

# Saving Money in the Cloud

Calculating the cost of cloud computing for Infrastructure as a Service (IaaS) as compared to on-premise computing is very complex for a number of reasons. First, there are a number of cost elements that interact in cloud pricing such as compute resources, storage, and licensing plus additional costs for security, disaster recovery, and other services. Second, there are a huge number of cost price points for each element that differs from provider to provider and circumstance to circumstance. Finally, it is extremely difficult to predict actual resource usage in the cloud.

The key to understanding the cost of cloud computing is understanding your actual resource usage.

- What is your compute usage?
- What is your storage usage?
- What is your license usage?
- What is your data usage?



Although it is a lot of work to determine actual on-premise resource usage, it is possible to look for some first order information in order to make valid comparisons. One mistake that districts often make when comparing on-premise and cloud computing is that they look at the cost of a lift-and-shift. That is, they assume that they will need as many resources in the cloud as they have on-premise. This is rarely true.

When it comes to purchasing compute and storage for on-premise, it is usual to purchase for the highest predicted utilization plus some margin. In a cloud environment that is a recipe for waste. The cloud offers costing where you pay only for what you use as with a utility. This means that a first-order understanding of your compute, storage, and license usage will make it possible to work with Cloud Service Providers (CSPs) to game out the cost of moving to cloud for IaaS. Some CSPs offer cost calculators that help you to predict and optimize your cloud computing costs. The trick is to avoid over-provisioning resources in the way on-premise computing requires.

This also holds true for licensing. Some districts may find that purchasing individual licenses for products provides a savings over site licenses when moved to the cloud as the licenses can be shared among non-simultaneous users.

CSPs also offer discounts for various scenarios where it is possible to save money on your predictable, sustained computing resources. How these work vary from provider to provider (see examples below.)

# COST SAVING ADVICE FROM CLOUD SERVICE PROVIDERS

*(Note: This list of Cloud Service Providers is not comprehensive. CoSN is vendor neutral and is not recommending a particular service or company.)*

## Saving Money with Google Cloud:

While security, flexibility and reliability are three main points we discuss when evaluating cloud, it all plays into a larger question of value. How much do you pay for the value of the infrastructure you receive? We fully believe that when districts move to the cloud they should only pay for what they truly use. For this reason, we offer distinctive billing features such as per second billing and sustained use discounts. You only pay for the time of the services that you use and additionally, the more you use from Google, the more we'll help you save with sustained-use discounts automatically.

## Saving Money with Azure:

Schools choose Azure because of the unique value it provides as a productive, hybrid, intelligent and trusted cloud. Azure is committed to providing a secure cloud foundation, while making available a comprehensive set of services to ensure that your cloud resources are secure and well-managed.

Azure is the only consistent hybrid cloud. You can choose what you want to move to the cloud and how fast you want to move. Our platform supports your ability to run workloads in your data center and Azure and manage them together as a single system. Schools can build and deploy wherever you want with Azure, the only consistent hybrid cloud on the market. Connect data and apps in the cloud and on-premises—for maximum portability and value from your existing investments. Azure offers hybrid consistency in application development, management and security, identity management, and across the data platform.

We often hear customers are looking to the cloud for cost-effective ways to manage and store their infrequently accessed data for use cases like backup and archiving. Another customer need that we often hear about is the need to control or lower hardware costs, particularly for workloads that are burstable and are only needed for specific sets of times. Another big need we hear from customers is how can they provide a scalable and secure environment to house their applications with student data and PII. These are all use cases that are ready made to consider moving to the cloud.

Azure is cost-effective for all server workloads. Over 40% of all workloads on Azure are open source. We also offer the opportunity to take advantage of Serverless computing

with Platform as a Service (PaaS) and Software as a Service workloads (SaaS). With these offerings you can purchase the ability to host workloads like websites, databases, analytics, AI and more and not have to worry about managing the underlying scalable server infrastructure. That is all provided with the offering. We offer education customers the ability to fundamentally rethink how they invest in the platforms they manage.

We offer the ability to purchase resources as pay for what you use and as prepay with Reserved Instance. Reserved Instance purchases of virtual machines can save up to 40% of the cost. We also allow you to bring your server and database licenses to Azure and purchase Hybrid Use versions of those workloads and save up to an additional 40%. For example, if you are a Windows Server customer with Software Assurance, you can combine Azure Reserved Instances (RIs) with Azure Hybrid Use Benefits and save up to 80%. In addition, with Azure Hybrid Use Benefit for SQL Server, customers with Software Assurance will be able to save even more.

Azure offers an end-to-end cloud cost management and optimization solution to help customers make the most of cloud investment across multiple clouds. Cost Management is free to all customers to manage their Azure spend.

### Saving Money with Amazon Web Services:

The mission of educational institutions is not to run data centers, yet in many cases a significant amount of time and money is spent doing just that. Amazon Web Services provides a way to acquire and use infrastructure on-demand. Amazon Web Services offers schools a pay-as-you-go approach for pricing for over 70 cloud services. Amazon Web Services pricing is similar to how you pay for utilities like water or electricity. You only pay for the services you consume, and once you stop using them, there are no additional costs or fees. This puts more money back into the classroom, so that you can innovate more, expand learning opportunities, and be more agile based on your student's needs.

With Amazon Web Services, you can get volume based discounts and realize important savings as your usage increases. As a result, schools benefit from the economies of scale that allow you to increase adoption and keep costs under control. Amazon Web Services also gives you options to acquire services that adapt to your school's needs. For example, Amazon Web Services' storage services portfolio, offers options to help you lower pricing based on how frequently you access data, and the performance you need to retrieve it. To optimize your savings, choose the right combinations of storage solutions that help you reduce costs while preserving performance, security and durability.

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For certain services like Amazon EC2 and Amazon RDS, you can invest in reserved capacity. With Reserved Instances, you can save up to 75% over equivalent on-demand capacity. When you buy Reserved Instances, the larger the upfront payment, the greater the discount. To maximize your savings, you can pay all up-front and receive the largest discount. Partial up-front RI's offer lower discounts but give you the option to spend less up front. Lastly, you can choose to spend nothing up front and receive a smaller discount, but allowing you to free up capital to spend in other projects. By using reserved capacity, your organization can minimize risks, more predictably manage budgets, and comply with policies that require longer-term commitments.

In addition to these features Amazon Web Services offers cost Explorer a free tool that provides pre-configured reports for common Amazon Web Services spend queries for current and historical periods, as well as forecasting. It also allows you to customize the reports to meet your specific needs or to download your billing information for use in your own tools. Another free tool, Trusted Advisor inspects your Amazon Web Services environment to find opportunities that can save you money, improve your system performance, increase your application reliability, and help you implement security best practices. Since 2013, customers have viewed over 2.6 million best-practice recommendations and realized over \$350 million in estimated cost reductions. Lastly Amazon Web Services has lowered prices on 62 different occasions in the last eight years passing those savings onto our customers.

This paper is part of [CoSN's Smart Education Networks by Design \(SEND\): Cloud Initiative](#)

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