School District Deploys VDI to Improve Computer Management

Executive Summary

- **Customer Name:** Garland Independent School District
- **Industry:** K-12 Education
- **Location:** Garland, Texas
- **Number of Employees:** 7,300
- **Number of Students** 58,000
- **Number of Campuses:** 71

Challenge
- Reduce management load for IT staff across district
- Improve productivity for staff and classroom time for students
- Reduce costs by streamlining management and lengthening refresh cycle

Solution
- Implemented Cisco Unified Data Center solutions to run virtual desktop infrastructure using VMware Horizon View across district
- Deployed X-IO storage to maximize predictable performance

Results
- Reduced AutoCAD rendering times from 80 minutes to four minutes
- Shortened server deployment time from 4 days to one hour
- Reduced time required for updates from months to one night

Garland Independent School District implemented VDI using Cisco UCS to support thousands of students, teachers, and staff.

Challenge

Educating 58,000 students at 71 campuses, Garland Independent School District (GISD) ranks as the twelfth-largest district in Texas, and is among the 100-largest in America. As a district with a demographically diverse population, GISD strives to provide exceptional education to all students and to prepare them for college or career opportunities. As part of this mission, the district uses technology to enhance classroom experiences and train students to use technology at work.

As the number of computers used by students, teachers, and administrators continues to grow, the cost of providing up-to-date technology has become an increasing burden for the district. "We have well over 30,000 computing devices in our district, each with a lifecycle of three to five years," says Jim Hysaw, CIO at GISD. "We knew that if we could extend the computer lifecycle, it would make a big difference to our bottom line."

In addition to cost concerns, managing and updating all of the computers was a growing load on the IT staff. GISD began looking into virtual desktop infrastructure (VDI) to centralize management and give schools more flexibility for their computer labs. After looking at converged infrastructure solutions, GISD decided to build its own top-class virtualized data center environment to support VDI. Cisco® Unified Data Center solutions, with Cisco Unified Computing System™ (UCS®), deliver high-performance compute and network capabilities within virtualized environments. Storage from X-IO Technologies eliminates performance congestion, with an effective combination of solid-state drive and hard disk drive storage, while maintaining that performance as the system reaches full capacity. For VDI, the district standardized on VMware Horizon View, an easily managed environment for providing end users with streamlined access to the applications and tools they need at any time.

> "Before, it would take IT personnel an entire summer to update all of the computers in a school. Now, we can complete updates in one night just by updating the applications and operating systems centrally. We're saving our staff an incredible amount of effort and keeping our systems more up to date at the same time."
>
> – Jim Hysaw
>   CIO
>   Garland Independent School District

"Working with Cisco and X-IO, we developed a highly scalable solution with the power to support thousands of Horizon View virtual desktops," says Shannon Rico, network engineer at GISD. Thanks to excellent support from both the Cisco and X-IO teams, the new IT infrastructure was deployed quickly. With fast performance and high reliability, GISD hopes that the VDI environment will deepen students' exposure to modern technologies and empower teachers to continue using technology to enhance the learning experience.

Solution

Cisco Unified Data Center solutions form the core of the GISD IT infrastructure. Three Cisco UCS 5108 Blade Server Chassis contain the blade servers that host the core of the VDI environment virtualized with VMware View 5.1. Twenty-one Cisco UCS B200 M3 Blade Servers offers excellent density to deliver high performance on the VDI environments, while three Cisco UCS B200 M1 Blade Servers act as admin servers for the VMware Horizon View environment.

Unlike other types of IT environments, the Cisco UCS environment significantly streamlines cabling and management by connecting power and fabric to the entire chassis instead of each individual server. As a result, GISD gains incredible flexibility with the ability to add or replace blades in minutes without ever taking the system offline. GISD improves the connectability even further by adding a Cisco UCS 2208XP I/O Module to each chassis, which provides four universal ports configurable as 10 Gigabit Ethernet, Cisco Data Center Ethernet, or Fibre Channel over Ethernet connections.

In addition to Cisco UCS Blade Servers, the GISD infrastructure also includes six Cisco UCS C240 Rack Servers to serve the VDI AutoCAD deployment. As an industry standard for computer-aided design, AutoCAD labs teach students valuable technical skills, but the AutoCAD software is very performance heavy. The enterprise-class Cisco UCS C240 Rack Servers deliver enough power to run AutoCAD on the VDI environment. By adding the Teradici APEX 2800 Server Offload Card to the Cisco UCS C240 Rack Servers, GISD helps to deliver a consistent user experience by reducing CPU utilization peaks and improving the VDI consolidation ratio.

Cisco UCS 6248 Fabric Interconnects extend the Cisco unified fabric to the servers with high-performance connectivity. Uplinks from the fabric interconnects connect directly to the Cisco Nexus® 5000 Series Switches and Cisco Nexus 2232 Fabric Extenders, which provide a cost-effective access layer while streamlining the IT infrastructure with unified ports. The fabric then disseminates to the Cisco Catalyst® 6500 Series Switches at the core of the network.

