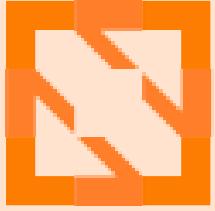




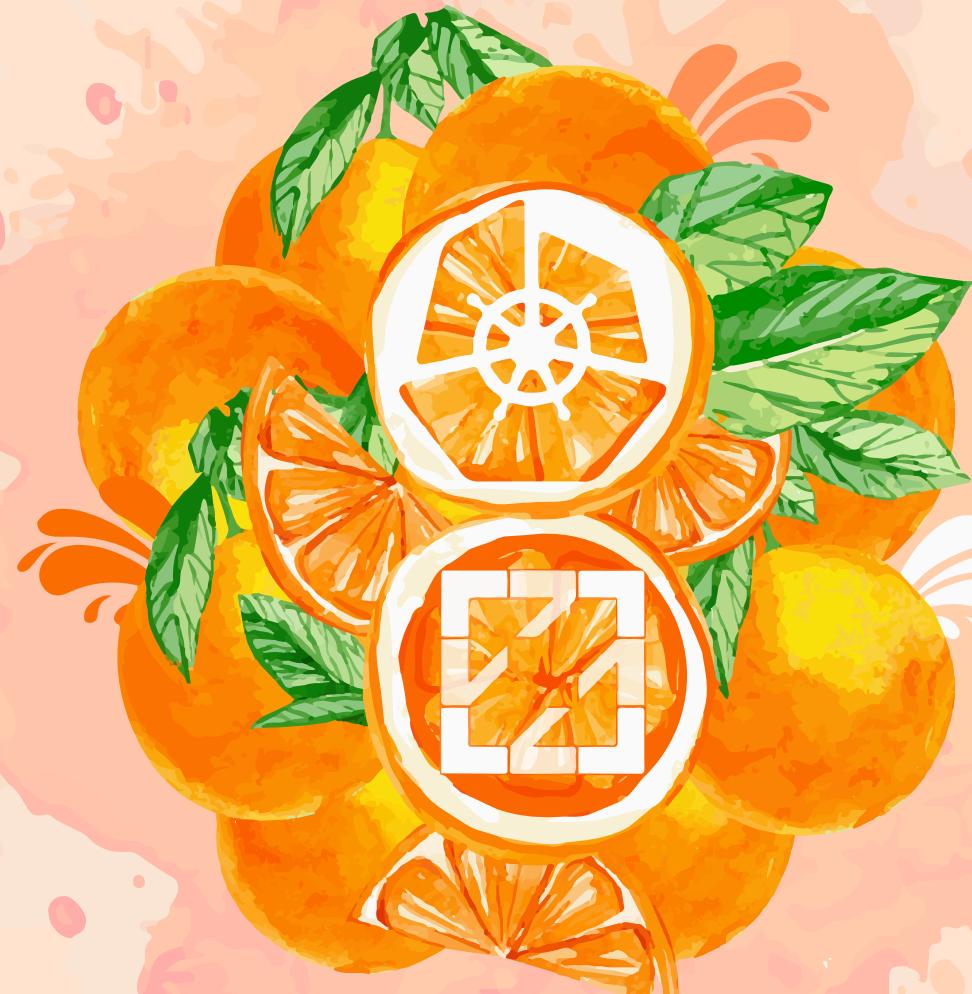
KubeCon



CloudNativeCon

Europe 2022

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KubeCon



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Kubernetes VMware User Group

Optimize Kubernetes on vSphere with Event-Driven Automation

Michael Gasch

Staff Engineer, Office of the CTO,
VMware (@embano1)

Steven Wong

Staff Open Source Software Engineer,
VMware

Friday May 20, 2022 14:55-15:30
Room 4F <https://sched.co/yttR>



Agenda

Kubernetes on vSphere – What's different from running on a public cloud?

