

Migrate Exchange 5.5 to Domino on Linux

Embrace Open Standards

Reduce installations of critical
security patches

Add Web access to clients



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International Technical Support Organization

Migrate Exchange 5.5 to Domino on Linux

December 2003

Note: Before using this information and the product it supports, read the information in “Notices” on page v.

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This edition applies to IBM Lotus Notes and Domino Version 6.5 and Microsoft Exchange 5.5.

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Preface

This IBM Redpaper describes why to migrate from Microsoft® Exchange 5.5 to IBM Lotus® Notes® and Domino® 6, and also provides a quick how-to. For a more complete set of information you should read *Migrating from Microsoft Exchange 5.5 to Lotus Notes and Domino 6*, SG24-6955.

We begin with a discussion of the reasons an organization using Exchange 5.5 would want to move to Domino 6, and describe the benefits that can be gained. We lay out the different options that the organization has for a future messaging infrastructure and discuss the pros and cons of each alternative. This is particularly suited to business and IT managers. The benefits of this migration are increased when also migrating to Linux at the same time.

This material is useful for anyone who would like to migrate to an Enterprise-level messaging system on Linux.

The team that wrote this Redpaper

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Migrating your out-of-support Exchange environment

This chapter discusses the issues involved in the process of choosing a new electronic mail system and why you need to migrate from the existing Exchange server to a different operational system and different platform. The idea of this redpaper is to inform managers about the benefits of migrating an Exchange environment to a Domino over Linux environment, providing IT managers information to understand what is involved in changing from a proprietary platform and culture to an open source environment with a multi-platform mail system.

1.1 Understanding the actual scenario

Understanding how e-mail is important to your company is the first step to be aware of out of everything that this paper talks about.

Like for most companies in our day, the electronic mail system has become a critical mission to your company. Whether looking for alternatives on order to replace the existing Exchange 5.5 or just looking for a more robust solution, it is very important to chose the best system that fits your organization's long-term need.

Is your company choosing the path of a single vendor for your IT solutions or is your strategy to choose an open platform such as Linux where you have increased vendor choices? Increased vendor choices give you an opportunity to choose the best-of-breed solution for all your IT requirements. IT managers have a good opportunity to review and update their mail and messaging strategy with both Exchange 5.5 and Windows NT® coming to the end of their mainstream support schedule. The cost of migrating (which includes money, time and personnel) will be similar when migrating to Exchange on Windows 2003 or migrating to another messaging system such as Domino on Linux. This is a time for IT managers to choose technologies and long-term direction. One potential choice you have is between .NET technology and the openness of Linux solutions.

1.2 Microsoft is ending mainstream service for Exchange 5.5

First, the approaching end of mainstream service for Exchange 5.5 and Microsoft Windows NT (upon which most Exchange 5.5 implementations are built) poses a challenge for organizations that have a policy of using only supported software. If you choose to not migrate but do not purchase an Extended Support Contract by the end of March, you may later find a non-security problem that needs fixing without the capability to request a fix. At that point your organization will be running software with a problem known by you, but unsupported without the Extended Support Contract you previously chose not to purchase. Many publicly traded companies will not employ unsupported software because bug fixes are not available, and the use of software with known flaws can raise issues of liability.

If your company is using Exchange 5.5, this leaves your company with one of several choices with mainstream support ending December 31, 2003:

- ▶ You can remain a supported Exchange 5.5 customer by paying Microsoft additional fees to extend their support of Exchange 5.5. If you have a Microsoft Premier Account or sign a Microsoft Professional Support Contract, you can purchase an Extended Support Contract for Exchange 5.5 that is good through December 31, 2005. Microsoft will give you the first year of Extended Support free, as written in:

<http://www.microsoft.com/exchange/support/lifecycle/55faq.asp>

This free year gives you a 50 percent discount for Extended Support—two years for the price of one. This will give you a two-year time frame to determine and execute your migration plan.

Attention: The same Web page states that an extended hotfix support contract must be purchased within the first 90 days following the end of a product's mainstream support phase. This 90-day deadline starts January 1, 2004 for choosing which direction that your company is going to choose.

- ▶ You can choose to migrate to Lotus Domino running on a Linux server.
- ▶ You can choose to migrate to Lotus Domino running on a Microsoft Windows server.

- ▶ You can choose to migrate to a newer version of Exchange. Some features of Exchange 2003 also require Windows 2003 or Windows 2000 Advanced Server. As you plan your migration, review the required/recommended hardware and software changes found on the Web sites.

It is clear, however, that Exchange customers staying with Exchange 5.5 have chosen a temporary solution that will still need to be addressed before the Extended Support option runs out. Mail administration management will feel the pressure to put a migration plan in place to migrate to Domino or Exchange 2000, or to Exchange 2003, which was released on September 28, 2003. Analysts estimate that only a minor percentage—less than 20 percent by most reports (InternetNews.com, “Lotus Domino - Should You Upgrade or Migrate, Now or Later?”, October 25, 2002)—had moved to Exchange 2000 by the end of 2002, two years after general release of the product. Most observers view the complexity of the upgrade, which is really a major migration, as the reason for the slow uptake of Exchange 2000. For example, a full implementation of Windows 2000 and its Active Directory user management system is required before Exchange 2000 can be run in “native mode;” until that is achieved the entire system is essentially still an Exchange 5.5 implementation. This activity has been reported to cost as much as \$700 US per user, with an average of \$400 US per user in typical organizations (Ferris Research White Paper, April 2002).

