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Survive the Cloud Native age with AppDynamics and Cisco Container Platform

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Stefano Gioia – Technical Solutions Architect

BRKCLD-2889

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Barcelona | January 27–31, 2020

Cisco Webex Teams

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How

1. Find this session in the Cisco Events Mobile App
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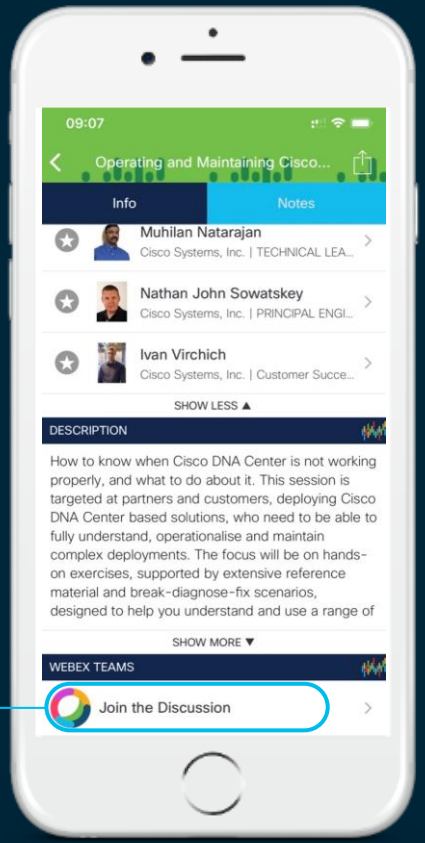


Users don’t care how your applications are built and where they run


Jan
Feb
Mar
Apr
May
Jun
Jul
2011

Agenda

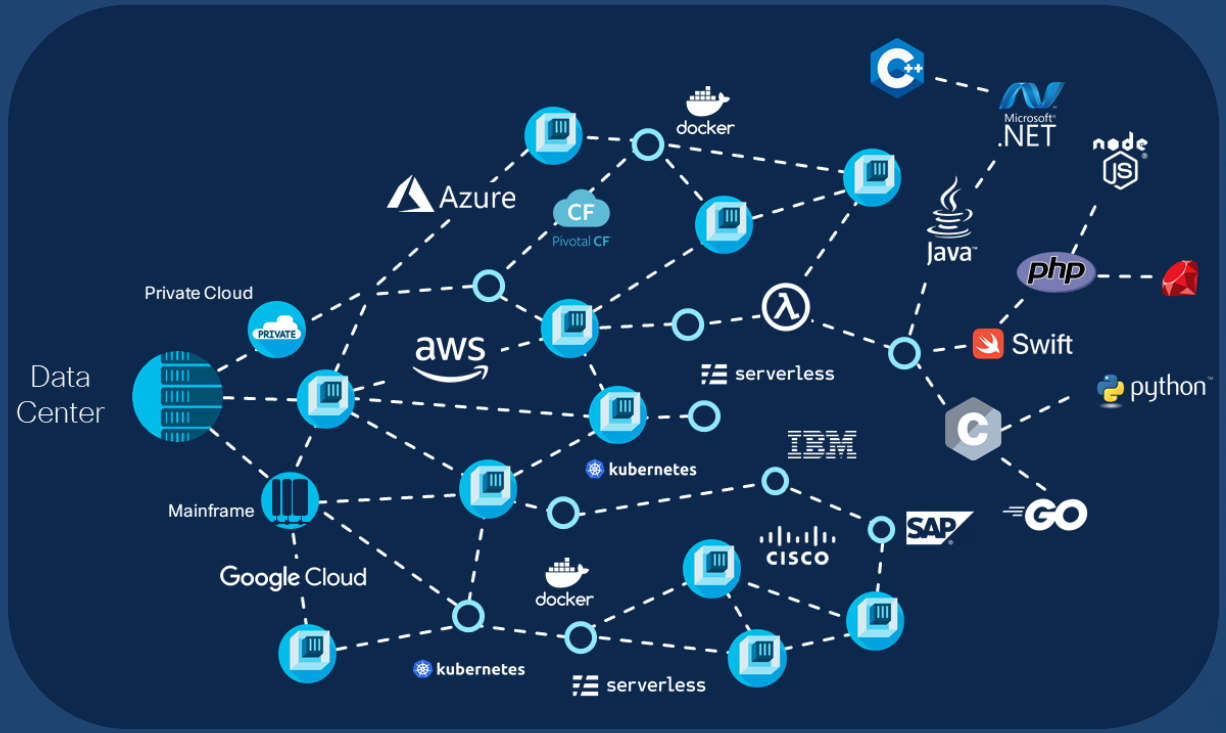
- Why cloud native
- The Cisco vision
- A sample application
  - Titanic Survivor
- Chapter 1: Provision the Infrastructure
- Chapter 2: Instrument the application and the infrastructure
- Chapter 3: I want the insights!
- Chapter 4: Detect and react to issues
- Wrap up and next steps

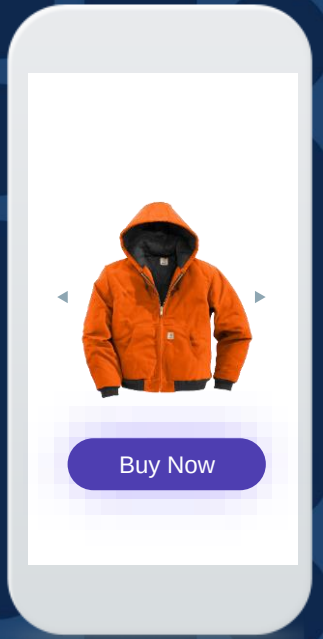
Why cloud native

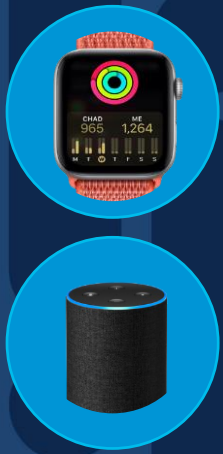
*"**Cloud native** technologies empower organizations to build and run **scalable applications** in modern, dynamic environments such as public, private, and **hybrid clouds.***

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

What you see







What your customers see

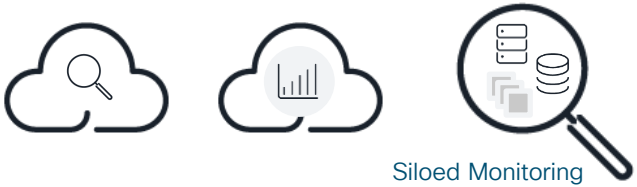
Not just a technology problem

UBER

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



Siloed Monitoring
& Analytics Tools

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

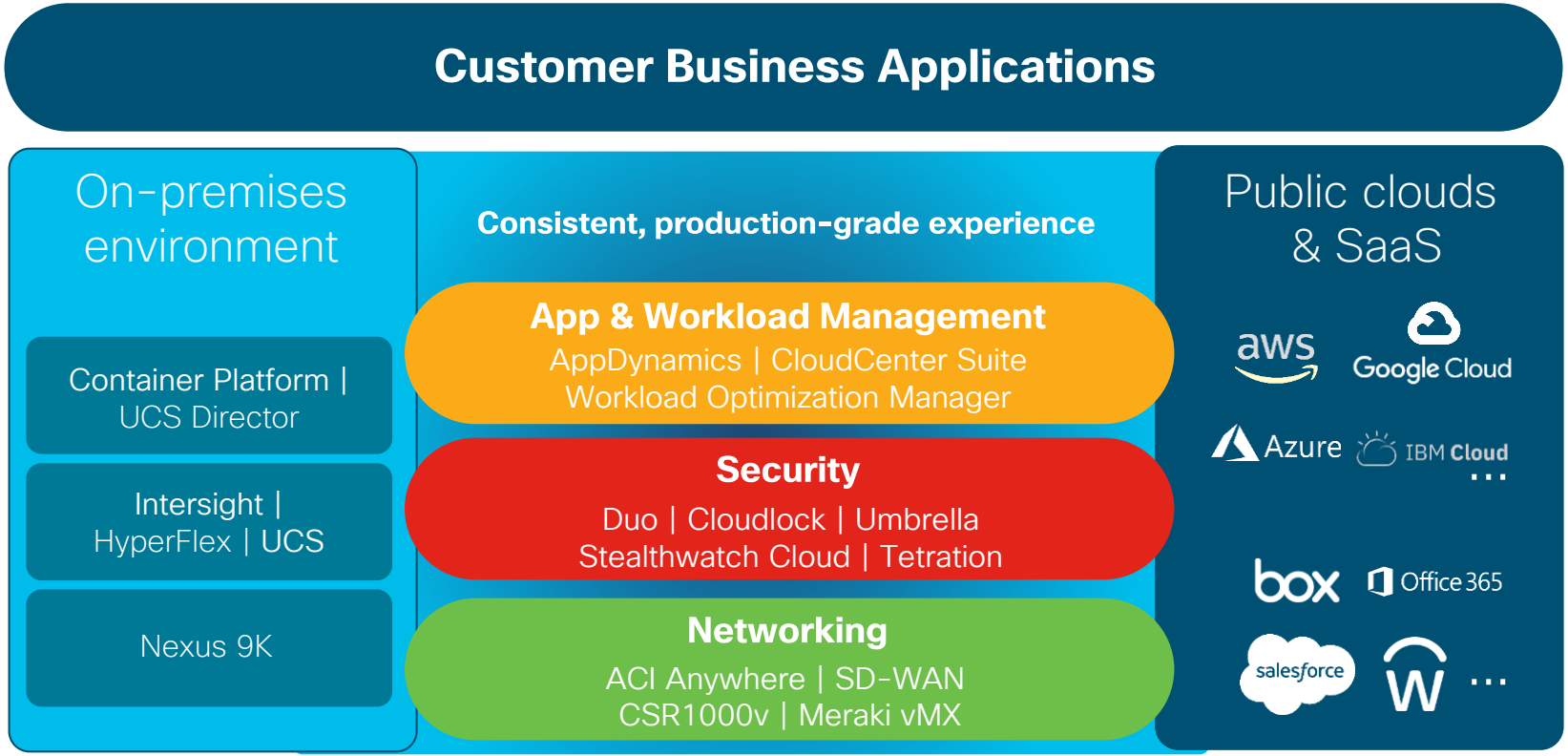
Ensure users are able to get what they want. Deployment, monitoring and issue remediation **must** be always done with this in mind

