



You make **possible**



Survive the Cloud Native age with AppDynamics and Cisco Container Platform

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Stefano Gioia – Technical Solutions Architect

BRKCLD-2889

CISCO *Live!*

Barcelona | January 27-31, 2020



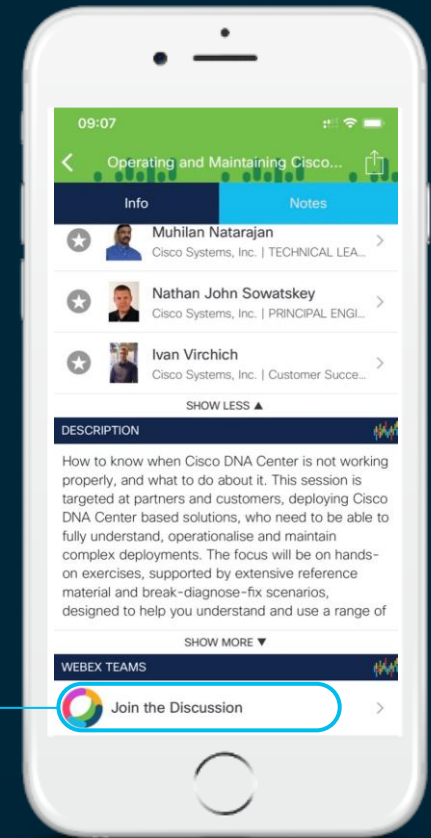
Cisco Webex Teams

Questions?

Use Cisco Webex Teams to chat with the speaker after the session

How

- 1 Find this session in the Cisco Events Mobile App
- 2 Click “Join the Discussion”
- 3 Install Webex Teams or go directly to the team space
- 4 Enter messages/questions in the team space



*Users don't care how your
applications are built and where
they run*









Agenda

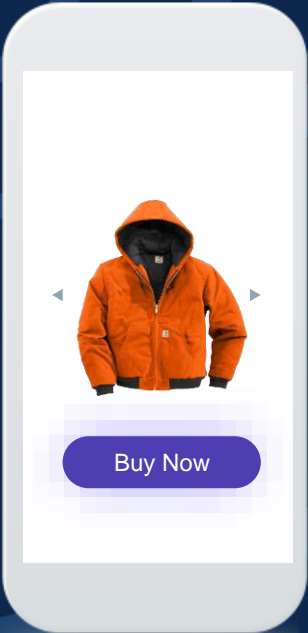
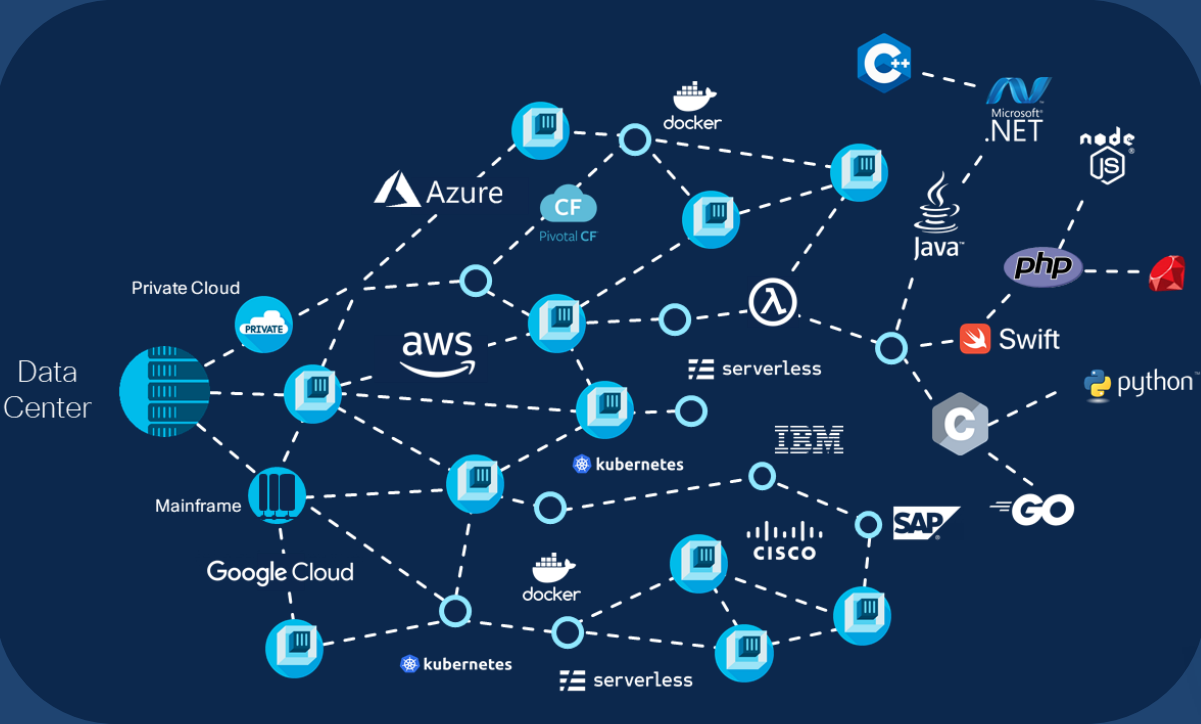
- Why cloud native
- The Cisco vision
- A sample application
 - Titanic Survivor
- Chapter 1: Provision the Infrastructure
- Chapter 2: Instrument the application and the infrastructure
- Chapter 3: I want the insights!
- Chapter 4: Detect and react to issues
- Wrap up and next steps

Why cloud native

*“Cloud native technologies empower organizations to build and run **scalable applications** in modern, dynamic environments such as public, private, and **hybrid clouds**.*

*Containers, service meshes, **microservices**, immutable infrastructure, and declarative APIs exemplify this approach”*

What you see



What your customers see

Not just a technology problem

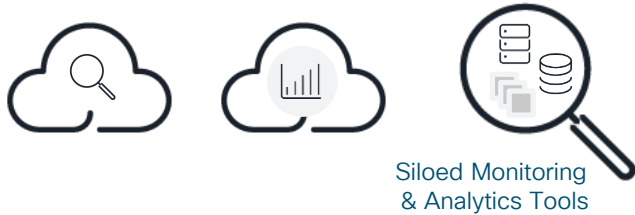


The new user expectation bar



It only takes a few seconds to your users to judge your services!

