CUG25 BOF - Kubernetes on HPE Supercomputers

5

Agenda

- Welcome and introductions (setup mentimeter)
- Poll and Q&As
- Presentation from HPE, CSCS and Bristol on status and use cases
- Close and next steps

Signposting relevant program items this week

Thursday 3:00pm-4:30pm
3:30pm: HPE Slingshot in the Kubernetes Ecosystem

Caio Davi and Jesse Treger (HPE)

Tuesday 3:00pm-5:00pm
3:30pm: Introduction To HPE Slingshot NIC Libfabric Environment Variables

Jesse Treger and Ian Ziemba (HPE)

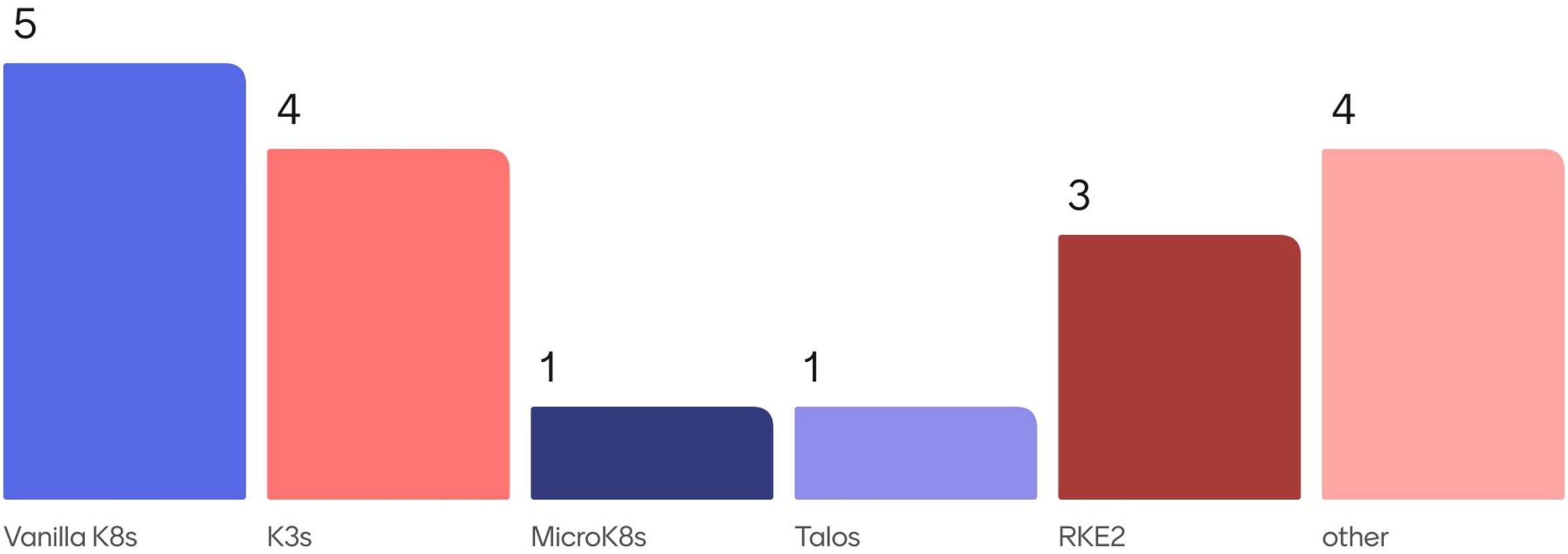
Mentimeter

Which Kubernetes distributions are you using or evaluating?

