The leading driver for consolidation has been improved TCO. Also, taming sprawl, which has been growing out of control, has often been cited. Easier day-to-day management of upgrades, reconfigurations, fixes, workload balancing and backup, coupled with more-effective use of CPUs and storage, is stimulating IT organizations to standardize and centralize systems. Business unit management is also providing an impetus toward consolidation. Many distributed systems are managed part-time by end users, causing end-user frustration and negatively affecting end-user productivity levels. A growing factor is improved agility to handle dynamically changing workloads. The silo effect of unconsolidated environments has led to either greatly overprovisioning each application silo or running the risk of reduced service levels during peak workload periods.

Although reduced TCO remains a major reason for consolidation, as does controlling sprawl, recent surveys show a change, by indicating that there is more interest in consolidation for providing better service, enhancing system management and improving agility. Newly surfaced, but growing more important daily, is the need to consolidate/virtualize to reduce power and cooling needs. We expect this to increase as virtualization software continues to be enhanced. Also, the modernization of applications and systems is becoming an important factor.
IT consolidation has been a major effort for the past decade. First we will look at the areas of IT consolidation that companies are working on. Then we will look at the two major areas that organizations are looking to consolidate, which are data centers and servers.

Key Issues

1. What types of IT consolidation projects are companies engaged in?

2. What best practices and processes should you follow when consolidating data centers?

3. What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?
Key Issue: What types of IT consolidation projects are companies engaged in?

The first step in server consolidation is logical consolidation, which involves placing all servers under the management of a single centralized group. It is not mandatory to do, but it aids consolidation greatly by reducing many of the political issues that impede consolidation projects early in the effort. This allows for good, centralized hardware and software asset management. Savings may start to accrue at this early point as ghost servers are discovered, duplicate licensing is uncovered and software that is being paid for, but not used, is discovered. Standards will enable enterprises to use fewer different products, which can provide savings through volume discounts, less support staff training and easier maintenance. Also, deal making may be easier because you can negotiate from volume numbers. We use the term "physical consolidation" instead of "data center consolidation" because it means reducing not only the number of data centers where servers are located, but also the number of servers not necessarily in official data centers, as well as those located in server closets and under desks. Even with the potential benefits of physical consolidation, companies must be careful to examine potential pitfalls. Rationalization, which has required the most effort and which requires newer technologies to enable, has proved to be a major effort for many companies. You should not just look at server rationalization, but also at storage, network, application and data consolidation.
Key Issue: What types of IT consolidation projects are companies engaged in?

The first step in consolidation is usually logical consolidation, which involves placing all data centers and servers under the control of a single centralized group. It is not mandatory, but it aids consolidation greatly by reducing many of the political issues that impede consolidation projects early in the effort. Two major responsibilities of this single group are hardware and software asset management, and setting standards. Savings may start to accrue at this early point as I&O leaders discover ghost servers (those servers still supported, but no longer providing useful services), uncover duplicate licensing and find software that is being paid for, but not used. Standards will enable enterprises to use fewer different products, which can provide savings through volume discounts, less support staff training and easier maintenance. Also, deal making with vendors may be easier because you can negotiate from volume numbers.
### Physical Consolidation — Benefits and Problems

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Major Problem Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economies of scale</td>
<td>Network bandwidth - No. 1 Problem</td>
</tr>
<tr>
<td>Hardware or equipment savings</td>
<td>- Cost</td>
</tr>
<tr>
<td>Facility savings</td>
<td>- Availability</td>
</tr>
<tr>
<td>Standardization and control</td>
<td>- Service level</td>
</tr>
<tr>
<td>Relieve departments of IT burden</td>
<td>Internal politics are a close second</td>
</tr>
<tr>
<td>Better security</td>
<td>Need to build a new facility</td>
</tr>
<tr>
<td>Improved business continuity</td>
<td>- Space</td>
</tr>
<tr>
<td>Staff reduction</td>
<td>- Power/cooling</td>
</tr>
<tr>
<td>Modernize data centers as consolidate</td>
<td>Local power capacity</td>
</tr>
<tr>
<td>Better agility to handle changes</td>
<td>Impact during move</td>
</tr>
</tbody>
</table>

