CISCO

You make **possible**

How to make IT Ops move at the speed of Dev

Action Orchestrator - Cisco CloudCenter Suite

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/in/athorrigan/

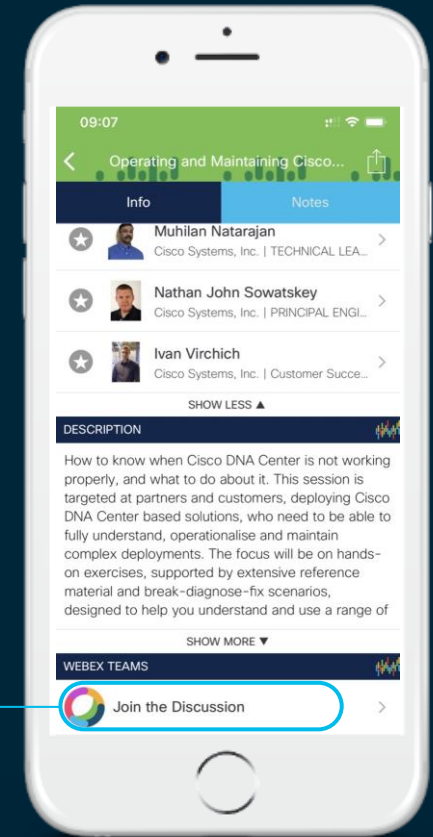Ali Ghorbani Moghadam, Technical Leader   /in/alighm/

PSOCLD-2980

Cisco Webex Teams

Questions?
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with the speaker after the session

How

1. Find this session in the Cisco Events Mobile App
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4. Enter messages/questions in the team space

Agenda

- Housekeeping

- Introduction
  - Industry Trends

- What is the problem? And what is the solution?
  - GitOps, DevOps and Infrastructure-as-Code

- Development Pipeline

- Cisco CloudCenter Suite Overview
  - Action Orchestrator Detail
  - Revisiting the Development Pipeline

- Demos

- Key Takeaways & What's Next?

- Questions

CloudCenter Suite
30-Day Free Trial

Other Cloud Sessions at Cisco Live

Monday

PSOCLD: 1981
Run modern serverless applications with Knative!
12:30 PM - 1:00 PM

Visit the Multicloud Showcase in the World of Solutions
12 – 5:30pm

Tuesday

PSOCLD: 2980
How to make IT Ops move at the speed of Dev
1:15 PM - 02:15 PM

Visit the Multicloud Showcase in the World of Solutions
10:30am – 8:00pm

Wednesday

INTCLD: 1315
Building the bridge to Multicloud: Powering the Application Revolution
12–12:30pm

TCRDCN: 2900
Cost Control in a Multicloud World
1:30pm–2:30pm

BRKCLD-1215
Simplify Multicloud Deployments with Workload Manager and Action Orchestrator in Cloud Center Suite
2:45pm–4:15pm

PSOCLD: 1983
Is your cloud bill too high? Learn how you can control costs with CloudCenter Suite
5:00 – 5:30 PM

Visit the Multicloud Showcase in the World of Solutions
10:30am – 6:00pm

Thursday

PSOCLD: 2982
How to optimize your K8s infrastructure for AI/ML development with a few clicks.
1:30 PM - 2:30 PM

PSODCN-2119
How to simplify and accelerate multicloud strategies with ACI
4:00pm–4:30pm

Visit the Multicloud Showcase in the World of Solutions
10:30am – 5:00pm

Gartner predicts that by 2020, 90 percent of organizations will adopt hybrid infrastructure management capabilities.

