



Optimizing IT through server consolidation—seven keys to success.

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Unlocking consolidation benefits

Whether it's a result of mergers and acquisitions or business model design, information technology (IT) departments and organizations are often overwhelmed by complex infrastructures, which may be made up of multiple platforms—with heterogeneous configurations and various business functions—spread across many locations. As they deal with the corresponding challenges, IT teams must also launch new e-business initiatives, manage time-sensitive business demand for new products and handle expanded business volumes. To make matters more difficult, top executives are increasingly pressuring IT managers and chief information officers to find ways to quickly reduce IT costs while maintaining or improving service delivery quality.

In an effort to reduce total cost of ownership and simplify the existing IT infrastructure while continuing to provide optimal customer service, many IT departments are considering server consolidation. It may seem to be a given that running five servers instead of 50 servers is easier and more cost-effective. Chances are, it is. However, executing a successful reduction isn't as straightforward. The reality of a server consolidation is more involved than simply physically combining hardware assets.



Highlights

Server consolidation projects must be logically and thoroughly planned to help businesses lower costs and maintain or improve service delivery quality.

IBM has outlined seven keys to unlocking the full potential of a server consolidation.

At its core, server consolidation is an enabling approach designed to optimize the IT infrastructure by leveraging existing skills and resources and simplifying existing architectures across applications and data. It provides a foundation for new application investments, as well as quicker and more efficient application deployment for a faster time to market. In addition to combining physical assets, server consolidation can be a starting point for other initiatives, such as post-consolidation implementation of standards and procedures for application testing and deployment, or establishment of a disaster recovery plan. It can also be used to realign resources, to integrate enterprisewide architectures and improve access to information, or to implement high-availability solutions. Whatever the goals of a server consolidation—planning is critical.

To help ensure that server consolidation results are long-lasting and predictable, it is important that consolidation projects are logically and thoroughly planned. If done correctly, server consolidation does work, and can help businesses lower costs and maintain or improve service delivery quality. However, since every organization is unique, there is no one-size-fits-all solution for server consolidation. IBM has outlined seven keys to unlocking the full potential of a server consolidation—based on our own experiences and those of our customers—which businesses of all sizes can use to plan their consolidation. This paper defines and examines each of the seven keys and their role in a successful server consolidation.

Highlights

Looking at a server consolidation strictly as a physical reduction of the hardware infrastructure can lead to unexpected challenges down the road.

While a server consolidation may decrease the number of machines, it increases complexity in the remaining servers, creating a need for higher process maturity.

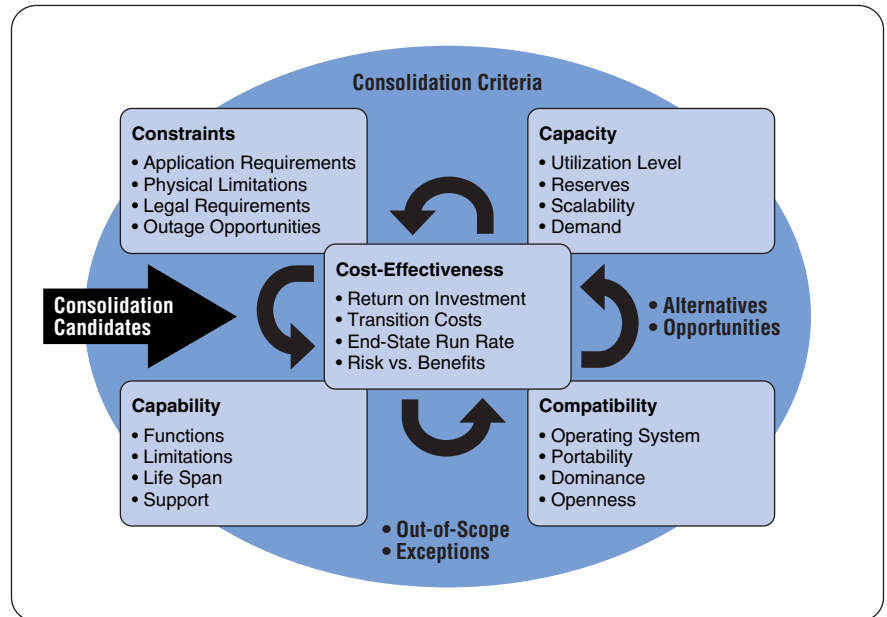
Key One: Implement a long-term IT management strategy

In many instances, companies run their server consolidation just like any other project. They have a kickoff, establish goals to reduce the number of machines and—once the goals are reached—close the project. This approach is usually driven by cost containment and is focused on a technical migration of many software products onto fewer servers. This is the trap of looking at server consolidation strictly as a physical reduction of the hardware infrastructure.

