Why would you use Aquila Clouds FinOps?

A differentiated cloud financial management platform from Cloud Vendors'

FinOps is a discipline that derives from Cloud Financial Management. According to FinOps Foundation, "it is the practice of bringing financial accountability to the variable spend model of cloud, enabling distributed teams to make business trade-offs between speed, cost, and quality."

In other words, FinOps is a complex discipline that requires close attention to cloud usage and costs amongst cross functional teams in IT, Finance, Product and more. Cloud vendors such as AWS, Azure, GCP and Oracle have their cost optimization recommendation tools, offered at seemingly no cost to their customers. You may think that with them your organization can be covered for all aspects of FinOps. We would think not. Cloud vendors are in the business of selling you more cloud resources and their best interest lies in the opposite of your interest.

In this paper, we go into detail about how our FinOps platform differentiates itself from the cloud native tools, and help you achieve more comprehensive goals in your FinOps endeavors. In particular we will dive into details about our capabilities in the following:

- Observability
    - Multi-cloud support for modern day cloud organizations
    - Observability of both performance and cost data in one single pane of glass
    - Self-service backed by RBAC
- Optimization
    - Data-rich analysis for resource rightsizing
    - Comprehensive resource and service optimization and automation
    - Intelligent resource scheduling
- Governance
    - Multi-cloud financial domains for budget control and chargeback
    - (Shared) cost allocation
- Communication
    - Facilitation of communication across cross functional teams

Observability

Multi-cloud support for modern day cloud organizations

"In a survey of Fortune 500 companies, 33% have a multi-cloud strategy in place, and 42% are looking to implement one in the next two years." Techradar.com, Oct 2021

Cloud vendors have been embracing the messaging of multi-cloud support, but in many occasions the reality remains on just messaging level - meaning the features are not as expected.

For example, Azure Cost Management and Billing has support for AWS billing. First of all, this is NOT a free feature. Users have to pay 1% managed cloud spend for AWS. Also, you only get the billing information from the CUR files in AWS, but there is no correlation between billing and performance metrics. This means you cannot figure out whether there are any anomalies in performance metrics that cost higher than expected billing.

If you have projects that span across multiple clouds, you cannot depend on the cloud native finance management platforms. A multi-cloud finance management platform like Aquila Clouds FinOps is what you need. We cover the public clouds - AWS, MS Azure, GCP, OCI, and will have VMware coverage in the near future for private cloud.

Observability of both performance and cost data in one single pane of glass

Public cloud vendors, AWS, Azure, GCP, treat performance metrics and cost data as different classes. Your cloud analysts need both of these two classes of data to derive insights and optimization methods for your cloud deployments. The inability for users to directly see the correlation of performance metrics trends and cost trends in one single pane of glass is a significant detriment to the organization's cloud finance management endeavors.

Take the AWS console as an example, performance metrics are available via the CloudWatch dashboards, and cost data are available via Cost Explorer. These disparate interfaces offer details at service or account level, but not at the individual resource level. Not only do you have to go back and forth between two interfaces to review the performance metrics and cost data, you also cannot deep-dive into the details at the individual resource levels where analysis for optimization occurs.

Similarly for Azure portal, users would even have to download the performance metrics for further analysis. They can choose to use Excel, Power BI or tools alike to perform the analysis. This just adds more complexity to the whole data analysis process. Your analysts will have to learn more tools and cannot have a single pane of glass for them to focus on data analysis.

GCP takes the same approach as other public clouds. Their console shows the cost data in the Billing section, and the performance metrics in the Monitoring section. They even recommend Stackdriver for their workload monitoring. Again, users have to go to different interfaces and/or tools. Correlating the cost data and the performance metrics becomes a very tedious task.

Aquila Clouds FinOps shows the cost data and performance metrics at the resource level for you to easily study the data to derive more insights. In our Explorer, we show the inventory of all resources, and for each resource you can find all cost data and performance metrics in time series graphs in one single view. This way you can correlate the cost data with the performance metrics without having to switch between different tools.