Gartner: https://www.gartner.com/en/newsroom/press-releases/2017-04-05-gartner-says-a-massive-shift-to-hybrid-infrastructure-services-is-underway

Multicloud Complexity

Evolving On-Premises

Adopting Public Clouds

"lack of **visibility and governance** across multiple clouds "

"inefficient methods to **monitor and optimize cloud consumption** and costs"

"to **develop fast** across multiple environments"

"to manage infrastructure for **both old and new** applications"

"**complex process for integration** with other ecosystem solutions"

Infrastructure and Operations Trends in 2020
Gartner IT Infrastructure, Operations & Cloud Strategies Conference

Trend No. 1: Automation Strategy Rethink

- *"As vendors continue to pop up and offer new automation options, enterprises risk ending up with a duplication of tools, processes and hidden costs that culminate to form a situation where they simply cannot scale infrastructure in the way the business expects."*

- *"We think that by 2025, top performing leaders will have employed a dedicated role to steward automation forward and invest to build a proper automation strategy to get away from these ad hoc automation issues."*

Trend No. 3: Scaling DevOps Agility

- *"We believe that the vast majority of organizations that do not adopt a shared self-service platform approach will find that their DevOps initiatives simply do not scale."*

- *"Adopting a shared platform approach enables product teams to draw from an I&O digital toolbox of possibilities, all the while benefiting from high standards of governance and efficiency needed for scale."*

Source: https://www.information-management.com/news/gartner-identifies-10-top-trends-impacting-infrastructure-and-operations-for-2020

What is the problem?
And what is the answer?

Agility · Test & Audit

Collaborate · Quality

- Inconsistency among environments creates snowflakes, which leads to issues during deployments.

- Administration and maintenance of infrastructure involves manual, hard to track processes which contribute to errors and reduced productivity.

GitOps

Infrastructure-as-Code (IaC)

RAPT

Repeatable
Changes should always be applied the same way, every time

Accessible
Anyone with the appropriate permissions should be able to make a change

Predictable
Results should be "expected" and consistent

Trackable
What changes were made, and by whom?

What is Infrastructure-as-Code?

Driven by Hyperscalers!

API-Driven Workflows
&
Elastic Infrastructure

- IaC evolved to solve the problem of environment drift in the release pipeline.

- Management of infrastructure in a **descriptive model**, using versioning for source code.

- Deployments should always set the target environment to the same configuration, regardless of the environment's starting state.

What is GitOps?

GitOps is a subset of DevOps where Git is the **"Single Source of Truth"**

Everything is code!
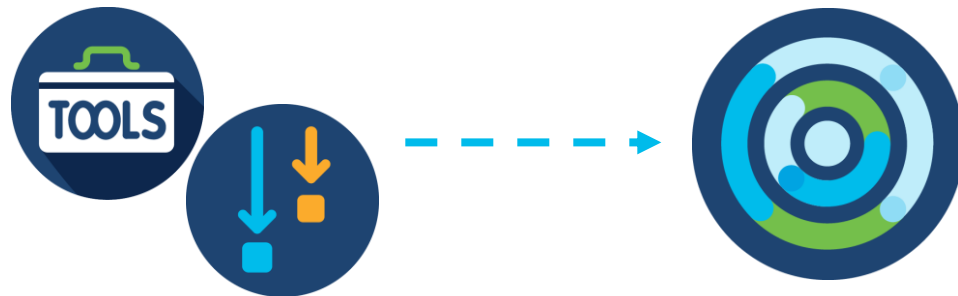
CICD toolchains automatically **test, deploy and track** pull requests and configuration changes to your infrastructure

