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# SIG Multicluster Intro & Deep Dive

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We'll cover:

- What this SIG is about
  - Our approach
  - ClusterSet: our fundamental building block
- Current activity
  - About API
  - Multicluster Services API
  - Cluster Inventory / ClusterProfile API
  - Work API
- How to follow and contribute
- Q&A!



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# What this SIG is about

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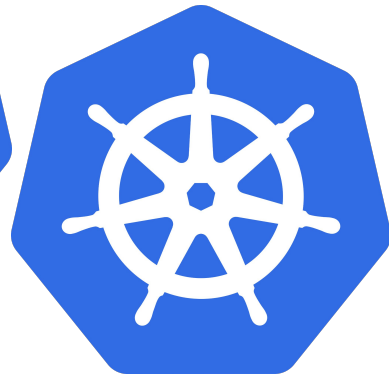


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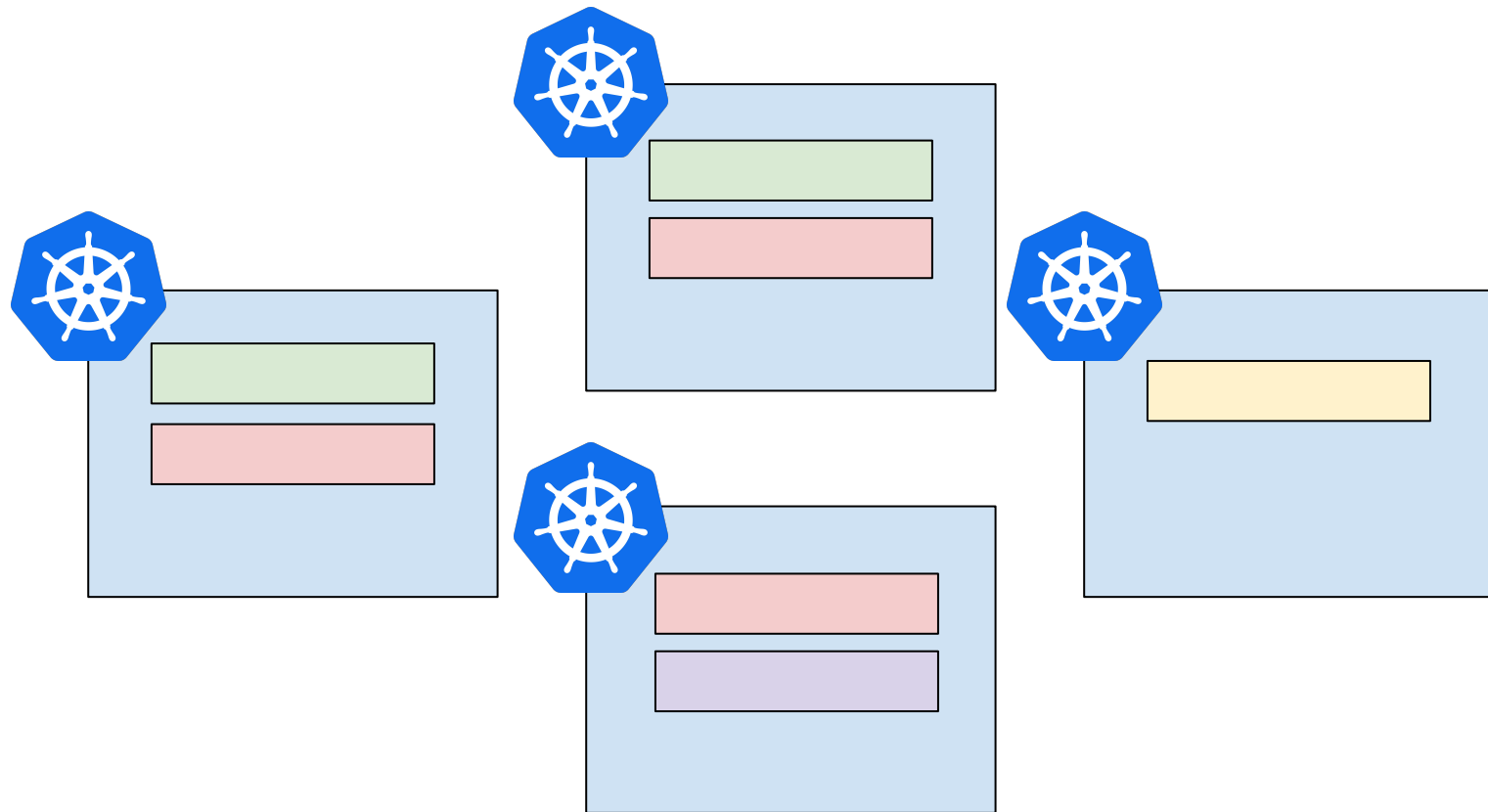


# What this SIG is about

- Multi-cluster is everywhere
  - Fault tolerance
  - Data locality
  - Policy
  - Capacity
  - Performance
- Kubernetes was built with the Cluster as the Universe
  - We've made some progress, but there's a long way to go
- We need your input!
  - Real user stories and use cases are extremely valuable
  - Tell us what you're working on!

