



## Messaging Solution Boosts Communication Among Students, Educators, and Parents

### Overview

**Country or Region:** United States

**Industry:** Education

### Customer Profile

The School District of Philadelphia is the seventh largest in the nation, with more than 200,000 students. In September 2006, it opened the School of the Future to 175 ninth graders.

### Business Situation

To meet objectives at the School of the Future, the district required a cost-effective, scalable messaging solution that could support e-mail compliance and collaboration between educators and students.

### Solution

With the help of Microsoft® Consulting Services and Drexel University, the district built a clustered messaging environment on Microsoft Exchange Server 2007 and 2007 Microsoft Office system Beta 2.

### Benefits

- Enables system scalability
- Delivers high availability
- Improves students' communication skills
- Meets district e-mail requirements
- Facilitates administrative manageability and efficiency

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Kirk Cless, Systems Engineer, School District of Philadelphia

For three years, the School District of Philadelphia worked with Microsoft® Consulting Services and Drexel University to build the School of the Future. Designed to support about 750 students over the next four years, the school opened its doors to 175 ninth graders in September 2006. What makes the School of the Future unique is that it employs the latest technologies and business processes to better prepare students for the global economy. For example, students use e-mail on personal laptop computers to communicate with educators, so that they can ask questions, submit assignments, or access online resources. The district chose Microsoft® Exchange Server 2007 to support the messaging infrastructure, because the application provides features that meet requirements for content filtering and journaling—and facilitate high levels of availability, scalability, and manageability.



## Situation

The School District of Philadelphia is one of the oldest and largest districts in the nation, with approximately 10,000 teachers and more than 200,000 students. In 2003, the district was working on plans to open several new schools when administrators learned that Microsoft had plans to build a school prototype at the Microsoft Center for Information Work Displays. School District of Philadelphia CEO Paul Vallas took action, suggesting that Microsoft could help develop an actual School of the Future in West Philadelphia. Microsoft agreed and, rather than donating actual technologies, committed a team of educators and technologists to work with district officials. The reasoning behind this decision was to ensure that the school cost about as much as a traditional high school—approximately U.S.\$63 million—so that other school systems could replicate the model.

Another key philosophy behind the School of the Future was to create a learning environment tailored to meet changing educational requirements. Drawing upon initiatives in educational reform, the district established several goals for the new school, including:

- Improve the quality of instruction by leveraging state-of-the-art technologies and business processes.
- Teach students how to better communicate.

One of the first steps toward achieving these goals would be to create a powerful computing infrastructure. Not only would wireless laptops play a critical role at the school—allowing for a nearly paperless environment including online textbooks and tests—but also e-mail services. “Just like at businesses today, we knew the messaging service would be the lifeblood of the School of the Future because e-mail would be used

to communicate just about everything, including homework assignments and links to information sources,” says Kirk Cless, Systems Engineer at the School District of Philadelphia.

More than 1,500 ninth grade students from the district turned in applications to attend the School of the Future. One hundred seventy-five children were chosen by lottery, 85 percent coming from low-income families.

## Solution

In December 2005, the school’s IT team decided to deploy the beta version of Microsoft® Exchange Server 2007 through the Microsoft Rapid Deployment Program. “Because it is the School of the Future, one of the goals was to introduce our latest and greatest technologies,” explains Jack Raskis, Senior Consultant from Microsoft Consulting Services.

According to Raskis, giving kids e-mail accounts brought about new challenges for the district. Not only would it need to build a new messaging architecture for the school, but also its district administrators needed tools that would allow them to verify that students were using e-mail appropriately and not sending content that violated any school policies. Exchange Server 2007 provides administrators with the tools they require, such as the ability to flag e-mail messages that contain certain words or word patterns. In addition, Exchange Server 2007 capitalizes on emerging functionality in other products, including those in the 2007 Microsoft Office system release and in Microsoft Office SharePoint® Portal Server 2007.

Along with supporting specialized requirements, the messaging environment needed to be extremely scalable and reliable. During the 2006–2007 academic year, approximately 175 ninth grade students would attend the school; each subsequent

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Drexel University

year, the School of the Future planned to add a new ninth grade class, so that in four years, the messaging environment would need to support approximately 750 students and 50 staff members.

