
KubeCon
CloudNativeCon
North America 2024


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SIG Multicluster Intro & Deep Dive

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Welcome!

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!

What this SIG is about

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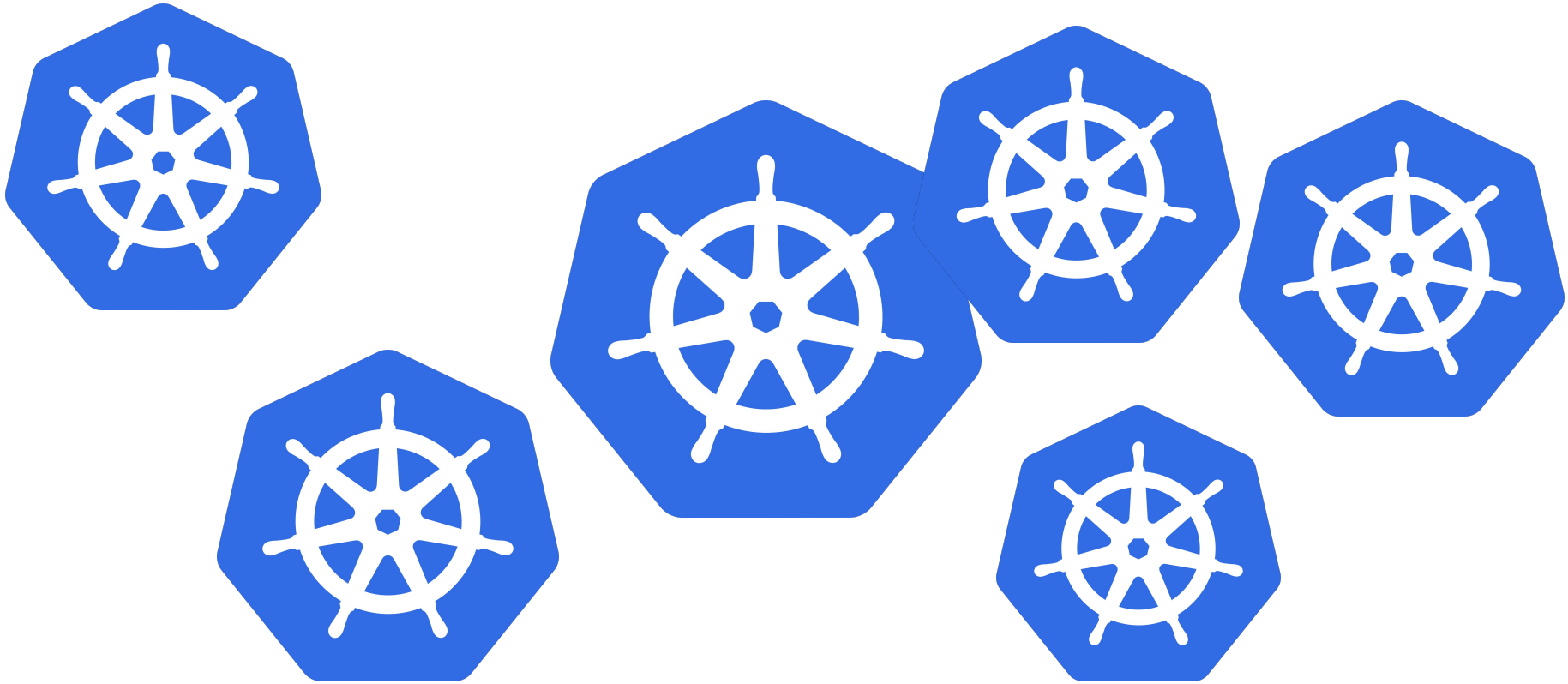


