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Cloud Cost Optimisation

Proven Tactics to
Minimise Cloud Expenditure

Riley.



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Abstract

In a cloud computing model, you can fit your architecture to specific business needs and functional requirements. To build an optimised framework that maximises cost efficiency, expenditures need to be considered throughout all phases of the project.

This paper describes a top-down approach to cost optimisation in the Cloud. We begin by enhancing visibility into costs, then exploring financial and technical methods. These key cloud savings measures will drive expenses down and help you get the most out of your solution without sacrificing performance or reliability.

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Introduction

Cost Optimisation

Cost optimisation involves the continual goal to reduce service expenditures, provide cost attribution and ultimately maximise the return on investment. It is a consideration in all design decisions that helps to improve your infrastructure while freeing up spend for other business initiatives.

This paper describes best practices and a top-down framework for actively identifying savings opportunities. A cost-optimised cloud project is one that:

- Utilises the lowest cost services to handle the workload
- Takes advantage of the offered payment models
- Makes architectural decisions that minimise resources
- Provides insights into service usage and costs to maintain a cost-optimised state.

Regardless of an organisation's choice of cloud service, the same principles apply and this methodology will drive down costs. Many of the services described in this paper have equivalent solutions on Google Cloud or Microsoft Azure.

Cost optimisation should be considered at every stage. Even if workloads and tasks have been “lifted and shifted” off-premises into the cloud, these concepts and services can be applied within the first months of operation. Optimisations extend throughout the entire life of the project.

Riley can take control of your cost strategy long-term, allowing your team to focus on building value-adding features.



Utilise a CMP

Cloud Management Platforms

A cloud management platform (CMP) is a unified solution that assists with forecasting, performance, security, governance and cost management. A CMP is the first step in gaining a deeper view into your costs and detecting savings opportunities.

Your cloud service provider, such as Amazon, Google or Microsoft, provides a simple online console or management dashboard to view costs. Software-as-a-Service CMP alternatives, however, offer a greater breadth of features and can support multiple cloud providers at once. Regardless of your choice of CMP, it should offer:

- Reporting and analytics features on all your cloud service costs, including support for forecasting and capacity planning
- Cost attribution tools that allow you to allocate expenses to teams and projects
- Resource-level insights on the performance and utilisation of each of your services
- Automated policy settings for notifications and warnings on your operations.

CMPs play a central role in cost optimisation. In this paper, we will examine Riley's partner platform, CloudHealth. CloudHealth helps analysts reduce cloud costs. For example, it identifies under-utilised or unused EC2 instances that could be scaled down or closed.