During the first week of August 2006, engineers set up six servers at Drexel University running Exchange Server 2007 as follows:

- Two Edge Transport servers, running on Dell 1850 dual-processor server computers and the Microsoft Windows Server® 2003 Standard x64 Edition operating system, employ Active Directory® Application Mode (ADAM) to store and configure recipient information, and PureMessage from Sophos to provide spam and virus filtering.
- Two Hub Transport and Client Access servers, running on Dell 1850 dual-processor server computers and Windows Server 2003 Standard x64 Edition, ensure that messages comply with school district regulations, while also providing secure access to messaging services.
- Two Mailbox servers, running on Dell 6850 quad-processor server computers and Windows Server 2003 Enterprise x64 Edition, are configured in an active/passive Single Copy Cluster (SCC) to maximize server resources and deliver high availability.

The servers are distributed between two buildings on the university's campus—each location hosting an Edge Transport, Hub Transport/Client Access, and Mailbox server. “High availability of all of the services was of paramount importance, so we used a redundant architecture for almost all of our servers,” explains Cless.

The servers access a shared 8 terabyte Internet Small Computer System Interface (iSCSI) storage area network (SAN) through the Microsoft iSCSI Software Initiator 2.02.

Engineers from Drexel University built the SAN, which also resides in the two buildings hosting the Exchange Servers, using SAN/iQ® clustering software and SAN/iQ Network RAID technology from Microsoft Gold Certified Partner LeftHand Networks to promote high availability levels.

One hundred and seventy five Gateway laptop computers to be used by the incoming ninth grade class were configured to run the Windows® XP Professional operating system and 2007 Microsoft Office system Beta 2. Microsoft Internet Security and Acceleration (ISA) Server 2006 Enterprise Edition and Office SharePoint Portal Server 2003 would enable the laptops to access e-mail services and other applications over the wireless network at school, or through Microsoft Office Outlook® Web Access from home.

In August 2006, the incoming students attended training sessions over a two-week period. “They got a sense of how the wireless network works and how to access and use the various applications, including e-mail services, before school started,” says Cless. On September 7, 2006, the school opened its doors to students, eager to learn using the new technologies and processes.

## Benefits

Exchange Server 2007 provides a highly scalable and available messaging environment that can help improve students' communication skills. In addition, Exchange Server 2007 meets district requirements by providing tools for monitoring content compliance and minimizes costs through manageability.

### Enables System Scalability

“Exchange Server 2007 provides a more scalable and affordable architecture than was possible with previous technologies,” says Paul Keenan, Director of Systems at Drexel University. “One reason for this is the

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ability to separate server roles, which allows engineers to scale only those elements of the architecture that need scaling, rather than the entire environment. As someone who has been administering Exchange Server for about ten years, I see the release of Exchange Server 2007 as a significant maturation in the product.”

This flexibility in server roles also minimizes costs, making the architecture affordable so that other schools can replicate the model. In addition, the School of the Future can easily expand its architecture to support other opportunities, such as providing e-mail services to other schools.

#### **Delivers High Availability**

Server roles, used along with cluster services in the Microsoft Windows Server 2003 operating system, promote high availability. “By building redundant servers—two for each role—engineers can provide constant system access, regardless of maintenance tasks or server outages,” explains Keenan. “For example, we recently installed the latest operating system patches on all of the servers supporting the school without impacting system availability.”

Instead of having to bring the entire system down, engineers can take one server in each cluster offline at a time. The server that is still operational manages all of the tasks for the cluster. After the installation is complete, engineers bring the offline server online, making it either the passive or active server in the cluster.

#### **Improves Students' Communication Skills**

By having students use e-mail every day, the School of the Future is instructing students in a technology that has become a dominant form of communication in the business world. “Students, parents, guardians, and teachers can use e-mail to communicate or ask

questions at any time, allowing for informal discussions and learning outside of the traditional classroom setting,” says Cless.

Teaching students the benefits and etiquette of e-mail as a form of communication is a critical skill. However, employing a corporate messaging system was another goal of the school. “The district did not want to deploy a messaging system commonly used by home users, such as America Online, because it would give students a completely different experience with pop-up ads and other types of commercials,” says Cless.

“Exchange Server 2007 is also easy to use,” adds Keenan. “The near likeness of the Outlook Web Access client to the full Microsoft Outlook client helps in cutting down the learning curve for students. They only need to learn how to use one interface for e-mail, not one at school and one at home.”

#### **Meets District E-mail Requirements**

Flexible journaling, edge server functionality, and spam and virus filtering capabilities—all features of Exchange Server 2007—are helping the School of the Future provide a safe e-mail environment for students. For example, administrators can save, or journal, every e-mail message sent to or received from a particular database, distribution list, or user. In addition, content in Exchange Server 2007 mailboxes is fully indexed and searchable using a variety of criteria. Administrators can search across multiple mailboxes with a single query and route results to a SharePoint Portal Server site or a mailbox accessible by administrators, teachers, or others.

