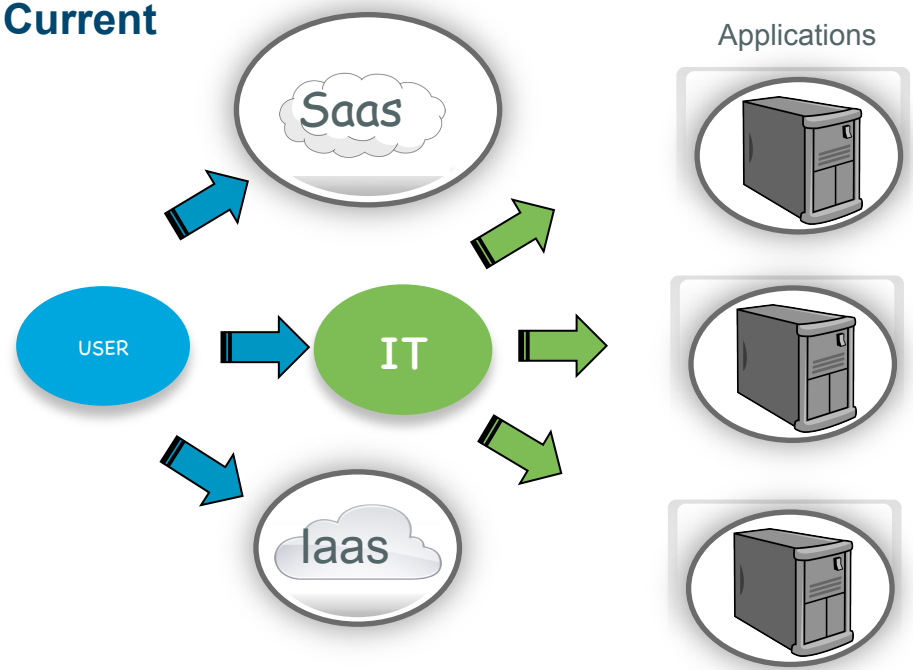
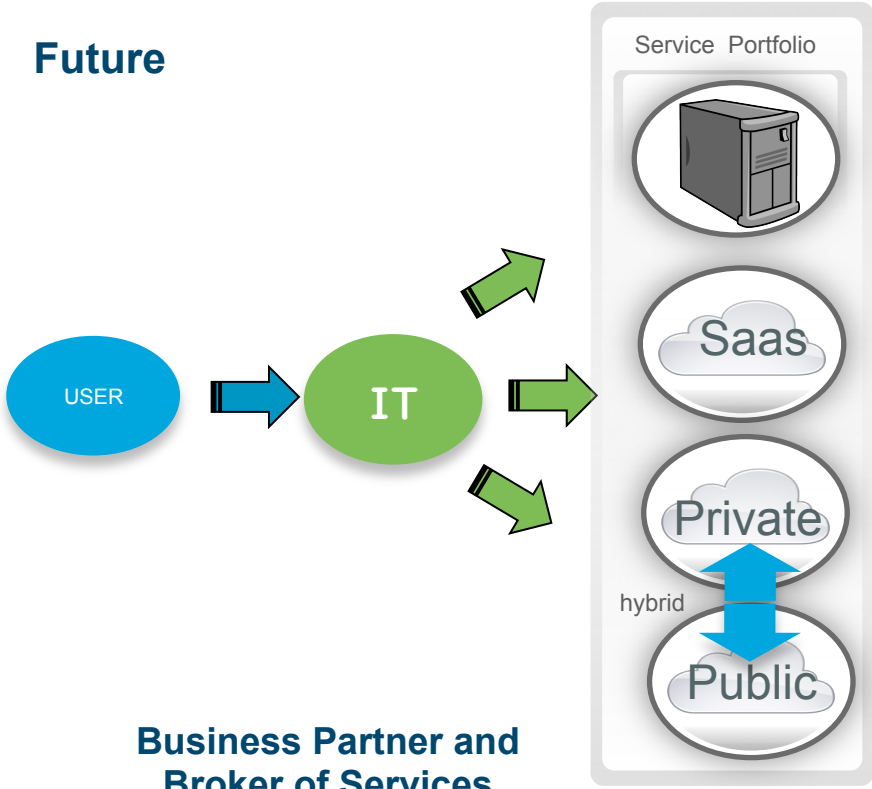
## Current




