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North America 2021



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# sig-autoscaling

*Joseph Burnett*

# Agenda



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1. Introduction
2. Overview of Kubernetes Autoscaling
3. Upcoming features
4. Questions

# SIG Autoscaling Introduction



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## Scope:

- horizontal and vertical pod autoscaling
- cluster-proportional system component autoscaling
- cluster autoscaling

## Chairs

- Guy Templeton, Skyscanner
- Marcin Wielgus, Google

[Community page](#)

# Overview of Autoscaling



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Horizontal Pod Autoscaler  
(HPA)  
Scale in / out



Vertical Pod Autoscaler (VPA)  
Scale up / down



Workload (Pods)

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Cluster (Nodes)

Cluster Autoscaler (CA)  
Scale in / out



CA selects node pool  
Scale up / down



# Overview of Autoscaling

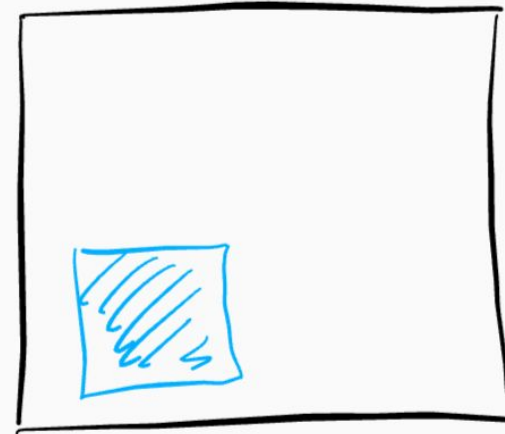
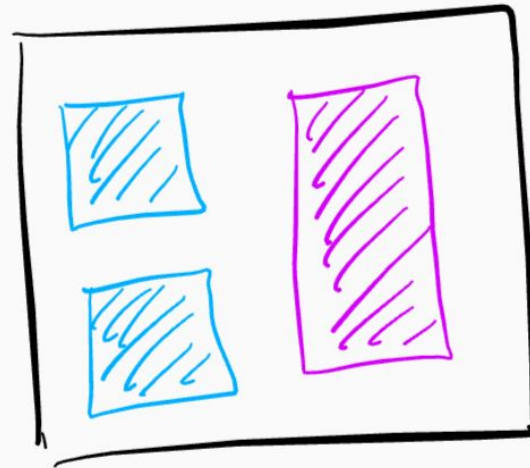
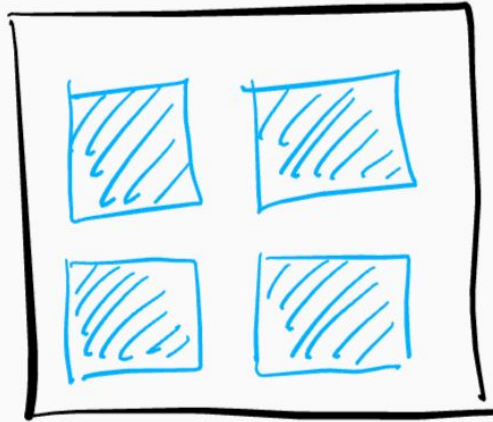


