

SIG-Service Catalog Deep-Dive

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Agenda

- What is this talk about?
 - Open Service Broker API
 - Kube-Service Catalog Architecture
 - Design Challenges
 - Recent Features
 - Future Plans
- What is this talk NOT about?
 - Service Catalog 101
 - Implementation Details

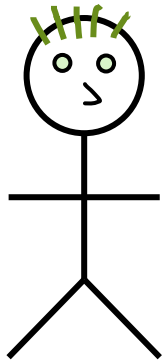
Open Service Broker API

- Specification of an API to allow automated deployment, management, and use of services
 - Cloud-native apps require resources such as stable storage, etc
 - App developers shouldn't have to care about how the service is managed
 - OSB API abstracts all of this away
- Client side implemented by Service Catalog
 - managed through custom resource types
- Server side implemented by service provider as a 'broker'
 - get catalog endpoint
 - provision service endpoint
 - bind service endpoint

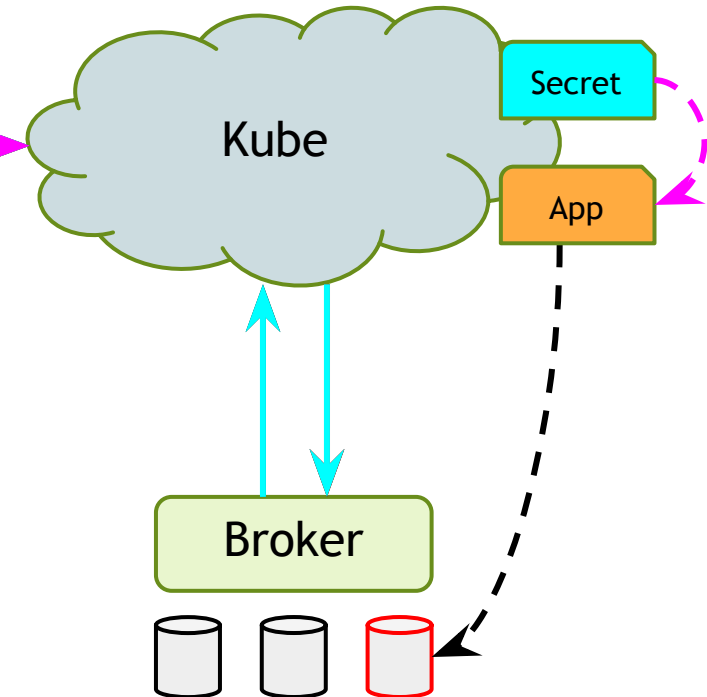
Service Catalog Resource Types

- **ClusterServiceBroker**
 - A server running somewhere that offers various services, e.g. MySQL Broker
- **ClusterServiceClass**
 - A category of services offered by a Broker, e.g. MySQL Databases
- **ServicePlan**
 - A specific type of a Service that a Broker offers, e.g. 100 MB MySQL Databases
- **ServiceInstance**
 - A single instantiation of a Service/Plan, e.g. Jonathan's 100 MB MySQL Database
- **ServiceBinding**
 - A unique set of creds to access a specific Instance, e.g. username/password for Jonathan's 100 MB MySQL Database

The Magic



1. Register Service Broker
2. Retrieve the Catalog of Services
3. Create a new Service Instance
 - Platform asks Brokers for Instance
4. Deploy Application
5. Bind Instance to an Application
 - Platform asks for new Binding/Creds
6. Access Service from Application
 - Using Creds from Binding Secret



Design Issues - API Aggregation

- CRDs didn't exist yet, TPRs were buggy
- Didn't want Service Catalog to have access to the main etcd in Kube for security reasons
- Solution: implement our own apiserver, use API aggregation to hook it in
- Allows normal interaction, i.e. `kubectl create -f serviceinstance.yml`

Design Issues - GUIDs vs. Names

- Kube names are fixed
- OSB API resources have mutable names, and fixed GUIDs
- Service Catalog types use OSB API GUID as the name, and have a mutable ExternalName field
- svcat cli tool alleviates this pain by referencing human-readable ExternalNames as much as possible

```
metadata:
```

```
  name: 12kbac-adad12kbasd // from the broker; immutable
```

```
  uid: affd6f9b-defe-11e8-87bb-0242ac110007 // generated by Kube
```

```
spec:
```

```
  externalName: mysql // from the broker; can change
```

```
  externalID: 12kbac-adad12kbasd // same as metadata.name
```

