



Strategy Guide
to **Converged**
Infrastructure in
K-12 **Education**





The Power of Convergence

(video)

The pressure to achieve in K-12 education has never been greater. Students are expected to learn more, teachers and administrators are expected to do more, and all of this has to be measured more, even while budgets are cut.

IT is a critical tool in helping schools do more with less. And yet technology at schools is sometimes neglected. Old, nonstandard equipment and legacy infrastructures often impede teaching and learning with slow, unreliable access to information and applications. Local schools may not even have on-site IT support, so teachers and administrators try to manage and troubleshoot systems along with all of their other responsibilities. This takes time and energy away from what's most important: the students.

Meanwhile, school districts are expected to gather data and comply with the requirements of laws such as the No Child Left Behind Act of 2001. To do that, districts need a high-performance, reliable IT network. But those two attributes—high performing and reliable—are hard to achieve without unified, well-integrated technology. To meet the needs of students, teachers and the government, districts need to upgrade, streamline and standardize technology

and operations. Although it requires a substantial investment, an improved infrastructure will pay off by enabling greater efficiency and effectiveness in collecting and reporting data, giving staff the tools to teach more effectively and delivering better quality education to students.

Unless the integration is carefully planned and executed, however, it can backfire and create more complexity, more expense and less efficiency. This strategy guide will explain how, by using [HP's Converged Infrastructure](#), you can upgrade technology, standardize equipment and improve IT practices in your school district, all of which can reduce IT costs, cut network downtime, increase productivity, improve learning, and enable more efficient and effective data collection and reporting.

“With HP thin clients, there is no need to re-image 1,200 computers every summer. We load applications onto servers and push them down to virtual desktops, and everybody is good to go.”

— Jason Willis, Network Manager
Minooka Community Consolidated School District #201

To learn how the school district cut costs and improved user experience by putting thin clients in the classroom, [click here](#).

// THE CHALLENGE

Technology is often rolled out at individual schools in a less-than-organized fashion. Each school may have different brands and models of hardware of varying age, a variety of nonstandard applications and a networking infrastructure that is slow, inflexible and quite likely capacity-constrained. This chaotic situation is not only time-consuming and expensive to maintain, but it often defeats the original rationale for the technology—to enable more effective teaching and learning. And at a time when the measurement of teacher effectiveness and student proficiency is so important, the situation may be a significant disadvantage to a school district. What's more, the lack of cohesive and capable infrastructure could prevent

“All business practices go through these switches. We have a 100%-implemented HP wireless framework and over 1,000 access points deployed throughout the county. We’ve noticed incredible performance improvements, probably as much as five times better.”

— Vince Hoaglin, Supervisor of Network Services, Manatee County School District

The Manatee County School District incorporated technology into its curriculum, and has experienced the benefits. [Learn more.](#)

schools from taking advantage of some of the biggest cost-saving trends of the decade: virtualization and cloud computing.

[HP’s Converged Infrastructure](#) is a preconfigured and pretested solution that helps address these issues. It simplifies, integrates and automates storage, networking, servers, management software, and even power and cooling. In particular, the HP branch office networking solution converges infrastructure and network applications to dramatically improve performance, simplify deployments, centralize management and reduce IT costs.

// MANAGE

Coordinating disparate IT resources across schools is a challenge. There is old, nonstandard equipment, not to mention different levels of IT sophistication. With [HP’s Converged Infrastructure](#) solutions for branch offices, districts can maximize resources and reduce costs through a unified, standardized approach to technology, and by using tools to automate processes and best practices. The solutions are more than just a suite of products, however. The key lies in standardized infrastructure, operations and processes using the same applications, security software, management software and data backup for each location. That not only ensures greater efficiency for operations, but by developing templates based on best practices, you can easily and quickly deploy the same infrastructure to new locations as your school district expands.

[HP’s Converged Infrastructure](#) incorporates tools that make remote support and management efficient and effective. A hodge-podge of technology makes it difficult to manage and measure the performance of IT assets. It’s hard to make intelligent investment and deployment decisions, for example, without insight into the utilization of servers, the level of power consumption and the amount of storage or bandwidth needed. HP’s managing software, HP Insight Manager and Insight Control, gives IT staff the ability to track such

SOLUTION SNAPSHOT

GILBERT PUBLIC SCHOOLS, the fourth largest district in the state of Arizona, needed to upgrade its network to provide better support to its 40 schools and two administrative offices. Its eight-year-old LAN was plagued by outages, dated software, security concerns, and spotty wireless coverage. These inadequacies were preventing the district from taking advantage of the latest technologies.