A successful consolidation effort cannot be a one-time effort that stuffs more applications into fewer machines, rather it needs to be part of a long-term strategy that redefines how IT assets can be better managed and utilized to achieve business and service level objectives. Once a consolidation program begins, the IT environment, and corresponding monitoring, testing, operational and forecasting procedures, must change dramatically. Servers now depend on shared rather than isolated resources. It is critical to update processes for enhanced performance management, testing, capacity planning, chargeback and service level management. While the number of servers may have decreased, the level of complexity within the remaining servers has increased, as has the need for interconnectivity. The processes used in each server must be carefully refined and aligned to support effective and efficient operation.

Highlights

Pre-Consolidation Considerations



IBM has extensive experience with analysis, design and implementation of complex consolidation efforts that has confirmed a need to look beyond the technology base in order to achieve an optimal solution.

By adopting a long-term management approach to server consolidations, companies can contain costs on an ongoing basis, rather than in just one-time increments.

The overall approach should be holistic, focusing on optimizing the entire IT environment rather than just individual assets. This approach requires a broader view of how systems interconnect and interact, how work flows across key components, and how work can be distributed and rebalanced across a pool of server, disk and network resources. By adopting a long-term management approach, you generally receive greater returns on investments. As an added benefit, costs can be contained on an ongoing basis, rather than in just one-time increments.

Highlights

As servers are consolidated, systems become more interdependent and problem resolution requires greater coordination between IT teams.

Key Two: Shift from siloed to cross-platform support

Beginning on day one of a server consolidation, the siloed approach to systems management becomes outdated. Systems are no longer independent of one another, and problem resolution requires greater coordination between the various IT support and management teams, which are now faced with increasingly complex interconnection challenges. The need for integrated, cross-platform teams supporting common cross-platform processes is essential to maintaining smooth and efficient operations. Consequently, in a server consolidation effort, the structure of IT operations must be carefully reconsidered.

The move from a siloed to an enterprise view of systems management requires a close examination of existing IT processes, which must be redesigned to achieve the benefits of a server consolidation. Before beginning a consolidation, the processes for managing problems, change, capacity, performance, chargeback and service levels, as well as application development and testing processes, must be modified to address:

- *Adherence to common processes through multiplatform integration*
- *Creation of a single process owner and an end-to-end scope of responsibility*
- *Clear definition of interfaces and handoffs to other processes.*

Highlights

Prior to beginning a consolidation effort, it is important to understand and forecast the demand of each key application set over a 12-month window.

A demand management system helps ensure that forecasts are accurate and that valid placement choices are made based on accurate and timely costing information.

Managing the demand for computing resources requires an integrated strategy and plan, crossing multiple IT management disciplines.

Key Three: Establish a demand management system

Prior to beginning a consolidation effort, it is important to study variations in usage patterns for applications and servers throughout a fiscal year. This is required to understand how much stress will be placed on various systems and subsystems during peak usage times. It also establishes when these peaks occur. The planned growth of the focus applications also needs to be examined. Based on this evaluation, you can forecast the demand of each key application set over a 12-24 month window. Since demand for an application can fluctuate dramatically over the course of a year, simply forecasting for day-one demand and application placement is insufficient. Data, application and workload placement decisions must be based on various considerations, such as the concurrency and timing of peak loads, future volume requirements, planned workload changes and new application enhancements.

All of these considerations are encompassed by capacity planning efforts. Effective planning for a consolidated environment requires understanding the current state of servers and applications, as well as their future state. Verifying that the plans are accurate and that valid placement choices are made based on accurate and timely costing information is possible through the implementation of a demand management system.

