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Exploring Application Portability Across Public Cloud Providers Using K8s

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Federation



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- What is Federation
 - Ability to manage N non-homogeneous clusters
 - Enables high-availability
 - Avoid vendor lock-in
- What does federation provide you (v2)?
 - CRD based Federation API
 - Federate any resource type
 - Overrides
 - Placement decision
 - Dynamic Scheduling
 - Cross-cluster service discovery

Application Portability



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Use Cases

- Move an application (and possibly it's data) to a new cluster
- Expand an application to run on multiple clusters and load balance between them
- Remove a cluster from the federation and have 0 disruption

Data Portability



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- Storage is arguably the most sticky piece related to the clusters
 - Federation enables communication which then enables new storage models
 - Stretch
 - caches, critical data, metadata
 - Geo-sensitive storage placement
 - Containerized storage across clusters
 - Data in place

Stretch



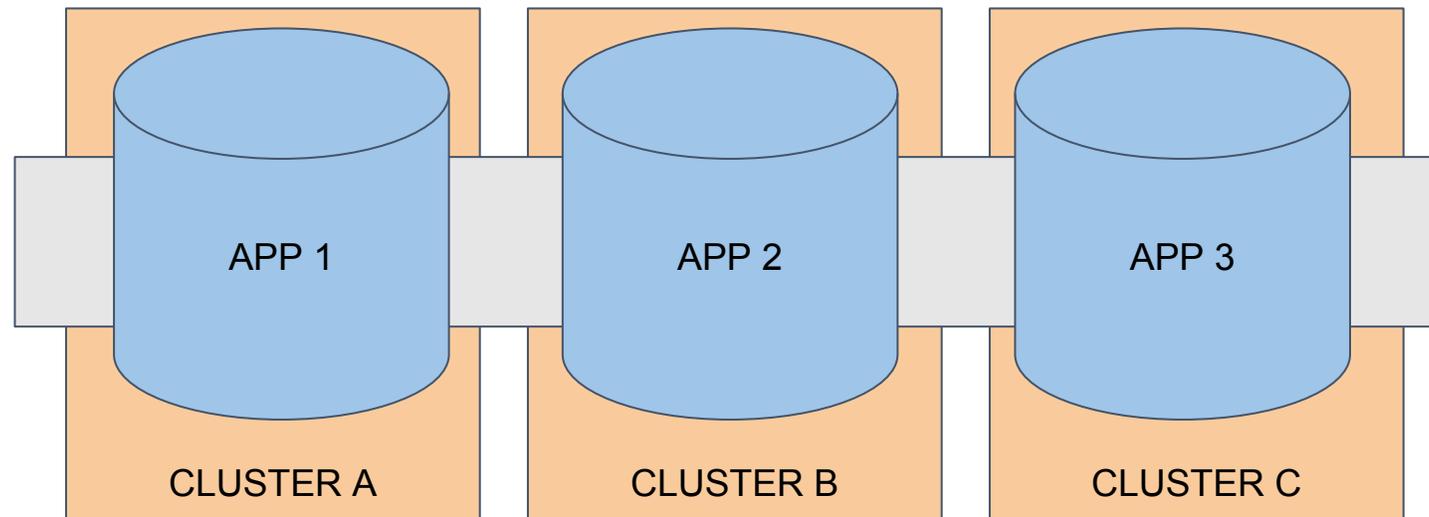
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- Always available...all the time
 - Cached data, logs