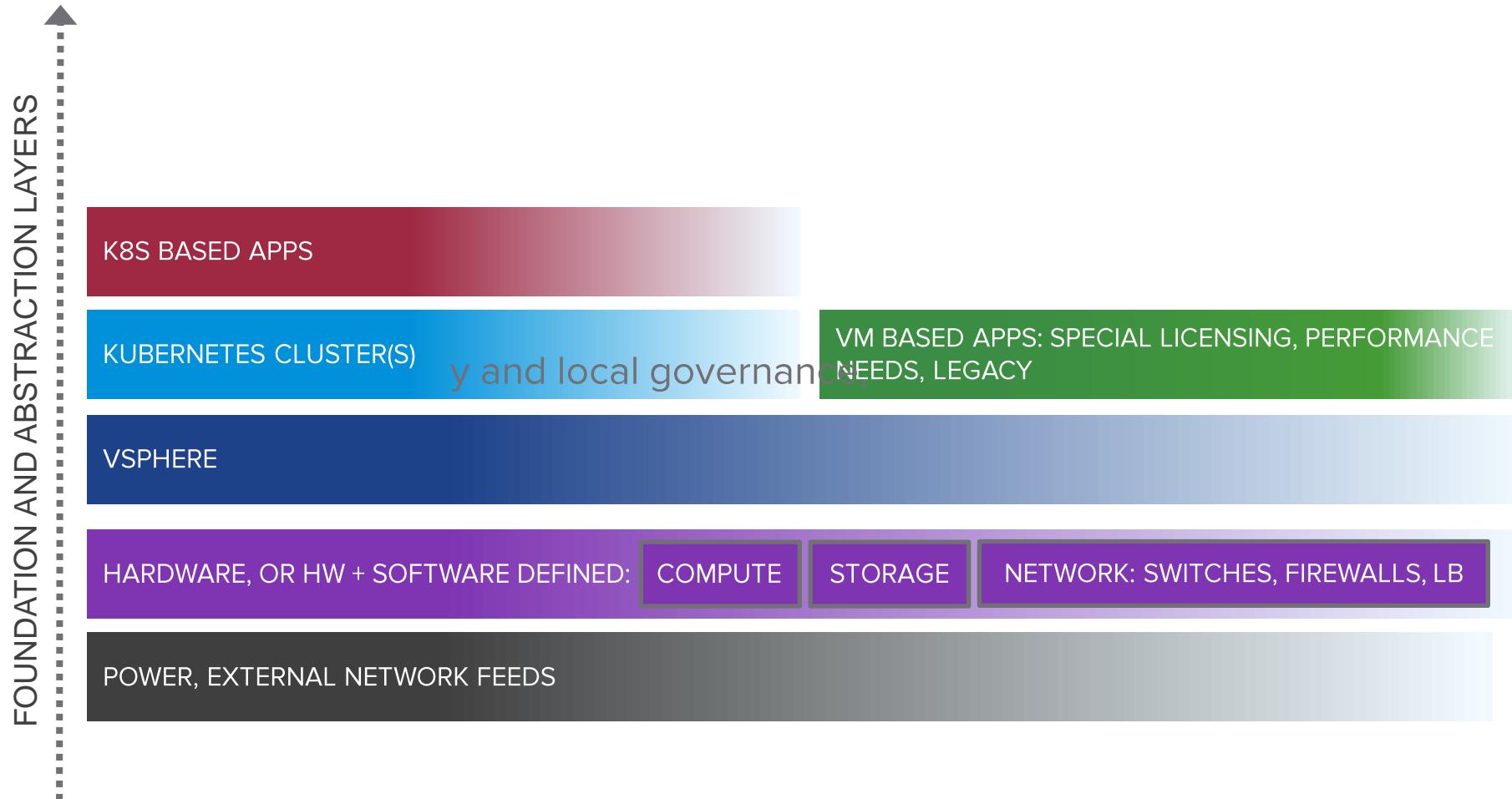
What is event driven automation? AND
How can it help us with operating Kubernetes clusters on vSphere

Demos

Resources: Learn more, get involved with the user community

Abstraction layers simplify

consistent platform = portability



Kubernetes and vSphere

Differences in Features & Design Goals in serving apps running above

Ensure K8s is neutral across clouds

Enable really good *self healing* of containers that go down

“Opinion-ated” expectation of cloud provider’s region and zones.



Neutral across compute/storage/network physical infrastructure

Enable *high availability* of VMs

Flexible model allowing user choice of redundancy – compute, storage and network can be independent