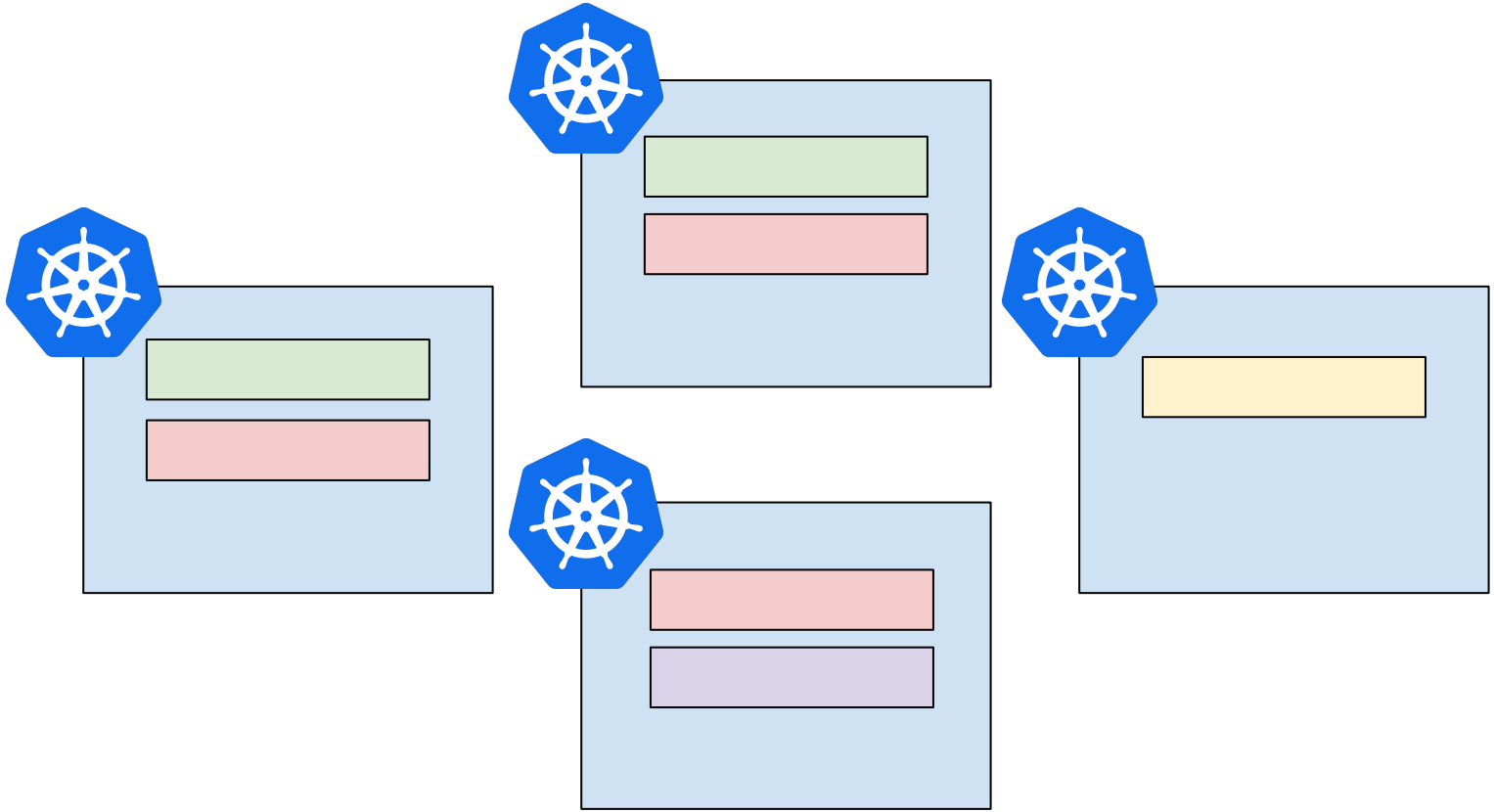
What this SIG is about

- 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

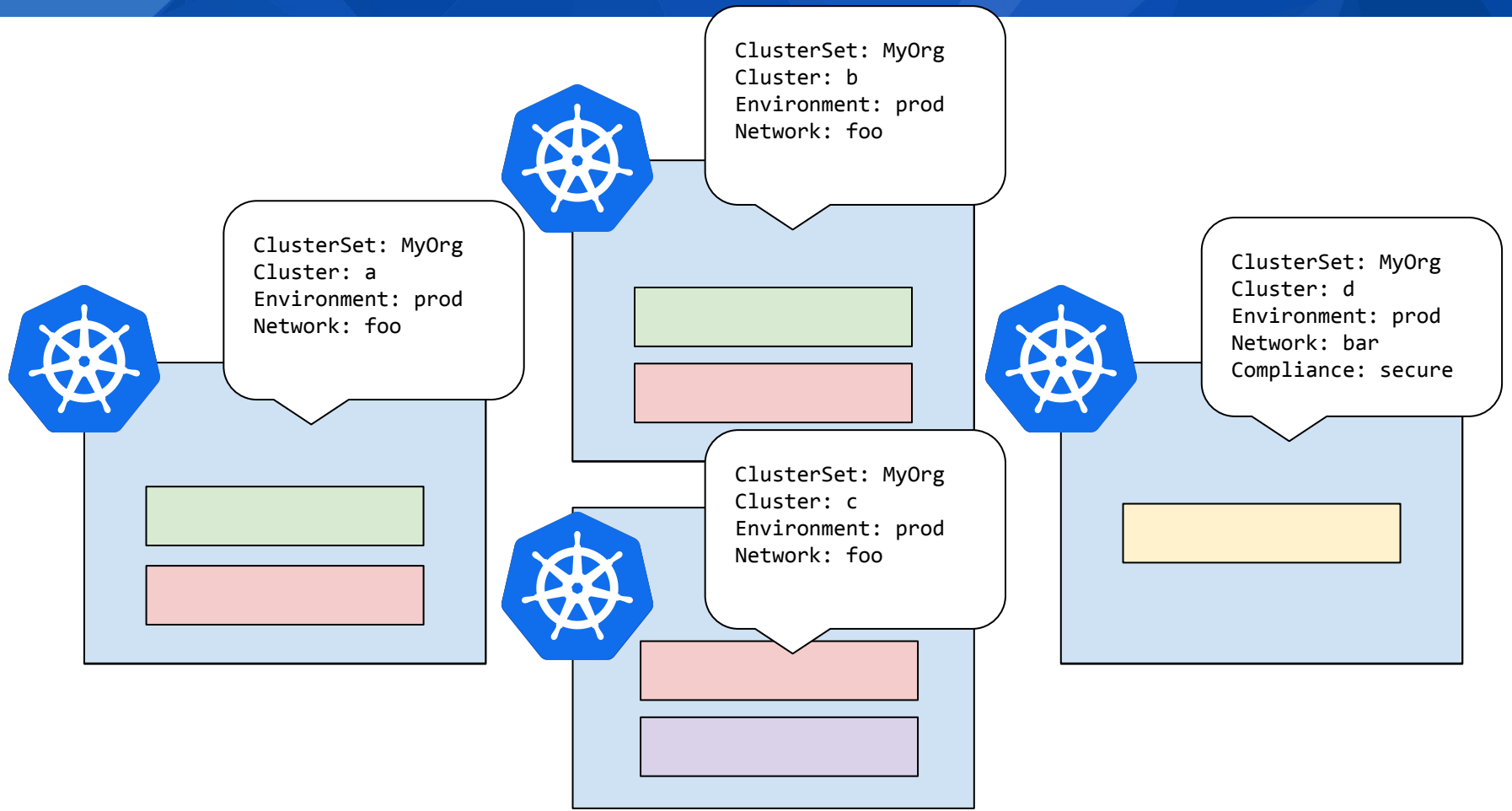


ClusterSet