“It was frustrating for teachers to plan a great lesson and then not have the access to the network they thought would be there,” says Barbara VeNard, assistant superintendent of educational services.

The school had been using Cisco Systems technology. But after conducting a competitive analysis it decided to go with HP, which saved it more than \$2 million. Combined with HP’s lifetime equipment warranty and free firmware and software upgrades, the district lowered its projected total cost of ownership for the new network.

OBJECTIVE:

Upgrade aging network to increase bandwidth, improve security and expand wireless coverage for easier and more reliable access to advanced teaching and administrative applications and digital tools

APPROACH:

Conduct competitive vendor analysis using disciplined requisition process

BUSINESS TECHNOLOGY IMPROVEMENTS:

- Increased network bandwidth from 1 GB/s to 10 Gb/s
- Established ubiquitous 802.11n wireless broadband access at all locations
- Gained multicast capabilities for broadcasting video and other media throughout network
- Acquired single-pane view for easier management

BUSINESS OUTCOMES:

- Saved more than \$2 million compared to project quote from Cisco Systems
- Improved network dependability for critical teaching and administrative tasks
- Provided anytime, anywhere broadband access to multimedia for students and teachers
- Increased access to online multimedia for teaching and advanced applications for efficient administrative operations

*“With the HP TeachNow system in the computer lab, managing the stations is easy. Simply rebooting a thin client deals with the typical challenge. **The time savings is substantial.**”*

— Patricia Jongbloed, Technology Instructor, St. Anne Catholic School

Learn more about the HP education solutions the school implemented that enhanced curricula with minimal cost and maintenance.

information and to manage equipment in less time, and from any location. Insight Control, for example, helps reduce server deployment time from four hours to just 20 minutes, a 12-fold decrease in deployment time. HP Insight Remote Support can bring diagnostic accuracy to nearly 100 percent and reduce the time it takes to resolve system problems by up to 20 percent.

A standardized approach also enables schools to take advantage of technologies like virtualization and cloud-based software and services. Some districts have found that by adopting a standardized approach as a platform for thin clients and desktop virtualization, they can reduce costs, centralize management and increase security. HP offers a cloud computing solution, called SchoolCloud, designed specifically for schools. HP has also recently announced HP [FlexNetwork](#) architecture, which can help harness the power of media-rich content, virtualization, mobility, and cloud computing

CRITICAL ISSUES

A RELIABLE, HIGH-PERFORMANCE NETWORK and well-integrated technology are imperative in today's schools. School districts need to be able to collect and report data to meet state and federal requirements. More important, they need unified technology that can help improve teacher effectiveness and student performance.

Among the most critical issues:

- **INFRASTRUCTURE/NETWORK RELIABILITY AND AVAILABILITY:** Slow or spotty network performance impacts productivity and precludes use of new advances such as desktop virtualization.
- **ENTERPRISEWIDE DATA COLLECTION AND REPORTING:** Increasing federal and state mandates require districts to collect, analyze and report information on student performance.
- **SECURITY:** IT systems, networks and storage must adhere to privacy and data security practices to protect student and teacher information.
- **REMOTE MANAGEMENT:** Individual schools may not have on-site IT, so ability to remotely manage systems is critical.



To learn more about Insight Control, watch this video

// PROTECT

The network is the foundation of the Converged Infrastructure. Slow or intermittent network performance reduces productivity, impedes learning, increases costs, and impacts service. School districts find themselves held back by a mix of legacy network infrastructures that is difficult to expand, lacks interoperability and costs too much. They find it challenging or even impossible to scale their networks and are unable to take advantage of advances in communications and technology. In addition, growth in data requirements—driven by mandates like No Child Left Behind—puts existing storage infrastructures under stress.

Converged Infrastructure provides a solid network at a reasonable cost. HP Networking Solutions, part of the Infrastructure, typically costs less than competitive offerings and can help lower total cost of ownership by up to 66 percent. HP [Virtual Connect](#) interconnects for BladeSystem virtualize network and storage connections and can reduce sprawl at the network edge by up to 95%. The [Virtual Connect Flex-10 Ethernet](#) module enables you to allocate up to 4 connections per port—and provide iSCSI connectivity.

Just ask Vince Hoaglin, supervisor of network services for the Manatee County School District in Bradenton, Fla. HP ProCurve Networking switches have saved the district about \$340,000. “Cisco was probably 30 percent higher in acquisition costs, but that does not factor-in support,” he says. “Not having to pay for support if an HP switch breaks down was a huge factor for us.”