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



Today's focus

CCP

Cisco Container Platform

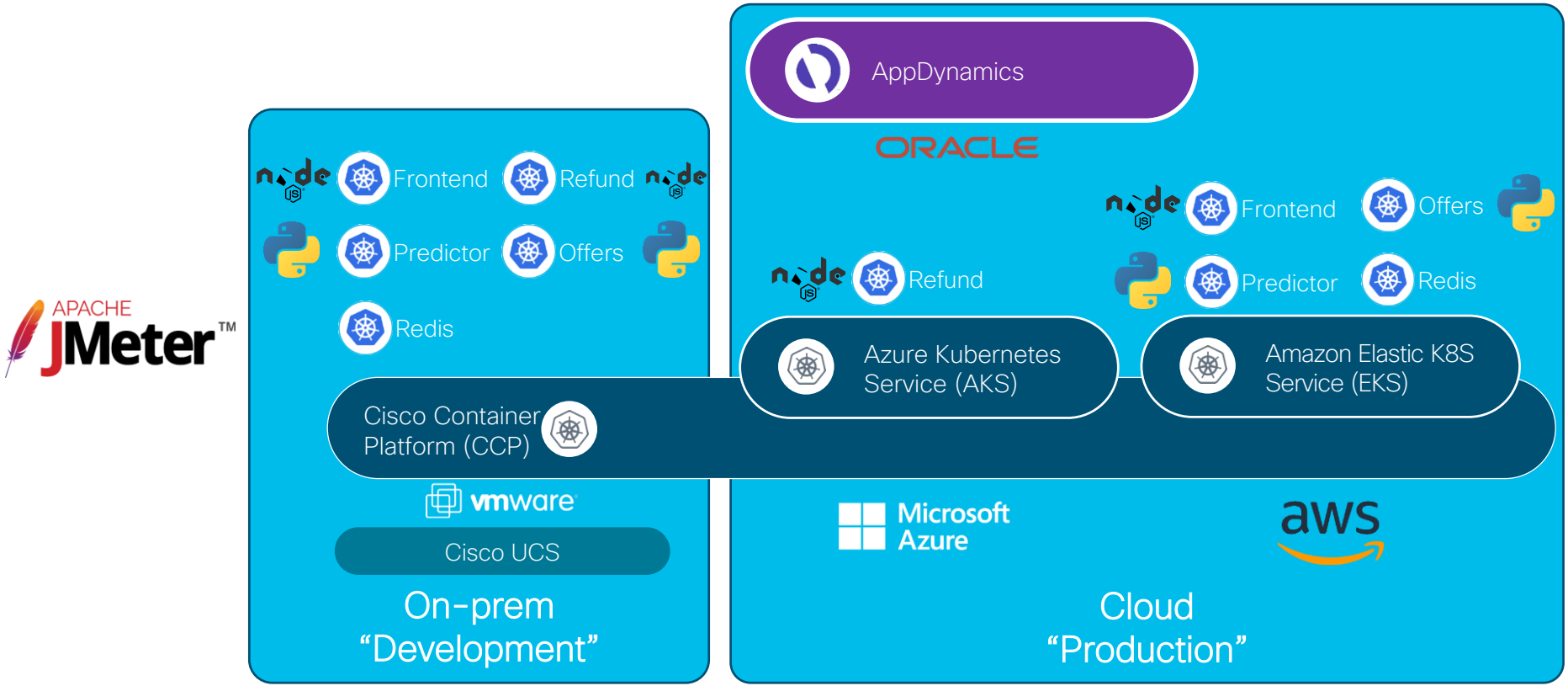
Infrastructure provisioning and governance

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

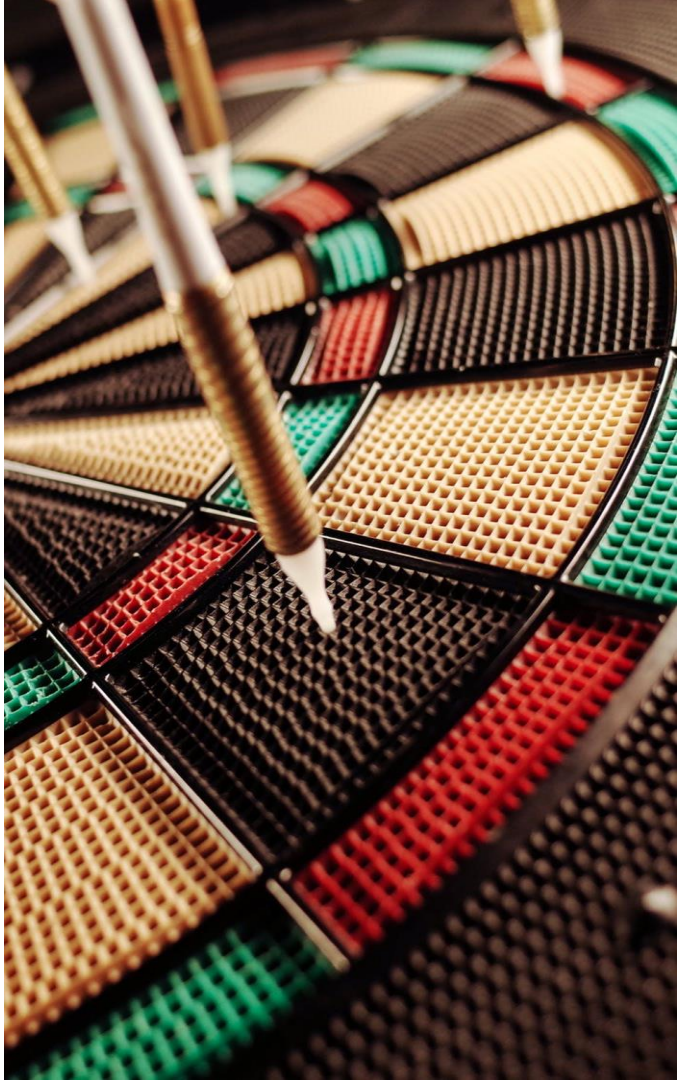
Leverage dynamic baselines to understand if something is leading to a potential issue