Geo-Sensitive or Cloud Specific



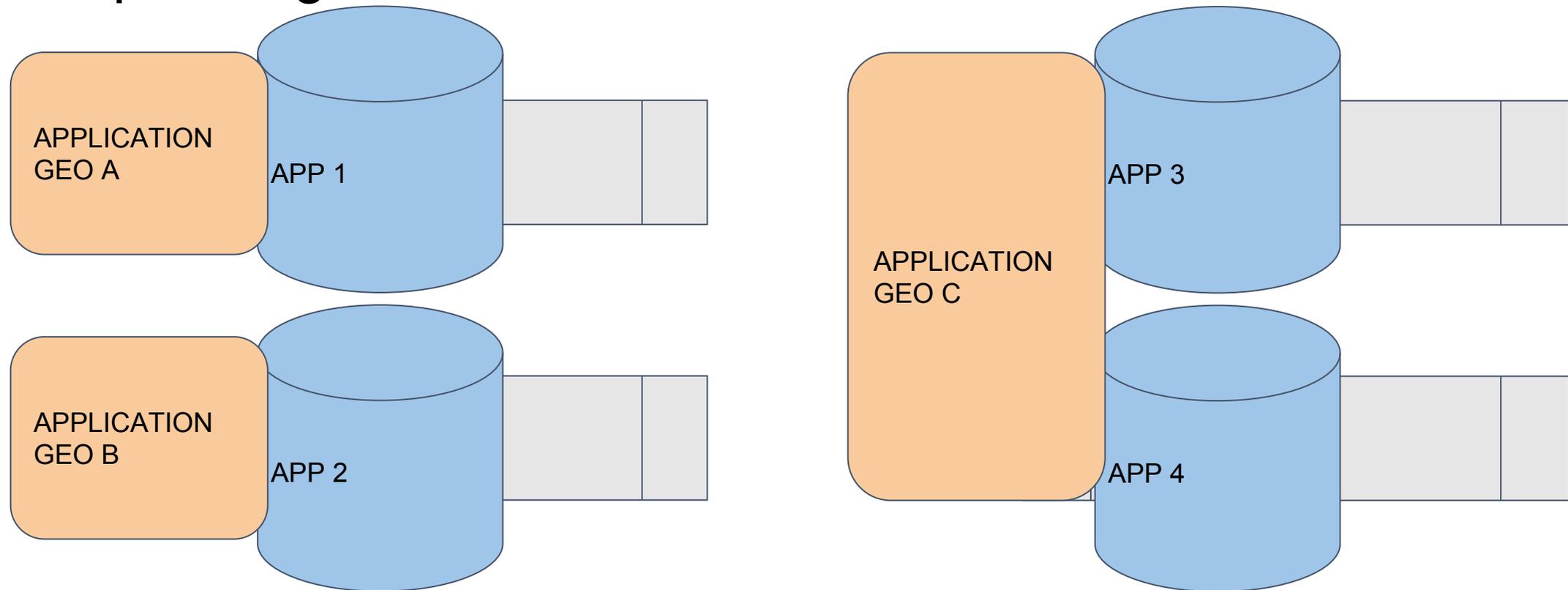
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- Store data in that cluster only or store application data in a specific geo



Containerized Storage Across Clusters



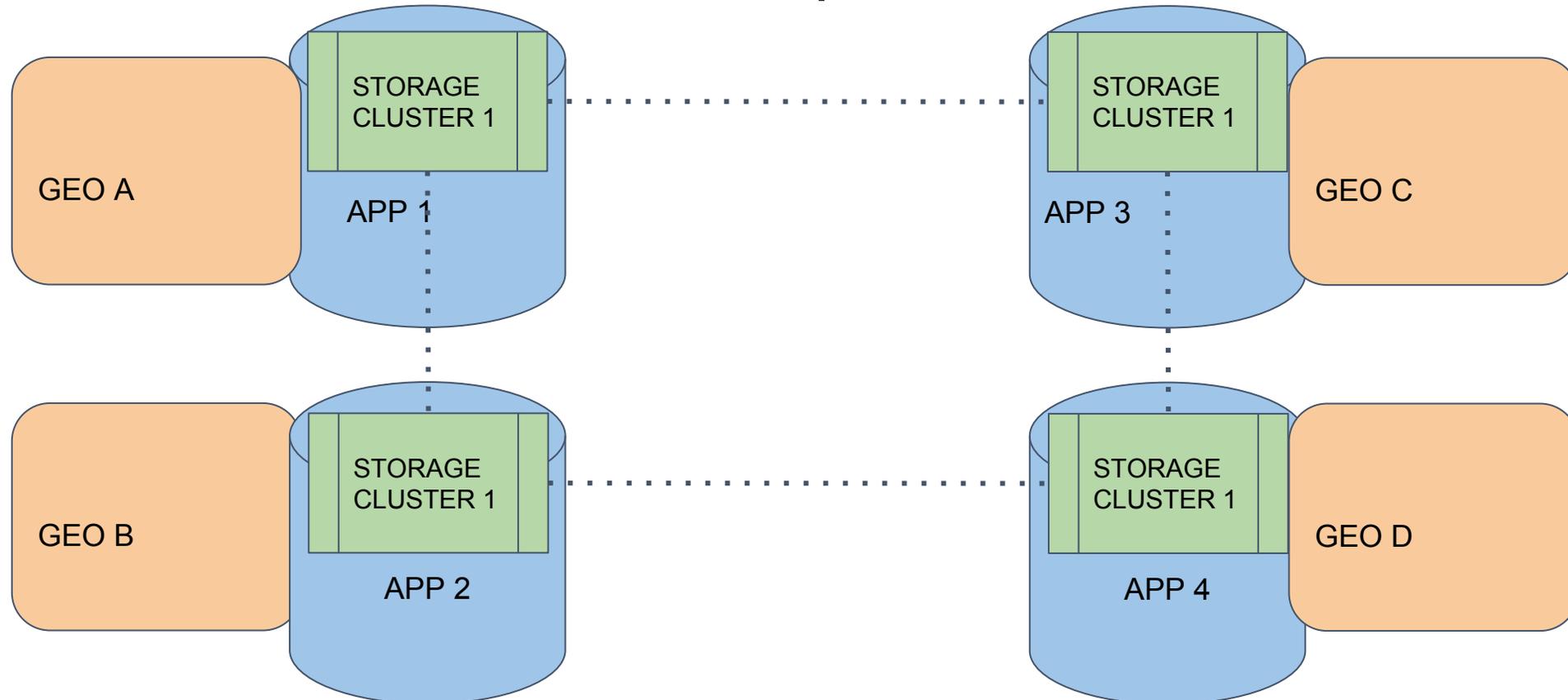
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- Single control plane for storage across all federated clusters with distributed, replicated data