At Aquila Clouds, observability is enhanced by our **real-time alerting mechanism**. We are integrated with ticketing systems such as **ServiceNow**, alerting systems such as **PagerDuty** to send notifications to the right personnel, and email systems. That being said, our platform sends an alert to the proper stakeholders when there are any anomalies in cloud usage, e.g. when there is an unusually high expense incurring in the last day within a certain department. The surge of cloud usage can signal a rogue user or an unexpected hack. Either way the organization is better off catching the anomaly earlier than later. Aquila Clouds can help.

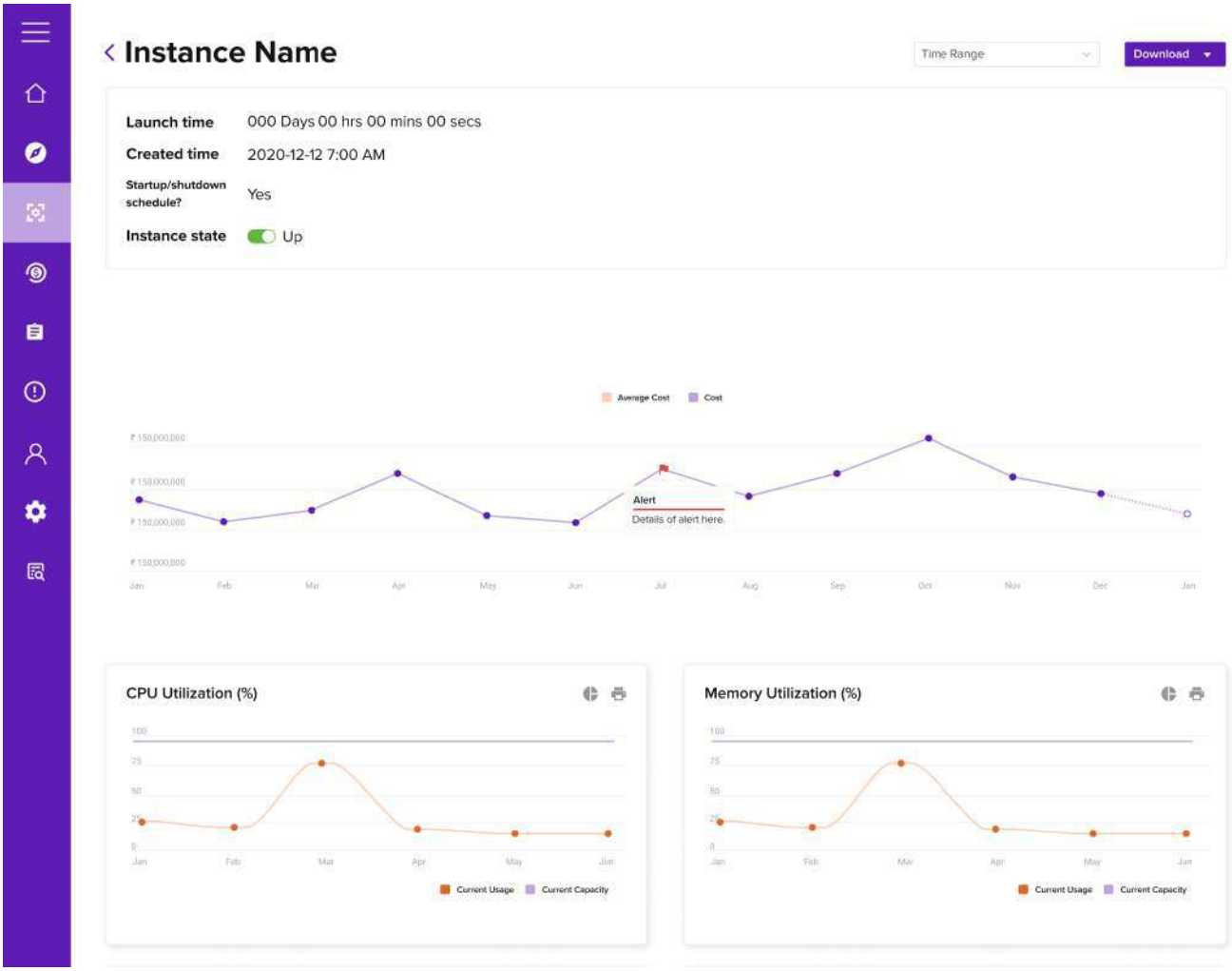

Fig. 1 - Trends of costs and resource utilizations of one instance shown in one single pane of glass