### Other Considerations
- Site selection
- Green building concerns
- Remote support
- Number of data centers
- Disaster recovery site
- Closing old data centers

---

**Key Issue: What types of IT consolidation projects are companies engaged in?**

Management is looking at the TCO savings (such as reduced servers, reduced IT equipment, reduced support equipment, reduced staff and reduced facilities), enhanced system management, increased security and agility offered in centralized data centers. Also, reducing the number of sites where servers are located allows for greater choices in consolidation through rationalization.
Conclusion: The rationalization of servers will add new functional tasks, such as tuning, and introduce changed ways of doing other tasks, such as chargeback and capacity planning.

**Server Rationalization Consolidation — Benefits and Problems**

**Benefits**
- Better resource use
- Reduce power/cooling requirements
- More agility
- Possibility for reduced software licenses
- Enhanced disaster recovery
- Help extend life of old data center

**Major Problem Areas**
- Internal politics
- Software coexistence
- ISV support of a rationalized environment
- ISV pricing for a rationalized environment
- Maturity of the virtualization product

**Other Considerations**
- Chargeback with shared resources
- Performance and capacity planning
- System management tools
- "Eggs in one basket" concerns

**Key Issue: What types of IT consolidation projects are companies engaged in?**

Many server consolidation projects are not started or do not achieve the intended results because of the above reasons. Although some problems can become "showstoppers," proper planning at the start of the project can help solve or mitigate other problems. For example, it will be important to understand software licenses and to negotiate with vendors prior to consolidation. This ensures that the enterprise negotiates from a strong position. Some pitfalls include ill-defined or poorly enforced standards, as well as poor organizational leadership for the consolidation, which can doom a project from the start. Often, individual departments will resist relinquishing control of their servers to a central site, and they will do everything they can to hinder or stop the process. Even if the operating system can run concurrent applications, the middleware used may not work well with other middleware (for example, Oracle and Informix) and, therefore, limit the effectiveness of the consolidation. A lack of good system management tools may lead to no savings in personnel costs when applications are run on the same system using partitioning techniques, despite what vendors may claim. The availability levels of the consolidation system may be questioned based on experience, due to the fear of creating a single point of failure for all consolidated applications. The implementation of a fair and reasonable chargeback system requires major effort as diverse workloads are consolidated.
## Why Data Center Consolidation Projects Fail to Meet Expectations

- Scope creep
- Political sabotage
- Human resources issues
- Communication failure
- Resources not freed up
- Lack of project management skills on move team
- No rationalization at consolidated site

---

**Key Issue: What best practices and processes should you follow when consolidating data centers?**

One of the biggest problems is side projects added to the main one that then cause timelines not to be met and expense overrun. HR issues are an integral part of all consolidation projects, especially failed ones, but most often the human resources team doesn't get involved until it's too late, or for the wrong reasons. In the most successful consolidation projects, the HR team is one of the first to get involved, and very early in the planning stages. Communications become the key to solving the political problem. Organizational dynamics have shown that in situations where little or no factual information is available about a project's goal or objectives, the disenfranchised will quickly begin to provide their own rationale, and unfounded rumors will begin to spread. If not careful many of the staffing and building resources will not go away which negates some of the planned cost savings. While the PMO should be tasked with developing an overall project plan, in many cases it is treated as a special project and given to senior IT personnel. Moving these environments as is can be efficient, but without a well-planned end state in mind, many of these projects result in a consolidated environment with a variety of types of equipment and applications that have been physically moved from one location to another, without thought to the longer-term consolidated state. These environments often become individual islands of automation within the same room, which in turn remain expensive to maintain and difficult to migrate into a standardized architecture.
Best Practices in Consolidating Data Centers

- Define objectives and metrics for success.
- Communicate constantly.
- Manage the impact on staff — involve HR.
- Common services are first move target.
- Focus on simple, less risky moves first.
- Leverage project supporters.
- Determine service levels, and measure before move.
- Reuse equipment where possible in rolling move.
- Work with vendors on equipment contracts.
- Use consolidation to modernize data center.