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# Overview of Autoscaling

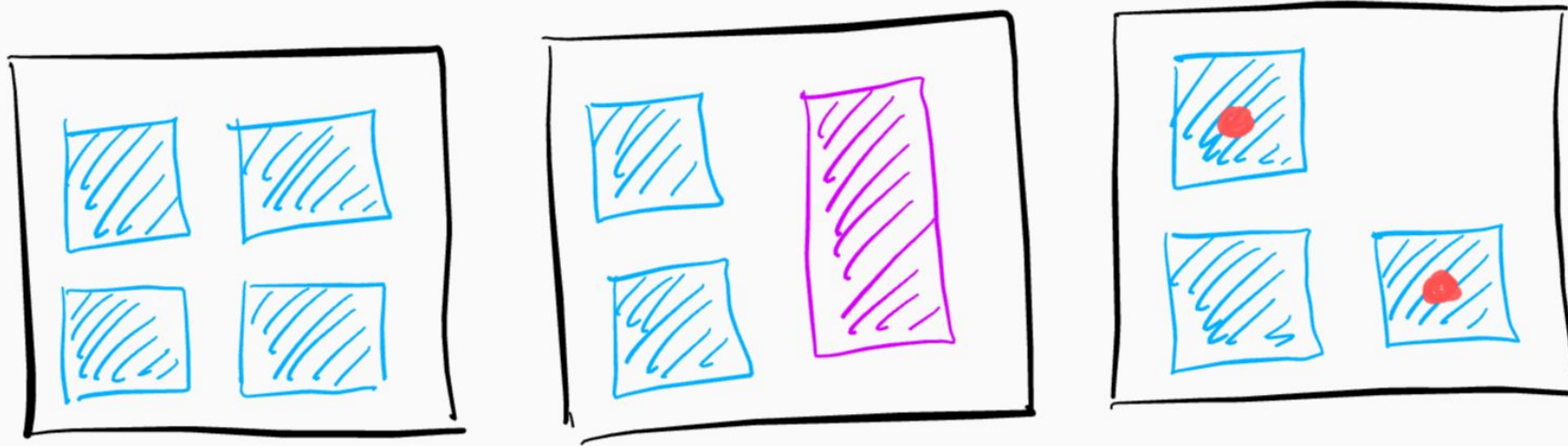


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HPA scales out blue.

# Overview of Autoscaling

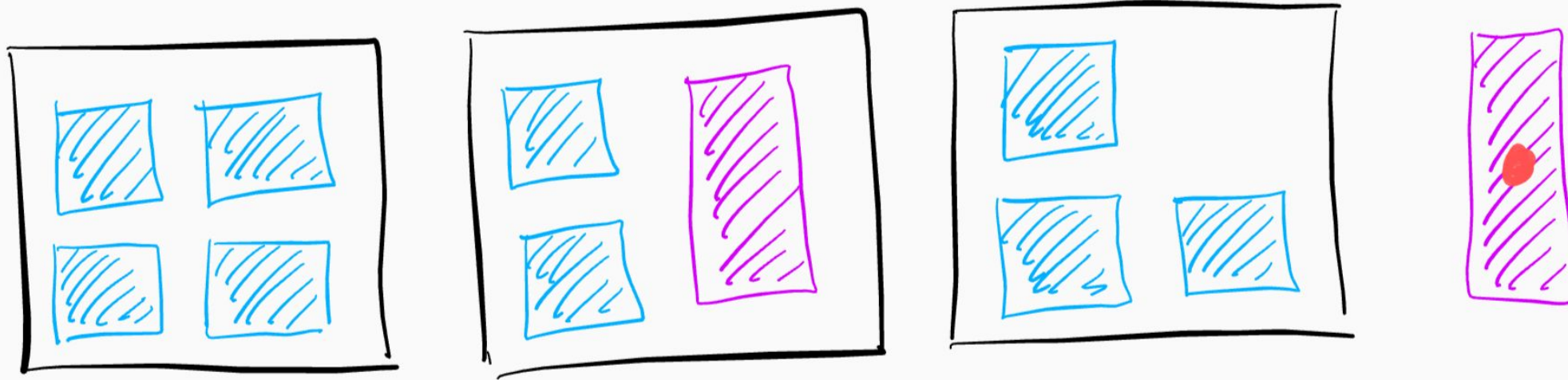


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HPA scales out purple (unschedulable).



