

White Paper

Cloud Cost Optimization: Tips, Strategies, and Best Practices

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Introduction

[Gartner predicts](#) worldwide public cloud end-user spending will reach \$679 billion in 2024, a growth rate of 20.4% year over year. However, much of that spend gets wasted on poorly provisioned environments, redundant workloads, over-provisioning, and other challenges.

In the [Flexera 2023 State of the Cloud Report](#), 82% of enterprises cited managing cloud spend as one of their top cloud challenges. The typical spend was an average of 18% over budget, with 28% waste.

So, how can your organization stay on top of your [cloud costs](#) and optimize your spend? In this white paper, you'll learn about the main drivers of cloud costs, cloud platform cost structures, and actionable strategies for optimizing your cloud investments.



Cloud Cost Structure

Major cloud providers such as [Amazon Web Services \(AWS\)](#), [Microsoft Azure](#), and [Oracle Cloud Infrastructure \(OCI\)](#) share similar cost structures for their services. They offer pay-as-you-go on-demand resources based on usage, as well as several savings vehicles that lower costs through reserved capacity (spending commitments).

You have a lot of flexibility to mix and match the services and features you use in the cloud. This granular control allows you to focus on what your workloads require and not have to overprovision instances.

The two primary drivers of your variable spend in the cloud are compute and storage. We'll use AWS-specific services in the following examples, but they also apply to Azure, OCI, and other cloud platforms.



Basic Structure of Cloud Compute and Storage Costs

Amazon Relational Database Service (RDS) and Elastic Compute Cloud (EC2) charge an hourly rate based on the vCPUs and memory of the instance size. Larger instances have higher hourly rates.

Additionally, you pay for storage attached to these RDS / EC2 instances. The cost varies based on storage size, storage type, and IOPS. For serverless/managed services, such as [Amazon DynamoDB](#), you are charged based on write and read request units.

Your block storage costs depend on the volume of data, as well as how much you access it, how quickly it needs to be retrieved, and its redundancy. Generally, you pay per GB provisioned per month, with pricing that scales based on whether you need frequent or infrequent access to it.

Data Transfer Costs

Another driver of variable cloud costs comes from data transfer. Data ingress into cloud platforms typically doesn't have a networking cost associated with it, but data egress does. If you're moving large amounts of data frequently between on-premises and cloud platforms, your data egress bill could be surprising.



Be Aware of What's Going On

Your best weapon in the war against overwhelming cloud costs is knowledge. Use the resources that you have available to understand where the costs are coming from, what's driving your highest costs, and areas that are available for cost optimization.

Each cloud platform has a way to set up multiple billing alerts, allowing you to be proactive about cost situations that are starting to exceed your budget and threshold. You can analyze trends and tag cost centers to fully understand your cloud cost scenarios.

Someone in your organization needs to own this cost analysis on a regular basis, whether that's a dedicated person, team, or department. For example, some organizations are [adopting FinOps](#), an operational framework and cultural practice, to handle the ever-increasing complexity and sprawl of cloud costs.

Examples of native AWS tools that you can use to help with the cost observability/optimization process include:

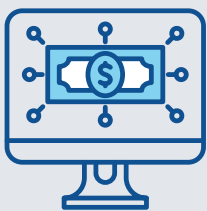
- AWS Trusted Advisor
- Cost optimizer for Amazon Workspaces
- Instance scheduler on AWS
- AWS Cost Anomaly Detection
- AWS Compute Optimizer
- AWS Billing & Cost Explorer

Now that you understand the common cloud cost drivers and the pricing structure, it's time to explore easy and not-so-easy wins in cloud cost optimization.



Cloud Cost Optimization: Easy Wins

You don't necessarily need to make massive, sweeping changes to your cloud strategy to achieve [cost optimization](#) wins. Some basic best practices can lead to quick savings that you can use to gain buy-in for your larger initiatives. AWS services are used in the examples, but the other cloud platforms have equivalent options.



Use Reserved Instances and Other Savings Vehicles

Leveraging Amazon EC2/RDS Reserved Instances (RIs) is an impactful way to reduce compute costs. RIs provide discounted hourly usage rates in return for a commitment to pay for EC2/RDS instance hours over a 1-to-3-year term. The potential savings compared to normal on-demand pricing is up to 72% less. Evaluate your most predictable workloads to identify those that can take advantage of RIs, and convert them from pay-per-use.



Delete Unneeded Resources

Deleting unneeded resources helps your organization avoid paying for unused capabilities. This includes storage volumes, snapshots, machine images, load balancers, Elastic IPs and more. Establishing lifecycle policies can automatically delete old unused object versions in AWS S3 buckets, and provide savings on storage costs. You should also shut down inactive instances when they're not needed to avoid hourly instance charges.



Right Size Your Compute Resources

Right sizing EC2 and RDS instance types to meet performance needs while minimizing costs is key. By monitoring utilization metrics, you can identify overprovisioned instances that could benefit from scaling down. If you are using auto-scaling groups, they match capacity closely to demand, so you're only paying for resources when needed. Combining right sizing with auto-scaling is an impactful way to use the benefits of the cloud to optimize your costs.