Development Pipeline

DevOps / GitOps

Development	Version Control	Automation Testing	Deployment Automation	Production

Automation Testing: Dev | Test | Stage

Deployment Automation: Rollback | Upgrade

Collaborative Development | Continuous Testing | Continuous Deployment

Infrastructure

Infrastructure-as-Code
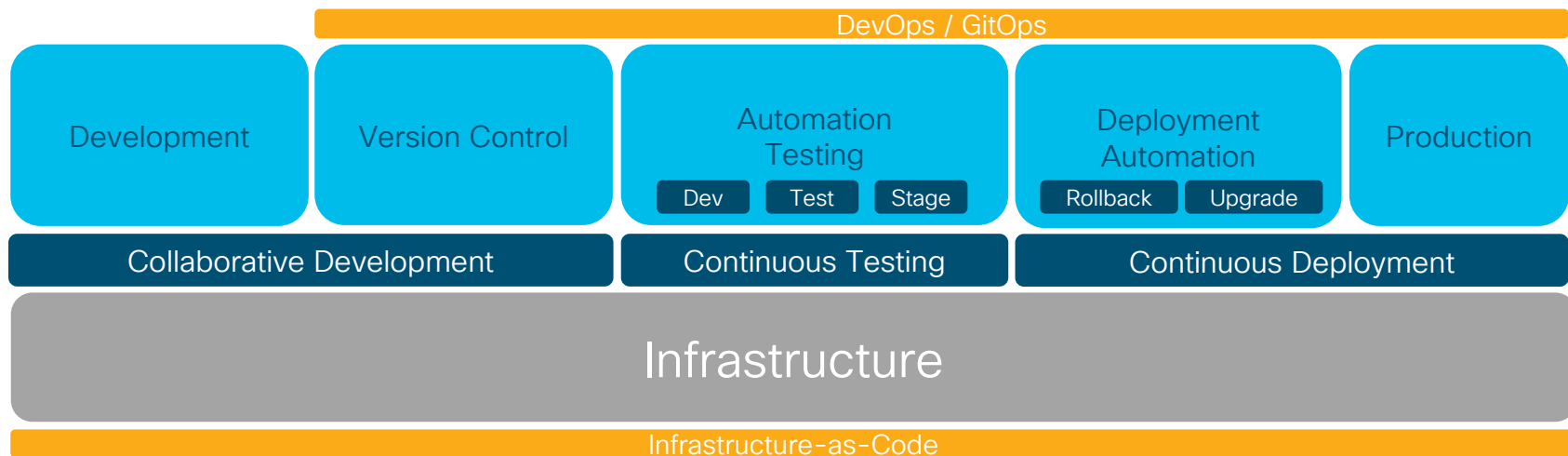
Development Pipeline

How do we stitch together these disparate platforms and workflows?

DevOps / GitOps				
Development	Version Control	Automation Testing	Deployment Automation	Production
		Dev · Test · Stage	Rollback · Upgrade	
Collaborative Development		Continuous Testing	Continuous Deployment	
Infrastructure				
Infrastructure-as-Code				

CloudCenter Suite

Evolving On-Premises

Adopting Public Clouds

Cloud Architect
Policy & Governance

End User
Request & Use

Network Admin
Provisioning & Configuration

Developer
Design & Test

IT Admin
Deploy Infrastructure

IT Ops
Operations

MULTICLOUD GOVERNANCE
POLICY
DESIGN
OPTIMIZE
DEPLOY

CloudCenter Suite Architecture

Workload Manager

Design, deploy and manage application workloads

Cost Optimizer

Provides public and private cloud cost visibility and optimization

Action Orchestrator

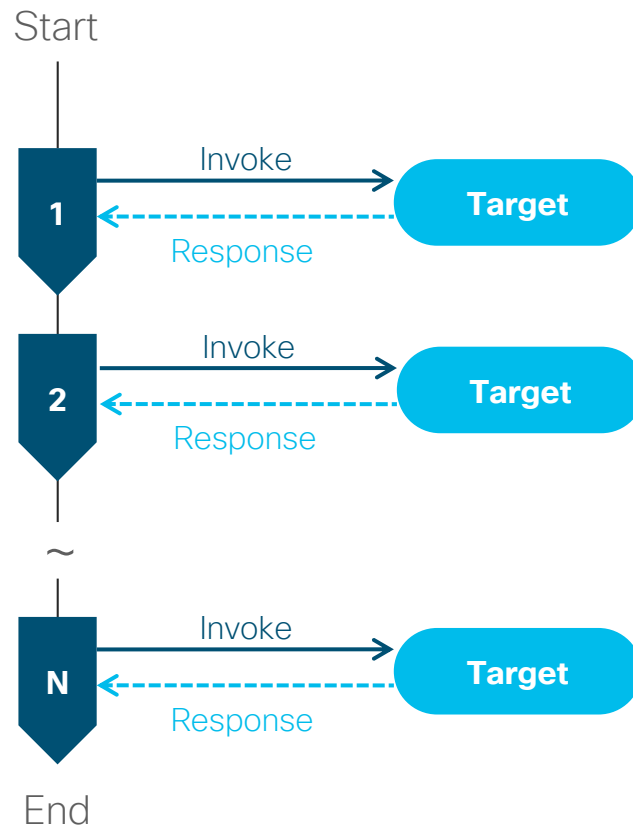Enables workflow process orchestration and automation