Fact: Cloud monitoring tools aren't enough



- 1 Don't provide real-time cross-stack, end-to-end visibility of User Experience
 - + 2 Limited/zero correlation of technical performance in context of business performance
 - + 3 Require coding changes to enable visibility with limited or no code level insight
 - + 4 More monitoring siloes that each take time, skills and effort to configure plus maintain
- = **Reactive, Siloed Monitoring!**



User Experience

Ensure users are able to get what they want. Deployment, monitoring and issue remediation **must** be always done with this in mind



Revenue

Bad user experience leads to critical loss of revenue. Loss of revenue impacts your salary

The Cisco vision

Covering the E2E for any business application

Customer Business Applications

On-premises environment

Container Platform |
UCS Director

Intersight |
HyperFlex | UCS

Nexus 9K

Consistent, production-grade experience

App & Workload Management

AppDynamics | CloudCenter Suite
Workload Optimization Manager

Security

Duo | Cloudlock | Umbrella
Stealthwatch Cloud | Tetration

Networking

ACI Anywhere | SD-WAN
CSR1000v | Meraki vMX

Public clouds
& SaaS



Google Cloud



Azure



IBM Cloud

...



Office 365



...

Today's focus



CCP

Cisco Container
Platform
Infrastructure
provisioning and
governance



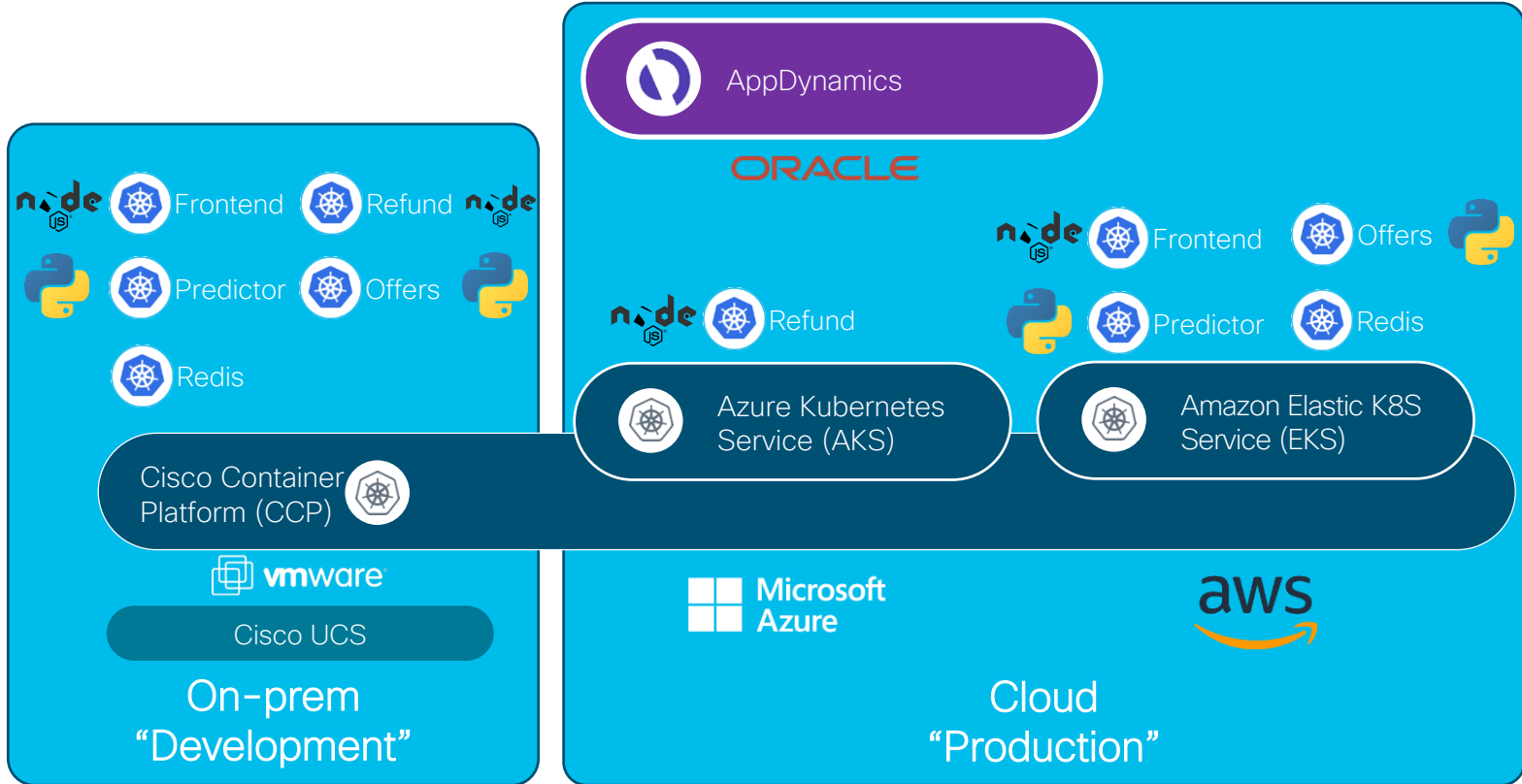
AppDynamics

Application and
infrastructure
performance
monitoring



A sample application:
Titanic Survivor, what the customer sees

Lab architecture



Today's goals



My application is profitable

We are able to track how many tickets we sell

We are able to monitor the user experience



Correlate loss of revenue with events

Instrument the application

Instrument the infrastructure

Create a business view



Detect and remediate as fast as possible

Leverage dynamic baselines to understand if something is leading to a potential issue

Chapter 1:

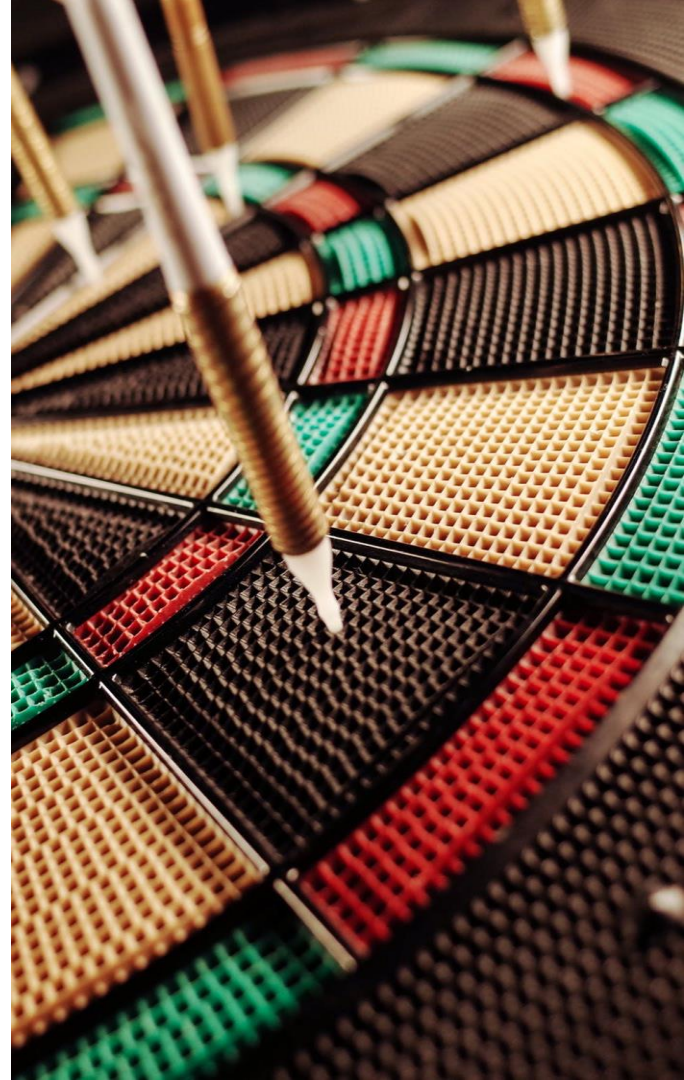
Provision the infrastructure

Infrastructure goals

1 Turnkey infrastructure as a Lego brick

2 Seamless experience on all clouds

3 Single governance across clusters,
vendor supported



Cisco Container Platform



Turnkey Solution
for Production-Grade Container
Environments

Native Kubernetes (100% Upstream)

Direct updates and best practices from open source community

Multicloud Optimized

Deploy on-premise and native Amazon EKS and Azure AKS clusters

Integrated

Networking | Storage | Management | Registry | Security | AI/ML

Flexible Deployment Model

VMware (air gapped) | OpenStack (air gapped) | Public cloud

Easy to acquire, deploy and manage | Open and consistent | Extensible platform | World-class advisory and support



Create a new cluster

Container Platform **VERSION 3**

v3 Clusters

vSphere AWS Azure

NEW CLUSTER

NAME	KUBERNETES VERSION	NODES MASTER / WORKER	STATUS	ACTIONS
jesse	1.14.8	1/2	Ready	
predator	1.14.8	1/1	Ready	

For your reference!

Fill in with infrastructure provider details

Create vSphere Cluster

01 Basic Information

02 Provider Settings

03 Node Configuration

04 Summary

Basic Information

* INFRASTRUCTURE PROVIDER
vsphere

* KUBERNETES CLUSTER NAME
onprem-k8s
Name should be DNS friendly.

NETWORK PLUGIN
calico

* KUBERNETES VERSION
1.14.8

Create vSphere Cluster

01 Basic Information

02 Provider Settings

03 Node Configuration

04 Summary

Provider Settings

* DATA CENTER
runDMZ

* CLUSTER
RUNDMZ_CLUSTER

* DATASTORE
Local-2TB

* VM TEMPLATE
ccp-tenant-image-1.14.8-ubuntu18-5.1.0

* NETWORK
CCP

Create vSphere Cluster

01 Basic Information

02 Provider Settings

03 Node Configuration

04 Summary

Node Configuration

GPU TYPE
No available GPUs

MASTER

* NODES
1 VCPUS 2 MEMORY (GB) 16

WORKER

NODES 3 VCPUS 4 MEMORY (GB) 32 GPUS 0

SSH USER
ccpuser

Cisco curated images!

For your reference!

Same for other infra provider like AWS or Azure

Create AWS Cluster

01 Basic Information

- 02 Node Configuration
- 03 VPC Configuration
- 04 Summary

Basic Information

- * INFRASTRUCTURE PROVIDER: AWS-RMLAB
- * AWS REGION: eu-central-1
- * KUBERNETES VERSION: 1.14
- * KUBERNETES CLUSTER NAME: ciscolive

Name should be DNS friendly.

Create Azure Cluster

01 Basic Information

- 02 Cluster Settings
- 03 Node Configuration
- 04 Summary

Basic Information

- * INFRASTRUCTURE PROVIDER: RTORTORI-AZ
- * KUBERNETES CLUSTER NAME: cleur-azure
- * AZURE LOCATION: eastus
- * KUBERNETES VERSION: 1.14.8

Name should be DNS friendly.

For your reference!

Confirm and enjoy

Create vSphere Cluster

- 01 Basic Information
- 02 Provider Settings
- 03 Node Configuration
- 04 Summary**

Basic Information

INFRASTRUCTURE PROVIDER: vsphere

NETWORK PLUGIN: calico

Provider Settings

DATA CENTER: runDMZ

DATASTORE: Local-2TB

NETWORK: CCP

Node Configuration

GPU:

WORKER: Nodes: 3, VCPUs: 4, Memory (GB): 33

KUBERNETES CLUSTER NAME: onprem-k8s

KUBERNETES VERSION: 1.14.8

CLUSTER: RUNDMZ_CLUSTER

VM TEMPLATE: ccp-tenant-image-1.14.8-ubuntu18-5.1.0

RESOURCE POOL:

v3 Clusters

vSphere AWS Azure

NAME	KUBERNETES VERSION	NODES MASTER / WORKER	STATUS	ACTION
onprem-k8s	1.14.8	1 / 3	Creating	
jesse	1.14.8	1 / 2	Ready	

For your reference!

