



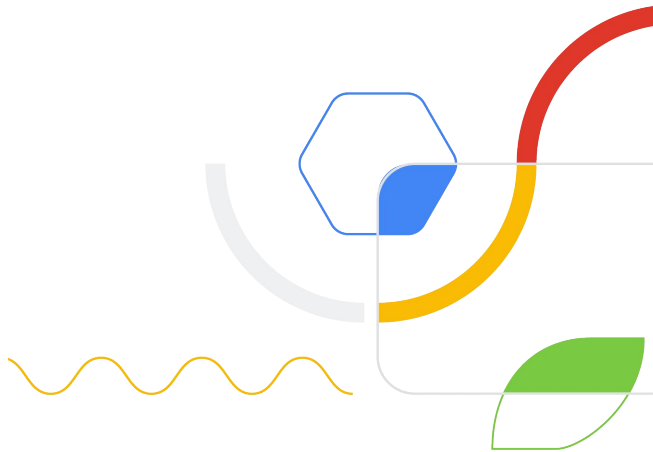
Botless: Building a Serverless Chatbot Framework

Scott Nichols

n3wscott

Software Engineer

Google

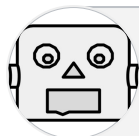


We are going to build the **botless** framework *together*, right now. We will optimize for **price**, and **flexibility** of extensions.

Collect Requirements

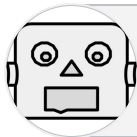


/uptime

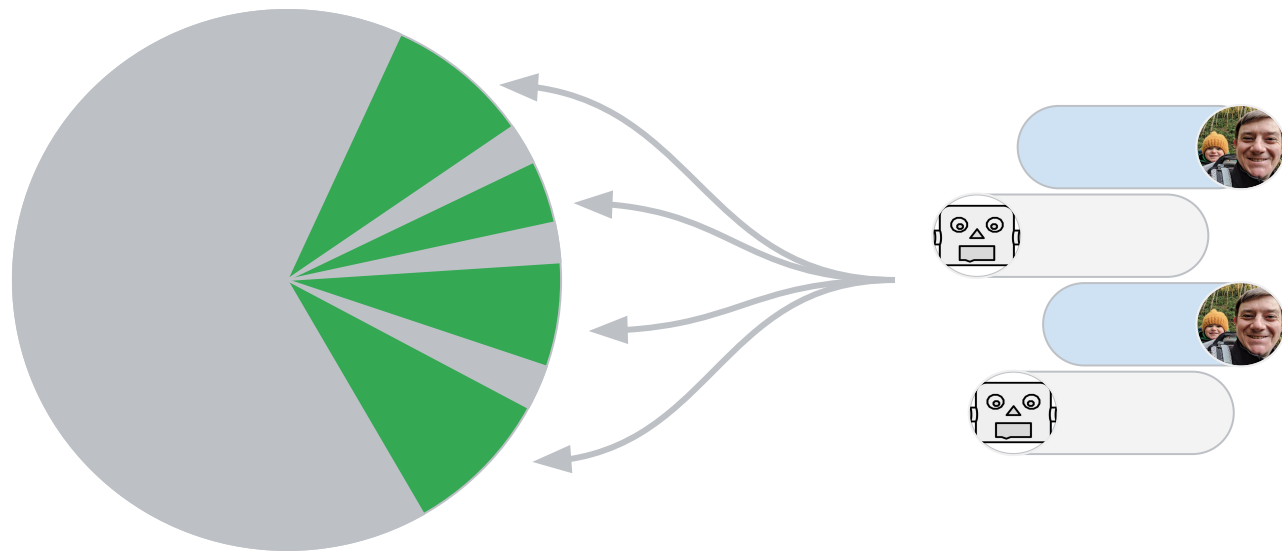


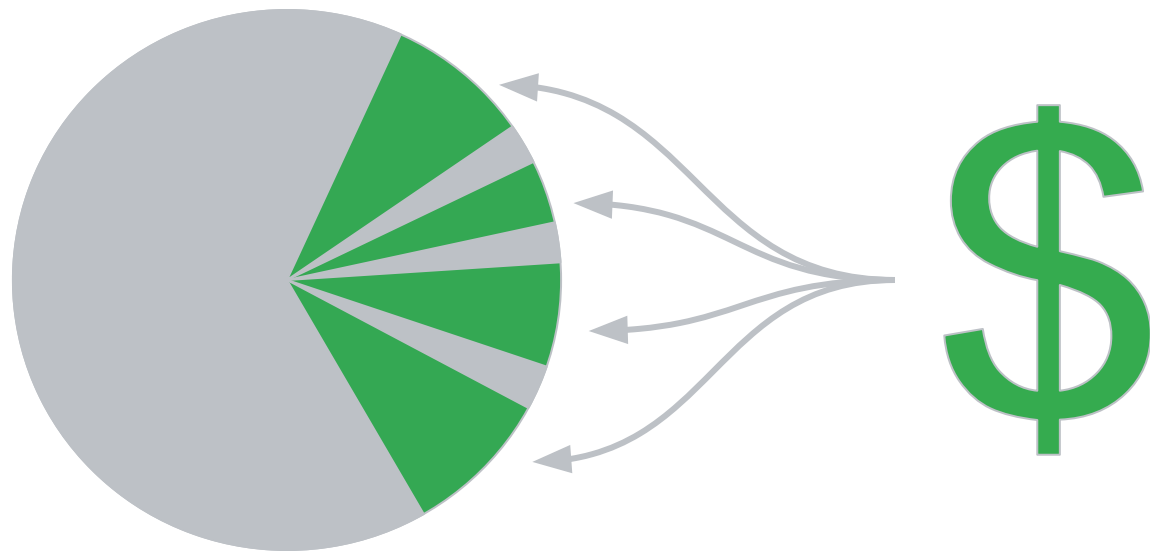
128 Days!

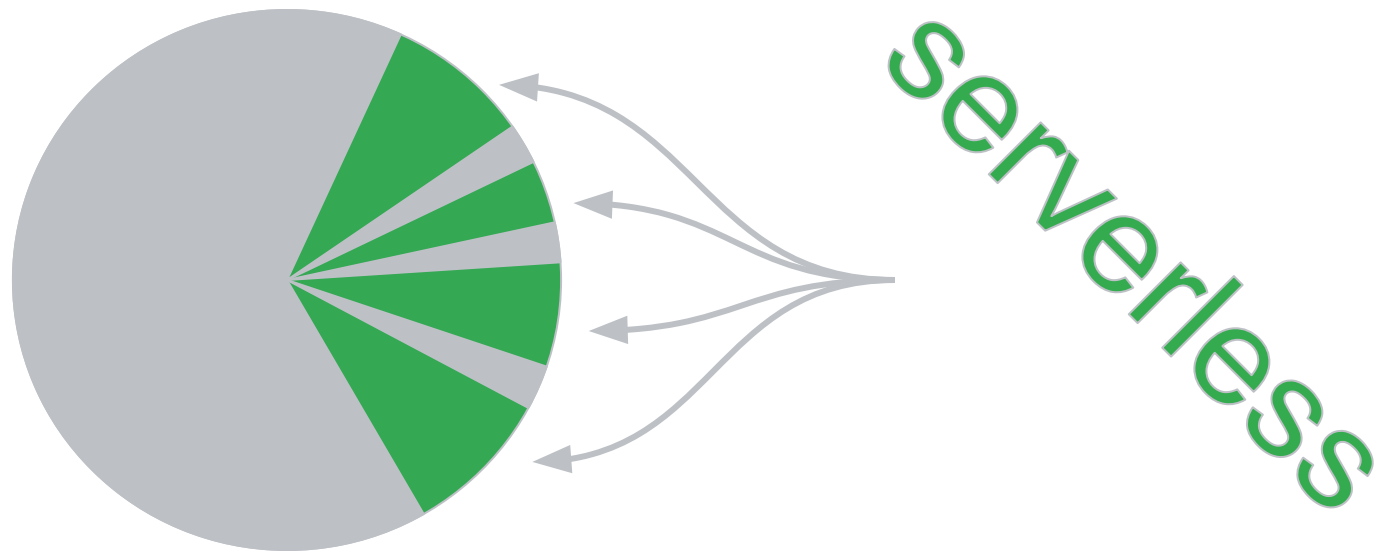
/define crd



CRD stands for Custom Resource Definition.