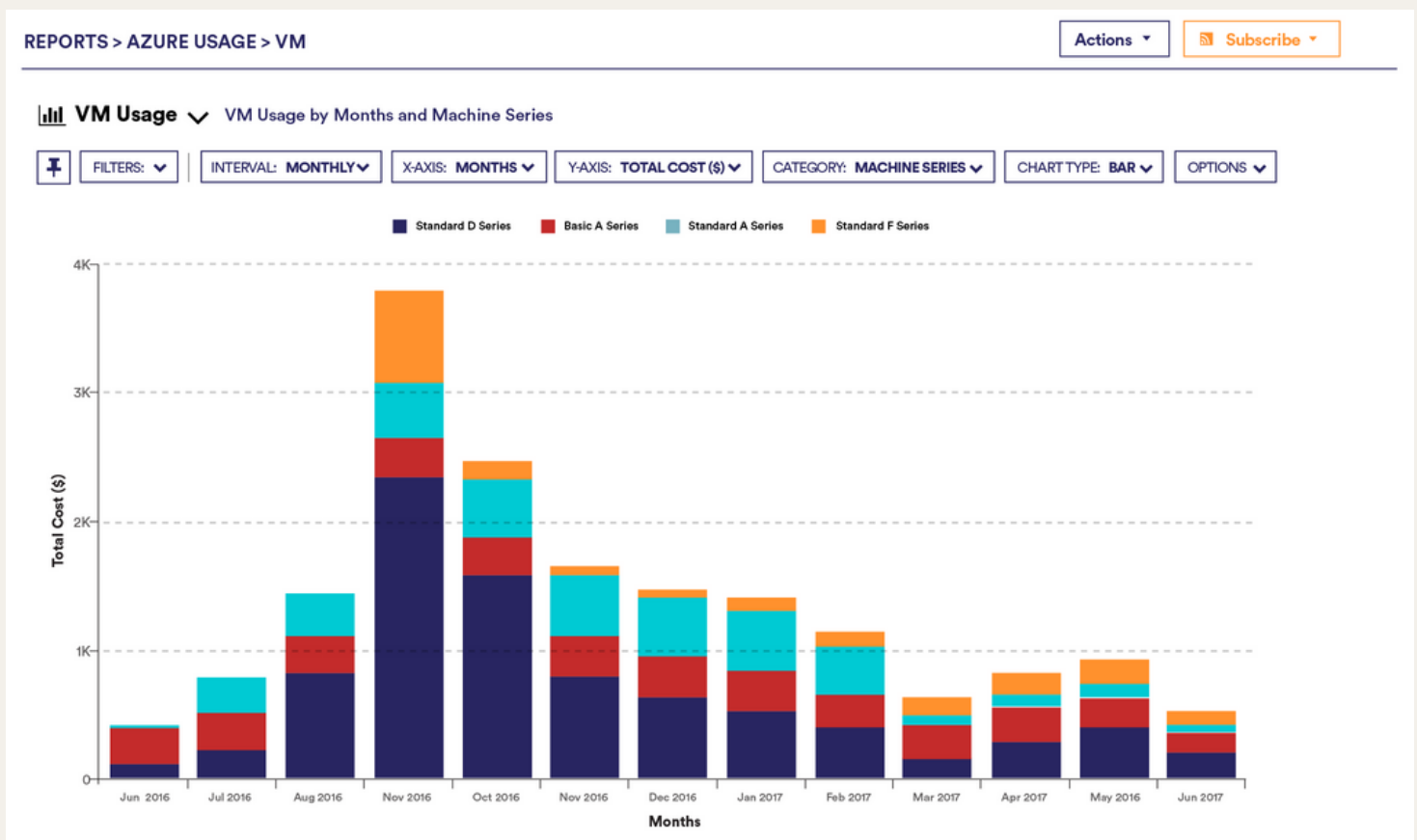


Enhancing Visibility

Billing data allows businesses to attribute costs, measure performance and adjust with agility. Highly accessible, clear data is essential in an ongoing, iterative approach to cost optimisation. CMP's provide customisable reports and dashboards that offer businesses full visibility of their expenditures. Unlike native cost explorers, a CMP such as CloudHealth is a comprehensive application. It displays all the relevant information in cohesive panes and generates advanced insights.

With a CloudHealth integration, users from around the business can better understand how the services that form your cloud environment perform and add to your end cost.

The platform includes enhanced support to help you tag instances, attribute costs to teams and evaluate spending trends over varying levels of time granularity.



Example: A CloudHealth Cost Report.

Task Automation

Alongside superior insights, CloudHealth allows you to build custom policies that automatically execute as your environment changes day-to-day. To maximise efficiency, let your CMP watch your services and perform actions for you when certain thresholds are met or exceeded.

For example, CloudHealth can send you an email when the CPU, memory and disk throughput of an EC2 instance falls below specified levels. Rather than relying on periodic reports, your CMP will flag issues for investigation as they arise. You can then use the alerts and their associated data to adjust the service selection.

Implementing a CMP

CMPs can be integrated with all of the major cloud providers, including AWS, Google Cloud and Microsoft Azure. To update CloudHealth, software agents are deployed to your cloud instances that report back CPU, disk and memory usage metrics. The instance-level, hourly data updates support and promote informed decisions.

As a CloudHealth partner, Riley can deliver enabled software, take care of the back-end and develop a personalised experience. Riley has already [saved businesses millions](#) by improving transparency and making recommendations based on CMP data.

Service Right Sizing

Right sizing is the identification of the best set of services to fulfil the specifications of the workload. With full visibility of your cloud environment, Riley begins the process of examining your service utilisation. By fine-tuning your service selection, you can drastically reduce costs. Matching your services to actual forecasted capacity can save even small environments thousands of dollars a month. Two common right sizing opportunities that frequently arise are:

- Migrating underutilised EC2 instances to smaller, cheaper and more efficient sizes.
- Closing unused or unattached EBS storage volumes.