Key Issue: What best practices and processes should you follow when consolidating data centers?

In order for everyone to be on the same page from the start, it is important that you clearly define the objectives of the consolidation project and the metrics that will be used to define success. Too often the objectives are just assumed, and in the end it may be a success from one viewpoint but be deemed a failure because management was looking at a different objective. Communicating constantly has proven to be one of the most consistent success factors in consolidation projects. Communications can take the form of formal corporate meetings, outlining the purpose and business goals of consolidation, ad hoc mailings with project updates, weekly newsletters or even online portals. For larger projects, the decision of what to consolidate first can often make or break a project. Rather than just focusing on individual sites as consolidation targets, or the largest potential financial benefit, successful projects often focus first on consolidating common services, those services that may be duplicated at remote sites, but can easily be replicated and supported centrally. You also need to leverage project supporters. You need to come to consensus on what metrics are used to determine service levels for each area and make sure you measure service levels before the move. Use the move as an opportunity to modernize the target data center.
Key Issue: What best practices and processes should you follow when consolidating data centers?

Data center relocations are difficult, complex, costly and prone to failures. Data center relocation projects succeed because of detailed and coordinated planning with key functional participants: operations, network management, applications, facilities and HR. If this is done well, the actual move will go smoothly. The use of skilled, experienced and qualified advisors (from the IT group, as well as building engineering) is also a key success factor. IT executives who underestimate the complexity and interdependencies among IT and the facilities of a major data center move risk budget overruns, missed schedules and serious business disruptions. The common thread of these guidelines is diligent and seamless integration between the facilities plan and the IT organization plan, and ensuring coordinated project management and execution. Most project difficulties can be traced to a breakdown between two major functional components — IT requirements and facilities location and design specifications. Miscalculations in location and building selection criteria, equipment densities, power capacity, and heating, ventilation and air-conditioning (HVAC) capacities can negatively affect IT operations and availability. Each tactical guideline relates to a critical stage in the data center project cycle. These guidelines apply to smaller centers (3,000 to 5,000 square feet of raised floor), as well as to large centers of more than 25,000 square feet.
Best Practices in Closing a Data Center

Organizations doing data center consolidation may need to close one or more data centers. Done properly, decommissioning a facility can yield substantial cost savings; done wrong, much of the savings may be deferred or lost.

**Best Practices**

- Begin planning shutdown at least a year in advance to help ensure quick disposal of building.
- Make plans for equipment disposal if not moving.
- Transfer hardware/software licenses to new site.
- Ensure all suppliers are aware of move.
- If building will be vacant, provide security.
- Dispose of all confidential waste securely.
- Ensure hazardous waste has been properly disposed of.

