

Data center consolidation restructures your IT costs for continued growth

New discovery tools determine logical and physical move dependencies to help limit risk



Executive summary

Cost reduction. It's in our blood. It helps us get through the tough years, and it helps us increase profits during the good years. Reducing costs is always a smart strategy because a more operationally efficient data center can provide the foundation for the future growth of the enterprise.

Many CIOs and IT managers may be reexamining their data center portfolios and restructuring them for growth. Some are likely focused on contraction of the portfolio to reduce costs; others may view efficient expansion or new data centers as keys to success.

So it comes as no surprise that many CIOs view consolidation to a central technology organization as the future model for data center operations. Centralized infrastructures and processes enable shared services optimization that, in turn, provides economies of scale to cut costs and increase the return on IT investment. When considering how to derive greater ROI from IT, a significant majority of the 2,500 CIOs we surveyed—75 percent—anticipates having a strongly centralized infrastructure in five years.¹

This paper describes the challenges infrastructure managers face when relocating data centers, the tools available from IBM research to help lessen the business risk of the move, and

the services that IBM provides to plan and execute the move of applications, data and IT equipment from one data center to another data center, locally or across geographies.

Consolidation can drive down both strategic and tactical costs

In our work with some of the largest business enterprises in the world, IBM has found that between 10 percent and 15 percent operational savings are possible for each data center consolidated, depending on how many sites we consolidate and certain other factors.¹

Data center consolidation helps provide strategic and tactical cost savings.

The data center portfolios of many companies have grown significantly through mergers, acquisitions and geographic expansion—external forces that will continue to affect the IT infrastructure. In this environment, data center consolidation is designed to provide strategic cost savings, reducing high infrastructure costs by relocating away from expensive data center leases or ineffective locations. Tactically, consolidation can improve operational efficiencies, reduce the assets managed and improve resource utilization.

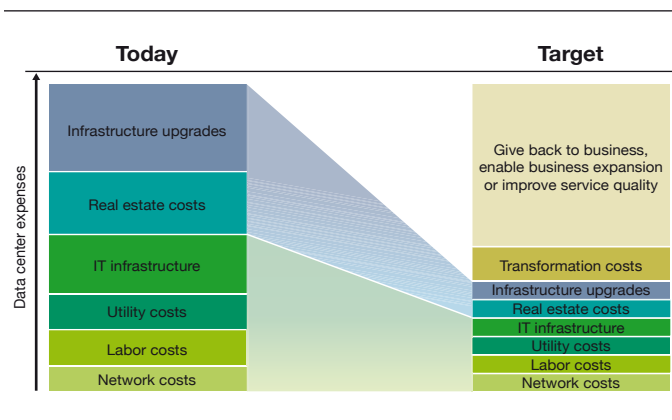


Figure 1: Consolidation can yield both strategic and tactical cost savings.

IBM's own consolidation experience bears this out. In the 10 years from 1997 to 2007, IBM consolidated the total number of data centers used to manage our own business from 235 to 12 in all geographies, consolidated from 31 different networks to one globally managed network, and reduced the number of deployed applications from more than 15,000 to just 4,700. The operational cost savings has totaled US\$1.5 billion over the past five years.¹

Restructure to grow

The cost savings provided by data center consolidation are attractive by themselves. This is especially true when you consider IBM research that indicates that as much as 70 percent of IT budgets is spent on maintaining existing environments.²

But consolidation is more than just a cost-saving measure; it is a strategic initiative that allows IT managers to achieve operational efficiencies while reducing the amount of time they spend managing the ongoing technology environment so they can focus more on applications development and other strategic projects.

This is an important shift in where time is spent because our survey found that today's CIOs spend an impressive 55 percent of their time on value-enhancing activities, such as creating and generating buy in for innovative plans, implementing new technologies and business initiatives, and managing non-technology business issues.¹

It's a good time to move—but not by yourself

Competitive companies know that now is the time to restructure their data center portfolios to support business growth. Yet application availability must also be maintained in a cost-effective manner during the migration.