Serverless



No servers



Elastic



Portable



Service-based

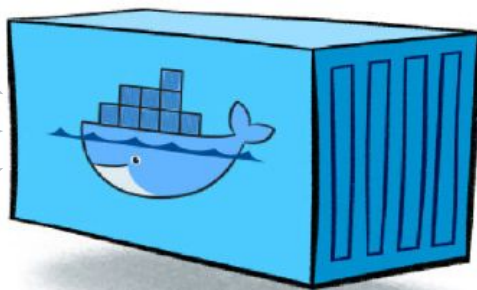


Event-driven

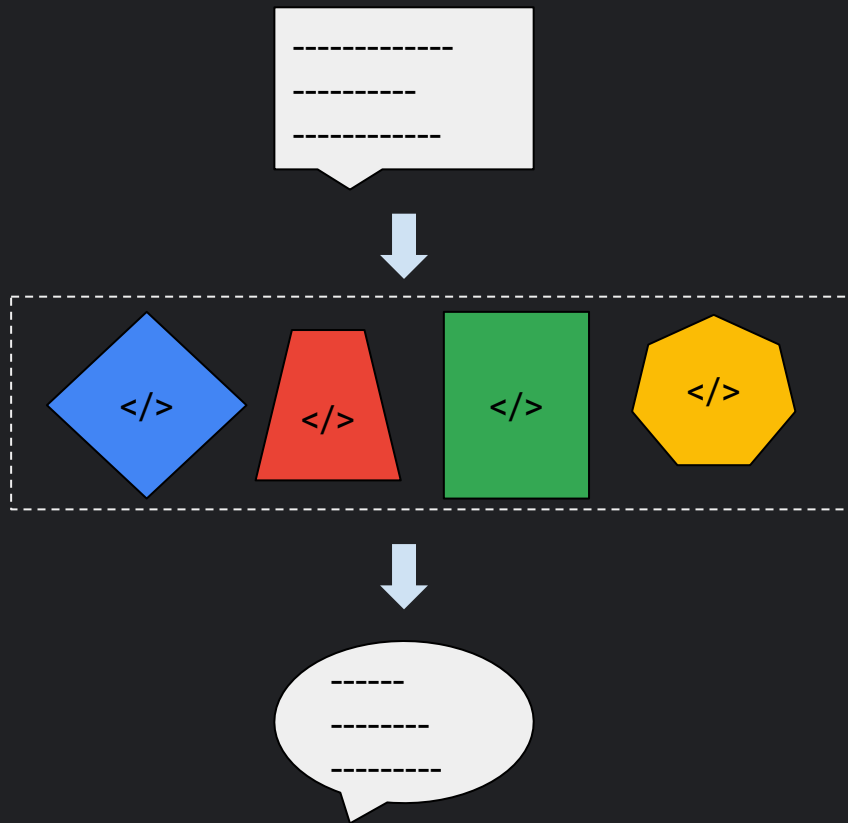


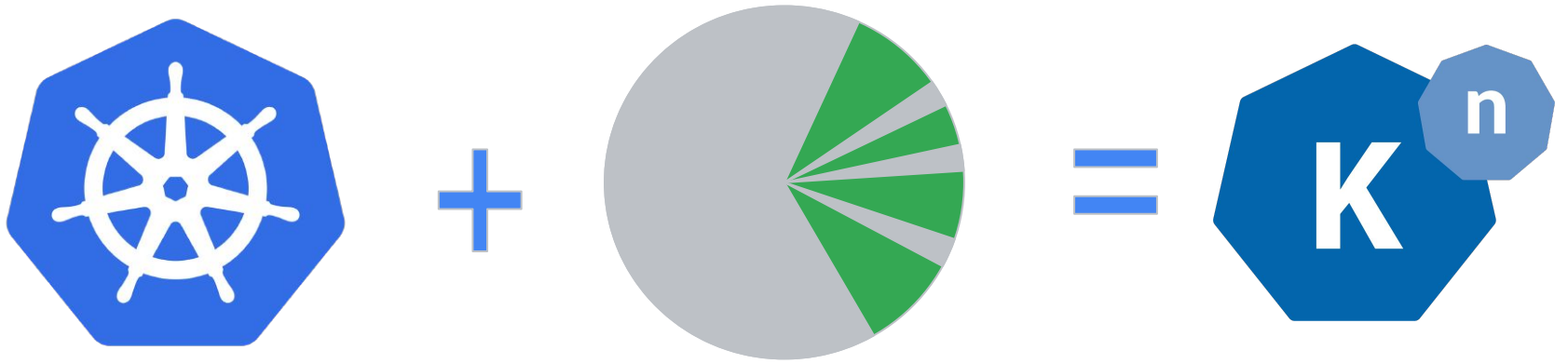
Pay only for usage

GO



Standardize







Knative

Building blocks for serverless
workloads on Kubernetes

Knative project



- Set of primitives (build, events, serving...)
- Solves for modern development patterns
- Implements learnings from Google, partners
- Ingredient or platform for Serverless

github.com/knative

Knative collaboration



redhat®



Knative enabled

Products

Serverless Containers on GCF

GKE Serverless Add-on

SAP Kyma

Pivotal Function Service

IBM Cloud Functions

Red Hat Cloud Functions

Pivotal riff

OpenFaaS

T-mobile Jazz

Primitives

Build

Serving

Eventing

...

