Improving Kubernetes Autoscaler E2E Tests

Michael McCune
@elmiko
Goals

- Add a Cluster-API provider to Cluster Autoscaler e2e tests
- Enable more automated tests for Cluster Autoscaler
- Open pathway for more contributors to create Cluster Autoscaler tests for their providers
- Stretch Goal: Demonstrate a possible future for other project communities to increase their testing
Current state of tests

- Kubernetes/Kubernetes
  - Cluster Autoscaler Tests
  - Other Tests
  - Cloud Provider Interface
  - GKE/GCE Kubemark Impl
Proof of concept experiment
Example 1: Tests and Providers in Kubernetes

Kubernetes/Kubernetes

- Cluster Autoscaler Tests
- Cloud Provider Interface
- CAPI Impl
- GKE/GCE Impl
- Other Tests
Example 2: Tests in Kubernetes, Providers outside

GKE/GCE C-A Provider

CAPI C-A Provider

Kubernetes/Kubernetes

Cluster Autoscaler Tests

Cluster Autoscaler Provider Interface/Lib

Other Tests
Example 3: Tests and Providers outside of Kubernetes

- GKE/GCE
  - C-A Provider

- CAPI
  - C-A Provider

Kubernetes/Autoscaler?

- Cluster
- Autoscaler
- Tests

- Cluster
- Autoscaler
- Provider
- Interface/Lib.

Kubernetes/Kubernetes

- Other
- Tests

- Cloud
- Provider
- Interface
Discussion

- Example 1, seems like this is undesirable (see https://github.com/kubernetes/kubernetes/issues/70194)
- Example 2, Kubernetes/Kubernetes would contain a cluster-autoscaler provider interface/library to ensure cloud providers have the appropriate functionality and setup.
  - How would cloud provider concrete implementation be linked during test deployment?
- Example 3, This seems like easiest approach from a breakage standpoint, but represents a shift in thinking from current testing deployment and workflow.
- Regardless of approach, separating the provider implementation from the tests is desirable for independent development, although this may add maintenance load.
- A library of building blocks approach is desirable to ensure consistency for setup and teardown.
References

- [https://github.com/kubernetes/kubernetes/issues/70194](https://github.com/kubernetes/kubernetes/issues/70194)
  - issue from 2018 where this idea was discussed in more depth
- [https://github.com/benmoss/autoscaler-tests](https://github.com/benmoss/autoscaler-tests)
  - Experimental break out of tests
- **Improving the state of Kubernetes cluster autoscaler testing**
  - Gist with some early thoughts about refactoring