Suite Admin

Administers modules, manages tenancy, licensing, logging, RBAC, monitoring, authentication

Action Orchestrator

- Ecosystem integration standardized using adapters and workflows

  - Execute workflows with business and technical logic

  - Use included adapters & activities

    … or create custom ones!

- **Benefits:** Eliminate repetitive tasks and broaden scope of cloud orchestration, simplify business process and reduce human error

Start

1 — Invoke → **Target**
← Response

2 — Invoke → **Target**
← Response

~

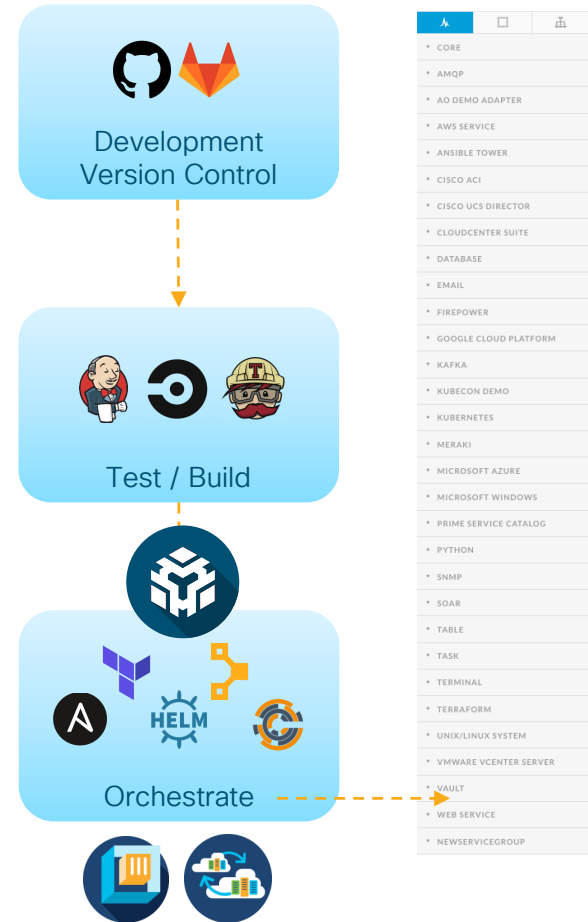**N** — Invoke → **Target**
← Response

End

Development Pipeline

Action Orchestrator enables IT operations to use best-in-class software and tools without developing complicated, fragile and ad-hoc work streams.
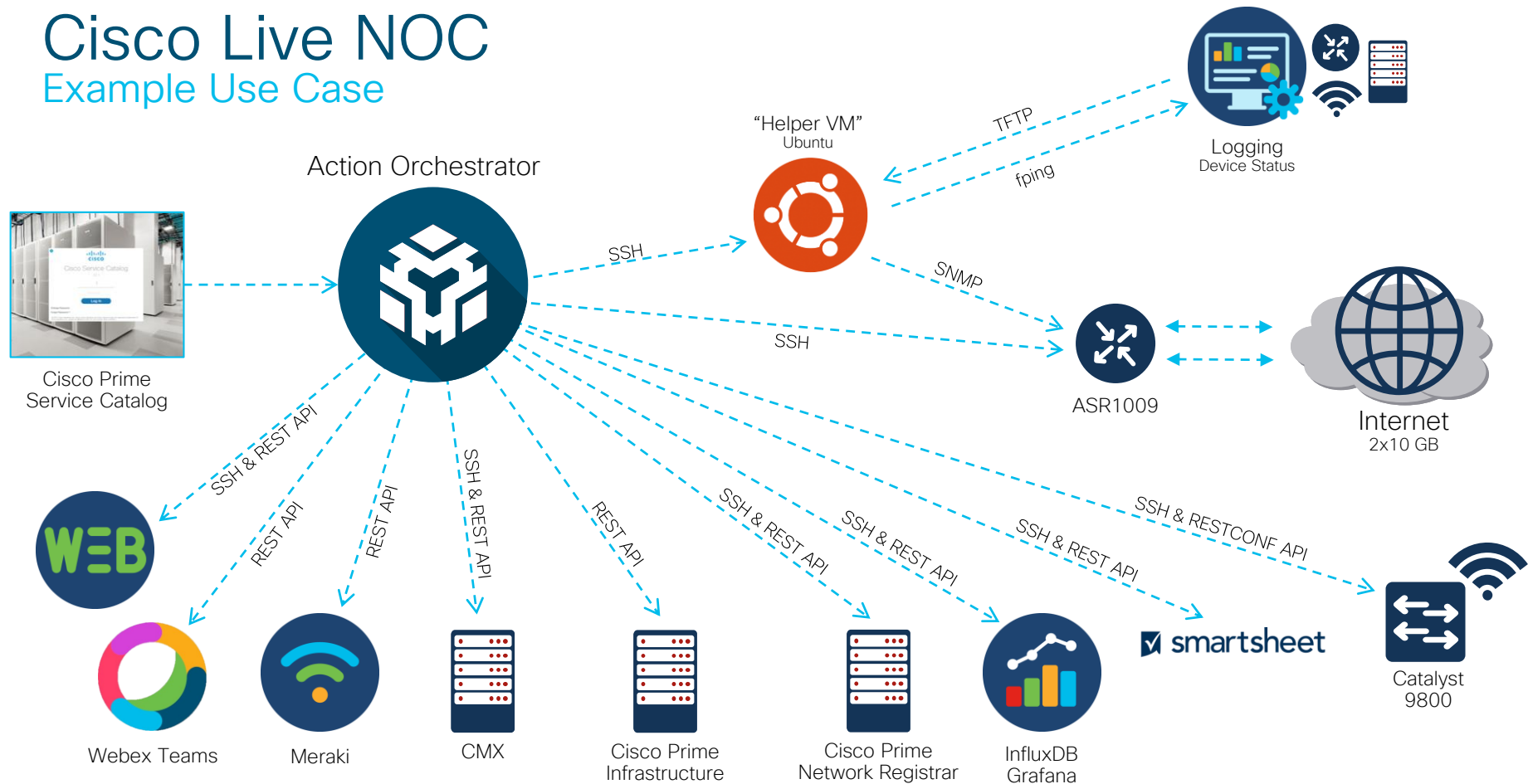
Build automation strategies that reduce human error and eliminate the repetitive and complicated tasks that often plague technical integrations and business processes.

- Simplify technical and business workflow automation by providing integration through a broad set of adaptors and standardized interfaces – Limitless Extensibility!
- "Drag n' Drop" UI w/ built-in out of the box Logical Flows & Adaptors that enables users to design and build complicated patterns without any coding experience– No coding required!

Development Version Control

Test / Build

Orchestrate

- CORE
- AMQP
- AO DEMO ADAPTER
- AWS SERVICE
- ANSIBLE TOWER
- CISCO ACI
- CISCO UCS DIRECTOR
- CLOUDCENTER SUITE
- DATABASE
- EMAIL
- FIREPOWER
- GOOGLE CLOUD PLATFORM
- KAFKA
- KUBECON DEMO
- KUBERNETES
- MERAKI
- MICROSOFT AZURE
- MICROSOFT WINDOWS
- PRIME SERVICE CATALOG
- PYTHON
- SNMP
- SOAR
- TABLE
- TASK
- TERMINAL
- TERRAFORM
- UNIX/LINUX SYSTEM
- VMWARE VCENTER SERVER
- VAULT
- WEB SERVICE
- NEWSERVICEGROUP