New, with this release, Exchange Server 2007 provides an Edge Transport server role that can take the place of a third-party Simple Mail Transfer Protocol (SMTP) relay server, minimizing costs and allowing for greater levels of system integration. Exchange Server

2007 also provides functions that can filter e-mails before they enter or exit the network. "Through the use of the Hub Transport Server role in Exchange Server 2007, administrators can enforce compliance on every e-mail message that traverses the internal system or goes out externally," Raskis explains. "This is significant in giving students access to e-mail services, because we need to ensure the system is being used appropriately out of the box."

Although the School of the Future currently leverages the virus and spam filtering software used throughout the district (PureMessage from Sophos), the school is beta testing Microsoft Forefront™ Security for Exchange Server on the edge servers to catch any viruses initiated from within the network. "The district filtering solution catches spam and viruses before they enter the Exchange Server network," explains Cless. "In fact, 75 percent of all of the messages the district receives is spam. However, we are testing Microsoft Forefront Security for Exchange Server Beta to see if it is required to catch any viruses initiated from within the network."

#### **Facilitates Administrative Manageability and Efficiency**

Exchange Server 2007 offers several new features that significantly boost manageability levels, helping to minimize costs. For example, administrators can perform bulk updates from the Exchange Management Shell, improving efficiency. "The ability to create scripts using various objects in Active Directory from the Exchange Management Shell will allow the operations team to make changes more easily, and in less time," says Keenan. For example, administrators can use the Exchange Management Shell to manage Exchange Server 2007, Active Directory, and some components of Microsoft Windows—as well as objects built using the Microsoft .NET

Framework and Component Object Model (COM) development technologies.

Cless agrees saying, "The functionality available through the Exchange Management Shell was what our administrators were most excited about in training. They felt that it increased the flexibility and power of Exchange Server 2007. And because the School of the Future is a work in progress, it is critical that our messaging environment is highly flexible and dynamic so it can meet the needs of the district going forward."

"We will use the Management Console for a lot of the day-to-day activities that affect an individual user," adds Keenan. "Whereas, we will use the Management Shell to complete more complex tasks so that we can script them and reuse the scripts for other users."

The school has also benefited from functionality made possible by a combination of other new Microsoft technologies. For example, when students started up Microsoft Office Outlook 2007 and logged into their accounts for the first time, the Outlook software automatically discovered Exchange Server and configured the Messaging Application Programming Interface (MAPI) client.

In addition, all of the new technologies in use—including Exchange Server, Microsoft Office Outlook, and Microsoft Office Web Access—have proved to be highly integratable and stable. "We set up the Exchange Server 2007 environment within a couple of days," says Cless. "The fact that all of our students and teachers are using Exchange Server 2007 and we have not experienced any major issues speaks very well for the quality of the product."

## For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to: [www.microsoft.com](http://www.microsoft.com)

For more information about Drexel University, call (215) 895-2000 or visit the Web site at: [www.drexel.edu](http://www.drexel.edu)

For more information about the School District of Philadelphia, call (215) 400-4000 or visit the Web site at: [www.phila.k12.pa.us](http://www.phila.k12.pa.us)

For more information about LeftHand Networks, call (303) 449-4100 or visit the Web site at: [www.lefthandnetworks.com](http://www.lefthandnetworks.com)

## Microsoft Server Product Portfolio

For more information about the Microsoft server product portfolio, go to: [www.microsoft.com/servers/default.aspx](http://www.microsoft.com/servers/default.aspx)

### Software and Services

- Microsoft Server Product Portfolio
  - Microsoft Exchange Server 2007
  - Microsoft Internet Security and Acceleration (ISA) Server 2000
  - Microsoft Office SharePoint Portal Server 2007
  - Microsoft Windows Server 2003 Standard x64 Edition
  - Microsoft Windows Server 2003 Enterprise x64 Edition
- Microsoft Forefront Security for Exchange Server Beta
- Microsoft Office
  - 2007 Microsoft Office system Beta 2
- Windows XP Professional

### Technologies

- Active Directory
- Microsoft Internet Small Computer System Interface (iSCSI) Software Initiator 2.02
- Microsoft Office Outlook Web Access

### Hardware

- Dell 1850 dual-processor server computers
- Dell 6850 quad-processor server computers
- Gateway laptop computers

### Partners

- Microsoft Consulting Services
- Drexel University
- LeftHand Networks