Publisher's Report

By Paul Korzeniowski

Visibility within the cloud

New cloud computing technology can identify end-user devices, bringing a better experience to students, staff, and others

With earlier generations of technology, the term "cloud computing" was an apt description for more reasons than one: As users connected to the cloud, the system was fairly opaque in that it couldn't "see" the type of device the person was using. As a result, the cloud delivered the same computing experience to a user whether he or she was connected via a desktop computer, a laptop, or a mobile device.

But new technologies have emerged that make cloud computing a more dynamic and user-centric experience. This so-called "cloud awareness" brings the ability to detect what kind of device a person is using, so the system can deliver an experience that is optimized accordingly. For education, this has a number of implications.

Suppose you're a student logging into a curriculum software program. If you log in from a handheld device, the system might deliver an experience that is optimized for a smaller screen. Conversely, if you log in from a desktop computer with more powerful capabilities, the system might offload some of the rendering of graphics to the client machine, thereby freeing up server capacity for other tasks.

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As the number of devices that schools are expected to support continues to explode, the flexibility this "cloud awareness" provides makes cloud computing an even more attractive option for schools.

The IT conundrum

Increasingly, the window to cloud computing is held in users' hands. Untethered from desktops, students and staff now roam about campus expecting ubiquitous access. And the variety of devices they rely on has increased as vendors have rushed to deliver new, cutting-edge smart phones, tablets, and ultrabooks. The result is that staff, students, and parents now rely on campus networks to access a wide array of information that is housed locally, or in the cloud, via a vast range of systems.

As a result, school IT departments finds themselves mired in a conundrum. They want to become an enabler rather than an inhibitor to mobile technology, but they need to manage these new connections in a cost-effective, secure, and transparent manner. This task has become very difficult for schools, largely because they know so little about the end device. If they can't see it, then they can't monitor, manage, or secure it. To be successful today, they require intelligent tools that provide visibility into what users are working with, so the IT infrastructure maximizes the users' experience.

Consumerization, collaboration, and clouds alter the IT landscape

A handful of factors are changing the way IT departments service their users. The most dramatic has been the consumerization of IT, also known as the "bring your own device" (BYOD) movement. Gone are the days when IT departments were the gatekeepers to computer technology, so it could be tightly controlled. Now, staff and students might walk to the local store at lunch, pick out a new device, and expect to use it before the bell rings for the next period.

On the plus side, the wider array of end devices has expanded the opportunities for collaboration. Teachers now use laptops, smart phones, and tablets to make the learning process more engaging and meaningful for learners. They also have more ways to interact with parents, making communication more efficient and effective. For instance, school administrators can more easily contact parents if a child gets sick during the day.

Another significant change, the emergence of cloud computing, also has taken shape. Rather than have IT staff meticulously provision servers in a tedious, linear fashion, schools are moving to the more dynamic cloud approach, which offers many potential benefits:

- Application deployment becomes simpler. Schools do not have to configure another server each time a new application emerges or expands.
- The IT infrastructure becomes more responsive. New releases can be rolled out in hours or days, rather than days or weeks.
- In these tight budgeting times, schools avoid significant up-front investments. Instead, they incur smaller recurring monthly costs based upon the services they need.
- Staffing requirements can be reduced. Rather than hire full-time employees, schools can rely on contract help from their cloud provider.

Stoneware's webNetwork can help simplify school IT.

The cloud movement has stemmed from the rise of automation and the growth of virtualization. One traditional bottleneck had been the amount of work needed to configure and maintain a server. Virtualization technology decouples a product's physical and logical identity, which makes it easier for technicians to get and keep IT devices up and running. Because suppliers have automated the process, getting a new server up and running and then maintaining it takes less time.

IT departments face new challenges

While these recent changes have brought some welcome improvements to how IT systems function, they've also created new burdens. "Because of the BYOD phenomenon, IT departments do not always know what type of devices users are working with," said Paige Johnson, education strategist at Intel. In effect, academic network end points are devolving from a fairly standard configuration (PCs and laptops) into a hodgepodge of systems, each with a different user interface and operating system. As a result, IT technicians must be conversant enough to answer technical questions about products that might have started shipping earlier that morning. Consequently, IT departments must spend a lot of time and put a lot of effort into training employees so they understand how the latest and greatest mobile gadgets function.