Self-service backed by RBAC

Cloud native finance management platforms have a varying level of RBAC control on billing data. Some provide granular access whilst others only provide aggregated data access. For example, AWS billing data is accessible at the management account level (aka master/payer level). This is a convenient feature

for the overall bill owner, but the lack of access granularity also means that other sub-organization owners cannot get access to only the information they are entitled to.

You need a cloud finance platform that provides uniform and granular access to billing data across all the clouds your organization uses. Aquila Clouds FinOps can help you.

In the cloud native consoles, resource listing is shown at a granular level, e.g. subscriptions, accounts or projects. To have an aggregated list, users are required to download the listings from all the granular level organizational units. This is a tedious process and does not scale well when you have more and more granular organizational units.

With Aquila Clouds FinOps, you can download the inventory list at any granular level you wish. This way you can always get your Change Management system to reflect the latest truth of your cloud inventory without having to move mountains.

Optimization

Cost optimization is often front and center in FinOps discussions, and optimization can take various forms, for example:

- Rightsize resources such as cloud instances, storage and more
- Minimize unused resources, e.g. unattached volumes, unused snapshots, unused IP addresses, etc.
- Establish start up and shutdown schedules to reduce idle resource hours
- Purchase reserved instances and savings plans according to forecasted usage and capacity planning
- Use instances in your reservation portfolio to maximize the utilization of your reservation plans
- Dynamically configure the min/max/desired number of nodes in auto-scaling groups
- Change the reservation of resources in your Kubernetes pods

Aquila Clouds makes optimization recommendations according to our AI/ML-driven analyses of your cloud usage data, and we provide automation mechanisms for you to execute the optimization directly on our platform at the time you desire. We can also integrate with your organization's approval workflow so that the changes can be carried out in the proper chain of command.

What's so special about our optimization and recommendation engines? Read on.

Data-rich analysis for resource rightsizing

Rightsizing recommendations are not created equal. As you can appreciate, the more abundant the data the more accurate the statistical analysis. AWS Cost Explorer uses 7 days of historical data, Azure

Advisor uses 14 days of data. If your resource activities fluctuate outside of the 1 - 2 week window, the analysis can be off. You need recommendations created from longer history or a configurable amount of time window.

Furthermore, rightsizing analysis should include as much resource utilization data as possible including CPU, memory, bandwidth and more. AWS Cost Explorer only uses CPU utilization data for their analysis.

Aquila Clouds FinOps platform uses 30 days of historical data by default. We take into account all the system utilization metrics, along with any other metrics such as transaction rates, latency, etc. as long as they are available to us[1]. Our framework enables us to make rightsizing recommendations for any resources, old or new types.