# Our approach

- Focus on APIs
  - The ecosystem is diverse, make room for customization
- Avoid solving any optional problems
  - “This could be useful” is an engineering fly trap!
- Consistency with existing APIs
- Composable building blocks





- ClusterSet represents a pattern of use from the field:
  - A group of clusters governed by a single authority
  - High degree of trust within the set
  - [Namespace Sameness](#) applies to clusters in the set
    - Permissions and characteristics are consistent across clusters for a given namespace
    - Namespaces don't have to exist in every cluster, but behave the same across those in which they do



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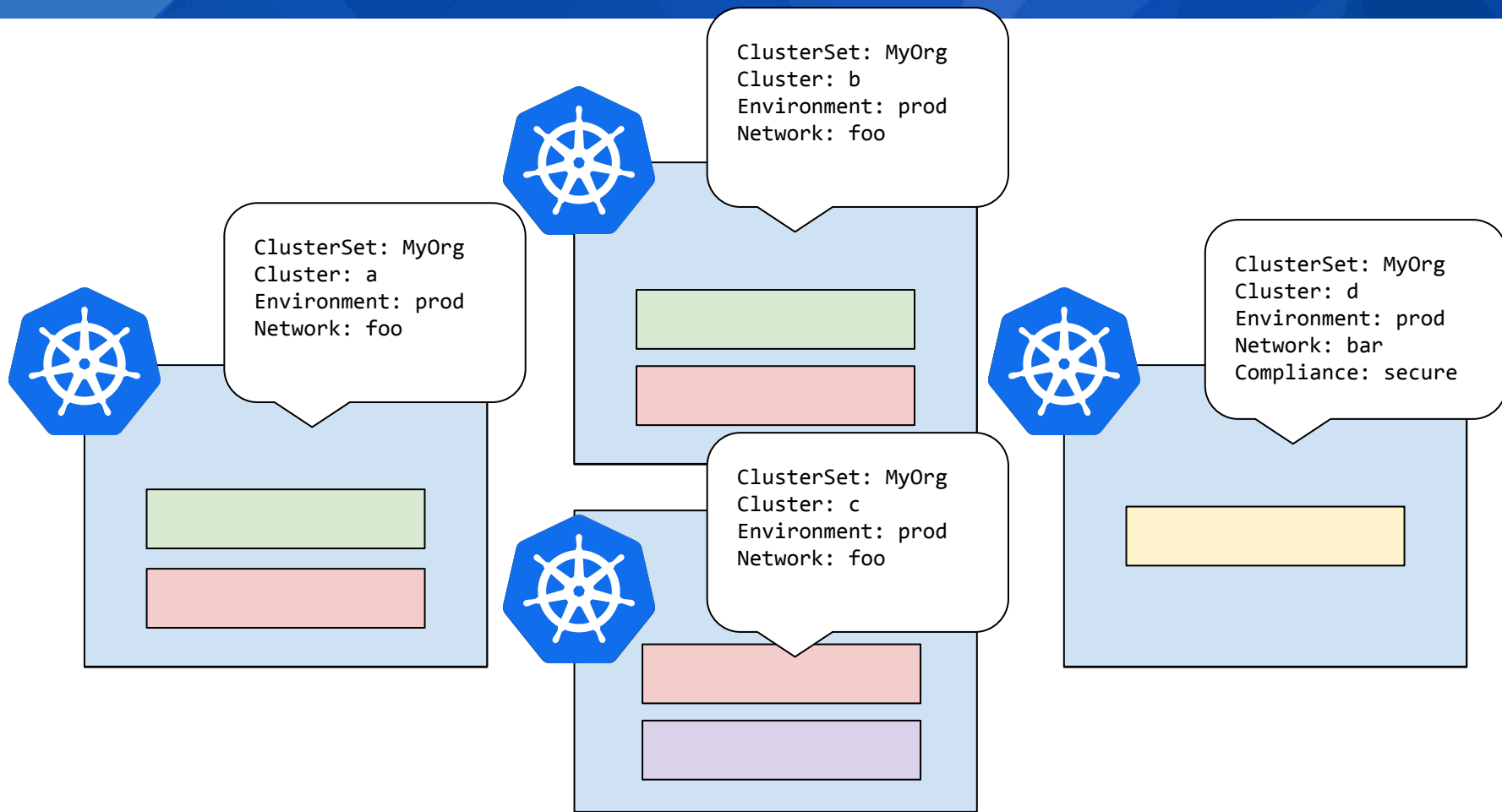