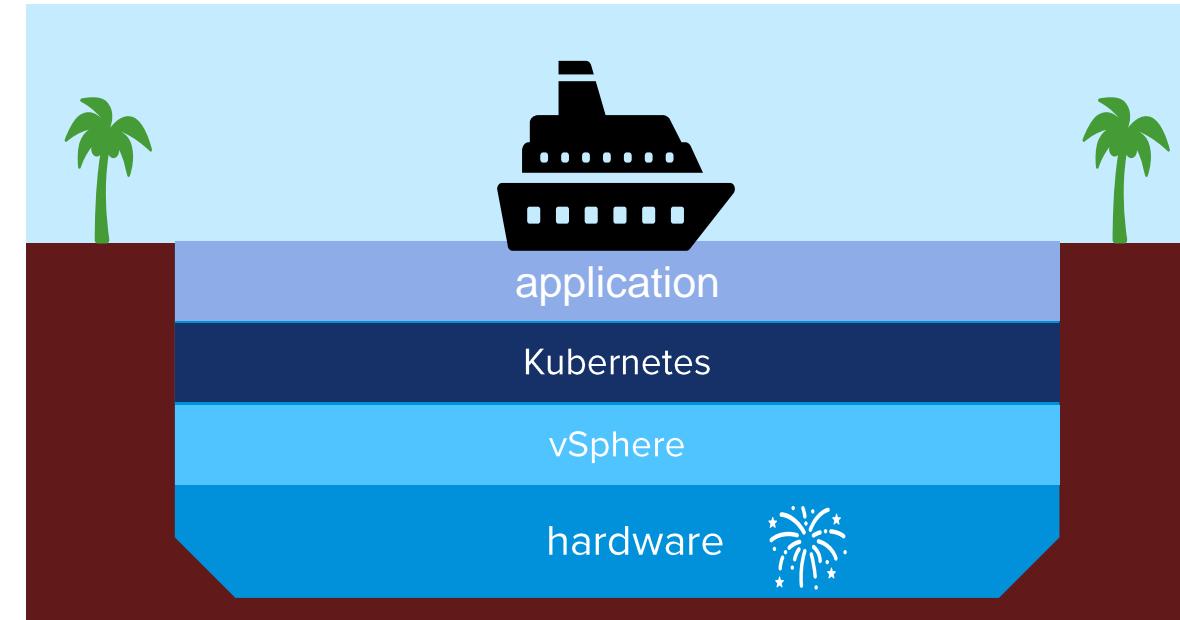


Kubernetes hosted on vSphere

Workload service model is different BUT ALSO

NOTE

failure zone model on vSphere is less
opinionated



Kubernetes is architected to be neutral to all public and private cloud platforms

A fault domain is a group of objects (VMs, datastores, other) that share a common dependency (power source, network switch, other). This could correspond to datacenter racks, aisles or something else. vSphere is intentionally flexible, and it is up to the user to establish groupings that map to available vSphere abstractions.

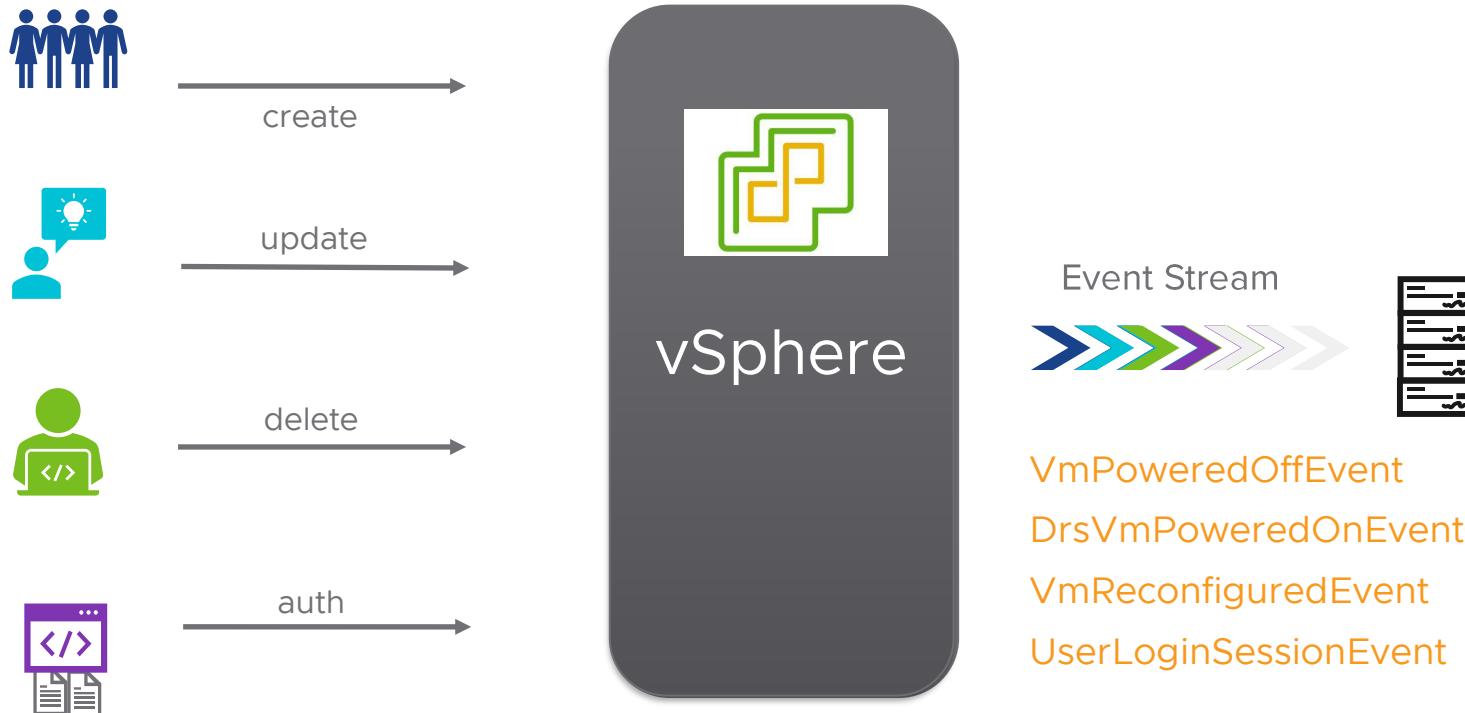
Kubernetes has built in abstractions for zones, that map with common public cloud availability zones fairly well – but the less opinionated flexibility of vSphere, along with issues of interop with Legacy workload can present challenges – and opportunities ...

