



## **The hidden costs of data migration.**

*Strategies for reducing costs and quickly achieving  
return on investment*

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**Executive summary**

There are many challenges associated with data migration. First, the amount of data to be migrated is increasing as quickly as storage capacity grows. Second, data migration is problematic for most users. Next, applications need 24x7 data availability, so that IT departments have only narrow downtime windows for essential system maintenance and don't want to "waste" this time migrating data. Data centers usually support multiple operating systems – mainframe, UNIX®, Microsoft® Windows® and Linux® technology – with the mix being determined by the specific applications in use. Finally, there usually is hardware from more than one storage vendor in the data center – further increasing complexity.

The organization thinking about data migration should consider the following key factors – and how the Softek™ data migration products can help:

Key factors	Description	Softek data migration software
Scalability	Storage capacity continues to grow at a rate of 50 percent annually as migration needs increase each year with more storage coming off of lease.	Can scale migrations from moving a single volume to migrating terabytes of data to new, larger storage locally or globally
Application availability	Data availability requirements have increased with 24x7 applications such as e-mail and online commerce.	Helps keep businesses running because applications stay online while volumes are relabeled and input/output (I/O) is transferred during patent-pending Dynamic Swap
Application performance	Performance measurements must take into consideration how quickly data is copied from the source to target and balanced against network bandwidth and system overhead.	Helps ensure application performance with dynamic throttling/tuning
Vendor independence	Multiple storage vendors have unique requirements for migration and different migration techniques, adding complexity to the process.	Helps lower storage costs with Softek's simple, comprehensive and proven methodology to assess, plan and validate migrations
Heterogeneous operating system (OS) and storage support	Multiple operating systems and storage arrays add to complexity in the data center.	Supports all operating systems and multi-storage array environments

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Highlights

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***Overtime work and lease overlap are hidden costs of data migration.***

***When you add them up, hidden data migration costs can exceed the cost of data migration tools.***

**Introduction**

In March 2005, Softek surveyed 700 end users on how data migration impacts their organizations. The results of the survey – carried out in conjunction with a leading industry analyst firm, Enterprise Strategy Group – show the full range of challenges such as unexpected downtime and cost overruns that users face in migrating data. The study found that many of these cost overruns remain “hidden,” because they involve overtime work and lease overlap. In addition, it found that even though tools are available to help users address their migration challenges, many IT managers are either not aware of these tools or have not yet implemented them. Exposing hidden costs of data migration and providing solutions to address them will help IT managers provide nonstop data migrations more effectively and efficiently.

Users cite cost as one of the key factors keeping them from implementing new data migration tools. They believe that, along with the actual purchase price of new technology, related costs – such as training, installation and professional services – can add up to an expensive bundle. However, they typically overlook the fact that the hidden costs of maintaining the status quo can be even greater than implementing new technology.

In this paper, Softek looks at the hidden costs of data migration that were revealed by the survey, including costs resulting from:

- *Unplanned downtime*
- *Delaying the purchase of new, better storage*
- *Lease overruns*
- *Overpaying for capacity*
- *The need for additional storage hardware*
- *Exceeding planned staff time*
- *Exceeding data migration budget*
- *Exceeding scheduled downtime*
- *Lack of validation procedures to ensure data integrity.*

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Highlights

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***As storage capacity continues to grow exponentially, it's important to reevaluate the advantages and costs of data migration tools.***

With storage capacity continuing to grow at a rate of 50 percent annually, data migration is a fact of life for the IT manager. Evaluating the costs and hidden costs of migrations, along with new migration tools, can provide a new perspective on how to approach moving data.

This paper demonstrates how to do the following:

- *Provide a simple, unified approach to data mobility by moving data:*
  - *Across virtually all operating systems, and storage vendors/platforms*
  - *At almost all volume, block and file (dataset) levels*
  - *Using a common management console*
  - *Locally or over distance*
  
- *Reduce the cost, complexity and risk of moving data with:*
  - *Nondisruptive storage/server replacement and consolidation designed to take full advantage of high-performance arrays with no lease overlaps*
  - *Tiered storage and workload balancing that minimizes outages*
  - *Nonstop distance replication with automated restore*
  - *A proven methodology for nonstop data mobility*
  - *Easy installation and use, with no additional hardware/software*
  
- *Ensure continuous application availability through:*
  - *Nondisruptive data movement, so applications remain online*
  - *Patent-pending Dynamic Swap technology*
  - *Dynamic performance throttling*

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Highlights

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***The key driver of data migration is technology refresh.***

***Increasing requirements for 24x7 data availability mean less tolerance for application downtime.***

**What is driving data migration?**

According to Softek's survey, technology refresh—replacing an array or server with a new one—is the number-one driver of data migration, followed by consolidation and relocation. The storage hardware and server replacement involved in technology refresh, coupled with the expiration of storage equipment leases, means that storage managers have to move data on a regular basis.