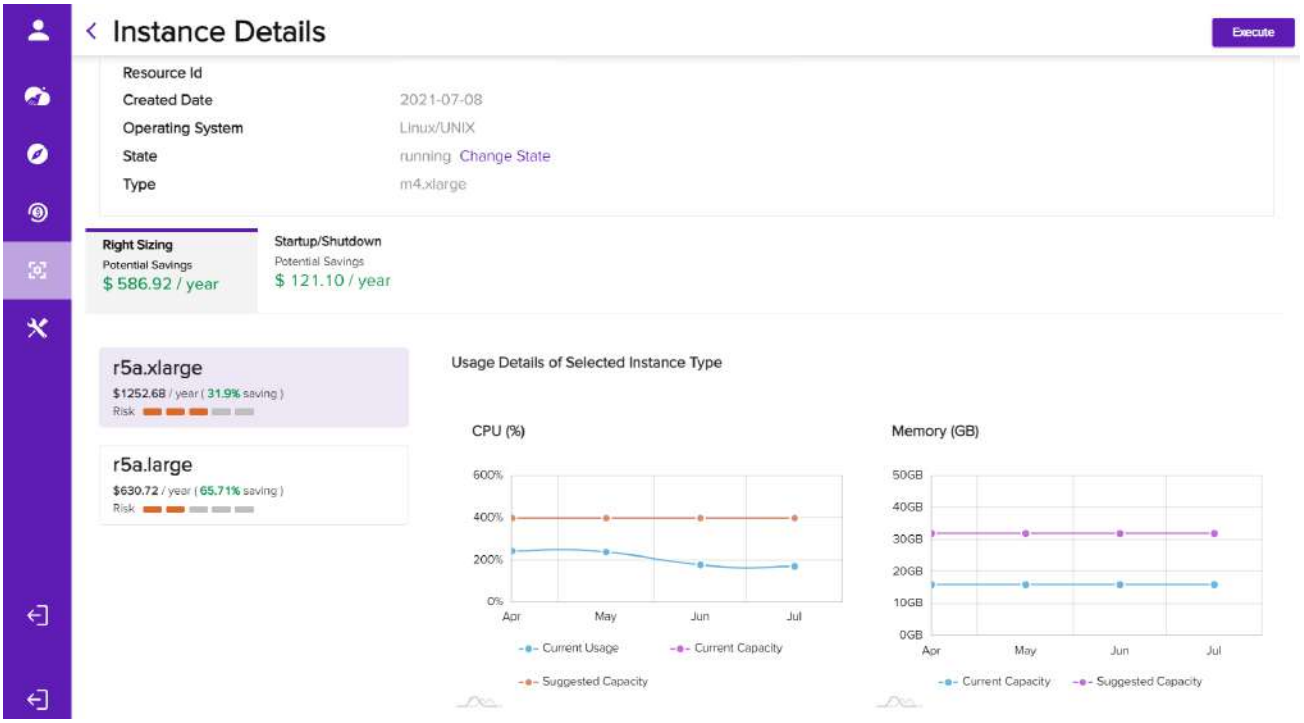

Fig. 2 - Rightsizing recommendations facilitated with resource utilization trend graphs for users to make a conscious decision for rightsizing.

Comprehensive resource and service optimization and automation

Depending on the cloud vendor, you may get different levels of information. Most of them focus on information around virtual instances. And yet resources can be in different categories such as virtual instances, storage volumes/snapshots, IP addresses, and more.

AWS Cost Explorer, for example, does not show the **unused EBS snapshots**. You will have to go to a different tool AWS System Manager to run an automation task to list out the unused EBS snapshots

[1] Users will have to enable the metrics to be sent to Aquila Clouds. For example, memory metrics are not sent via Cloud Watch unless users enable them explicitly.

and delete them accordingly. This makes minimizing unused storage a difficult task, and hence your cloud cost cannot be easily reduced.

Besides unused storage volumes, **unused IOPS** can also be crucial in reducing your cloud costs. And yet unused IOPS are typically not surfaced by the cloud native finance management tools.

Now let's switch gear to look at the **containers**, which are of increasing importance at organizations. AWS ECS, EKS, Azure AKS, Google GKE, and Kubernetes are being used for microservices. Recommendations such as changing the resource reservations and consolidating the hosting nodes to reduce costs are not surfaced by the cloud native finance management tools.

Aquila Clouds covers all of the aforementioned resources and services, and we are building more modules for more application monitoring in the near future.

Intelligent resource scheduling

Some cloud organizations focus their FinOps practices in their production environments. Keep in mind the following. According to a study conducted by a FinOps vendor, 44% of cloud resources are for non-production systems, and a daunting 76% of the corresponding workloads are idle because of many reasons such as release cadences, and negligence on the part of developers.

