



# **The Cost of Migrating From Microsoft Exchange v5.5 to v2000**

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# Executive Summary

The costs of upgrading from Microsoft Exchange v5.5 to Exchange v2000 can be substantial. For large organizations, this cost is typically about \$400 per mailbox; it can rise to as high as \$700 per mailbox but can also be as low as \$50 per mailbox. Understanding the costs is worthwhile because it helps you work out how to minimize total expenditures and identify where it makes sense to apply resources.

To illustrate, consider the following three cases:

- Compaq Computer migrated 100,000 users spread over 600 locations. It spent \$16.5 million on hardware and \$6 million on technical support staff time. Not including the cost of user disruptions, the total project cost was \$22.5 million – or \$225 per mailbox.
- A leading petroleum refiner migrated 12,500 users spread over 40 locations. Not including the cost of user disruptions, the total project cost was \$4 million – or \$320/mailbox. \$2.3 million was spent on hardware and the rest on technical support staff time.
- Cinergy, a public utility based in Cincinnati, Ohio, migrated 10,000 users. Server software was upgraded at two locations. Not including the cost of user disruptions, the project cost \$300,000 – or \$30/mailbox.

This report explains the major cost elements involved and how to calculate the costs of a given migration. It includes a spreadsheet that readers can use to develop their own analysis. We conclude with a series of observations, including suggestions on where it makes sense to invest resources, and how to minimize expenditures.

# Major Cost Elements

We now review the main factors to consider when assessing the cost of a migration from Exchange 5.5 to Exchange 2000.

## *Labor*

Labor, whether it's by in-house technical support staff or external consultants brought in to help with the migration, is obviously a major cost factor. You must consider the following stages:

- *Research.* Here information is gathered about the legacy Windows NT and Exchange 5.5 environment, such as network diagrams, the locations and numbers of servers, WAN links, the number of users at each location, and WAN bandwidth utilization.
- *Evaluation.* Here the general migration strategy is defined, at a high level. There are usually several migration options, and these must be evaluated. Examples of questions that need resolution at this stage include: Will we migrate users' local data? Will we simply upgrade server software? Will we use third-party migration tools? Will we provide user training? What will our co-existence strategy be?
- *Design.* This is where detailed specifications, standards, and processes are drawn up. For example, the following are defined: new server configurations, naming conventions, what automated migration tools will do, how Exchange 2000 servers will be installed, how many users will be placed on each server, and message store limits.
- *Testing.* These labor costs encompass testing and debugging the migration processes and standards, as well as ensuring the various components work together as intended. Testing generally consists of a series of dry runs and pilots.
- *Implementation.* This refers to the physical process of going out and changing servers and, if necessary, user workstations. Implementation is generally the most expensive phase of the migration, one that affects all locations and users.
- *Training.* This will be required for administrators and team members involved in the project, especially for those who execute migration and implementation processes. It may also be required for end users.

When figuring the cost of internal staff, allow for hidden costs such as benefits, office support, and vacation time. In the United States, total annual labor costs are typically salary-plus-50%, in Europe, salary-plus-100%. To figure hourly costs, divide by 1,800.

## ***Hardware***

New Windows 2000 and Exchange 2000 servers may be required for the migration. Reliability is important, and these servers are generally well-endowed with hard disk and RAM. Typical configurations cost in the \$15,000 to \$20,000 range.

Additional machines may also be needed to run gateways (software that connects different email systems), directory servers, calendar servers, or Internet mail and X.400 gateways (the last two provide for standards-based communications with people outside the organization). Spare server hardware may also be needed.

Most organizations take out maintenance contracts on their hardware. The annual fees for these contracts are typically about 20% of the purchase cost of the hardware.

## ***Software Licenses***

You need to purchase Windows 2000 and Exchange 2000 software, as well as any required client access licenses. Because Microsoft's licensing is complex and always changing, we simplify the cost structure associated with software licensing in the accompanying spreadsheet (see "The Spreadsheet" section below). Depending on the type of migration, software costs may be minimal.

Maintenance contracts add another cost. Normally these include technical support and upgrades.

## ***Travel and Expenses***

Migration staff incurs travel costs when visiting remote offices. Sponsors and technology champions may also have to visit the home office from remote locations.

## ***User Disruptions***

Migrations interfere with user productivity. The main cost areas include:

- *Lost Time.* Normally the impact will be minimal, as is the case, for example, when servers are migrated outside business hours, and when no changes are made to workstation software.
- *Learning Time.* When workstation software is upgraded, users have to learn new features.
- *Time Helping Others.* When new features are introduced, often users spend time helping colleagues learn the new features.

Laptop users suffer the most. For example, they may have to ship in their machine for an upgrade, and be without a system for several days.