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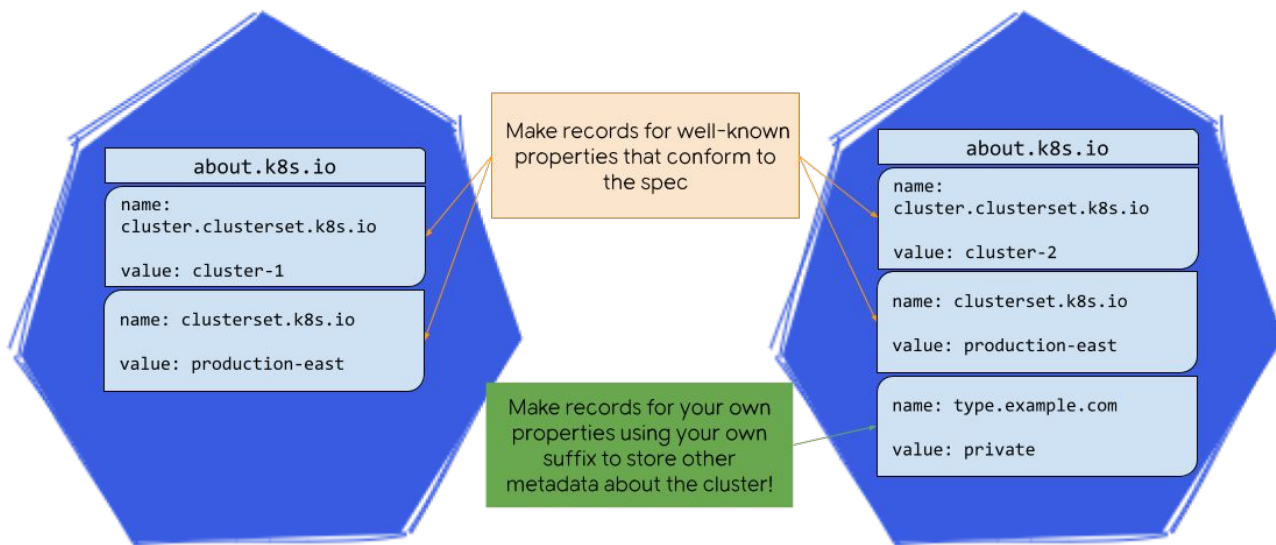
# Current projects