Data in Place with distributed applications



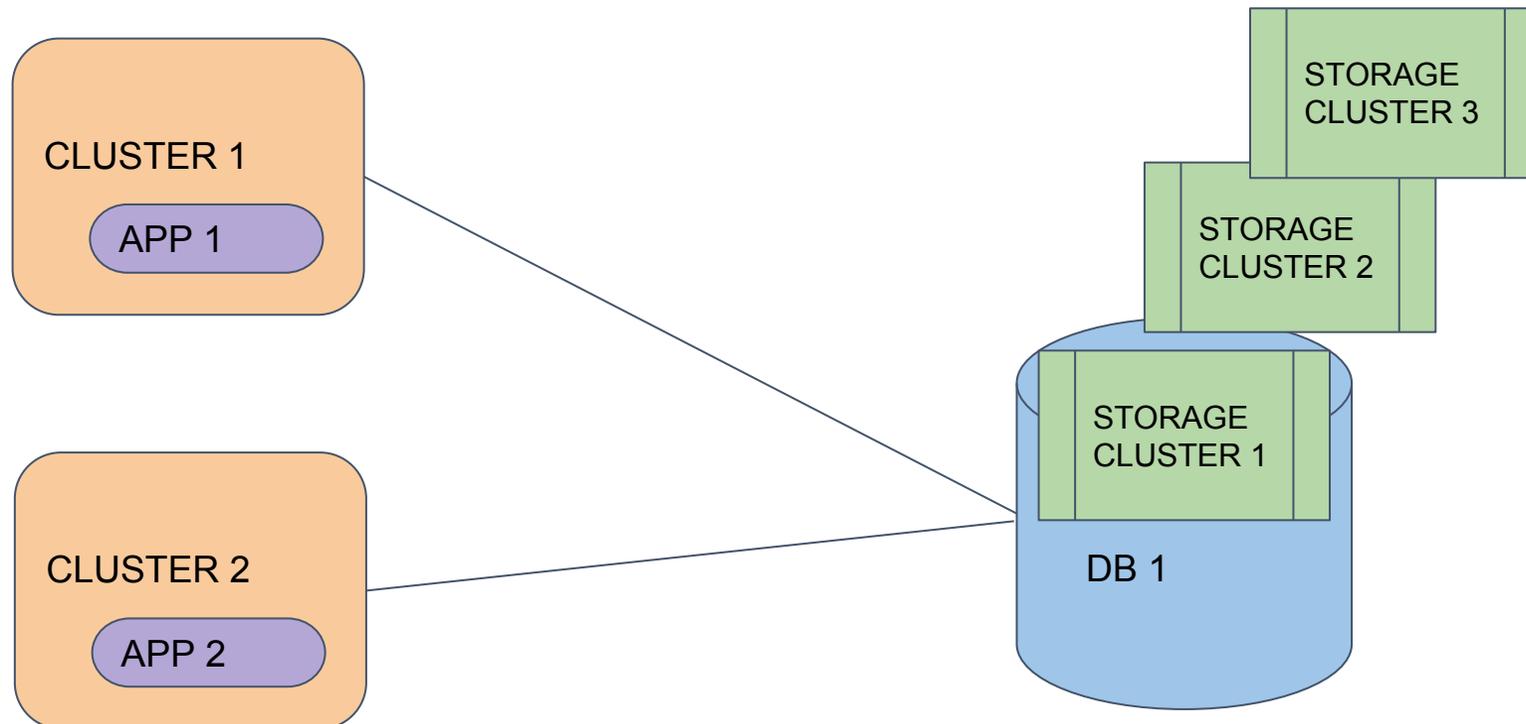
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Demo