**Provider of Infrastructure**

## Future




**Business Partner and Broker of Services**

# Orchestration and Automation

# IT Roadblocks

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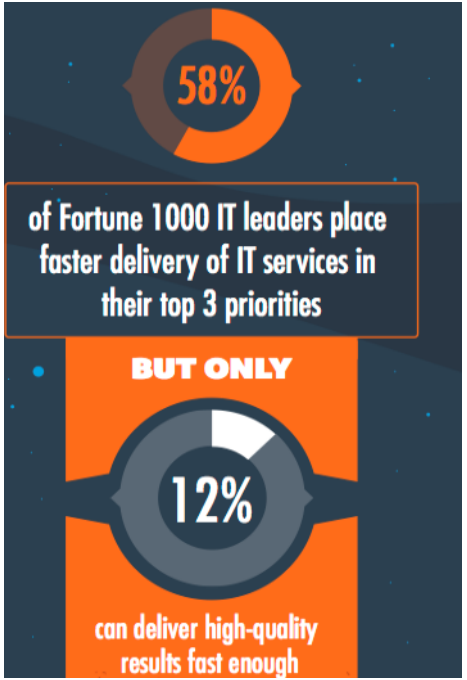
- Change management processes cause change to move at a very slow pace
- Often times, the business puts further pressure on IT by cutting resources or outsourcing them in an effort to reduce costs
- The future of IT without automation is a myth



# Overcoming IT Challenges

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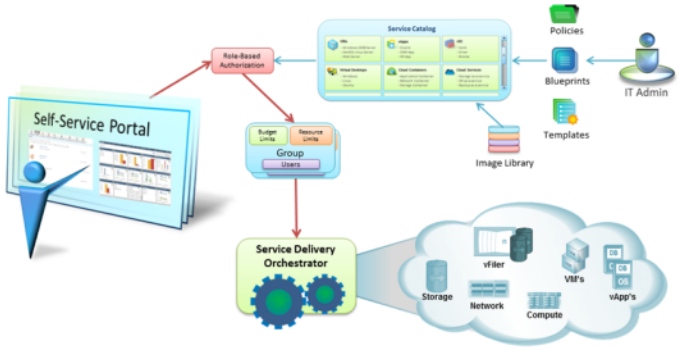
- Infrastructure needs to be elastic and highly scalable
- Provisioning needs to be automated
- Operational and lifecycle management
- Self-service option for users to select an application or service from a catalog

# User Shift to Self Service

- Users of a public, private, and hybrid cloud all like having the on-demand option of deploying applications
- This typically is modeled after most public cloud operations where the user can simply select an application from a catalog and have it deployed instantly
- Lifecycle management, chargeback, and accounting need to be tied into this as well