1.3 Messaging futures are key

Future upgrades are another problem facing Exchange customers. The same Eradicate study cited earlier shows that Exchange customers can also expect more than three times the expense for “migration and upgrade costs.” Microsoft has announced that future Exchange versions will be based on its SQL Server relational database, replacing the non-relational data stores in versions up to and including Exchange 2003. Positioned as a natural evolution for messaging storage, in fact this is needed by Exchange to address one of its most troublesome design elements: Shared data storage. Because all users on a given Exchange 5.5 server actually share a single database, corruption of a single message or user mailbox can bring everyone down, necessitating complex and lengthy restoration from backup systems.

In contrast, Domino is based on proven non-relational database technology that has been refined and optimized through six full releases, with the last two benefitting from the expertise of the IBM DB2® relational database team and IBM Almaden research labs. In fact, IBM Lotus has announced that DB2 will be supported as an optional data source in the next major release of Domino 7, scheduled for release in 2004. However, both data stores will be supported, even for the same user, and will continue to be based on the same robust “one user, one mail file” model as all previous versions of Domino. (Domino has offered a “single mail store” option for several years, but very few customers elect to implement it, preferring the administrative simplicity and inherent redundancy of the standard model.)

1.4 Messaging architecture impacts all IT plans

Business and technology managers are wise to pay special attention to the impact that the messaging system plays in overall IT architecture. Once regarded as a “point” solution to a specific communication need, messaging has become a core element of a collaboration platform that includes portals, instant messaging, online meetings, team workspaces, and electronic learning. Moving forward, elements of all types of collaboration, from in-box and group scheduling, to awareness and chats, to Web conferencing and workplaces, will be delivered as modular components that can be integrated anywhere and everywhere in an IT infrastructure. In fact, IBM already delivers market-leading offerings in all of these

collaboration categories. The concept of using these capabilities pervasively, defined as “contextual collaboration” by leading analysts including Gartner and IDC, represents a fundamental evolution of collaboration from application “silos” separate from other important technology systems, to a set of core capabilities that can be exploited anywhere they add value to an application or process.

The purpose of this document is not to delve into the underpinnings of the IBM Lotus strategy for Workplace and contextual collaboration; there is already a great deal of information available in other places, including the Lotus Website at:

<http://www.lotus.com>

However, it is important to understand how both Domino and Exchange will play in this emerging model, particularly in regard to the implied or assumed dependencies that will be required to gain the promised benefits.

Exchange, like all Microsoft products, is evolving to participate in an overarching strategy dubbed “Microsoft.NET.” Like nearly all Microsoft offerings, it works only on the Microsoft Windows operating system. One element of .NET is that, since it assumes that only Windows and Microsoft products will be used, it allows Microsoft to treat all its products as a holistic system and apportion functionality in different places. One good example is Active Directory, which is part of Windows and acts as the central user repository and management system for all .NET applications including Exchange. Another is the SQL database, especially in its forthcoming “Yukon” iteration due sometime after 2005, which is slated to become the underlying data store for .NET elements, including the Windows file system and Exchange.

In fact, many features and functions that had previously been part of Exchange or other applications are being broken out as separate offerings, and/or built into the Windows platform. For example, Exchange 5.5 and 2000 were initially positioned as application platforms in the Domino model, but that capability was later deprecated in favor of other parts of the Microsoft portfolio, including the SQL Server and Internet Information Server (IIS), using Visual Basic and Visual Basic.net development tools. (Most observers agree that Exchange application development never approached the equivalent Domino capabilities, and in fact an IBM Lotus-sponsored study [SyteL, A Comparison of Exchange and Domino Application Development, January 2001] showed Domino to be 44 percent less expensive and 42 percent faster than Exchange 2000 for a similar application, with the Domino version being of superior quality.) Similarly, instant messaging was initially a component of Exchange, but Microsoft has announced that future versions will be part of Windows.

What does this all mean to business and IT managers? In pieces it's really just a set of tactics that address shortcomings, or exploit opportunities, in the Microsoft product line. That's both the prerogative and expectation of any software vendor. In sum, however, it is an inexorable march toward a single proprietary platform, and each implementation of a component serves to make it harder to make a non-Microsoft choice somewhere else. For organizations that have consciously made a .NET decision, of course, that is not an issue. If you believe in the .NET architecture and its benefits, particularly in the area of integration, there is nothing wrong.

But, in fact, most organizations run mixed environments, with hardware and software platforms from a number of vendors. There are many reasons for this, including the widespread popularity of the Java™ platform, greater scalability and reliability of UNIX®-based operating systems, and the explosion in open source software such as Linux. IBM has earned a leadership position in many of these areas, and IBM Lotus is an important participant in such initiatives. The philosophy underlying the IBM strategy—in fact the strategy embraced by every leading vendor except Microsoft—is to adhere to open standards and protocols that permit integration and interoperability among disparate products from a

universe of vendors, with the result being increased choice and the benefits of true competition for every customer dollar.