# Analysis & Interpretation

Migration costs vary from organization to organization. Nevertheless, a number of general conclusions can be drawn.

## *Migrations Cost \$50-\$700/Mailbox*

Email migrations are more complex than many other types of migration, such as migration to a new version of a network operating system. It is easy to overlook all the different tasks involved and the potential impact to end users. Total costs are likely to be at least \$50 per mailbox and potentially as high as \$700 per mailbox.

## *In-Place Migrations Are Least Expensive*

The least expensive migrations are in-place migrations, where Windows 2000 is already installed on Exchange servers. Here you keep the same Exchange organization, upgrade servers to Exchange 2000, use the same hardware, and don't make any changes to user workstations. Users are barely impacted because server migrations take place outside normal business hours.

These migrations can cost as little as \$50 per mailbox (see CostModel-Least.xls, discussed in "The Spreadsheet" below). The main cost elements are typically travel expenses and project management (roughly 40%), user productivity losses (roughly 15%), and software (about 10%).

In-place migrations are usually impractical for larger organizations that undergo mergers and acquisitions, or that wish to avoid the complexity of Exchange 5.5 and 2000 coexistence.

## *Typical Corporate Migrations Cost \$400/Mailbox*

A typical corporate email migration from Exchange 5.5 to Exchange 2000 includes a full Windows 2000 deployment, with new servers. In addition, most corporations larger than 1,000 seats will implement Exchange 2000 as a separate email system, with a new Exchange organization. New workstation software is typically not needed, so client deployment and user training are skipped.

These migrations cost about \$400 per mailbox (see CostModel.xls, discussed in "The Spreadsheet" below). The main cost elements are typically the hardware and software for the Windows 2000 and Exchange 2000 systems (roughly 40%), implementation of the new systems (roughly 25%) and user productivity losses (roughly 20%).

### ***Some Migrations Cost Up to \$700/Mailbox***

Some migrations from Exchange 5.5 to Exchange 2000 are extremely costly (see CostModel-Most.xls, discussed in "The Spreadsheet" below). These migrations require a full Windows 2000 deployment with new servers, where Exchange 2000 is implemented as a separate email system with a new Exchange organization. In addition, a new client is deployed, often bundled as part of a complete desktop refresh, such as migrating to Windows 2000 on the desktop. In these types of deployments, most organizations include at least minimal end-user training. Many larger organizations have gateways connecting different email systems, which further increases project complexity and expenditures.

The main cost elements are typically the hardware and software for the Windows 2000 and Exchange 2000 systems (roughly 40%), implementation of the new systems (roughly 30%), and user productivity losses (roughly 20%).

### ***Hardware and Software Comprise the Greatest Cost***

Hardware and software represent roughly 40% of the total project budget. The proportion depends largely on the number of users per server and the number of locations requiring servers. The ratio can climb as high as 80% in some environments and as low as 20% in others.

### ***Leased Servers Can Slash Hardware Costs***

Exchange 5.5 servers may be leased, and due to Exchange 2000's better scalability, fewer messaging 2000 servers may be needed with the upgraded system. The hardware costs can thus, in certain circumstances, be very low, or even negative. Be aware, however, that behind the accounting treatment, the reality is that new servers are being installed and paid for, and they're being paid for from past leasing fees.

### ***Physical Implementation Is the Second Largest Cost***

After hardware and software costs, the next biggest cost component is physical implementation, where servers and possibly workstations are reconfigured. The main time-consuming tasks here are workstation software deployment, migrating the messages in each server mailbox, and migrating messages stored on user workstations. Implementation costs are typically 25% to 50% of the total.

Similarly, implementation is likely to consume roughly 70% of the total project hours, but it can climb as high as 85% if workstations are updated. Efficient, automated processes can significantly reduce the expenses and disruption, to as little as five minutes per user.

### ***Directory Cleanup Is Fundamental for Good Planning***

A key requirement when migrating messaging systems is to clean up the Windows NT and Exchange 5.5 directories. This establishes a single source for all email address and account information. Cleaning up the directories is the best way to determine your current environment, and thus is fundamental for the planning process. Further, without proper directory cleanup, process automation becomes impractical.

Some of the items involved in directory cleanup include:

- Resolve mailbox ownership issues. Under Active Directory, mailboxes are a property of a user account. Therefore, multiple mailboxes can no longer be associated with a single NT account.
- Establish unique keys to ensure that the correct users are migrated. Eg, if you have two John Smiths, you might use their different Internet mail addresses.
- Resolve how to handle functional recipients and resources since it may be a security risk to create separate network accounts for these resources. (Explore using distribution lists or public folders.)
- Determine exactly what needs to be migrated (how many mailboxes, distribution lists, etc.) and use your clean directory to schedule migrations.
- Get rid of mailboxes, distribution lists, public folders, and other objects that are no longer in use. This will save time and money migrating worthless objects.

