When Cloud?

Thriving in a Multi-Cloud World: A Guide for K-12 Districts

from the CoSN Network & Systems Design Committee

The cloud is an essential infrastructure for modern education, powering everything from student information systems to online learning platforms. While most districts have embraced cloud computing to some degree, the challenge now lies in strategically managing a multi-cloud environment. This involves selecting the right mix of services, ensuring data security and privacy, optimizing costs, and maintaining flexibility for future needs. This document aims to equip district leaders with the knowledge and insights to navigate this evolving landscape and make informed decisions about their district's cloud strategy.

Cloud is not a ubiquitous term. Cloud can refer to a wide range of services including Software as a Service, Infrastructure as a Service and Platform as a Service. Understanding when to use cloud includes understanding which type of cloud services to leverage.

Definitions

- **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 software via web applications without owning or installing it on their devices.

- **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.

- **Platform as a Service (PaaS):** A cloud service delivering a full platform for developing, running, and managing applications. PaaS simplifies app creation by handling the underlying infrastructure, allowing developers to focus on software development.

1. Security

Cloud services offer schools and districts the opportunity to enhance cybersecurity by providing access to advanced security features and integrating with existing security controls.

- **Compliance to Security Standards and Audits**: Cloud providers can meet a broad spectrum of compliance certification and accreditation standards such as: HIPAA, NIST, ISO and FedRamp. Check with your vendor for certification of compliance

with standards required by your organization and governmental regulations. Validate that your vendor participates in rigorous third-party audits to verify adherence to the strict security controls these standards mandate.

- **District ownership, stewardship, and control of data**: When using IaaS solutions, cloud providers give should education institutions full ownership and control of their data when purchasing Infrastructure as a Service. Agencies control where data is stored and how it is securely accessed or deleted. In the SaaS model, cloud vendors and school districts frequently enter into a shared responsibility for the ownership and control of data. Districts should vet cloud vendors and we recommend using the [K12-Community Vendor Assessment Tool (K12-CVAT)](#) before purchase to identify and address areas of concern and address.

- **Leverage Enterprise Security Capabilities**: Cloud services offer the benefits of aggregation of security services and ensure that the highest levels of security developed for customers are automatically made available to all accounts. These include strategies like encryption and zero-trust. IaaS providers offer CIS hardened servers.

- **Business Continuity and Disaster Recovery**: It is easy to make a plan for continuity in the foundational architecture, with many features built in to help with durability and redundancy. Education institutions should ask vendors for their business continuity and disaster recovery plans to determine if it meets their organizational plans.

- **Elasticity**: Cloud architectures are flexible enough to absorb unwanted traffic such as Distributed Denial of Service (DDOS)

attacks. Cloud services are also advantageous as they are designed to flex and scale on demand, saving organizations from large up-front investments in hardware.

- **Monitoring**: Cloud service providers offer the opportunity for aggregated monitoring services including monitoring for potential security issues and providing advanced threat protection and response.

2. Simplification

Cloud services simplify technology management by handling infrastructure maintenance, software updates, and hardware replacement, freeing districts from these time-consuming tasks. This allows IT teams to focus on delivering organization-specific services and leveraging applications and equipment to meet educational goals.

- **Automation**: Cloud provides automation to assist with provisioning, patching, and scaling infrastructure. Districts should ensure automated tasks do not cause issues with hosted services and applications.

- **Administration**: Cloud has provisions to set up rules to administer and manage systems across the organization.

- **Business Continuity and Disaster Recovery**: – Cloud services can simplify business continuity and disaster recovery by providing built-in fail-safes and failover mechanisms. These features ensure seamless operations during disruptions, eliminating the complexity and high costs associated with traditional on-premises solutions. However, these features are not automatically included in all cloud services, so it is essential to

review contracts carefully and confirm that they meet your organization's requirements.

- **Device Agnostic**: – SaaS solutions provide a fully web-based environment, enabling access to cloud resources from any device without relying on specific programmed clients. This device-agnostic approach ensures flexibility and broad compatibility, enhancing usability across various platforms and reducing dependency on specialized hardware or software.

- **Management**: Cloud allows districts to simplify server management to a single console accessible from any location and gets equipment off site. Cloud also offers managed services for software patching and management. Software is managed by the SaaS provider who takes care of updates, upgrades, etc.

- **Procurement**: – Cloud services allow districts to select only the features they need through an à la carte purchasing model, avoiding the cost and complexity of buying a full package. This approach streamlines implementation by integrating software and hardware while operationalizing billing with predictable, flat-rate expenses.

- **Planning**: Cloud platforms allow you to spin up and down servers, which readily simplifies the planning process. Cloud platforms also support scalability for increasing or decreasing enrollment or budget cuts and handling peak usage needs for special circumstances, like state testing.

3.   Analytics & Insights

Cloud computing offers districts easier and more effective access to powerful analytics and insights by processing large volumes of data quickly and efficiently.