Introduction + Demo

VMware Event Broker Appliance



Control Planes like vSphere generate useful Events!



💡 vCenter 7.0 has over 1800+ events.

Event Driven Architecture

Introduction

Event-driven architecture (EDA) is a software architecture paradigm promoting the production, detection, consumption of, and reaction to events. [Wikipedia](#)

An event is an immutable fact (information), e.g. “VmPoweredOnEvent”.

What can you accomplish with this?

Notification

Enable additional notification channels such as Slack, PagerDuty, SMS, etc.

Automation

Automate repetitive tasks and improve efficiency with event-driven functions powered by Knative

Integration

Consume vCenter Events using the public cloud services of your choice

Remediation

Streamline operations by leveraging events to monitor and automate remediation efforts

Audit

Cut through the noise! Store some or all the events that you care about for future use

Analytics

Take it a step further and learn from the past to help predict future trends or issues

VEBA to the Rescue

EVENT BROKER APPLIANCE

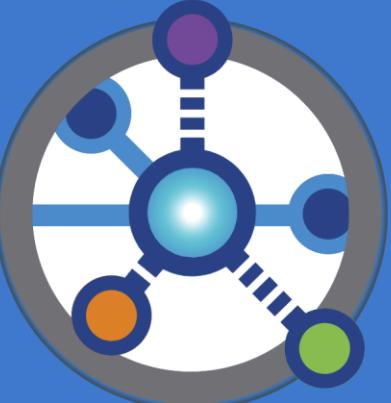
Home Evolution Documentation Functions Community FAQs Resources

Unlocking the Hidden Potential of Events in the VMware SDDC

Use event-driven automation and take your system events to the next level! Easily trigger custom or pre-built actions to deliver powerful integrations within your datacenter but also across public cloud services. Integrations like Slack, Pager Duty, Service Now, etc. has never been easier before

#VEBA brings a Day  Night of difference to your SDDC

[DOWNLOAD & INSTALL](#) [DEPLOY FUNCTIONS](#)



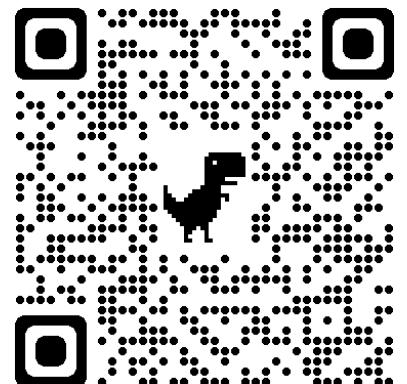
Extend your Systems
Event-driven interactions with vSphere and Horizon using Functions as a Service (FaaS).