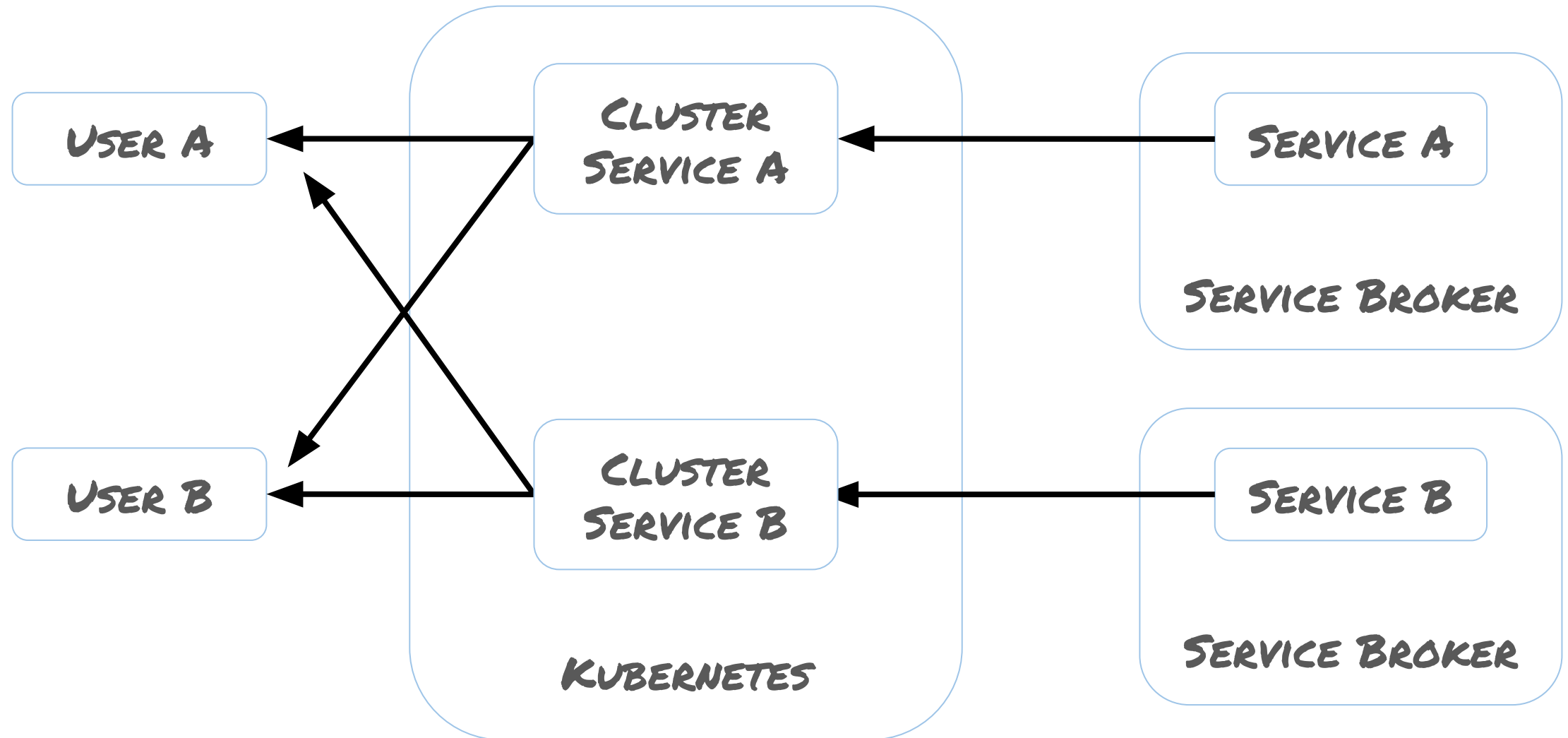
Design Issues - Broker Synchronization

- Kube isn't the sole source of truth
- Declarative control flow allows users to manipulate Service Catalog resources at-will
- Broker can still reject these changes
- Ongoing work to fix these sync issues