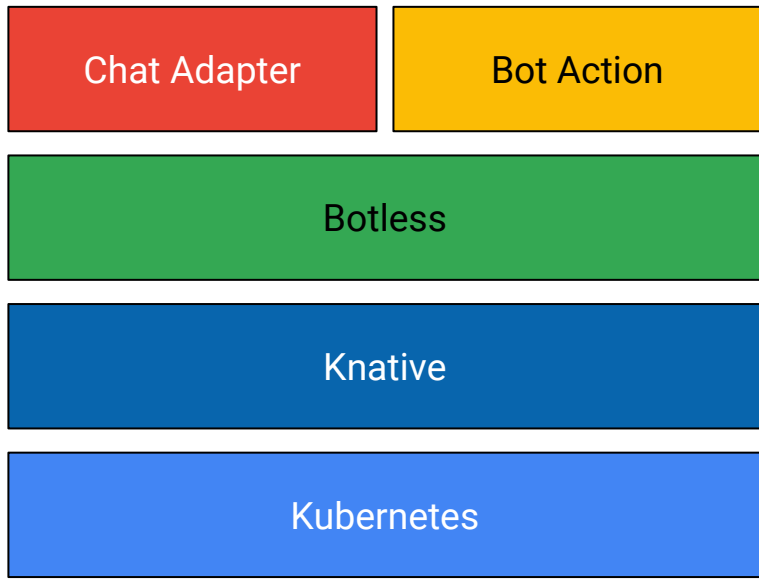


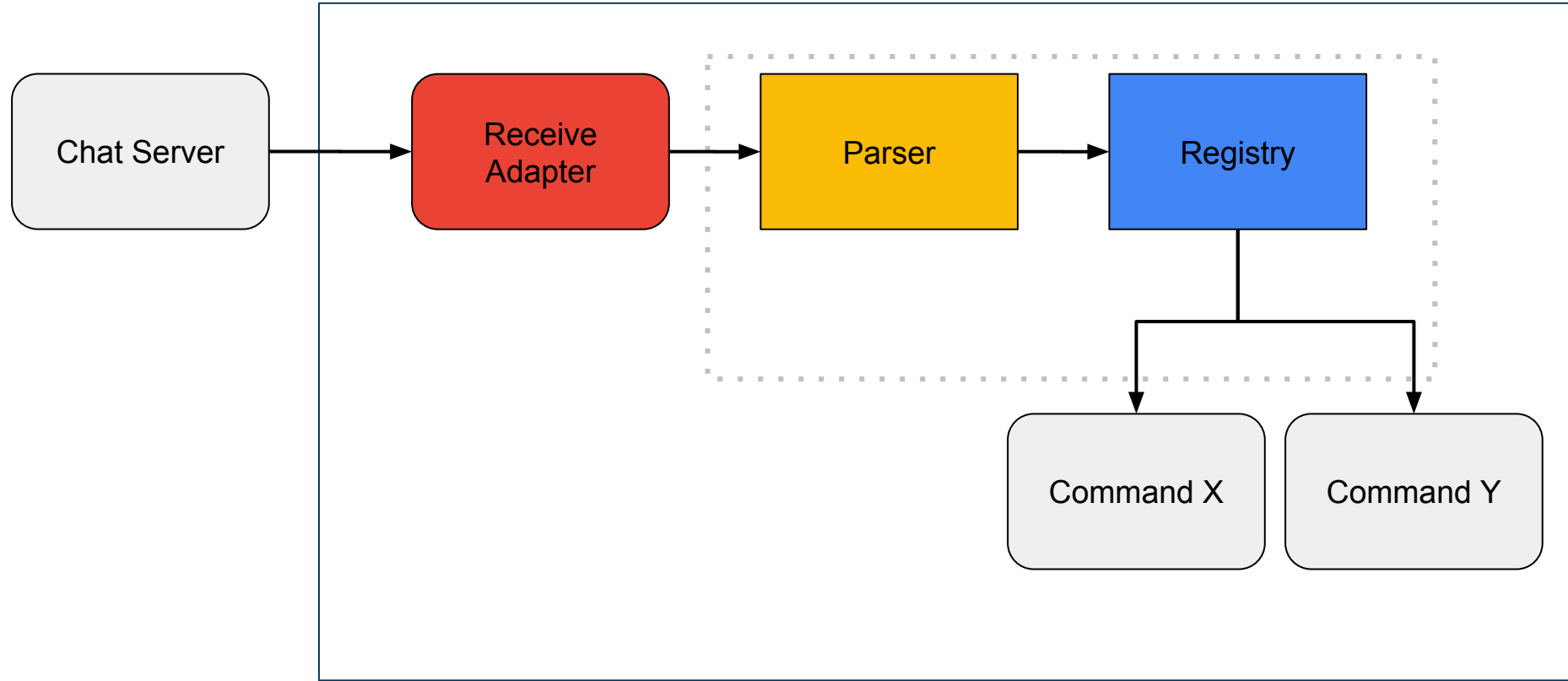
Platform

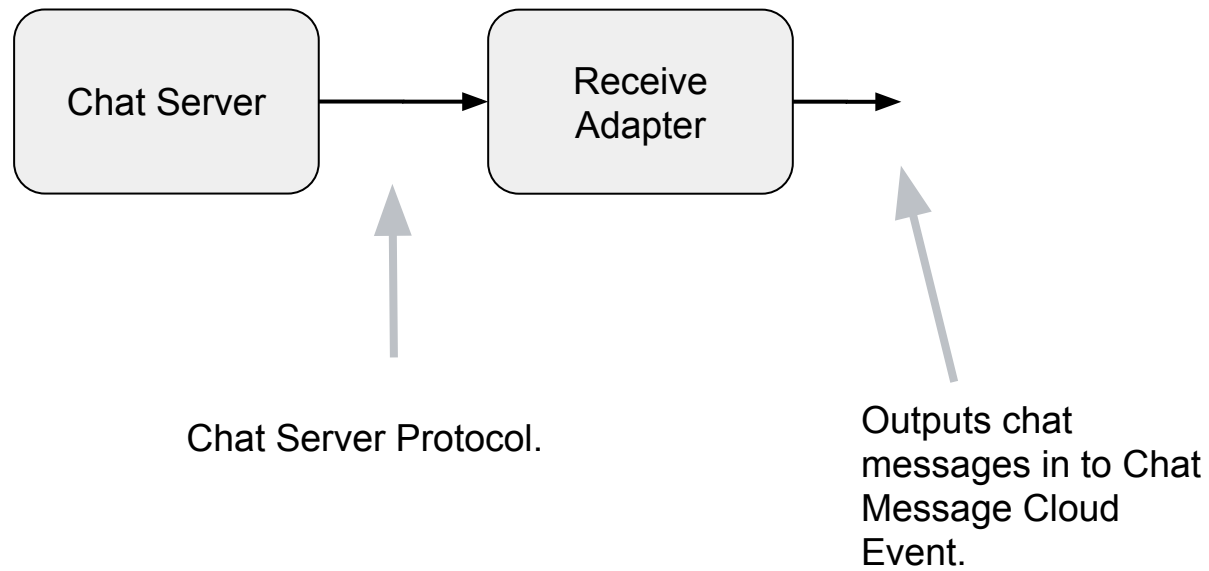


Kubernetes

General Architecture







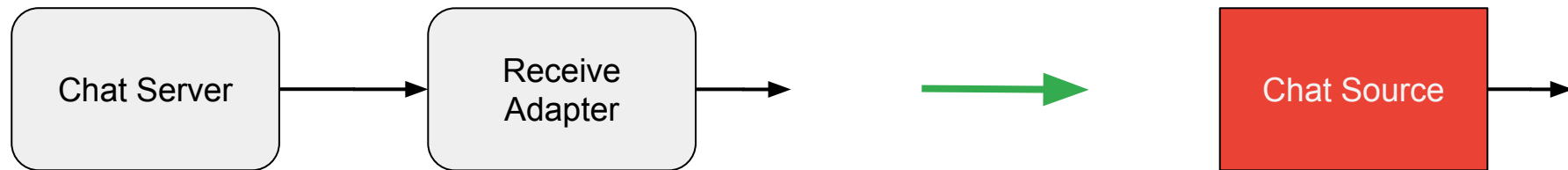
CloudEvents

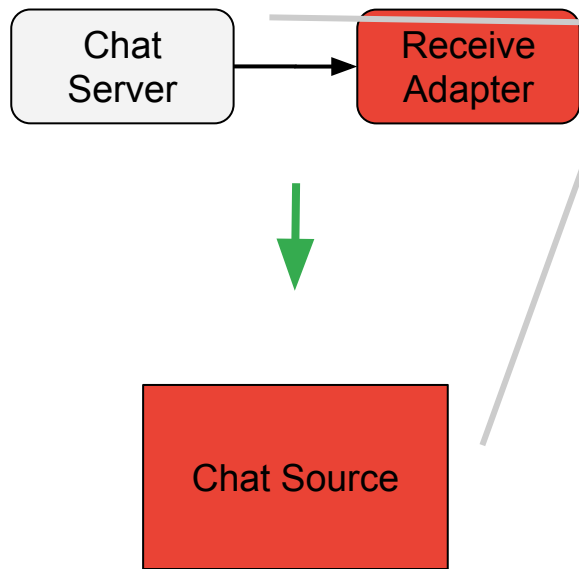


a specification for describing
event data in a common way.

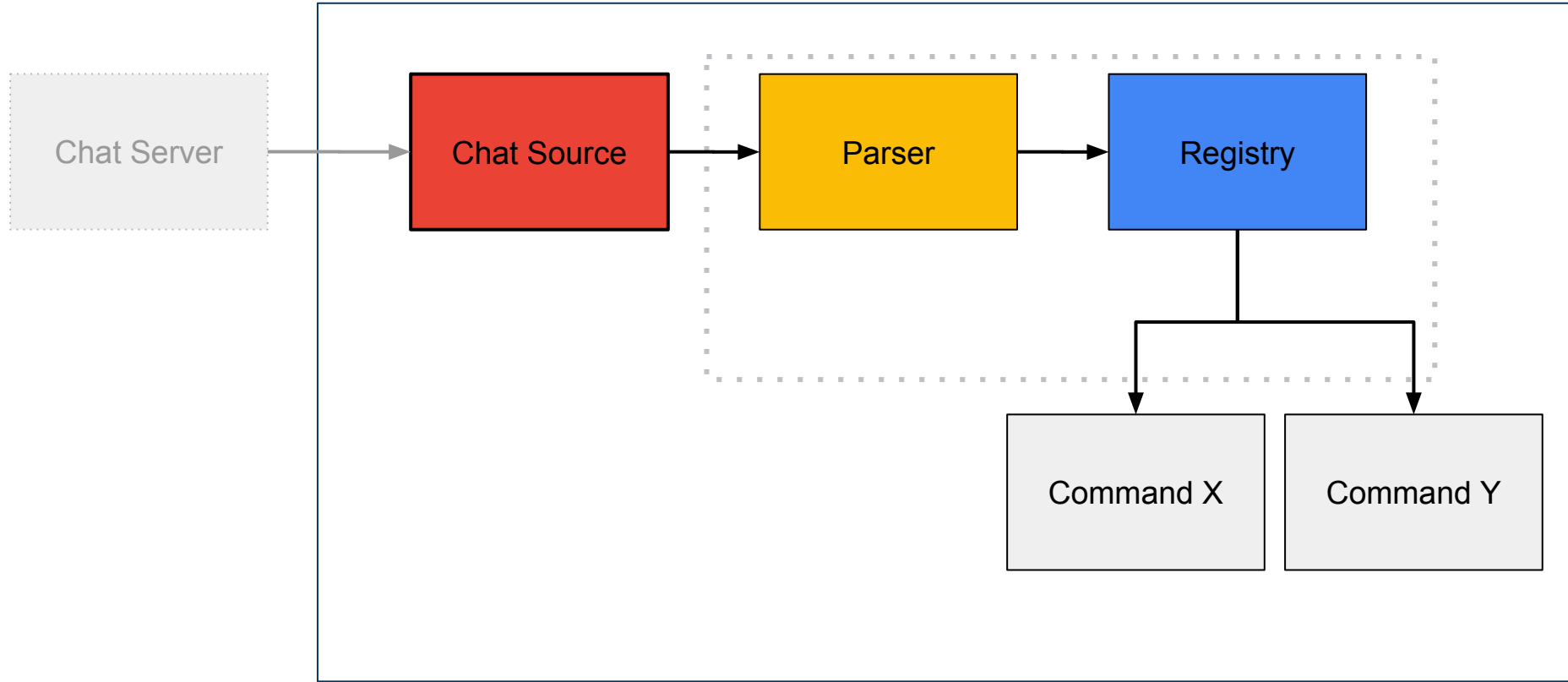
CloudEvents

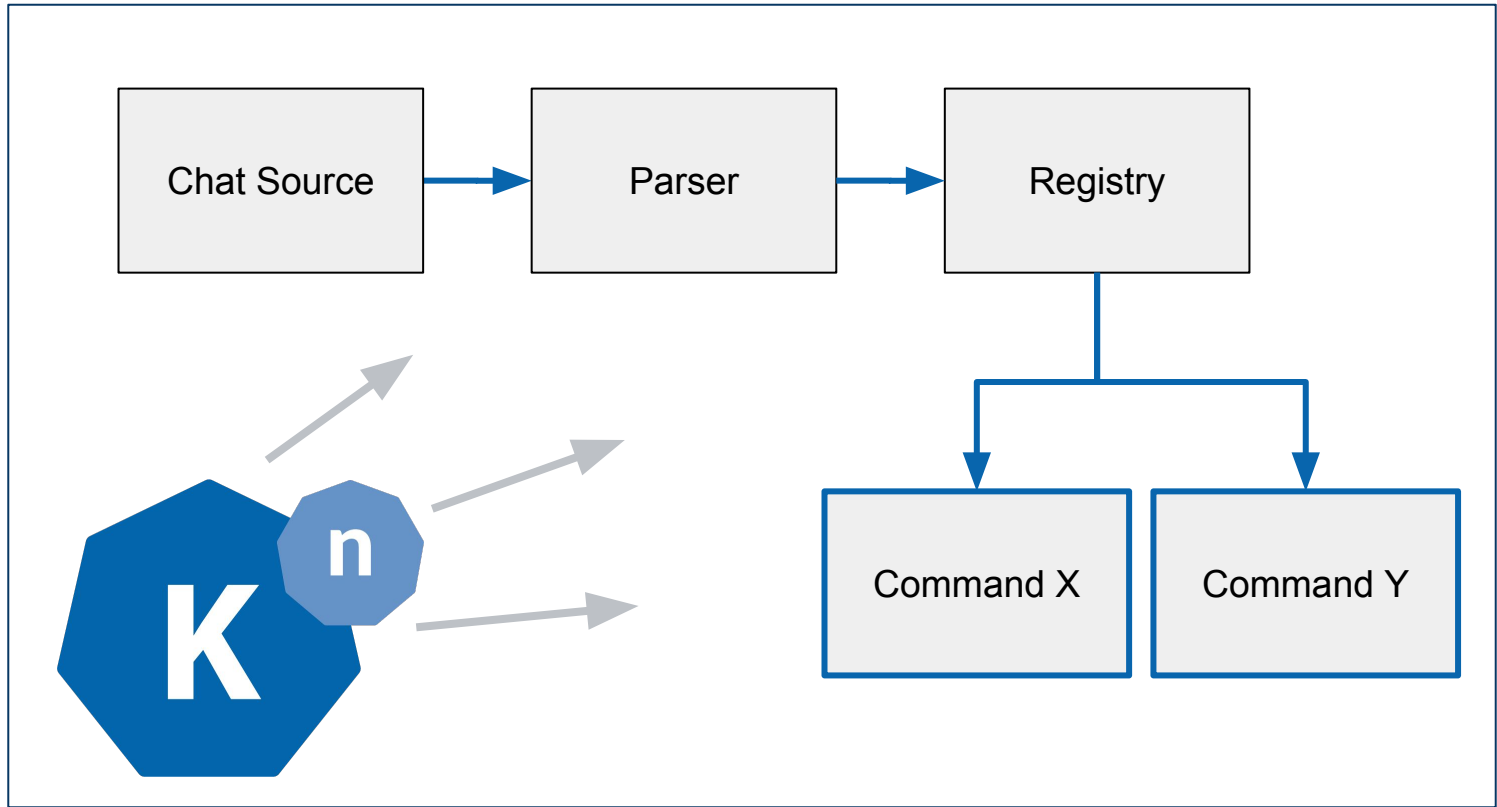
```
{  
  "cloudEventsVersion" : "0.1",  
  "eventType" : "com.example.someevent",  
  "source" :  
    "http://example.com/mycontext",  
  "eventId" : "A234-1234-1234",  
  "eventTime" : "2018-04-05T17:31:00Z",  
  "contentType" : "text/xml",  
  "data" : "<much wow=\"xml\"/>"  
}
```





```
apiVersion: sources.botless.dev/v1alpha1
kind: ChatSource
metadata:
  name: example-chat-source
spec:
  server:
    host: http://chatserver.example.com
    auth:
      username: botless
      password:
      ref:
        name: botless-chatserver
        key: botlessCredentials
  sink:
    apiVersion:
      eventing.knative.dev/v1alpha1
    kind: Channel
    name: msg
```