- 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

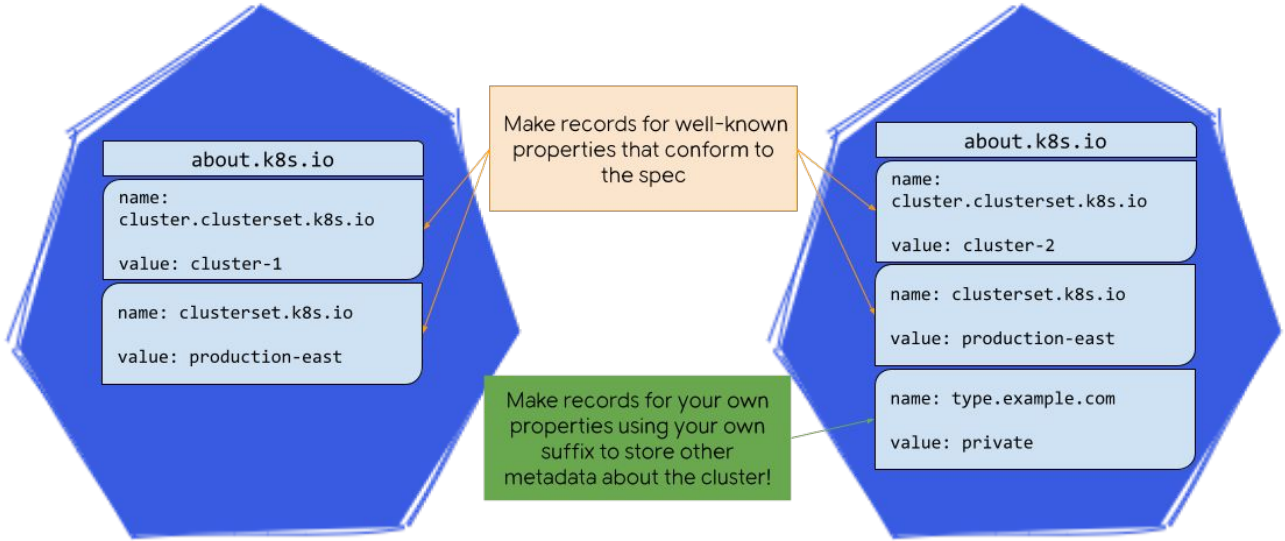
Current projects

About API

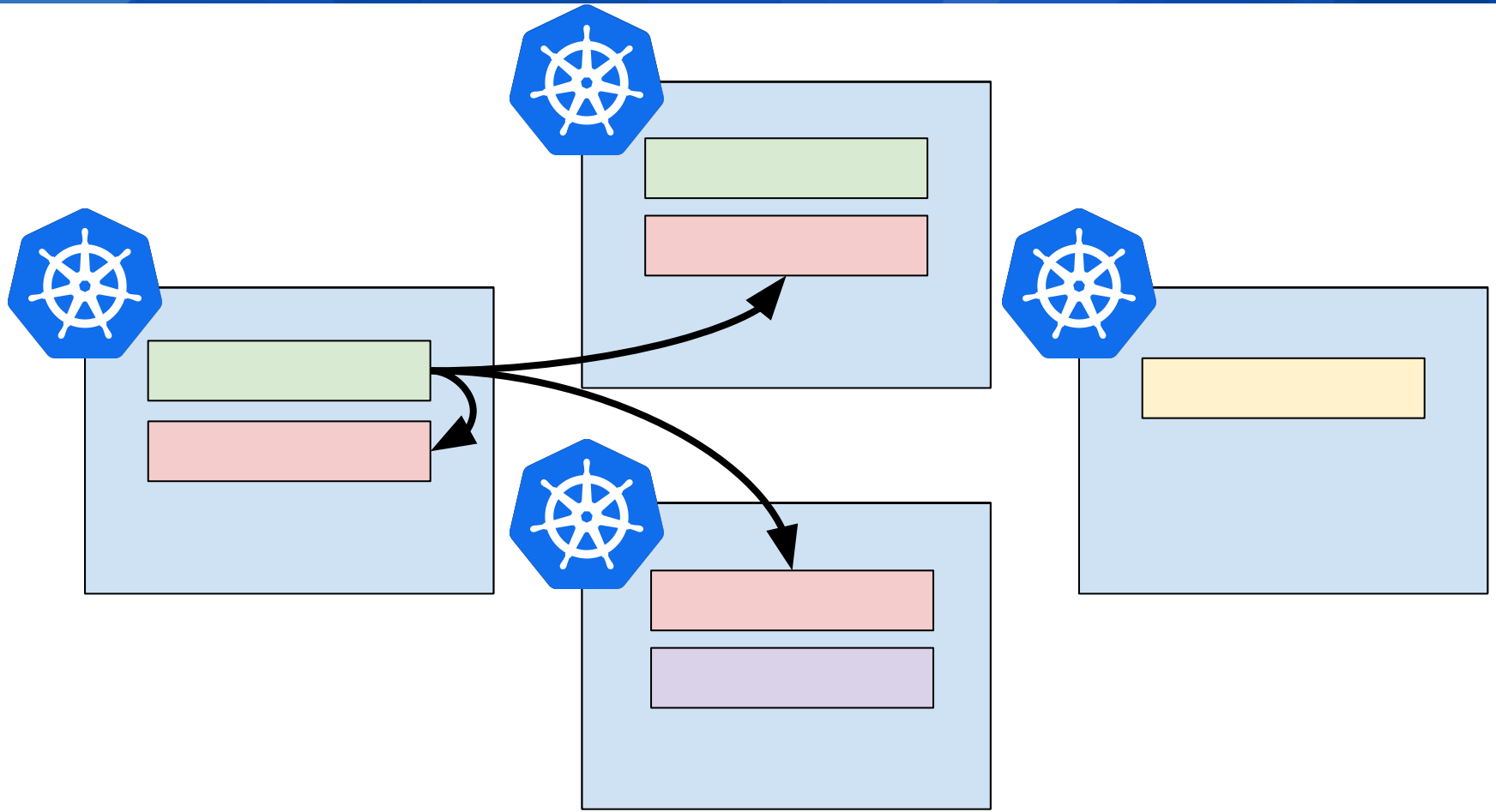

ClusterSet: MyOrg
Cluster: a
Environment: prod
Network: foo
ClusterSet: MyOrg
Cluster: b
Environment: prod
Network: foo
ClusterSet: MyOrg
Cluster: c
Environment: prod
Network: foo
ClusterSet: MyOrg
Cluster: d
Environment: prod
Network: bar
Compliance: secure