You also have to consider whether your IT staff has any significant experience in application and data migration and whether your staff is current on the latest planning and implementation techniques. Tasks such as provisioning new servers or managing tape drives are part of the day-to-day operations of a data center. Data center consolidations or relocations, however, are major events that require specialized knowledge to make them go smoothly, provide desired benefits and minimize the impact to your business.

IBM IT Facilities Consolidation and Relocation Services – data center consolidation and relocation migrates applications, data, and IT equipment between data centers while helping to reduce risk and provide a seamless transition for end users by facilitating your ability to:

- Move dependent applications and equipment together
- Meet critical application availability requirements by using specialized data migration techniques
- Reduce cost and improve operational efficiencies by helping to centralize your IT environment
- Limit risk by leveraging your organization, experienced IBM relocation practitioners and third parties
- Allow IT operations to focus efforts and resources on more critical operational areas

This service provides the planning and execution of moves of applications; data and IT equipment, such as servers and storage arrays; and the data center infrastructure, such as racks, power systems and cooling systems. These moves can help you move within a data center, from one data center to another data center or across geographies.

Data center consolidation drives application growth

A major global bank needed to reduce time to market for new applications, optimize its existing workloads across 36 data centers and reduce its overall costs while improving resiliency and security. With the help of IBM, the bank consolidated those data centers into one production and one business continuity and recovery services center. IBM also helped establish an enterprise command center to manage and control all of the bank's data center operations.

With consolidation, the bank achieved US\$180 million annual operational cost savings with a security-rich environment and 99.95 percent availability. Moreover, the company improved its time to market for new banking services in core banking, commercial lending and Internet banking. Consolidation meant that the bank's IT managers could now focus their staff and resources on developing new applications to drive revenue growth. By restructuring its data center portfolio, the bank is now well positioned and among one of the 20 global banks based on market capitalization.

Help ensure a seamless, low-risk migration for end users

If you've made the decision to migrate a data center, you realize that a move is more complex than simply physically relocating a few servers from one location to the next. You have to think about the risks to the availability of data and applications during the move. Depending on the industry, the revenue cost of a single application outage could run from the hundreds of thousands of dollars to millions of dollars—per hour. You have to be confident that your migration strategy can anticipate and avoid these crippling unplanned outages.

Consolidation and relocation help drive down cost—but end users don't want to know they have been moved.

And your customers—internal or external—have decreasing tolerance for downtime in accessing their essential applications, even for planned events such as migrations. Acceptable application outage windows—the amount of time and frequency an application may be unavailable—are getting shorter and shorter. Long outages to migrate data center equipment are simply not an option.

A three-phase methodology for successful migrations

IBM has developed a three-phase approach to migrating applications and equipment that helps ensure that all elements of the project are managed successfully.

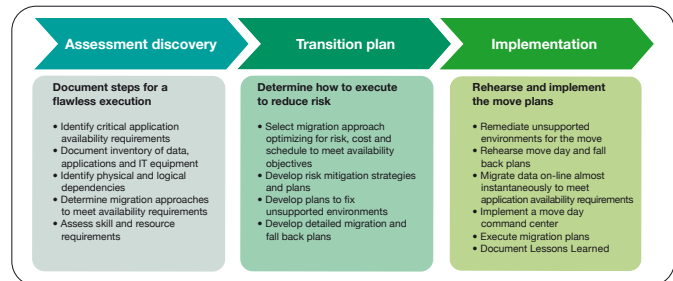


Figure 2: A three-phased migration methodology helps ensure that details are covered.

Assessment discovery

This phase is intended to document steps for a successful execution to identify critical application availability requirements and inventory the data, applications and IT equipment.

Physical and logical dependencies are determined to make sure that applications and their equipment come down and move together.

Affinity groups that are applications, data and equipment with similar characteristics and business requirements are identified. Multiple affinity groups are then moved together, reducing project cost, time and business impact.

With the application dependencies revealed, the IBM team will develop possible migration approaches that satisfy budget requirements and time constraints outlined by the client. The IBM team will also develop a top-level expense estimate as well as skill and resource requirements.

The output of the assessment discovery phase is a project review and recommended decision to progress with the migration.