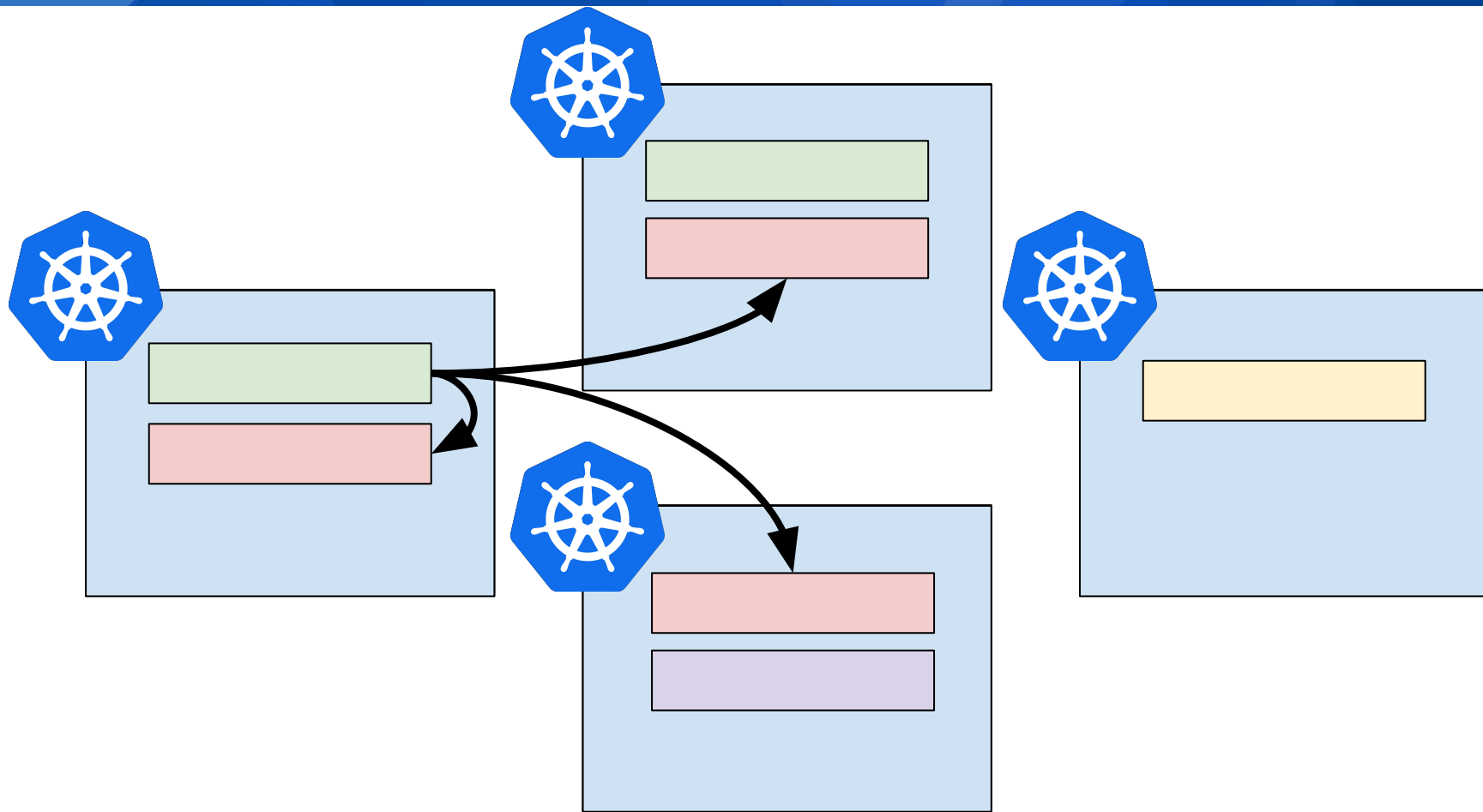
# About API



# About API: cluster-local cluster metadata

- [KEP-2149](#)
- Available at [sigs.k8s.io/about-api](https://sigs.k8s.io/about-api) in **Beta**





- [KEP-1645](#) and [sigs.k8s.io/mcs-api](https://sigs.k8s.io/mcs-api)
- Implemented by Submariner, GKE, Istio, AWS, Antrea, Cilium coming soon, and ✨your thing? ✨
- Work in progress
  - [V1 Alpha2](#) to handle ServiceImport's inherited Service properties (previously in spec)
  - Various backward-compatible [improvements](#) are also in-flight
  - MCS + Gateway integration needs to be finalized
  - Thank you to [@mikemorris](#), [@MrFreezeex](#), [@tpantelis](#), [@nojn huh](#), [@jackfrancis](#)