pacman.example.com

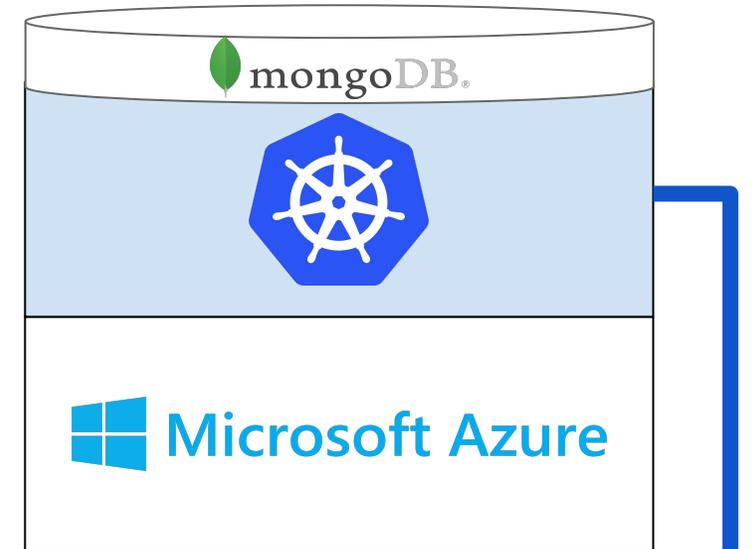


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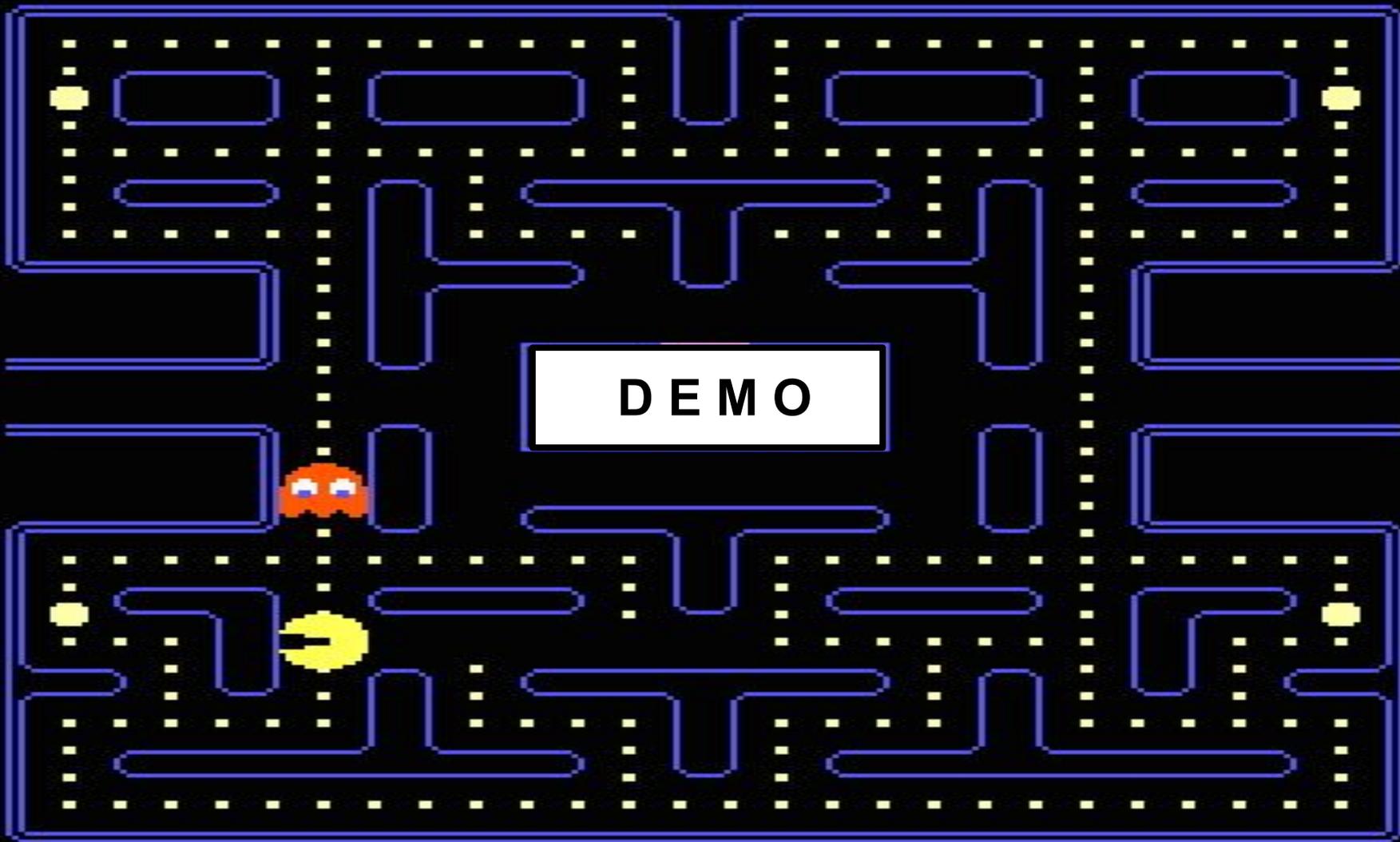
GAME
SCORE