Transition plan

During the transition planning phase, IBM determines the best path to execute migration with minimal risk. IBM makes recommendations on migration approaches to select a final approach to reduce risk and optimize cost and the project schedule.

Ensuring that applications move successfully within predefined outage windows is more complex than you might expect. IBM will build an experienced team with the right platform architecture and relocation project management skills to reduce business and technical risk.

After you decide on the approach, IBM finalizes detailed migration plans and updates expense estimates, if necessary. The output of the transition plan is a detailed planning, budget and timeline document that is ready for implementation.

Implementation

In the implementation phase, IBM rehearses and then implements the move plans. This can take anywhere from a few weeks to several months, depending on the nature of the project. Before the move, we develop plans to remediate unsupported environments and rehearse move and fallback plans in order to identify and resolve potential issues. We establish a move day command center to address unforeseen issues. All are key elements of a comprehensive plan.

IBM provides project management teams with the skills and resources necessary to meet your project objectives while at the same time managing expenditures to initial financial estimates.

After the implementation is complete, a post-project review documents the lessons learned to help plan future data center projects and support daily operations.

Safely migrate to a new data center in only four months

A waste disposal company that serves more than 600,000 residential and 60,000 commercial customers in more than 50 communities needed to implement a new data center and then safely migrate IT equipment quickly and safely. IBM Global Technology Services helped the company build an energy-efficient, scalable and resilient data center and relocated its equipment from the old location in only four months. As part of the project, IBM helped define requirements, scout locations, design and implement the new data center, and then safely migrate data and applications without any unplanned service interruptions.

At completion, the company had a future-ready data center scoped, designed and delivered by IBM. It gives the client improved availability through enhanced redundancy. The expanded data center capacity supports a doubling of the client's business. And it reduces operating costs up to 20 percent through improved efficiency. The client reported that "after the move, a number of users came back and said this project seemed like it was flawless and went just like we told the users it would go."

Leverage IBM research innovation to identify critical dependencies

Our experience has shown that client inventories are generally 70 - 90 percent accurate based on performing manual interviews, but to plan a major relocation requires a more accurate inventory. Performing manual inventories is time consuming and expensive, and the information obtained has a limited useful life. To combat these challenges, IBM uses a discovery tool to improve the equipment and application discovery process to help ensure a seamless relocation with reduced risk.

Applied mathematics can help ensure a seamless migration

Working with IBM Research, we created the analytics for a logical dependency mapping tool, which applies advanced mathematical modeling to map application and server dependencies. This can help us to identify up to 100 percent of the server, storage and application assets which need to be moved. The example shown in figure 3 illustrates the associations with an IT environment as small as 27 servers—you can imagine the complexity in a larger enterprise environment.

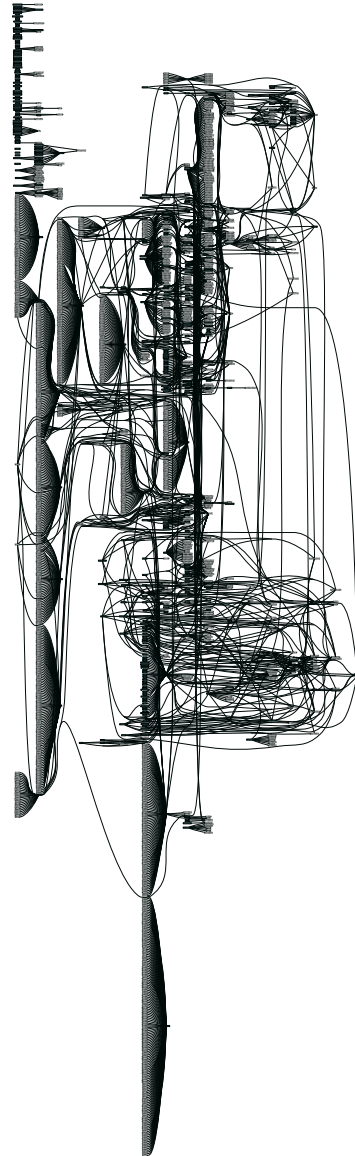


Figure 3: Analytics for logical dependency mapping tool for 27 servers



Leverage IBM's discover tools to better understand the IT infrastructure before relocation

A large financial services institution was planning a move and needed to better understand the environment—especially the 700 Wintel servers and over 400 critical applications deployed on all the platforms.