# MCS + Gateway

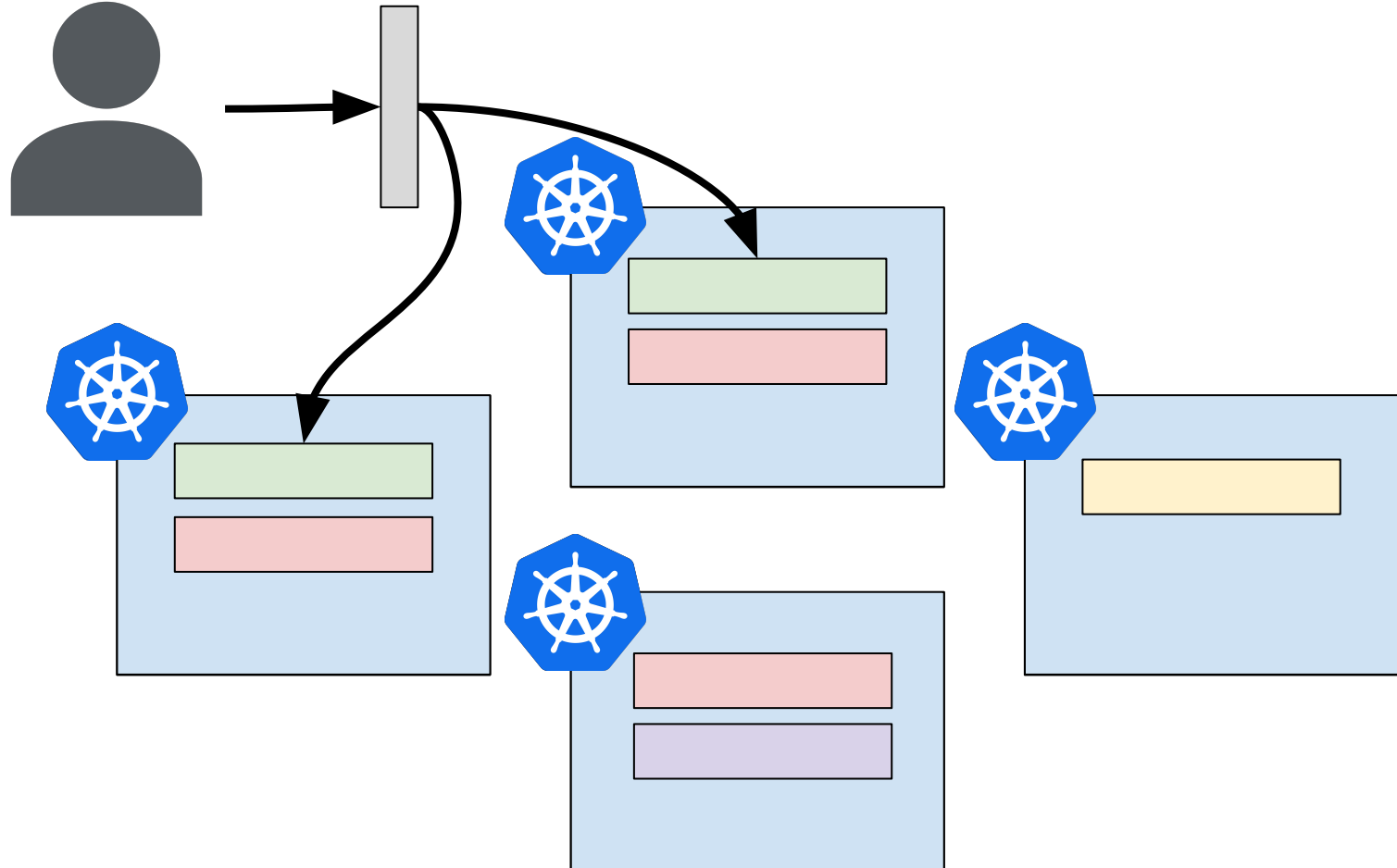


