# Leveraging the Power of the Cloud to Expand the Reach of Virtualized Desktops

In a K-12 environment with a complex mix of PCs, Macbooks, tablets, Chromebooks and laptops, desktop-as-a-service or DaaS is uniquely suited to allow IT to deliver a high-performing, equitable, reliable computing environment to students for learning and testing. VMware leads the industry with its DaaS solution.

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As we enter the new school year, IT has a lot to worry about. Pending online assessment mandates related to the Common Core State Standards Initiative require a locked down, reliable computing infrastructure. Technology in most schools is aging and the districts don't necessarily have the funds to keep it up to date. Budgets and staffing are limited. And an increasingly mobile faculty, staff and student population need secure access to critical applications for anywhere-anytime learning.

IT leaders are continually seeking out new ways to maximize the value of their existing IT investments. The trend is showing that this year much of that focus will be directed to the desktop. The goal: to create a user environment that will extend the life of existing investments, be more easily manageable and allow IT to be more responsive to shifting demands. By putting a layer of abstraction between the physical hardware being used in the classroom and the operating systems, applications and data, that goal is achievable.

This report briefs K-12 IT leaders and professionals on how desktop-as-a-service is uniquely suited to meet the current challenges of school districts to meet the needs of students and shows how VMware Horizon® Air™ Desktops and Apps sets itself apart and ahead as the leading solution.

### The New Virtual Desktop

The lack of enthusiasm among users and IT for the virtualized desktop infrastructure (VDI) model of the past is understandable. While it proved its value in strategic areas, this technology for delivering applications from a central server to end users also earned a well-deserved reputation historically for being complex and pricey to implement. First, there was the data center infrastructure — storage and more storage — needed to accommodate the influx of user data previously stored on local computers. Second, few IT people had time or the skills to manage VDI infrastructure.

Now it's time to re-examine what is now simply called "virtual desktops." The technology offerings from virtualization market leader VMware have proven to be far easier to implement; setup happens in a few clicks. They're intended to deliver a desktop experience in a mobile and BYOD environment, where the user could be working on an older computer, newer tablet, smartphone, Chromebook or laptop.

With desktop virtualization students and teachers can access their educational resources on demand in a "follow-me" format. Rather than feeling constrained by the physical capacity of the particular computer in front of them, they can bring up a virtual workspace on the same machine to access the resources needed to get their work done. The moment they move to a completely different device, they can pull up the same functionality and pick up where they left off.

On the tech side, instead of managing hundreds or thousands of user computers, school district IT can focus on managing a few image files on the servers in the data center that feed the virtual desktops.

Earlier this year virtualization leader VMware introduced Horizon, its family of virtual desktop

## Desktop virtualization case study "nuggets"

**VMWARE VIRTUAL DESKTOPS IN ACTION**

Last year Wisconsin's School District of Somerset was part of field testing for Smarter Balanced, one of the consortia preparing online assessments based on Common Core learning standards. The Smarter Balanced assessments require the use of a secure browser on the computer being used for testing to prevent students from leaving the test to open other web pages or applications. IT created an image for virtual desktops that ran the browser required for the assessment and deployed that to 500 devices being used for the testing. When the testing period was over, the students closed the testing browser and — virtually — brought up their usual desktop applications.

Georgia's Morgan County Schools deployed VMware virtual desktops on "zero client" devices to replace 1200 classroom PCs that had reached end of life. Help desk calls dropped by 90 percent and energy expense fell by $30,000 a year. An upgrade to Windows 7 was done overnight. The ability for IT to use VMware's "Linked Clones" feature and resource pools lets IT deploy hundreds of virtual desktops "within hours" and reduced storage requirements by 80 percent of what was projected.

One small school in Michigan's Rockford Public Schools district without space for a dedicated computer lab uses virtual desktops to power a "mobile lab." Students can check out laptops and take them to their classrooms then access their desktops from any of the machines.

Mobile carts of thin clients running VMware Horizon replaced small handfuls of computers placed in each classroom at Ontario-Montclair School District in California. Now, rather than rotating out students from classroom activities to give them time on the machines, they can reserve a cart of devices for a slice of time. When students log off their device, the virtual instance reverts to its original state, destroying viruses or spyware that may have found their way onto the system.

products that includes an on-premises solution as well as a cloud-based offering. VMware Horizon Air (a desktop and application as-a-service offering) was built from the ground up for cloud usage. Horizon Air Desktops allow organizations to offload the infrastructure and staffing requirements of desktop virtualization to a service provider — akin to outsourcing the work.