They were able to reduce the time to understand the dependencies between applications and servers by 50 percent (as compared to manual methods) using IBM's discovery tool, analytics for logical dependency mapping. The tool helped them to reduce risk and costs by identifying areas of the IT environment that needed to be remediated before the move, such as unsupported environments or operating systems. Through more insightful understanding of the logical dependencies, planners were able to move equipment and applications without disruptions, as well as identify and fix a key single point of failure in a critical application.

This discovery tool is a set of server side scripts that automatically discovers equipment connections over networks, systems software, middleware and applications. It is a simple and transparent shell/VBE script that you run on your servers without requiring IBM-specific skills or IBM access to the systems. The script creates a data file for each server, which is then combined with other server data files, creating a graphic depiction of your entire IT environment that identifies logical dependencies. This automated process using the tools helps reduce the time required to inventory the equipment by up to 10 - 15 percent, is less costly than manual efforts and avoids the risk of missing up to 10 percent of the physical assets.

Once the environment has been identified, IBM Research developed algorithms are used to identify the dependencies and recommend affinities. This dependency mapping is shown in figure 4, where the algorithms look for relationships between what was discovered in the inventory. Minimum-cut graph algorithms are then applied to recommend what has to move together to meet application availability requirements—thereby helping to reduce the risk of not moving the right servers and applications together. Having an electronic model of the inventory allows us to work with you to quickly evaluate affinity grouping scenarios to provide a plan for a cost-effective move based on your business operations.

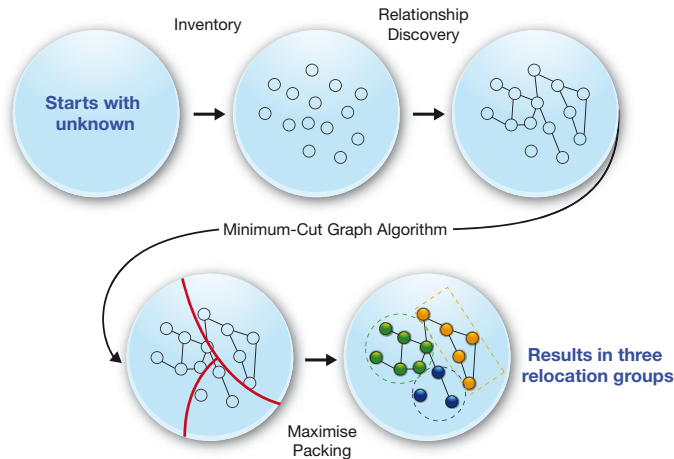


Figure 4: Dependency group mapping

Applications with high availability needs are identified and the move recommendation factors in time, distance and cost trade-off to accomplish the move within the availability window. Noncritical data can be migrated online almost instantaneously to the new data center.

Meet critical application availability requirements to reduce project risk

The inherent risks of migration can be mitigated—if you understand the risks and all of the possible issues that might arise and then use advanced risk mitigation techniques to avoid them. Using the right migration techniques can help you address your specific outage window requirements while optimizing for project cost and schedule. And the breadth of techniques you select from will have to encompass all of the applications and equipment from multiple vendors—going back many years—that will need to be moved together. You also need to carefully plan migrations because moves that are not performed by qualified vendors could potentially void your hardware warranties.

The right migration techniques help balance cost, schedule and the allowable outage window.

We work with you to migrate data online almost instantaneously to meet application availability requirements. This allows you to help reduce expenses by using the more costly method for only the most critical applications and protects from outages due to physical data transportation.



Helping avoid service interruptions while migrating to a new data center

A commodities and securities dealer needed to transition to a new office location without service interruptions. IBM helped the organization implement and migrate to a new, state-of-the-art data center to support more than 1,000 traders and 500 back-office users without incurring downtime that would negatively affect business processes.