Cisco Live NOC
Example Use Case

Action Orchestrator

"Helper VM"
Ubuntu

TFTP

fping

Logging
Device Status

SSH

SNMP

SSH

ASR1009

Internet
2x10 GB

Cisco Prime
Service Catalog

SSH & REST API

REST API

REST API

SSH & REST API

REST API

SSH & REST API

SSH & REST API

SSH & REST API

SSH & RESTCONF API

Web

Webex Teams

Meraki

CMX

Cisco Prime
Infrastructure

Cisco Prime
Network Registrar

InfluxDB
Grafana

smartsheet

Catalyst
9800

Demo

Infrastructure-as-Code with Action Orchestrator

CISCO *Live!*

Infrastructure Requirements

GitOps

Infrastructure

How-To: Create CCP Tenant Cluster in CPSG-Galaxy

In order to create a tenant cluster in CPSG-Galaxy for development/testing, please perform the following steps:

1. CLONE glxy_ccp-env_manifest.json

2. Add the necessary information for your required development environment:

   - [[USERNAME]]
   - [[CLUSTER_NAME]]
   - [[K8S_VERSION]] = [[1.14.8]]
   - [[CLUSTER_TYPE]] = [[vmware | azure | aks]]
   - [[NODES]] = [[3 | 5]]
   - [[VCPU]] = [[2 | 4]]
   - [[SSH_KEY]]

3. Commit your changes and perform a PULL REQUEST

4. Once the request is approved, your tenant cluster will be automatically created and you will receive an email notifcation

Example JSON

```
{
    "clusterfile": [
        {
            "username": "username",
            "clusters": [
                {
                    "cluster_name": "username_cluster-1",
                    "cluster_type": "vmware",
                    "k8s_version": "1.14.8",
                    "nodes": "3",
                    "vcpu": "2",
                    "memory": "16384",
                    "ssh_key": "ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIG94bb+s1tKhuSM7gko6HkmbrpHcFiXwwhAJHM
                }
            ]
        }
    ]
}
```

README.md

Infrastructure Manifests

This is the **Git** in **Git**Ops

Branch: master ▾   **hx1-ccp** / glxy_ccp-env_manifest.json   Find file   Copy path

🔲 **anhorrig** Update glxy_ccp-env_manifest.json   f9301c1   7 days ago

2 contributors 🔲🔲🔲

38 lines (38 sloc)   1.07 KB   Raw Blame History 🖥 ✏ 🗑

```
 1  {"clusterfile":[
 2    {
 3      "username": "anhorrig",
 4      "clusters": [
 5        {
 6          "cluster_name": "ccp-1055-anhorrig-1",
 7          "cluster_type": "vmware",
 8          "k8s_version": "1.14.8",
 9          "nodes": "3",
10          "vcpu": "2",
11          "memory": "16384",
12          "ssh_key": "ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIG94bb+s1tKhuSM7gko6HkmbrpHcFiXwwhAJHM59SSgj anhorrig-ccpuser-key"
13        },
14        {
15          "cluster_name": "ccp-1055-anhorrig-2",
16          "cluster_type": "vmware",
17          "k8s_version": "1.14.8",
18          "nodes": "3",
19          "vcpu": "2",
20          "memory": "16384",
21          "ssh_key": "ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIG94bb+s1tKhuSM7gko6HkmbrpHcFiXwwhAJHM59SSgj anhorrig-ccpuser-key"
22        }
23      ]
24    },
25    {
26      "username": "mchenetz",
27      "clusters": [
28        {
29          "cluster_name": "ccp-1055-mchenetz-1",
30          "cluster_type": "vmware",
31          "k8s_version": "1.14.8",
32          "nodes": "3",
33          "vcpu": "2",
34          "memory": "16384",
35          "ssh_key": "ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAII31wRzI/YYpYCXKr6leYvGn1smmyT3rWb3/hvRgWE9M mchenetz-ccpuser-key"
36        }
37    ]}
38  ]}
```