# The Challenge of Application Delivery Today

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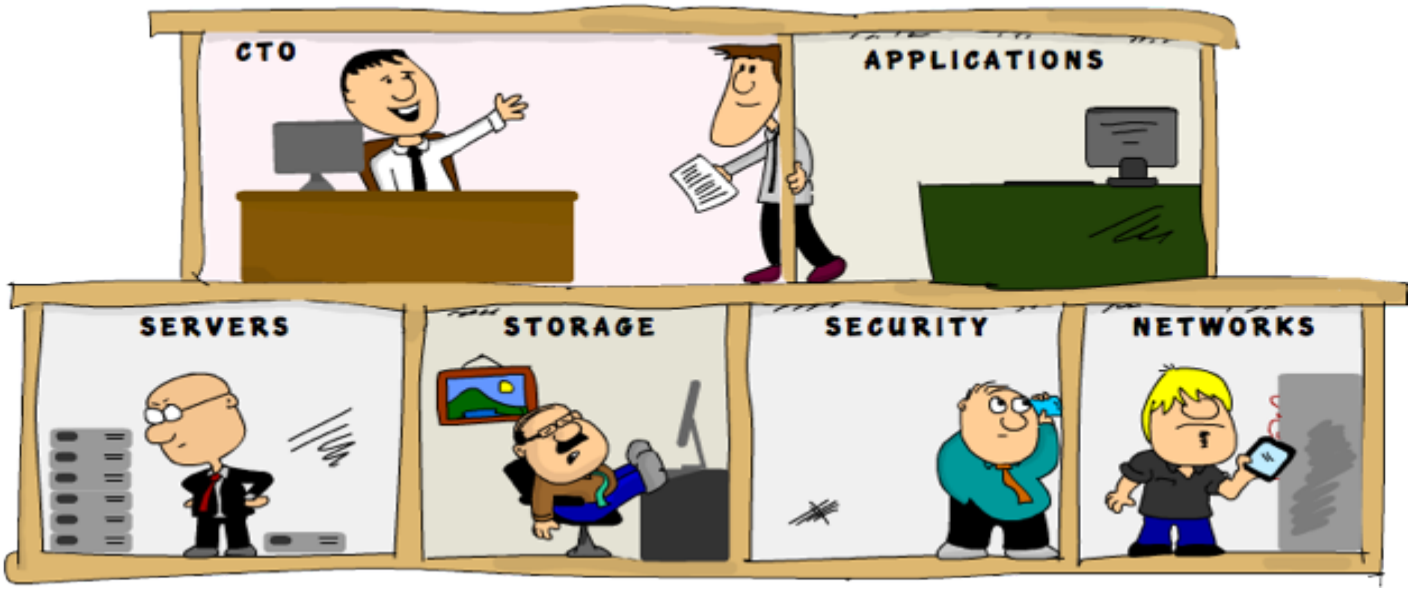

# Automate Service Delivery

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From Weeks to Minutes

| Capacity On Demand | Policy-Based Provisioning | Adaptive |
| --- | --- | --- |

# What is an Application Programming Interface (API)

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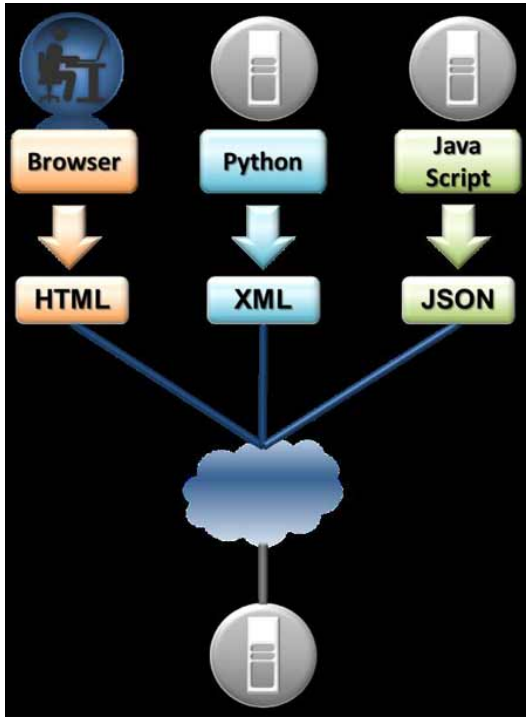
- A set of requirements that govern how an application can be used by another
- The API exposes a limited amount of the programs' internal functions to the outside world—this allows for other external applications to utilize functionality within the application
- Not a new concept—most applications have an API of some sort
- Often uses authentication (through key exchanges, certificates, etc.)
- Communication often uses either Java scripting, Python, XML, or simple HTTP