1

Mentimeter

Open Source



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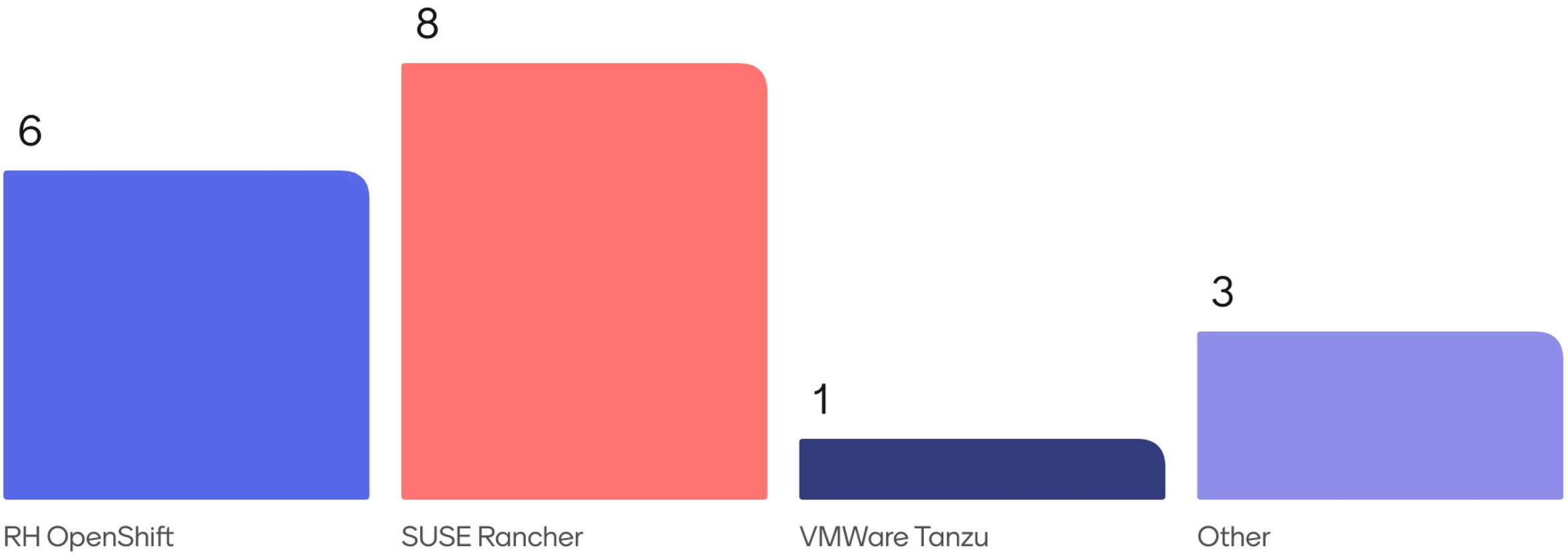
Private Cloud Managers



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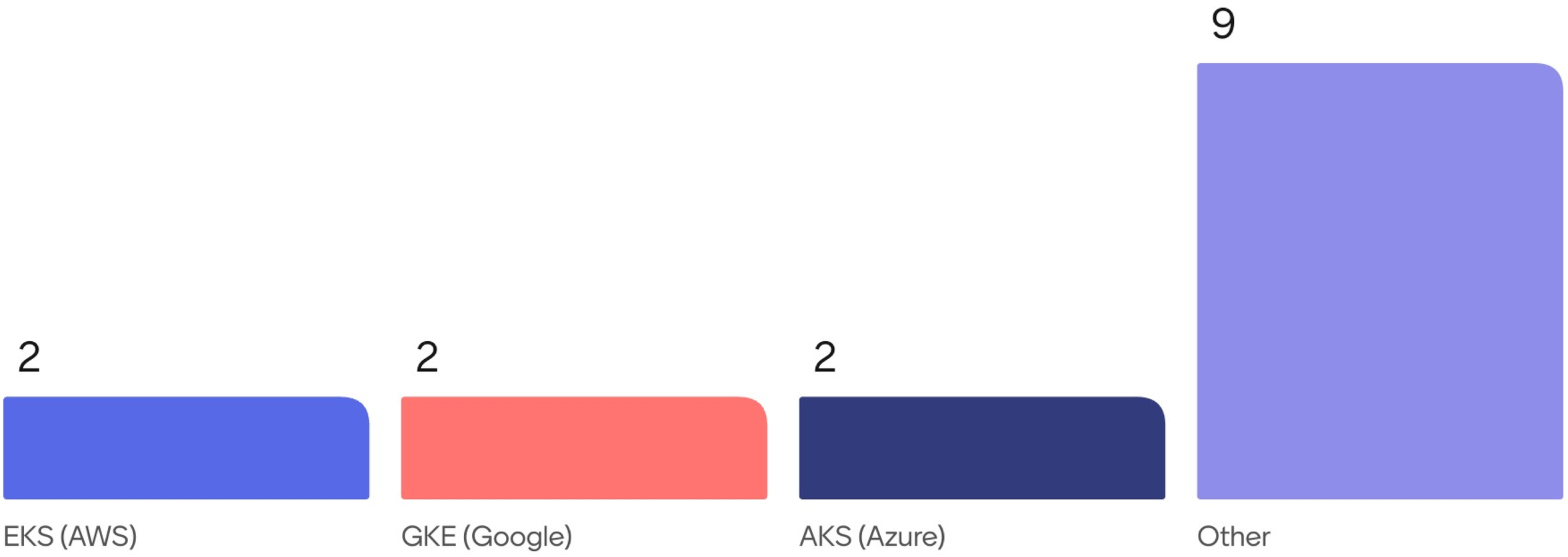
Public Cloud Managed



