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Jason Radford, System Administrator, IlliniCloud and Bloomington Public Schools

Illinois School Districts Get Affordable Cloud Services, Cut Storage Costs with BIG-IP Products and ARX

IlliniCloud is a non-profit cooperative that hosts applications for school administration, facilities management, student performance tracking, multimedia, and library management for K–12 school districts throughout Illinois. To optimize the delivery of these services through its private cloud and to help member districts manage annual data growth of up to 300 percent, IlliniCloud chose F5® BIG-IP® Application Delivery Controllers and ARX® intelligent storage virtualization products. With these solutions, IlliniCloud can provide cost-effective and highly reliable cloud-based applications to member districts. The co-op significantly reduced its storage costs and recouped its ARX investment in less than one year.

Business Challenges

Until 2007 when IlliniCloud began offering co-op IT services, all Illinois school districts were responsible for providing their own IT services. State mandates required each district to support as many as 75 applications ranging from facilities management to multimedia creation and library administration. With budgets varying widely from district to district, inefficiencies and duplicate efforts were commonplace, and quality of services was inconsistent across the state. Small districts that lacked the purchasing power to negotiate competitive prices incurred higher costs, and many

districts’ IT budgets were too limited to fund IT professionals. Since the recent economic downturn left Illinois with a \$15 million budget shortfall, some districts have scarcely been able to provide basic applications, much less advanced online collaboration and multimedia capabilities.

Managing data is one of the biggest challenges districts face; many are hard-pressed to provide adequate storage capacity, and they need better tools for managing, disseminating, and archiving data. “Between the rising demand for

Overview

Industry

K–12 education

Challenges

- Provide cloud-based applications and services to member school districts
- Ensure affordable, long-term data storage
- Provide disaster recovery plans for all districts
- Manage explosive storage growth on a restricted budget

Solution

- BIG-IP Local Traffic Manager
- ARX Series

Benefits

- Realized ROI in less than one year
- Provided reliable IT services to 860 Illinois school districts
- Reclaimed more than 70 percent of tier 1 fibre channel storage
- Reduced backup window by 80 percent
- Enabled policy-based management of unstructured data

multimedia and the requirement of districts to keep administrative and student records 'forever,' annual storage requirements are increasing as much as 300 percent, depending on the district," says Jason Radford, System Administrator for IlliniCloud and Bloomington Public Schools. In addition, nearly 95 percent of school districts lack disaster recovery (DR) plans, so applications and data are potentially at risk. For those districts that have DR plans in place, backup sites are located too close to the districts to provide true protection.

With one of the largest IT budgets of all 860 Illinois school districts, Bloomington Public Schools wanted to help relieve the financial and management burden for smaller districts. In 2007, it founded IlliniCloud, a non-profit cooperative that offers IT services to districts on an opt-in basis. IlliniCloud dodged the expense of building new data centers by using three existing facilities owned by local districts. The co-op deployed 30 VMware virtual servers based on HP/Cisco converged computing platforms. Internet access, video conferencing, and multimedia sharing are facilitated by Illinois Century Network.

"To build out our private cloud infrastructure, we needed a solution that could provide intelligent traffic management and ensure redundancy if a network component failed or had to be taken offline for maintenance or patching," says Radford. Equally important, the co-op needed a cost-effective way to help school districts manage and store rapidly rising amounts of student and administrative data. "We were looking for a standards-based, vendor-neutral data management solution so we wouldn't be locking up our data in a proprietary solution," says Radford. The solution also needed to be tightly integrated with Microsoft Active Directory and provide economical long-term scalability.

Solution

In November 2009, IlliniCloud added two F5 BIG-IP® Local Traffic Manager™ (LTM) Application Delivery Controllers to its evolving cloud infrastructure. Deployed as a redundant

"The BIG-IP devices provide redundancy and uptime...so users always have reliable access to applications."

pair in its Bloomington data center, these BIG-IP LTM devices intelligently load balance and manage all incoming user requests, offload compute-intensive and repetitive tasks from Web and application servers, and provide advanced application security, acceleration, and optimization. These features help ensure that IlliniCloud users always have consistent and highly reliable access to their data and cloud-based applications.

"By leveraging the BIG-IP product we were able to simplify both our application delivery model while also providing a level of multi-data-center redundancy that would not be possible with other products. The built-in, simple yet powerful iRules language is truly a revolutionary toolset that doesn't require a certified network expert to understand or use. It's empowering," says Radford.

After evaluating several storage vendors' offerings, IlliniCloud concluded that none matched the advanced file virtualization, storage tiering, and data archiving capabilities of F5's ARX Series solution, which IlliniCloud deployed in July 2010. "We eliminated one leading storage vendor when we realized they couldn't provide features that we felt were critical to helping us manage our growth," says Radford, adding that the solution also would have meant a vendor lock-in, both hardware and software, and entailed expensive ongoing professional service engagements.

