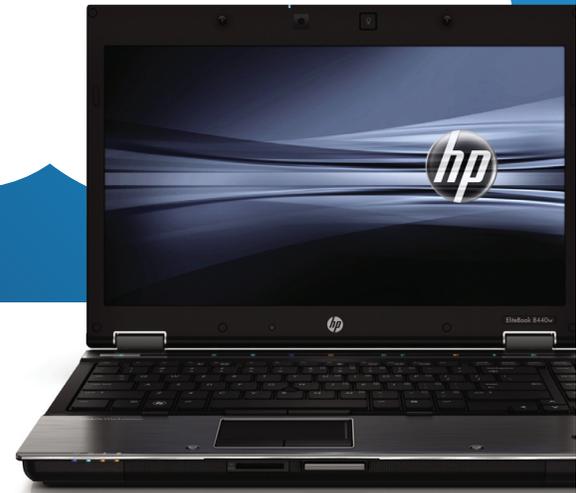*TOP 10 CONSIDERATIONS FOR*

MOVING TO THE CLOUD

There is a recent and exciting movement to cloud-based infrastructures in K–12 education— and for good reason. Cloud computing enables access to applications, data, information, content and curriculum from anywhere an Internet connection is available. It helps improve secure data management and meets the needs of rapidly changing content and software applications. Perhaps best of all, cloud computing helps districts maximize every dollar by creating IT efficiencies, scalability, and compatibility with multiple hardware platforms. By hosting applications, content, and data on a small number of servers—"in the cloud"— district employees, students, and parents have access to the information they need to be successful.

Cloud computing perfectly suits today's students, who routinely harness the power of technology throughout their day-to-day lives. And experts agree that integrating technology into the classroom is essential to preparing students for successful futures in higher education, internships, and the competitive global workforce.

HP SchoolCloud delivers a browser-based virtualized desktop that optimizes anytime learning. With HP's access devices, servers and storage, professional development, and a user-friendly instructional interface from our partner, ClassLink, we can help schools and districts create a private cloud environment. ClassLink's virtual desktop, LaunchPad, gives teachers and students access to all their applications and files from any Internet-connected device.

Following are ten considerations for schools or districts that are interested in the substantial benefits of cloud computing.

1. Security and Reliability

School systems should seek solutions that provide security for files uploaded and managed through the cloud.

- Your data should be kept private, with the options of making it publicly accessible by third parties.
- Files should be backed up nightly.
- Schools should be able to retrieve all files in the event of a change in providers or to bring data in-house.
- The level of security should be greater than that which is implemented locally.
- Your provider should use proven cryptographic methods to authenticate users, and you should be able to add encryption to your data before storing it in the cloud.
- Your provider should redundantly store your files on multiple devices across multiple facilities.
- The infrastructure should be designed to sustain concurrent device failures.

2. Multiple Views (virtual, instructional, mobile)

Cloud computing uses a virtual desktop that allows users to define their own unique views of the desktop. Because it is rendered in a browser, a virtual desktop is accessible on nearly any Internet-connected device. The desktop view:

- Can mimic many elements of a traditional operating system and organize information in a context familiar to teachers and students alike.
- Provides collaboration and communication tools, a shared virtual chalkboard and class calendar, and easy-to-use tools for teachers to publish syllabi and add resources to a class.
- Allows teachers to quickly add or drop students from a course.
- Offers a 'drop box' for students and teachers to share and upload files. Can be accessed on any device, in any location where there is Internet availability.
- Accommodates and integrates emerging mobile appliances (e.g. Smartphones and pad/tablet devices), allowing your district to provide equal access to learning resources for students and teachers.

3. SSO and Provisioning

Your cloud infrastructure and software as a service provider should provide a means to enable Single Sign On (SSO) integration with frequently used web (SaaS) and traditional Windows (via Terminal Server or Citrix, for example) applications. LaunchPad provides Single Sign On connectors to a growing number of web assets and a number of traditional Windows-based applications. SSO is enabled through Active Directory (AD) or eDirectory/LDAP. For example, your Active Directory is published as a web service (using Port 80) and the LaunchPad Virtual Desktop syncs with this AD to provide SSO and application provisioning. For IT administrators, SSO dramatically simplifies the creation of custom virtual desktops for each user profile.

4. Virtually Anytime Access

Because cloud computing provides dynamic, on-demand access to processing power (e.g., servers in the cloud) and this processing power scales dynamically based on usage, your access devices (desktops, laptops, tablets, slates, pads, Smartphones, etc.) no longer require the hefty footprint and processing power to run applications locally. As a result, using LaunchPad, you can now leverage the use of any device, virtually anywhere an Internet connection is available. This can lower your cost of ownership and create a smaller power footprint, and thus offer a greener solution in terms of computing infrastructure.

5. Flexible App Hosting & File Storage

The virtual desktop allows you to designate the location of applications and files that are accessed by end users. Some tools (SaaS) you may want managed in the cloud while other tools, such as Windows applications, you may want to render as published applications using locally hosted Terminal Server or Citrix technology. These published Windows applications can be integrated within LaunchPad, allowing flexible application hosting and reliable and scalable file storage for each user.

6. Active Directory

Like many school systems, you may have implemented Active Directory (AD) to manage credentials (user-names/passwords) for your users. Your cloud solution should embrace and support this investment. Launch-Pad accesses your AD as a published service that you can enable in IIS via Port 80. LaunchPad syncs with this AD (you set the frequency) and then uses the same credentials you have defined for users to provide access to the LaunchPad environment. This process enables SSO to both ClassLink, and third-party tools.

7. Enabling BYO

Perhaps your district is considering embracing privately owned (student- or parent-owned) computers—a Bring Your Own Device (BYO) model for student and teacher computing. LaunchPad can help you easily deliver more secure services to a wide array of privately owned technology. After you define your minimum requirements (e.g. a browser with Java), any device that meets those requirements can be used to access the virtual desktop.

8. Classroom Management Tools (teacher sees student screens)

As with any implementation of instructional technology, your cloud-based virtual desktop should provide teachers with tools to manage and guide the classroom experience. Within LaunchPad, teachers can use simple tools to screen-grab student devices, share their virtual desktop with students, start or stop student virtual desktops, or enable/disable services on these virtual desktops.

9. Collaboration Tools (students and teachers work together in groups)

Cloud computing should also enable collaboration between users to enhance and extend the learning process.

- Students exercise and develop collaboration techniques within the safety and security of an online communication system integrated into the desktop.
- Chat is available on nearly any device, allowing users to connect in real-time.
- Administrators can allow student-to-student chat, teacher-to-teacher chat, student-to-teacher chat, or group chats.
- All dialogue is captured and archived to ensure acceptable use. The desktop also integrates video chat, which uses the video and audio chat technology (camera and audio controls) available with many computers.
- Video chat allows one-to-one or one-to-many broadcasts, with screen sharing, an interactive white board, and a freehand writing tool for online tutoring support or problem solving.

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10. Sustainable and Affordable

Resources are dynamically scalable over shared resources, so you only pay for what you use. Management of applications moves to the cloud provider and it takes less time to deploy (provision) new services for end users. Cloud solutions also scale with demand, thus additional processing power and bandwidth is available as required during peak usage times.

For more information about HP SchoolCloud, please visit www.hp.com/go/SchoolCloud.

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