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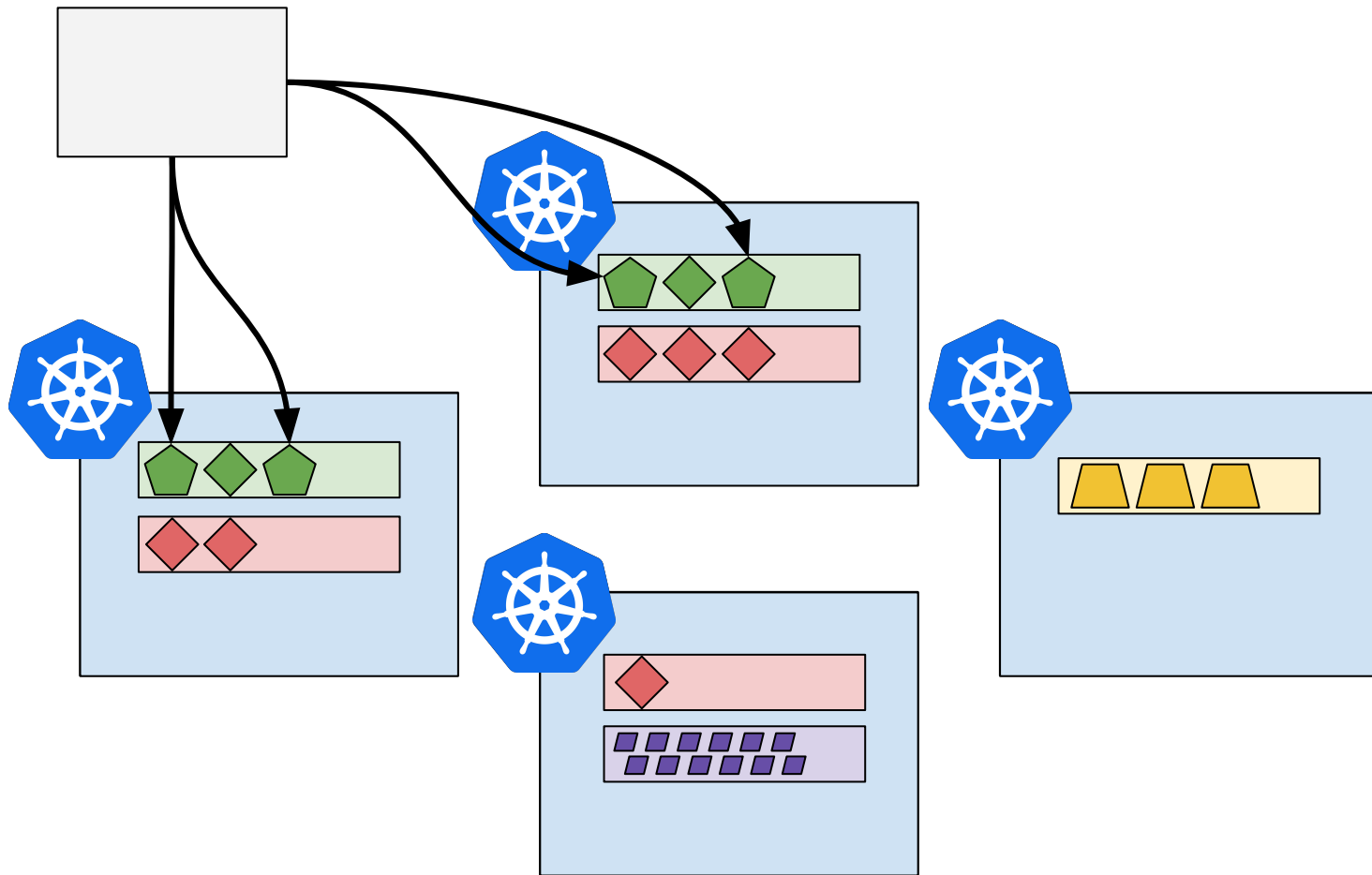