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HIGH
SCORE

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DEMO





pacman.example.com

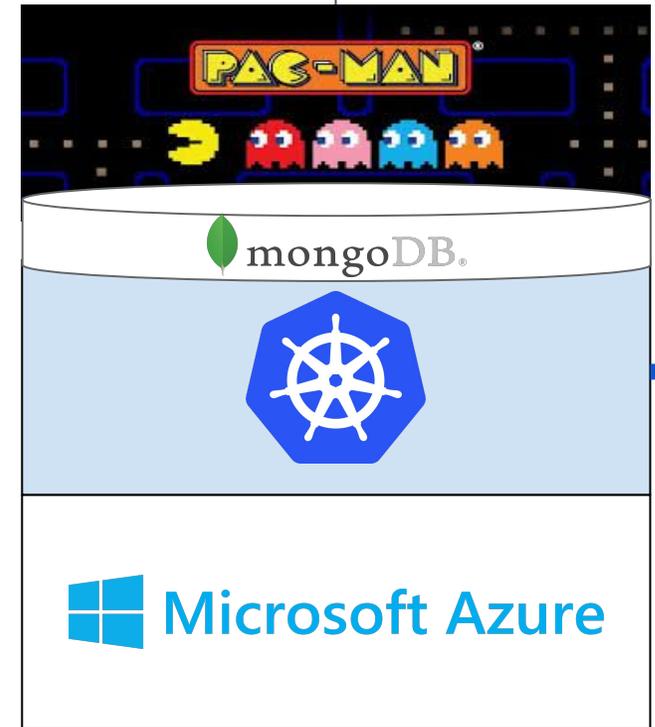


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Federation-v2

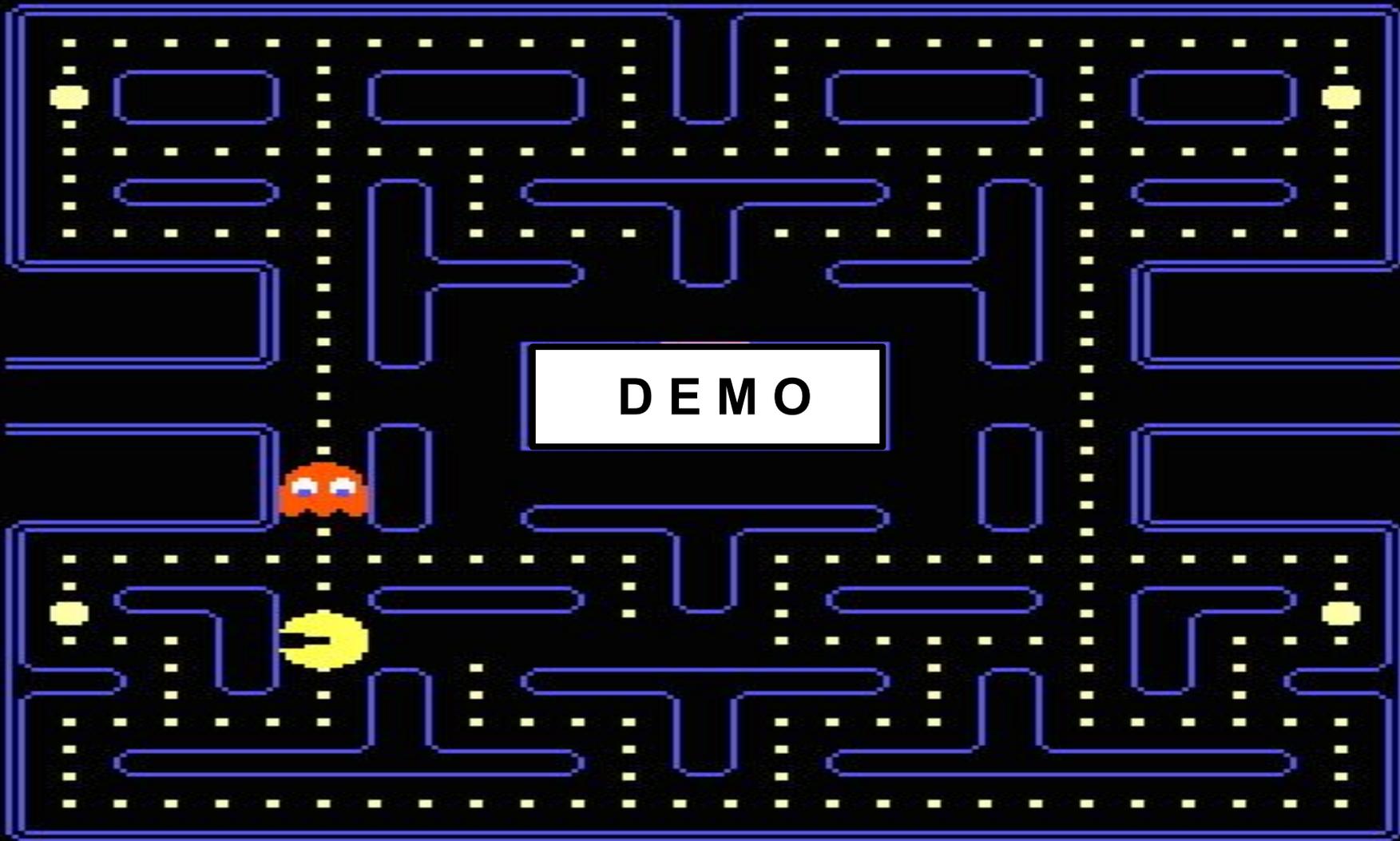
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DEMO