In addition, storage and server capacity are acquired at a rate typically ranging from 25 to 50 percent annually to accommodate data and application growth. So, every year—or even more often—a typical organization acquires storage technology to replace arrays on which lease or maintenance agreements are expiring, and it acquires additional capacity to accommodate anticipated growth.

With the explosive growth of storage and with older storage coming off of lease, the need for data migration is ever increasing. Additionally, applications such as e-mail and online banking run 24x7, meaning increased requirements for data availability, even during data migrations.

**Data migration challenges**

One of the main issues that emerged from Softek's user survey is that application downtime is the biggest overall challenge to data migration. As a result the majority of migrations are conducted on weekends.

The survey also found that while migrations are routine, they can be risky events, with 83 percent of migrations experiencing problems. Unexpected downtime was cited as the leading problem. Other problems include technical compatibility issues, data corruption, application performance issues and data loss.

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Highlights

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***To minimize risk, most organizations conduct migrations on weekends— which leads to costly overtime.***

***Since the cost of downtime can be millions of dollars per hour, migration can impact the bottom line.***

In addition, users talked about how migrating data can be a complex process, with most migrations taking more than two weeks to plan and involving five people to implement. Add to this the composition of the typical data center – where multiple operating systems and multiple storage vendors increase the complexity.

Attesting to the fact that data migration is a fact of life for the IT manager, 39 percent of those surveyed said that they perform migration on a weekly or monthly basis. But with the downtime problems, the majority conduct their migrations on weekends to avoid overall risk. So, weekend migrations mean costly overtime. Because many companies lack sufficient numbers of IT staff, weekend migrations also can result in unhappy employees.

There is no getting around the fact that data migrations are difficult, but they have to be done. IT managers do their best to plan the most efficient migration, estimating the best time to take applications down, how many people they will need, and how much it will cost. But the survey found that the plan often goes awry.

**Hidden costs of migration**

Considering that the cost of downtime can be up to millions of dollars per hour, migrating data can have a significant impact on an organization's bottom line. Though data migration is conducted during planned downtime, the process seldom works out as planned. The best solution would be to eliminate the need for downtime and conduct data migrations when applications are running.

Delaying storage purchases as a way to avoid the risks or problems of moving data is also costly. Organizations can overpay for capacity, lease or maintenance overlap. And as long as they are using their old equipment, they won't be able to access cost-efficiencies that new storage hardware can provide.

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**Highlights**

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***Most organizations rely on user feedback to determine the success of their data migrations.***

***Data mobility solutions can reduce the cost, complexity and risk involved in moving data.***

Most survey participants said they rely on their end users to validate whether their data migration has been successful or not. Without validation procedures, problems show up when the business is running. The result can be downtime during working hours that the weekend data move was intended to avoid.

From the discussion above, it is clear that users face very real issues in IT environments where the need for storage grows rapidly and downtime is not an option. Depending on the business and the amount of data being moved, there is no question that online data migration solutions that do not require application downtime can help reduce the hidden costs of data migration, including its significant administrative costs. Online solutions can take the risk out of moving data by eliminating downtime, streamlining the migration process and ensuring data integrity.

**Softek data mobility solutions**

IBM Nonstop Data Mobility™ software provides a simple and unified approach designed to move live data over any distance, regardless of server platform or storage vendor. Softek's Nonstop solutions can reduce the cost, complexity and risk of moving data, thereby increasing application availability and customer choice.

Since 1996, Softek has set the industry standard for data migration, moving terabytes of data for more than 60 percent of Fortune 1000 companies. Softek can meet the key requirements and provide benefits in virtually all data migration scenarios:

- *Technology refresh—Softek solutions can eliminate lease or maintenance overlap charges; they can enable data migration across array platforms and can assure data integrity during the process.*
- *Consolidation—Softek solutions enable IT organizations to easily reconfigure volumes or logical unit number (LUN) sizes, use an automated and repeatable process and perform the migration with minimal downtime.*

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Highlights

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***Softek data migration products can help with a variety of issues related to distance, availability and performance.***

- *Relocation—Softek solutions can help bring systems back online quickly, minimizing revenue impact and avoiding data loss or corruption.*
- *Improvements to application performance—Softek solutions provide work-load balancing, tiered storage and the ability to perform maintenance during business hours.*

Softek's data migration products provide solutions to a full range of migration needs, including:

- *Migration over any distance—Data can migrate from and to almost any location, locally or globally.*
- *Application availability—Applications can continue running during the migration; volumes are relabeled and I/O is transferred using Dynamic Swap.*
- *Application performance—Dynamic throttling/tuning ensures application performance.*
- *Assessment, planning and validation—Softek solutions and processes are based on proven methodologies.*
- *Open, heterogeneous storage support—Softek solutions enable moving data in multi-storage array environments, to any storage architecture and on virtually all major operating systems and platforms.*