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

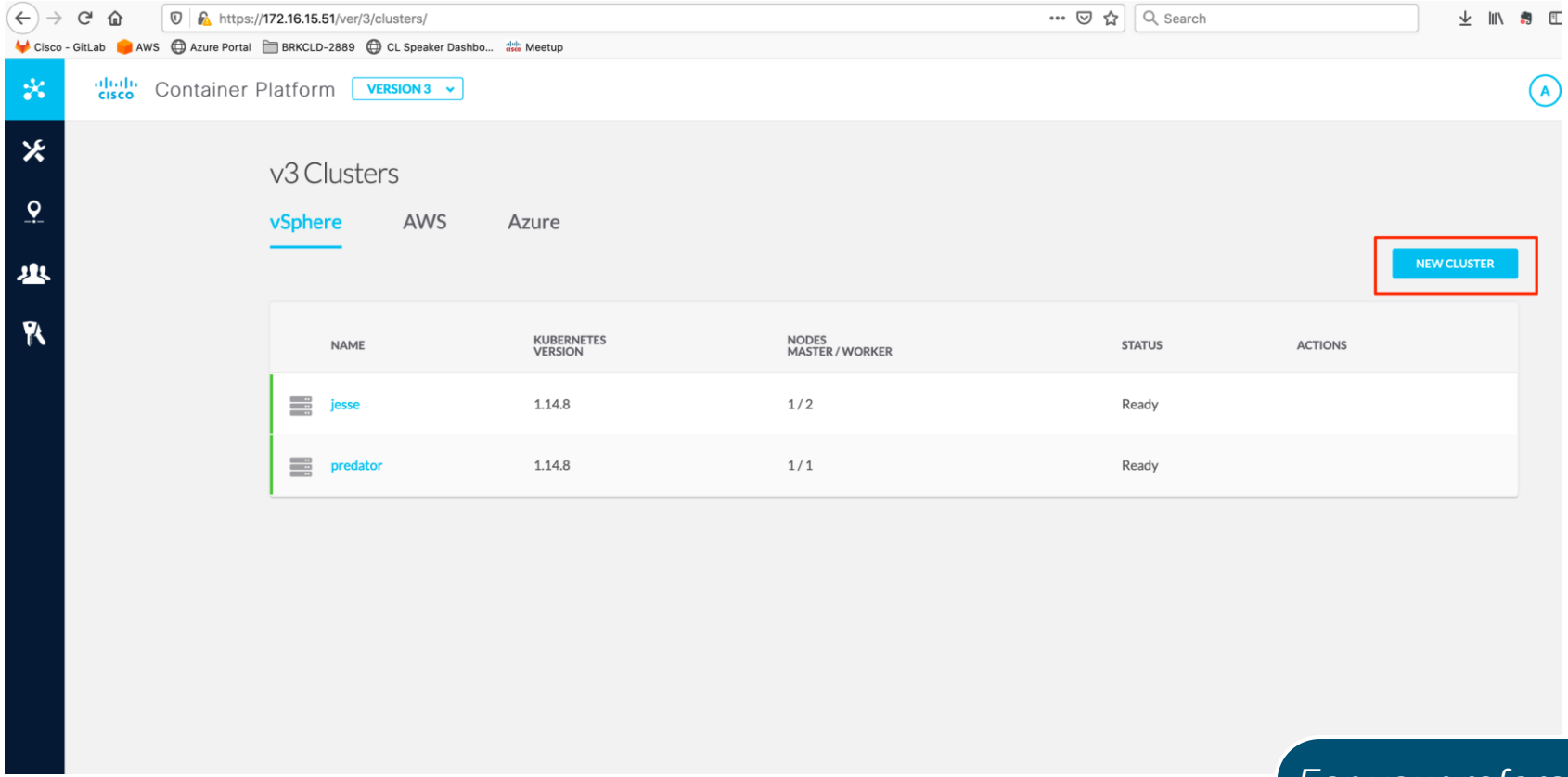
Multicloud Optimized
Deploy on-premise and native Amazon EKS and Azure AKS clusters

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

Flexible Deployment Model
VMware (air gapped) | OpenStack (air gapped) | Public cloud

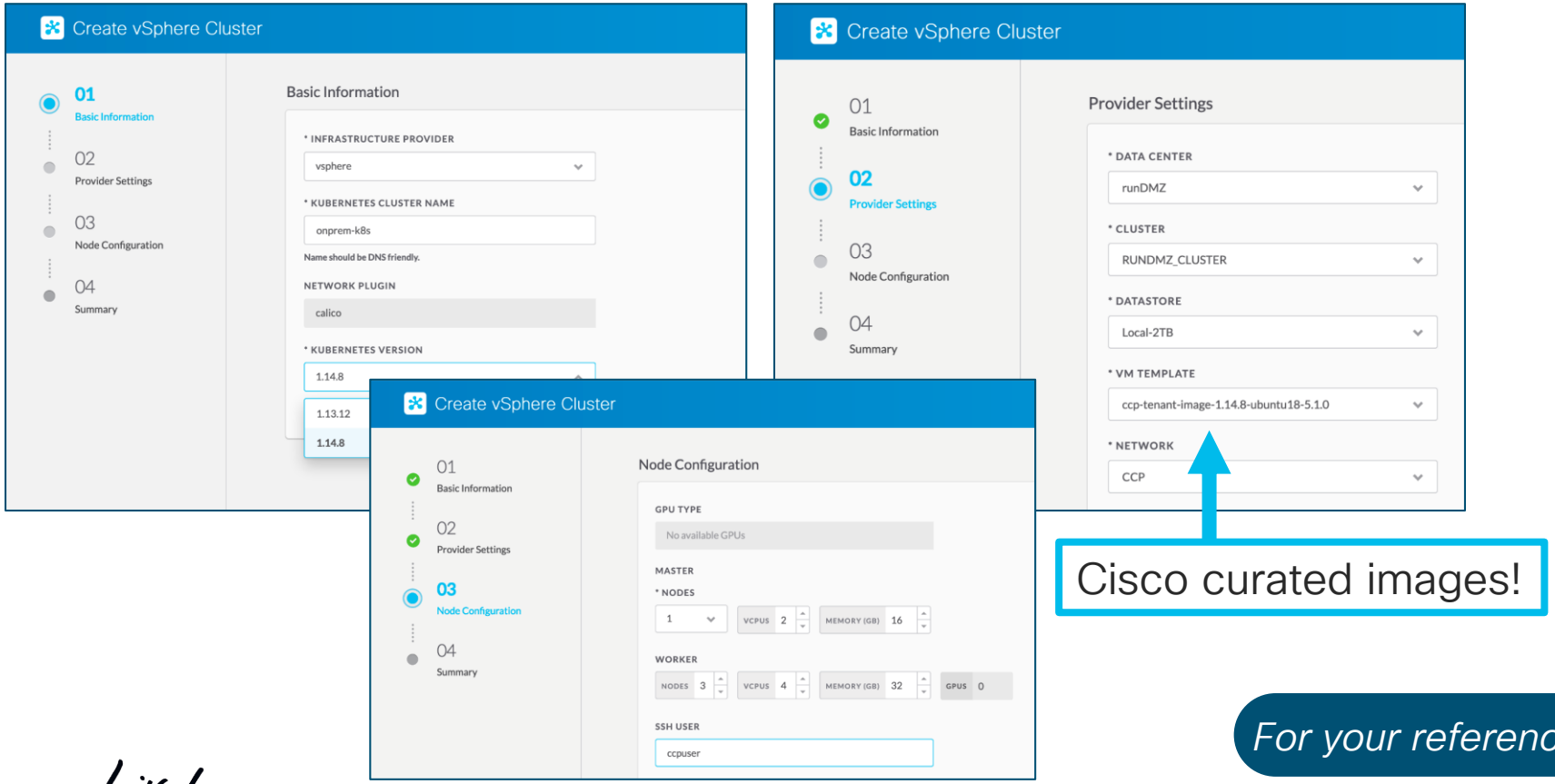
Easy to acquire, deploy and manage | Open and consistent | Extensible platform | World-class advisory and support

Create a new cluster

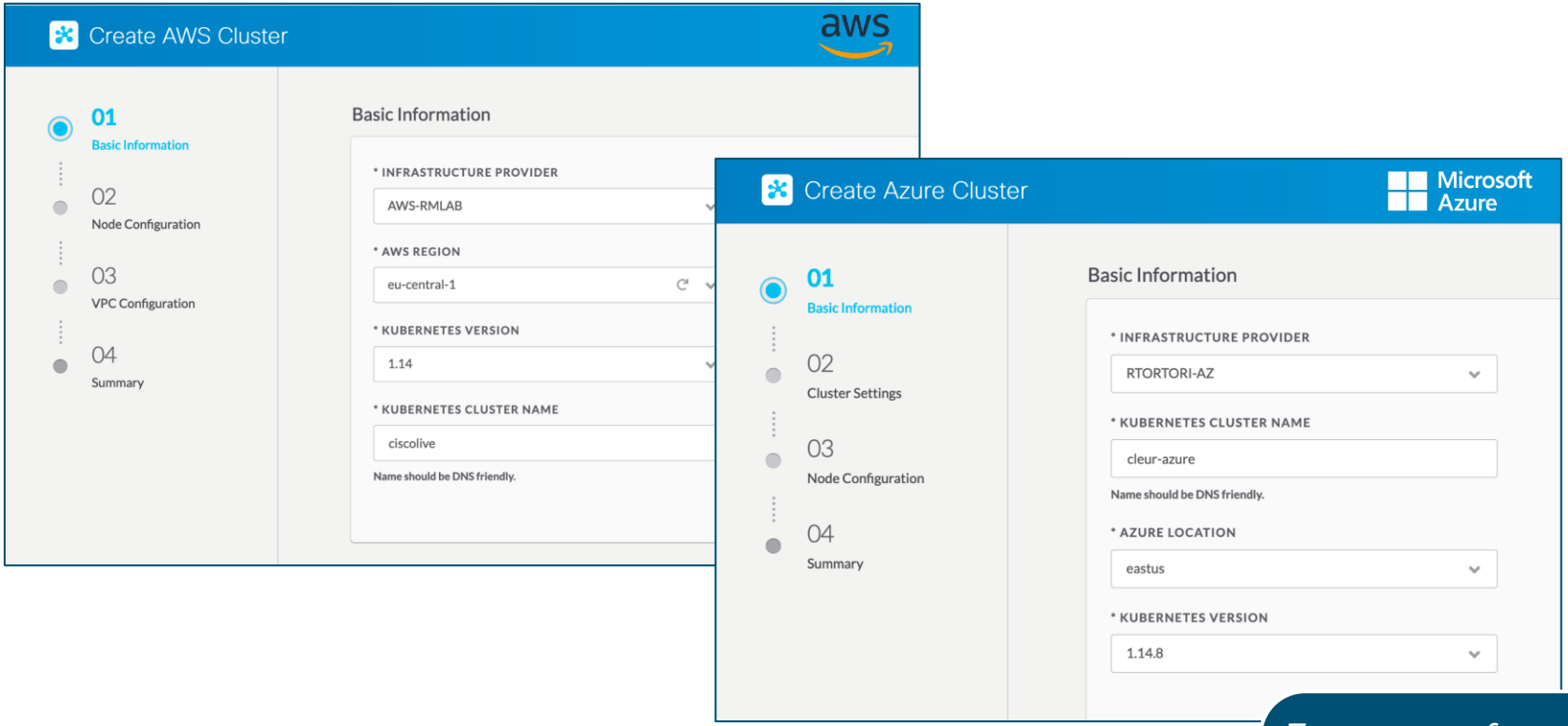


For your reference!

