

# Saving Money in the Cloud

from the CoSN Network & Systems Design Committee

There are opportunities for school organizations to save money by leveraging cloud services. However, a total cost of ownership (TCO) approach must be taken to calculate potential savings and evaluate the cloud against on-premise services and systems. Opportunities for savings will vary based on the type of cloud service being evaluated. The three most commonly utilized cloud services include:

**1. Software as a Service (SaaS):** A cloud computing model where providers offer application software over the Internet, managing all required physical and software resources. Users access the software via web applications without owning or installing it on their devices.

**2. Infrastructure as a Service (IaaS):** A cloud service offering on-demand compute, storage, and networking resources, eliminating the need to manage physical infrastructure. Users handle their own software installation and configuration while the provider manages the hardware.

### Software as a Service Cost Evaluation

There are multiple elements to calculate when evaluating software as a service against on-site hosting. This table provides a list of elements to guide your cost analysis.

Software as a Service (SaaS)	On- Premise Software Hosting
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**Subscription Fees:** These are usually paid annually or monthly based on the number of users or volume of usage (e.g., per user or data storage).

**Implementation Costs:** Any costs for setting up and customizing the SaaS product.

**Security & Backup:** This service is not always included in SaaS solutions. Make sure to include any additional costs associated with data security, backups, and disaster recovery.

**Training Costs:** Any costs related to training staff to use the new system.

**Support and Maintenance:** SaaS providers typically include customer support in their fees, but you may want to confirm any additional support charges.

**IT Staff Costs:** Salaries for in-house IT staff required to manage SaaS solutions, interact

**Hardware:** The initial cost of purchasing servers and storage devices to host the software. Remember to include operating systems licensing.

**Software Licenses:** Any upfront licensing fees for the software (often a one-time payment and/or annual renewal – annual license maintenance costs are usually around 15% of the original purchase).

**Energy Costs:** The ongoing electricity cost to run the servers.

**IT Staff Costs:** Salaries for in-house IT staff required to manage, maintain, and troubleshoot the local servers.

**Security & Backup:** Costs associated with data security, backups, and disaster recovery.

**Upgrades & Patches:** The cost of keeping hardware and software updated, including any required hardware replacements and software version updates.

with the vendor, and provide local application support.	
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## Infrastructure as a Service (IaaS):

Calculating the cost of cloud computing for Infrastructure as a Service (IaaS) as compared to on-premise computing is complex for several reasons. First, several cost elements interact in cloud pricing such as compute resources, storage, and licensing plus additional costs for security, disaster recovery, and other services. Second, pricing can be impacted by the volume of data moving into or out of the environment and the time of day in which processing is occurring. Third there are a substantial number of cost price points for each element that differs from provider to provider and circumstance to circumstance. Finally, it is 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 computer 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-prem 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 districts purchase equipment for on-premises use, it is typically sized based on the maximum capacity required for use across five years. Much of that capacity is not used until later in the hardware's life cycle. Whereas IaaS is charged based on actual usage not on potential future use.

However, it is important to do a comprehensive cost analysis. There are cases in which it is not cost effective to host in the cloud, and an on-prem solution will make more sense financially.

The table below provides a list of elements to guide your cost analysis for Infrastructure as a Service.

<b>Infrastructure as a Service (IaaS)</b>	<b>On-Premises Servers &amp; Hosting</b>
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**Subscription Fees:** These are typically based on the resources consumed. Costs are often billed monthly or based on usage. Make sure to calculate costs for each of the following:

- Compute
- Storage
- Data Transfer  
(including ingress and egress charges)
- Licenses
- Backup and data retention costs

**Implementation and Setup:**

Initial costs for setting up and configuring the IaaS platform (if applicable). This might include the cost of migration from an on-premises system to the cloud.

**IT Staff Costs:** Salaries for IT staff to manage, maintain, and troubleshoot the cloud servers and infrastructure.

**Training Costs:** Costs associated with training staff on the new IaaS platform. Do not stint on training for staff. IaaS platforms are

**Hardware Costs:** The upfront cost of purchasing and maintaining physical servers, storage devices, networking equipment, and backup systems.

**Software Licenses:** Licensing costs for operating systems, virtualization software, and any other required applications.

**Data Center Facility:** Costs related to operating or renting data center space, including rent, utilities, security, cooling, and other facility management costs.

**IT Staff Costs:** Salaries for IT staff to manage, maintain, and troubleshoot the servers and infrastructure.

**Energy Costs:** Electricity costs to power the servers, cooling systems, and other data center infrastructure.

**Security and Backup:** Costs for physical and network security, as well as backup solutions for disaster recovery.

<p>managed differently than on-premises systems and require upskilling for staff.</p> <p><b>Support and Maintenance:</b> Support is often included in the subscription fee, but you may incur additional charges for premium support or customized services.</p>	<p><b>Maintenance and Upgrades:</b> Costs to regularly upgrade and replace hardware, install patches, and maintain the servers to keep them operational.</p>
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Some Cloud Service Providers (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.

CSPs also offer discounts for various scenarios where it is possible to save money on your predictable, sustained computing resources. How these works vary from provider to provider (See examples for evaluating potential cost savings below.)

### Steps to Calculate Savings:

1. Calculate 5-year cost of Cloud solution.
2. Calculate 5-year cost of On-Premises solution (use a five-year cost as that will give you a good idea of the full cost across the five-year life cycle of your server hardware)
3. Compare the two costs.
4. Also do a benefits assessment. If costs are similar, you may decide that there are substantial benefits in terms of security,

sustainability, or support options that are significant and should be included in your final decision.

Evaluate whether a Cloud solution changes the funding source (e.g., capital verses operating expenses). For more information on capital verses operational expenses see: [Technology Budgets: Moving from Capital Expense \(Cape\) to Operational Expense \(OpEx\)](#)

*CoSN is vendor neutral and does not endorse products or services. Any mention of a specific solution is for contextual purposes.*

## **About The Consortium for School Networking**

CoSN, the world-class professional association for K-12 EdTech leaders, stands at the forefront of education innovation. We are driven by a mission to equip current and aspiring K-12 education technology leaders, their teams, and school districts with the community, knowledge, and professional development they need to cultivate engaging learning environments. Our vision is rooted in a future where every learner reaches their unique potential, guided by our community. CoSN represents over 2050 school districts reaching over 11 million students. Our state presence is expanding with 33 [CoSN Chapters](#) in 34 states who function at the grassroots level to further effect change and continues to grow as a powerful and influential voice in K-12 education.

CoSN also provides opportunities for companies that support the K-12 EdTech community to participate as corporate members.



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