About API: cluster-local cluster metadata

- KEP-2149
- Available at sigs.k8s.io/about-api in ***Beta***



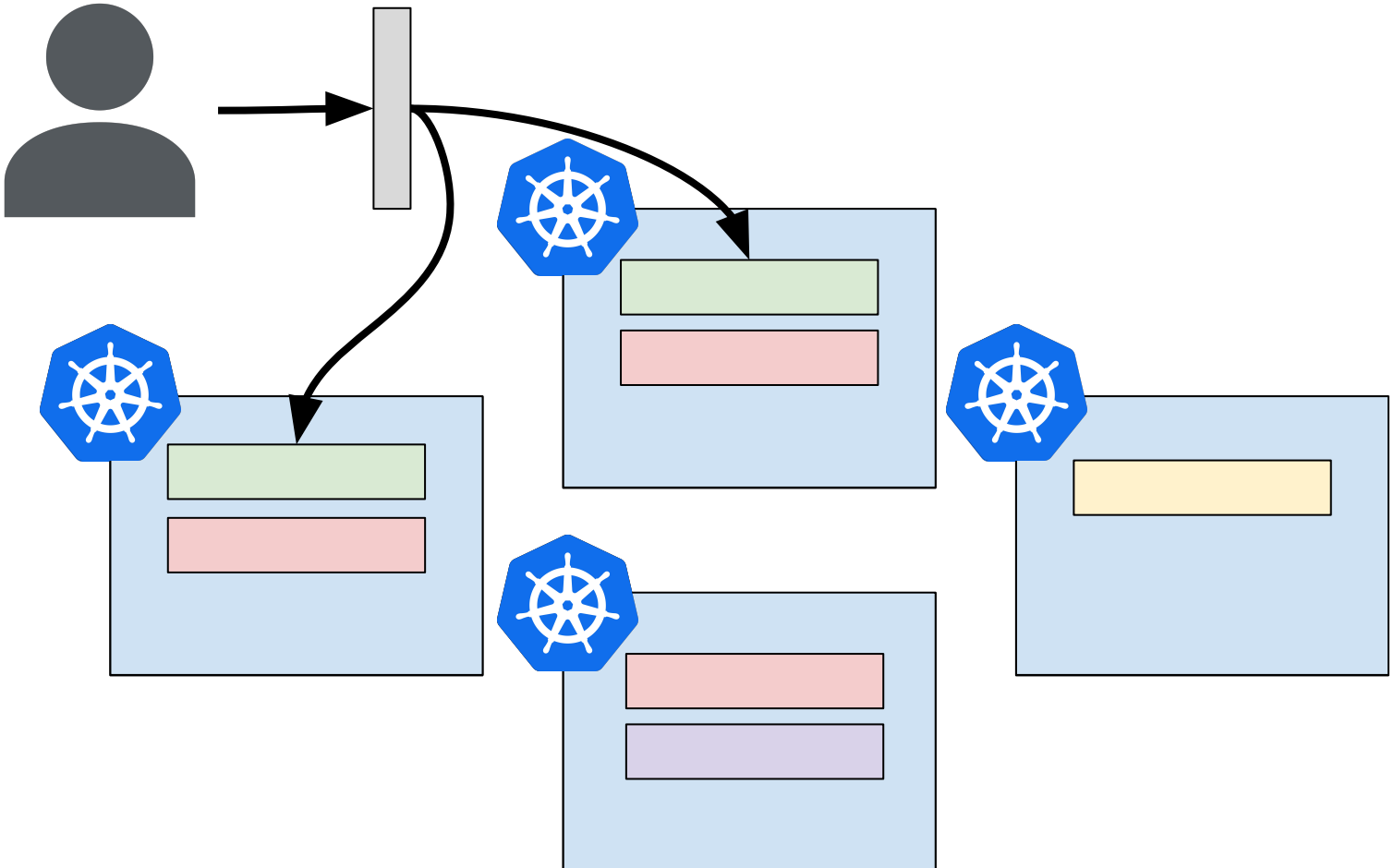
MC Services API