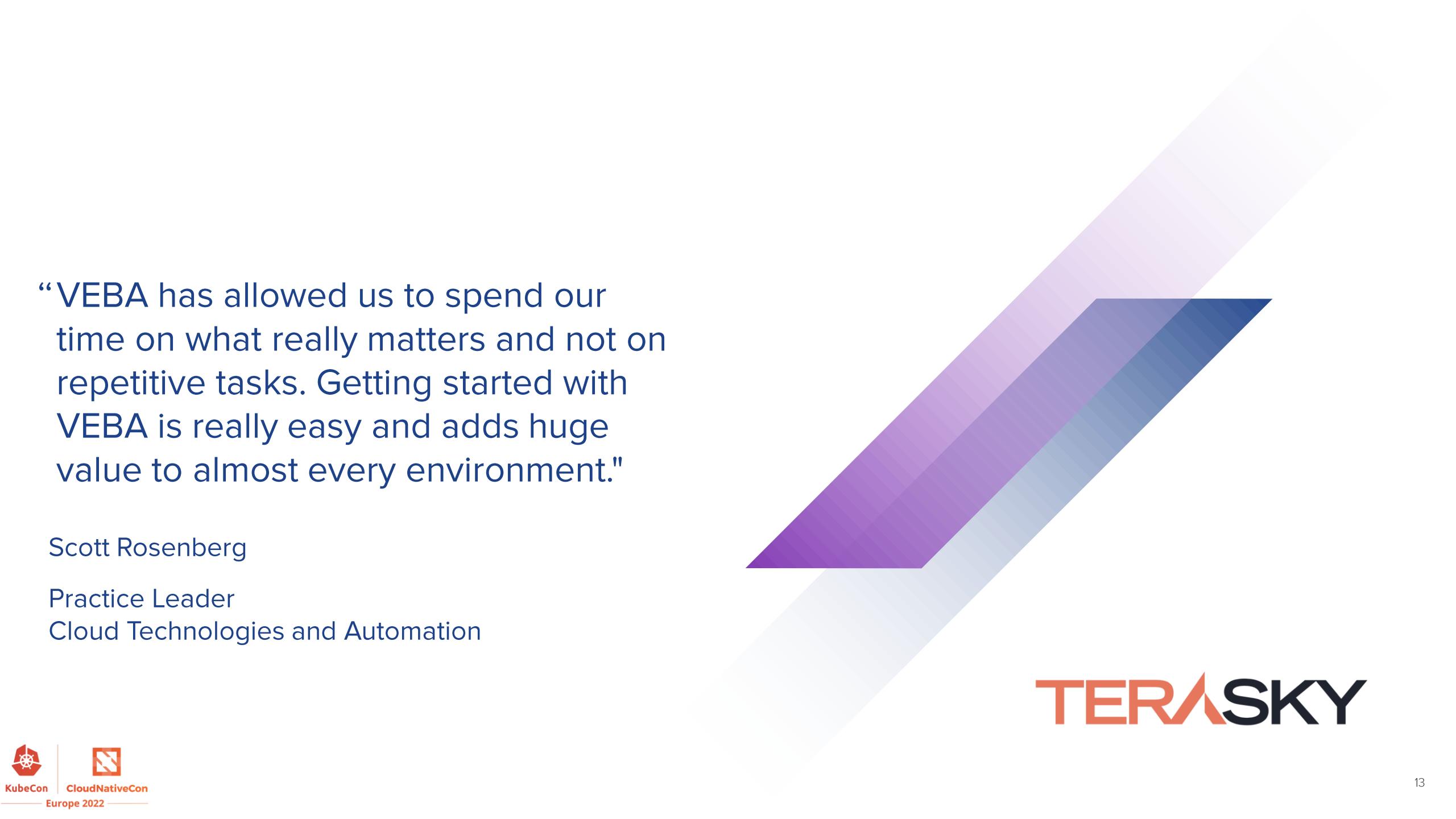
Event-Driven Remediation
Automatically revert or fix system issues based on state changes.

Bring Your Own Language
Build functions using the language of your choice.

Webhook Support
Use the webhook HTTPS endpoint to send CloudEvents from any external source to VEBA.

 <https://vmweventbroker.io>





“VEBA has allowed us to spend our time on what really matters and not on repetitive tasks. Getting started with VEBA is really easy and adds huge value to almost every environment.”

Scott Rosenberg

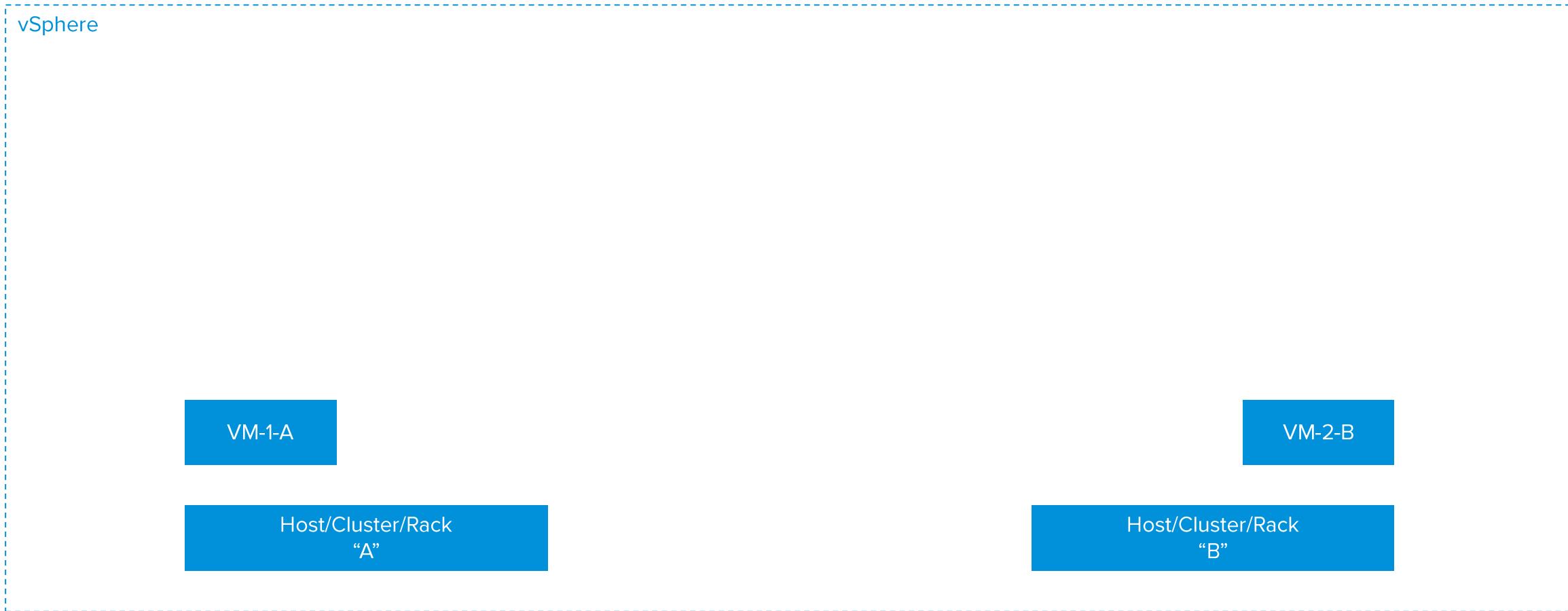
Practice Leader
Cloud Technologies and Automation