- **Analytics Services**: Analytics are built into many cloud services by default and provide access to the same analytics tools as the top fortune 50 companies and top research institutions.

- **AI:** Cloud services offer access to AI tool sets and data models, including the potential to use machine learning for enhanced personalization, predictive analysis, or real-time monitoring. However, it is crucial to ensure that district data is stored in its own secure space, separate from other organizations' data, and that privacy and data ownership are clearly defined in the contract to protect sensitive information.

- **Personalization**: Districts can better serve students with personalization due to the power of analytics across disparate data sets in the cloud.

- **Storage**: Cloud offers the ability to store large unrelated data sets from multiple sources and gain real-time insights.

4.   Agility and Experimentation

Cloud services allow districts to access equipment and systems on a pay-as-you-go basis, eliminating the need for large upfront capital expenses. This flexibility enables districts to be more agile in-service delivery and experiment with innovative technologies and approaches without the financial burden of traditional infrastructure investments.

- **Agility**: Cloud can support data intensive or resource intensive short-term needs. And pay for what you use.

- **Microservices**: Provides potential for faster development, efficient resource utilization and network resilience.

- **Scaling** – Being able to scale resources up or down based on needs ensures efficient long–term use without overprovisioning. This flexibility allows organizations to adapt quickly to changing demands.

- **Sandbox and Learning:** PaaS and IaaS solutions offer access to learn and test modern or updated platforms and infrastructure without large investments.

5. Efficiency

Cloud services enhance efficiency by streamlining operations through automated updates, centralized management, and seamless integration of tools and resources. This allows district IT staff to focus on efforts specific to supporting schools and educational priorities, rather than managing infrastructure.

- **Flexible Licensing**: Districts can pay only for the licenses they actively use and provision, avoiding unnecessary costs. However, the ability to scale down licenses may vary by contract, as many agreements allow for easy increases but not as quick a decrease in licensing, so districts should ensure this flexibility is clearly included in their contracts.

- **Free tiers:** – Many cloud providers offer free service tiers that allow districts to experiment with new tools or services without a cost commitment. However, these free tiers often come with

restrictions or limited features and may not provide full control or ownership of district data, so they should be reviewed carefully before use.

- **Labor**: IT workload shifts from managing infrastructure and applications to focusing on tasks and projects that address the specific needs and priorities of the district.

- **Resources**: Districts can minimize capital outlay by operationalizing large architecture assets and procuring them as needed on a monthly, annual or as load dictates basis.

- **Sustainability**: Cloud services can reduce energy consumption and carbon footprint with efficient use and design of data centers.

6. Equity

Cloud services promote equity by providing consistent access to resources and tools regardless of location or device, ensuring all students and staff have the same opportunities to succeed. This flexibility helps bridge gaps in technology access, supporting underserved communities and creating a more level playing field across the district.

- **Access**: Agnostic (web-based) access to resources opens the door to universal access as long as broadband Internet access is pervasive and widely available to all. Make sure to review resources to ensure they meet accessibility standards.

- **Equitable Access**: Cloud-based resources have the agility to be adapted more quickly and updated to meet the needs of diverse learners.

- **Virtual desktops**: Virtual desktops offer a uniform digital experience, giving students equal access to the same tools and learning environments regardless of their device or location. This technology helps bridge equity gaps and ensures consistent opportunities for all learners.

Considerations

Cloud services offer districts significant opportunities to streamline, modernize, and maintain their technology environments, providing enhanced efficiency, scalability, and innovation. However, as districts decide when and where to leverage cloud solutions, they must carefully consider potential challenges and risks. For example, while cloud computing enhances security, national and international providers are more likely to be targeted by data attacks than smaller, localized systems. To protect their interests, districts should review data breach protocols, ensure contracts clearly outline safeguards, and implement robust data governance processes that limit provider access to only necessary data and include procedures for securely deleting outdated information.

Transitioning to the cloud is more than just moving files to new servers—it requires strategic planning, thoughtful risk mitigation, and comprehensive staff training to navigate the learning curve. Advanced analytics and leading-edge platforms often require specialized expertise, which may necessitate retraining staff or hiring new talent. Additionally, cloud pricing can be complex and unpredictable, requiring careful budget planning to avoid financial strain. Districts also need to address equity concerns, ensuring all students have access to cloud-based services, especially those who may lack reliable Internet connectivity outside of school.

Finally, while cloud solutions can bring transformative benefits, districts should remain aware of potential risks like vendor lock-in. Proprietary technologies, inconsistent data governance, and rigid contractual obligations can limit flexibility and long-term adaptability. To mitigate these risks, districts should carefully evaluate vendor contracts and develop an exit strategy to transition to alternative solutions if the services no longer meet their needs. By balancing the opportunities with these considerations, districts can make informed decisions about how best to leverage cloud computing for their unique needs.

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.

Published Jan. 2025