



KubeCon



CloudNativeCon

Europe 2023

# Knative's Road Ahead: A Project Update

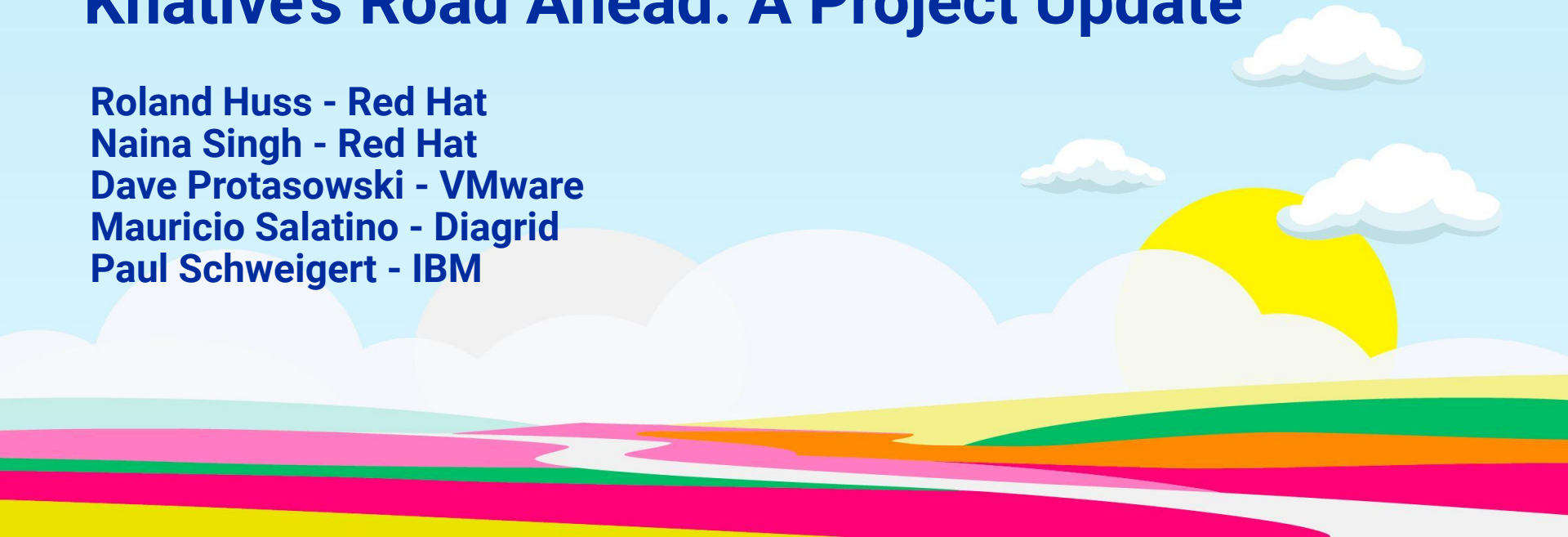
**Roland Huss - Red Hat**

**Naina Singh - Red Hat**

**Dave Protasowski - VMware**

**Mauricio Salatino - Diagrid**

**Paul Schweigert - IBM**



(To be deleted): Links to 30 sec video and  
kiosk slide deck

[https://docs.google.com/presentation/d/1qDfKG0izjmMH7aiH8zcveEzZcplV579spfTizk\\_444U/edit#slide=id.g229bd527e5e\\_1\\_310](https://docs.google.com/presentation/d/1qDfKG0izjmMH7aiH8zcveEzZcplV579spfTizk_444U/edit#slide=id.g229bd527e5e_1_310)

[https://docs.google.com/presentation/d/14roZH1IKTfBk8GsbgTzTEH3fd95uMHgR/edit#slide=id.g21f9ac1f608\\_1\\_38](https://docs.google.com/presentation/d/14roZH1IKTfBk8GsbgTzTEH3fd95uMHgR/edit#slide=id.g21f9ac1f608_1_38)

# Use Knative to make Kubernetes easy!

- Easy containers with Knative Functions
  - Code to cloud in 2 steps
- Kubernetes the easy way with Knative Serving
  - Powerful defaults: scale from zero and traffic splitting
- Declarative Event Driven Apps with Knative Eventing
  - Connect apps with each other and event sources



