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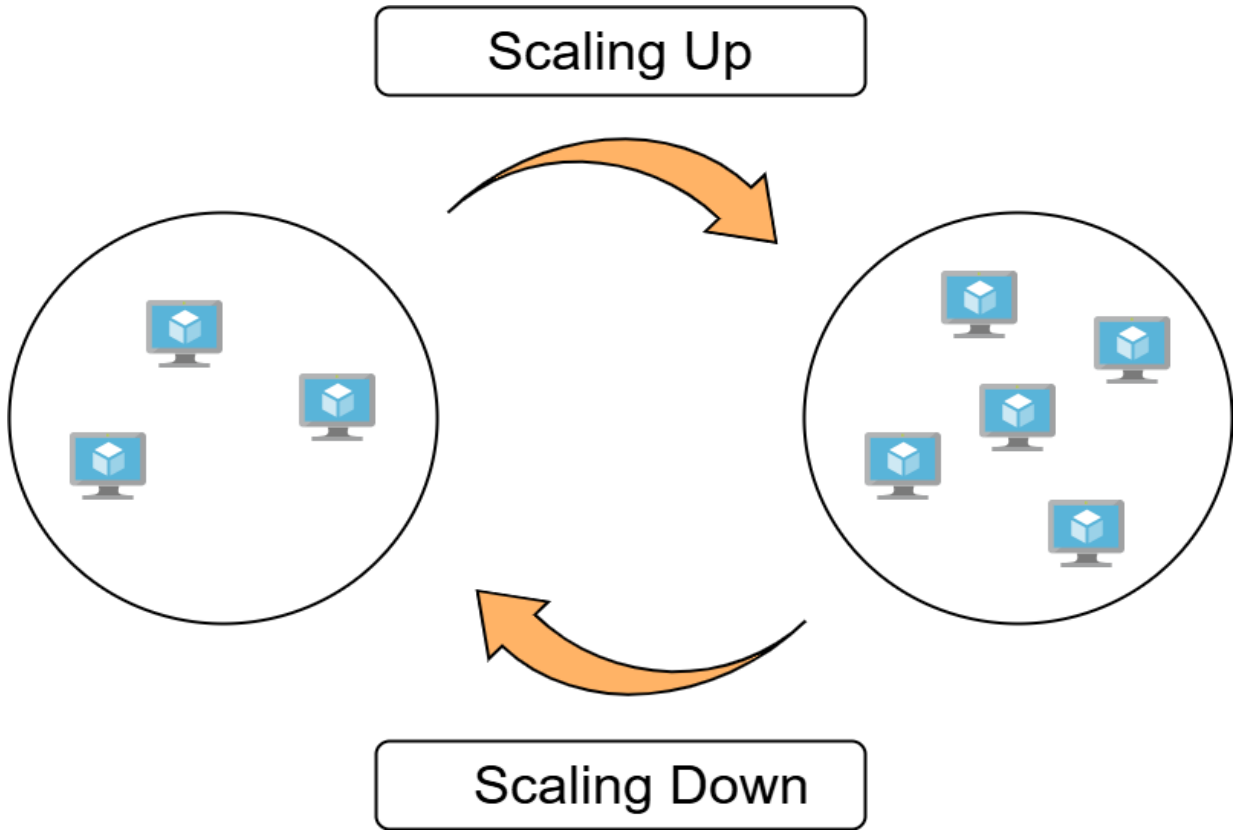
LAS
Liqo Autoscaling System

Cluster Autoscaling

Ability of a cluster to **dynamically manage** its number of nodes based on the current/future workload.

This feature is well **established** in a **cloud ecosystems**, but remains **critical** in on-premise environments.



Benefits of Liqo Dynamic Cluster Autoscaling

Challenges in **on-premise** environments:

- Heterogeneous platform providers
- Application constraints, including latency requirements, hardware dependencies, security, etc
- Limited local resources

While cloud solutions efficiently address resource limitations, Liqo is better suited to handle the other types of challenges.