[HP Converged Infrastructure](#) includes technology that enables easy storage expansion, protects from unplanned downtime and ensures backup and rapid recovery in the event of a disaster. The solution incorporates two HP ProLiant DL180 G6 servers running Hyper-V with HP StorageWorks P4000 Virtual SAN appliance software. The [ProLiant G6/G7 servers with Intel Xeon 5500/5600 series processors](#) offer greater



[Learn more](#) about cloud computing and virtualization solutions using HP School Cloud solutions. Empower your educators while creating a personalized learning environment for your students.

performance and use less power than previous generations, allowing more to get done with fewer servers and lower operating costs. The combination of these technologies transforms server disk drives and existing external storage systems into a virtual iSCSI SAN, ensuring high server availability and increasing storage capacity utilization. Also included is the HP StoreOnce D2D Backup System with deduplication software, which reduces capacity and network bandwidth required for remote data replication back to the main office.

HP also offers a comprehensive portfolio of Network Support Services to help you manage your network efficiently, mitigate risks and downtime, and increase the value of the technology. And HP Financial Services

will help you recover value from the assets you're retiring. Under its [Asset Recovery program](#), HP Financial Services evaluates the market value of unwanted equipment, remarkets the product and shares the proceeds with you. It disposes of equipment that has no remaining value in accordance with environmental regulations.

// GROW

With [HP's Converged Infrastructure](#), you can start with [HP BladeSystem](#), which integrates server, storage, networking plus power management, and lets you grow and re-use your infrastructure from client to the cloud. By offering three different Converged Infrastructure reference solutions, HP enables you to tailor the solution whether your district is small, midsized or large.

The standardized hardware, software and infrastructure, along with consistent IT practices across the network, allow you to consolidate schools or roll out new locations quickly, easily and efficiently. These infrastructure solutions not only speed deployments, they also streamline operations and significantly reduce costs. Most important, the Converged Infrastructure provides fast and reliable access to data and applications across the district, enabling teachers to teach and students to learn more effectively.

All these aspects of the [HP Converged Infrastructure](#) add up to deliver the value you need today by positioning you to manage, protect and grow your educational organization. ■

// Suggested Reading

These additional resources include business white papers and previously published articles from IDG Enterprise.

Top 5 worries keeping IT pros up at night

Data security, upgrades top the list of IT managers' worries.

Case Study: Hope Technology School

Students with special needs at Hope Technology thrive using HP TouchSmart PC.

The Case for Infrastructure Convergence

The recession and global economic crisis in 2009 had a profound effect on organizations' investment and operations priorities. Some of these (e.g., delayed capital expenditures, staff reductions) are of a temporary nature, but others accelerated long-developing, fundamental changes in business practices and IT operations.

Getting a handle on chaos and complexity

There's a lot of interest these days in the notion of "controlling complexity," particularly when it comes to networks.

A Better Way to Connect Branch Offices and Control IT Costs

Adapted from *Improving the Way Branch Offices Compete, Connect, and Control Costs*, by Raymond Boggs, Jean S. Bozman, and Randy Perry, IDC #227476
Sponsored by HP



IN TODAY'S ECONOMY, companies with branch operations find that maintaining productive and smoothly running business operations in their branch offices is absolutely mission-critical. Branches are the places where the business meets the customers—places such as retail outlets, bank branches, sales and service operations, and local branches of nationwide pharmacies that fill patient prescriptions.

The branch delivers customer service and receives revenue on behalf of the entire corporation. That's why frequent updates from branch systems and rapid reports of local business issues need to be continuously available and supported by local computer systems.

No longer remote outposts of the business that merely reboot local servers and periodically back up files to tape, today's branches are local engines of commerce. They are connected to central headquarters—and to other branches—by high-speed network links. That improvement in bandwidth has made all the difference: That is why the servers, storage, software, and all of the networking links must be up and running, all the time, to maintain business momentum and local in-branch employee productivity. In many branches, the IT systems may not be up-to-date or easy to manage.

IT systems—servers, storage, networking, networked PCs, and printers—carry mission-critical applications and corporate data, but they must be affordable to acquire and easy to operate on a day-in, day-out basis to effectively support the business. Further, given the way branches must quickly adapt to changing business conditions, these IT systems must be resilient and flexible, because they may be redeployed to fit changing business conditions or provisioned with new software as needed.