TERASKY

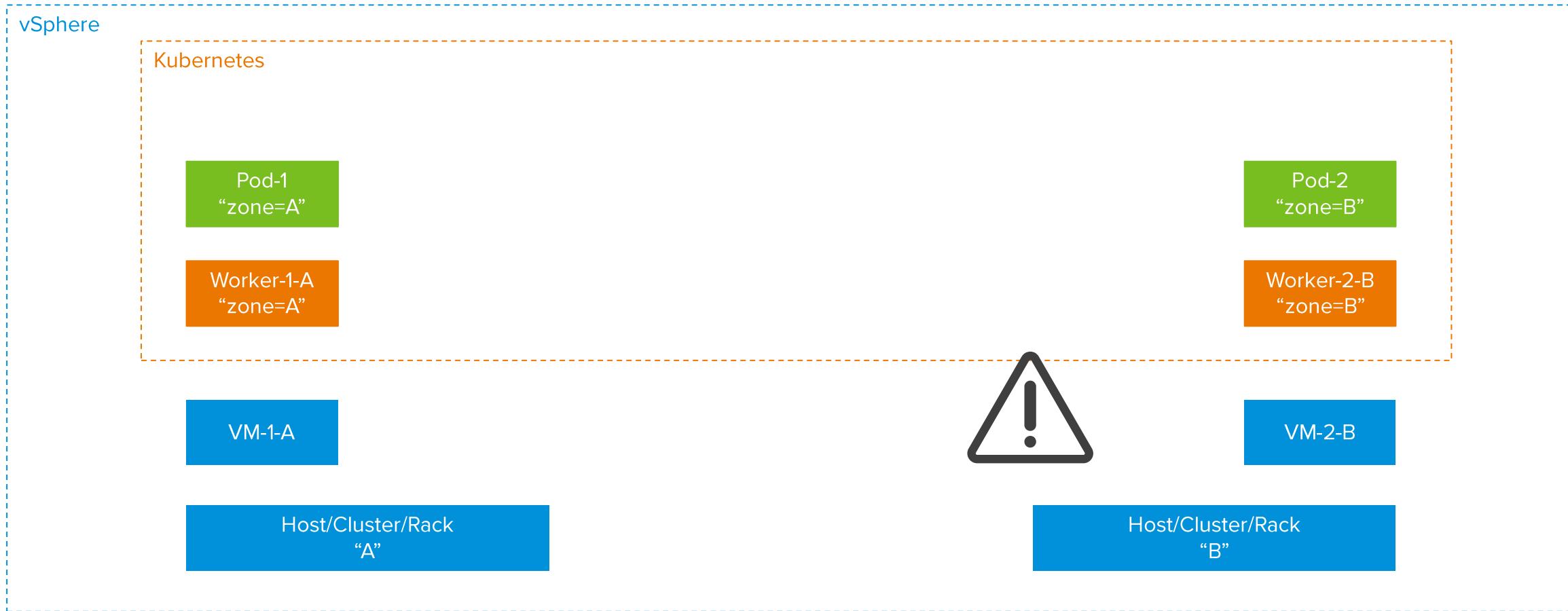
Scenario 1

vSphere & Kubernetes Tag/Label Drift

vSphere & Kubernetes Tag/Label Drift



vSphere & Kubernetes Tag/Label Drift



DEMO

Scenario 2

Slack Notification on a critical vSphere Alarm

vSphere Alarms are AWESOME

The screenshot illustrates the configuration of a vSphere alarm rule and its application to a specific datastore.