Managing the demand for computing resources requires an integrated strategy and plan which crosses multiple IT management processes, which include:

- *Chargeback—to accurately represent IT costs to the business and provide incentives for responsible IT conduct*
- *Capacity planning—to align the business plans and forecasts with IT growth*
- *Performance management—to help ensure that business priorities and objectives are properly reflected in day-to-day performance monitoring*

Highlights

When architected for demand management, chargeback, capacity planning, service level management and the application development lifecycle can all be used to modify end-user behavior.

- *Service level management—to help ensure that service objectives and performance targets are reflected in IT performance and service management policies and practices*
- *Application development—to help ensure that accurate costing models are used to evaluate application design and architecture decisions, and that capacity planning is involved during the lifecycle, so that adequate computing resources will be in place to meet service objectives.*

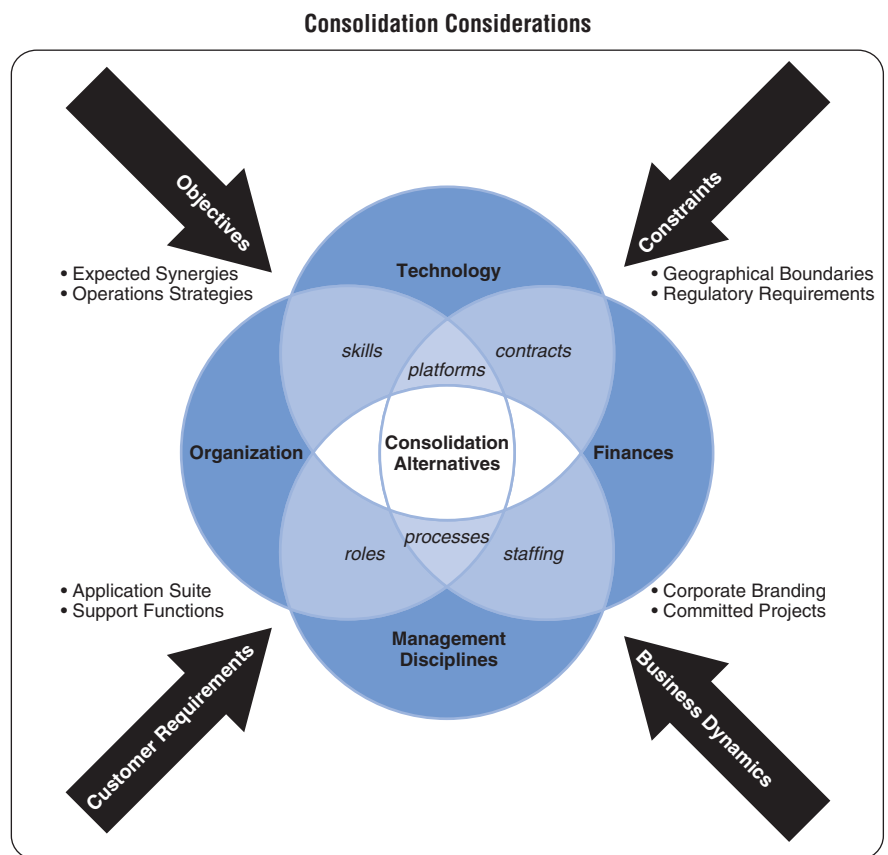
Key Four: Develop an understanding of the existing IT infrastructure in relation to business objectives

A successful consolidation effort hinges on gaining a clear understanding of the current IT infrastructure. Developing this understanding entails performing an audit of existing IT infrastructure components so that you know exactly what you are starting with. IT processes and application profiles should be clearly outlined so they can be properly evaluated. Performing a baseline of servers and network performance is an important step, as it provides insight into which systems are least efficient; it also provides a benchmark against which to measure post-consolidation performance tests. Finally, business and service objectives and service delivery plans must be created to help ensure coherent goals and similar expectations among all involved parties.

Highlights

Since a dedicated team is required to plan and implement a consolidation, it is critical to understand the competing projects that are vying for the team's time.

Developing a detailed understanding of each of these areas requires an objective assessment of organizational capabilities, strengths and weaknesses. A dedicated team is required to plan and implement a consolidation; it is therefore critical to understand the competing projects that are vying for the team's time so that all plans can be adjusted for priorities. An assessment provides a solid foundation for realistic planning. Figure 2 illustrates how the knowledge gained from a comprehensive assessment of the various factors mentioned above can be used to form the foundation on which an optimal consolidation strategy is created.