Peer Review Deployments

Be proactive about potential cost issues by catching them before they go into production. Require peer reviews of infrastructure templates before deployment to catch inefficiencies in architectures, instance types, and configurations. You can use a service catalog that offers approved templates for your organization.



Not-So-Easy Cloud Cost Optimization Wins

Once you've gotten the basics of [cloud cost management](#) out of the way, it's time to look at more complex strategies that can yield significant savings. AWS services are used for the examples, but equivalent services are available on other cloud platforms.

Adopt Platform-as-a-Service Solutions

Adopting managed cloud services can reduce overhead costs compared to operating on virtual machines and Infrastructure-as-a-Service. For example, AWS Lambda can be a more cost-efficient service for workloads with spiky or intermittent usage patterns. Other managed services like DynamoDB, SQS, and RDS remove the need to manage infrastructure tasks like installation and backups.

Evaluating where managed services can replace custom self-managed implementations on EC2s can generate savings. Although the base cost of PaaS could be higher in this scenario, you remove the associated overhead expenses related to the IaaS solution.

Right Size HA/DR

Your high availability and disaster recovery (HA/DR) strategy also has room for cost optimization. For example, do your dev and test environments really need multi-region failover capacities? Likely not. Optimizing RTO (Recovery Time Objectives) and RPO (Recovery Point Objectives) to your business requirements can prevent overspending on HA/DR solutions.

Use Spot Instances

Leveraging EC2 Spot Instances allows taking advantage of unused EC2 capacity within AWS regions at discounts of 90% compared to on-demand prices. However, Spot instances are not appropriate for all workloads. Spot works well for batch jobs, dev environments, machine learning model training, and test workloads that can handle interruptions. Alternatively, you can design your workload to be tolerant to interruptions by saving state.

Turn Off Dev/Test Environments

Turning off your non-production environments like dev, test, and staging during off-hours conserves resources. You can set up auto-scheduling to programmatically manage starting and stopping resources.

Migrating to Open-Source Databases

Commercial license-based databases, such as Oracle and SQL Server, have high licensing costs that could place a heavy burden on your cloud bill. Whether you use Bring Your Own License (BYOL) or License Included (LI) options, you still have to factor in these expenses. Migrating to an open-source database technology, such as PostgreSQL and MySQL, can remove licensing from the cost equation. However, this process is effort-intensive.

Refactor Your Applications

If you moved a legacy monolithic application into the cloud, you can't allocate and scale resources based on the individual components of the software. By refactoring these applications into microservices, you can reduce costs by scaling each microservice based on traffic, volume, and metrics.

Establish a Cloud Center of Excellence

For continued cloud cost optimization, your organization needs to establish a Cloud Center of Excellence (CCOE). A CCOE promotes cost discipline through governance, best practices, training, and organizational alignment. It acts as a cloud adoption enabler, rather than organizational red tape, by aligning business transformation with technology transformation.

Some ways that a CCOE helps in your continual cost optimization efforts include:

- Standardization of tagging, regions, and naming conventions
- Approved architecture patterns and reference architecture diagrams
- Encouragement for well-architected reviews
- Adoption of a cloud maturity model
- Central team responsible for cost governance and optimization
- Prescriptive guidance in place for all IT teams (DevOps, Site Reliability Engineers, Database Administrators, Analytics, and Development teams)



By approaching cloud governance holistically, a CCoE provides the foundation for cost optimization.

Migrating business-critical databases, systems of record, and proprietary or custom applications to the cloud unlocks innovation potential through modernization. However, realizing a return on investment requires actively managing the cloud cost.

Optimizing public cloud costs requires shared accountability across technology, financial, and business leaders working in coordination. You don't need to tackle every cost issue at once – even small wins can lead to incremental cost optimizations.

Actions both big and small can reduce waste and unnecessary spending over time through consumption awareness. With the right visibility, governance, and commitment to cloud cost awareness, your organization can accelerate cloud adoption and innovation while keeping costs under control.



How Datavail Can Help Your Cloud Cost Optimization Journey

With over a decade of deep cloud expertise, hundreds of successful migrations, and proven cost optimization strategies, Datavail has the experience to help you control cloud costs. Our cloud optimization services, coupled with managed support and strategic consulting, give you the resources you need to conquer your cloud spend. We help mid-market and enterprise companies optimize their cloud environments and maximize the value of their investments through:

- Cloud Cost Assessments
- Cloud Cost Savings Plans
- Right Sizing
- Cloud Migration and Modernization
- Licensing Assessments
- HA/DR Optimization
- AWS, Azure, and OCI Funding Programs

[Contact us today](#) to learn more about the cloud cost optimization opportunities that await your organization.

Biography



Michael Agarwal

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Michael Agarwal is Director & Global Practice Leader for Cloud Databases, Site Reliability Engineering, and NoSQL at Datavail. He has 20+ years of experience in IT including more than eight years in cloud. He has skills and experience in both AWS and Azure including two AWS certifications. Early in his career he was a software developer, database administrator/DBA manager, and API developer. Michael later transitioned into more strategic roles of Enterprise Architect at Hertz where he led the initial cloud adoption and Chief Information Officer at Prevention Genetics LLC where he led IT strategy. Prior to joining Datavail, Michael was a consultant with Amazon Web Services where he led client engagements and solution architecture.



About Datavail

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