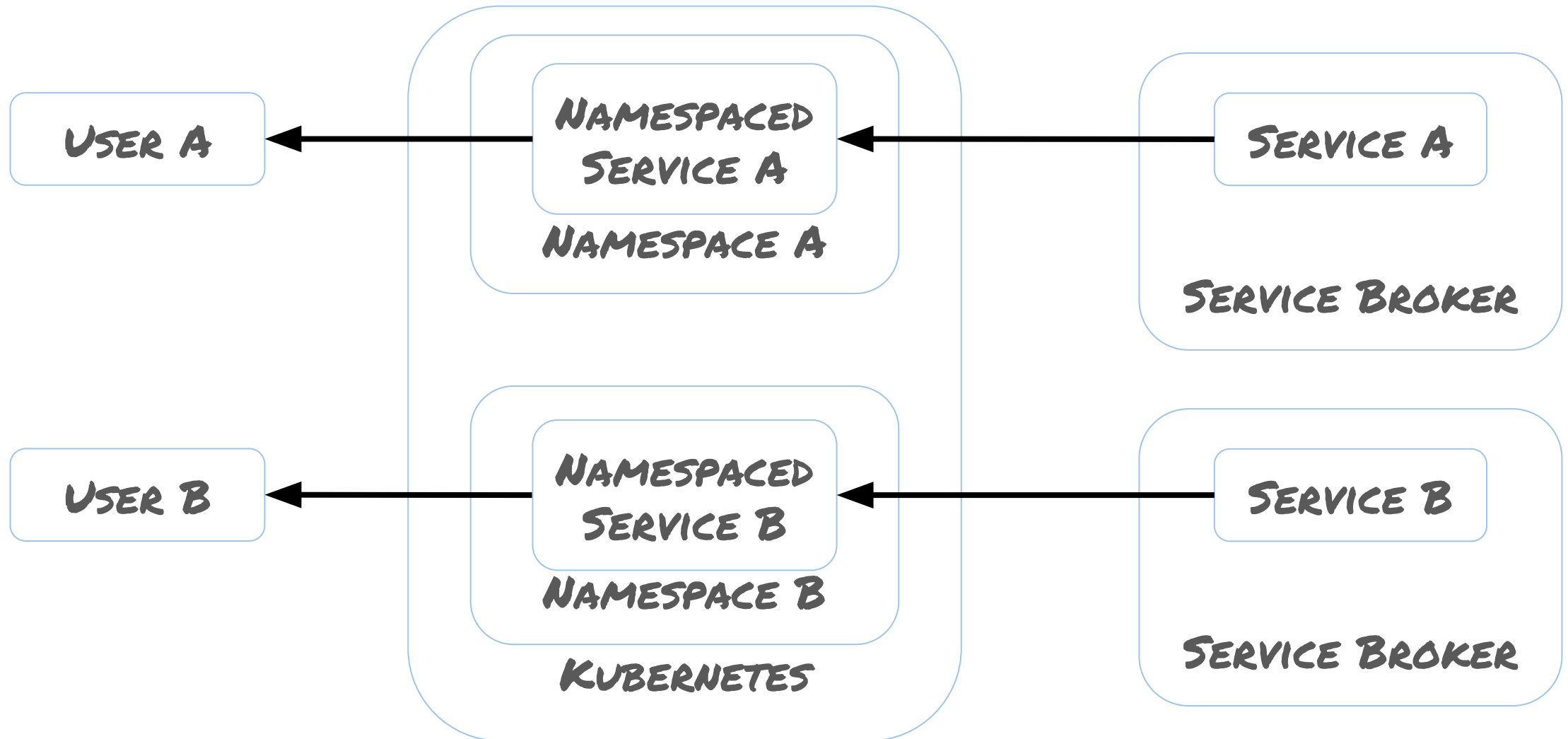
Recent Features - Service Curation

- Original resource types available cluster-wide
- Allow Kube operators and users to grant selective access to service brokers/classes/plans
 - Namespaced brokers
 - Catalog Restrictions