IBM Lotus has embraced open standards support in Domino since its inception. The Domino 6 release contains deep support for the Java 2 platform, Enterprise Edition (J2EE) model, including rich Java interfaces and support for many leading directory and database systems, including those from Microsoft. This preserves customer choices because it integrates with everything in the IT environment, while exploiting benefits specific to each. For example, while Exchange requires Active Directory, Domino supports it with its ADSync tool for bidirectional user and group management. But Domino also includes its own enterprise-grade directory, and supports open standards-based LDAP directories as well. All of this makes it easy to develop contextual collaboration in applications throughout the enterprise, interfacing with multi-vendor workplace and portal metaphors.

Going forward, IBM Lotus has announced a Workplace strategy that surfaces all of the collaborative elements in a single user interface—including all Lotus product offerings and those from other vendors—and will continue to enhance support for J2EE in future versions of Domino. Customers can own Domino with confidence that it will continue to deliver the capability to play well in open architectures, and even in less-open architectures such as .NET. At the same time, IBM Lotus has announced new initiatives that build upon its expertise as a collaboration leader to create a set of pure J2EE components that offer individual collaboration elements—such as e-mail, in-box, awareness, instant messaging, and e-meetings—that can be “dropped in” whenever and wherever appropriate. While separate technology from Domino’s integrated application approach, the new “next generation” offerings are designed to fully complement and integrate with Domino—in places supplementing Domino capabilities through Web services integration, and in other places providing capabilities for users who do not need the full range of Domino features.

The first example of a next-generation offering is IBM Lotus Workplace Messaging™ (LWM), released in May 2003. Built upon IBM WebSphere® J2EE technology and IBM DB2 database technology, it is able to provide low-cost e-mail capability to under-served user populations in Domino accounts. Studies show that large user populations such as factory workers and retail staff can benefit from electronic communications, but do not need the full features of enterprise e-mail. LWM delivers a way to serve those users within the same domain and administrative interface, but without the overhead required by a knowledge worker.

In summary, the less visible benefits of Domino may be as important as the visible ones, and should be factored into the Domino versus Exchange decision. For maximum flexibility, and the ability to preserve choices in emerging architecture models, Domino is not only better, but safer for your organization.



Domino and Linux benefits

This chapter lists the benefits of the Lotus platform over Linux and how your company can take advantage of these benefits to increase security and reliability, and lower costs when migrating the electronic mail environment.

This chapter includes:

- ▶ “Benefits of the Lotus over Linux platform” on page 8
- ▶ “Linux can be secured more easily” on page 8
- ▶ “Backing up data on Linux” on page 10
- ▶ “IBM support and its commitment to the open source culture” on page 12
- ▶ “Improving performance with Linux” on page 12
- ▶ “Lower cost of ownership” on page 12

2.1 Benefits of the Lotus over Linux platform

In addition to the benefits of migrating your mail system to Lotus Domino that were discussed in the redpaper *Exchange Your Exchange: Migrating from Microsoft Exchange 5.5 to Lotus Domino 6*, REDP-3694, we explore in this redpaper the benefits of having Lotus Domino running on a Linux platform. We look at the differences between the Windows implementation and the Linux implementation of the Domino environment, especially focusing on a management and end-user point of view.

2.2 Linux can be secured more easily

Today security has become the first concern of IT staff. Linux has become a standard for security experts when talking about Intel® platforms.

2.2.1 Windows security problems

IBM IT architects do not recommend placing Windows servers in a DMZ due to security concerns. All the recent virus and worms incidents just reinforce this concept. So a common solution to improve security it is to put a Linux box running sendmail, qmail or some other mail solution; it relays all incoming messages to the internal Exchange server. This has resulted in many companies already using Linux in at least a part of their e-mail topology, even if those solutions are not corporative solutions. That is because Windows has been shown to be susceptible to malicious hacker attacks.

2.2.2 Pure TCP/IP

A well-known principle in the security world is: "Get rid of every thing you don't really need." The point is that the system is vulnerable directly proportional to the number of doors that exist to access it. Lotus Domino only requires TCP/IP on the network. This means that you do not need all the other protocols that come in the Microsoft platforms, like netbios, RPC protocols, and others.

2.2.3 Remote management

Natively, Linux provides several ways to remotely manage the system; some of them are considered the most secure by security experts. With Secure Shell protocol any Linux administrator can access, with 128 bits of cryptography, the Linux box from any terminal requiring only a low-speed TCP/IP connection (that is, a phone line). This is very useful in demographically diverse companies where a single Linux administrator can be responsible for several servers in different locations through a slow connection without performance problems to the link.

2.2.4 Virus-free environment

Because Unix and all its flavors are virus-free environments, even being a multi-user system, Linux inherited the same advantage as Unix. Unix systems are designed in a model where a computer virus would not be very destructive, unlike in a Windows box. Process owning is a concept that Microsoft improves in each Windows release, but it still far from the Unix security model. Even having multiple uses for the same Linux box, viruses are not a big issue. In addition, there are a variety of commercial anti-virus solutions for Linux and Domino over Linux in the market as described in the publication *Lotus Domino 6 for Linux*, SG24-6835. These solutions are helpful for Windows clients using the Domino solution.