Leading midsize companies are succeeding at both upgrading IT support and reducing IT costs for the branch. As discussed in the following pages, IDC research about small and medium-sized businesses (SMBs) and branch offices shows that well-targeted

technology upgrades, coupled with a rigorous program to standardize and improve IT practices at a company's remote locations and headquarters, can deliver substantial business value and could reduce total annual IT costs in the branches by more than 30 percent.

// HP's Solutions for Branch Offices

HP's ProLiant servers can play a role in this type of improvement. They have been widely deployed in branch offices both in the U.S. and in the rest of the world, and are now getting a technology refresh with the introduction of the G6 and G7 generations of ProLiant servers. Compared with earlier generations of ProLiant servers, these new G6 and G7 servers offer faster performance, enhanced management, improved energy efficiency, and new financial terms for acquiring the servers through purchase or lease. As such, these systems are optimized to support branch businesses, which are facing a period of economic challenges on a scale that has not been seen for many decades.

HP is delivering new Branch Office Solutions built on Converged Infrastructure (CI), aimed at delivering business benefits over the life of the technology. Converged Infrastructure brings the technology building blocks—servers, storage, and networking equipment—closer together, avoiding the need for onsite system integration that could result in one-off builds of branch office servers.

This is a full-spectrum approach to IT infrastructure solutions, making them easier to acquire, to deploy, and to maintain over the entire infrastructure life cycle. This approach is becoming more important as the economy remains uncertain, making it more difficult for branch offices to buy infrastructure solutions (e.g., servers, storage, PCs, networked printers, and other networking devices) needed to support growing business requirements. Mindful that acquisition of new technology solutions is challenging for midsize firms and the branch offices within those enterprises, HP is providing the following for its branch office solutions:

- **“Recipes” for channel partners.** HP has highly customizable infrastructure solutions that combine server, storage, management and data protection software, networking, PCs, and printers. These reference solutions are provided to HP channel partners to speed deployment of consolidated branch offices. Because the components of these solutions are tested against many operational conditions, they are easier to support and maintain in the branch office site.
- **Rightsizing of solutions.** HP has designed solutions for branch operations of different sizes: small (with fewer than 25 employees), midsize (with 25 to 50 employees), and regional (with up to 100 employees). Sizing is important because it provides the appropriate amount of data processing power, storage, and bandwidth capacity for the right number of users to optimize system response time to boost branch end users’ productivity.
- **Ease of use in management tools for system administrators.** IT staff costs must be contained—and the ratio of system administrators to servers and the ratio of administrators to other types of managed devices (e.g., storage, networked printers, and networking devices) must be improved, if possible. Recognizing that system management must be simplified and easy to learn for branch offices, HP is providing integrated software tools that can be used within the branch, at a channel partner site, or at an enterprise central site to manage branch servers remotely.
- **Improved financial terms for branch offices.** Continuing economic uncertainty has made it more difficult to acquire or lease new technology. HP Financial Services provides financial terms, including zero-percent financing, and improved lease provisions to make it easier to acquire new technology—or to refresh server technology—compared with earlier generations of HP ProLiant servers.
- **Improved network support for branches.** HP networking solutions improve networking

links between branches and from branches to headquarters. Support for industry-standard links, including 10GbE and Fibre Channel, allows servers to send data to other servers and to local or remote storage devices. The networking solution for branches integrates accelerated, survivable branch communication (HP AllianceONE), security (HP A-Series Routers and HP TippingPoint), wireless, video distribution, and unified communications and collaboration (UC&C) applications. Unified management and centralized policy administration reduce the need for branch office IT staffing and support-related travel.

- **More effective pooled storage for growing storage demands.** HP’s storage solutions, such as StorageWorks P4000 Virtual SAN Appliance (VSA) software, can help branches deal more effectively with growing data demands by pooling storage resources and achieving better capacity utilization along with more effective storage management functions. For example, with VSA solutions, branches can transform server disk drives into a virtual iSCSI SAN.

// Conclusion

HP’s introduction of the G6 and G7 series of HP ProLiant servers is bringing a new form of business value to branch office customers. Improvements in performance, price/performance, management, and energy efficiency of new generations of server technology (e.g., multicore processors, reduced power and cooling requirements) have the potential to change the financial evaluation of acquiring new servers. Consideration of OPEX savings, which have been rising in recent years, along with new financing options, can offset acquisition costs.

At a time of increasingly strict budgetary constraints, branch offices are seeing increased demand for processing, data storage and protection, and networking efficiency and security. Midsize firms, many of which are consolidating branches, are looking to align IT costs with business requirements and will be exploring new ways to acquire technology during the downturn. HP’s new solutions for branch offices are designed to address that new economic reality. ■