Fill in with infrastructure provider details

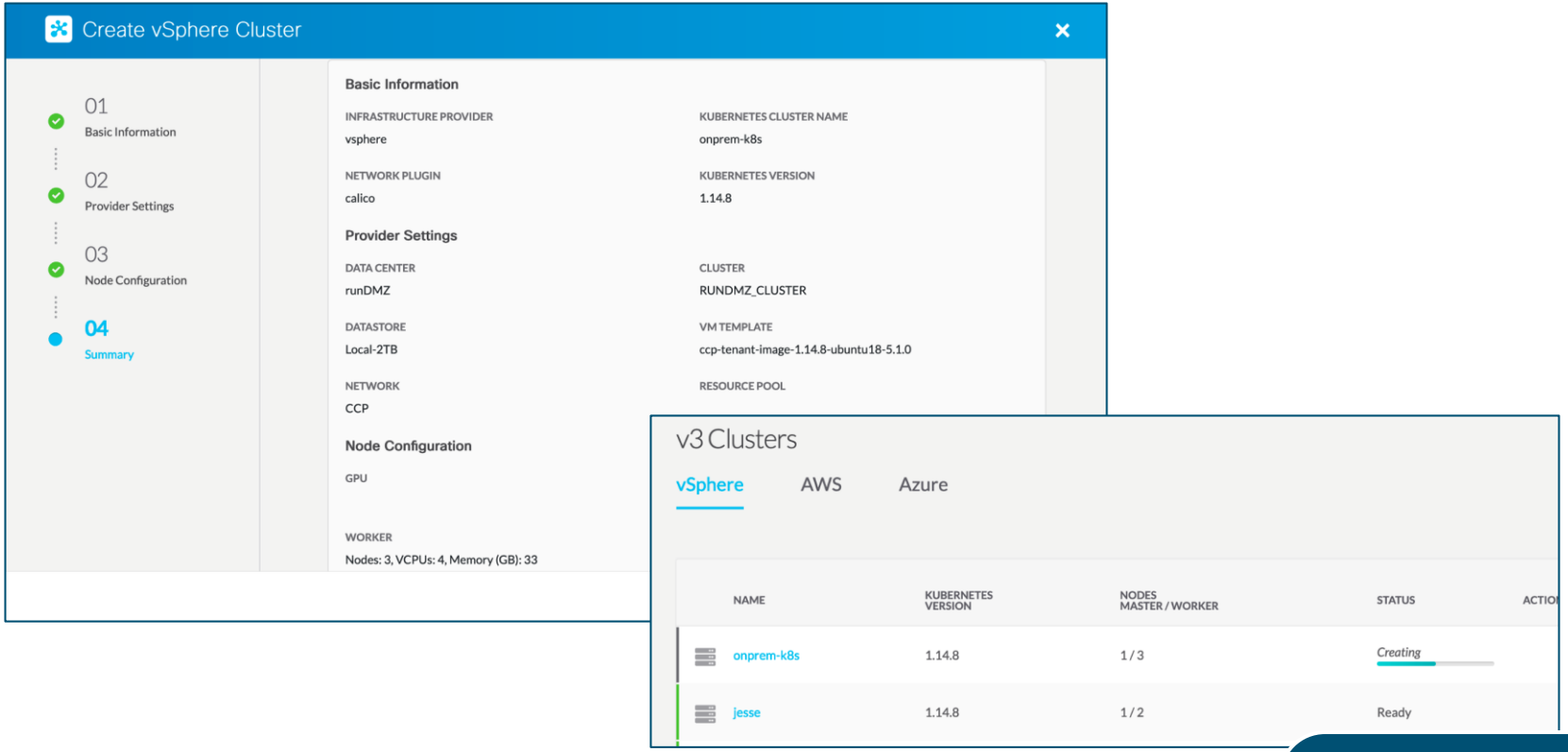


Same for other infra provider like AWS or Azure



For your reference!

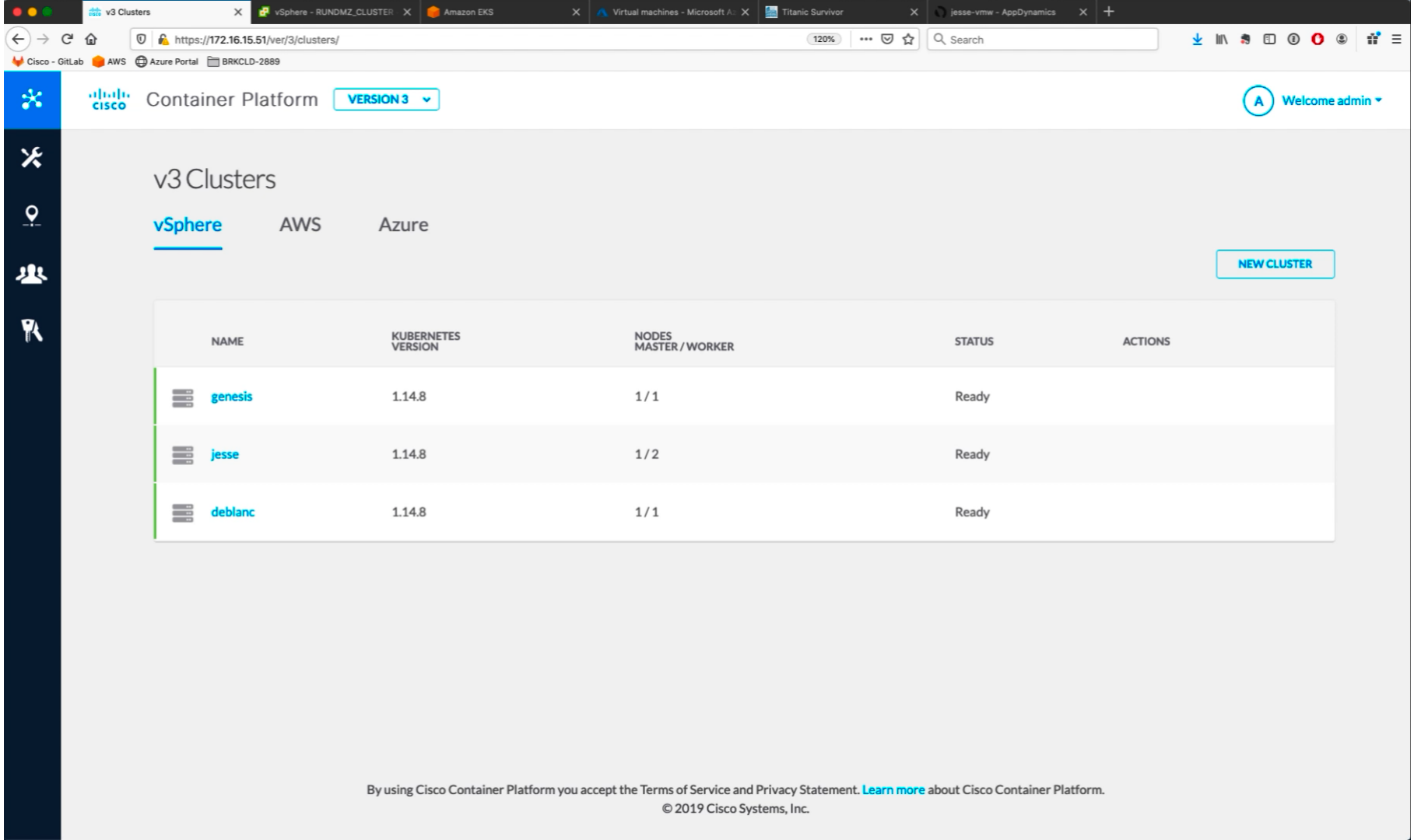
Confirm and enjoy



For your reference!