Operating system level antivirus software

Antivirus software for Linux is a program that scans the files in the computer for known viruses. It may also scan the memory or incoming data. When it finds a virus, it shows a message and acts on the virus (for example, it can erase the virus or put the virus in quarantine).

Following is a list of some of the companies that offer operating system level antivirus software for Linux. For more information, visit their Web pages:

- ▶ Norton AntiVirus, by Symantec
<http://www.symantec.com>
- ▶ ServerProtect for Linux, by Trend Micro
<http://www.trendmicro.com>
- ▶ eTrust InoculateIT for Linux and eTrust Antivirus, by CA
<http://www.ca.com>
- ▶ RAV AntiVirus Desktop, by GeCAD
<http://www.rav.ro>
- ▶ Kaspersky Anti-Virus for Linux Servers
<http://www.kaspersky.com>

Application-level antivirus solutions for Domino Server

Antivirus software for the Domino server works at the application level, in this case at the Domino level. It can scan for viruses in Domino databases and in files attached to e-mail messages.

At the time of writing there are a few companies that offer antivirus products for Domino for Linux. The following is a list of some of the companies that offer this type of product. For more information, visit their Web sites:

- ▶ Kaspersky Anti-Virus Business Optimal for Lotus Notes/Domino, by Kaspersky. This was the first product of its kind released.
<http://www.kaspersky.com>
- ▶ ScanMail for Lotus Notes, from Trend Micro, now includes Linux support. This complements the offerings Trend Micro already has for Windows, AIX®, Solaris, OS400, and z/OS®.
<http://www.trendmicro.com>
- ▶ Norton AntiVirus for Lotus Notes/Domino, by Symantec.
<http://www.symantec.com>

2.2.5 More secure with transparency

End-user transparency is one of the best aspects of adopting the Lotus Domino platform. It does not matter if the server is running Windows, Linux, AIX, or Solaris. Users will not be able to distinguish the difference between them. Usually when a more secure model is adopted, the model implies changes in what the user is used to (for example, password policy), and also, in general, a more secure system means that users have more complex access to data. In Linux this is not true, and actually the IT staff familiarized with Unix environments will feel much more comfortable.

2.3 Backing up data on Linux

In addition to the native tools largely used in the market by Unix administrators, there are other third-party backup tools supported by Linux, as referred in the publication *Lotus Domino 6 for Linux*, SG24-6835.

2.3.1 Backup software from third-party vendors

This section introduces some of the numerous backup software products provided by third-party vendors. Many vendors offer backup software for the Linux operating system, as well as for the Domino Server. However, at the time of writing, there was only one product available for Domino Server for Linux that will back up the databases while the server is still running.

Although performing a backup with backup software on a Domino Server is possible, the major drawback is that you have to shut down the Domino server for the duration of the backup. If your systems do not require non-stop operation, you could consider using one of the third-party backup products.

2.3.2 Third-party backup software solutions available for Linux

In this section we discuss third-party backup software solutions available for Linux

IBM Tivoli Storage Manager

IBM Tivoli Storage Manager is a scalable client/server software for backing up any data. Both the server software and the client software are available for the Linux platform. With the administration client you can easily retrieve and access the backed-up data.

To learn more about the software and availability, check the IBM Tivoli Web site at:

<http://www.ibm.com/tivoli>

VERITAS NetBackup BusinessServer

NetBackup 4.5 is also client/server software. Both the client and the server are available for Red Hat; only the client is available for SuSE.

Check the VERITAS Web site to learn more about the software, at:

<http://www.veritas.com>

BrightStor ARCserve Backup for Linux

CA has created backup software specifically for Linux. It has a Web browser-based user interface, there is a built-in virus scanner, and it provides disaster recovery services. The current version of the product, BrightStor ARCserve Backup for Linux 7 Advanced Edition, supports Red Hat Linux 6.x, 7.0, 7.1 and SuSE 7.2 and 7.3 according to CA's Web site at:

<http://www.ca.com>

Galaxy iDataAgent for RedHat Linux

This is backup software for RedHat Linux from Commvault. See more information at:

<http://www.commvault.com>

2.3.3 Backup software for Domino Server for Linux

Since most Domino servers are expected to provide non-stop service, you cannot shut down the server in order to perform a backup. The only option is to perform an online backup. This is possible because Domino provides backup/recovery APIs and there are third-party products that utilize these APIs, providing the possibility to perform an online backup of a Domino server.

NetWorker Module for Lotus Notes

At the time of writing we were aware of only one backup product for Domino on Linux: NetWorker Module for Lotus for Linux, by Legato. You can find details at the Legato Web site at:

<http://www.legato.com>

For Linux, the supported platforms are:

- ▶ Red Hat 7.1, 7.2
- ▶ Red Hat Advanced Server
- ▶ SuSE 7.2
- ▶ SuSE Enterprise Server 7
- ▶ Lotus Notes and Domino Server 5.0.3, 5.0.4, 5.0.6, 5.0.7, 5.0.8, 5.0.9, 5.0.10, 5.0.11, 5.0.12, 6.0.1

NetWorker Module for Lotus Notes is installed on the Lotus Domino Server and has the ability to search out all the Notes databases on that server, using one of three user-specified search methods: The explicit file name, the standard Notes directory, and a search of the whole machine. It reads the database files, formats them into a NetWorker savestream using XOpen's Backup Services API (XBSA), and passes the data to the NetWorker server. The NetWorker server may be either on the same machine, or on another machine on the network. The NetWorker Module can also be installed on the Notes Client to back up any databases that reside on that machine.