Demo:

Cluster management and
governance with RBAC

v3 Clusters

vSphere AWS Azure

[NEW CLUSTER](#)

NAME	KUBERNETES VERSION	NODES MASTER / WORKER	STATUS	ACTIONS
 genesis	1.14.8	1 / 1	Ready	
 jesse	1.14.8	1 / 2	Ready	
 deblanc	1.14.8	1 / 1	Ready	

How can do I monitor my tenant cluster?

The screenshot displays the Kibana interface for monitoring a tenant cluster. The top navigation bar shows 5,611 hits and search filters. The left sidebar contains navigation options: Discover, Visualize, Dashboard, Timelion, Dev Tools, and Management. The main content area is split into two panels. The upper panel is a bar chart titled 'December 20th 2019, 17:44:30.449 - December 20th 2019, 17:59:30.449' with a time range of 30 seconds. The y-axis is labeled 'Count' and ranges from 0 to 200. The x-axis is labeled '@timestamp per 30 seconds' and shows time intervals from 17:45:00 to 17:59:00. The bars show a fluctuating count, with a notable peak around 17:50:00. The lower panel is a log viewer with columns for 'Time' and 'log'. It displays several log entries with timestamps and detailed messages, including information about Helm chart reconciliation, fetching charts, and transaction cleanup.

Time	log
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="Install requested for ccp/ccp-efk" func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.(*ReconcileHelmChart).Reconcile" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/helmchart_controller.go:166"
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="Reconciling HelmChart ccp/ccp-efk\n" func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.(*ReconcileHelmChart).Reconcile" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/helmchart_controller.go:97"
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="Fetching chart /opt/ccp/charts/ccp-efk.tgz" func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.fetchChart" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/client.go:120"
December 20th 2019, 17:59:24.000	16:59:24,444 INFO [AD Thread Pool-Global25] BTOverflowCounter - Transactions cleanup detected. Resetting overflow transaction timer.
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="Found release ccp/ccp-efk" func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.(*HelmClient).GetRelease" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/client.go:289"
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="Override Hash is not changed." func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.(*HelmClient).OverrideChanged" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/client.go:310"
December 20th 2019, 17:59:24.000	time="2019-12-20T16:59:24Z" level=info msg="ccp/ccp-efk has no kubeconfig secretName, targeting local cluster" func="wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart.(*HelmClient).SetContext" file="/go/src/wwin-github.cisco.com/CP5G/ccp-helm-operator/pkg/controller/helmchart/client.go:228"
December 20th 2019, 17:59:24.000	[storage] 2019/12/20 16:59:24 listing all releases with filter

How can do I monitor my tenant cluster?



Infrastructure goals recap

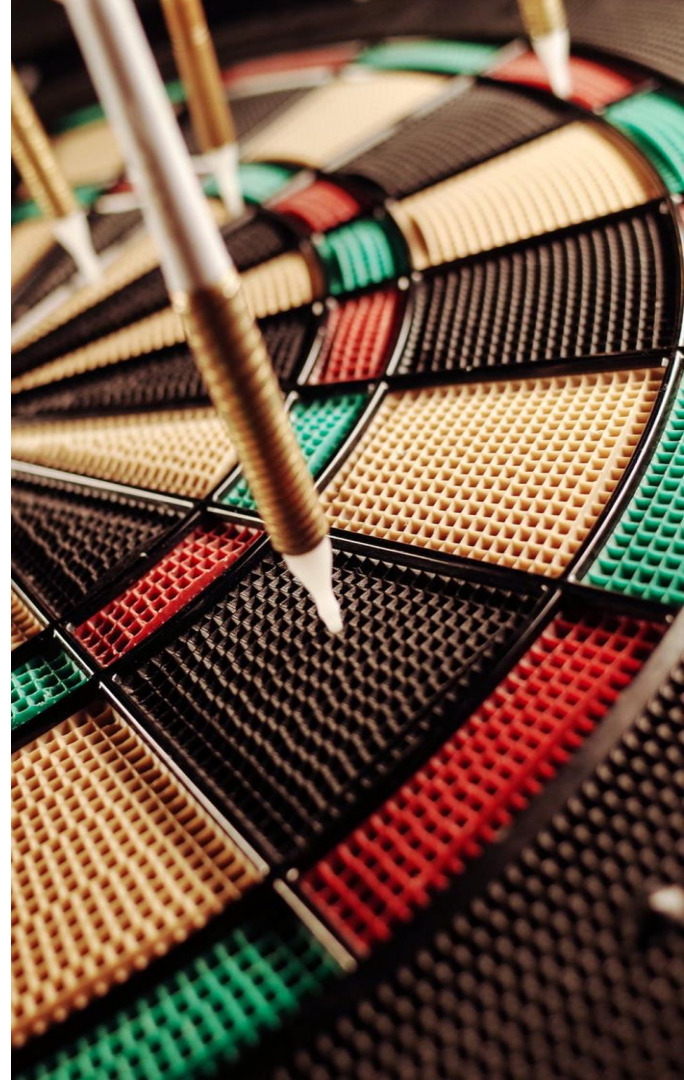
1 Turnkey infrastructure as a Lego brick