Branch: master ▾   **hx1-ccp** / glxy_ccp_create-vmw-tc.json   Find file   Copy path

🔲 **anhorrig** Update glxy_ccp_create_vmw-tc.json   212c20b   13 hours ago

1 contributor

52 lines (52 sloc)   1.49 KB   Raw Blame History 🖥 ✏ 🗑

```
 1  {
 2    "network_plugin_profile": {
 3      "name": "calico",
 4      "details": {
 5        "pod_cidr": "192.168.0.0/16"
 6      }
 7    },
 8    "vsphere_infra": {
 9      "datacenter": "GFFA-DC",
10      "datastore": "GFFA-HX1-Datastore-1",
11      "networks": [
12        "VLAN1055"
13      ],
14      "cluster": "GFFA-HX1-Cluster",
15      "resource_pool": ""
16    },
17    "load_balancer_num": 1,
18    "subnet_id": "123bbc05-90d9-4a56-9c4f-d5e5fbd8d0eb",
19    "node_groups": [
20      {
21        "name": "node-group",
22        "size": "[[NODES]]",
23        "vcpus": "[[VCPU]]",
24        "memory_mb": "[[MEMORY]]",
25        "gpus": [],
26        "template": "hx1-ccp-tenant-image-[[K8S_VERSION]]-ubuntu18-5.1.0",
27        "kubernetes_version": "[[K8S_VERSION]]",
28        "ssh_user": "[[USERNAME]]",
29        "ssh_key": "[[SSH_KEY]]"
30      }
31    ],
32    "master_group": {
33      "name": "master-group",
34      "size": 1,
35      "vcpus": 2,
36      "memory_mb": 16384,
37      "gpus": [],
38      "template": "hx1-ccp-tenant-image-[[K8S_VERSION]]-ubuntu18-5.1.0",
39      "kubernetes_version": "[[K8S_VERSION]]",
40      "ssh_user": "[[USERNAME]]",
41      "ssh_key": "[[SSH_KEY]]"
42    },
43    "kubernetes_version": "[[K8S_VERSION]]",
44    "insecure_registries": [],
45    "root_ca_registries": [],
46    "ntp_servers": [],
47    "ntp_pools": [],
48    "ip_allocation_method": "ccpnet",
49    "provider": "55101b70-5286-4a0a-bf2a-006cce629fbe",
50    "name": "[[CLUSTER_NAME]]",
51    "type": "[[CLUSTER_TYPE]]"
52  }
```

Infrastructure-as-Code with Action Orchestrator

CloudCenter Suite deploys Cisco Container Platform Clusters

January 2020

Live Demo
CICD Development Pipeline with Action Orchestrator

cisco Live!

What's Next?