Identifying When to Right Size

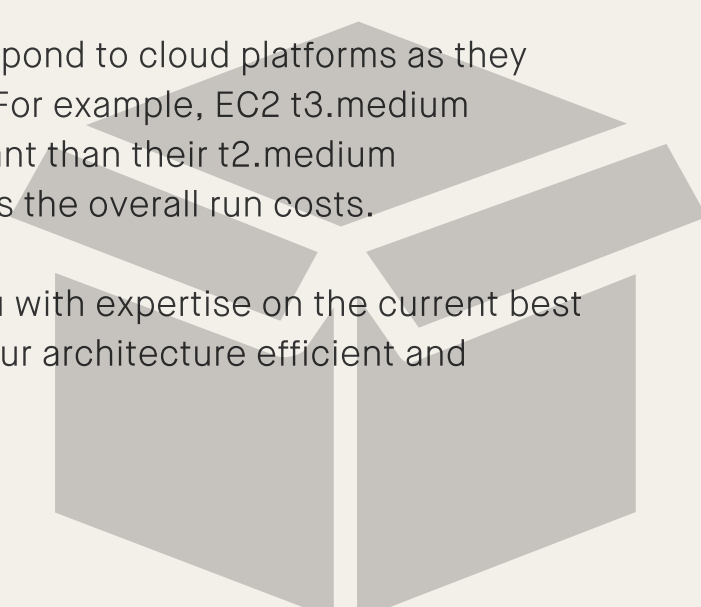
To decide whether to right size, we recommend:

- Analysing historical usage of the service at the appropriate time granularity. To avoid provisioning less service than required and degrading system performance, carefully investigate cycles of demand and peak usages.
- Balancing the cost savings of right sizing against the time and migration costs. Ensure that a decision to close or migrate an instance will not have to be reversed or adversely affect performance. To address this, work iteratively and adjust the cost optimisation strategy every month. As usage and requirements change, right sizing becomes a constant, iterative task.

Adjust to Innovation

To maximise cost efficiency, projects need to respond to cloud platforms as they release and develop new services and features. For example, EC2 t3.medium instances are newer, cheaper and more performant than their t2.medium counterparts. Migrating to the new family reduces the overall run costs.

As an AWS partner, Riley continually provides you with expertise on the current best practices, recommending alternatives to keep your architecture efficient and evergreen.



Power Scheduling

Not all instances need to be running continuously. Scheduling tools can be used to shut down compute instances when they are not in use, eliminating idle resources. For example, testing instances can be automatically turned off outside of work hours, reducing billable hours by 73%.

Usage data from your CMP can indicate patterns and cycles of demand to help identify periods of underutilisation. Amazon does not natively support automatic scheduling, so Riley uses its own software solution, called Insight, to start and stop instances. Insight is able to:

- Orchestrate your instances, simplifying and automating shutdowns, snapshots and update patches, allowing your team to focus on critical tasks.
- Generate and distribute additional information on security, costs and performance.



Reserved Instances

Cloud Billing Models

Switching to a cloud architecture can offer tremendous savings with unlimited scalability and innate world-class security and reliability. To minimise complexity, it is easiest to use the default, on-demand billing models whilst you wait for usage data and develop your architecture.

As your project moves to a maintenance phase, Riley explores and suggests long-term billing plans that maximize return on investment over the entire life of the project. Cloud providers offer considerable savings when compute capacity is reserved. You can identify which instances to reserve with help from your CMP, then reduce costs by up to 75% by committing to them.

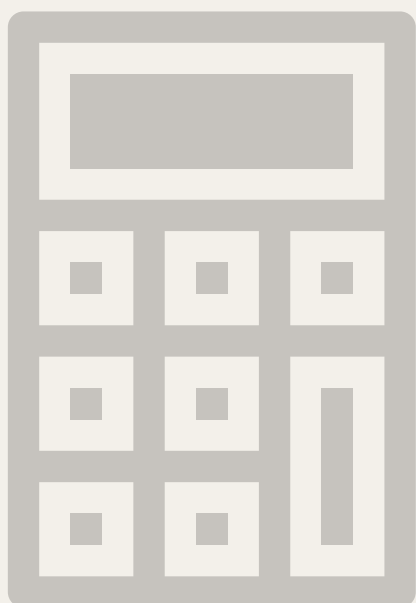
The billing models explored below are for AWS, but equivalent programs are available on Google Cloud and Azure.

On Demand Billing

Default on demand billing offers flat rates with no long-term commitments.

It gives you the flexibility to scale your application with new requirements and migrate to other services at no cost.

On demand billing is suitable for volatile environments or when under testing and development. Once a project reaches stability, Riley follows up and begins exploring the best billing options.



AWS Reserved Instances

An AWS Reserved Instance (similar to Google Cloud's Committed Use Discounts) offers saving of up to 75% to the on-demand rates by committing to use a certain amount of resources. If Riley identifies that your usage of a service is predictable and will extend into the next one to three years, your billing model can be switched.

A Standard Reserved Instance is a commitment to use a particular instance family, size and availability zone within the period. If your architecture is variable, a Convertible Reserved Instance allows conversion to different instance families and locations.