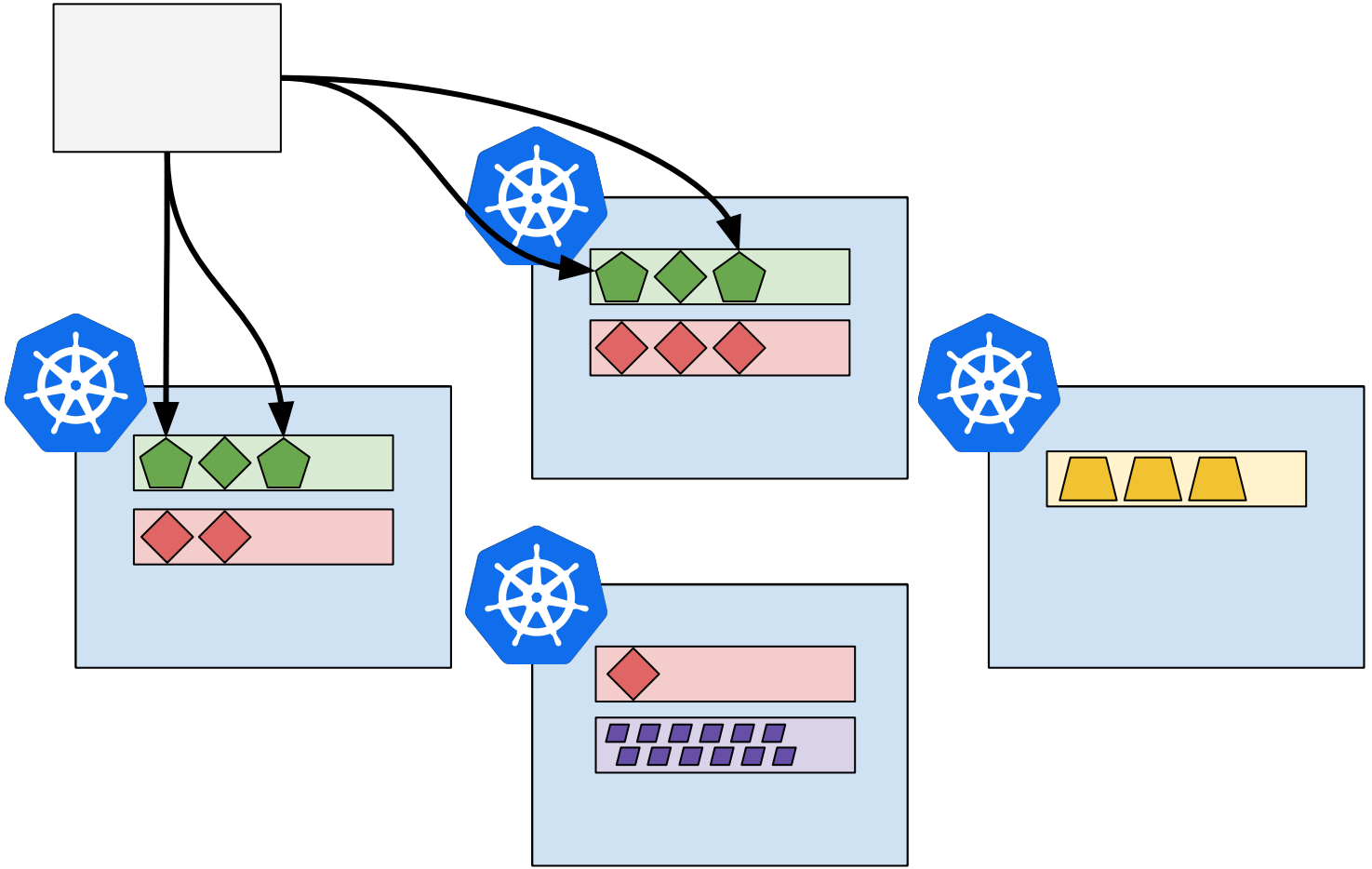
MC Services API

- KEP-1645 and 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, @nojnhuh, @jackfrancis