Among the key features provided by NetWorker are:

- ▶ Online, non-disruptive backups
- ▶ Full or incremental backups
- ▶ Document-level backup and restore (phase2)
- ▶ Point-in-time restore and directed (to another directory) restore
- ▶ Autochanger support
- ▶ Media management (tape tracking, labeling, and bar code support)
- ▶ User notification by e-mail and log files
- ▶ Graphical scheduling interface
- ▶ Seamless integration of Notes backup with file system backup for enterprise-wide storage management
- ▶ Local or remote backup and restore
- ▶ Optional data compression and encryption

Note: Check the Legato Web site for newer releases.

Other solutions

There are numerous other backup products from third-party vendors for Domino servers, but at the time of this writing they do not support the Linux operating system.

Some of the products are listed here; check their Web sites to see whether support has been added:

- ▶ IBM Tivoli Storage Manager for Mail (former name IBM Tivoli Data Protection for Lotus Domino)
<http://www.ibm.com/tivoli>
- ▶ VERITAS Netbackup
<http://www.veritas.com>
- ▶ CA Brightstor
<http://www.ca.com>
- ▶ Commvault Galaxy for Notes R5
<http://www.commvault.com>

2.4 IBM support and its commitment to the open source culture

One of the problems we hear most from IT managers when adopting Linux in their infrastructure parks is “How can I trust the Linux community to provide, as fast as I need, all the patches for the problems I usually have?”

There are several governments and huge companies around the world adopting Linux, and surely this is a reason why patches will be released as fast as possible. IBM continues to increase the number of customers using Linux and would not recommend Linux if it was not reliable and supported.

2.5 Improving performance with Linux

Why have a graphical environment in a server if no user will access it? Loading graphical environments surely consumes more machine resources. By choosing to install only the components necessary on the server, the server utilizes less memory and also has fewer ports open to be secured.

2.5.1 Memory management

Memory management in Linux is one of the main reasons it is stable and highly available. It is standard practice to schedule a reboot of a server after a period of uptime. IBM data centers find that UNIX and Linux boxes need fewer reboots than Windows servers running similar workloads. Usually what happens is that Windows servers are less effective in freeing used memory. Under Linux, memory utilization it is very effective, freeing unused resources to be used later by other applications, especially in Domino where the workload is based on the number of concurrent users. Fewer reboots results in longer uptime rates.

2.6 Lower cost of ownership

In an IT perspective there are many reasons to change to Domino over Linux, but justifying the cost of a migration is not a easy task. However, if you have an Exchange 5.5 solution

running on a Microsoft Windows NT 4.0 system, you will be doing a migration to another solution on a different network operating system to obtain a supported solution. Understanding that heading to Linux is a strategic movement in the IT cost perspective is a first step to justifying an Exchange 5.5 to Domino migration using Linux. For more information see the redpaper *Linux, Why It Should Replace Your Windows NT Domain*, REDP-3779.

2.6.1 Domino licensing

Domino is sold in the classic client-server model, as well as in a Complete Enterprise Option (CEO) offering that charges on a per-user basis.

In the client-server model, a customer acquires licenses equivalent to the number of CPUs on its Domino servers, and a Client Access License (CAL) for each user. Once a user has a CAL, he can connect to any Domino Server without any additional requirements. The exception is that some CALs come in two varieties: Messaging and Collaboration. Messaging CALs, like the Domino Messaging Server, only entitle the user to messaging, calendar, discussions, and teamrooms. Collaboration CALs, like the Domino Enterprise Server, also include access to packaged and custom applications based on Domino. Collaboration CALs are by far the most popular option.

There are a few different ways to acquire CALs: Basically, a Lotus CAL is required to access Domino for messaging, even with third-party client software. The Notes client software contains an “embedded” CAL, so further CAL purchases would not be required.

Other client types based on open standards-based (that is, HTTP, POP3/IMAP4) or third-party software (for example, Outlook) require a separate CAL.

It is important to note that Outlook is included with Office and/or with an Exchange CAL. If neither of these license types is valid, the software would have to be purchased separately.

2.6.2 Domino offers major TCO and functional benefits

The second factor that will cause most organizations to migrate is the improvements available—both in functionality and in cost—from the latest technology as demonstrated by Lotus Domino. Domino 6 was released in September 2002, and was the first leading messaging system to embrace the TCO theme. This has proved to be a timely and powerful strategy. A Radicati study, “Messaging Total Cost of Ownership 2003,” shows that Lotus Domino 6 has 47 percent lower TCO than Exchange 2000; administration costs alone are more than three times higher for Exchange.

As noted previously, few IT projects will be funded unless they can provide a measurable and positive return on investment. While Domino has been widely hailed for its TCO focus, Exchange 2000 offers few improvements over Exchange 5.5; in fact, mostly it just addresses shortcomings in the previous version. This is also a factor in the slow uptake of Exchange 2000. Exchange 2003 is positioned as the “TCO” release for Exchange, with improvements in scalability, administration, and data management; it is designed to offer relief from the high ownership costs of Exchange 5.5 and Exchange 2000. However, it still requires an all-Windows 2000 or 2003 infrastructure.

