



eBook

CLOUDCHECKR ON AWS AND AZURE: A GUIDE TO PUBLIC CLOUD COST MANAGEMENT

TABLE OF CONTENTS

- 3** Intro
- 4** Optimization Requires Visibility
- 7** Cost Management with AWS and Azure
- 9** Leveraging Data from Public Cloud Ecosystems
- 10** Summary

Intro

If you're like many users of the cloud computing services from Amazon Web Services (AWS), you may be considering adopting or already using Azure, the cloud services platform from Microsoft. Moving to a multi-cloud environment provides redundancy should an outage occur with one of your cloud platforms from security attacks, technical issues, or natural or manmade disasters. While Amazon Web Services (AWS) remains the market leader in cloud computing services, Microsoft Azure is rapidly gaining market share in this area. As a signal of this shift, Forbes cites a Morgan Stanley prediction that cloud offerings from Microsoft would increase from 11% of the tech giant's revenue in 2015 to 30% in 2018.

You've likely chosen one or both of these cloud services platforms for good reason—both have landed in the Leaders Quadrant of Gartner's Cloud Infrastructure-as-a-Service Magic Quadrant for the last two years. Each offers a portfolio with an extensive range of cloud computing services that provides cost-effective IT infrastructure that enables your organization that operate at web scale. And both continuously optimize your environment and save money. International Data Corporation (IDC) research notes that enterprise users on AWS have experienced 64.3% savings over equivalent on-premises or in hosted environments deployments.

Moving to the cloud alters the way you purchase resources by shifting IT budgets from capital expenditures (CAPEX) to operational expenditures (OPEX). The cloud also changes how you measure and control computing resources usage and costs. As a result, to maximize the cost-savings and other benefits of using AWS and Azure, you must understand the cost structure and monthly invoices for these two platforms.

In this whitepaper, we discuss the benefits associated with using AWS and Azure, the challenges to gaining those benefits, and some of the tools and practices they provide to assist you in managing your cloud resources. We also explain how third-party tools like CloudCheckr provide additional critical information and capabilities to help maximize your cloud benefits through better managing the cost and security of those resources.

Optimization Requires Visibility

AWS and Azure cloud platforms offer many advantages over on-premise or hosted environments. They let you expand application environments at a much lower cost. You spend less time managing, administering, and updating hardware, while enjoying agility, scalability, and improved performance from your IT resources. Finally, you reduce risk and minimize the frequency of application downtime.

To realize those benefits, though, you must:

- ✓ Determine the right pricing model and appropriate resource types
- ✓ Properly manage your dynamic cloud resources
- ✓ Correctly allocate costs for resources
- ✓ Right-size your purchase
- ✓ Plan for future cloud needs and costs

All of this requires deep, detailed visibility to your cloud costs and usage.

Determining the Right Pricing Model and Resource Types

AWS and Azure provide multiple pricing models. Each also offers around 80 different families and generations of resource types based on their intended purpose, amount of memory, computing power, and other variables.

When it comes to pricing models, the two cloud platforms differ slightly. AWS offers a pay-as-you-go model that charges an hourly rate for any hour in which you use an instance. AWS also allows you to purchase Amazon EC2 Reserved Instances (RIs) at a lower cost or leverage high-volume discounts for workloads like storage and data transfer. You can get even deeper discounts by purchasing Amazon EC2 Spot Instances.

While Azure also provides a pay-as-you-go model, it charges by the minute. Discounts come from making upfront annual commitments for usage through enterprise agreements (EAs). You can also purchase Azure services through cloud service providers (CSPs). Microsoft may simply charge them a pay-as-you-go model, but many CSPs get discounts from Microsoft through an EA agreement or special CSP agreements. If you purchase Azure through a CSP, interpreting your invoice can be challenging because they often lack sufficient detail to show exactly what you received for the money spent.