If your organization puts FinOps energy into your non-production environments and gets rid of the idle resource hours, you will be able to **save up to one-thirds of your cloud costs**. This can be very significant depending on your overall cost spend size.

Cloud vendors may provide you with a cron-like interface to schedule for startup and shutdown of your instances. And yet you have to know the exact usage pattern of each of the instances spawned off in your entire environment. This mission is impossible for a CloudOps professional to take on due to the large number of instances and their owners' unique usage behavior. And yet with Aquila Clouds, we make this scheduling feasible with ease.

Intelligently Aquila Clouds surfaces the usage patterns of each instance and provides the capability to suggest a suitable startup and shutdown schedule for an individual instance or a group of interdependent instances (what we call a Service Domain), and puts the schedule in execution per your instructions. You have all the information needed to make decisions for the schedules and can be a lot more effective and efficient in this endeavor.

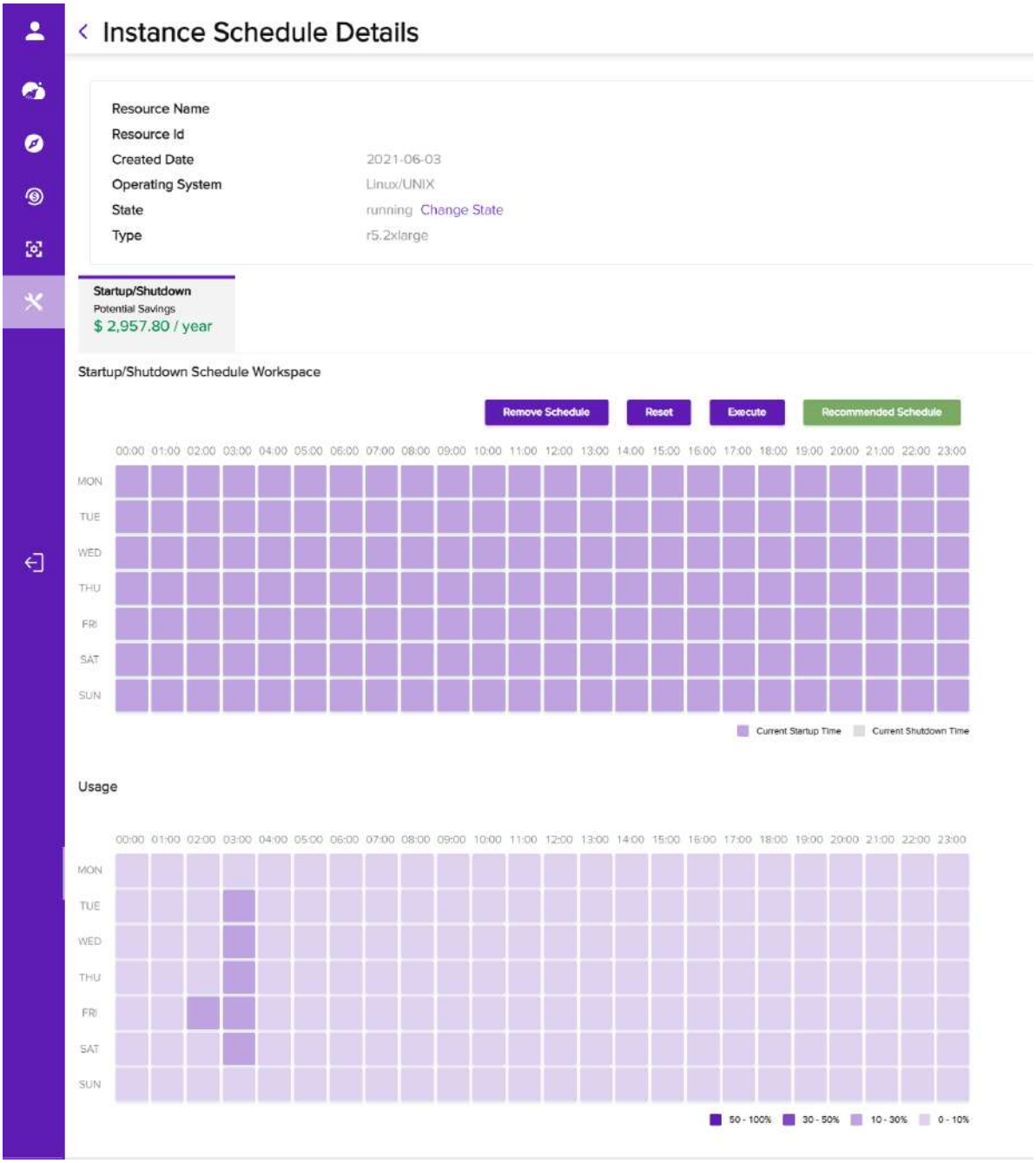

Fig. 3 - Formulation of startup and shutdown schedules with usage heat map

Governance

Multi-cloud financial domains for budget control and chargeback

In large **multi-cloud** organizations, managing the cloud spend for different departments and projects can be a huge task amidst the dynamism of cloud deployments. You need a clear delineation of cloud resources being used by your organizational units. Allocation of costs in

cloud resources and services needs to be usage-based, instead of plain ownership based. Budget alerts can then be effective and fair. Aquila Clouds provides a construct called Financial Domains for this purpose.

Financial Domains can have a hierarchical structure, respecting the federated model of policies, such as **budget allocations, chargebacks, provisioning and entitlements, as well as security policies**. Aquila Clouds can also customize the policies for organizations with specific policies that are not available out-of-the-box.