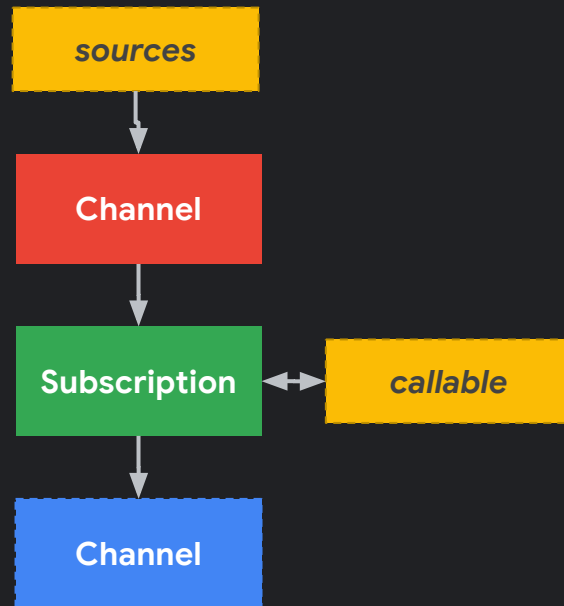





Knative, principled eventing objects

Eventing constructs :

- ***sources*** (producer)
- **Channel** (delivery)
- **Subscription** (linkage)
- ***callable*** (custom functions)



Knative, channels

```
apiVersion: eventing.knative.dev/v1alpha1
kind: Channel
metadata:
  name: k8ssource
spec:
  provisioner:
    name: default
```



Channel

Knative, subscriptions

apiVersion: eventing.knative.dev/v1alpha1

kind: Subscription

metadata:

name: sub-example

namespace: default

spec:

channel:

apiVersion: eventing.knative.dev/v1alpha1

kind: Channel

name: upstream-channel

subscriber:

ref:

apiVersion: serving.knative.dev/v1alpha1

kind: Service

name: caller-example

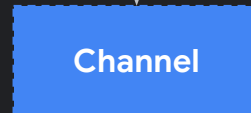
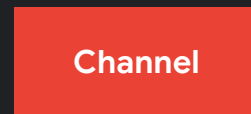
reply:

channel:

apiVersion: eventing.knative.dev/v1alpha1

kind: Channel

name: downstream-channel



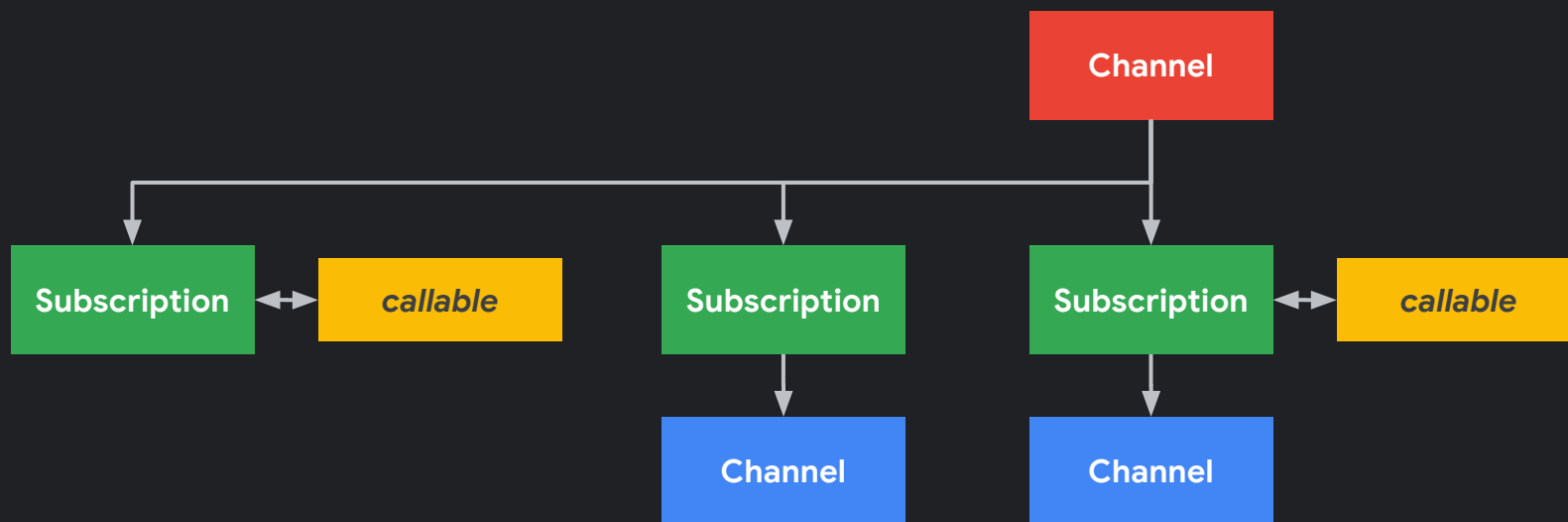
Channel

Subscription

callable

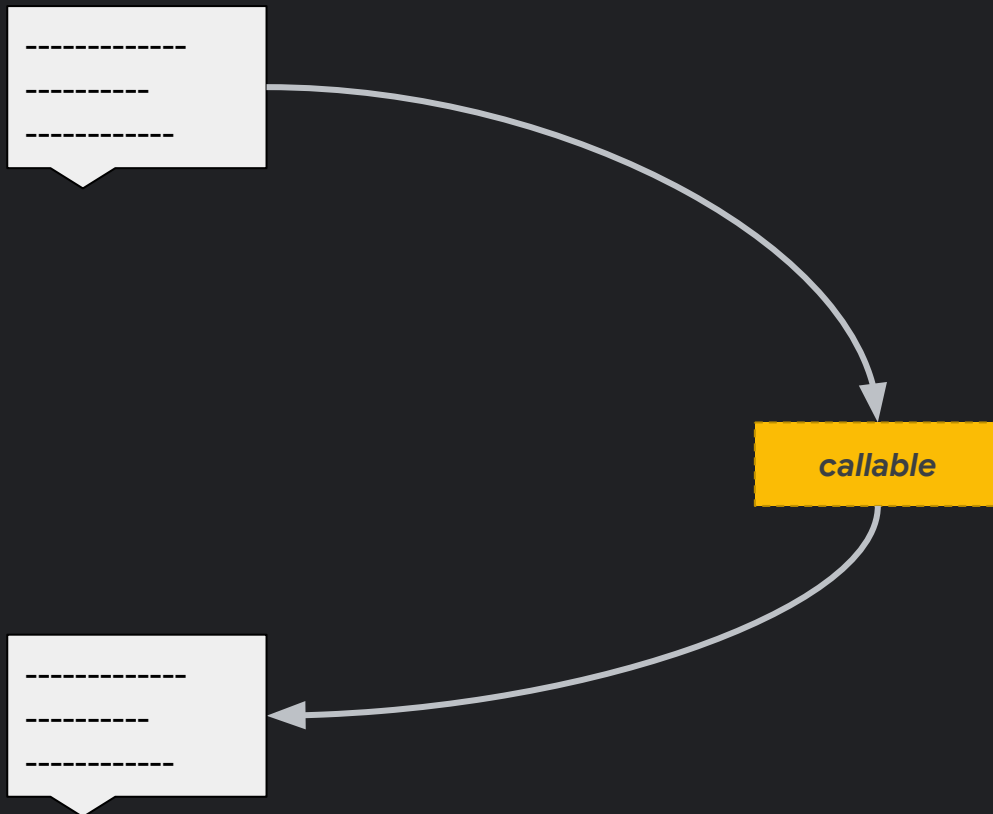
Channel

Knative, fanout



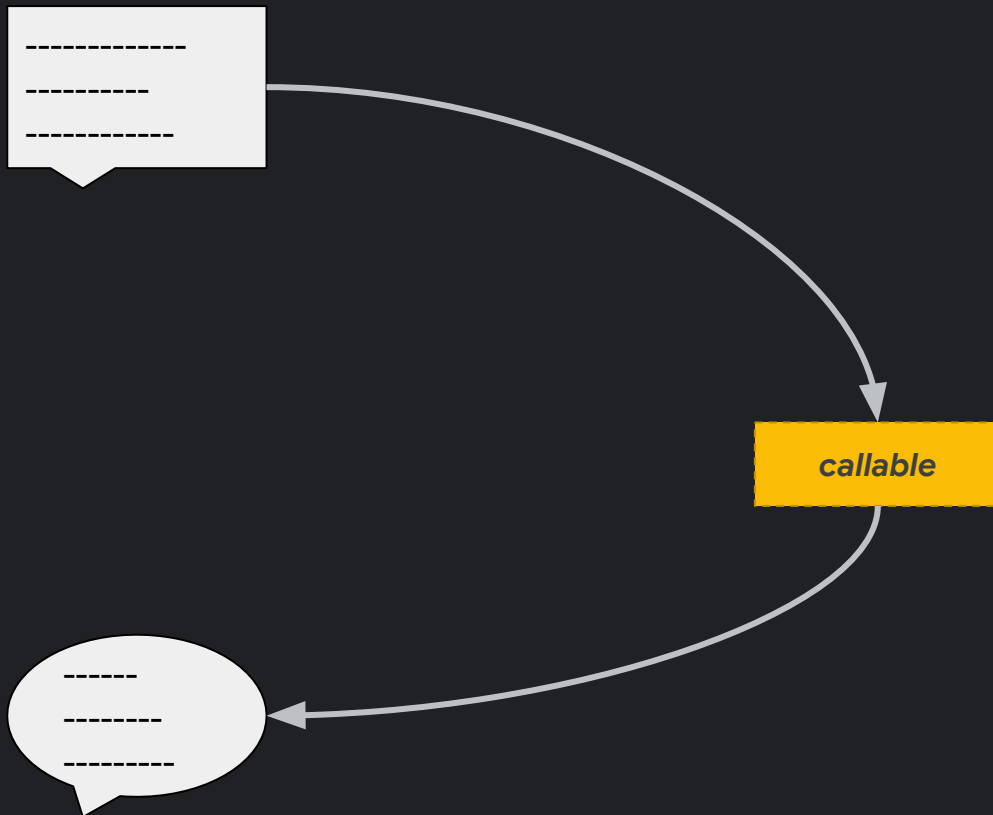
Knative, callable

passthrough



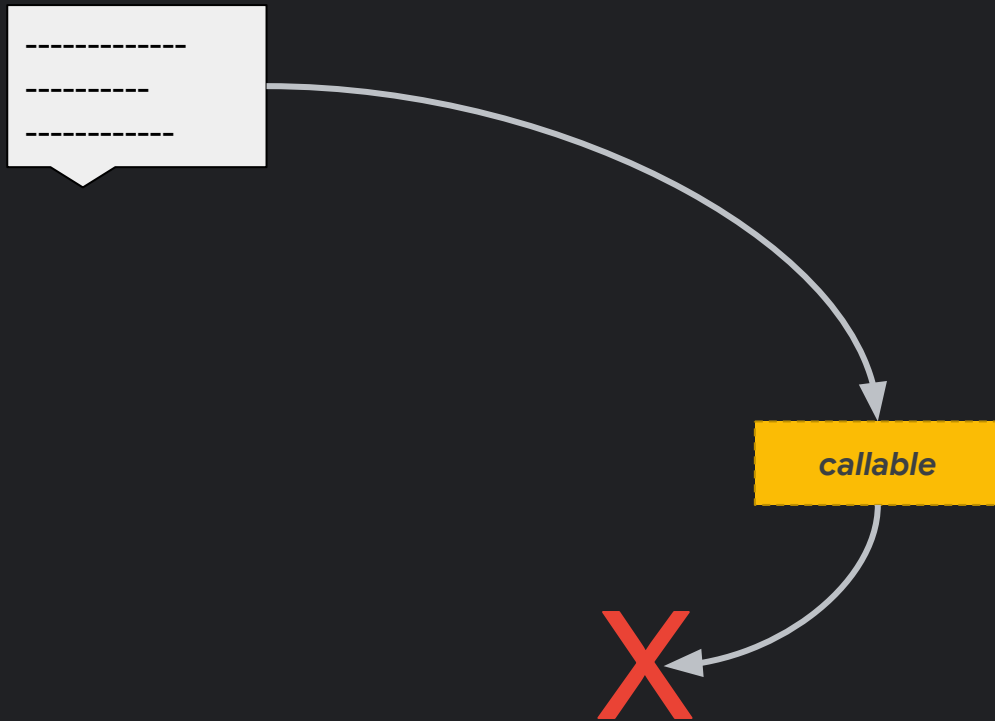
Knative, callable

mutation

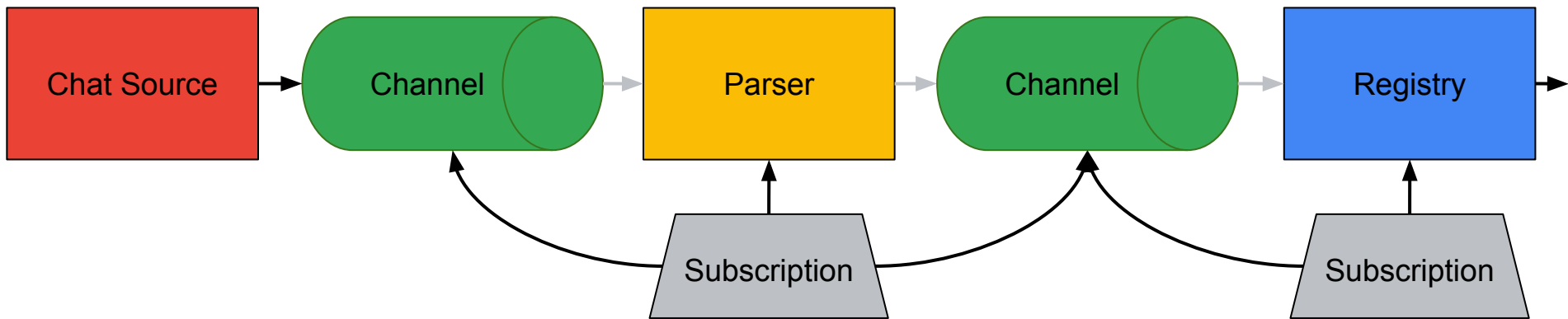


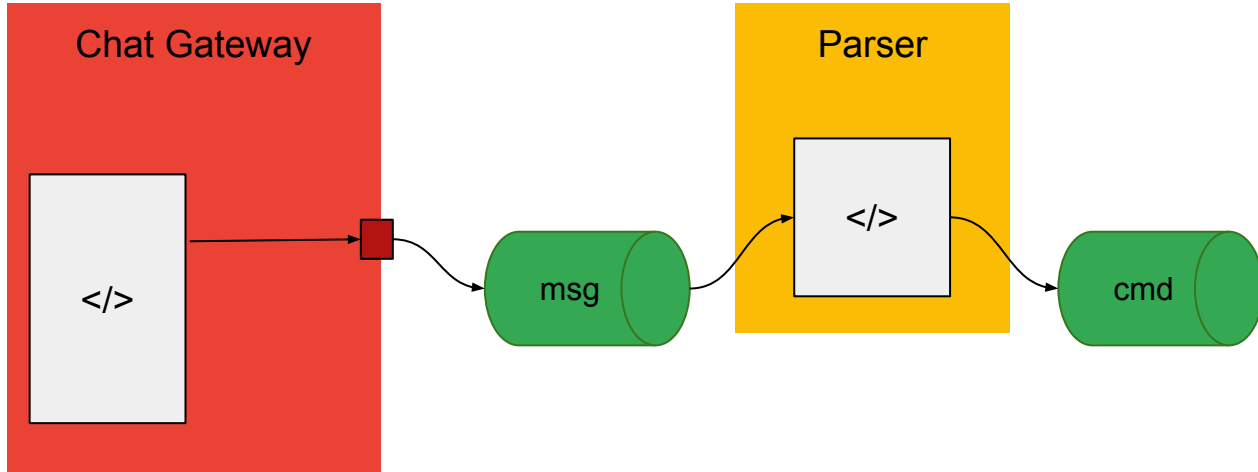
Knative, callable

filter



Applied Eventing





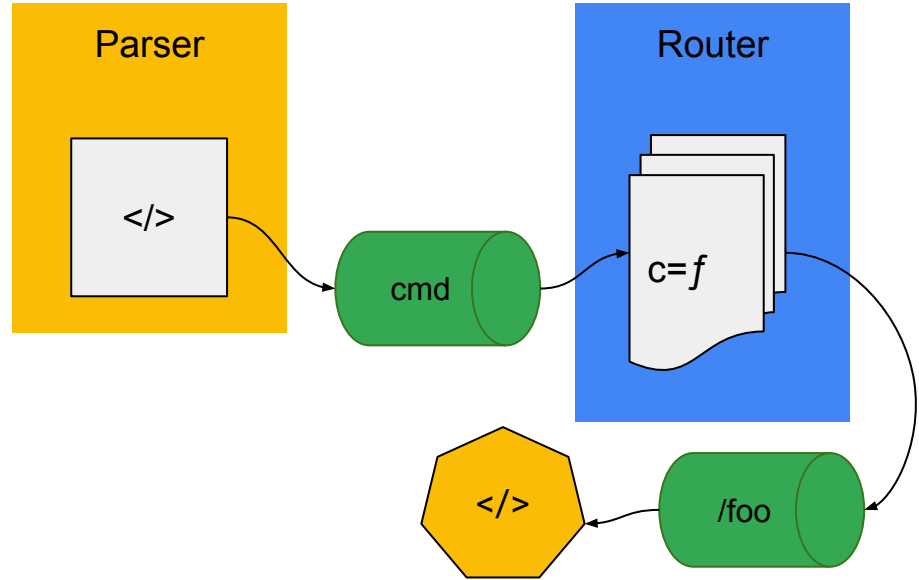
Chat Server

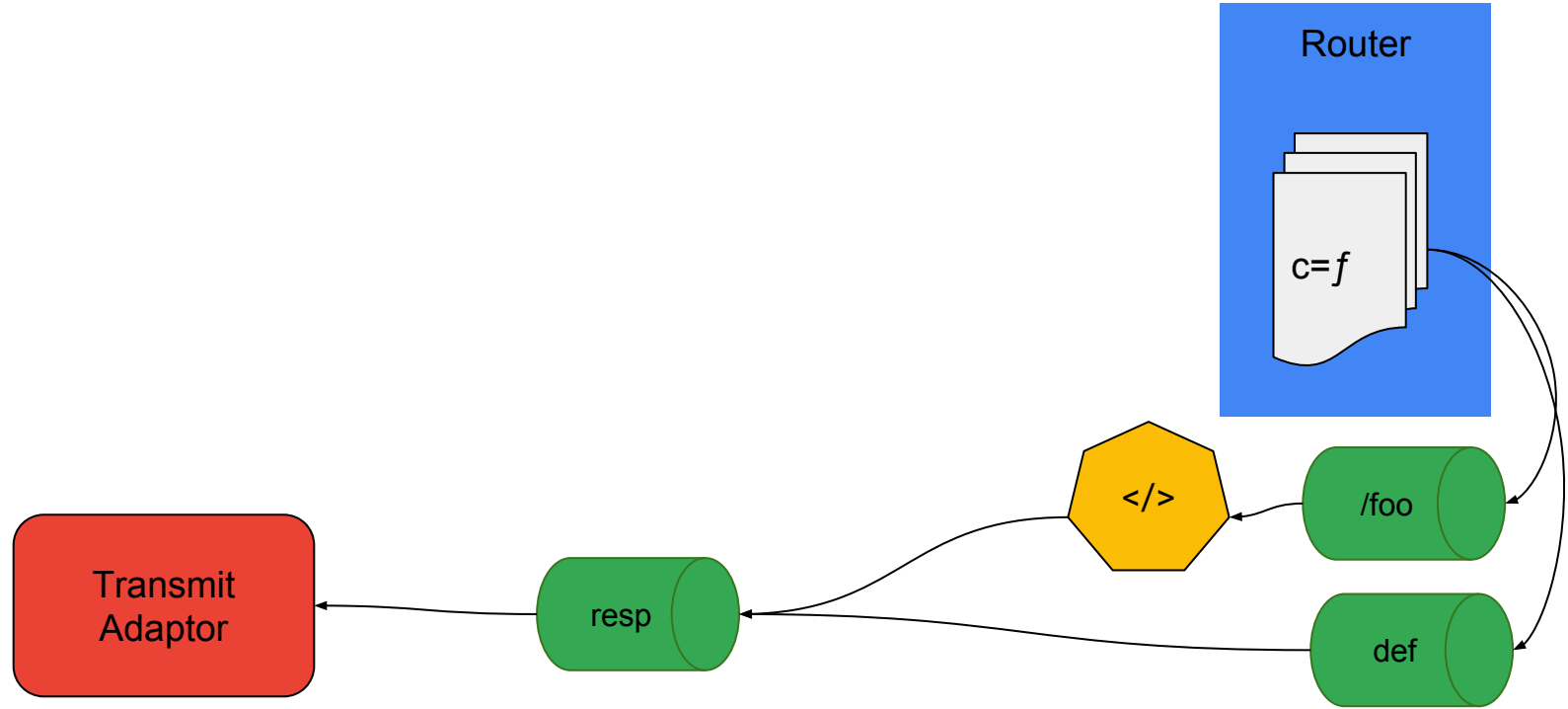
Chat Source

{

```
{  
  "text": "/uptime",  
  "user": "n3wscott",  
  "room": "default"  
}
```

```
"cloudEventsVersion" : "0.1",  
"eventType" : "dev.botless.chat",  
"source" : "http://botless/source",  
"eventID" : "B134-5678-3251",  
"correlationID" : "1ACB-2123-JKE3",  
"eventTime" : "2018-04-05T17:28:00Z",  
"contentType" : "application/json",  
"data" : {  
  "message": "/uptime",  
  "author": "n3wscott"  
}  
}
```