Given the many different pricing models and resource types available from AWS and Azure, finding the option that best fits your organization's needs can be challenging. Yet you need to identify that option if you're to realize the greatest cost savings and overall benefits of moving your data center to the cloud. Fortunately, both cloud providers offer Total Cost of Ownership (TCO) calculators and monthly cost calculators for a broad range of options.

Managing Dynamic IT

In comparison to traditional, on-premises environments, which lack flexibility, cloud environments are highly dynamic. These environments can easily consist of hundreds or even thousands of instances that automatically scale based on demand, with multiple databases and terabytes of storage that constantly grow. Instances may be associated with different applications, cost centers, or specific users. Without deep visibility into the resources in those environments and how they're being used, it can be extremely difficult to manage your cloud environments and appropriately allocate costs.

Visibility into your cloud environments becomes particularly important for detecting possible security attacks. For example, a distributed denial-of-service (DDoS) attack can cause tremendous spikes in traffic and associated costs. You need to be able to detect these types of events early by receiving immediate notification when usage and costs surge.

Lack of visibility within the dynamic environment can result in uncontrolled and eventually inefficient cloud operations. Third-party tools like CloudCheckr that provide detailed and flexible views into cloud resource usage and costs can help you better manage your environment, reap the benefits of the cloud, and increase your ROI from it. CloudCheckr also sends notifications when traffic and costs spike, allowing you to take action to address security concerns and keep costs down.

Allocating Costs for and Right-sizing Resources

With on-premise environments, enterprise IT organizations tend to over-purchase physical resources. They do this to account for the strong likelihood of growth in future demand. In the cloud, you can start small and scale your capacity as your demand grows. The cloud also averts the risk of wasting funds on underutilized physical resources, while ensuring you have the resources you need should demand increase.

The challenge in determining which cloud resources to purchase stems from the many resource types available from AWS and Azure. As mentioned earlier, Amazon Elastic Compute Cloud (Amazon EC2) and Microsoft Azure Virtual Machines offer many instance types from various generation families. The many different possible combinations of instance type, family, and other variables can make it difficult for your IT organization to select the resources that best balance the required compute power, performance, and price. IT often selects the wrong size, much as they would with on-premise hardware, so you end up over-provisioning and paying more than is necessary.

To right-size your cloud resources, you must understand your levels of usage and demand and continuously adjust to create an efficient, optimized environment. CloudCheckr provides greater visibility into resource utilization, which allows you to make better-informed decisions when selecting resource size and setting the auto-scale thresholds.

Budgeting and Forecasting for Future Needs

Without extensive knowledge of your historical resource usage and cost, including allocations to specific lines of business (LoBs) and organizational groups, planning for future usage and costs is difficult. To create an accurate budget forecast, you need to analyze past usage trends and align them with your application's demands and performance before creating your quarterly or annual cloud budget.

Once you've developed a budget forecast, you need to remain vigilant against resource sprawl and budget creep by consistently monitoring your accounts and forecasting the next month's usage and invoice. This can be particularly challenging if your IT department must forecast and monitor a budget that meets the cloud needs of multiple IT departments and projects. In such cases, a partner solution like CloudCheckr that's specifically built for AWS and Azure can make this task much easier.

Cost Management with AWS and Azure

Tools for Planning Your Migration to the Cloud

AWS and Azure provide you with many tools you can use when planning your migration to the cloud and for controlling your cloud costs once you've migrated. In cases where you require deeper insights and greater control than those tools offer, you can rely on third-party tools like CloudCheckr to meet these needs.

AWS and Azure provide TCO and monthly calculators. The TCO calculator lets you compare your current on-premise operations costs to your costs for equivalent operations in the cloud. The monthly calculator lets you easily estimate your planned cloud environment costs based on your identified resource needs. Both calculators let you gain a better understanding of AWS and Azure cloud functionalities and costs before rolling them out across your organization.