AWS Savings Plans

If flexibility is a non-functional requirement, AWS savings plans offer discounts of up to 72% for a commitment to use a specific amount of compute power, measured in dollars per hour.

Relative to Reserved Instances, a Compute Savings Plan or EC2 Instance Savings Plan provide a lower discount. However, they allow you to move your services into different families, sizes, regions and operating systems. Use an AWS Saving Plan when usage is predictable but your business needs the freedom to move between instances.

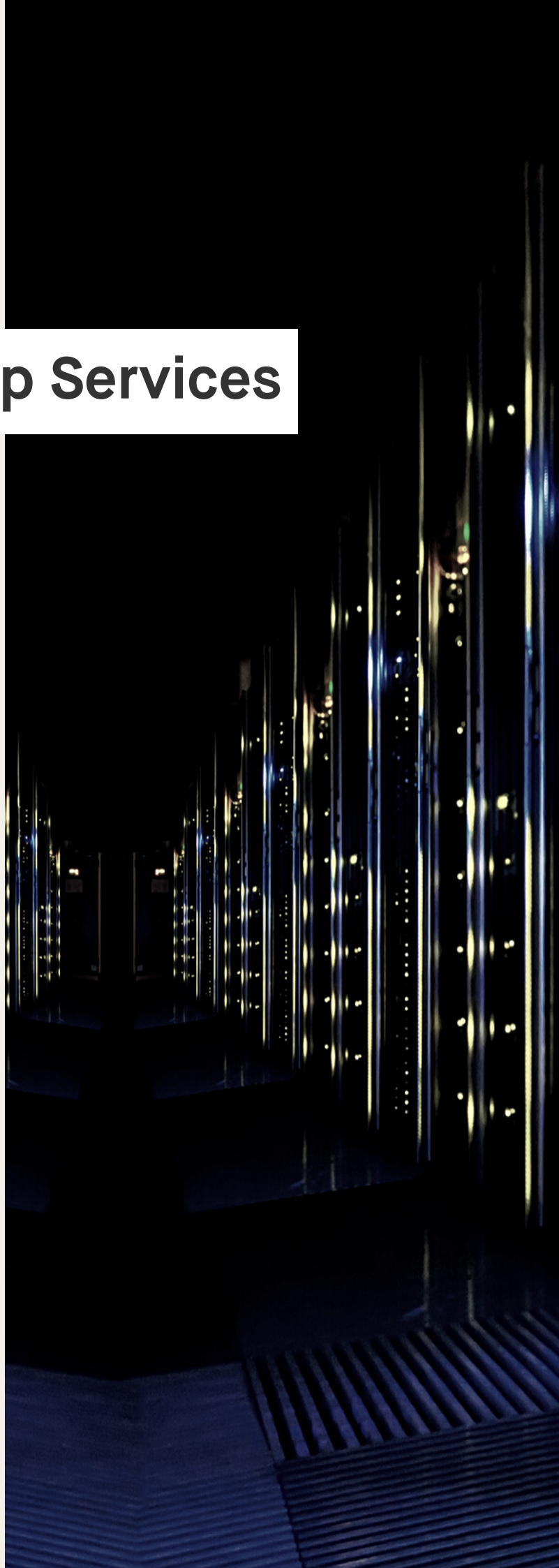


Reconfigure Backup Services

The final tenet of Riley's cost optimisation process involves evaluating backup and disaster recovery plans at an architectural level. Backing up instances to EBS snapshots are popular due to their speed and convenience, but are only incremental backups.

Alternative backup services, such as n2WS, save the entire volume and its associated metadata in a complete backup. This can be restored at a click of a button.

From a cost perspective, Riley uses n2WS to move snapshots to Amazon S3 buckets or Amazon S3 Glacier. A lower cost storage option can reduce the cost of maintaining backup services by up to 60%, while still protecting your data.



Conclusion

Riley helps organisations build cost-efficient, optimised cloud architectures that are high-performing, secure and reliable.

Cost optimisation is a central service in Riley's cost management portfolio. Starting from the top and gathering clear insights into expenditure, we investigate cost saving opportunities in service selection, pricing models and architectural decisions.

By ensuring that projects are cost optimised at all life cycle stages, we ultimately deliver the highest possible return on investment to your cloud initiatives.

About Riley

Our purpose is to seek a positive return on creativity. We recognise the only actions worth taking are those that move toward building a better future.

Riley is an Australian technology company with a primary focus on digital transformation, data and analytics, and infrastructure modernisation. Our highly skilled team specialise in the design, deployment and management of enterprise workloads on customised AWS infrastructures.

We help customers realise the true potential of public cloud by providing tested, proven and trusted solutions.