The key to server consolidation lies in results from analysis of the current environment data.

Highlights

Because it will compete with other IT projects and initiatives, it is important to “sell” a consolidation project internally and gain the personal commitment of a dedicated team.

An end-to-end performance monitoring strategy is critical to managing complexity in a consolidated environment where each server handles more applications.

Key Five: Generate staff commitment to the consolidation strategy

Like any IT venture, a consolidation effort will compete with other IT projects and initiatives. Consequently, it is important to “sell” a consolidation project internally and gain early personal commitment of the dedicated team by establishing:

- *Clear, long-term vision for the effort*
- *Detailed strategy and corresponding benefits to the company*
- *A clear implementation plan*
- *Well-defined project plans for specific time frames.*

The vision demonstrates the scope of changes that can occur in the areas of technology, process and organization, as well as the associated benefits. Focusing on ongoing consolidation savings versus one-time consolidation savings motivates the project team, and others in the company, to devote time and energy to making consolidations a success.

Key Six: Establish end-to-end performance monitoring

Although a server consolidation can lessen the number of servers in an environment, it does not necessarily reduce complexity. With each server in the new shared environment handling more, or larger, applications, an end-to-end performance monitoring strategy and architecture becomes critical. This strategy has to be designed to deliver consistent responsiveness that meets the service and business requirements of the end users. The process must enable the quick identification and correction of performance issues while

Highlights

Performance monitoring systems help maintain system availability by quickly detecting performance anomalies and initiating automated responses at the infrastructure and application levels.

While IT processes are being retooled for the consolidated environment, proven methods and techniques must be employed to oversee migration logistics and run the target environment.

avoiding performance degradation through over-analysis. The performance monitoring system is pivotal to maintaining system availability through quick detection of performance anomalies and initiation of automated responses at the infrastructure and application levels. Key elements of an effective end-to-end performance monitoring strategy should include:

- *Establishment and close monitoring of application performance budgets for each important IT resource*
- *Monitoring of IT resource usage to compare it to the performance budget and for performance threshold exceptions*
- *Monitoring of application performance to compare it to the performance budget and for end-to-end response time*
- *Adoption of principles and practices to facilitate end-to-end monitoring*
- *Centralization of console and event correlation to:*
 - *Correlate performance events and initiate corrective action*
 - *Log performance events*
- *Implementation of a unified performance database to:*
 - *Provide for historical trend analysis*
 - *Enable the anticipation and avoidance performance degradation.*

Key Seven: Use existing consolidation methods and patterns that work

When considering an approach to consolidation, it is important to recognize that while IT processes are being retooled for the consolidated environment, proven methods and techniques must be employed to oversee migration logistics and operations of the revamped environment. Based on our extensive experience of performing large server consolidations, IBM has developed a four-stage approach that we recommend for consolidations. The stages include discovery (or assessment), planning, implementation and running the environment.

Highlights

IBM has more than 25 years of experience helping customers with end-to-end server consolidations.

We approach each consolidation engagement using industry-leading services, methodologies, and hardware and software tools.