## The Benefits of Desktop-as-a-Service

These two approaches for delivering virtual desktops have multiple advantages for K-12.

*DaaS has no upfront costs.* Funding for major IT capital expenses isn't always possible. DaaS requires no upfront investment and has very little operational overhead. The result is a reduction in total cost of ownership for user computing and a conversion of what has traditionally been a capital expense — buying loads of new servers and storage — into a predictable operating expense.

*DaaS allows you to leverage existing IT investments.* DaaS provides a way to use the working computers you have in your inventory as thin clients to deliver a superior user experience to your students with an updated computing environment and capabilities

*DaaS delivers greater reliability.* Few districts have sufficient IT staff on hand to manage the morass of user computing devices being used in their schools during the day, let alone before and after school hours. By defining and delivering virtual desktops through a cloud service, IT can guarantee a service level-caliber user experience with an infrastructure managed and monitored by experts who are on the job 24/7.

*DaaS improves access and speeds processing.* In order to create a level playing field for students, districts and schools struggle to ensure equal access to computing resources among all of their students. Increasingly, this effort calls for a mix of BYOD, 1-to-1 computing programs, shared computers, and mobile computer carts. The use of virtual desktops delivered through DaaS can provide a consistent, snappy student experience across all of those myriad devices without relinquishing IT control over the applications accessed and how data is stored.

*DaaS can help you meet hard deadlines.* Shortly, school districts all over the country will be scrambling to meet the deadlines for their new online assessments mandated by the Common Core State Standards Initiative and they want to give all students an equal chance at doing the best they can on those tests. DaaS provides an easy, affordable way to deliver testing experiences in all schools, no matter whether they're using the latest computer gear or legacy equipment that just couldn't be replaced yet.

*DaaS is flexible.* There are situations where a large number of computers need to be set up rapidly with a particular image — for testing, professional development training or a specialized education program. DaaS allows IT to provision delivery of extra desktops during peak demand and reduce usage when those user environments are no longer needed. And, just as with on-premises virtual desktops, DaaS allows you to switch quickly among computing images to address dynamic school and classroom needs — testing in the morning, general coursework in the computer lab in the afternoon.

## Potential energy savings of DaaS

### DAAS OFFLOADS ENERGY CONSUMPTION

The size of the slice of the IT budget dedicated to the expense of data center power and cooling may fluctuate depending on the current price of oil, but it's never insubstantial. An advantage of DaaS is that it eliminates the expense of operating power-hungry servers that would be dedicated to supporting a virtual desktop infrastructure. (Yes, that energy consumption gets picked up by the service provider; but unlike the typical school district, they can dedicate resources to continuously seek out ways to make their server farms more energy efficient.)

## VMware DaaS and Google Chromebooks

### VIRTUAL DESKTOPS AND CHROMEBOOKS

Earlier this year VMware and Google struck an agreement whereby the use of VMware's virtual desktop software was guaranteed to work on Chromebooks in order to let users run Windows environments. The importance of this collaboration can't be underestimated for K-12. Because of their overall affordability, Chromebooks are becoming the go-to computing device for schools and districts, particularly in 1-to-1 and mobile cart scenarios. But in some cases, these "ultra notebooks" can't run specialized software that requires Windows. Going the virtual desktop route enables students and instructors to access and run any variety of software they require that has been converted into an image. And why not extend the savings by supplying Chromebooks to non-teaching staff? The users in other parts of the district operations — who may be more accustomed to Windows — will more readily accept the use of a computer that can run the software they're already accustomed to. That offering is available for on-premises use and as a cloud offering.

*DaaS provides richer functionality.* In a BYOD environment where staff and faculty are on the go, it can be a real struggle to print reliably from their device to the network printer they're standing in front of. DaaS allows the user to do location-based printing based on where he or she is in the school or whatever access point is being connected to.

*DaaS heightens security and ensures compliance.* The handling of student information must comply with the regulations of FERPA. Even with those laws in place, rare is the month when some district or school hasn't had to divulge a data breach. Maybe a laptop containing personally identifiable information was stolen; possibly a user clicked on the wrong link in a phishing attack. With DaaS, the personal data at risk is never kept on the physical device; and once a user session is done, the environment reverts back to its original state, which means malware never gets to stick around to do its damage.