# Overview of Autoscaling

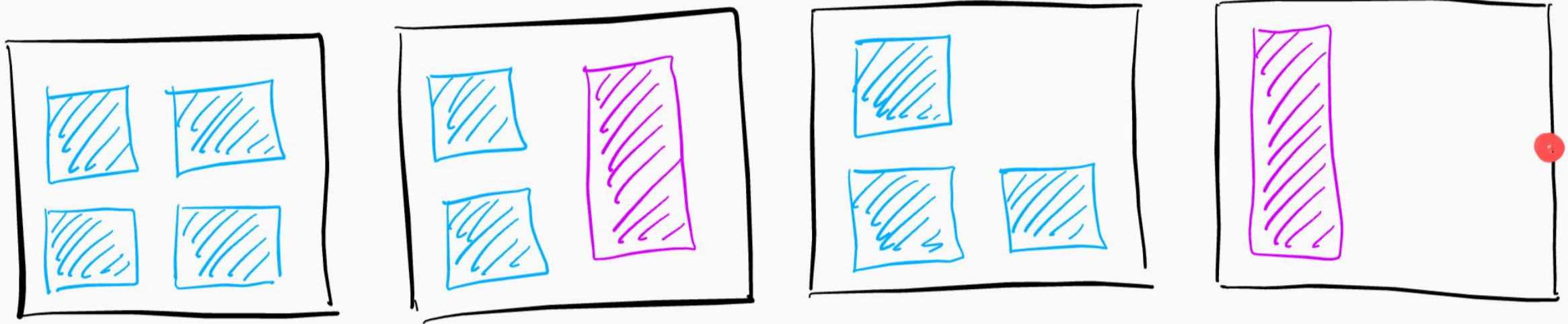


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CA scales out node pool. Purple is scheduled.

# Overview of Autoscaling

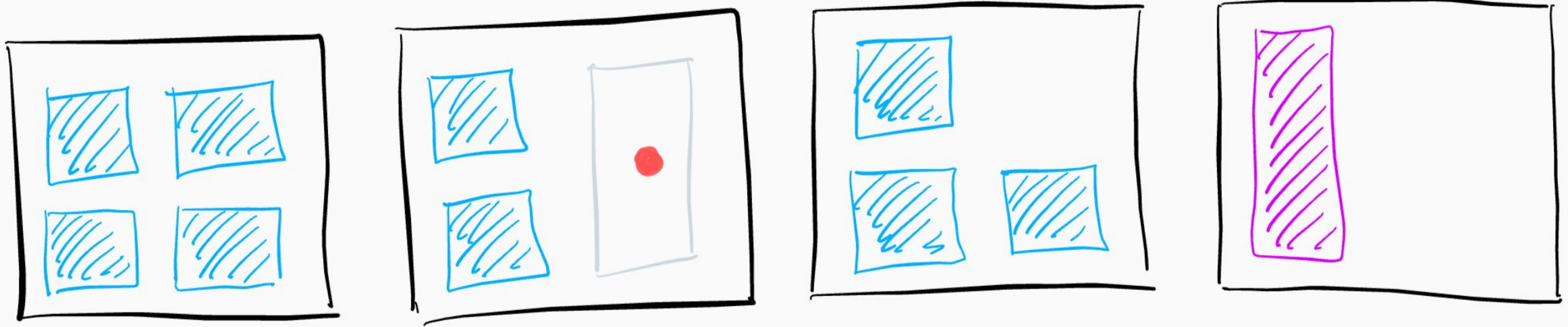


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VPA recommender scales down purple.  
VPA updater deletes a pod.

# Overview of Autoscaling

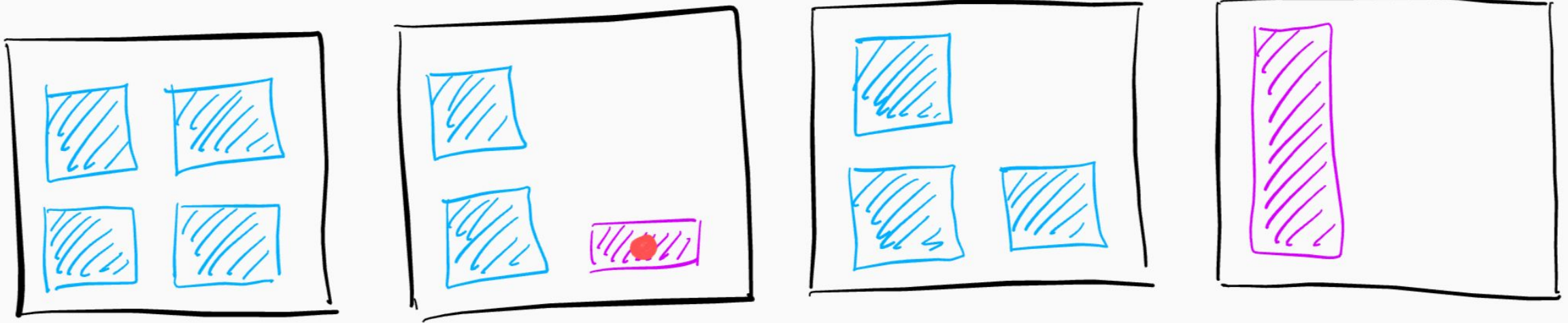


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Purple pod is rescheduled with updated size.