Proposed Demo storage distribution



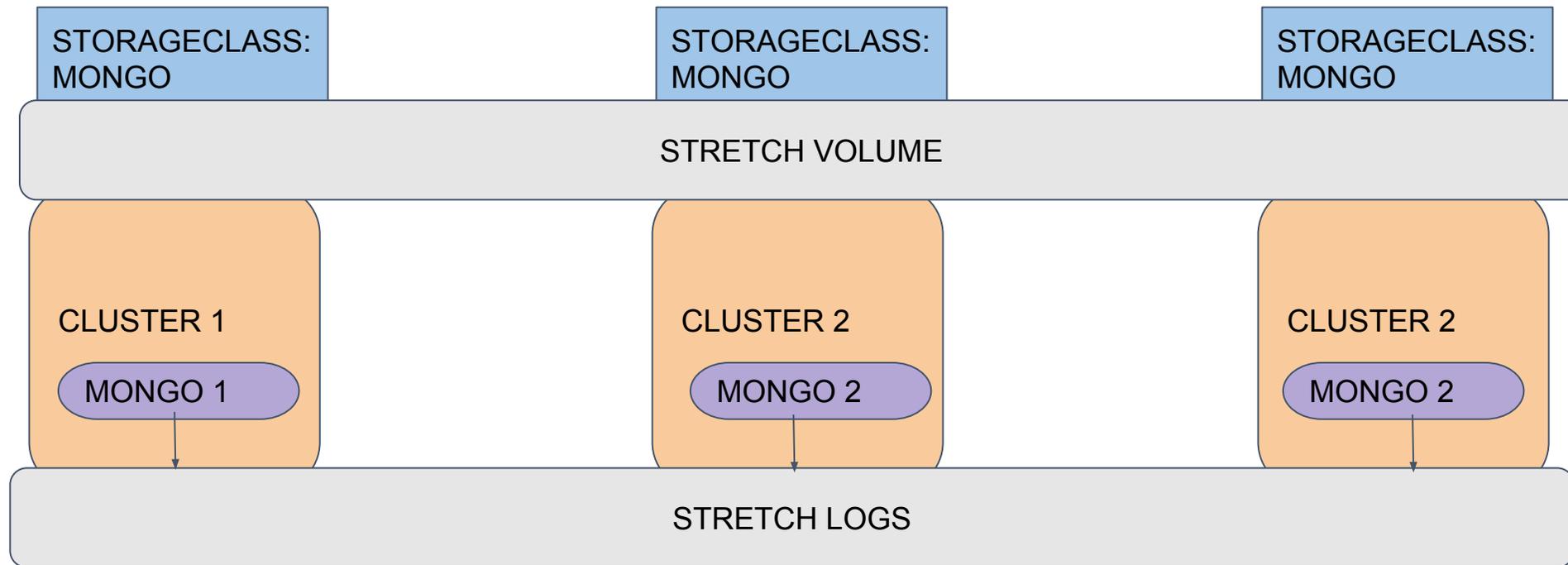
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- Use one storage technology for everything