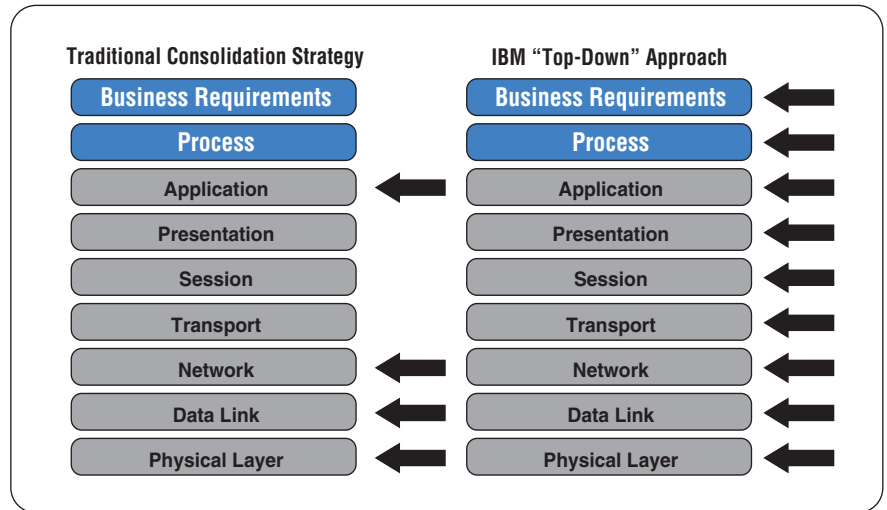
Each of the four stages in the IBM server consolidation approach includes a variety of predefined steps. The discovery stage involves performing a critical analysis of the current environment, as well as designing a new environment while identifying how it will impact requirements related to staffing, equipment and more. A final target environment design is created in the planning stage, which also entails forecasting resource requirements for applications and servers, as well as creating an overall migration plan. In the implementation stage, the migration plan is executed while new systems and processes are synchronized and closely monitored. Finally, the run stage involves performing ongoing process evaluations and updates to optimize performance.

How IBM can help

With more than 25 years of experience helping customers with server consolidations, IBM understands the processes and components that are necessary to plan, implement and run an end-to-end consolidation. Knowing that every business is unique and that there is no “one-size-fits-all” solution, we approach each consolidation engagement using industry-leading services, methodologies, and hardware and software tools to help ensure that a consolidation is completed smoothly and with optimal business and technical benefits.

Highlights

Consolidation Approach Comparison



The IBM methodology and tools can help companies determine their IT needs and how to achieve higher levels of service at lower total costs.

IBM Global Services can provide end-to-end consolidation services worldwide. Our consolidation professionals possess the skills, experience and methodology, modeling and predictive tools necessary to evaluate your company's business needs and design and implement a solution. We can help you determine your company's present and future IT needs and help you to achieve higher levels of service at lower total costs.

Highlights

Whether consolidation takes the form of centralization to reduce data center locations, physical consolidations of many servers into one data center, or application and data migration and integration, IBM consolidation services provide:

- *A focus on infrastructure design and reduction of support costs*
- *An emphasis on analytical and systems integration that aids in and supports our highly customizable system redesign process*
- *An asset database from each redesign effort*
- *Multisupplier and multiplatform resources to help ensure that our solutions can integrate and accommodate virtually any and all architectures you may utilize, including UNIX[®], Microsoft[®] Windows NT[®], Linux, IBM z/OS[™] and NetWare.*

IBM consultants provide training to a core customer IT team throughout a consolidation engagement.

Because a server consolidation also involves long-term IT considerations and strategies, our consultants emphasize providing training to your core IT team throughout the consolidation engagement. And through our IBM Global Services - Learning Services unit, we can provide additional training for your entire IT staff. That way, once the engagement is complete, your team has the knowledge and experience necessary to run the consolidated environment and maintain performance levels. IBM Global Services also offers a variety of strategic outsourcing alternatives for companies requiring supplemental or alternate ways to manage and support their IT operations.

Highlights

A long-term management strategy that focuses on optimizing your IT environment is key to unlocking the full potential of server consolidation.

Conclusion

Server consolidation can be a daunting task. When done right, it can provide an effective way for IT departments to address the all-important issues of lowering the total cost of ownership, improving service levels, providing a faster time to market and improving access to information. When done incorrectly, a consolidation can lead to more headaches than benefits. Most consolidation failures are the result of a poor strategy, which often lacks vision and includes a hardware-centric approach. To unlock the full potential of a server consolidation, you must adopt a long-term management strategy, like the one outlined in this paper, which focuses on optimizing the entire environment rather than individual assets.

Once your company's technical infrastructure is aligned with its business requirements through a server consolidation, both savings and infrastructure performance can increase. In addition to potentially significant cost savings, a simplified server environment can free up IT personnel to focus on business-critical tasks while paving the way to higher availability, improved cost-avoidance processes and faster application deployment. And, given the benefits of a server consolidation, the question of whether or not to consolidate quickly changes from "is it a good idea" to "who has the expertise to help us address our unique needs, and when's the start date?"

For more information

To learn more about server consolidation and IBM Global Services, visit:

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