Throughout, IBM provided expertise in data center construction and IT relocation processes. We brought together a diverse group of internal resources to deliver project management services, consultancy services and physical relocation of IT systems and network components. We helped the company quickly design and build a new large-scale data center and network infrastructure, relocate critical IT components and sensitive data, and move the existing applications and IT systems. The applications and systems were fully operational by the next business day with no downtime, and no business processes were affected.

What to do when you're ready to relocate

IBM assembles an experienced relocation team by leveraging your organization, IBM and key third parties to help reduce the risk of your relocation and ensure a smooth project execution. We have the flexibility to assist you in only those areas where you most need help to minimize disruption to ongoing operations by maintaining key staff on day-to-day support. We can also manage the consolidation and relocation activities from end to end to help ensure maximum accountability.

Professional project management helps you stay on schedule and can scale to address your needs.

Consolidation and relocation projects are typically collaborative efforts between customers and IBM teams. IBM will assess your internal team's experience and availability to participate in the project to determine what IBM resources are required. IBM project managers will gain agreement from stakeholders on project goals, timelines and communication plans. Professional project management can help you stay on schedule and manage expenses to address your needs.

Next steps to begin a consolidation and relocation project

Consolidation and relocation projects are significant undertakings that can span 6 to 18 months, yet have far-reaching influence on the future of your business. Given this importance, it is essential that you also develop a strategy for initiating a project and seeing it through to conclusion.

- **Identify the executive who will be responsible for the relocation project.** CIOs are often the best choice for a champion, but CFOs can be allies when you intend to demonstrate business value.
- **Determine the scope of the project and the migration objectives.** Understand the data center priorities—supporting growth, reducing costs, improving application availability, increasing resiliency—and understand how a migration will affect those priorities. Assemble information from your experts to document the inventory of assets to be moved, to define critical application availability requirements and dependencies and to develop risk mitigation strategies for unsupported platforms.
- **Identify skill and resource requirements.** Decide whether any of your existing data center staff can be reassigned to help plan and execute the project. Determine whether any equipment will need to be acquired to execute the move.
- **Identify business and technical requirements.** Understand which applications are to be given priority.
- **Begin developing the project plan.** Plan the migration after objectives and requirements are clearly understood.

A site and facilities representative from IBM can help you decide the best approach specific to your data center and your business environment.

Why IBM?

In the recent IBM survey of CIOs, risk management and compliance was cited as the third most important factor in supporting visionary plans to increase competitiveness. In short, innovation must be achieved without increasing risk. The same survey indicated that “56 percent of high-growth CIOs use *third-party business or IT services*, versus 46 percent of low-growth CIOs,” indicating that companies that make use of external resources are more able to focus efforts on new technologies and new business initiatives.¹

Data center consolidation and relocation from IBM can help you migrate applications, data, IT and infrastructure within your data centers or from one data center to another while maintaining your application availability, reducing project risk and meeting project budgets and timelines.

In the past three years, IBM has successfully migrated hundreds of thousands of servers and thousands of applications. And remember, we’ve done this for our own systems.

All of this experience offers you the confidence that you can achieve growth while limiting your risk to support innovations that increase the competitiveness of your business.

For more information

To learn more about the IBM IT Facilities Consolidation and Relocation Services – data center consolidation and relocation, please contact your IBM marketing representative or IBM Business Partner, or visit the following website:

ibm.com/services/siteandfacilities

Additionally, financing solutions from IBM Global Financing can enable effective cash management, protection from technology obsolescence, improved total cost of ownership and return on investment. Also, our Global Asset Recovery Services help address environmental concerns with new, more energy-efficient solutions. For more information on IBM Global Financing, visit: ibm.com/financing



© Copyright IBM Corporation 2010

IBM Global Services
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
November 2010
All Rights Reserved

IBM, the IBM logo and ibm.com are trademarks of International Business Machines Corporation in the United States, other countries or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at ibm.com/legal/copytrade.shtml

Other company, product or service names may be trademarks or service marks of others.

¹ IBM, *The New Voice of the CIO: Insights from the Global Chief Information Officer Study*, September 2009.

² IBM, *Dynamic Infrastructure, Helping build a smarter planet*, 2009



Please Recycle