Edit Alarm Definition (Left Panel):

- 1 Name and Targets
- 2 Alarm Rule 1** (Selected)
- 3 Reset Rule 1
- 4 Review

Alarm Rule 1 (Main Panel):

IF: Datastore Disk Usage is above 80%
ADD ADDITIONAL TRIGGER

THEN:

- Trigger the alarm and * Show as Warning
- Send email notifications (Switch Off)
- Send SNMP traps (Switch Off)
- Run script (Switch Off)

Buttons at the bottom: ADD ANOTHER RULE, DUPLICATE RULE, REMOVE RULE

sharedVmfs-0 (Datastore Summary):

- ACTIONS: custom-usage-alert-1, Acknowledge, Reset To Green
- Summary (Selected)
- Monitor, Configure, Permissions, Files, Hosts, VMs

But they also have Limitations

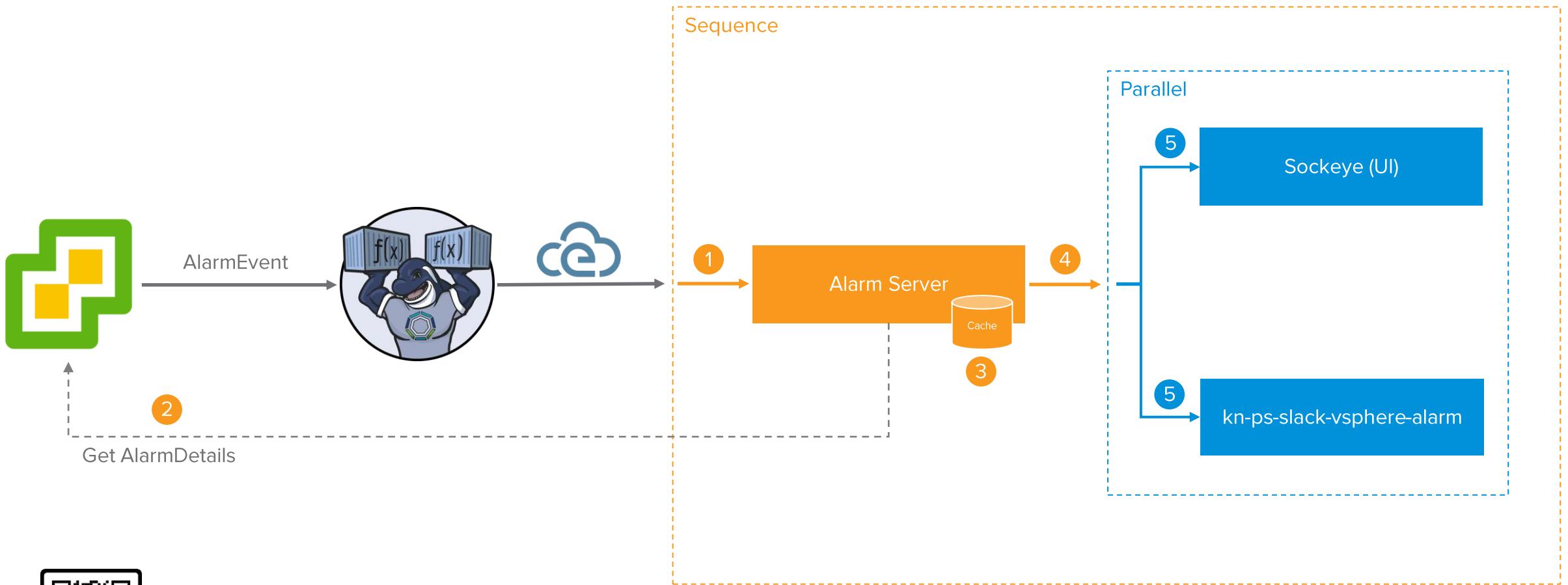
The screenshot shows the 'Edit Alarm Definition' interface with the following details:

- Left sidebar:** A vertical list of steps: 1 Name and Targets, 2 Alarm Rule 1 (highlighted in light blue), 3 Reset Rule 1, 4 Review.
- Main area:** A window titled 'Alarm Rule 1'.
 - IF section:** 'Datastore Disk Usage' is selected, set to 'is above' 80%.
 - THEN section:** 'Trigger the alarm and *' is set to 'Show as Warning'.
 - Action buttons:** 'Send email notifications', 'Send SNMP traps', and 'Run script' are listed with toggle switches. The 'Send email notifications' switch is highlighted with an orange rectangle.- Bottom buttons:** ADD ANOTHER RULE, DUPLICATE RULE, REMOVE RULE, CANCEL, BACK, NEXT.

- Limited Extensibility (integrations)
- Security Concerns (VC Access, VCSA Scripts)
- Resource Concerns (Polling & Coupling)
- AlarmEvent Schema (missing Alarm Details)

Enriching Alarm Events

With Knative Flows (Sequence/Parallel)



github.com/embano1/vsphere-alarm-server

DEMO

Resources

Where to get more details on what was presented

Demo used in this session [embano1/kubeconeu22: vSphere Event-Driven Tutorial with Knative and VEBA \(github.com\)](#)

VEBA appliance

- Source code (BSD-2 license) <https://github.com/vmware-samples/vcenter-event-broker-appliance>
- General [embano1/kubeconeu22: vSphere Event-Driven Tutorial with Knative and VEBA \(github.com\)](#)
- Download free pre-built AM appliance [VMware Event Broker Appliance | VMware Flings](#)
- Community info: meetings, Slack, etc [VMware Event Broker Appliance Join our Community \(vmweventbroker.io\)](#)