AWS and Azure give you the flexibility to expand your investment in cloud resources as you validate cost predictions. As a result, it's recommended that you start small with the cloud and grow as needed. Compared to on-premise equipment that locks you into ownership of infrastructure that can't easily adapt as needs change, the cloud allows you to grow or shrink usage as you need and save on budget. To further minimize your risk, both also provide a free tier that give you hands-on experience to learn and acclimate to the service before you commit to purchasing.

Tools for Gaining Control of Your Cloud Resources

Once you've migrated to the cloud, you can use several different tools and best practices to manage and track the costs of those resources.

Tag your resources

To allocate costs per LoB, ad-hoc projects, or even specific systems tiers, categorize your resources by adding cost allocation tags in AWS and resource tags in Azure. For example, you can tag a specific pool of Amazon EC2 instances and Amazon Simple Storage Service (Amazon S3) buckets or Azure Virtual Machines used in your test environment with "test." This will later allow you to retrieve a cost allocation report (CSV file) with aggregated cost data for specific resource pools associated with your test environment. You can pull that CSV file into a cloud cost management tool like CloudCheckr that provides easy-to-interpret, yet detailed reports to help you better evaluate this cost data and make better budgeting decisions.

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Monitor your usage

Amazon CloudWatch monitors billing and budgeting for AWS, while Azure Monitor provides this functionality for Azure. Both monitoring tools let you set up alerts that notify you in the event of high usage spikes. This helps prevent the issue of sporadic cost increases that can easily occur due to sudden increases in demand, or even a manual misconfiguration in your auto-scale configuration. By setting up multiple alerts based on how much of your budget you've consumed, you can better stay informed about your costs. For example, you could set up either tool to alert you when you've spent \$200, \$500, \$1000, and \$5000 of your budget for each platform.

Analyze and optimize your spend

AWS offers Cost Explorer, a free tool that provides highly visual graphs of your costs, or "spend data," for up to the last 13 months. The tool also forecasts your likely spend for the next three months. You can use Cost Explorer to identify patterns in how much you spend on AWS resources over time, reveal areas of usage that need further inquiry, and see trends that you can use to understand your costs. Currently, Azure does not offer an equivalent tool for reviewing past cost data and forecasting future spend. This may be because costs can vary significantly based on any EA or CSP agreements in place.

AWS provides Trusted Advisor, an online tool to help you reduce cost, increase performance, and improve security by optimizing your AWS environment. The tool provides real-time guidance to help you provision your resources following AWS best practices. Azure similarly offers Azure Advisor, which analyzes resource configuration usage to increase performance and reliability while improving security.

However, as your cloud usage becomes more complex, you may need a third-party tool like CloudCheckr to gain deeper, more comprehensive, and automated visibility. Such tools advise you of and send notifications for various optimization opportunities that arise. For example, you could see underutilized Amazon EC2 Reserved Instances, Amazon Elastic Block Store (Amazon EBS) volumes that you've purchased, underutilized Azure Virtual Machines, and unassigned Elastic IP addresses. In response, you could shift workloads or data to better use these resources.

Optimize your environment

Once you've set up and are running your cloud environment, you must continuously adjust it to fit current demand while leveraging the various pricing models offered by AWS and Azure. The various pricing models offered by the two cloud platforms can impact the way you optimize your cloud environment.

For example, if you plan to continuously use Amazon EC2 instances from AWS, you need to understand your constant capacity and leverage the Amazon EC2 Reserved Instances (RIs) model. According to AWS, when used optimally, RIs can help you save up to 70% in usage costs. The Amazon EC2 Spot Instance option can also offer savings—up to 50-90%. An organization can combine the mixed pricing of Reserved Instances, Spot Instances, and On-Demand to scale cost-effectively. By giving you reservation with Reserved Instances and scalability with On-Demand and Spot Instances, you can launch instances with minimum required capacity and scale as needed.