POC

Three main components:

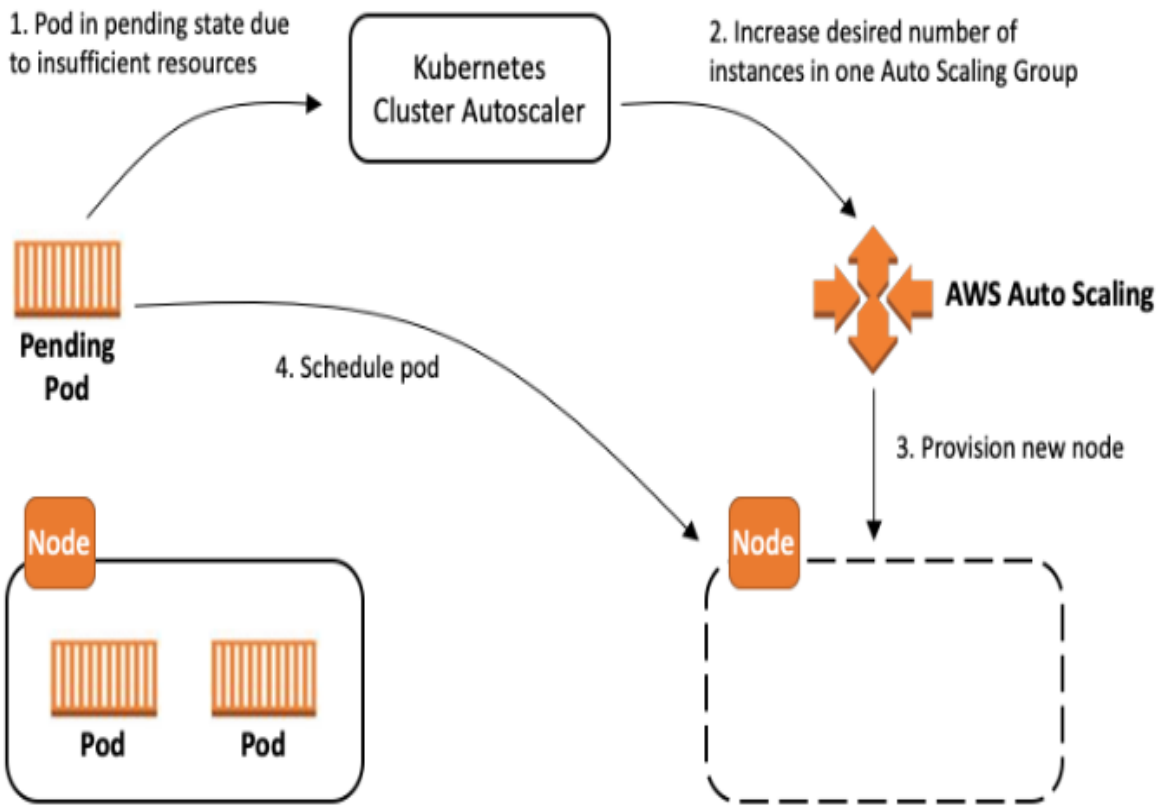
- **Autoscaler:** Software dedicated to detecting issues caused by resource shortages. In this POC, it was used the open-source Cluster Autoscaler, but it can be replaced with other systems.
- **Node Manager:** Component responsible for managing nodes using Liqo features (adding/removing nodes, management via groups).
- **Discovery Server:** Database containing information about available remote clusters for resource sharing.