Knative CNCF project <https://knative.dev/docs/>

CloudEvents CNCF spec and project <https://cloudevents.io/>

Where to experience more
material like this and interact
with other users

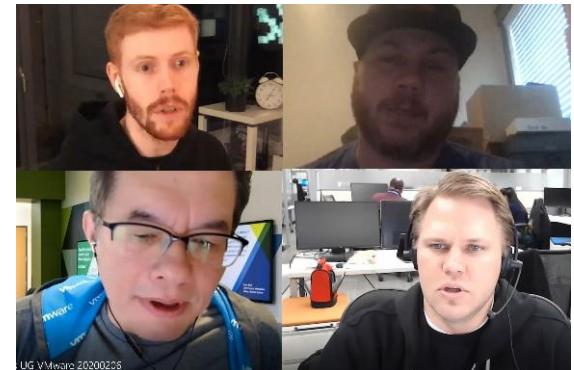
The Kubernetes VMware User Group

Kubernetes VMware User Group

What is it?

Similar to SIGs and Working Groups - intended to serve the needs of users running Kubernetes on particular platforms.

The VMware User group is the first (and currently only) K8s UG for a platform - covers running K8s on all VMware hypervisors.



Why is this important?

Create community culture among our users

- Users can help each other
- Users can help us make Kubernetes better – and strengthen user experience on our platforms:
 - Feature requests
 - Feedback + issue resolution

Who is involved?

Co-chairs

- Steven Wong, Vmware Staff Engineer
- Myles Gray, VMware Storage Tech Marketing, UK

User Co-leads

- Bryson Shepherd, Walmart
- Joe Searcy, T-Mobile

Kubernetes VMware User Group

Note that we are considering a proposal to transition Kubernetes users groups to a new form under the CNCF

User Group Meeting:

First Thursday each month 11am PT
calendar [link](#)



Link to join the group

- groups.google.com/forum/#!forum/kubernetes-ug-vmware

Link to join Slack channel (280+ Slack channel participants as of Oct 2022)

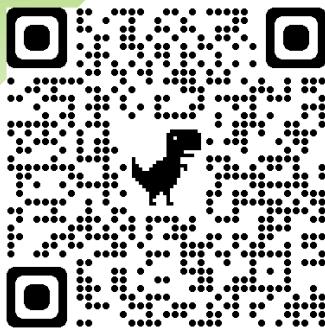


- <https://kubernetes.slack.com/messages/ug-vmware>

Q&A:

<https://kubernetes.slack.com/messages/ug-vmware>

Deck here: <https://via.vmw.com/EiC0>



Michael Gasch

Staff Engineer, Office of the CTO,
VMware
(@embano1)

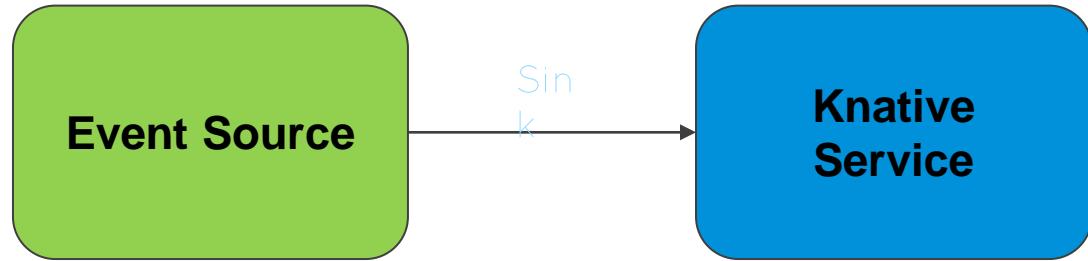
Steven Wong

Staff Open Source Software Engineer,
Vmware
@cantbewong

Thank You

Knative eventing

Sinks



CloudEvents

cloudevents.io

"A specification for describing event data in a common way"

```
Content-Type:  
application/json  
ce-specversion: 1.x-wip  
ce-type: myevent  
ce-id: 1234-1234-1234  
ce-source: example.com
```

```
{  
  "specversion": "1.x-wip",  
  "type": "coolevent",  
  "id": "xxxx-xxxx-xxxx",  
  "source": "bigco.com",  
  "data": { ... }  
}
```

- Consistency
- Accessibility
- Portability



Using Event Driven

Patterns and anti-patterns

Event persistence: Events are persisted as a replayable stream history. Event consumers are not tied to the producer.

View an event is a record of something that has happened and so can't be changed.
(You can't change history.)

Messages on common delivery platforms can often deliver these characteristics - but can also be used in ways that are not events (messages targeted at specific recipients, request reply patterns, transient data deleted on read). Re-inventing RPC calls over a message bus sometimes doesn't end well on projects

Rules are and should be different across latency, failure domain and context boundaries

favor asynchronous and eventual consistency across the boundaries

Synchronous might be OK within a boundary