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# Orchestration





- History from different angles:
  - Cluster-registry
    - Early attempt, lack of clear use case
  - Kubefed
    - Some use, too broad, development stalled
- Clear demand exists for multi-cluster orchestration, but what comes next?
- **Cluster Inventory ([KEP-3442](#))** *(new)*
  - New proposal from several groups/projects
  - We have a talk tomorrow specifically for Cluster Profile API
    - 2:30pm - 3:05pm MST [Salt Palace | Level 1 | 155 B](#)
  - Opportunity to help steer — come work with us!

# Cluster Profile API

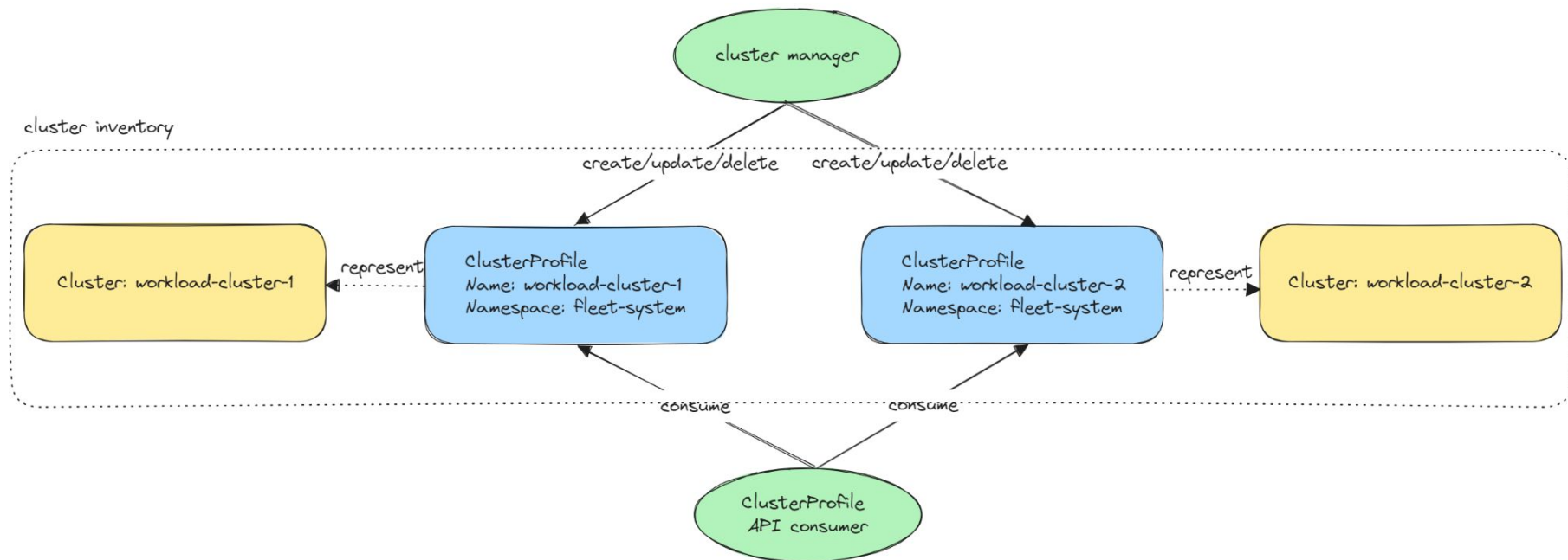


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# Cluster Profile & Friends

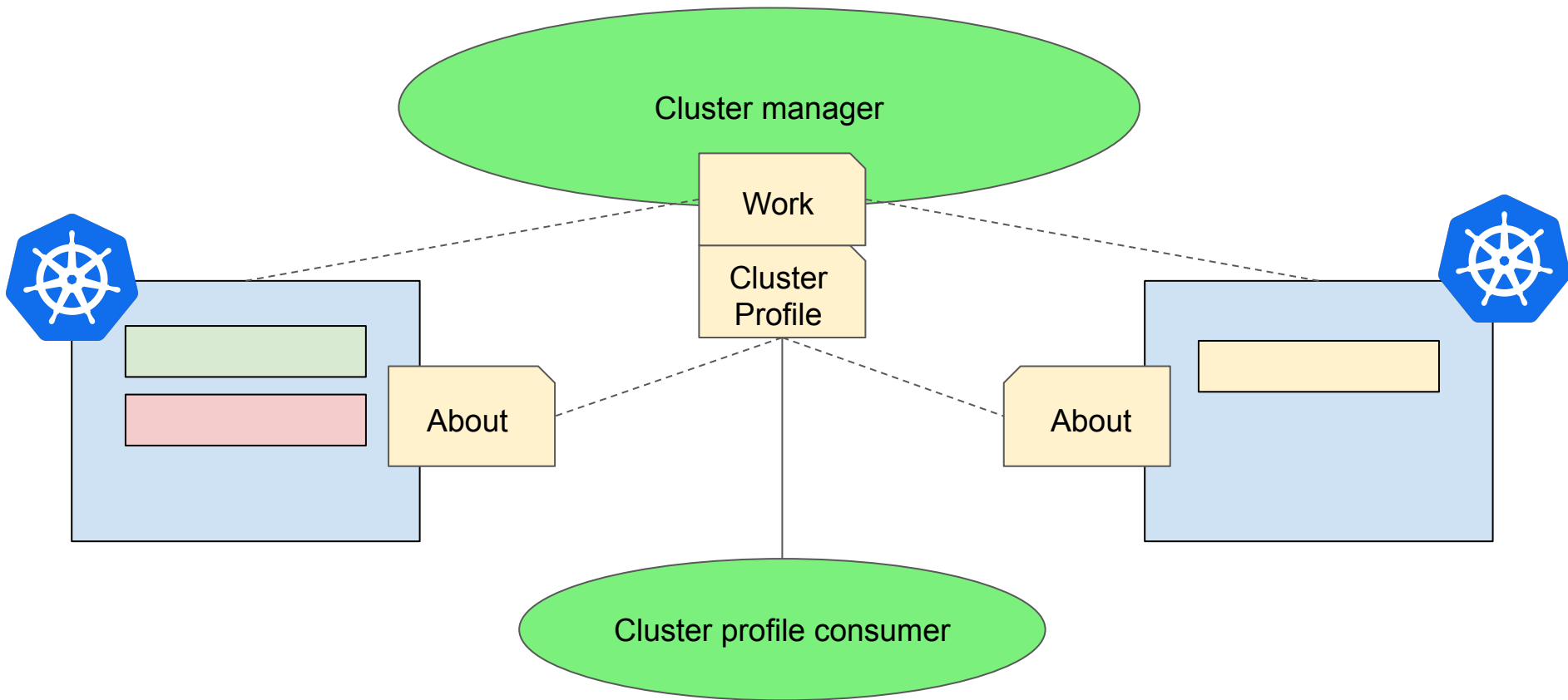


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# What's next?

# What's Next?

- Cluster Profile API tie ins with other SIG projects
  - [Work API](#)
  - [About API](#)
- Canonical patterns?
  - We've got tools, how do you use them?
  - Are there patterns or workflows we should recommend?
- Leader election across clusters
  - Global controller management needs coordination
- What else do we need to start operating above the cluster?



