KNATIVE

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Abstract

Knative is serverless framework based on Kubernetes based platform, which is used to deploy and manage serverless workloads. This was developed by Google.

Introduction

Knative extends Kubernetes that provides middleware components which are essential to build modern, source centric and container-based applications which can run anywhere – OnPrem, On Cloud or in 3rd party data center.

Knative Details

Major cloud service providers provided Function as a Service (Faas) services like - such Amazon Web Services' Lambda, Google Cloud's Functions, Microsoft's Azure Functions.

The deployment of these serverless solutions involved source code compilation, deployment and event management. Each provider had different ways to implement. The lack of standardization has highlighted the risk to being bound to a specific solution provider.

For cloud service providers, there were difficulties in migrating applications to Cloud in a serverless manner. To address the issues with interoperability, Google along with Pivotal, Redhat and IBM initiated the Knative project.

Knative Architecture:
The below diagram explains the Knative architecture.

Source: Knative GitHub repo

Developers
Developers can use Kubernetes-native APIs to deploy serverless-style functions, applications, and containers to an auto-scaling runtime.

Operators
Knative components can be integrated with products provided by Cloud service providers, or by in-house teams in large enterprises which they operate. Knative is implemented based on Kubernetes

Contributors
The people who actively participate in Knative community

Users

Knative services can be accessed by users through the Istio gateway, or they can trigger serverless services in Knative using Eventing system.

Components of Knative

Build component

Build component obtains source code from code repository, compiles the code into images, publishes the code to image repositories. These operations are carried out in Kubernetes pods.

Eventing Component

The design implementation is carried out in Eventing component using serverless event driven mode. The notable features included are -external event source connections, event registry, event subscription and event filtering.

Using the event model, the event producers and consumers can de decoupled and made independent. Any producer can generate events before the active consumer starts and any consumer can listen to event before active producer starts.

Knative serving is used to autoscale (both up and down), managing external services and to provide external services.

Advantages of Knative

Knative is built on Kubernetes to support serverless orchestration, and the implementation is based on Istio to provide features like service connection, route management and phased release.
Knative is built on the existing cloud native basis and has a huge community base.

Azure Functions vs Knative

Azure Functions is an FaaS service that extends the existing Azure application platform with capabilities to implement code triggered by events occurring in virtually any Azure/ 3rd party service or on On-Premises applications.

 Knative: Knative provides a set of middleware components to build modern, source-centric, and container-based applications that can run on On-premises, On cloud, or onthird-party data center.

Pros of Azure Functions	Pros of Knative
Event Driven	Open source
Azure Component services for Storage, services	Auto scaling
Used as light weight https service	On Top of Kubernetes
Easy scalability	Portability

Conclusion

This article provides an overview of Knative, the advantages of using Knative for standardizing the server-less components across cloud service providers, in-house development and on 3rd party data centers.

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