# Overview of Autoscaling

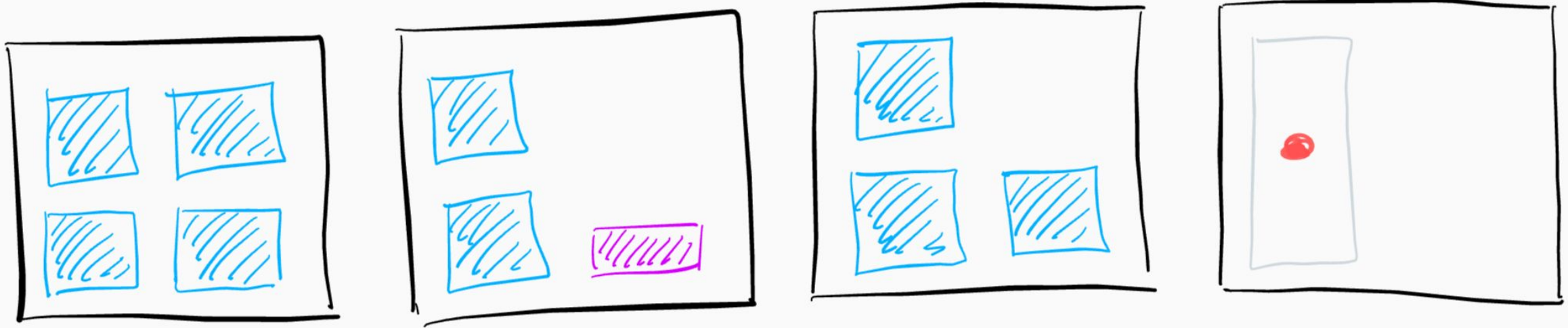


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VPA updater deletes another purple pod.

# Overview of Autoscaling

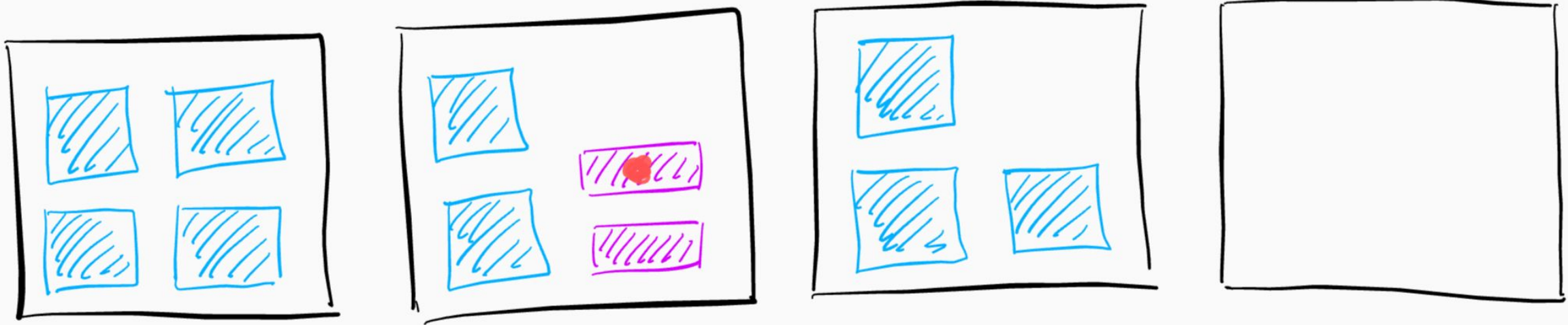


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Purple pod is rescheduled with updated size.