Cluster Autoscaler

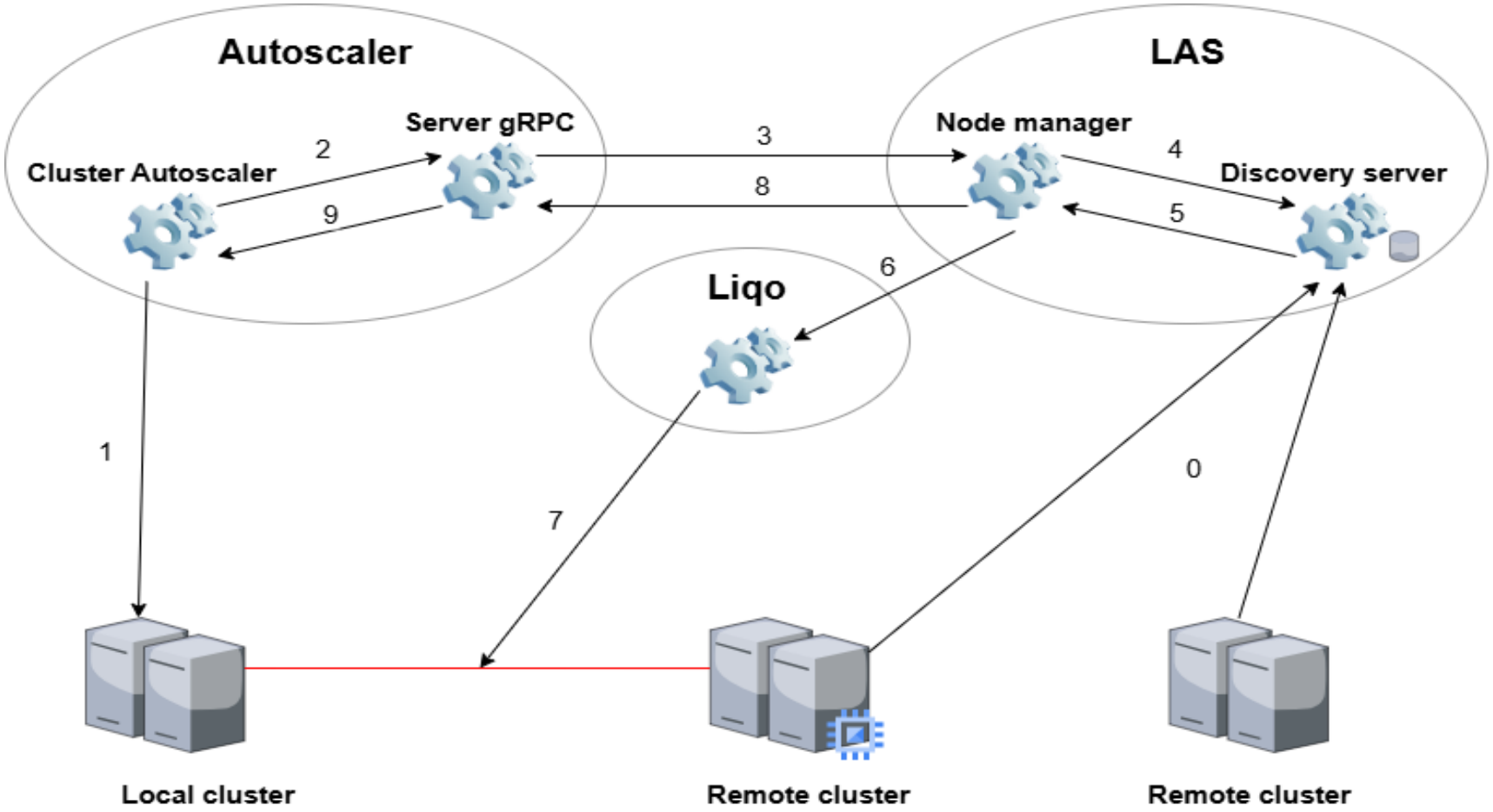
Open-source tool, already integrated into many cloud ecosystems, based on **monitoring pods.** Its main purposes are:

- **Scale up:** Trigger scaling when there are pods **that cannot be scheduled** due to lack of resources.
- **Scale down:** Trigger scaling when a node **is underutilized** for an extended period and the pods on it can be rescheduled on other nodes.

To work with a **new provider** such as Liqo, it needs to use a **gRPC server**.



Scale up worflow



Next steps

- **Forecast autoscaler:** The Cluster Autoscaler performs reactive scaling, initiating operations only when a problem arises. The next step in its evolution would be to replace this component with an autoscaler capable of predictive scaling features (e.g., DREEM by Miracapillo).
- **Discovery agent:** Component responsible for periodically updating the database server with information about the resources available on each remote cluster.

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