Because ARX uses industry-standard access protocols, it is compatible with most NAS storage devices. As a result, IlliniCloud can enforce intelligent data management policies and automate storage management tasks

in real time on its Oracle/Sun Storage 7000 Unified Storage System devices, which also provide data corruption protection. "The F5 ARX solution nailed all of our requirements," says Radford. "It was storage-agnostic, tightly integrated with Active Directory, and performed exactly as advertised in terms of cost and storage efficiency."

Benefits

Using the F5 BIG-IP and ARX solutions, IlliniCloud has enhanced its application delivery and traffic management capabilities and significantly reduced its application delivery and storage costs. Since deploying these solutions, the co-op is able to provide cloud-based application and DR services to member districts that cannot provide these services on their own.

Ensures Availability

To convince districts that were struggling to provide their own IT services to join IlliniCloud, the co-op needed to ensure that the critical applications and services that districts rely on daily would always be available and responsive. Because BIG-IP LTM inspects and responds to any system, server, or application failure, applications and services are always available. "The BIG-IP devices provide the redundancy and uptime we require—even when the local ISP or a server goes down—so our users always have reliable access to applications and services," says Radford.

Protects IT Investment

With many Illinois school district budgets cut to a bare minimum, investment protection is a critical component of IlliniCloud. Integrating BIG-IP LTM devices into its cloud infrastructure helped the co-op significantly reduce its server and bandwidth costs. "To build out our cloud platform, we needed a solution with very low up-front and ongoing administrative cost," says Radford. "The SSL offloading, compression, caching, and other optimizations that BIG-IP provides not only help increase our server capacity, they also improve our bandwidth utilization, both of which contribute significantly to lowering our costs."

Likewise, ARX delivered a solid return on investment for IlliniCloud. "The ARX storage virtualization solution not only exceeded our expectations in terms of capabilities, it paid for itself within a year. I wouldn't run a data center without it," says Radford.

Reduces Infrastructure and Operating Costs

With F5 solutions integrated into IlliniCloud's shared infrastructure, individual school districts no longer have to worry about providing and managing their own IT resources, and they aren't paying significantly higher prices to purchase them. "Because the F5 solution lowers our overall costs, we're able to charge our members \$200 per server compared to an estimated \$4,000 that districts would have to pay without the benefit of IlliniCloud," says Radford. "That's a 95 percent savings in overall IT costs for member districts." Additionally, the availability of these services lifts a huge burden from smaller districts that previously relied on staff and teachers to manage IT resources in their spare time.

Using ARX policy-based management and automatic storage tiering capabilities, IlliniCloud was able to reclaim a significant amount of tier 1 storage capacity. "We started off with 30 TB of tier 1 fibre channel, and recovered 80 percent of it using just one ARX storage policy," says Radford. With more available tier 1 storage capacity, the co-op can defer these costly fibre channel storage purchases for 12 months. In the meantime, if more capacity is needed, IlliniCloud can purchase SATA drives that, on a cost-per-gigabyte basis, are 65 percent less expensive than fibre channel disks.

Less tier 1 data requires less time for administrators to routinely back up, which ultimately helps lower IlliniCloud's operating costs. "We don't need to worry about managing as much storage, watching our resources, and keeping up with storage

growth in unstructured file data. That's worth at least half of a full-time employee's time," says Radford.

Enables Policy-Based Management

ARX uses industry-standard access protocols, so it is compatible with most NAS storage devices. This enabled IlliniCloud to tier data from a 3PAR T400 storage system containing 300 GB of 10 K fibre channel drives to an Oracle Sun Storage 7410 system running 1 TB SATA drives. "With ARX, we can use policy-based migration features to manage our unstructured data growth, and we can set and enforce custom file sharing and placement policies. For example, we have a policy that automatically moves any data that hasn't been accessed for one year to tier 2 storage," says Radford.

"ARX also gives us the flexibility to set policies based on file type, so we have another policy that automatically stores multimedia directly onto SATA drives." Radford adds that one of the best things about ARX's policy-based management features is that data migrations are transparent to users. "Our initial data migration to tiered storage took three or four days and was entirely non-disruptive—the users didn't even know it was happening."

F5 Networks, Inc. 401 Elliott Avenue West, Seattle, WA 98119 888-882-4447 www.f5.com

F5 Networks, Inc.
Corporate Headquarters
info@f5.com

F5 Networks
Asia-Pacific
apacinfo@f5.com

F5 Networks Ltd.
Europe/Middle-East/Africa
emeainfo@f5.com

F5 Networks
Japan K.K.
f5j-info@f5.com