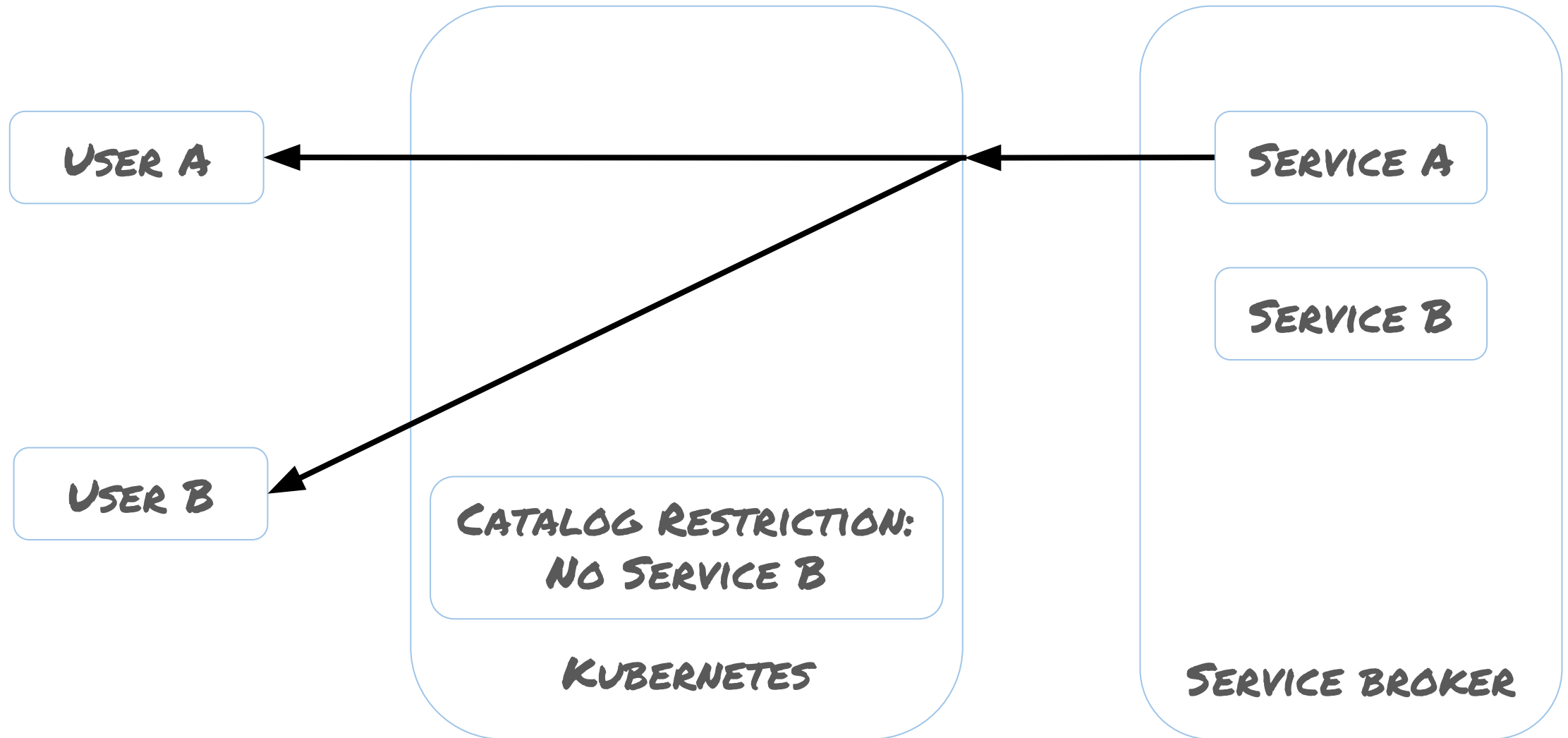
Cluster Service Brokers



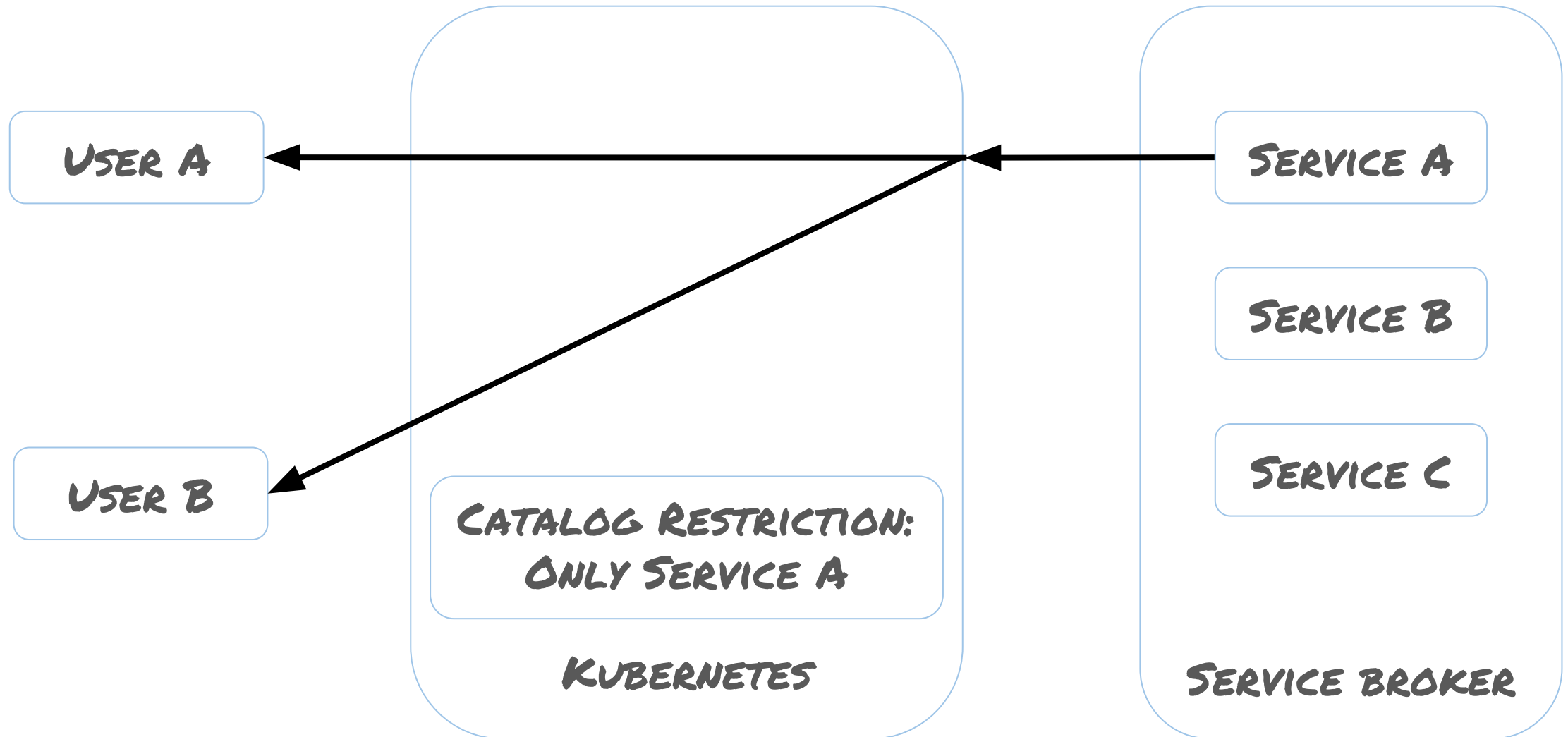
Namespaced Service Brokers



Catalog Restrictions



Catalog Restrictions



svcat

- CLI to allow for CRUD of Brokers, Classes, Plans, Instances, Bindings
- Additional commands for non k8s-like features, such as viewing the marketplace of services

```
jberkhahn@Purgatory> svcat marketplace
```

| CLASS | PLANS | DESCRIPTION |
|---------|---------|------------------------|
| mysql | 5-7-14 | Helm Chart for mysql |
| mariadb | 10-1-26 | Helm Chart for mariadb |
| | 10-1-28 | |
| | 10-1-29 | |
| | 10-1-30 | |
| | 10-1-31 | |
| | 10-1-32 | |
| | 10-1-33 | |

Future Plans

- Investigating use of CRDs to replace aggregated API server
- Improve synchronization between Kube and brokers
- Default parameters to allow for operator creation of custom classes/plans
- Pod presets
- Coming up on 1.0.0

Questions

More information:

- <https://svc-cat.io>
- <https://github.com/kubernetes-incubator/service-catalog>
- <https://www.openservicebrokerapi.org/>
- If you're interested in contributing, we host weekly SIG meetings at 1:00 PM PST at <https://zoom.us/j/7201225346>