### ***Upfront Planning Pays Off Big Time***

You save a lot of money with good upfront planning and design. The savings are particularly clear for large migrations, where planning is amortized across many mailboxes. For example:

- Automated migration processes can save \$10 to \$20 per user. Try to have these processes encompass mailboxes, functional mailboxes, aliases, public folders, distribution lists, directories, user accounts, and permissions.
- Good documentation makes migration teams more productive.
- Thorough testing also makes migration teams more productive; it also reduces user disruption.
- The time and location of training can minimize user disruption.
- Laptop users can be migrated when they come to a central location.
- Alternately, laptops can be shipped to a central location to be converted, and then shipped back, saving travel expenses.

### ***Good Economies of Scale***

The more seats migrated, the less the cost per seat. This is because many tasks (eg, developing user training, testing, research, and evaluation) take roughly the same amount of time, irrespective of how many mailboxes are concerned.

For example, a typical corporate migration for 1,000 seats is likely to cost about \$700 per seat (see CostModel.xls, discussed in "The Spreadsheet" below). The same sort of migration, but for 50,000 seats, is likely to cost about \$300 per seat.

### ***End-User Disruption Is Costly***

Substantial costs are incurred when the user experience is altered. This occurs in particular when new workstation software is deployed. For example, suppose a user migrates from Microsoft Outlook 98 to Outlook 2002. Many features are now in different places, and new features include instant messaging, default controls on the opening of executable files (to help control viruses), and a new synchronization engine.

A user can easily spend one to three hours learning new features and helping colleagues. Staff cost at least \$25/hour, including overhead, for unskilled labor, and normally run to \$100/hour or more for professional staff. So to minimize costs, avoid user disruption.

### ***Third-Party Migration Tools Save \$10 to \$20/Mailbox***

Third-party migration tools typically cost \$5 to \$15 per seat, and they commonly save \$20 to \$30 per seat by reducing implementation time. So they end up trimming costs by some \$10 to \$20 per seat. However, the biggest benefits of migration tools, as follows, are non-financial:

- Total project time is reduced. For example, a six-month migration project probably now takes four months.
- The tools do many useful things to ensure addresses are properly converted so that, for example, users can reply to migrated messages, and when old messages are forwarded they don't cause non-delivery reports to be generated.
- Users are less disrupted because they spend less time readdressing migrated messages.
- Tools eliminate errors such as incorrectly typed names that arise when mailboxes are manually migrated.
- They have useful reports telling you, for example, how many distribution lists, directory entries, and mailboxes must be migrated.

Note that automated migration processes need a clean directory.

### ***Include User Disruption Costs***

Most organizations ignore the cost of user disruptions. We think this is a mistake. When these costs are included, you have a way to think about how to reduce them. Also, if you ignore these costs, in effect you are asking users to subsidize the costs of migration, without asking their permission.

### ***End-User Training Hard To Justify Financially***

User training obviously doesn't make sense if you're not changing the user experience. If a new email client is deployed, the total cost of training is likely to be \$25-\$35 per user, including curriculum development, and the time of instructors and students. The training is likely to save about the same amount through reduced user disruption. In short, investments in training are unlikely to entail overall financial savings. Justify training on non-financial grounds.

### ***Laptop Migrations Cost \$25-\$2,000/Mailbox!***

Laptop users present a particular problem. Even if their workstation software is not being upgraded, their offline store (.ost file) will often need to be resynchronized. These files are 50MB to 100MB in size, and can't be synchronized over slow dialup links.

Many corporations solve this problem by having users bring laptops in and performing the initial synchronization while connected to the LAN. However, this entails user disruptions. Laptop users must be caught while they are in the office, or they must ship their laptops to the office, have their information migrated, and then have the laptop shipped back. Either approach is extremely time-consuming and disruptive.

One way to minimize the expense is by planning laptop user migrations around company meetings when large numbers of laptop users are in from the field. An example of this might be a corporate training event, where sales personnel are gathered in a central location.

Depending on how the migration is performed, and how much users are disrupted, lost productivity costs can amount to between \$25 and \$2,000 per user. Note that not all migrations raise resynchronization issues; test your migration process to ensure whether or not you must deal with the issue.

### ***Client Deployment Is Expensive***

Microsoft has done a good job of ensuring that Outlook clients interoperate between versions of Exchange, and Exchange 2000 is no exception. Therefore, organizations can quite likely skip deploying new client software.

If new clients are deployed with Exchange 2000, it is often the case that the new client is part of a complete workstation refresh to Windows 2000 on the desktop. This is beyond the scope of this cost analysis. Including new client deployment as part of the migration significantly increases costs since it involves developing the workstation image, integrating it with existing hardware (or purchasing new hardware), and testing all applications to ensure that they work under Windows 2000.