# Why Are APIs Important to a Data Centre/Cloud

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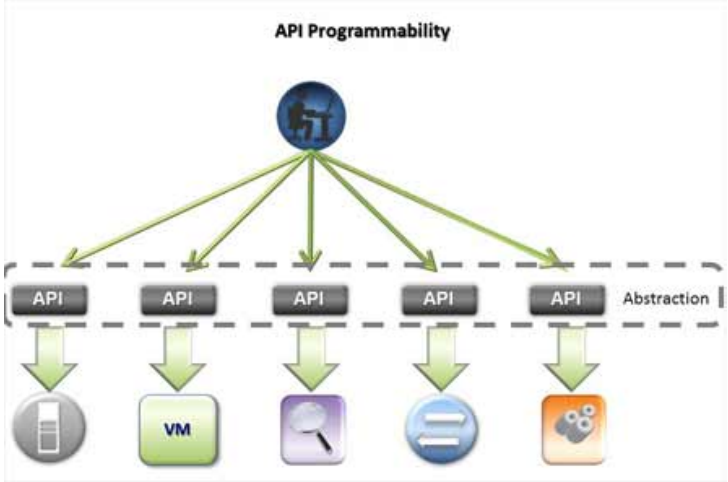
- Applications can be built into modules which can then communicate with other modules through an API (e.g., OpenStack)
- By exposing part of a program's functions external tools, such as orchestrators, functions can be automated within an application or infrastructure
- APIs are important for cloud technologies because they allow for resources and provisioning to be dynamic through automation
- Both public and private clouds make use of APIs for automation and management



# Data Centre Automation

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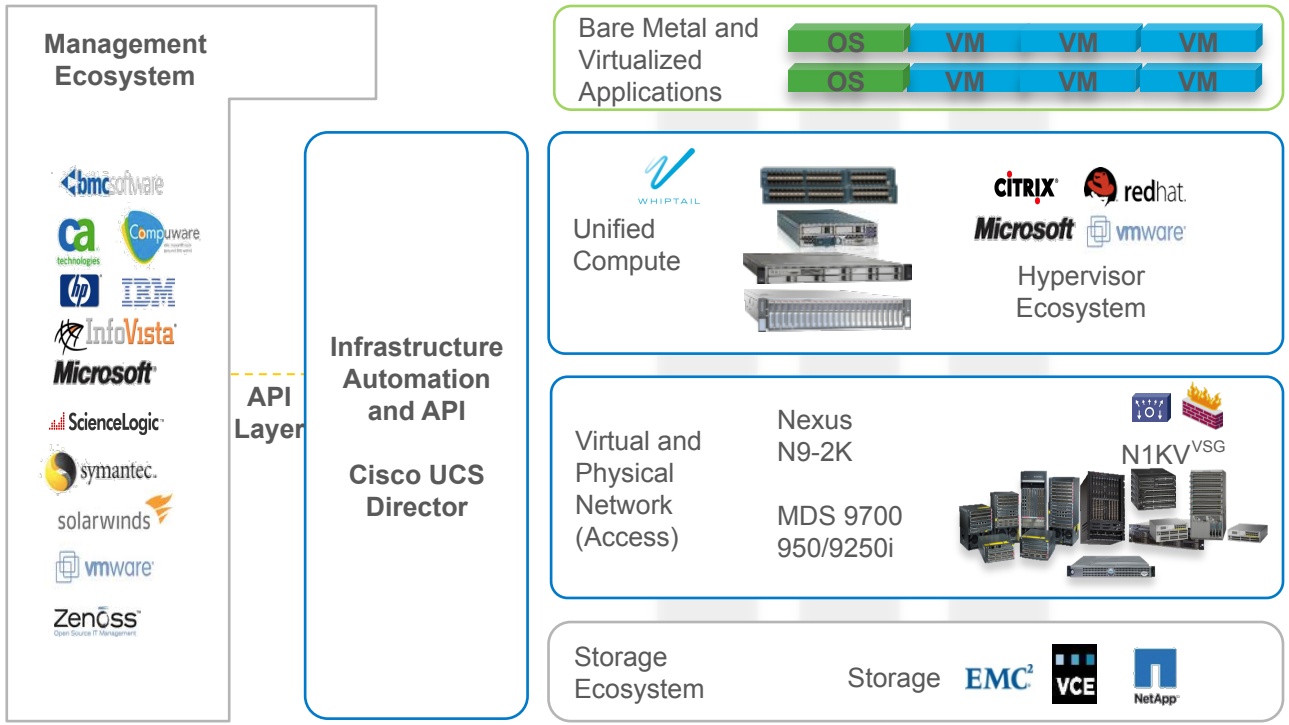
Partner choice: Manage each component individually or utilize API to access as single system