# Overview of Autoscaling

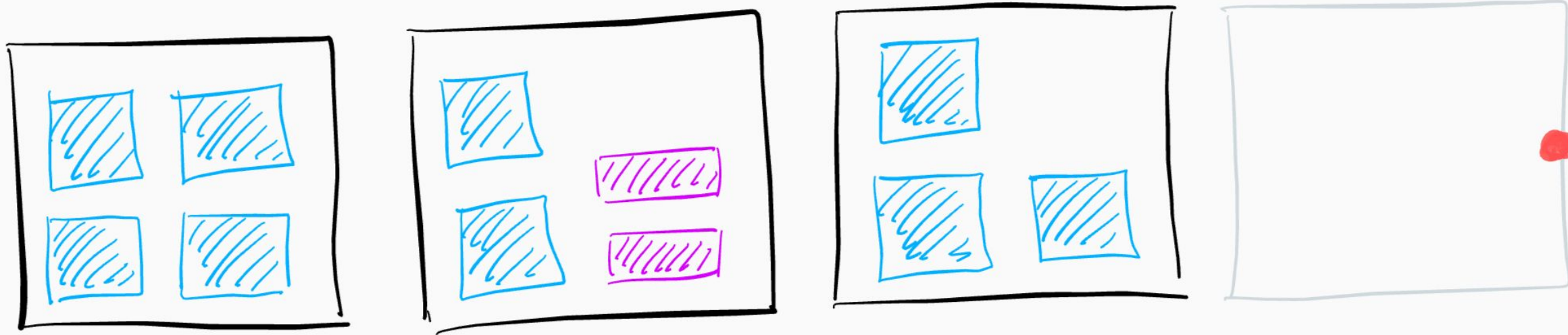


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CA scales in empty node.

# Overview of Autoscaling

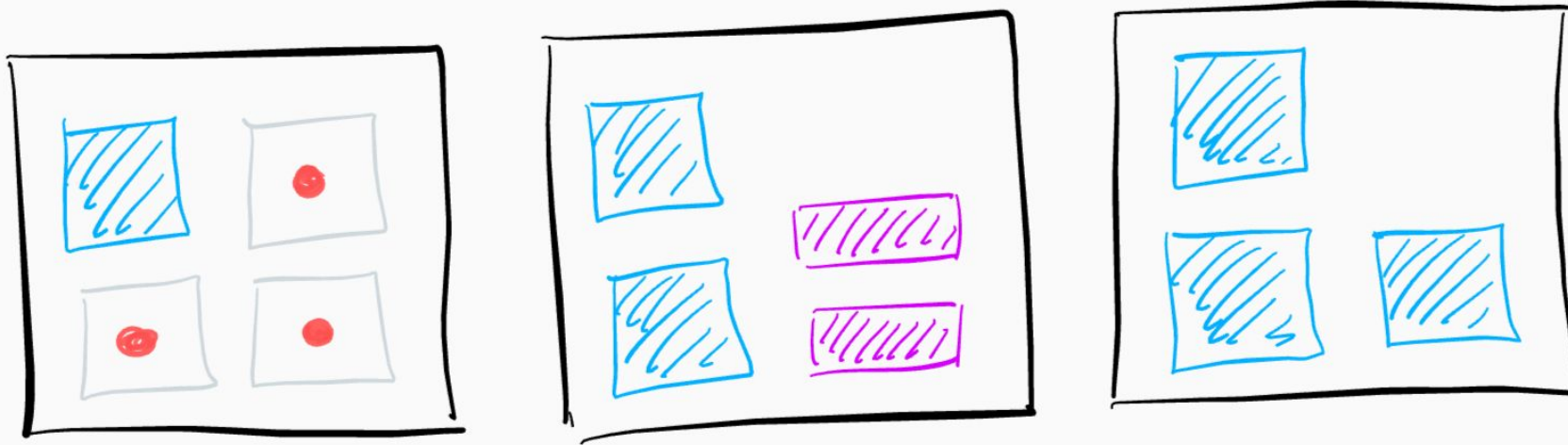


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HPA scales in blue.