The Cisco MDS 9513 Multilayer Director delivers an intelligent, 8-Gigabit fibre channel connection to the storage environment from X-IO Technologies. Three chassis of X-IO Hyper ISE 700 Series hybrid storage systems serve linked clones and replicas for the virtual environment, while an additional three chassis of X-IO ISE 200 Series storage systems serve all other storage needs for the environment. The multi-tier X-IO storage systems offer highly available and highly reliable storage.

The X-IO ISE storage, a Cisco compatible product, is particularly suited for VDI environments, which feature variable levels of demand. During the school day, hundreds of teachers, staff, and students may be refreshing desktops at the same time. The X-IO Hyper ISE delivers true hybrid storage, using solid-state drives (SSD) and hard disk drives (HDD) as a single pool of storage. By monitoring demand and performance, X-IO Hyper ISE can move high-

demand data to SSD, in real time using its patented Continuous Adaptive Data Placement (CADP) to reduce latencies on the virtual machines.

"Unlike other storage solutions, X-IO Hyper ISE maintains excellent performance levels even when it's being worked hard," says Rico. "We can maximize usage of the device, giving it excellent performance in our VDI environment."

Results

One of the biggest advantages of the VDI environment is the productivity gains for the IT staff. With thousands of computers in each school, installing new software or running a system update was a time-consuming, manual task that required touching every computer. "Before, it would take IT personnel an entire summer to update all of the computers in a school," says Hysaw. "Now, we can complete updates in one night just by updating the applications and operating systems centrally. We're saving our staff an incredible amount of effort and keeping our systems more up to date at the same time."

Cisco UCS also supports management of the virtualized environment with a highly scalable infrastructure. Unlike traditional servers that can take several days to deploy, Cisco UCS enables GISD to install a new blade server in less than a day by running connections through the chassis. Since VDI offloads most of the processing onto the central data center, computers used as VDI terminals require far less performance. This capability enables GISD to use computers longer and save costs by extending the computer lifecycle by at least three years.

With the high performance gained from Cisco UCS and X-IO, GISD is able to run entire labs of AutoCAD in VDI. As performance-heavy software, the AutoCAD lab often required GISD to upgrade computers frequently. When the IT department was deploying the VDI environment, it discovered that all the computers in the AutoCAD lab had to be replaced to keep up with demand. For less than 30 percent of the cost to purchase an entire lab of computers, GISD purchased six Cisco UCS C240 Rack Servers to run AutoCAD on the VDI environment.

Unlike standalone computers, AutoCAD running on the VDI environment shares the powerful performance available from the Cisco and X-IO infrastructure. As a result, GISD reduced the rendering time in AutoCAD from about 80 minutes to only 4 minutes. "Before, students would spend entire class periods waiting for their projects to render," says Rico. "Now, students can spend more classroom time working on projects and diving deeper into AutoCAD capabilities."

The Horizon View VDI environment also provides great benefits beyond the classroom for GISD staff. Staff in the procurement department were working with 7-year-old computers that could take almost an hour to load their batch jobs. After the staff had been migrated to VDI terminals, the batch jobs ran in seconds, enabling staff to maximize their productivity for the first time in years.

School administrators also use VDI to reduce paper waste in meetings. Rather than printing handouts and notes, administrators can use their iPads or other tablet devices as a terminal to connect to the school's VDI environment. "When teachers or staff log into the VDI, they gain access to all of their files, applications, and information systems just as if they were on their desktop," says Rico. "Now they can work effectively from anywhere, whether in a meeting or at home."

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Product List

Data Center Solutions
- Cisco Unified Computing System (UCS)
- Cisco UCS B200 M3 Blade Server
- Cisco UCS B200 M1 Blade Server
- Cisco UCS C240 Rack Server with Teradici APEX 2800 Server Offload Card
- Cisco UCS 5108 Blade Server Chassis
- Cisco UCS 2208XP I/O Module
- Cisco UCS 6248 Fabric Interconnect

Routing and Switching
- Cisco Nexus 5000 Series Switches
- Cisco Nexus 2232 Fabric Extender
- Cisco Catalyst 6500 Series Switches
- Cisco MDS 9513 Multilayer Director

Storage
- X-IO ISE 200 Series Storage Systems
- X-IO ISE 700 Series Hybrid Storage Systems

Applications
- Novell eDirectory
- Novell ZENworks configuration Management
- Oracle
- VMware Horizon View

Virtualization
- VMware View 5.1

Next Steps

GISD will continue to deploy thousands of virtual terminals in schools across the district. GISD also sees many opportunities to expand academic experiences through VDI. Students in the future could log into their school's VDI environment from a home computer to complete homework or school projects using the same tools available in the school labs. By making VDI access available in facilities like public libraries, GISD also recognizes an opportunity to close the digital divide for students who cannot afford computers or fast Internet connections in their homes.

For More Information

To find out more about Cisco UCS, please visit: www.cisco.com/go/ucs.
To find out more about Cisco Unified Data Center, please visit: www.cisco.com/go/unifieddatacenter.
To find out more about X-IO Technologies, please visit: https://marketplace.cisco.com/catalog/companies/x-io-technologies.

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