2 Seamless experience on all clouds

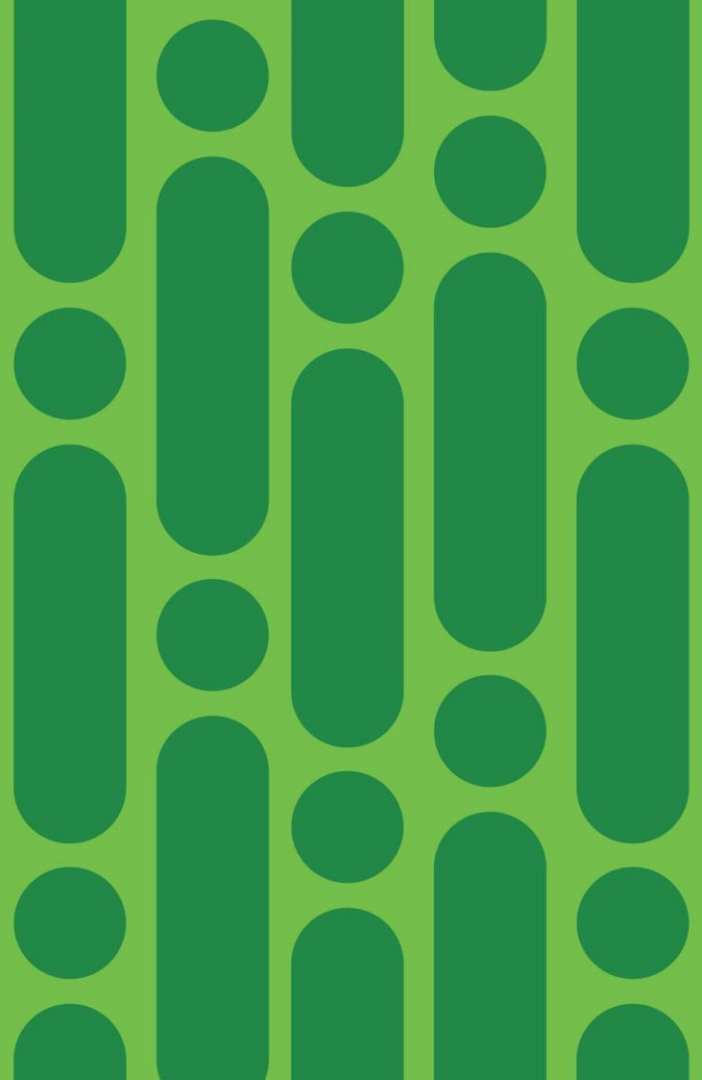


3 Single governance across clusters,
vendor supported



Chapter 2:

Instrument the
application and the
infrastructure



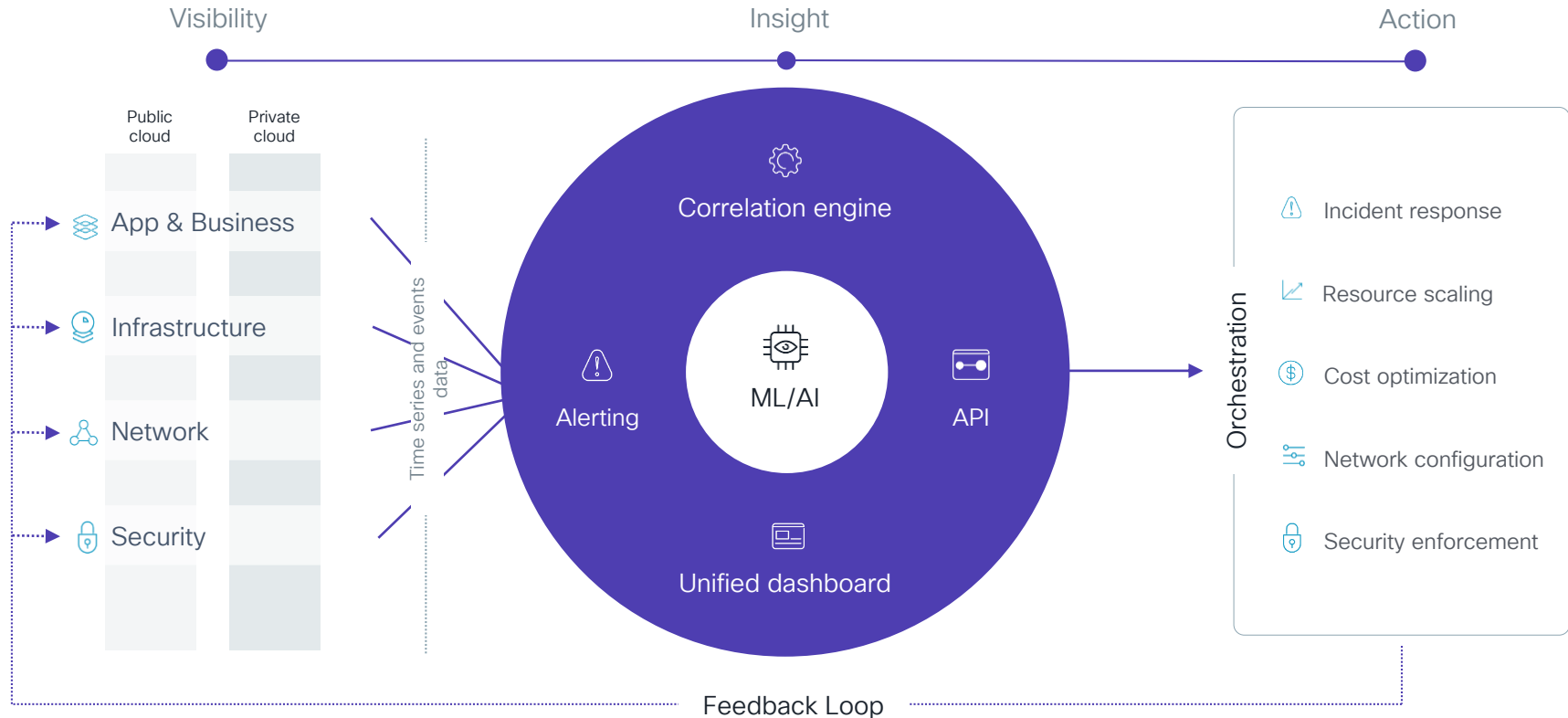
Instrumentation goals

1 Visibility into K8S performance & health

2 Visibility into App's performance & health



AppDynamics: The Central Nervous System



Meet AppD Cluster Agent

1

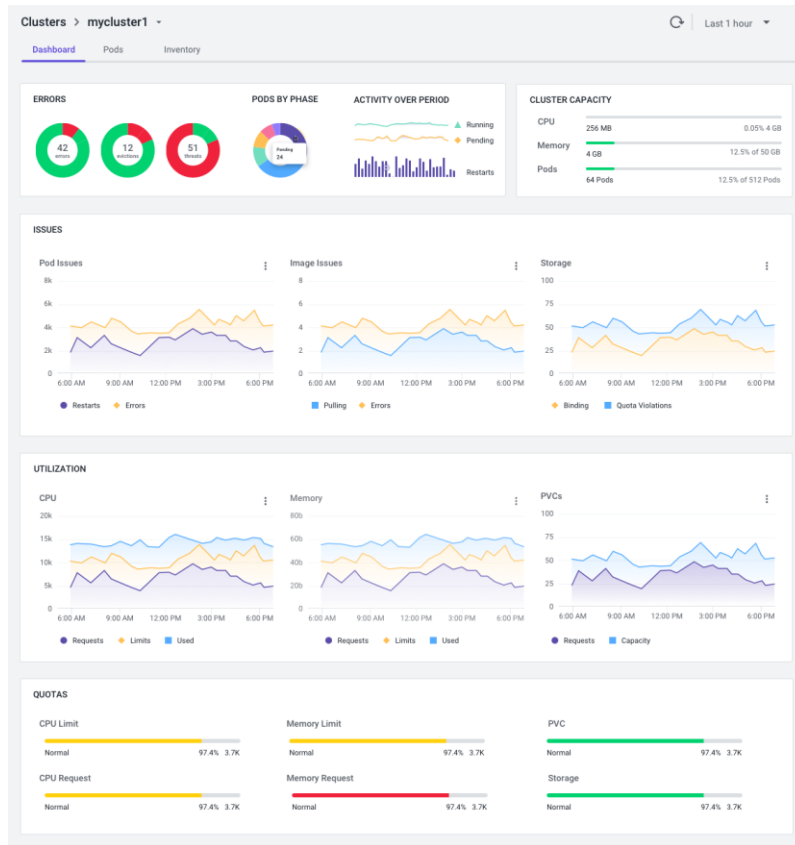
Visibility into K8s' performance & health

- Works on all Kubernetes distributions:
 - DIY, EKS, EKS Fargate, AKS, GKE, OpenShift, Rancher, Docker Enterprise, CCP...
- Real-time visibility into Kubernetes clusters
 - deployable via Helm/Operator
- Metrics categorized for easy triage:
 - App issues, config issues, overconsumption, quota violations, network problems
- Correlate Cluster Metrics with application performance
- All container runtimes supported (Docker, CRI-O, containerd)



Technology Partner

OpenShift Certified Operator

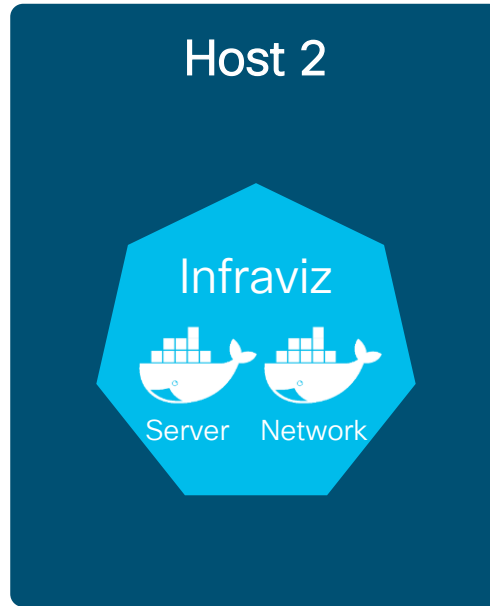
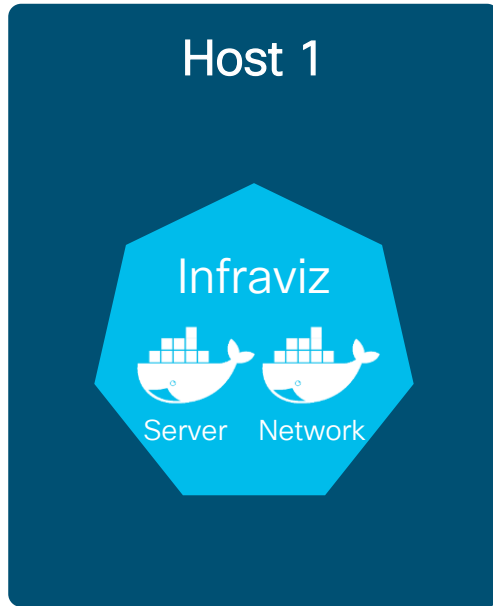


CISCO *Live!*

Instrumentation. Server Viz

1

Visibility into K8s' performance & health



Deployment Options



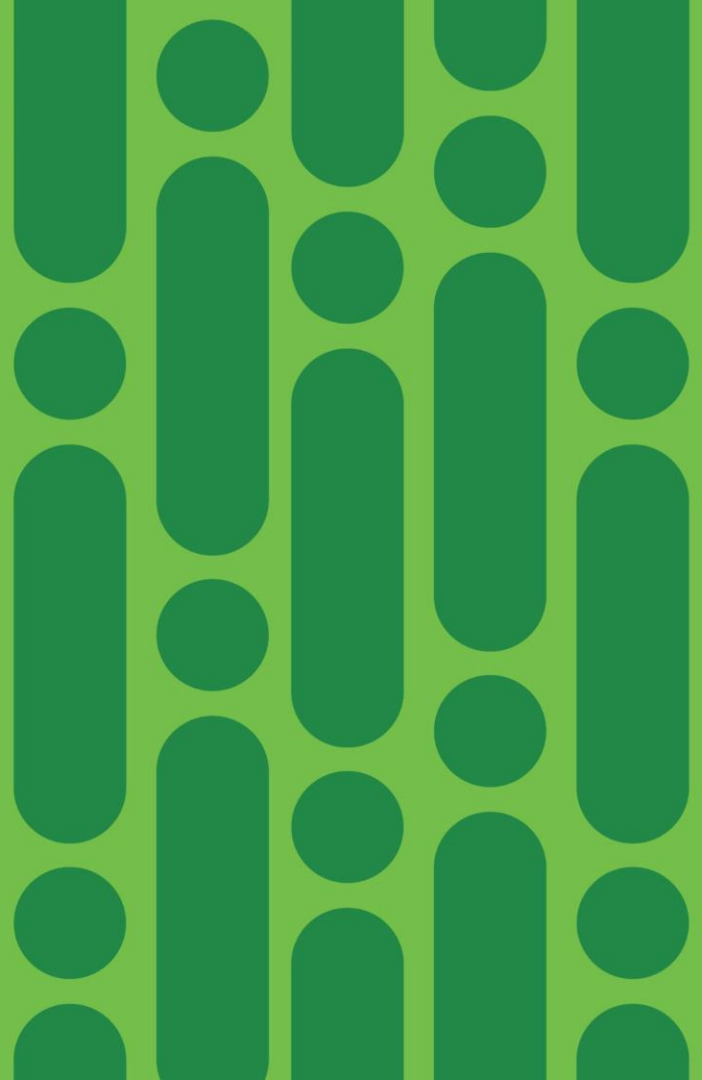
Demo:

Instrument the
infrastructure

For your reference!