Proposed Demo storage distribution

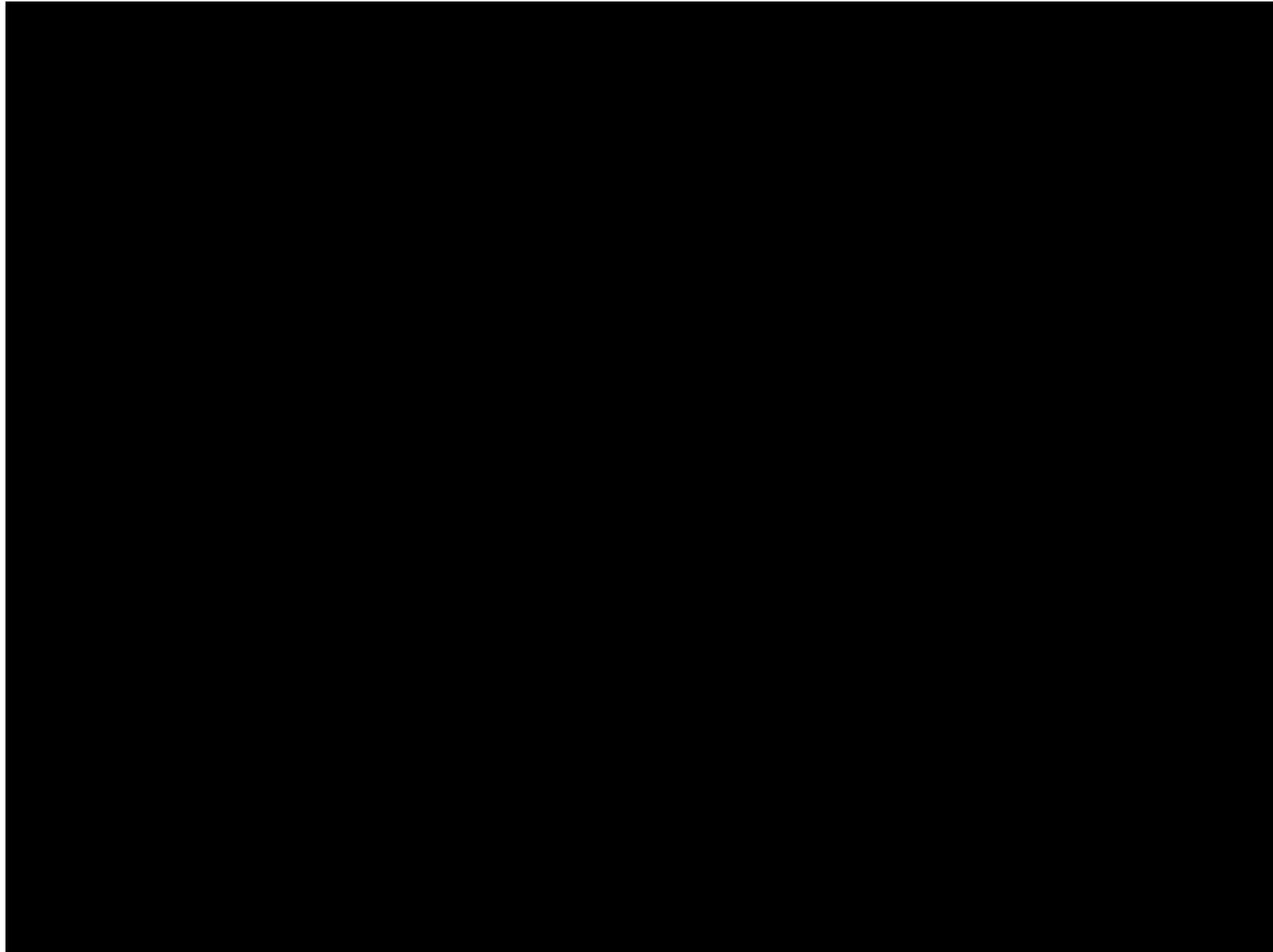


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Proposed Demo storage distribution