Demo:

Cluster management and governance with RBAC


v3 Clusters
vSphere - RUNDMZ_CLUSTER
Amazon EKS
Virtual machines - Microsoft A
Titanic Survivor
jesse-vmw - AppDynamics
https://172.16.15.51/ver/3/clusters/
120%
Search
Cisco - GitLab
AWS
Azure Portal
BRKCLD-2889
Container Platform
VERSION 3
Welcome admin
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
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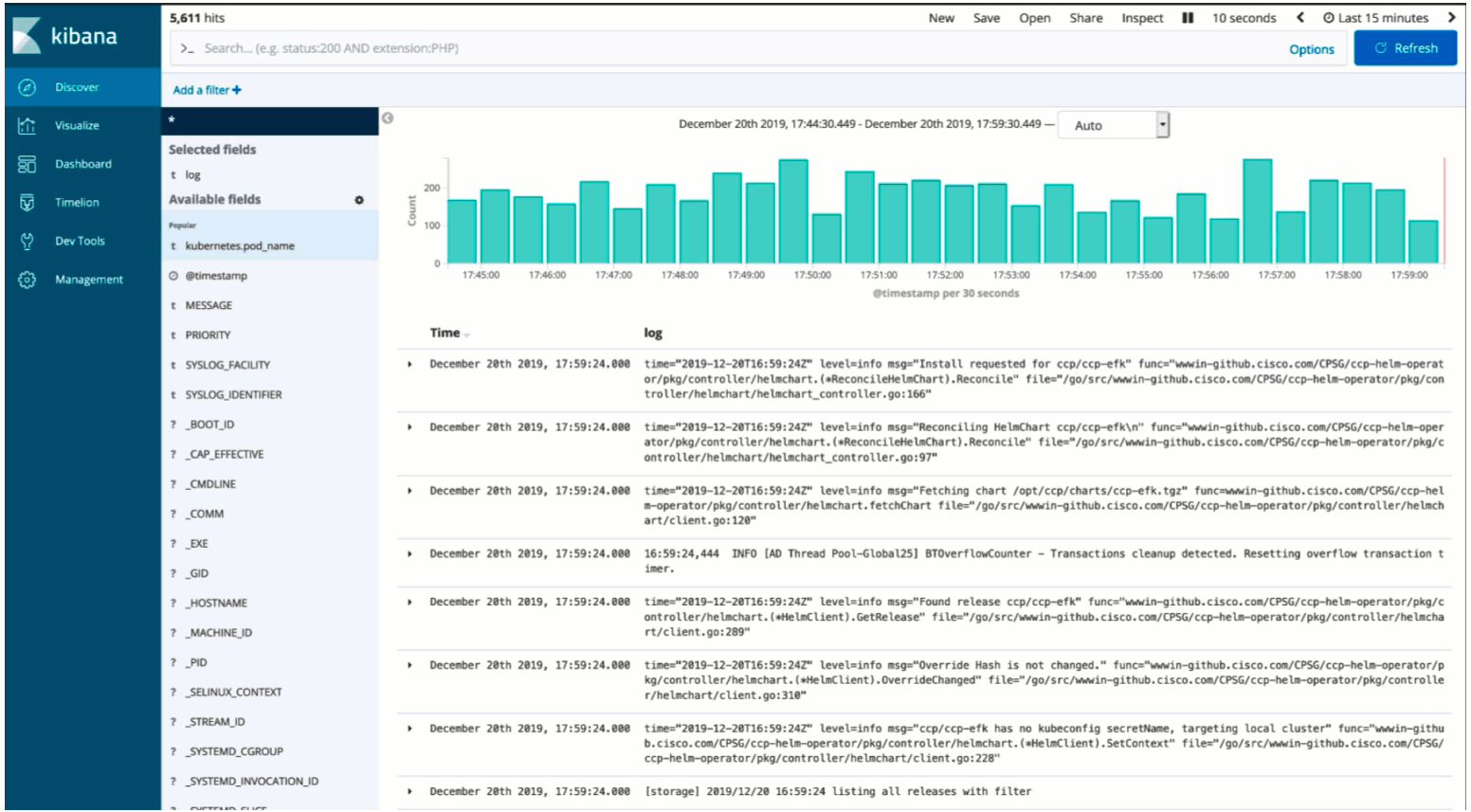
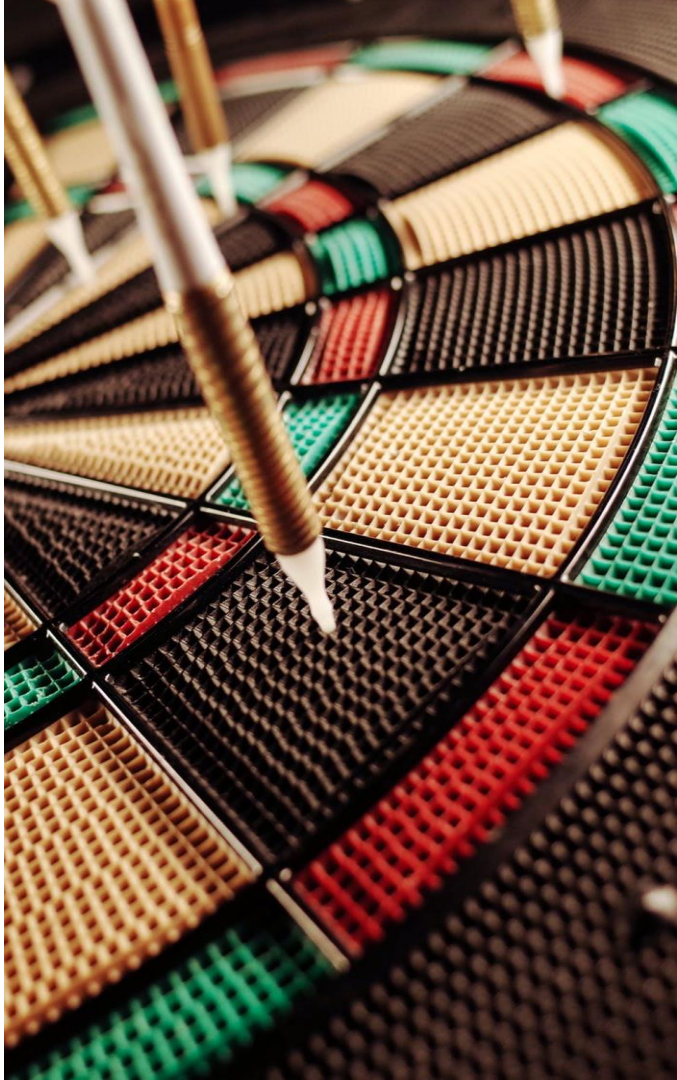
How can do I monitor my tenant cluster?



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:

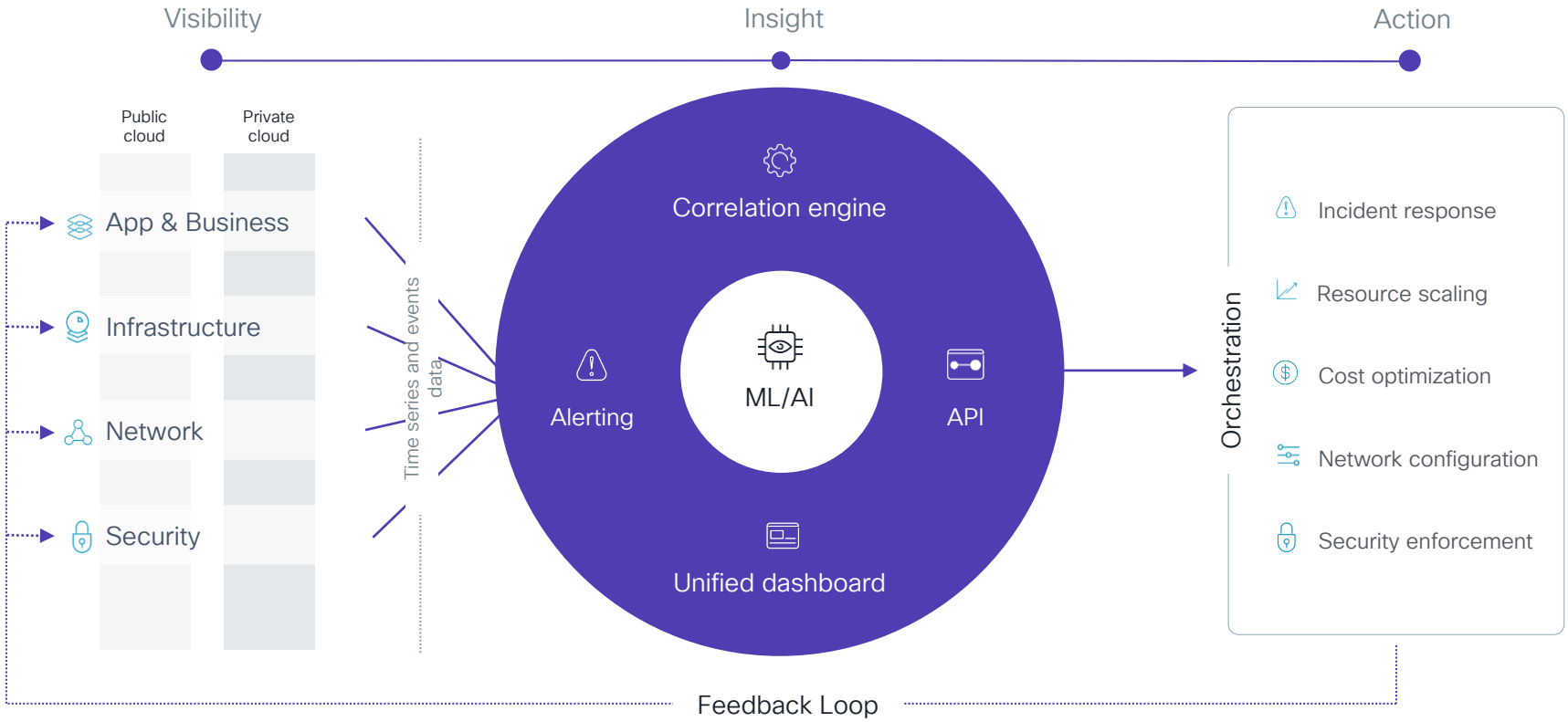
Instrument the application and the infrastructure