Why has TCO become so important to messaging customers? Throughout the period from 1995 to 2001, many organizations were motivated by competitive pressures to adopt Internet technologies including e-mail. The driving force was to get as many users as possible up and running with e-mail, and to keep downtime to a minimum. The ability to do these things well propelled Domino to the front of the market, a position it retains despite furious assaults from Microsoft and others. Over time, e-mail (and, later, enterprise scheduling) came to be

regarded as essential utilities. Like other utilities such as light, heat, and transportation, it became clear that e-mail is an expense that needs to be managed and controlled.

Hundreds of individual improvements in Domino are focused on TCO. For example, new compression algorithms for file attachments reduce the cost of disk storage up to 40 percent, and network compression technology reduces bandwidth requirements up to 50 percent. Communication between clients and servers is up to 60 percent faster, saving in network costs and helping users be more productive. Highly optimized code in Domino 6 delivers faster response time and lower CPU utilization, and increases scalability up to 400 percent for some messaging protocols. Building on existing strengths in multi-platform support, Domino 6 server consolidation can cut the number of machines drastically; for example, IBM reduced its European, Middle East, and Africa (EMEA) Domino infrastructure from 28 servers to two servers, and cut its data center requirements in half.

Numerous improvements in Domino 6 dramatically lower the requirements for administrative support. Profile-based administration allows for highly flexible and maintainable user management.

2.6.3 Functionality equivalent

It is important to understand that your company is actually getting at least the same functionalities from the exchange server. But also, one of the Lotus Domino package's strongest points is the collaborative solutions. When evaluating the product, have in mind that Domino functionalities are much more extended, and Domino 6.5 for Linux has all the same functionalities as Domino 6.5 for Windows.

Table 2-1 illustrates the equivalent products in your Exchange to Domino migration. We go into detail about the IBM/Lotus pieces following the table, but the overview will help you to create a "mental map" of how they compare.

Table 2-1 IBM and Microsoft messaging product offerings

IBM Lotus product/offering	Microsoft product/offering	Description
Domino Messaging Server	Exchange Standard Edition	Basic messaging and calendar server software
Domino Enterprise Server	Exchange Enterprise Edition	Advanced messaging and calendar server software
Notes client	Outlook client	Integrated collaborative environment client software
Domino Web Access	Outlook Web Access	Rich Web access to messaging and calendar
Domino Access for Microsoft Outlook	Outlook 2002 Connector for Lotus Domino	Connector to support Outlook against Domino
POP3/IMAP4	POP3/IMAP4	Internet standard access to e-mail
WebMail		Basic Web access to messaging and calendar

In more detail:

- *Domino Messaging Server*: This software supports messaging, calendar, discussions, and teamrooms. It is technically the same software as Enterprise Server, but restricted by

license terms to essentially the same functionality as Exchange server, meaning no access to custom collaborative applications created using Domino Designer®. Messaging server supports partitioning, to run multiple instances of Domino on one machine, but not clustering, which provides failover and load balancing. The equivalent to this would be an Exchange Standard Edition product, which technically differs from the Enterprise Edition in that it has a 16-GB limitation on the information store on the server. In contrast, the Domino Messaging Server is not limited in any technical way.

- ▶ *Domino Enterprise Server*: This software supports messaging, calendar, discussions, and teamrooms, as well as packaged solutions or custom applications based on the Domino application platform. Enterprise Server supports both partitioning and clustering. This is by far the most popular version of Domino because of its scalability and flexibility.
- ▶ *Notes*: The client software in the Domino family includes the same “runtime engine” as Domino. What this means is that messaging (and other applications) run the same on the client as on the server. Therefore, Notes is 100 percent functional even when disconnected from the server, a factor that is the basis for its legendary mobility. It even supports disconnected access to corporate directories and other users' calendars, when configured appropriately by the user or administrator. Notes 6 features a classic e-mail interface that is intuitive for Outlook users and anyone who has used Netscape Mail, Outlook Express, Eudora, and so forth.
- ▶ *Domino Web Access*: Formerly called iNotes™ Web Access (iWA), this is a rich dynamic HTML (DHTML) interface to the full range of Domino messaging and calendar features. It runs on all “5+” level browsers and includes an option for offline usage via Domino Offline Services (DOLS), which is available to all Domino applications including messaging and calendar.
- ▶ *Domino Access for Microsoft Outlook*: This open standards-based connector software sits between Domino and Outlook, allowing users an option to continue in their familiar interface during a migration or coexistence project. While its function is very good and scheduled for continued enhancement, it is not recommended for permanent usage. IBM Lotus worked with Microsoft to create a Microsoft version of a connector. Based on proprietary MAPI and Notes technology, it is highly functional and endorsed by IBM Lotus. Its drawbacks are the requirement for Outlook 2002 and later, and Windows XP (the Lotus connector also supports Outlook 2000 and above, and Windows 98/200/XP), and the requirement that a full Notes client be installed on the user workstation. IBM Lotus will be providing a targeted install that eliminates the Notes requirement, sometime in 2003.
- ▶ *POP3/IMAP4*: The Internet standards for e-mail are supported by both Domino and Exchange.
- ▶ *WebMail*: Basic Web access to e-mail and calendar are provided by the new WebMail offering. While less feature-rich than Domino Web Access, WebMail runs on a wide variety of browsers and hardware and is ideal for lower-usage scenarios.