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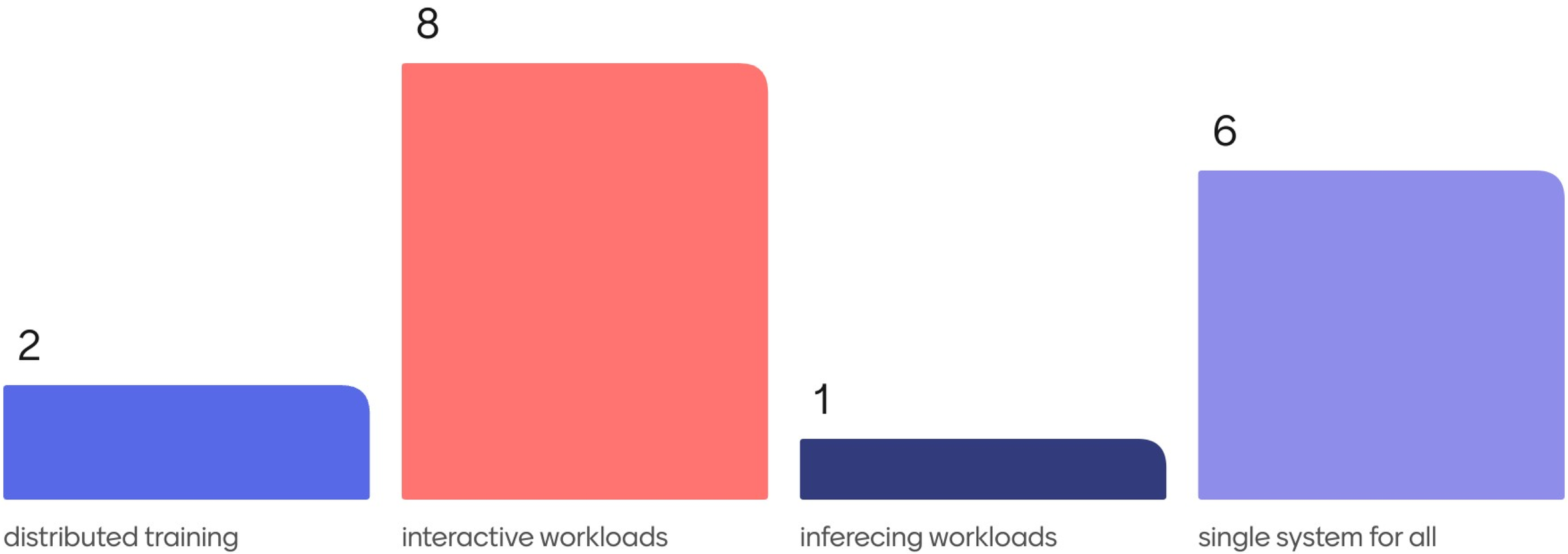
Kubernetes Use Cases at your site