# Independent Components that Work Well Together

## Serving

- Automagic HTTP Services
- Container → URL

## Eventing

- CloudEvents over HTTP
- Declarative Event-Driven Architecture

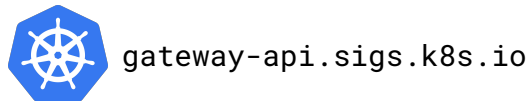
## Functions

- Code → URL
- Easy HTTP & CloudEvents processing



# Plug and Play using *your* Stack

## Serving



## Eventing



## Functions



Buildpacks.io



Java



python



GO



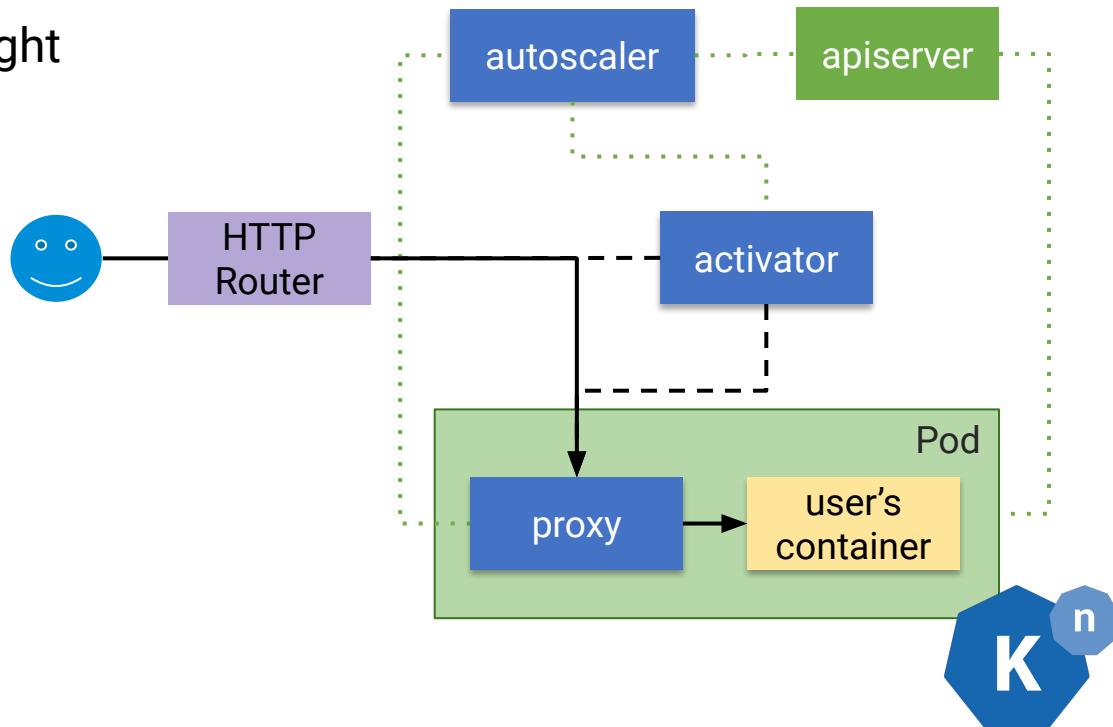
# Knative - Quick Facts

- Website: <https://knative.dev>
- Core + Interfaces → [github.com/knative](https://github.com/knative)
- Extensions & Experiments → [github.com/knative-sandbox](https://github.com/knative-sandbox)
- Release
  - Latest Release - **1.9 out now**, 🎉 **1.10** out next week 🎉
  - Change in Cadence - **6 weeks** → **3 months**
- Slack: [#knative](https://knative.slack.com) channel on <https://slack.cncf.io/>

# Serving - Automagic HTTP Services

## *If you have a container that speaks HTTP*

- Scale based on requests in flight
- Roll out by traffic percentage
- Automatic revision tracking
- Automatic health checks
- Automatic TLS provisioning



# Simplifies Kubernetes

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  selector:
    matchLabels:
      app: nginx
  replicas: 2
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.14.2
          ports:
            - containerPort: 80
```

```
apiVersion: v1
kind: Service
metadata:
  name: nginx
spec:
  ports:
    - port: 80
      protocol: TCP
      targetPort: 80
  selector:
    app: nginx
```



```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: nginx
spec:
  rules:
    - http:
        paths:
          - path: /
            backend:
              serviceName: nginx
              servicePort: 80
```