2.6.4 Unix compliance using existing hardware

Why spend money on new hardware if the company already has a good Intel-based server? That is one of the most attractive parts of migrating to Linux: Being able to have the advantages of a stable and reliable Unix-like environment, without the cost of it. Also, if your company already has Unix servers, it is possible to make use of native Unix resource-like Network File System (NSF) to share disks and back up data.

2.6.5 New hardware support

Linux supports several models of IBM servers and storage solutions as described in the publication *Linux Handbook: A Guide to IBM Linux Solutions and Resources*, SG24-7000. It is

possible to choose the model that best fits in the company's Domino environment, depending on the number of users and running applications. For more information on sizing Domino refer to the Server.load tool designed to benchmark Domino Servers capacity:

<http://www-1.ibm.com/support/docview.wss?uid=swg21089092>



Understanding the migration

This chapter provides an overview of the migration process. The intention is to give managers tools to understand the process itself and how to get through it successfully. Planning your migration is key to the success of the migration.

This chapter covers:

- ▶ “Know what you already have” on page 18
- ▶ “Choose the right distribution” on page 18
- ▶ “How long it will take” on page 18
- ▶ “Migrating (a technical overview)” on page 19
- ▶ “Post-migration” on page 20

3.1 Know what you already have

This is the first part of your migration process; during this step you will look inside your IT environment and determine how many machines you have, how many people there are, and what kind of technology you do the work with.

In order to make good decisions, this is some information vital you need to know:

- ▶ What is the budget for this project?
- ▶ How many users will be migrated?
- ▶ How many servers will be migrated?
- ▶ What are the project's duration and checkpoints?

3.2 Choose the right distribution

Supported Linux distributions for Domino 6.x need to be determined. According to Lotus technote #1140377, the Linux supported distributions are:

- ▶ Red Hat 7.2
- ▶ Red Hat Enterprise Linux AS 2.1 (Uni- processor only)
- ▶ SuSE 8.0 (Server and Enterprise)
- ▶ UnitedLinux 1.0
- ▶ Powered by UnitedLinux 1.0

The factors that should be considered before making a distribution choice are (in order of importance):

1. Support

Support from the company that created the distribution is the assurance that any problems related to the operating system will be treated by a specialist in that distribution. Even during this time of electronic services over the Internet it is important to have support close to your IT site, in case you need a specialist at the server's site. Also consider the update tools each distribution offers, and the cost of the annual support.

2. Hardware compatibility

Choose a distribution that supports the servers you are using. If you did not buy them yet make sure that the servers you are planning to buy are supported by your chosen Linux distribution as described earlier.

3. In-house team experience

Why not choose a distribution that your company's administrators are familiar with? Training your staff or hiring people can be an avoidable cost if you have staff with experience in one of those distributions.

Note: Make sure to choose the right distribution and after that, stick to it. We recommend keeping all your servers with the same distribution in order to maintain them with the least effort and cost.

3.3 How long it will take

Project duration depends on the following factors:

- ▶ How many people will be migrating the users
- ▶ How many users will be migrated

From previous experience doing this work, setting up the servers takes part of a week, depending on the environment. Testing everything before it is put into production is important and may take 2–5 days, depending on the different client types you are using and the additional integration with LDAP or other software components.

To migrate a user it takes about an hour, depending on her mailbox size. If the mailbox is bellow 100 Mb, an hour is a good average. This is dependent on your network and both machines' performance characteristics.

3.4 Migrating (a technical overview)

The objective of this technical overview is to give the manager an idea of the operational steps to accomplish the migration process. Migrating to a Domino over Linux environment is exactly the same as migration to a Domino over windows environment. As long as the Domino Server is property set up, there is no difference in the migration process.

The project can consist of two steps: One of migrating the Exchange server to a Domino environment over windows, and then migrating the Domino over windows to Domino over Linux. *But this is not recommended.* We find that when migrating in one step you do not have to face the common problems of a Windows to Linux compatibilization, like file name case sensitivity, for example.

3.4.1 Install Linux

There are several choices of services when installing the Linux server. Make sure there is no other daemon listening in the same ports of the Domino server. Linux installation details are not the focus of this redpaper and will not be discussed here. For more a detailed explanation on installing Linux servers and parametrization refer to the publication *Lotus Domino 6 for Linux*, SG24-6835

3.4.2 Install and configure Domino

This is a brief explanation of the Domino installation. To install a production server make sure to have previous understanding of the Lotus Domino achitecture and to do extensive reading of the publication *Lotus Domino 6 for Linux*, SG24-6835.

Install the Domino Server as shown in Example 3-1.