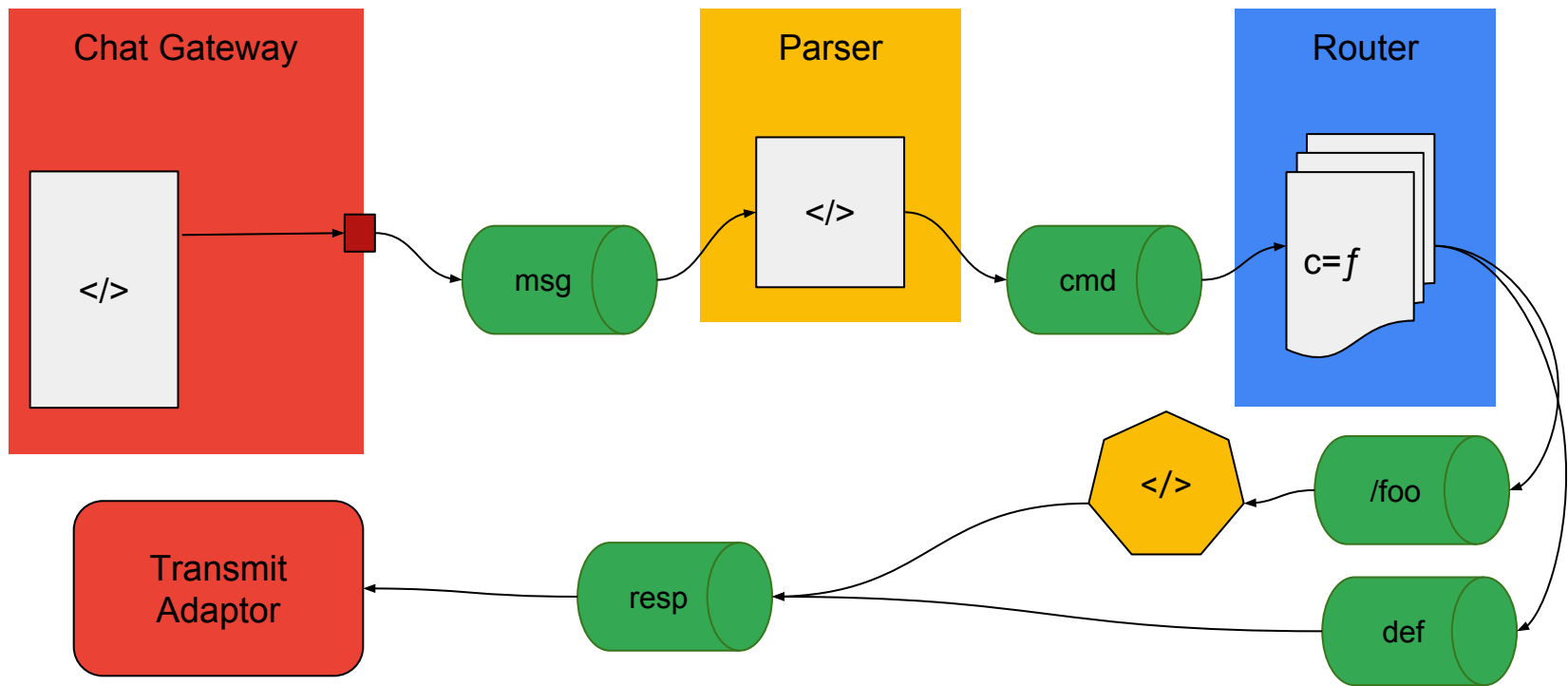


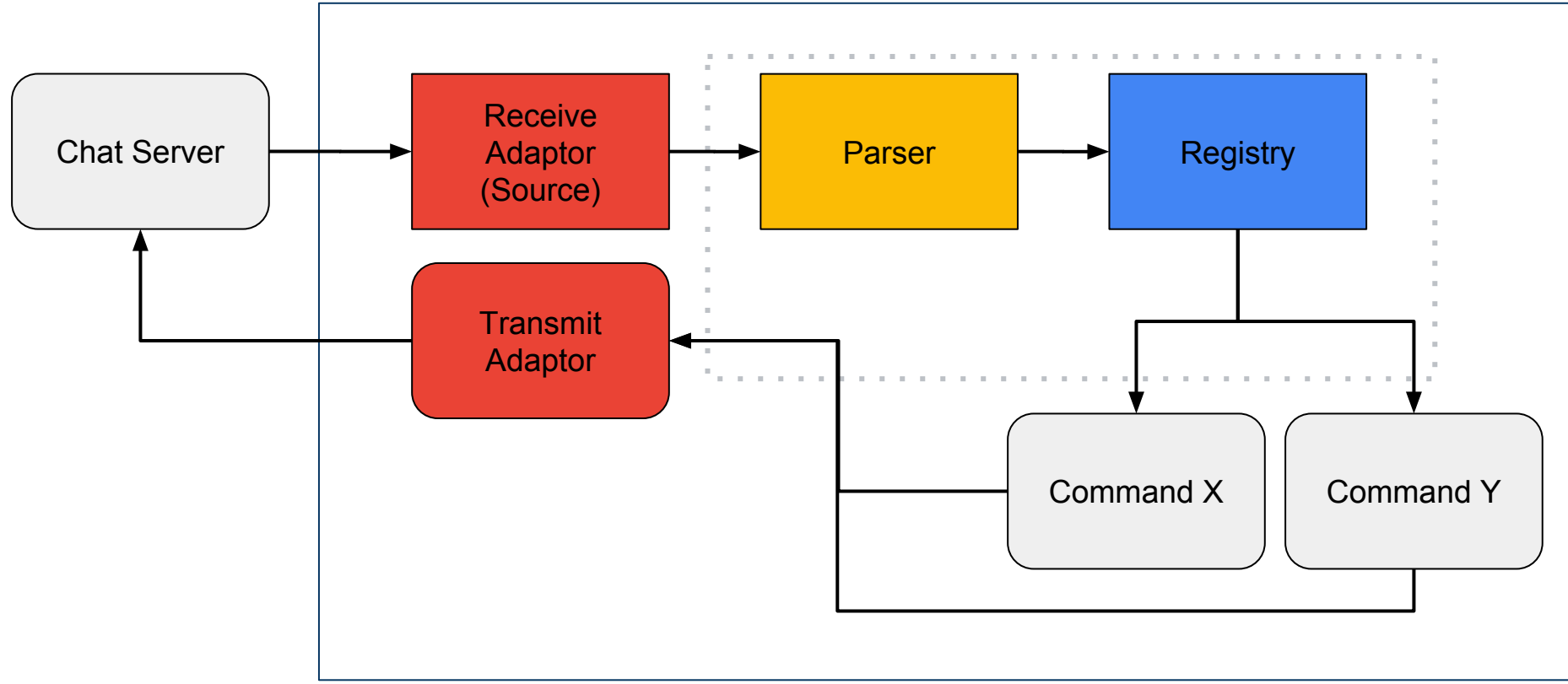
CloudEvents, correlating events

```
{  
  "cloudEventsVersion": "0.1",  
  "eventType": "dev.botless.chat",  
  "source": "http://botless/source",  
  "eventID": "B134-5678-3251",  
  "correlationID": "1ACB-2123-JKE3",  
  "eventTime": "2018-04-05T17:28:00Z",  
  "contentType": "application/json",  
  "data": "..."  
}
```



```
{  
  "cloudEventsVersion": "0.1",  
  "eventType": "dev.botless.command",  
  "source": "http://botless/parser",  
  "eventID": "A234-1234-1234",  
  "correlationID": "1ACB-2123-JKE3",  
  "eventTime": "2018-04-05T17:31:00Z",  
  "contentType": "application/json",  
  "data": "..."  
}
```



Knative, principled serving objects

Knative defines primitives with clear separation of concerns

Configuration

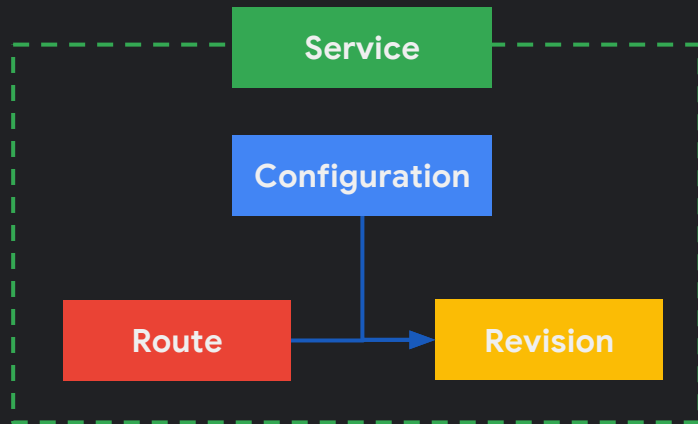
Current/desired state for your application
Code & configuration (separated, ala 12 factor)