In addition, schools need to secure such connections. "Schools are not able to require that all users have a VPN (Virtual Private Network) connection whenever they access information," said Johnson. Instead, they need a simple way to ensure that only authorized users access information, especially sensitive information, like student data.

Cloud computing has emerged as a potentially beneficial delivery model, but schools have practical daily considerations right now. They have invested a lot of time, money, and energy in legacy systems. Because it is costly and disruptive to migrate to new solutions, they cannot turn those off and jump to directly to cloud computing on all services. Instead, they need solutions that enable them to maintain what is now in place and move to the cloud in incremental, intelligent steps.

As districts begin this migration, the complexities involved in augmenting installed, premises-based solutions with new cloud capabilities become clear. For one thing, their architectural foundations are fundamentally antithetical. To make the two work together seamlessly, a great deal of integration middleware is needed.

Traditionally, the only possible solution was tying a handful of autonomous solutions together. To link premises-based systems with cloud solutions, schools must integrate a series of point products: SSO, Portals, Remote File Access, Security, Remote Access, Reporting, and Management. This approach requires a lot of time, energy, manpower, and money—both at the start of the process as well as on an ongoing basis.

Given these various challenges, IT departments are on the lookout for new solutions that offer the flexibility needed to move slowly toward the cloud without dramatically increasing their workload or their budget. Such tools must meet three key criteria: (1) improving users' computing experience; (2) enhancing the educational environment; and (3) simplifying IT administration.

Making users happy

The focus of any new technology initiative must start with the end-users' needs in mind. Consequently, schools must begin with the premise that any new tool must be simple to operate. Ed-tech solutions need to be intuitive, with a simple interface that works with a wide variety of data types. Students, teachers, parents, and staff must be able to access resources from a private data center, public cloud, or local device via a common interface.

Stoneware's webNetwork solution meets those criteria. It allows individuals to enter a single user ID and password on any device and immediately work with any file, access any applications, and generate any report. Users run applications locally or in the cloud, whichever approach suits them best. If they are tinkering with client-end spreadsheets, then the work is executed on their PCs; if they rely on online spreadsheets, it is completed in the cloud.

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The Stoneware product even goes one step further than simply delivering a seamless, intuitive interface: It actually enhances the end-user's experience. Stoneware's webNetwork is smart enough to recognize what device a user has; collect contextual information from both the user and the client device; and adjust IT system settings (graphics, network, application) to maximize the user's experience. As a result, users realize the most fully functional and efficient interactions possible.

Enhancing education

With Stoneware's webNetwork, the educational process is enhanced in many ways. Students, teachers, parents, and staff are given the latitude to bring their own devices to school but are still able to access needed files, applications, and reports. They can download data from anywhere on the network and use a variety of traditional and cloud-based services.

Stoneware's webNetwork provides the connectivity needed so users can exchange information regardless of the underlying infrastructure they are using, whether it is a local drive, a private cloud, or a public cloud. In this "unified cloud" approach, there are no boundaries between traditional and cloud services. A school can rely on free or low-cost public cloud services, such as Google Docs, Microsoft's Skydrive, and eTextbooks. While embracing the new, the Stoneware solution also supports the old. Certain applications, such as AutoDesk's AutoCad, Adobe Systems' Photoshop, or internally developed apps, might never move into the cloud. That's no problem: Users have access to these applications as well, because the solution provides seamless access to all data types.

Simplifying IT

With new technologies emerging at hyper speed, school IT departments find themselves under duress because scarce, often expensive, technical resources must service a rapidly growing volume of requests. Consequently, any new technology must be easy for technicians to manage. IT support staff do not want to work with archaic command-line interfaces. Instead, they want to troubleshoot device problems via simple web technologies and interfaces. With Stoneware's webNetwork, money does not need to be spent on training, because staff intuitively understand how to operate the solution.

What's more, as a result of partnerships among Stoneware Inc., Intel Corp., and Lenovo, novel solutions are emerging that promise to simplify school IT operations dramatically. In fact, Stoneware has developed a unique approach for the K-12 market, a tool that will benefit many school districts. "Middleware has become the key for schools that want to maximize their IT investments," explained Intel's Johnson.