<https://docs.appdynamics.com/display/PRO45/Monitoring+Kubernetes+with+the+Cluster+Agent>

CISCO *Live!*



App Instrumentation. Init Container

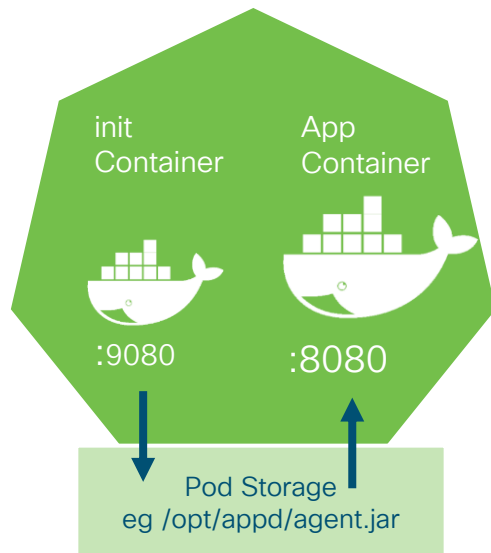
2

Visibility into App's performance & health

Embedded



RunTime



AppDynamics App Agent is in the Init Container.

Init Container copies the Agent artifacts to the Pod Storage

Application references the agent from the Pod storage using an environment variable

Instrumenting the application

- Install AppDynamics agent via pip packages
- Embedded in the docker image
- Variable passed as config-maps



```
1 # Use alpine-python-3 appd image
2 FROM rtortori/ubuntu-python3
3
4 # Set the working directory to /
5 WORKDIR /
6
7 # Copy app requirements
8 ADD requirements.txt titanic_dataset.csv /
9
10 # Optionally define proxy environment
11 ARG http_proxy=http://proxy-wsa.esl.cisco.com:80
12 ARG https_proxy=http://proxy-wsa.esl.cisco.com:80
13
14 # Install requirements
15 RUN pip install -r requirements.txt && pip install -U appdynamics==4.5.4.0
16
17 # Set Entry point
18 ENV APP_ENTRY_POINT "python /predictor.py"
19
20 # Copy app requirements
21 ADD predictor.py utils.py start_with_appd.sh /
22
23 # Expose port 5001
24 EXPOSE 5001/tcp
25
26 # Run it
27 ENTRYPOINT ["/start_with_appd.sh"]
28
```

```
1 [agent]
2 app = prod-survivor
3 tier = predictor
4 node = node-1
5
6 [controller]
7 host = myappdcontroller.fake.address.com
8 port = 90
9 ssl = off
10 account = my_fake_account
11 accesskey = my_fake_key
12
```

```
1 #!/bin/sh
2
3 AGENT_CONFIG="/opt/appdynamics/agent.cfg"
4 if [ "${APPDYNAMICS_AGENT_CONFIG}" != "x" ]; then
5     AGENT_CONFIG=${APPDYNAMICS_AGENT_CONFIG}
6 fi
7
8 ENTRY_POINT=" python /predictor.py"
9
10 if [ "${APP_ENTRY_POINT}" != "x" ]; then
11     ENTRY_POINT=${APP_ENTRY_POINT}
12 fi
13
14 AGENT_PROXY=""
15
16 if [ "${APPD_PROXY_CONTROL_PATH}" != "x" ]; then
17     mkdir -p ${APPD_PROXY_CONTROL_PATH}
18     chmod 755 ${APPD_PROXY_CONTROL_PATH}
19     AGENT_PROXY="--use-manual-proxy"
20 fi
21
22 pyagent run $AGENT_PROXY -c $AGENT_CONFIG $ENTRY_POINT
23
```

Demo:

AppDynamics overview

Instrumentation goals recap

1 Visibility into K8S performance & health



2 Technical & Business Application visibility



Chapter 3:

I want the insights!

The business view goals

1 Is my application profitable?

2 Is my application performing correctly?

3 How is the end-user experience?



Demo:

AppDynamics
insights & visibility
Overview

The business view goals recap

1 Is my application profitable?



2 Is my application performing correctly?



3 How is the end-user experience?



Chapter 4:

Detect and react to issues

Remediation goals

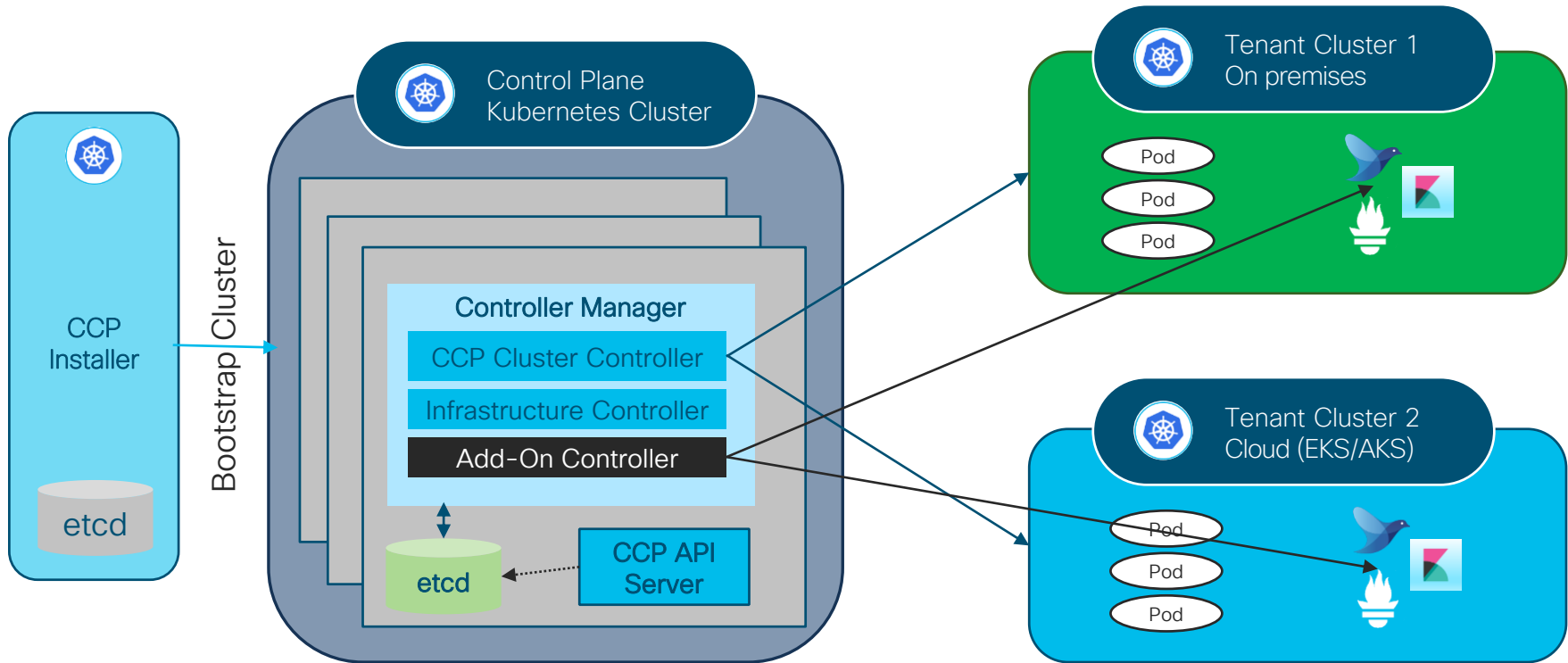
1 My infrastructure recovers automatically