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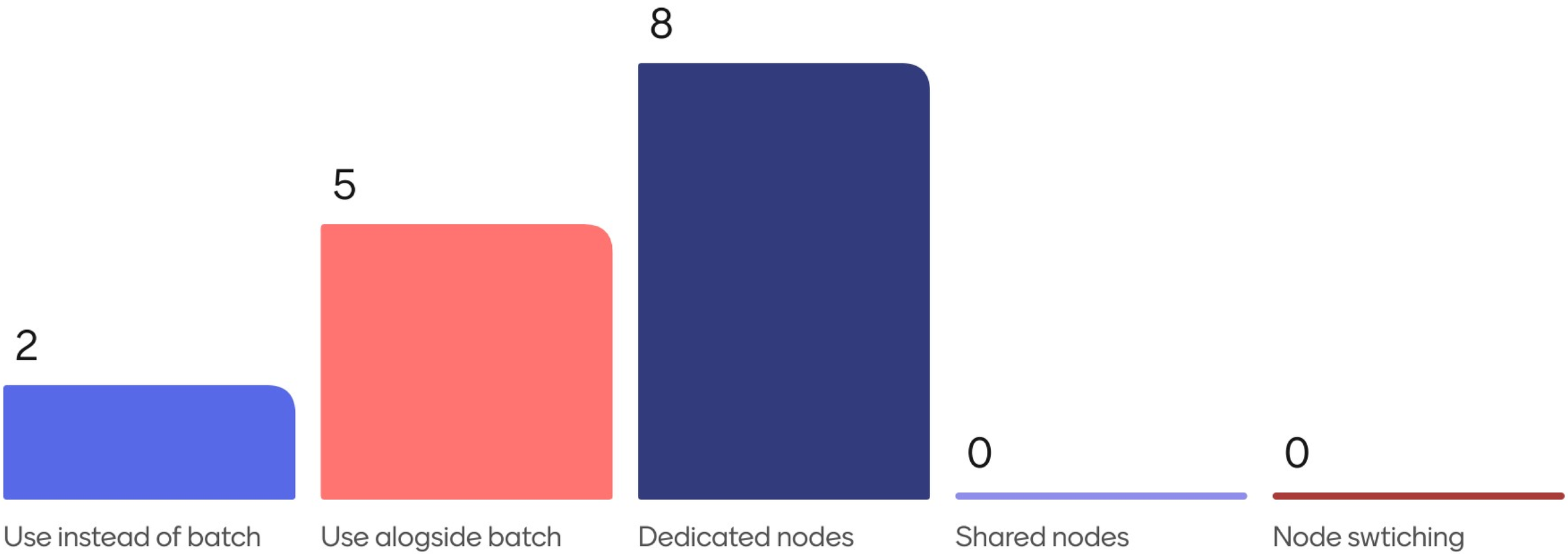
Kubernetes usage models at your site



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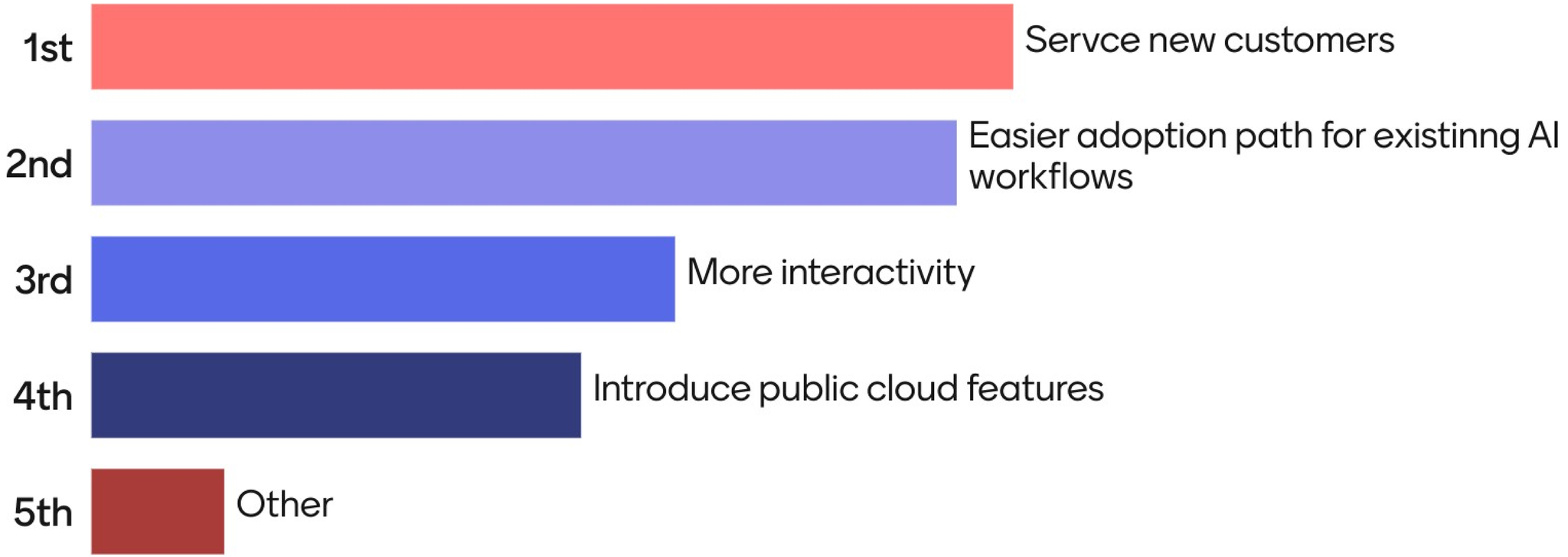
Why do you want to adopt Kubernetes?