Project Tercel

01 Dashboard	
02 IT Services Catalog	
03 Service Management	
04 Inventory	

Simplifying how organizations can seamlessly connect software and hardware across multiple domains, deployed across a variety of different target environments (cloud and on premises) for visibility and management
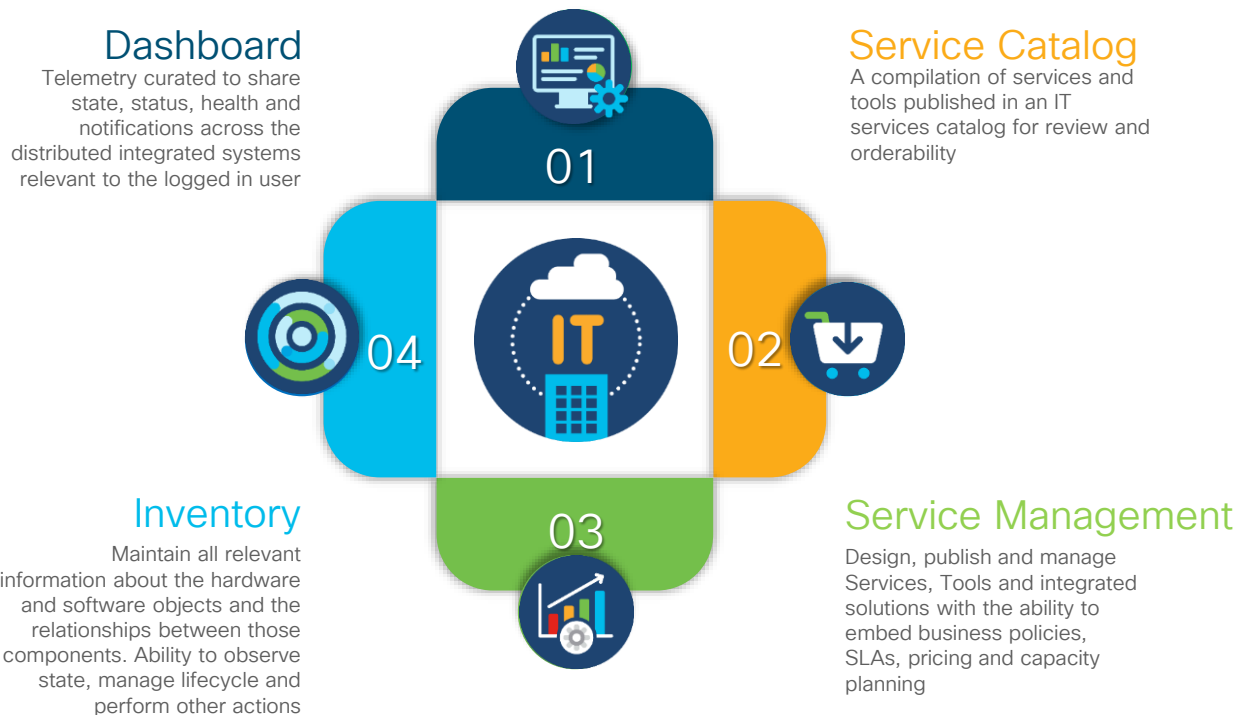
100%
Cloud Native

Check out the UX Demo!

Reduces complexity of distributed environments

Orderable (Aug 2020)

Simplifying Connected Management Software

Dashboard
Telemetry curated to share state, status, health and notifications across the distributed integrated systems relevant to the logged in user

Service Catalog
A compilation of services and tools published in an IT services catalog for review and orderability

01

04

02

03

Inventory
Maintain all relevant information about the hardware and software objects and the relationships between those components. Ability to observe state, manage lifecycle and perform other actions

Service Management
Design, publish and manage Services, Tools and integrated solutions with the ability to embed business policies, SLAs, pricing and capacity planning

Key Takeaways

- Scripted infrastructure and automation are the key first steps through which other DevOps practices become accessible - by codifying our infrastructure, we enable better testing and quality control, more efficient and predictable deployments, and decreased recovery times.

- Action Orchestrator enables IT operations to use best-in-class software without developing complicated, ad-hoc work streams that do more to get in the way than solve the many challenges of running a modern data center and cloud strategy.

- [CloudCenter Suite 30-Day Free Trial](#)

CCS@CLEUR20

- Additional Sessions:
  - BRKCLD-1215 – Simplify Multicloud Deployments with Workload Manager and Action Orchestrator in CloudCenter Suite
  - DEVNET-2756 – Automate Kubernetes Infrastructure deployment in a MultiCloud environment using Cloud Center Suite API
  - DEVNET-2907 – Programming with Cisco Cloud Center Action Orchestrator Engine
  - TCRDCN-2900 – Cost Control in a Multicloud World

- World of Solutions!
  - Multicloud Booth – CCS, CCP, ACI
  - Cisco Live NOC in World of Solutions
  - LABCLD-2694 – Programming with CloudCenter AO for AWS Instance Management

- Read/Share these blogs:
  - IT Ops at the speed of Dev: Finding Balance in your Automation Strategy
  - Pondering Automation in Data Center Blogs
  - Your cloud bill is probably too high, and you should probably care

CloudCenter Suite
30-Day Free Trial

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