Instrumentation goals

1. Visibility into K8S performance & health

2. Visibility into App's performance & health

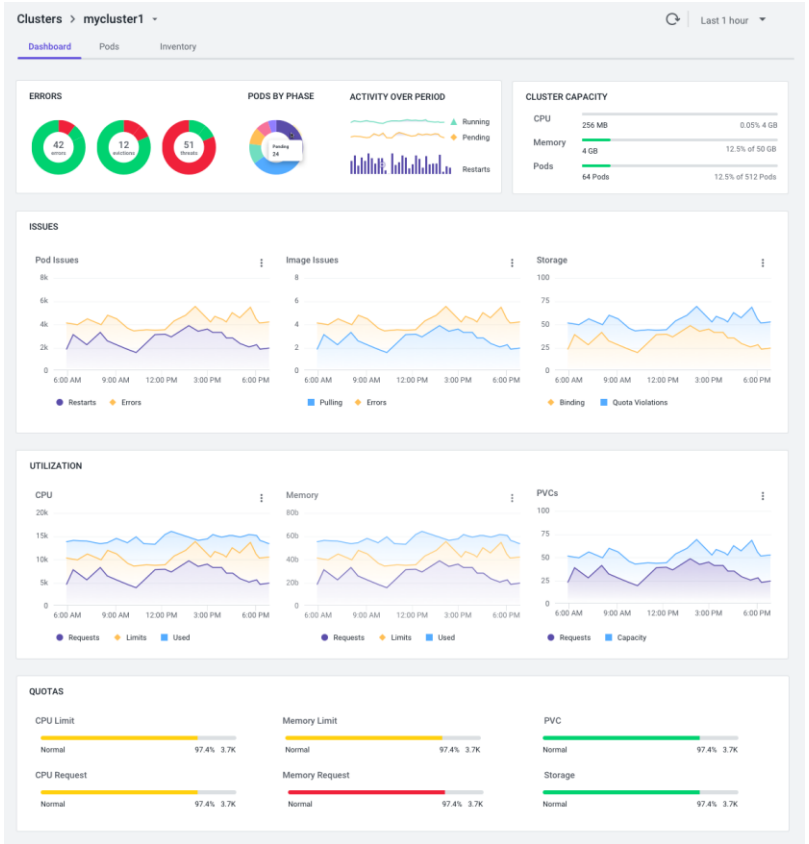
AppDynamics: The Central Nervous System



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)



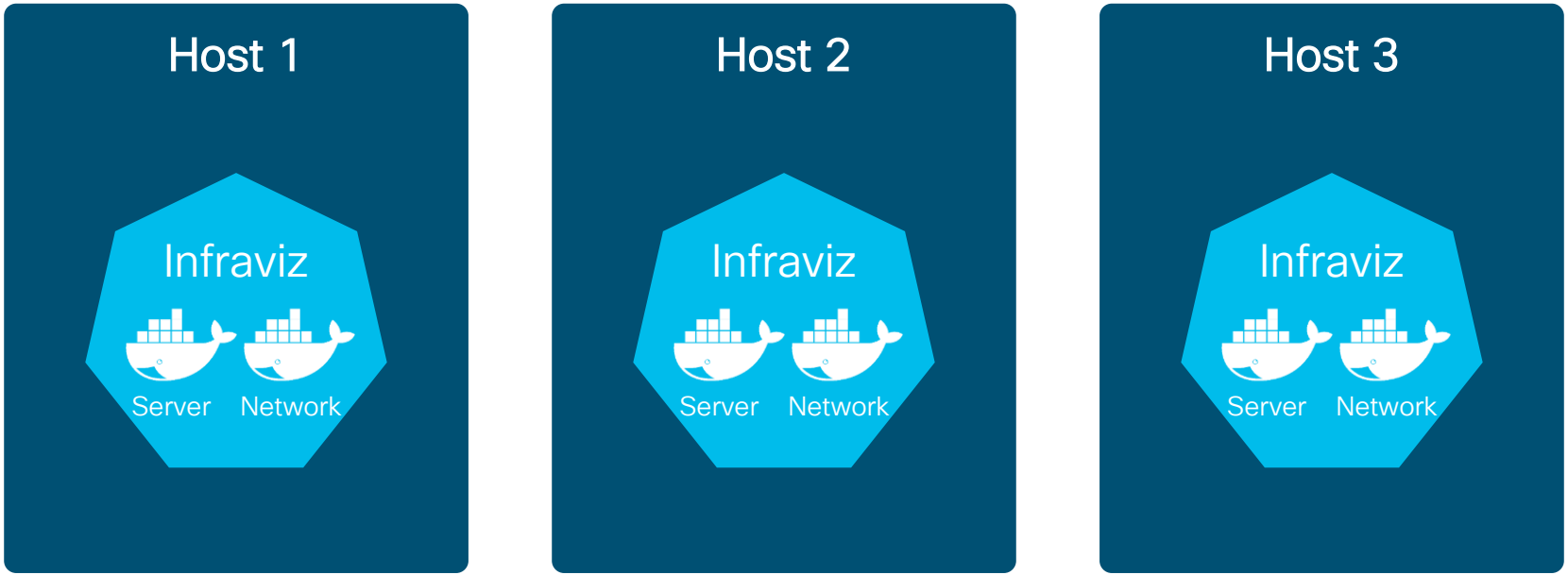
Red Hat

Technology Partner

OpenShift Certified Operator

Instrumentation. Server Viz

1 Visibility into K8s' performance & health

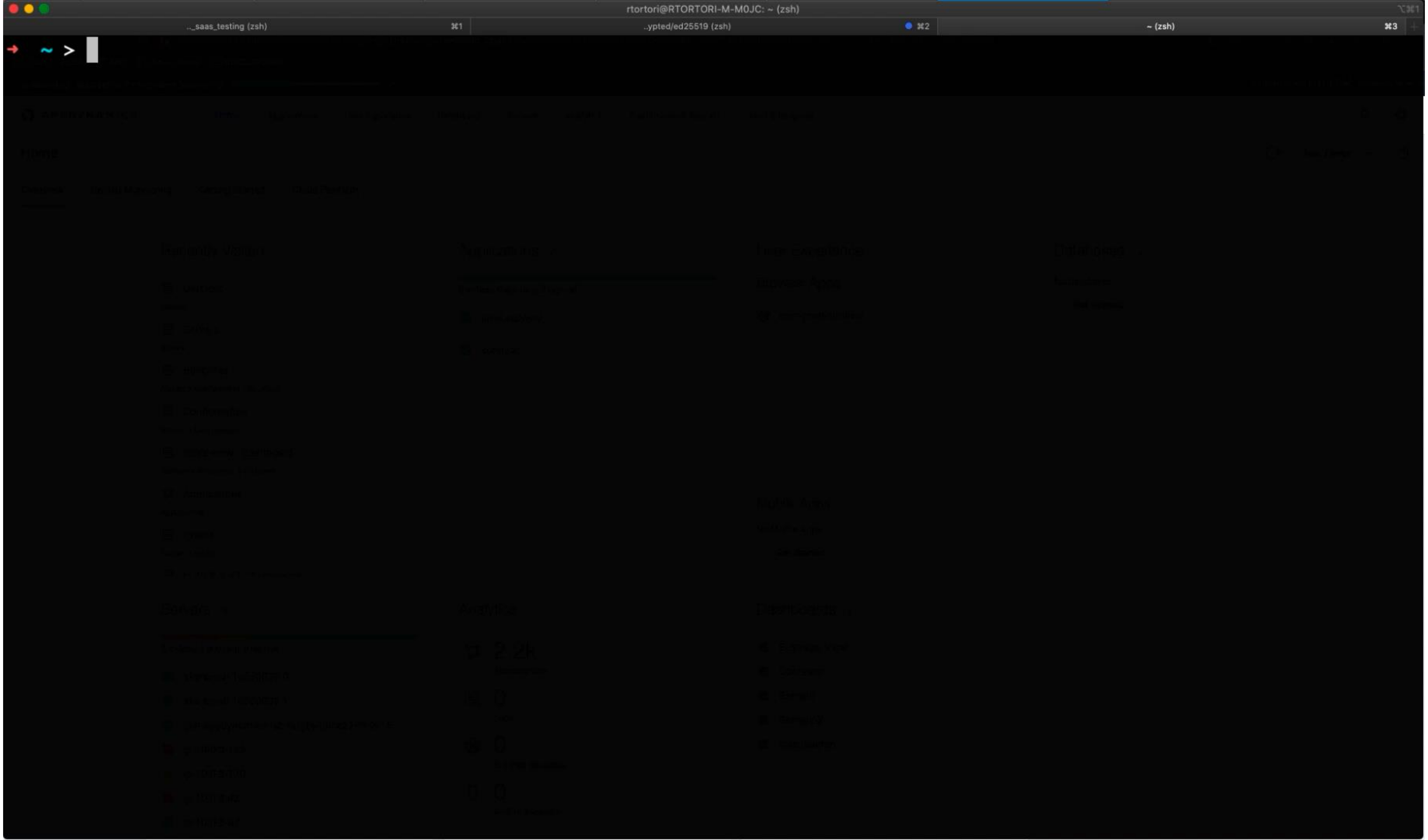


Deployment Options

Demo:

Instrument the infrastructure

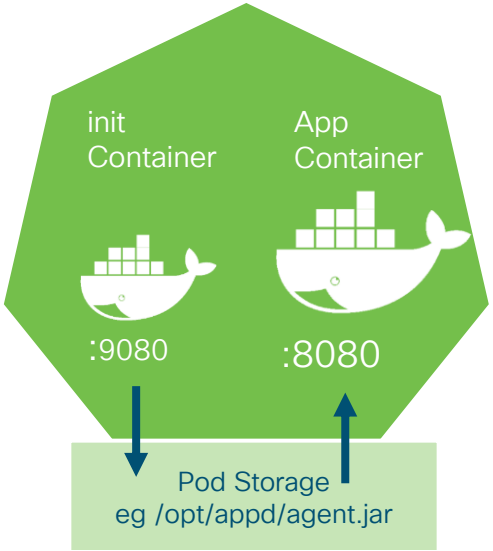
For your reference!
https://docs.appdynamics.com/display/PRO45/Monitoring+Kubernetes+with+the+Cluster+Agent


rtortori@RTORTORI-M-M0JC: ~ (zsh)
..._saas_testing (zsh) ⌘1
..ypted/ed25519 (zsh) ⌘2
~ (zsh) ⌘3
~ >

App Instrumentation. Init Container

Embedded

RunTime



AppDynamics App Agent is in the Init Container.

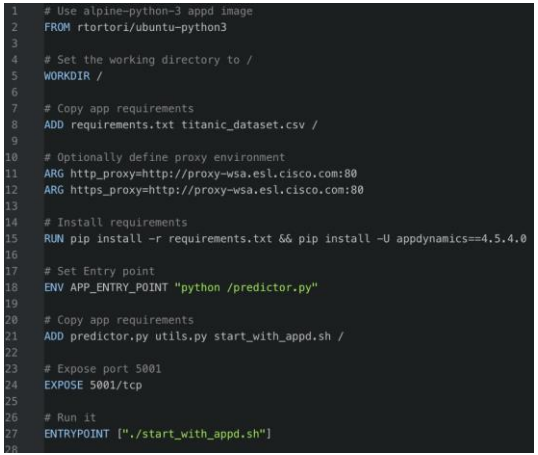
Init Container copies the Agent artifacts to the Pod Storage

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

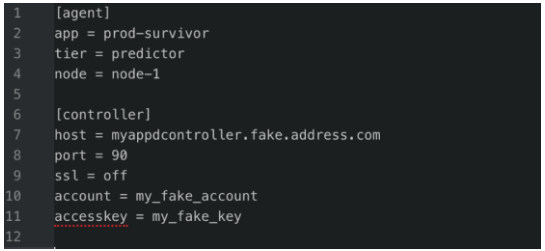
App Agent initialized with
e.g. $JAVA_OPTS: -javaagent /opt/appdynamics/agent.jar

Instrumenting the application

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



```
# Use alpine-python-3 appd image
FROM rtortori/ubuntu-python3

# Set the working directory to /
WORKDIR /

# Copy app requirements
ADD requirements.txt titanic_dataset.csv /

# Optionally define proxy environment
ARG http_proxy=http://proxy-wsa.esl.cisco.com:80
ARG https_proxy=http://proxy-wsa.esl.cisco.com:80

# Install requirements
RUN pip install -r requirements.txt && pip install -U appdynamics==4.5.4.0

# Set Entry point
ENV APP_ENTRY_POINT "python /predictor.py"

# Copy app requirements
ADD predictor.py utils.py start_with_appd.sh /

# Expose port 5001
EXPOSE 5001/tcp

# Run it
ENTRYPOINT ["./start_with_appd.sh"]
```



```
[agent]
app = prod-survivor
tier = predictor
node = node-1

[controller]
host = myappdcontroller.fake.address.com
port = 90
ssl = off
account = my_fake_account
accesskey = my_fake_key
```

```
#!/bin/sh

AGENT_CONFIG="/opt/appdynamics/agent.cfg"
if [ "x${APPDYNAMICS_AGENT_CONFIG}" != "x" ]; then
    AGENT_CONFIG=${APPDYNAMICS_AGENT_CONFIG}
fi

ENTRY_POINT=" python /predictor.py"

if [ "x${APP_ENTRY_POINT}" != "x" ]; then
    ENTRY_POINT=${APP_ENTRY_POINT}
fi

AGENT_PROXY=""

if [ "x${APPD_PROXY_CONTROL_PATH}" != "x" ]; then
  mkdir -p ${APPD_PROXY_CONTROL_PATH}
  chmod 755 ${APPD_PROXY_CONTROL_PATH}
    AGENT_PROXY="--use-manual-proxy"
fi

pyagent run $AGENT_PROXY -c $AGENT_CONFIG  $ENTRY_POINT
```

For your reference!

https://docs.appdynamics.com/display/PRO45/Install+App+Server+Agents

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:

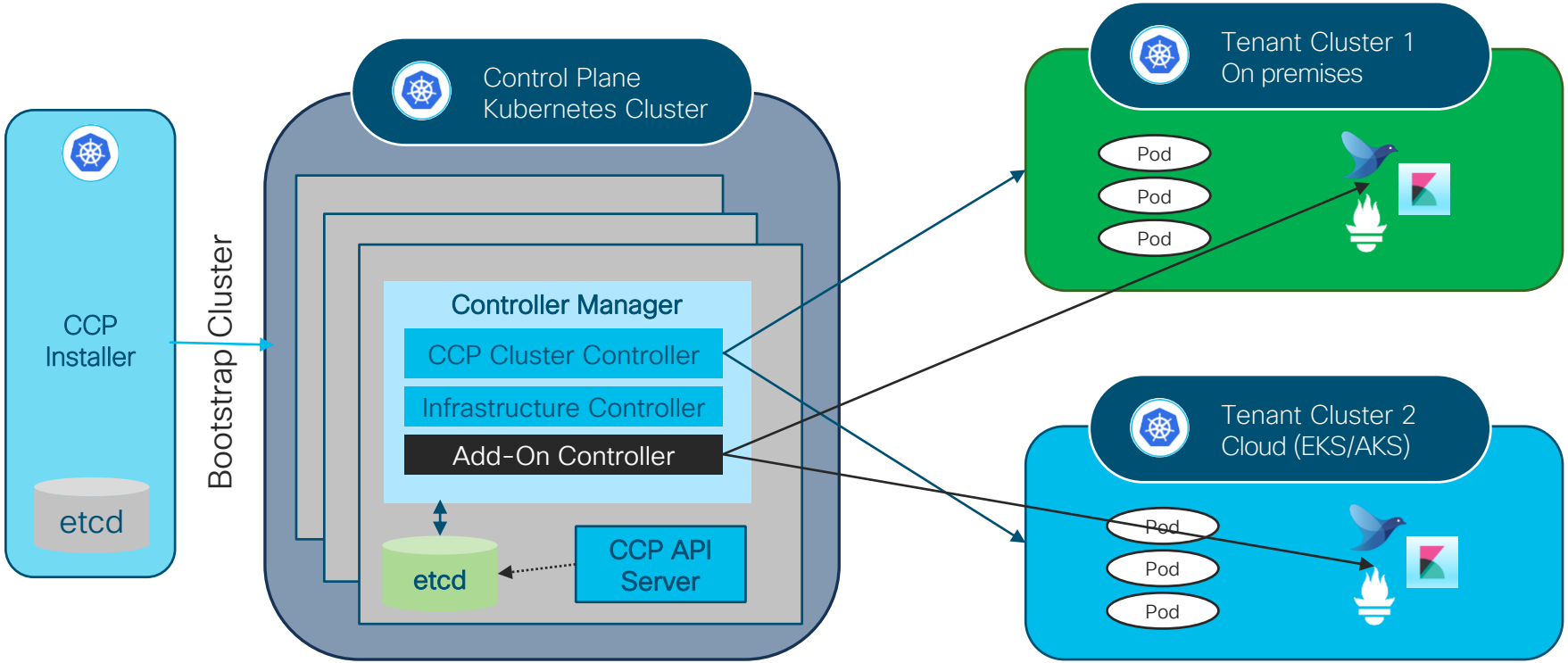
Detect and react to issues

Remediation goals

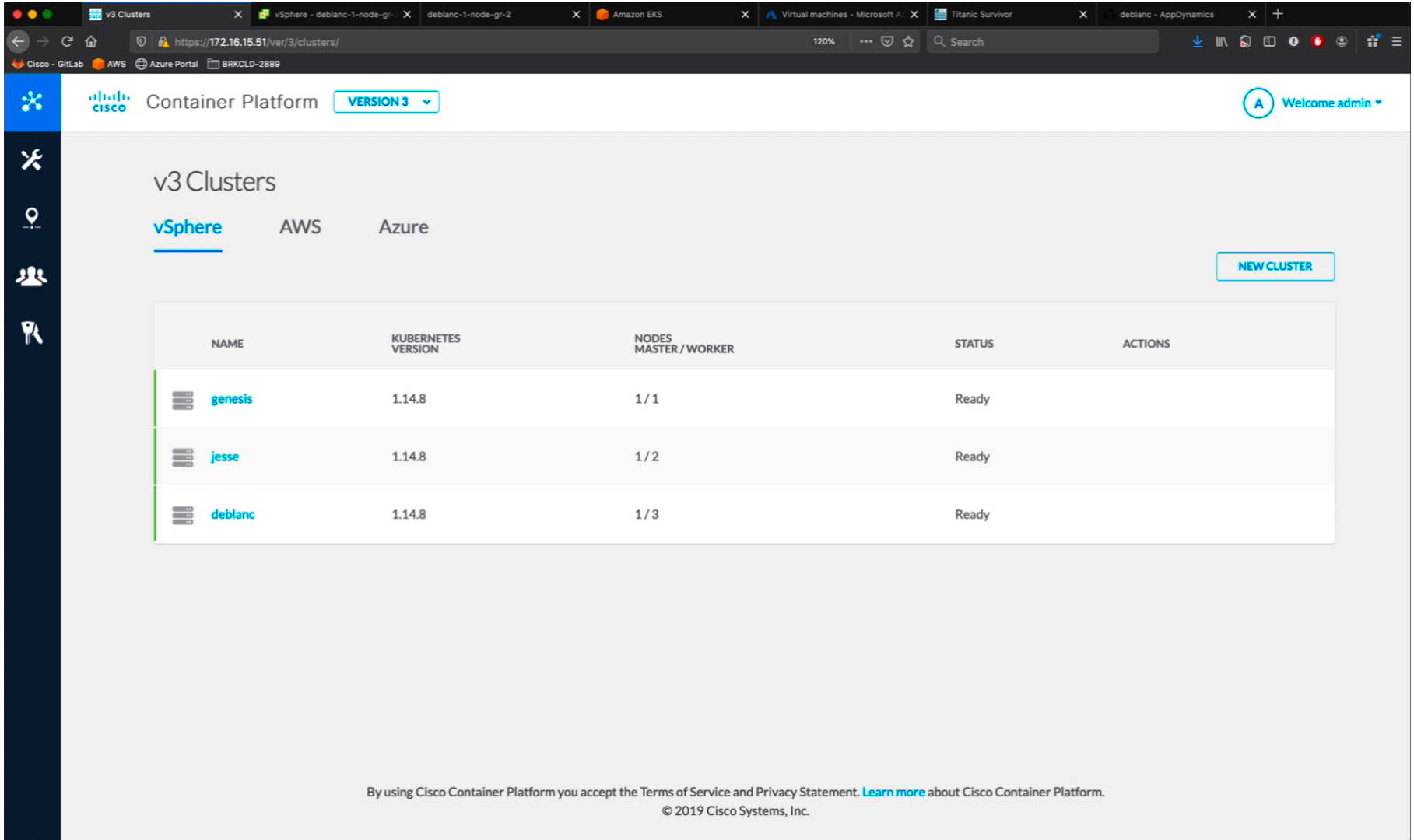
1. My infrastructure recovers automatically
2. My business service has a low MTTR

Declarative Life Cycle Manager Self Healing Clusters

1 My infrastructure recovers automatically



Demo: Automatically recover after node faults


v3 Clusters
vSphere - deblanc-1-node-gr
deblanc-1-node-gr-2
Amazon EKS
Virtual machines - Microsoft A
Titanic Survivor
deblanc - AppDynamics
https://172.16.15.51/ver/3/clusters/
120%
Search
Cisco - GitLab
AWS
Azure Portal
BRKCLD-2889
Container Platform
VERSION 3
Welcome admin
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
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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

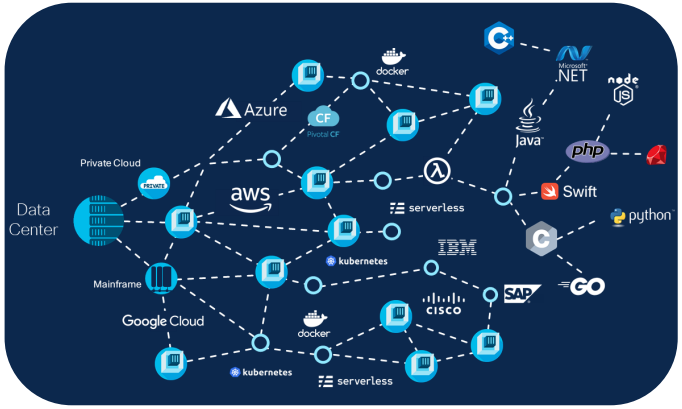
Web

Cloud & Microservices

Better, Faster

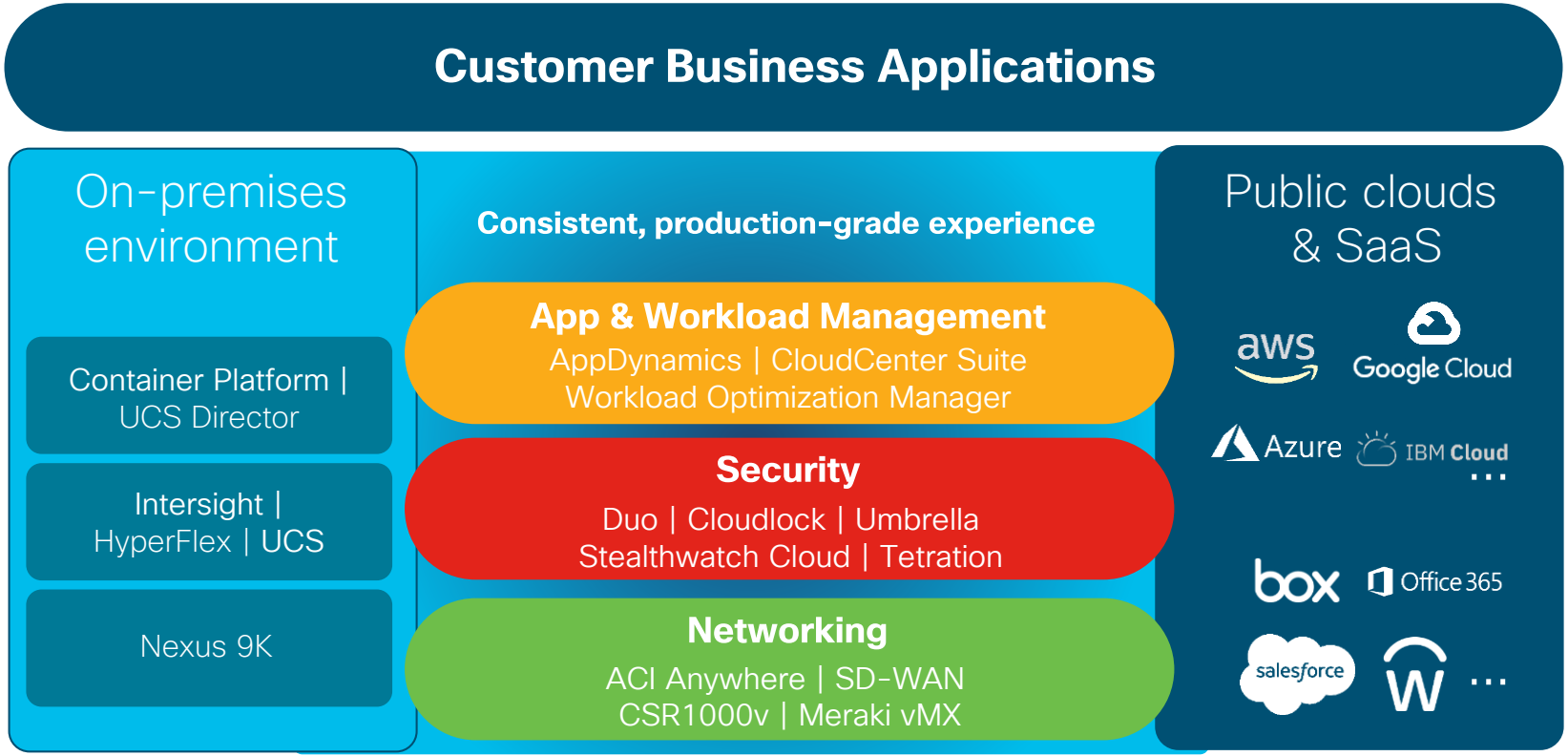
Major paradigm shifts to accommodate user demand

This is what users expect from you



Decentralized, multi-cloud multi-vendor hybrid

Covering the E2E for any business application



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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.

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!

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.

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**

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**

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