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Advanced Job Scheduling Considerations

Kubernetes is a powerful and extensible container orchestrator that natively excels at automating the deployment, scaling, and operation of containerized applications. However, for advanced job scheduling needs, especially for batch, HPC, or AI/ML workloads, you need to extend Kubernetes with additional tools:

- **Kueue** (maintained by Google)
  - Native queuing system for batch workloads
  - Works well for ML/AI and HPC jobs
- **Volcano** (CNCF and community-driven, originally from Huawei)
  - Offers more features than Kueue for complex HPC and batch job orchestration
- **Yunikorn** (Apache)
  - Designed for large-scale scheduling in multi-tenant environments

1

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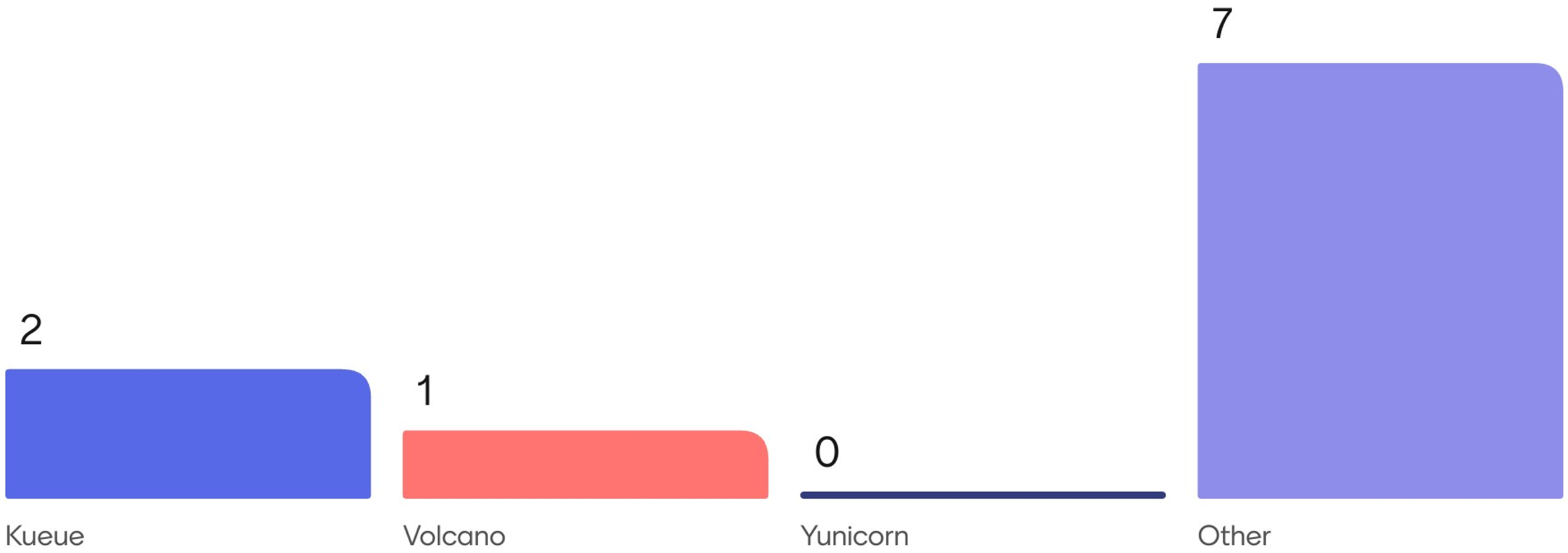
Which on do you use or plan to?