```
apiVersion: serving.knative.dev/v1
kind: Service
metadata:
  name: nginx-deployment
spec:
  template:
    spec:
      containers:
        - image: nginx:1.14.2
          ports:
            - containerPort: 80
```



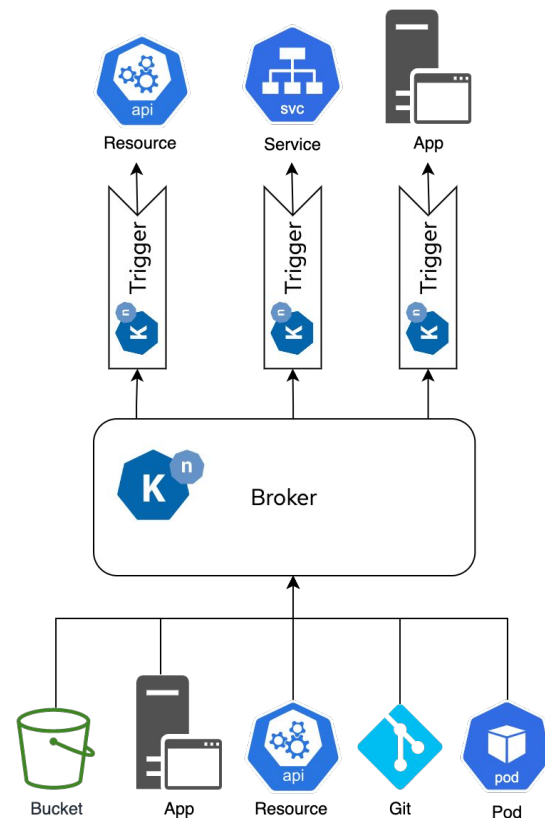


- Lots of stability improvements
  - Bringing back performance testing
- Expanding Timeouts ⌚
  - Activation Timeouts
  - Revision Request Timeouts - `IdleTimeout`, `ResponseStartTimeout`
- AutoTLS with long domain names
- Security
  - Security Guard
  - Default domain is now cluster local - `*.svc.cluster.local`

- Roadmap: <https://github.com/orgs/knative/projects/35>
- Internal encryption
- Migrate to OpenTelemetry
- Gateway API
- Scale Testing/Performance Improvements

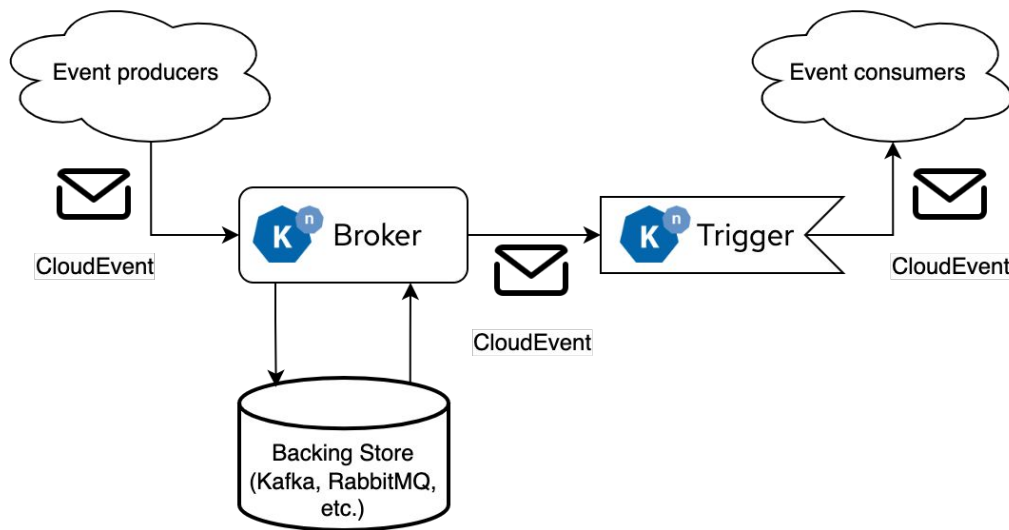
# Eventing - Event Driven Application

- Simplified publish-subscribe messaging pattern based on K8s APIs
- Decouples producers and consumers
- Ingressing: receive events from event sources
- Event routing: filtering, subscriptions, reliable event delivery
- Event discovery and documentation: self-service event catalog



# Eventing - Event-Driven Applications

- Event routing by attributes
- Various persistence technologies
- Retries
- Dead letter handling
- Handling pace difference (backpressure regulation)
- Scalable



# Eventing - Recent Highlights & Roadmap

- Multi-namespace ApiServerSources
- Kafka Broker with multiple isolated data planes
- Enable autoscaling Kafka Source and Broker by KEDA
- Roadmap: <https://github.com/orgs/knative/projects/38/views/1>
  - Knative TLS Support for events
  - Multi Tenancy Support
  - Integration with Istio (<https://github.com/knative-sandbox/eventing-istio>)
  - OIDC client auth support ([Feature Track](#))
  - Event Discovery

- Client for using Knative Serving and Eventing
- CRUD operations on all objects
- Plugin Support
  - Inlining possible
  - <https://artifacthub.io>
- Roadmap:
  - <https://github.com/orgs/knative/projects/37>
  - Plugin Context Sharing ([Feature Track](#))
  - Eventing UX improvements
    - Event Discovery
    - Automatic Trigger generation
  - Secret management
  - Improved Export