Intel delivered the first building block of this new solution by embedding end-user device instrumentation in its 2nd Generation Intel Core processor family (Sandy Bridge). The vendor's Cloud Ready Client supports a range of devices, from diskless PCs up through ultrabooks. This approach is based on Intel's Cloud Vision 2015 Web API (Application Programming Interface), which allows endpoints to express hardware attributes to the cloud. With it, cloud services can be changed to maximize endpoint functionality. Cloud services adapt seamlessly to the end user's device, identify the system configuration, and optimize application delivery so the end-user experience is as good as possible.

Working with Stoneware, Lenovo is the first hardware vendor to take advantage of these functions. The Intel Cloud Ready Client is compatible with all Lenovo ThinkPad laptops and ThinkCentre desktops powered by Intel's 2nd generation Core and Core vPro Processors. These solutions rely on Intel-developed APIs to expose the client's key hardware attributes to cloud applications.

Client awareness can tell the type of device you're using.

Stoneware played a key role in this development: Its webNetwork solution is the glue that ties the Intel API to the endpoint device. With it, Lenovo developed Secure Cloud Access (SCA). This leverages Intel's Client Aware Cloud Software Development Kit (SDK) to create a unique industry solution where the cloud communicates with the end-user device to create an optimal experience for the user.

"SCA levels the playing field between cloud application and device by mirroring what users are already familiar with, while creating an easy management experience for the IT staff," said Rich Cheston, executive director and distinguished engineer for Lenovo. SCA gives users access to their web-based or local Microsoft Windows applications on any device through a browser-based interface that mimics the look and feel of their Windows desktop.

In addition, the product leverages current investments in existing IT infrastructure and items, such as directory services. Whenever users access cloud services from their Cloud Ready Client devices, SCA recognizes situational cues, such as the user-authentication method, capabilities of the device being used, time of day, location, and network. This delivery method then improves the way cloud-based applications interact with end-user devices like Lenovo Cloud Ready Clients, smart phones, and tablets. SCA delivers applications based on the device's capabilities and adjusts the transaction's security and performance settings for that device.

The solution dramatically improves the user's experience. The system identifies the user's unique configuration and determines, for instance, if it has or does not have a powerful graphics card, multi-factor authentication (such as a fingerprint reader or an RSA token system), lots of memory, an underutilized network connection, or a lot of internal memory. This information then is analyzed, and the transmission is tailored accordingly. The solution chooses one of seven different application delivery methods to create an optimal user experience.

For example, if the cloud detects that the client device has high-end graphics, it can let the client do some rendering, transmitting abbreviated math that describes the function to be rendered, rather than forcing the server to do the work centrally and ship lots of pixel values down the line. Making use of the superior endpoint graphics this way frees up both server and network resources. In addition, the middleware is able to recognize multiple versions of an application. Rather than a static image, this layer creates a dynamic image based on credentials stored in Active Directory. Cloud content services can be delivered as a web page, a published application like terminal services, or served as a streamed or local application, depending on the client's capabilities.

By relying on a "unified cloud" experience, school IT departments no longer need to stitch together a variety of point products to create a seamless cloud experience. Instead, Stoneware's webNetwork leverages a school's current investments in its existing IT infrastructure. It piggybacks on items such as directory services to ensure that all communications are secure. Schools can rely on any Lightweight Directory Access Protocol (LDAP) directory to enforce multi-factor authentication and deliver only the appropriate images to users.

Cost is another benefit. The Stoneware webNetwork solution is significantly cheaper and much more scalable than alternatives, like Virtual Desktop Infrastructure (VDI). VDI tends to be very server-centric; additional servers typically are needed each time a schools adds about 100 users. The Stoneware solution does not have such a limitation: Schools simply bring on more users as needed at no extra cost. Besides reducing hardware costs, this approach eliminates the software licenses needed for each additional server.

The time is now

The solution is available today. Schools are now starting to use it to enhance their users' experience while cutting IT costs. The Stoneware solution fills current voids between premises and cloud-based solutions, while delivering an IT infrastructure that is dynamic, efficient, effective, and more responsive to each individual user.

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