

Internet of Things company uses Gravity to Scale & manage Multi Cloud

Summary

A leading Internet of Things customer leveraged Gravity to rapidly scale their backend infrastructure and seamlessly manage infrastructure across multiple Cloud Providers.

Gravity helped the customer to:

1. **Seamlessly Auto Scale** their backend infrastructure as they scaled the number of connected devices from 33K to 350K
2. Manage infrastructure across multiple Cloud Providers through a **single control plane** thereby streamlining all of their infrastructure operations
3. **90% reduction in engineering efforts** required to integrate Cloud Services with Kubernetes workloads by leveraging Gravity's 1-click cloud integration

Background

The customer provides smart devices for water management in residential and commercial complexes. These smart devices help property owners to conserve water by regulating its flow, detect leaks by monitoring the usage in real time and by sending instant alerts of water wastage to users.

The backend infrastructure for these smart devices were deployed across multiple cloud providers. The infrastructure comprises streaming data ingestion endpoints, Data processing pipelines, Relational and Timeseries datastores and APIs for the customer facing mobile apps.

The infrastructure was primarily deployed over Virtual Machines in two public Cloud Providers and utilized some cloud services such as managed databases.

Challenges

The customer was rapidly onboarding new devices into their platform. The number of connected devices quickly grew from little over 33K to 350K within a span of 8 months.

The rapid growth of connected devices posed challenges with respect to scalability of the infrastructure and operating the infrastructure across multiple cloud providers.

Whenever new customers were onboarded, careful planning of backend infrastructure had to be made. For example, a single residential complex may have 1000s of units that need to be onboarded into the platform in one go. DevOps teams had to plan capacity in advance to ensure a smooth onboarding experience.

DevOps teams also had to adjust capacity during night times when there is lesser load on the system (due to lesser water consumption by customers) and during month ends when customers typically look at their dashboards and reports.

Lastly, whenever users turned off their subscription, they had to periodically optimize the infrastructure by resizing the number of Virtual Machines they were running.

Virtual Machine as the unit of scaling started becoming a bottleneck.

And lastly, the entire infrastructure was deployed across two cloud providers. This posed an additional challenge of maintaining configurations and tools for operating infrastructure across two cloud providers.

The team decided to transform the infrastructure to Containers and Kubernetes for the following reasons:

1. To have a better unit of scaling and achieve better TCO
2. Ability to scale (both up and down) much quickly
3. Reduce the operational burden of being on two cloud providers

The team conducted various proof of concepts in Kubernetes and quickly concluded that the complexities of operating a Kubernetes infrastructure across multiple cloud providers isn't the best usage of their resources and time. They were looking for a managed Kubernetes solution that takes away the operational complexities while still they can get the benefits of containers.

Solution

The customer chose Gravity, a platform that provides a simplified Kubernetes experience to deploy workloads across multiple cloud providers. Gravity runs on top of managed Kubernetes offerings of Cloud Providers and provides an experience where developers can deploy their applications without dealing with Kubernetes complexities.

- **Metrics and Event Based Scaling:** Gravity provides both metrics and events based scaling that can be used to dynamically scale containers in response to spikes in usage. Using event based scaling, containers can be automatically scaled based on events from sources such as Queues, Stream Sources (Kafka)
- **Seamless Multi Cloud:** Workloads can be deployed across multiple cloud providers through the same set of simplified workflows and user experience that Gravity provides. Gravity takes care of all the heavy lifting to deploy workloads across multiple cloud providers. This eliminates the need for Developers and DevOps teams to maintain separate sets of configurations and tools for different cloud providers.
- **Standardized Kubernetes Experience:** Developers and DevOps engineers get the same standardized Kubernetes experience even when operating across multiple cloud providers. This eliminates the need for learning cloud provider specific terminologies, APIs, tools, interfaces, etc.
- **Developer Friendly Kubernetes Experience:** Using Gravity, developers can manage the entire lifecycle of application deployments without knowing Kubernetes. These include Config & Secrets management, Continuous Deployments, AutoScaling, Rolling & Canary deployments, Service Mesh configurations and management, TLS certificates, DNS management
- **1-Click Cloud Integration:** Gravity seamlessly integrates Kubernetes microservices and Cloud Services of multiple Cloud Providers. In literally 1-click, developers can integrate cloud services with their microservices. Least privileged IAM permissions are automatically created and managed by Gravity allowing various microservices in a Kubernetes infrastructure to securely connect to Cloud Services.



Results

Post migrating to Gravity, the team was able to seamlessly scale the backend infrastructure whenever newer devices got onboarded. They were also able to streamline their operations across multiple cloud providers by using Gravity as a single control plane.

Benefit	Description
Seamless Scalability	By shifting the unit of scale from Virtual Machines to Containers, the team was able to rapidly scale their infrastructure whenever additional devices got connected to their platform. Both the containers and the underlying Virtual Machines of the Kubernetes cluster were configured with Auto Scaling. This allowed the team to get away with any capacity planning in advance.
Single Control Plane for Multiple Clouds	By moving to Kubernetes and Gravity, the team is now able to use a single Control Plane for running infrastructure in both the clouds. The team no longer has to maintain configurations and tools separately for each cloud provider.
Reduced TCO	The combination of Event based Scaling, Cluster Auto Scaling and Kubernetes' efficient bin packing meant that the infrastructure always runs optimally. In addition, Gravity eliminated any Kubernetes learning curve that the team otherwise would have spent significantly. All of this resulted in an overall reduction of TCO of operating a Kubernetes based infrastructure. The customer estimates they were able to reduce their TCO upto 70% .

Conclusion

Gravity's Kubernetes Platform enabled this customer to rapidly scale and operate their infrastructure across multiple cloud providers without worrying about Kubernetes complexities. The team was also able to reduce their overall TCO by choosing a Kubernetes platform like Gravity that takes care of all the heavy lifting.