Revision

Point in time snapshots for your code and configuration

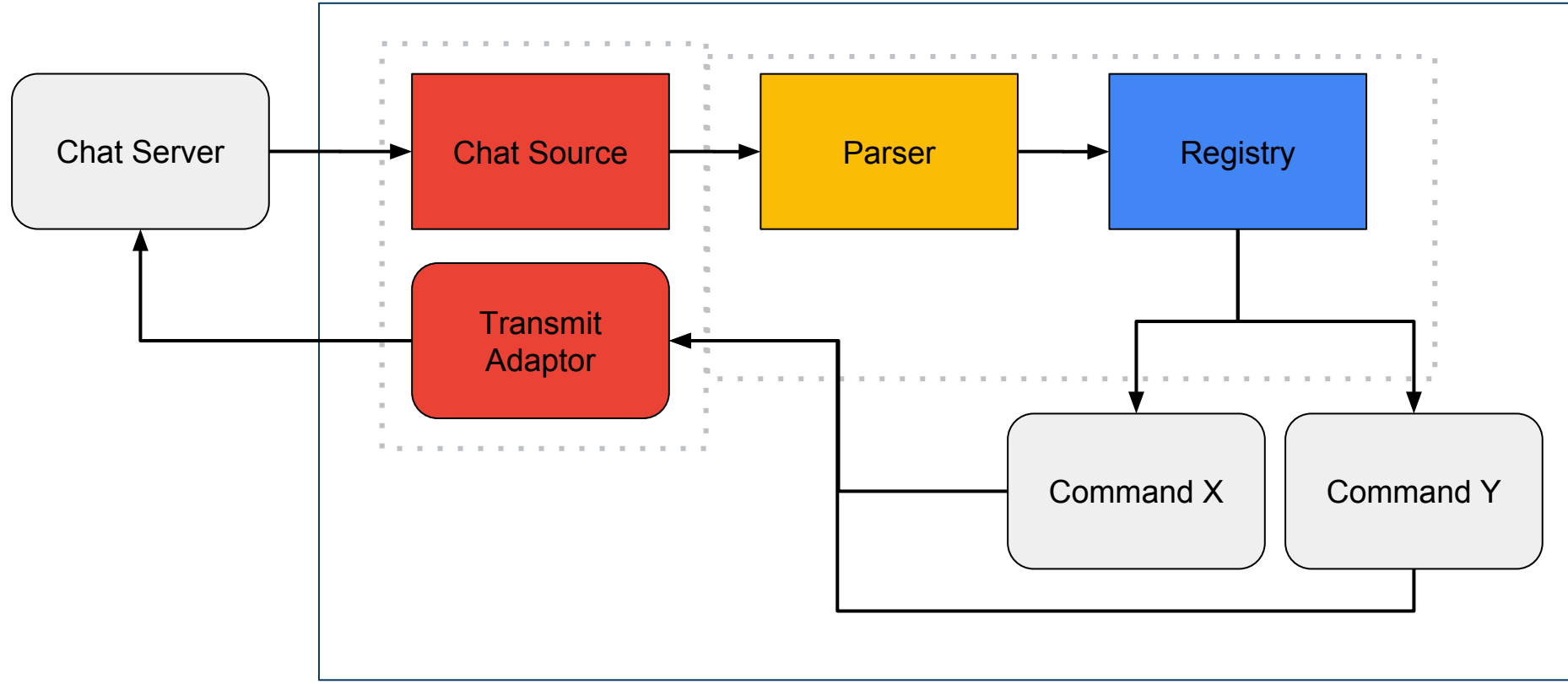
Route

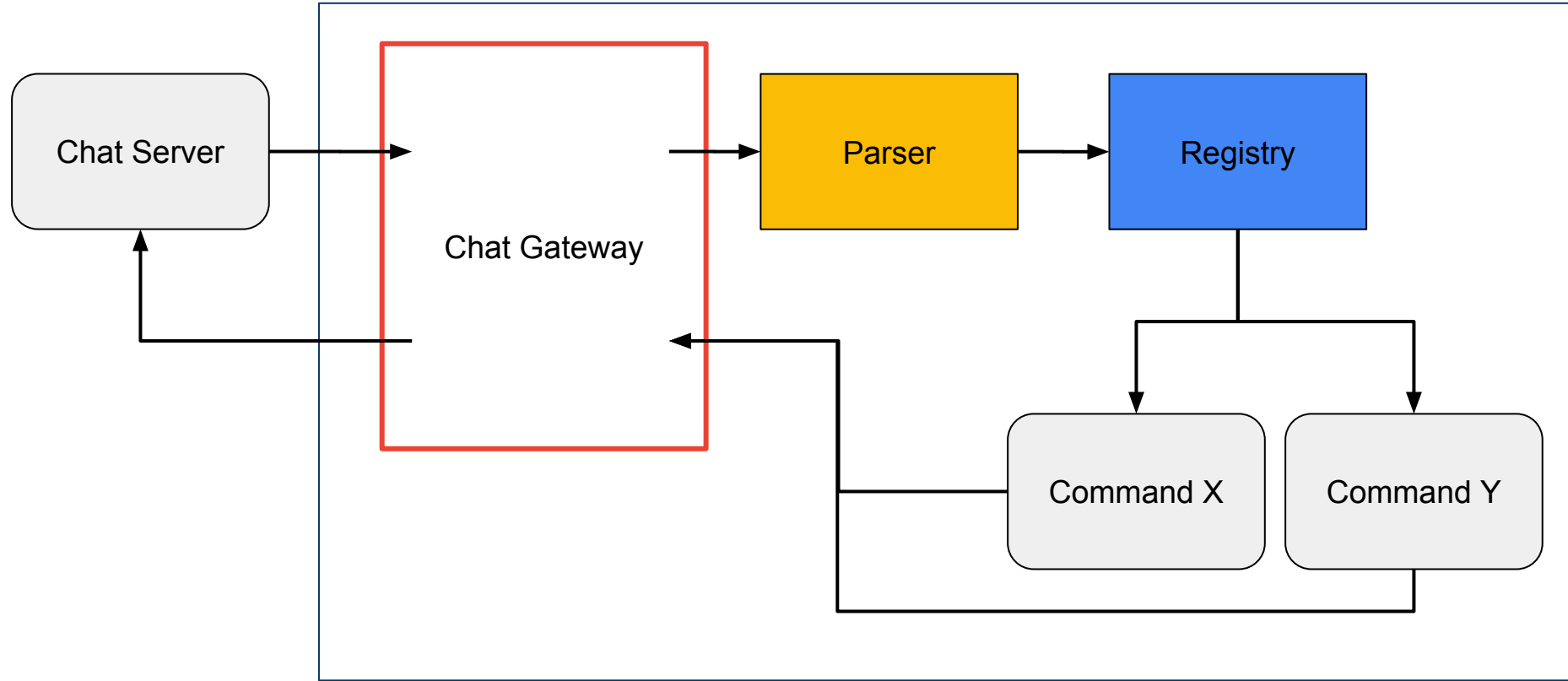
Maps traffic to a revisions
Supports fractional, named routing



Encapsulate Complexity







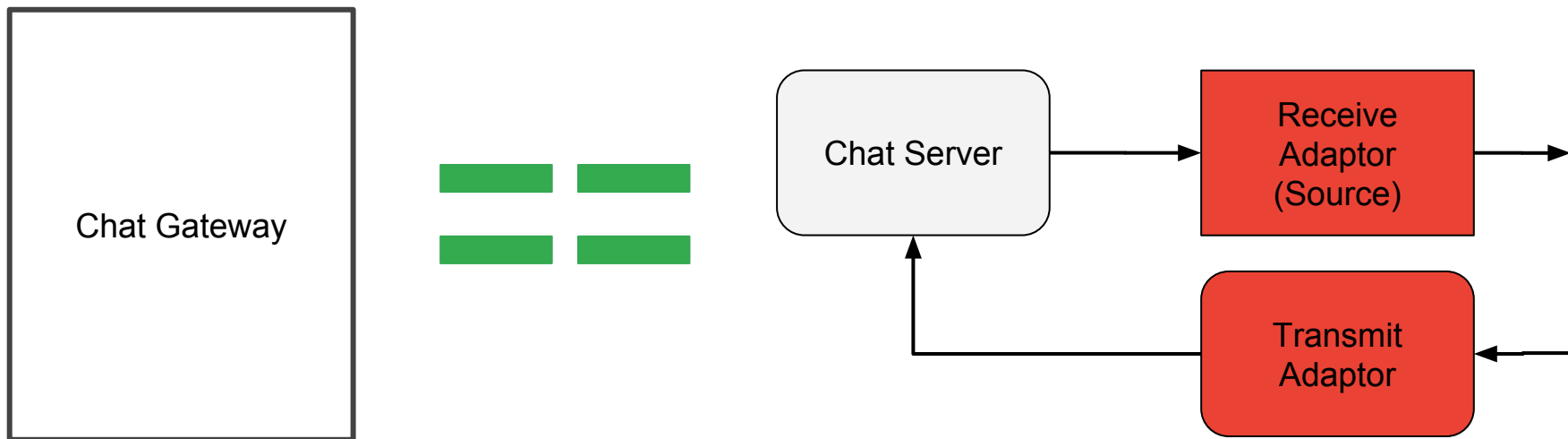


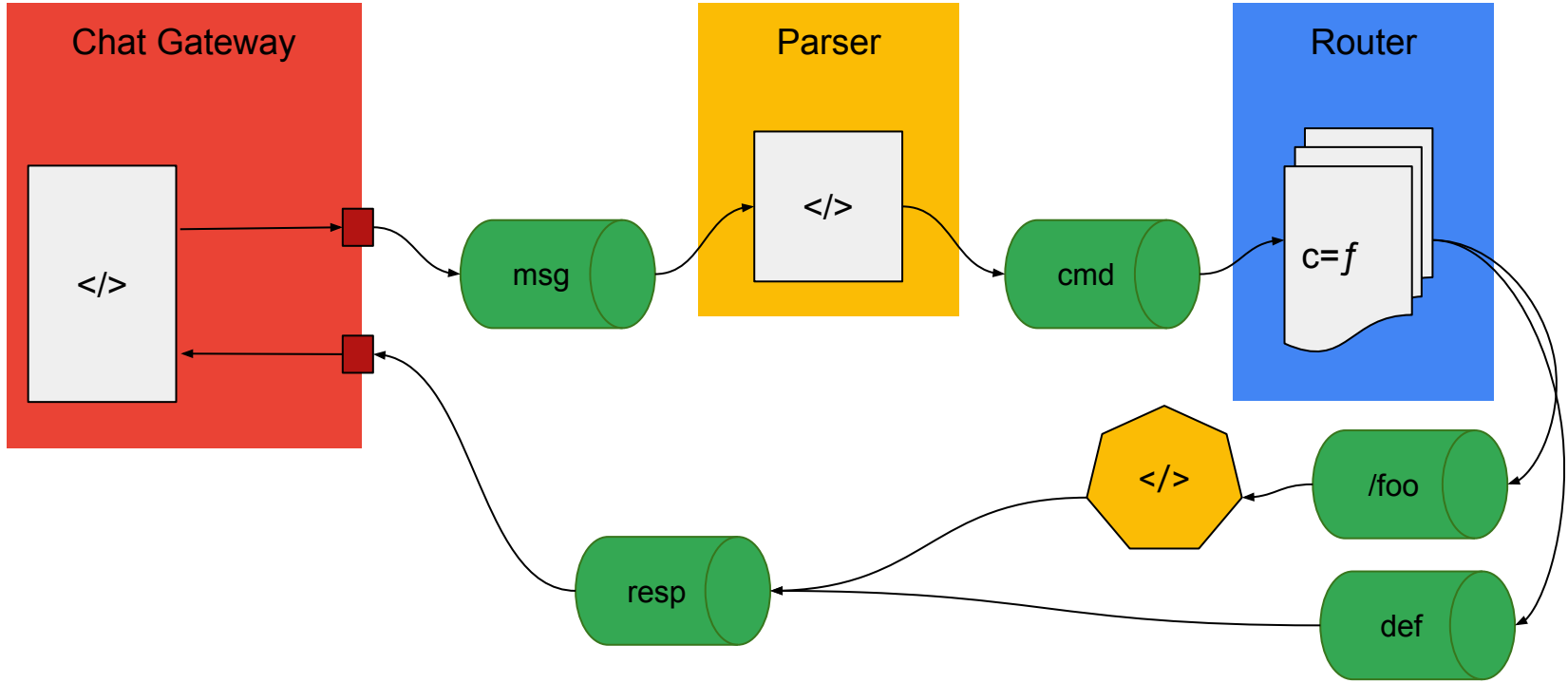
Chat Gateway

```
apiVersion: apiextensions.k8s.io/v1beta1
kind: CustomResourceDefinition
metadata:
  name: chatgateways.sources.botless.dev
spec:
  group: sources.botless.dev
  names:
    categories:
      - sources
    kind: ChatGateway
    plural: chatgateways
  scope: Namespaced
  version: v1alpha1
```



```
apiVersion: sources.botless.dev/v1alpha1
kind: ChatGateway
metadata:
  name: example-gateway
spec:
  server:
    host: http://chatserver.example.com
    auth: ...
  sink:
    apiVersion: eventing.knative.dev/v1alpha1
    kind: Channel
    name: msg
  response:
    apiVersion: eventing.knative.dev/v1alpha1
    kind: Channel
    name: resp
```