Deliver on a holistic approach to simplified, open automation and orchestration

Customer choice for hypervisor and storage

# Cisco UCS Director Turn-Key Solution

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Secure Cloud Container

Network Compute VMs Storage

Policy-Driven Provisioning

UCS Director

On-Demand Automated Delivery

Single Pane of Glass

End-to-End Automation and Lifecycle Management

Domain Managers

OS and Virtual Machines

Compute

Network

Storage

VM VM Bare Metal

Virtualized and Bare-

Compute and

A B C

Network and Services

Tenant A Tenant B Tenant C

# Seamless Infrastructure Management

## Automation Powered by UCS Director

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**Simplicity**
Ready for Use in Hours

**Velocity**
Rapidly Deploy Applications

**Quality**
Enforce IT Best Practices

Unified Computing System

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UCS Director

Nexus Product Family

**L4-7 Services**

**Storage**

EMC NetApp

**Virtualization**

redhat XEN

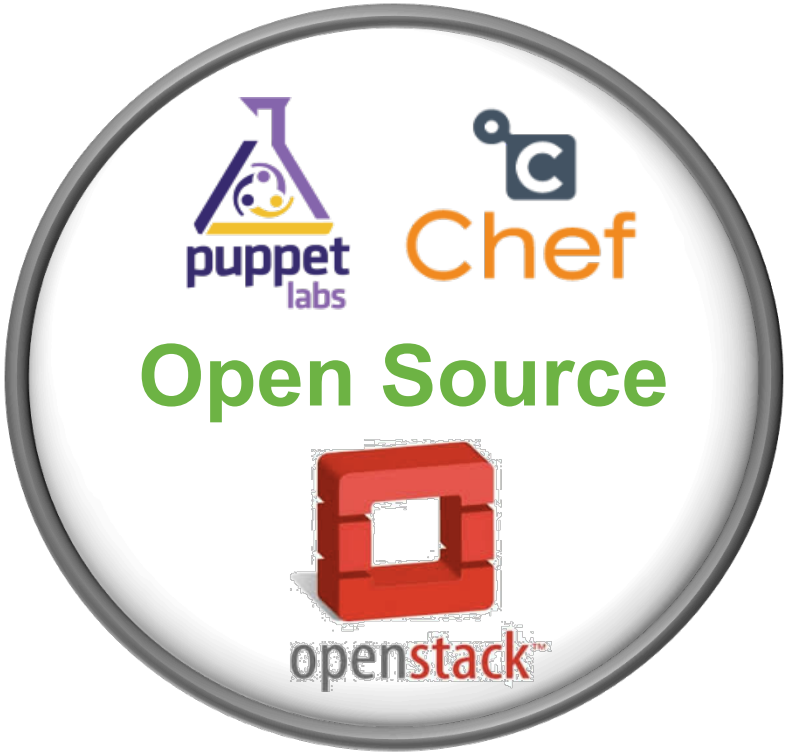
**New!**
Integrated application containers for secure workload provisioning

**New!**
Hadoop integration to easily manage large clusters

**New!**
Application Centric Infrastructure configuration

**New!**
Open developer kit for ecosystem acceleration

# The Rise of Open Source




Open source solutions are gaining mindshare:

- Configuration tools like Puppet/Chef
- Hypervisors like KVM or Docker (container solution)
- Cloud solutions for orchestration such as OpenStack
- Networking management solutions (controller) like Open Daylight

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