MCS + Gateway



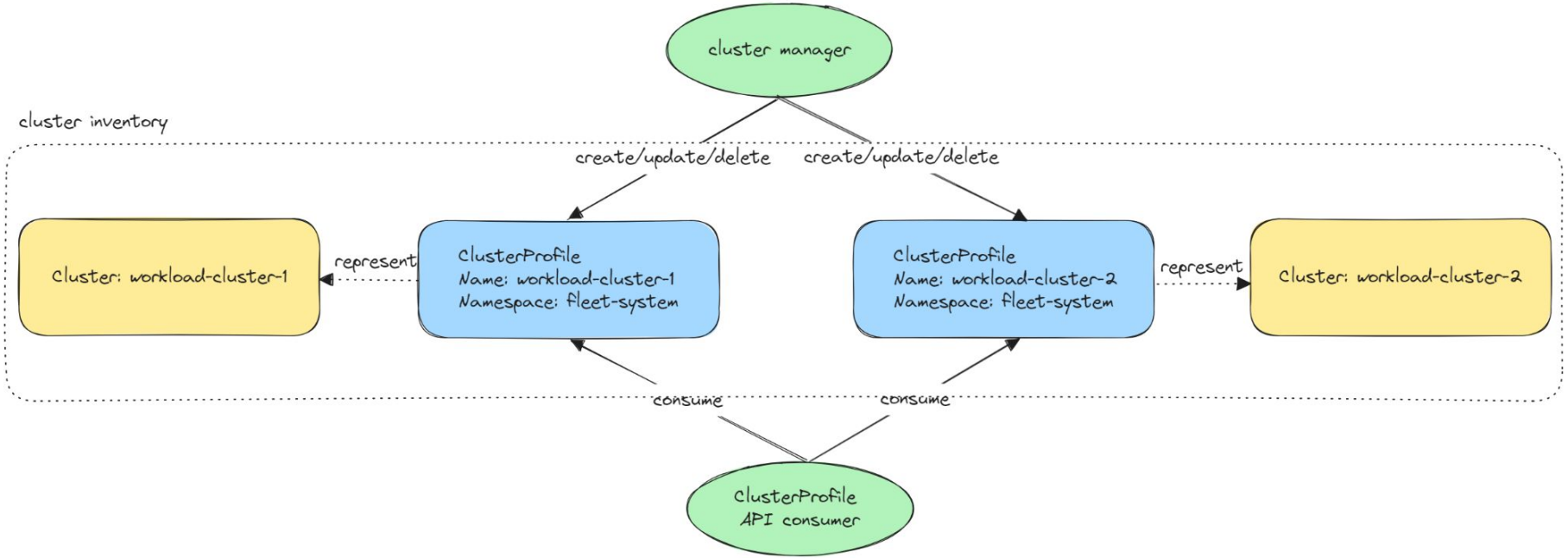
Orchestration



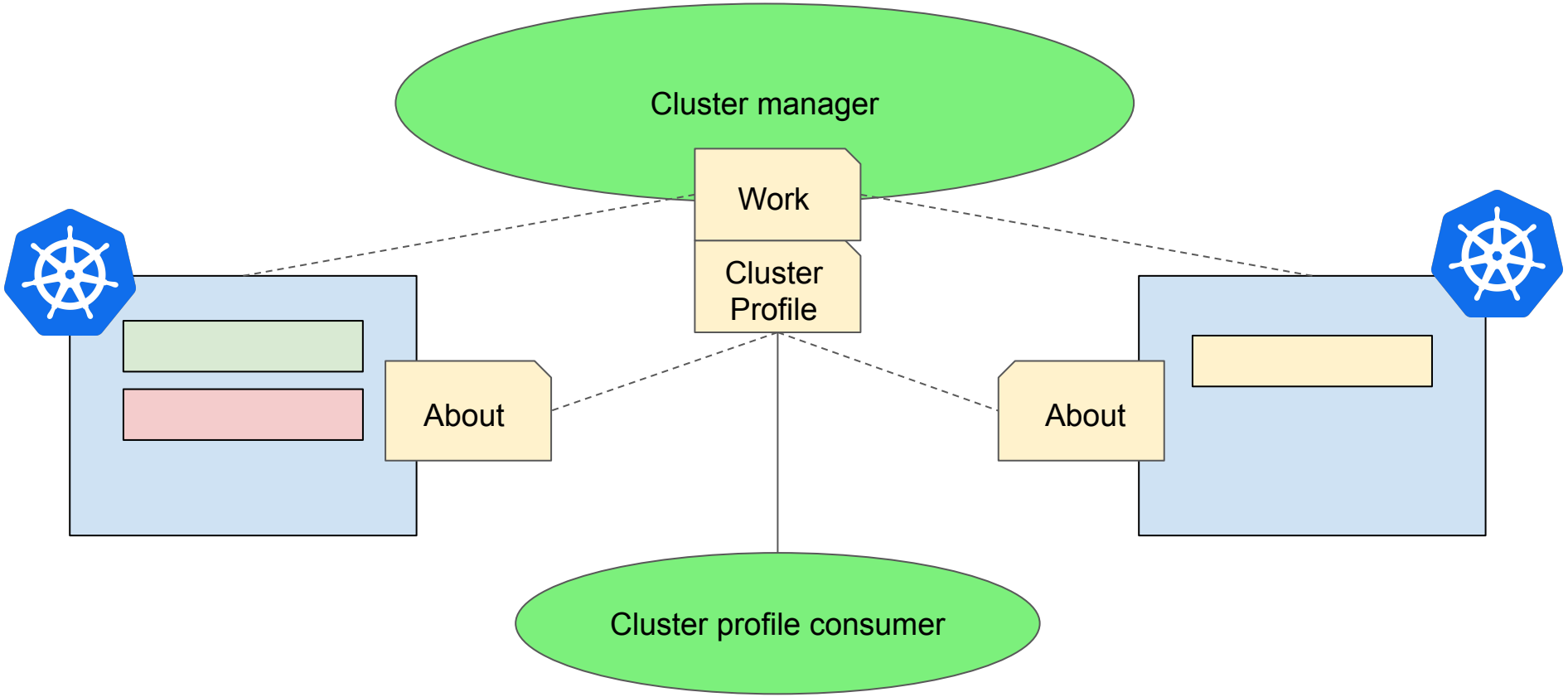
Orchestration

- 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



Cluster Profile & Friends