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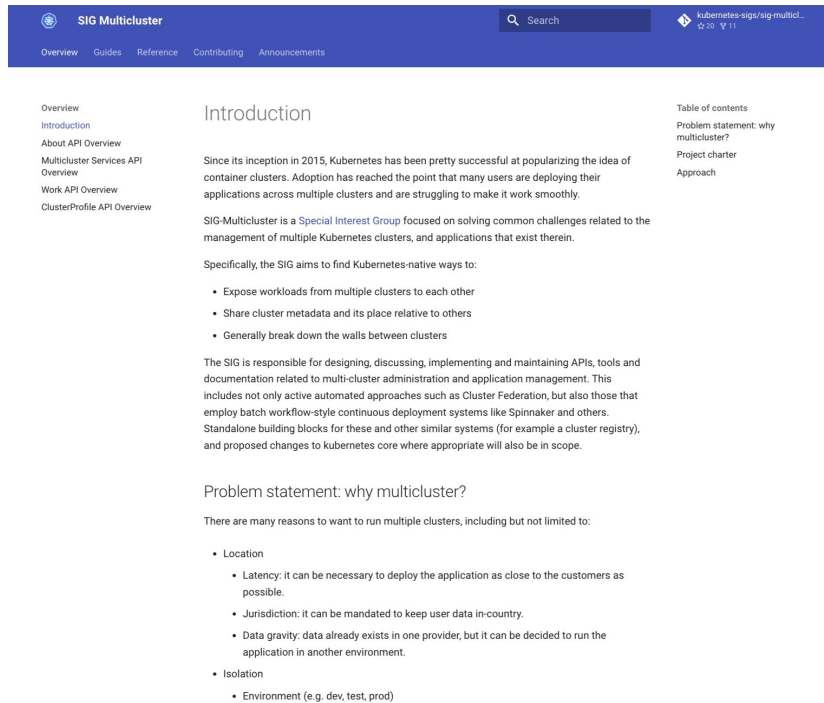
# Follow and get involved

# Be part of the SIG

- What are you working on?
  - Tools you're building, tools you're missing - agenda is always open for demos!
- What problems do you or your customers have?
- Do you have unique needs that have been overlooked?
- Do you want to help?
  - Contribute to the test suite(s)
  - Add information to the web site

# Be part of the SIG

- Home page:  
<https://multicluster.sigs.k8s.io>
- Slack channel:  
<https://kubernetes.slack.com/messages/sig-multicluster>
- List:  
<https://groups.google.com/forum/#!forum/kubernetes-sig-multicluster>
- Meetings are biweekly Tuesdays, 12:30 Eastern, 9:30 Pacific, 16:30 UTC
  - Next one in two weeks



The screenshot shows the SIG Multicluster website. The header includes the SIG Multicluster logo, a search bar, and navigation links for Overview, Guides, Reference, Contributing, and Announcements. The main content area is titled "Introduction" and contains the following text:

Since its inception in 2015, Kubernetes has been pretty successful at popularizing the idea of container clusters. Adoption has reached the point that many users are deploying their applications across multiple clusters and are struggling to make it work smoothly.

SIG-Multicluster is a *Special Interest Group* focused on solving common challenges related to the management of multiple Kubernetes clusters, and applications that exist therein.

Specifically, the SIG aims to find Kubernetes-native ways to:

- Expose workloads from multiple clusters to each other
- Share cluster metadata and its place relative to others
- Generally break down the walls between clusters

The SIG is responsible for designing, discussing, implementing and maintaining APIs, tools and documentation related to multi-cluster administration and application management. This includes not only active automated approaches such as Cluster Federation, but also those that employ batch workflow-style continuous deployment systems like Spinnaker and others. Standalone building blocks for these and other similar systems (for example a cluster registry), and proposed changes to Kubernetes core where appropriate will also be in scope.

Problem statement: why multicluster?

There are many reasons to want to run multiple clusters, including but not limited to:

- Location
  - Latency: it can be necessary to deploy the application as close to the customers as possible.
  - Jurisdiction: it can be mandated to keep user data in-country.
  - Data gravity: data already exists in one provider, but it can be decided to run the application in another environment.
- Isolation
  - Environment (e.g. dev, test, prod)

On the right side of the page, there is a "Table of contents" section with links to "Problem statement: why multicluster?", "Project charter", and "Approach".





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Feedback



<https://sched.co/1hove>

**Thanks!**



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