# Overview of Autoscaling

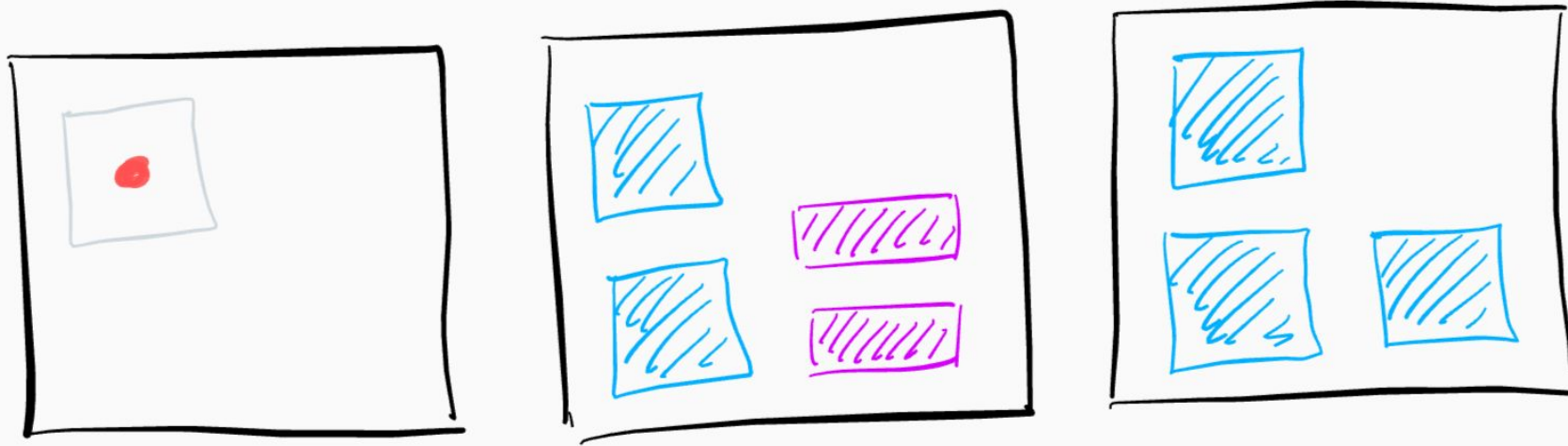


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CA consolidates blue.

CA taints the node and evicts its pods.



# Overview of Autoscaling

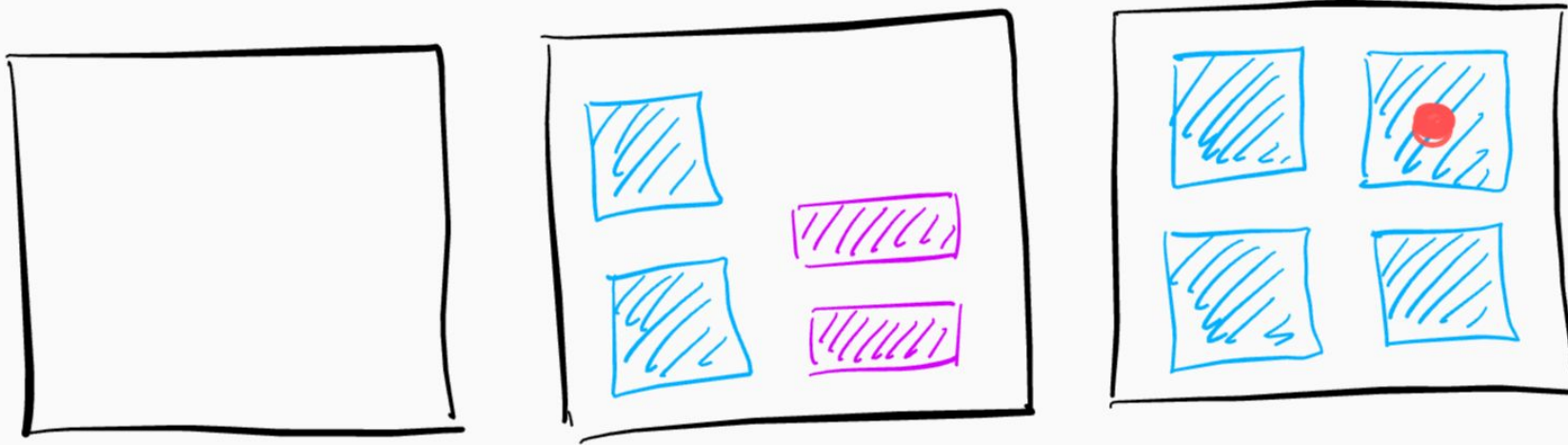


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Blue pod is rescheduled.