Project Managers tell us that they need to achieve a project within a time horizon and a budget. To ensure timely delivery of projects, they can enable developers to self-provision cloud resources. And yet this creates more dynamism for cloud costs and utilization of the best rates.

For effective project management, there needs to be checks and bounds for the following:

- Project budget across project time horizon needs to be observed
- Project costs should be known at any given time
- Developers can provision only necessary resources and utilize reserved resources
- Project expenses should be able to be charged back to the project owners

You can use Aquila Clouds Financial Domains to track the resource usage in your projects. We provide near real time showback of project costs and send out alerts when projects are about to cross a threshold of cost boundary, and when they are out of budget. In the same view, we also provide an assessment of reservation utilization for each project so that you can ensure that the project members are good corporate citizens who contribute to the full utilization of reserved resources.

(Shared) Cost allocation

As we mentioned above, cloud vendors allow observability and monitoring only in their own cloud space. If you want to clearly show to your project owners the total cloud costs that span across multiple clouds, you will need to account for each cloud separately.

Aquila Clouds FinOps Platform supports multi-cloud cost allocation in a flexible way using our Financial Domains. Any organizational units can have resources across clouds allocated to them - **as a whole or a portion**. We make shared cost allocation easy by allowing users to assign **percentages** of each resource or service to the corresponding Financial Domains.

For Kubernetes users, pods are units of services that need to be accounted for in different projects. Aquila Clouds FinOps allows allocation of pod costs to Financial Domains. This way Kubernetes infrastructure costs can be borne by different projects according to their real usage.