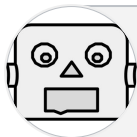





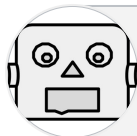
Expand



/learn demo <https://github.com/botless/demo-command/cmd/demo>

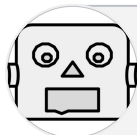


Learning...

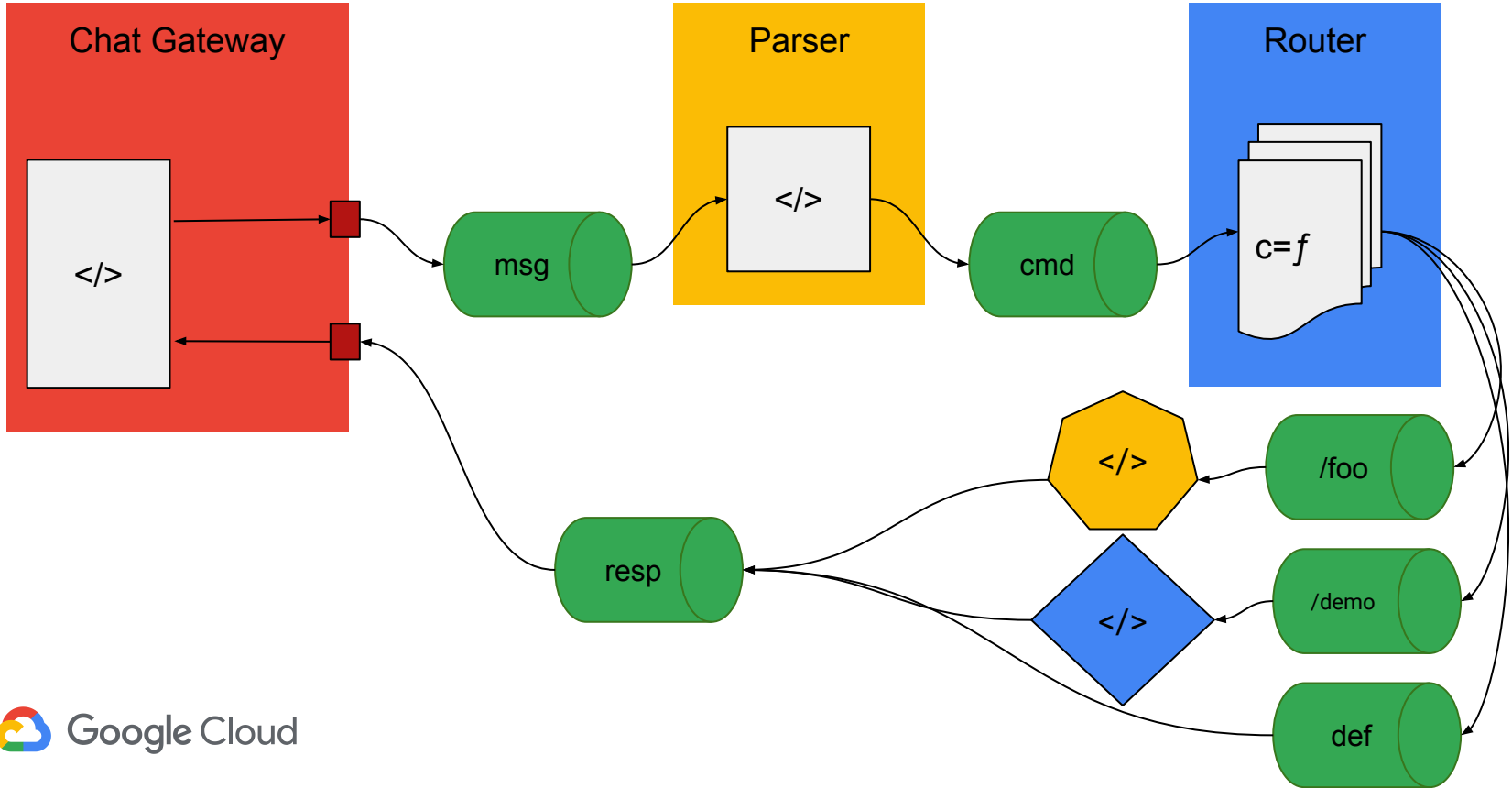


/demo Ready!

/demo

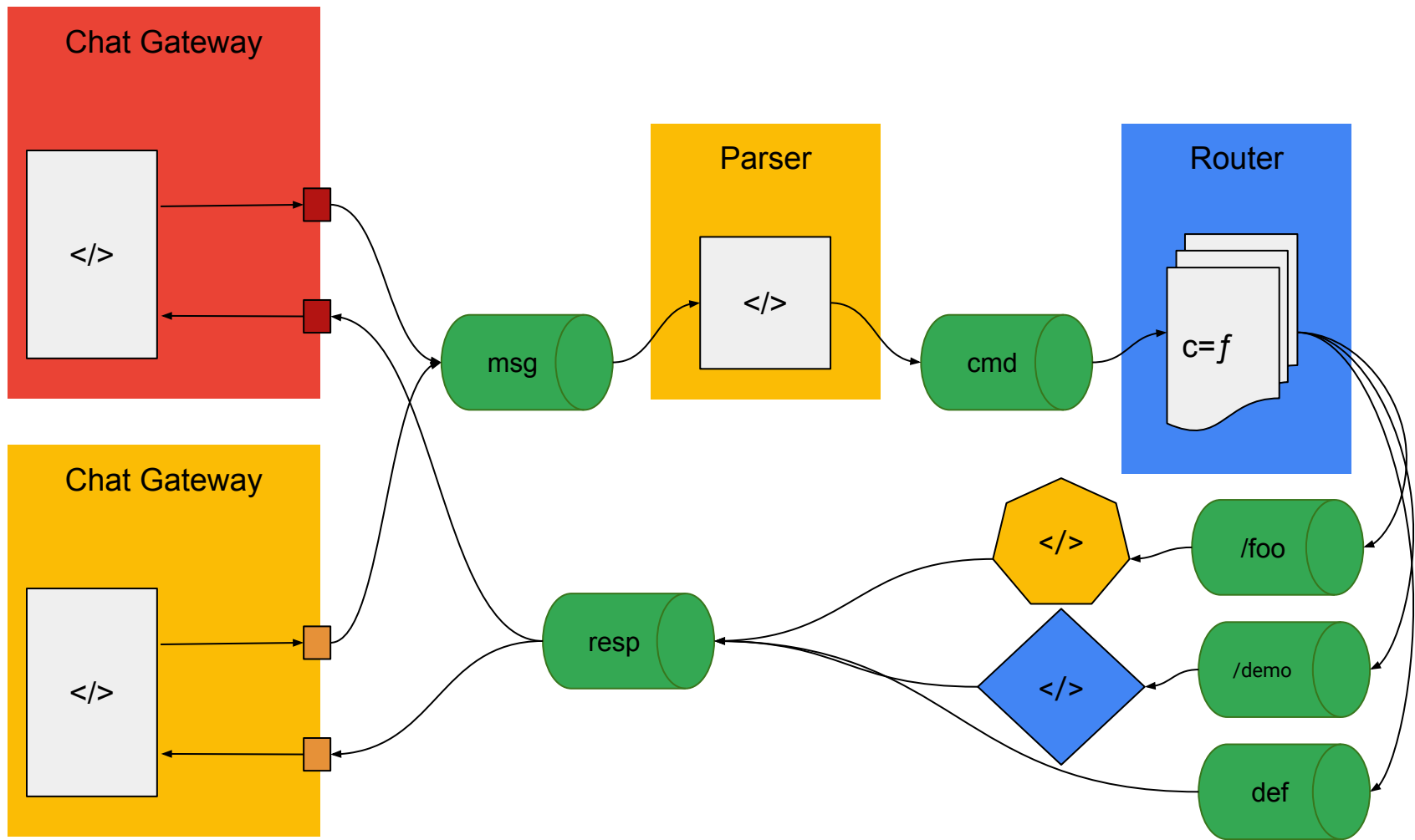


Hello KubeCon China!



Knative, principled build objects

TODO



Botless, new custom framework

Leverages Knative for:

- Serverless functions
- Eventing Connections
- Container Building

Leverages Kubernetes for:

- Framework Portability
- Custom Extension (CRDs)

Takeaways, consider the following

Customize Kubernetes

- Extend k8s to encapsulate your software
- Careful to design in composability between resources

Knative is an example of a framework built on top of k8s.

Botless is a purpose built custom framework as an example, you can do this too!

Thank you

Google Cloud



Scott Nichols

n3wscott
Software Engineer
Google



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