```
kn service create myservice \  
  --image mycomp/myapp \  
  --scale-target 50  
  --env foo=bar  
  --...
```

```
kn broker create default
```

```
kn revision list
```

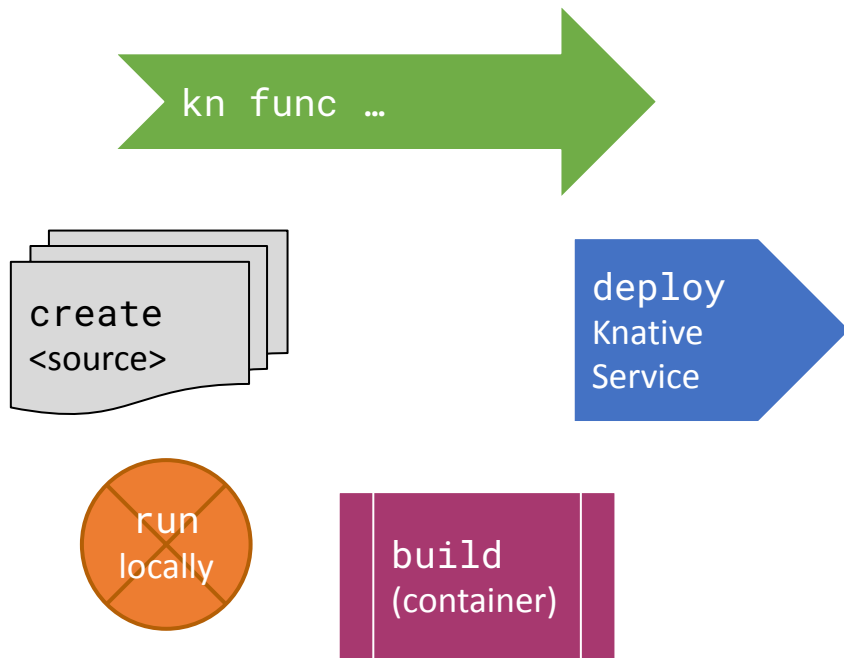
```
kn quickstart minikube
```

```
....
```

# Functions - Simplifying Code → Container

*In the language of your choice:*

- Quick get-started template
- Avoid wrangling HTTP libraries
- Handle POST requests
- Handle CloudEvents
- Build standard container images
- Build without DockerFiles





python™



File: **handle.go**

```
1 package function
2
3 import (
4     "context"
5     "fmt"
6
7     "github.com/cloudevents/sdk-go/v2/event"
8 )
9
10 // Handle an event.
11 func Handle(ctx context.Context, e event.Event) (*event.Event, error) {
12     fmt.Println("Received event")
13     fmt.Println(e) // echo to local output
14     return &e, nil // echo to caller
15 }
```

Plus,  
customizable  
and extensible  
Language Packs



# Functions - Roadmap

- Roadmap: <https://github.com/orgs/knative/projects/49/views/1>
- New scaffolding mechanism
- Pipelines as Code
- WASM Functions
- Dapr Integration

- New scaffolding mechanism
  - Run your functions locally with and without Docker
  - Separate platform concerns from the Function's project
  - Instanced based functions for lifecycle hooks
  - Dapr component's support out-of-the-box





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