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Options for ML Workflows

- **Kubeflow**
  - Comprehensive platform for machine learning on Kubernetes
- **Argo Workflows**
  - Ideal for defining workflows where tasks have clear dependencies and execute in a specific order (DAG-style execution)

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What do you use or plan on using for ML Workflows and MLOPs?

15 responses

7

How are you handling persistent storage and data locality in Kubernetes at scale on HPC?

4 responses

csi

nfs

none

3

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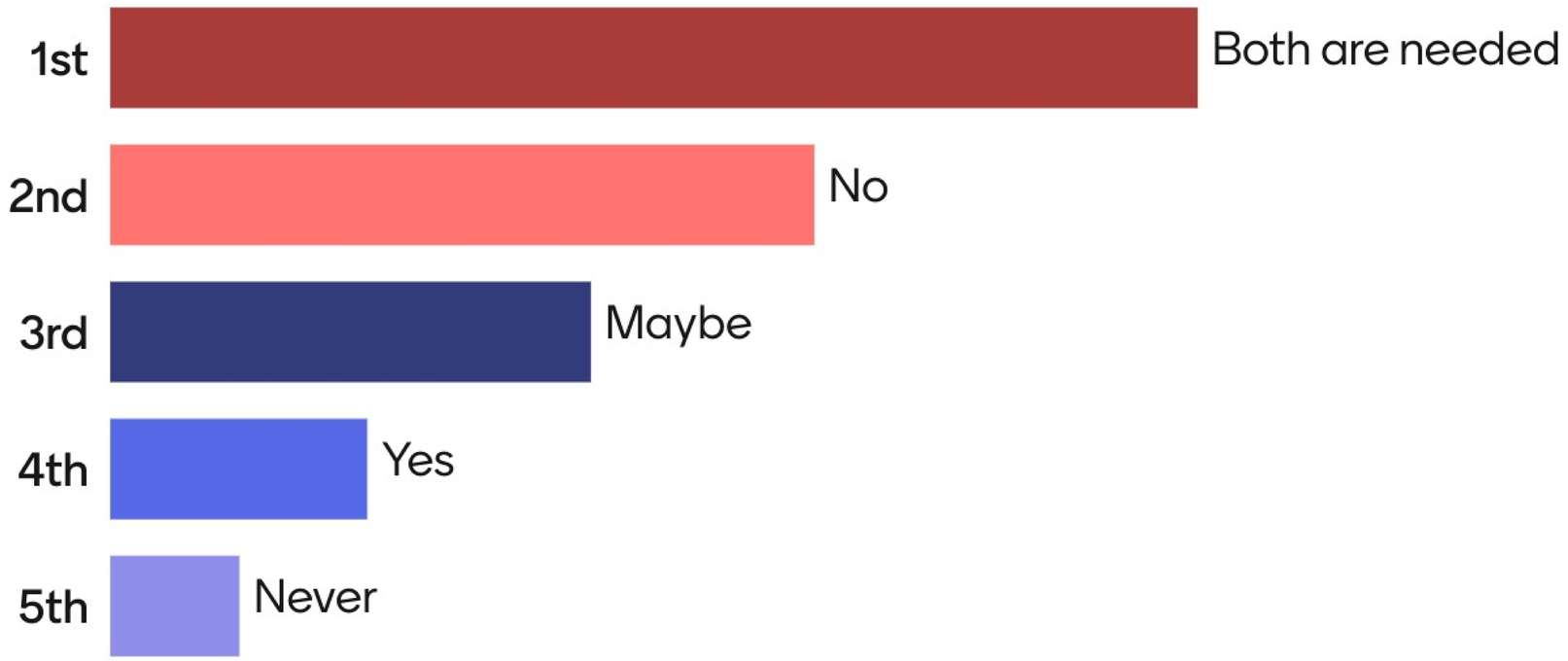
Do you see Kubernetes replacing traditional workload managers (Slurm, PBS, Condor, ...) in your environment?



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Have you extended Kubernetes with batch scheduling tools? if yes, how?

No

No

No

1

3

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What serviceability tools are you using for monitoring Kubernetes clusters and jobs?

NueVector

1

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What's on your Kubernetes "wish list"?

Other eBPF tools for security and observability

Default support for parallel GPU computation

Gradual interop with batch schedulers

3

If you'd like a copy of mentimeter poll, please contact one of the organisers

Not gathering and sharing details due to data protection and privacy policies at different institutions