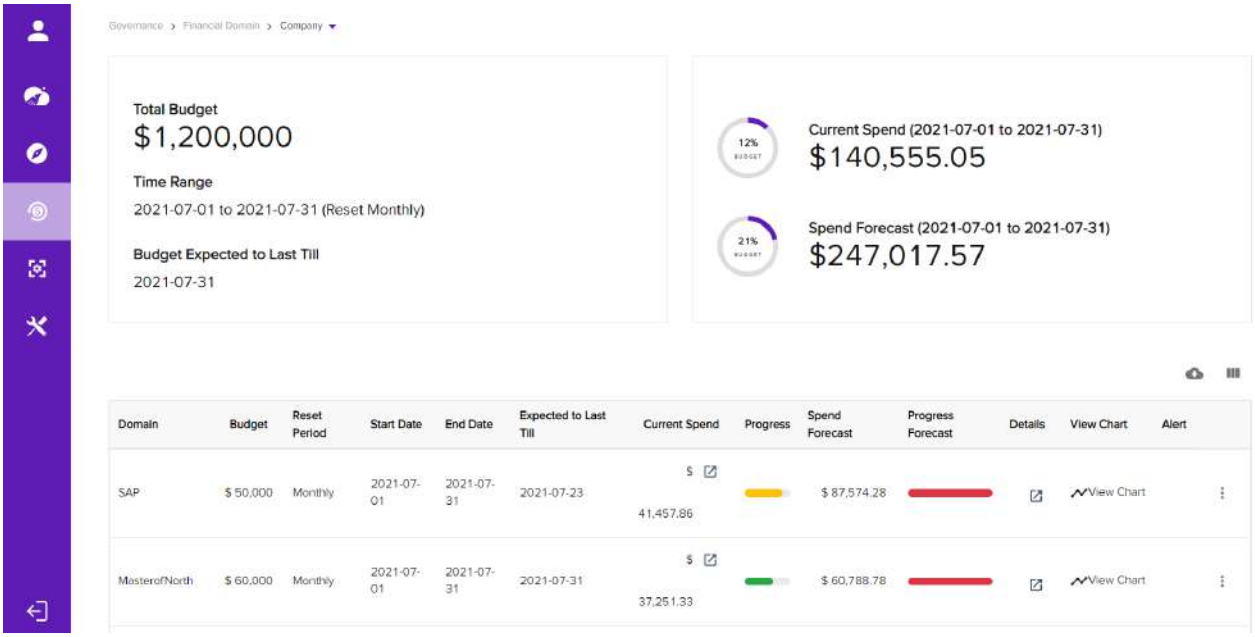

Fig. 4 - Budget controls and cost allocation in Aquila Clouds Financial Domains

Communication

Facilitation of communication across cross functional teams

Organizational alignment across IT, Finance, Product and other organizational units is crucial for the success of FinOps. For instance, IT and Finance typically have diverging goals. IT wants to have more resource buffers to ensure their service level agreements, whilst Finance would like to be as lean as possible to reduce the cloud expenses and boost profitability.

Team members from different cross functional teams do not have access to the same level of cloud asset and financial information via the native tools offered by the cloud vendors. Oftentimes finance team members would be on the receiving end of the bad news when cloud costs hit the roof when the IT team members finally put together some reports at the end of a month.

You need a platform that can provide the necessary information to any team member regardless of their functions, as long as they are entitled to it. Cloud native tools do not support this type of working environment.

On the contrary, Aquila Clouds FinOps platform enables our users to easily share the views and reports on our platform using an RBAC-backed URL. This way they can freely exchange information with a single record of truth in real time without having to wait until a long-awaited meeting to take proper FinOps actions.

Summary

Cloud vendors such as AWS, MS Azure, GCP, and OCI are in the business of selling you more cloud resources. Providing the best FinOps platform to optimize your cloud deployments is not in their best interest. And yet they do provide you with some cloud financial management tools such as AWS Cost Explorer and Azure Cost Management. As the FinOps discipline becomes more complex, you will need to look elsewhere for better cloud financial platforms.

In the paper, we showed you how Aquila Clouds provides differentiated capabilities in each of the 4 areas: Observability, Optimization, Governance and Communication. If you have any comments or suggestions, Aquila Clouds would be more than happy to hear from you. Please feel free to contact us at sales@aquilaclouds.com.

About Aquila Clouds

At Aquila Clouds we embrace the paradigm of Continuous Monitoring and Continuous Optimization **(CMCO)**. Regardless of where you are in your cloud development and deployment, we provide you with the capabilities to ensure a smooth daily operation. Whether you are a CFO or finance manager at an enterprise company looking for better finance governance, or you are a cloud reseller looking for better billing productivity and profitability, or you are a cloud operator looking to improve your daily workflows, Aquila Clouds has you covered.