2 My business service has a low MTTR



Declarative Life Cycle Manager Self Healing Clusters

1 My infrastructure recovers automatically



Demo: Automatically recover after node faults

v3 Clusters

vSphere AWS Azure

[NEW CLUSTER](#)

NAME	KUBERNETES VERSION	NODES MASTER / WORKER	STATUS	ACTIONS
 genesis	1.14.8	1 / 1	Ready	
 jesse	1.14.8	1 / 2	Ready	
 deblanc	1.14.8	1 / 3	Ready	

Demo:
“My revenue is
decreasing, I want
to know why!”

Remediation goals recap

1 My infrastructure recovers automatically



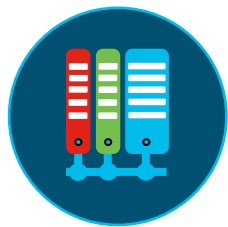
2 My business service has a low MTTR





Wrap up

The cloud native era challenges



Mainframe



Client/Server



Web



Cloud &
Microservices

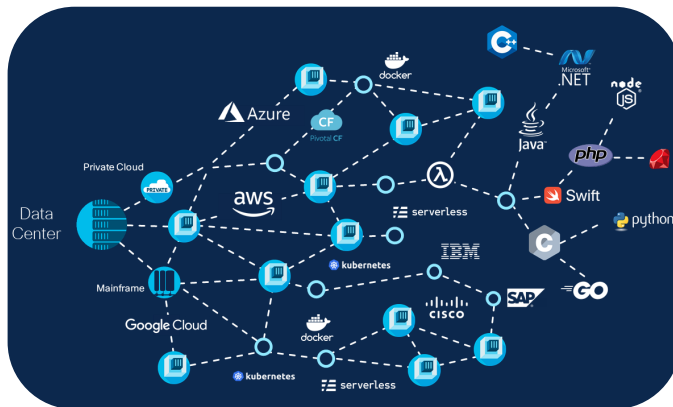


Better, Faster

*Major paradigm shifts to
accommodate user demand*



*This is what users expect
from you*



*Decentralized,
multi-cloud
multi-vendor
hybrid*

Covering the E2E for any business application

Customer Business Applications

On-premises environment

Container Platform |
UCS Director

Intersight |
HyperFlex | UCS

Nexus 9K

Consistent, production-grade experience

App & Workload Management

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Stealthwatch Cloud | Tetration

Networking

ACI Anywhere | SD-WAN
CSR1000v | Meraki vMX

Public clouds
& SaaS



Google Cloud



Azure

IBM Cloud

...



Office 365



...

Embark on the journey



“Your application experience”
booth at Cisco Showcase
Hall 7, Location DCR-12

1

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2

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license at [appdynamics.com](https://www.appdynamics.com)

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Related Sessions

DevOps with CloudCenter and Kubernetes in a multicloud environment - BRKCLD-2826

SCHEDULE Wednesday, January 29 | 11:00 AM - 12:00 PM

[Luca Relandini](#), PRINCIPAL ARCHITECT.SALES, Cisco Systems, Inc.

[Stefano Gioia](#), TECHNICAL SOLUTIONS ARCHITECT.SALES, Cisco Systems, Inc.

But... why do I need a service mesh? Real traffic management use cases with Istio on Cisco Container Platform - BRKCLD-2429

SCHEDULE Tuesday, January 28 | 02:30 PM - 04:00 PM

[Julio Gomez](#), TECHNICAL SOLUTIONS ARCHITECT.SALES, Cisco Systems, Inc.

Deploying Kubernetes with Cisco ACI - BRKACI-2505

SCHEDULE Wednesday, January 29 | 04:45 PM - 06:15 PM

[Camillo Rossi](#), ENGINEER.TECHNICAL MARKETING, Cisco Systems, Inc. - **Distinguished Speaker**

Cisco Container Platform for Infrastructure Teams - BRKCLD-2005

SCHEDULE Thursday, January 30 | 02:45 PM - 04:15 PM

[Justin Barksdale](#), TECHNICAL SOLUTIONS ARCHITECT.SALES, Cisco Systems, Inc.

Today!

How Cisco Customer Experience Is Enabling a Multicloud World for Our Customers - BRKCLD-1153

SCHEDULE Wednesday, January 29 | 02:45 PM - 04:15 PM

[Dave Malik](#), FELLOW.CUSTOMER EXPERIENCE, Cisco Systems, Inc. - **Distinguished Speaker**

[David Stanford](#), DIRECTOR.CX PRODUCT MANAGEMENT, Cisco Systems, Inc. - **Distinguished Speaker**

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Meet the Engineer
1:1 meetings



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Thank you





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