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?

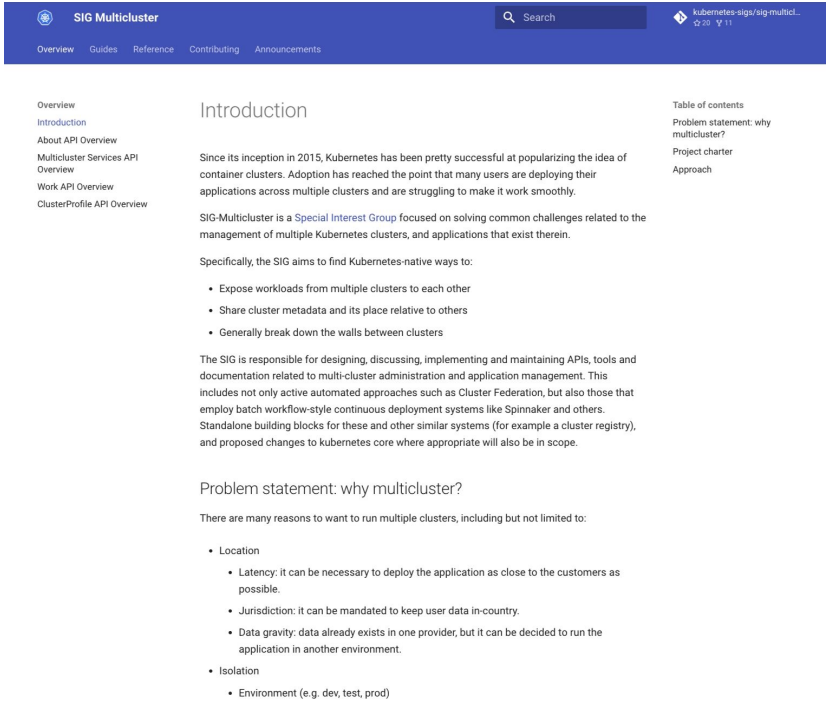
Follow and get involved

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

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Feedback
https://sched.co/1hove
Thanks!