## The Spreadsheet

Three Excel spreadsheets accompany this white paper. The most important is CostModel.xls, which can be downloaded from <http://www.ferris.com/rep/200204/SM.html>. Readers can use this to analyze the cost of their migration. It also illustrates the cost of a typical migration.

The other two spreadsheets were referenced in the Analysis & Interpretation section above. Both are available at <http://www.ferris.com/rep/200204/SM.html>. CostModel-Most.xls illustrates the cost of expensive migrations, and CostModel-Least.xls illustrates an inexpensive migration.

CostModel.xls consists of four worksheets, titled: Instructions, Assumptions, Cost Detail, and Summary. The model, when taken with the preceding analysis and interpretation, and the documentation included in the spreadsheet, is largely self-explanatory. However, the following explanations will likely make it easier.

### *How To Complete the Cost Model*

First, go to the Assumptions worksheet in CostModel.xls. Enter the data that describes your situation. We provide typical default values that you can override.

Now go to the Cost Detail worksheet. This contains many cost line items, most of which relate to human-performed tasks. Ignore all yellow cells, which are calculated. Just enter data into uncolored cells.

When entering task data:

- Column D contains Ferris Research's suggestion for the number of hours a given task is likely to take. Don't fill this in.
- Enter the number of hours your own staff are likely to spend on the task in column E, and the number of hours you expect external consultants to spend in column F.
- Specify the level of skill required in column C.

Depending on the nature of the migration, many line items may not apply. So at the very top of the Cost Detail worksheet, you will see a place where you can specify the type of migration:

- Whether Windows 2000 migrations are included
- Whether you'll simply be doing an in-place Exchange migration (ie, where the migration is limited to simply upgrading server software from 5.5 to 2000)
- Whether workstation software will be upgraded
- Whether end-user training will be included, and
- Whether you'll use third-party migration tools.

Checking each box will include or exclude corresponding line items.

The Summary spreadsheet summarizes the migration costs. Don't enter data into this worksheet.

### *Miscellaneous Notes*

- The spreadsheet uses U.S. dollars as currency. It can easily be reformatted for other currencies.
- Hover your mouse over any cell with a red triangle in the upper right-hand corner to see an explanatory comment.
- User disruptions lists the amount of productive time lost by users due to migration-related issues (such as downtime and learning.) Remember it is very easy to lose 15 minutes or more per user due to migration-related issues. Fifteen minutes times 10,000 users is 2,500 hours. Therefore, it is easy to rack up large numbers of hours and expense due to productivity disruptions.
- Under "Other Project Costs" there are three custom expense rows that can be used to account for migration-related expenses particular to your environment (such as WAN upgrades.)
- There are two hidden columns in the Cost Detail worksheet, columns I and J. These columns are simply linked to the various check-boxes and other form elements on the sheet.
- There are two hidden worksheets, Assumptions Defaults and Cost Detail Defaults. They provide default values to the Assumptions and Cost Detail worksheets. To view them, select "Format | Sheet | Unhide."
- There are a number of macros included in the spreadsheet that are activated by clicking various form elements. To view these macros and the code behind them, select "Tool | Macro | Macros..." from the menu. To see the code behind the macro, highlight the macro and choose the "Edit" button.

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# BindView

BindView, based in Houston, Texas, was founded in 1990. The firm's suite of cross-platform software and associated services help secure, automate, and reduce the costs of managing information technology infrastructures.

For Microsoft environments, BindView's .Security Solution provides Windows system administrators and security professionals with software to protect from vulnerabilities, internal threats, and configuration inaccuracies. For migration to Exchange 2000, BindView helps in several ways.

## *Pre- and Post-Migration Cleanup*

- Locate and quickly delete unused or orphaned mailboxes
- Locate mailboxes with Exchange aliases different from Windows NT account user names
- Locate and delete mailboxes with no NT or multiple NT accounts
- Document the server versions in the environment – including hot fix and service pack information
- Locate and delete inactive accounts
- Move mailboxes into different organizations (for consolidations).

## *Secure Administration*

- Locate and quickly delete viruses still lurking in your environment
- Automate distribution list updates
- Enforce information store policies
- Manage disk space (locate and quickly delete inappropriate GIF, JPG and MP3 files).

## *Exchange Server Migration (Scheduled for 2Q 2002 Availability)*

- Migrate mailboxes, distribution lists and public folders
- Synchronize the directory
- Perform project-based migrations
- Perform unattended data migration (for trail migration, actual migration, rollback, and synchronization)
- Maintain and synchronize security
- Schedule migrations.

For more information, visit [www.bindview.com](http://www.bindview.com) or call +1 800 813 5869 or +1 713 561 4000.

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