Azure, on the other hand, enables you to determine the best approach for each situation—whether through changing the machine size or terminating the machine altogether. For example, if your team created a machine to perform testing, and initially the test had to process a large data set your team might have selected a large machine size. If later on the data set dropped, your team would perhaps need a smaller machine size. With Azure, you can simply change to that smaller machine size.

In AWS and Azure environments, CloudCheckr continuously looks for and identifies under- and over-utilized machines. In each situation, you could determine the best approach, whether that's to use different types of instances in AWS or to get rid of a machine or change its size in Azure. Optimizing based on the different pricing models offered by AWS and Azure represents one of the most important ways you can manage your cloud spend.

CloudCheckr solutions for AWS and Azure continuously look for and automatically shut down idle capacity, while scaling down and consolidating underutilized instances. By closely monitoring your capacity and usage, CloudCheckr allows you to make the most informed purchase decisions across your public cloud infrastructure.

Leveraging Data from Public Cloud Ecosystems

Public cloud ecosystems have experienced tremendous growth in recent years. This growth has been accompanied by an increase in the number of providers of cloud cost management solutions from third-parties like CloudCheckr. These solutions can support enterprises with large cloud footprints—from single to hybrid or multi-cloud environments. They gather large amounts of detailed cloud usage and cost data and use it to deliver easy-to-use dashboards, reports, and notification systems, and provide comprehensive customized reports and invoicing for cost allocation and chargeback purposes.

When qualifying a third party solution to manage a multi-cloud infrastructure, examine the analysis capability to verify that it looks deeply enough into both usage and cost allocation to handle the inevitable growth in your cost complexity. Consider also how well you can apply the solution across your organization. Be aware that in the public cloud, cost is not isolated from inventory and security issues—you need a solution with broader functionality that ties in with your other IT management functions.

CloudCheckr web-based software solutions for AWS and Azure meet these criteria and allow you to do the following in both cloud platforms:

- ✓ Discover and visualize what's running in your cloud environment
- ✓ Consolidate views across multiple cloud accounts and regions
- ✓ Understand cloud costs
- ✓ Analyze your resource usage
- ✓ Monitor for changes
- ✓ Receive recommendations for AWS RI purchase opportunities or Azure machine size changes
- ✓ Leverage hundreds of best practice checks for security, availability, cost, and usage
- ✓ Maintain a historical record of your cloud configuration

Both AWS and Azure provide management consoles for configuring and setting up your accounts. CloudCheckr does not replace the functionality of these management consoles and doesn't make any updates to either cloud environment. Instead, it uses the AWS or Azure Application Program Interface (API) to look at your cloud setup. CloudCheckr connects to your account, takes a snapshot of all of the settings and details on your account. It uses that snapshot to analyze and report on your usage and costs, optimize your spending, provide historical usage data, monitor for changes, and to provide best practice advice.

Summary

Cloud environments from AWS and Azure have and will continue to disrupt the traditional IT world for the foreseeable future. Because these environments accelerate innovation, they're being used by the largest web-scale modern enterprises in the world. If you've shifted IT infrastructure to the cloud, you're likely receiving tremendous benefits. However, you're not maximizing those benefits until you face and overcome the challenge of managing costs within a dynamic virtual environment. AWS, Azure, and their partners such as CloudCheckr provide tools and services to help you overcome these challenges.

When planning your cloud deployment be sure to pick tools like CloudCheckr and use methods that provide you clear visibility into cloud capacity, usage, and costs. Such tools will deliver optimal value and savings as you move your operations into the AWS and Azure cloud environments.

About CloudCheckr

The CloudCheckr cloud management platform unifies cost, security, and inventory management with visibility and intelligence to mitigate security risks, optimize costs, and increase operational efficiencies across cloud infrastructure. With continuous monitoring, 400 best practice checks, and built-in automation, CloudCheckr enables IT, Security, and Finance teams to manage their AWS environments with confidence. Government organizations and Global 2000 enterprises trust CloudCheckr to unify their native AWS data and deliver the most robust cloud management platform in today's marketplace.

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