Example 3-1 Selecting Remote Server Setup Method

```
=====
                        Domino Server Installation
=====
Installation settings:

    Installation type : Domino Enterprise Server

Install template files : Yes
Server Setup Method   : Remote Server Setup
Configure to ASP Server: No

    Program directory : /opt/lotus
    Data directory    : /local/notesdata
        UNIX user     : dds
        UNIX group    : dds
```

Press the Escape key to re-configure the settings
or
Press the Tab key to perform the installation...

Note: If you select Remote installation setup, be sure there is no firewall blocking port 8585 of your Linux server, otherwise the Remote installation Client will not be able to connect to the Remote Installation Server.

Administrators with previous experience with Domino over Windows will find the remote installation method very similar. Once the administrator is in the remote installation setup, there is no difference from a Domino over Windows setup.

3.4.3 Configure your exchange server

On order to establish communication between the Domino server and Exchange server there is a connector that comes with the Exchange package that can be configured. By configuring this connector the migration can be implemented in a way that users are gradually migrated from the Exchange environment to the Domino environment.

1. Install a Notes Client on the Exchange server.
2. Install the Microsoft Exchange Connector for Lotus Notes.
3. Configure Microsoft Exchange Connector for Lotus Notes.
4. Configure SMTP coexistence.

3.4.4 Migrate users

Migrating a user is a task that will take about an hour, but it only affects the user that is being currently migrated. This means that for all other users the migration will not cause any impact, and should be almost transparent.

You will want to create a schedule with users to migrate their mailboxes and their personal folders. Make sure to show users how important the migration is in order to keep the project on schedule. Items that can double the time to migrate users are simply those that want you keep coming back to them later...or do all the migrations overnight. You need to determine this schedule with the users *before* you begin your migration.

3.5 Post-migration

After migrating the exchange server, Lotus Domino still gives users choices in order to maintain a flexible environment in a hybrid environment.

3.5.1 Access mail through your favorite Web browser

It is possible to access all the main functionalities of a native client using the iNotes Web Access. You can write and read encrypted notes and make use of almost all collaborative features. For mobile computers Lotus Domino off-line services enable users to access the webmail without being connected to the Domino server or the Internet.

3.5.2 Keeping the exchange clients

It is possible to keep the exchange clients, but not recommended. If it is possible, the best choice is to go directly to the native Notes client. Enabling IBM Lotus Domino Access for

Microsoft Outlook is easy and it has almost all features of the regular Notes client, like mail, calendar, and task list. This implementation is only recommended for small organizations, and additional configuration is needed in the Outlook client after the server migration. It does not have applications support and is not considered a secure implementation of the Domino environment.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this Redpaper.

IBM Redbooks

For information on ordering these publications, see “How to get IBM Redbooks” on page 24. Note that some of the documents referenced here may be available in softcopy only.

- ▶ *Exchange Your Exchange: Migrating from Microsoft Exchange 5.5 to Lotus Domino 6*, REDP-3694
- ▶ *Linux Handbook: A Guide to IBM Linux Solutions and Resources*, SG24-7000
- ▶ *Linux, Why It Should Replace Your Windows NT Domain*, REDP-3779
- ▶ *Lotus Domino 6 for Linux*, SG24-6835
- ▶ *Migrating from Microsoft Exchange 5.5 to Lotus Notes and Domino 6*, SG24-6955
- ▶ *Open your Windows With Samba*, REDP-3780

Online resources

These Web sites and URLs are also relevant as further information sources:

- ▶ Lotus Web site
<http://www.lotus.com>
- ▶ Microsoft free first-year Extended Support
<http://www.microsoft.com/exchange/support/lifecycle/55faq.asp>
- ▶ Symantec Web site
<http://www.symantec.com>
- ▶ ServerProtect for Linux, by Trend Micro
<http://www.trendmicro.com>
- ▶ eTrust InoculateIT for Linux and eTrust Antivirus, by CA
<http://www.ca.com>
- ▶ RAV AntiVirus Desktop, by GeCAD
<http://www.rav.ro>
- ▶ Kaspersky Anti-Virus for Linux Servers
<http://www.kaspersky.com>
- ▶ Tivoli web site, Tivoli Storage Manager
<http://www.ibm.com/tivoli>
- ▶ VERITAS Web site
<http://www.veritas.com>

- ▶ Galaxy iDataAgent for RedHat Linux
<http://www.commvault.com>
- ▶ NetWorker Module for Lotus Notes
<http://www.legato.com>
- ▶ Server.load tool designed to benchmark Domino Servers capacity
<http://www-1.ibm.com/support/docview.wss?uid=swg21089092>

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Redpaper

Migrate Exchange 5.5 to Domino on Linux

Embrace Open Standards

Reduce installations of critical security patches

Add Web access to clients

This IBM Redpaper gives an executive overview of why you would want to migrate from Microsoft Exchange 5.5 to IBM Lotus Notes and Domino 6.

It begins with a discussion of the reasons an organization using Exchange 5.5 would want to move to Domino 6, and describes the benefits that can be gained. While Domino 6 could run on various operating systems including Microsoft Windows, reasons for migrating to Linux are also included in this publication.

It lays out the different options that the organization has for a future messaging infrastructure, and discusses the pros and cons of each alternative. It is particularly suited to business and IT managers.

For more detailed migration steps and a deeper migration discussion, read the additional IBM Redbooks and Redpapers listed in the bibliography.

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