# Overview of Autoscaling

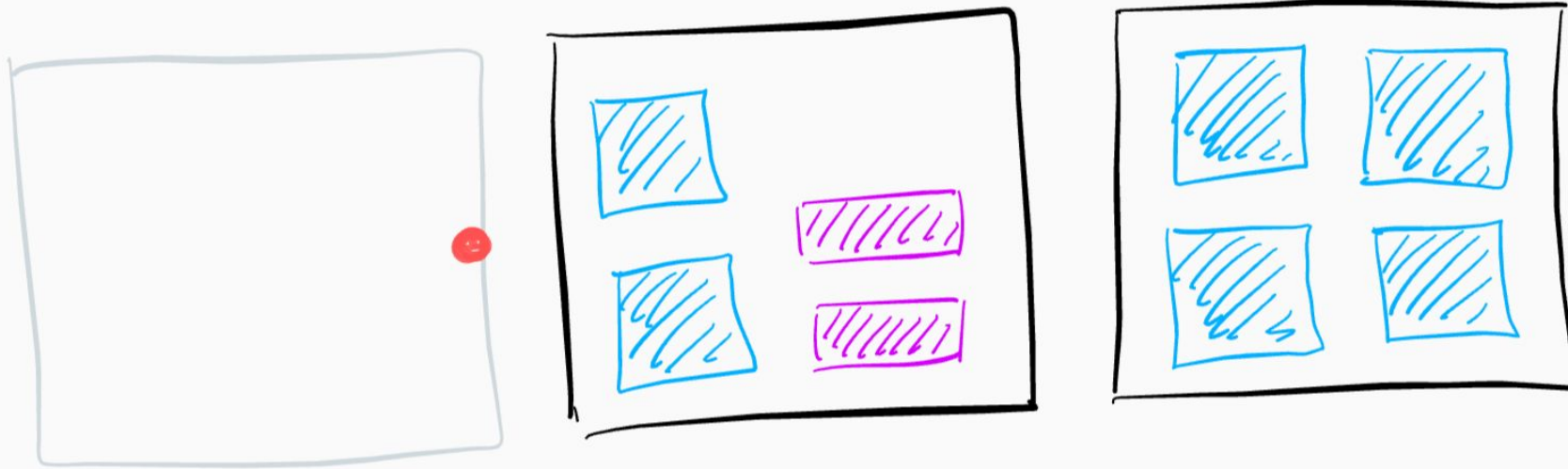


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CA scales in node pool.

# Overview of Autoscaling

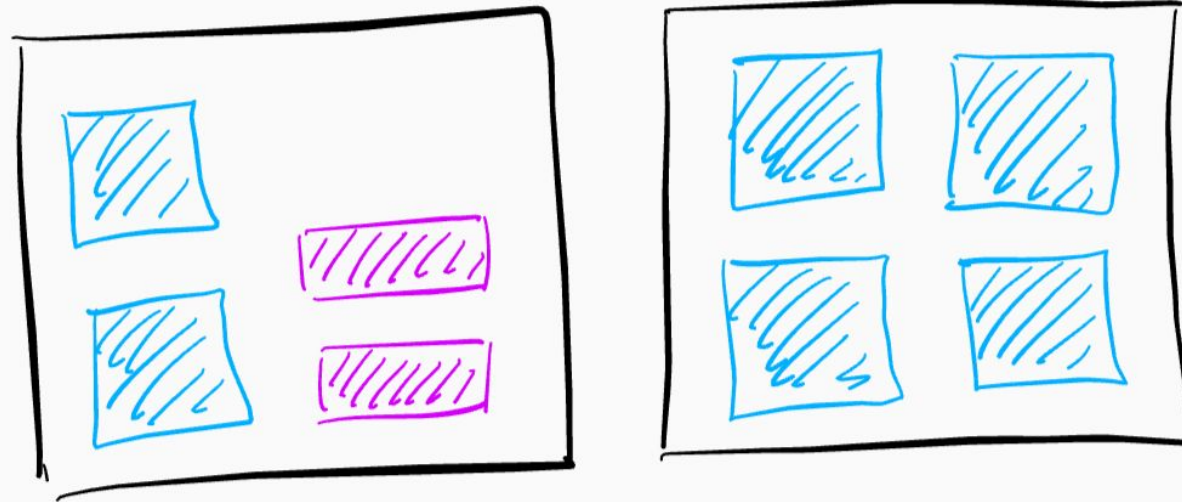


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Final state.

# Upcoming Features



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## 1. HPA v2 Stable API

[KEP](#), [Doc](#), [v2 API](#) (and many other PRs)

## 2. VPA support for multiple recommenders

[KEP](#), PRs: [#1](#) [#2](#)

## Contact us:

- [#sig-autoscaling](#) (General questions)
- [#sig-autoscaling-api](#) (API related)
- SIG meeting 16:00 CET weekly ([Zoom](#), [Agenda](#))