### Making the Case for DaaS

The technology of virtual desktops as implemented in VMware's Horizon line has reached a level of capability, functional usefulness and pricing that appeal to K-12 school districts. How could Horizon Air Desktops and Apps play out on the ground? Let's look at several use cases.

*Fast set-up and takedown of testing operations:* If certain classroom computer banks or mobile carts are scheduled to be dedicated to assessment activities, Horizon Air can be tapped to deliver the testing environment to the appropriate machines efficiently while ensuring that the virtual desktops comply with testing specifications.  Once testing is complete, the same devices can be used to access general computing images, minimizing downtime for setting up and taking down test environments.

*1-to-1 initiatives:* How many days has the IT team lost to imaging the laptops, iPads and Chromebooks to be handed out to students when they arrive in the fall? DaaS offers a way out of this summer rut by providing a cloud-hosted virtual desktop with VMware managing the entire back-end infrastructure. All students access the same image and have the same computing power, leveling the playing field.

*BYOD programs:* In a bring-your-own-device environment teachers need to count on student devices being able to run the programs they require for class. Otherwise, valuable learning time will be lost to troubleshooting. VMware's approach to DaaS guarantees the virtual desktop and all necessary software will be available to student devices when they're needed.

*Computer labs and libraries:* Anywhere there's a bank of computers available for student use, there's the potential for conflict. What one class requires won't necessarily be what the next class needs. The image for virtual desktops can be selected from a self-service application catalog or tied to a specific student role that defines what is available when the student logs in at the start of class. Because the work is saved to a predefined location off of the computing device, personal files won't "clog" the computers.

## Virtual Desktops Certified for Testing

VMware Horizon has long been certified to deliver the Pearson's TestNav testing environment. This is the same platform being used to deliver the online assessments developed by the PARCC consortium. The American Institutes for Research (AIR)), which is developing the testing platform for Smarter Balanced, so far has certified only a single device for its assessments, and in this case it's actually a virtual desktop: VMware's Horizon.

In both instances, the virtual desktops created with Horizon have been proven to comply with the security and performance requirements of the testing system, enabling students to take assessments within the same environments they're already familiar with. If the physical hardware fails, a different device can quickly be brought in and the virtual desktop brought up to minimize test downtime (and test proctor stress).

*Specialty application usage:* Courses where students use Photoshop, AutoCAD or other high-end and resource-intensive applications don't always fit into the model of anywhere-anytime learning. Horizon Air Desktops can deliver virtual desktops with those programs along with the computing power to allow students to continue their education outside of class hours.

### Best Practice: Hybrid Delivery

In many situations, virtual desktops can be delivered from a private cloud sitting inside the school district data center running VMware Horizon on premises. In other situations where there isn't the infrastructure or personnel to support the need, Horizon Air as a public cloud service will be the better fit. What's important is to have the option of choosing either solution depending on the circumstance.

VMware is the only company that can deliver on both models today, allowing IT to use a hybrid approach and leverage existing resources while using cloud delivery to address new or unexpected needs that arise. VMware Horizon Air Desktops is proving to be a straightforward way to test out the usefulness of virtual desktops with minimal risk.

The bottom line is that you don't have to face the current crop of challenges facing K-12 school districts alone. There are new but proven approaches to desktop computing that have a place in your school districts IT strategic planning. Leveraging the power of the virtual desktop foresees the day when it's no longer relevant whether the student has a laptop, an iPad, a Chromebook or some other client device that's even newer. He or she will be able to turn on that device and reach the applications and data needed for that day's learning or testing and gain access to the same rich features as every other student in the district.

## About VMware

VMware is the leader in virtualization and cloud infrastructure solutions that enable businesses to thrive in the Cloud Era. A pioneer in the use of virtualization and policy-driven automation technologies, VMware simplifies IT complexity across the entire data center to the virtual workplace, empowering customers with solutions in the software-defined data center to hybrid cloud computing and the mobile workspace. With 2013 revenues of $5.21 billion, VMware has more than 500,000 customers, 55,000 partners, and 14,000+ employees in 50+ locations around the world. At the core of what we do are our employees who deeply value execution, passion, integrity, customers, and community.

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