TDMF software—setting the standard in data migration

The cornerstone to Softek's enterprise data migration software offerings is the Softek Transparent Data Migration Facility (TDMF™) family of products. For the past ten years, the TDMF name has become synonymous with nondisruptive



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Highlights

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***Now considered the gold standard, TDMF technology enables organizations to move data without interrupting applications.***

***With LDMF technology, organizations can easily upgrade and consolidate storage and fine-tune performance on the fly.***

data migration in multivendor storage environments. Today, TDMF technology is recognized as the de-facto “gold-standard” in heterogeneous, host-based software for performing online migrations in enterprise environments.

TDMF software enables IT organizations to move data at the volume or block level between different storage vendors or versions – with no interruption to the applications running the business. The TDMF solution provides local or global data migration for technology refresh, consolidation, relocation and performance improvement.

The TDMF product suite currently supports IBM z/OS®, UNIX, Microsoft Windows, and Linux environments.

LDMF software—the solution for mainframe dataset migration

Building on its enterprise data migration heritage, Softek also offers Softek Logical Data Migration Facility (LDMF™), the industry’s first product for mainframe dataset-level migration. LDMF technology is architected from the ground up to nondisruptively migrate mainframe datasets. This ability provides a long-sought-after way to easily upgrade and consolidate storage, provide on-the-fly performance tuning and deliver tiered storage.

**The bottom line**

The bottom line is that Softek’s products and expertise help IT organizations to avoid “wasted time” in moving data. More important, organizations can quickly improve the return on investment (ROI) of their storage systems by keeping applications running, eliminating lease overlap costs and avoiding budget overruns.

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Highlights

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Following is an example of how one large company was able to leverage its investment in Softek technology to achieve ROI and overcome the hidden costs of the status quo.

Before implementing the Softek solution, the company experienced the following:

- *This international media conglomerate migrated 75TB of data nine times per year.*
- *When performing these migrations, the company experienced 90 minutes of application outage per server, with an average of 15 servers experiencing the outage.*
- *A conservative estimate of the planned downtime cost was US\$2,500 per hour.*
- *The average burdened hourly wage of staff that performs migrations was US\$51.*

***By taking advantage of Softek technology, one company not only saved US\$841,000 in lease extensions, but also reduced downtime and staff effort by 66 percent.***

After implementing the Softek solution:

- *By enabling migration onto newer volumes more quickly, Softek's TDMF solution enabled the company to avoid lease extensions of US\$841,000 annually, based on an average of:*
  - *Overlapping capacity of 337TB*
  - *A monthly per-TB cost of US\$555 overlap<sup>1</sup>*
  - *Average overlap of four and a half months*
- *Softek TDMF technology reduced downtime and staff effort by 66 percent.*

**Highlights**

*For this company, the Softek payback was a 53 percent ROI in just 27 months.*

Based on the assumptions outlined above, the estimated two-year financial impact of TDMF software on operations of this company is outlined in the chart below.

Hidden costs versus Softek solution (technology refresh example)			
	Status quo	Implementing Softek	Savings
Cost of downtime	US\$1,012,500	US\$334,125	US\$678,375
Cost of staff (specific to migration)	US\$52,908	US\$17,571	US\$35,337
Cost of overlapping leases	US\$1,683,315	0	US\$1,683,315
<b>TOTAL</b>	<b>US\$2,748,723</b>	<b>US\$351,696</b>	<b>US\$2,397,027</b>

Savings summary	
Hidden costs	US\$2,397,027
Investment in Softek software, services, and maintenance over two years	US\$1,375,000
<b>Net savings</b>	US\$1,022,027
<b>ROI</b>	<b>53 percent</b>
Payback time	27 months
<b>Cost of NOT investing in Nonstop Data Mobility Solution</b>	<b>US\$99,876/month (after payback period ends)</b>

This example shows that Nonstop Data Mobility Solutions can achieve faster ROI by:

- *Keeping applications running all the time*
- *Decreasing unexpected downtime*
- *Reducing staff costs*
- *Implementing new storage today, not tomorrow*
- *Eliminating lease overlaps.*



In summary, the best solution is to conduct data migration while applications are running.

**For more information**

To learn more about how Softek products can help you conduct data migration while your applications are running, visit:

**[ibm.com/services/storage](http://ibm.com/services/storage)**

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<sup>1</sup> Depreciation on 1TB of data, given a purchase cost per TB of US\$20,000 (or US\$0.02/MB) is US\$555 per TB per month, assuming a 36-month useful life for the hardware.