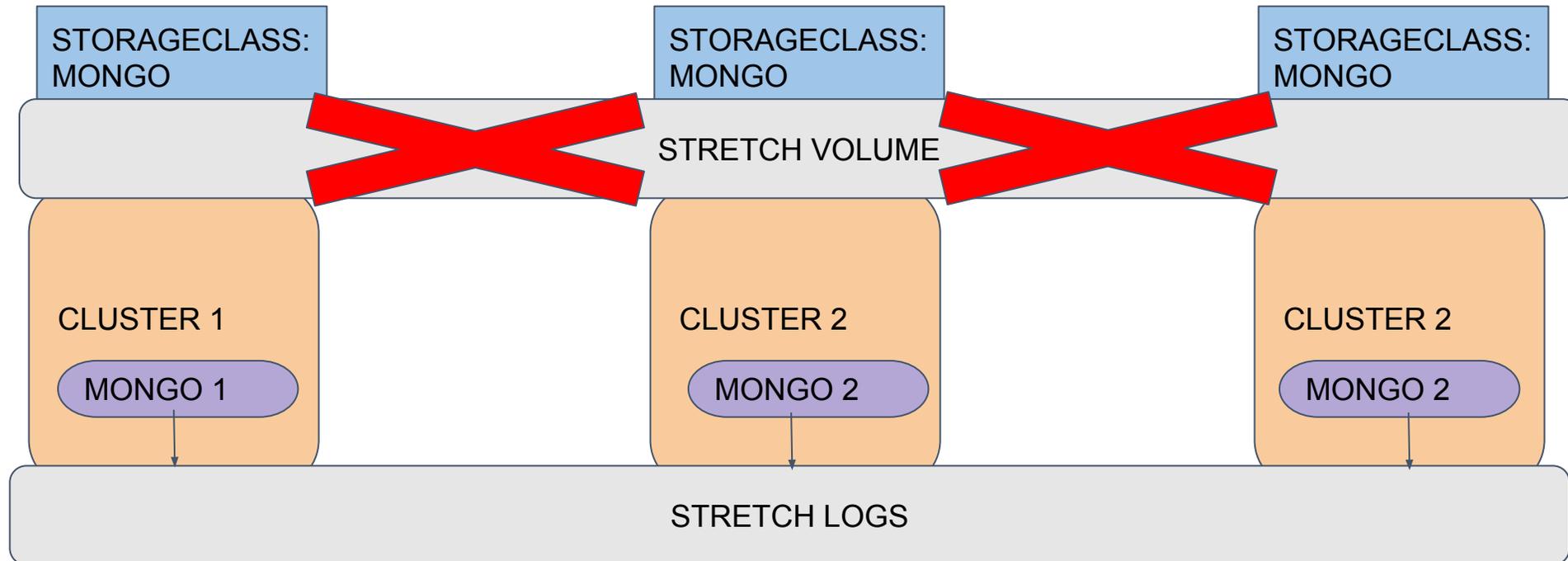
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- Tinfoil hat pattern
- Double replication != Double Prizes



Demo storage distribution



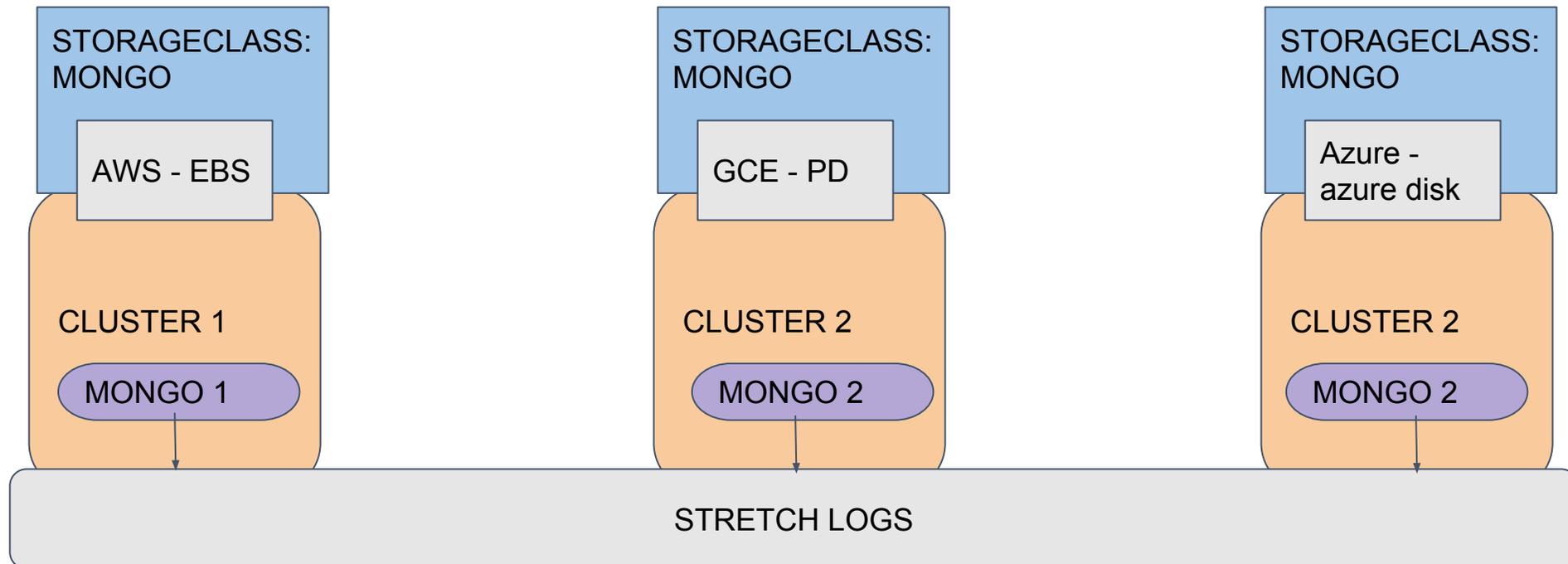
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- Native storage can be utilized as Mongo is self-replicating
- Aggregate of data can be shared and replicated





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