**Key Issue: What best practices and processes should you follow when consolidating data centers?**

- Determine which staff will relocate and which will be cut; provide counseling and outplacement for skilled, but redundant, staff. Uncertainty will erode morale, which will impact quality during the shutdown period. Handling employees and suppliers with respect and courtesy during the difficult transition will generate benefits to the organization.
- Pay attention to dangerous materials, such as storage batteries, as environmental cleanup costs (not to mention the negative impact on the firm's reputation) may be substantial. Consider using a third party to recover certain physical assets. How the building will be used by your organization after closing the data center may impact what changes are necessary for local emergency systems.
- Properly erase all storage media. Carefully run down inventories for consumables and disposables; prepare and execute plans for durable inventory that will be sold or shipped to another work location. Begin removing maintenance contracts for equipment not to be transferred, and schedule a transition to time-and-materials support for short-term gear, as appropriate.
- Recover and terminate all software licenses for equipment not being transferred to other locations.
- Be aware of laws and regulations covering the transfer of certain kinds of information and technology across national boundaries if equipment is to be shipped out of the country.
- Properly terminate contract for all services running the gamut from telephony and utilities to emergency services. Ensure that disaster recovery and archiving vendors are notified properly of location and procedure changes.
- Planning for a data center shutdown should begin, ideally, a year before the planned closure. Stage the inventory and contract evaluations to minimize ongoing expenses following shutdown, and pay close attention to systems that may have an impact on personnel safety, both in the structure and in the neighborhood. Define and follow as well-defined a process for closing a site as you would for taking residence in a new site.
Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?

Server Consolidation Projects — Eight Big Myths

- The bigger and fewer servers you can consolidate to, the better.
- The more you consolidate, the better.
- Consolidation implies rationalization to a single vendor.
- All workloads now virtualize equally.
- Server consolidation will yield large TCO savings.
- Consolidated servers run just like before, only on fewer physical servers.
- Once the server consolidation project is done, you're done.
- If you haven't consolidated yet, don't worry — cloud will make it all go away.

There are a number of fallacies we've encountered in observing server consolidation projects. The first is that it is not necessarily the case that consolidating down to the theoretically fewest number of processors is optimal. Scenarios such as that often do not leave room to accommodate growth or may prove to be less than optimal from a software licensing perspective. The law of diminishing returns should also be considered.

Consolidation does not automatically imply that you become a one-vendor server shop. There are reasons why a multivendor strategy is optimum to minimize overdependency and maximize or preserve negotiating leverage.

Virtualization technologies have made major advances over the past few years — it is no longer just about consolidating test and development servers. Nevertheless, we are not yet at the point where we can consolidate without considering performance.

A well-structured consolidation project should deliver an improved cost structure — but there is no guarantee that it will be the lowest-cost alternative. Developing an impact analysis is a vital step to guard against unexpected performance problems introduced by the consolidation.

Believing all the hype surrounding cloud can cost organizations valuable time and budget relief.

Finally, your work is not done when the project is complete — you must put in place the disciplines for workload placement going forward.
Best Practices in Data Center and Server Consolidation

Strategic Planning Assumption: Through 2014, more than 30% of server consolidation projects will fail to meet their TCO savings objectives.

**Server Consolidation TCO**

**Through 2014, more than 30% of server consolidation projects will fail to meet their TCO savings objectives.**

<table>
<thead>
<tr>
<th>Reasons why SPA will be false:</th>
<th>Reasons why SPA will be true:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consolidation projects are now well-understood, and well-honed processes exist.</td>
<td>• Constrained spending continues putting pressure on projects to stretch their targets.</td>
</tr>
<tr>
<td>• Virtualization technologies have matured sufficiently and are well-understood.</td>
<td>• Best practices of past projects are lost — too many will make the same mistakes the second time around!</td>
</tr>
<tr>
<td>• Realistic expectations are now the norm.</td>
<td>• Assumptions about the maturation of virtualization technology mean due diligence is not done.</td>
</tr>
<tr>
<td></td>
<td>• Project stuffing continues unabated.</td>
</tr>
</tbody>
</table>

**Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?**

Although consolidation projects have been ongoing for many years, basic mistakes have been made and will continue to hound consolidation projects. These mistakes will leave consolidation projects open to missing their TCO objectives. We see organizations continue to try to skimp on investing in the projects or to try to add too many extra things into consolidation projects. Also, some believe that just by using virtualization, great savings will be achieved. If organizations learn from their past mistakes and set realistic expectations, they should be able to achieve their objectives.
Best Practices in Data Center and Server Consolidation

Tactical Guideline: I&O leaders must deal rationally with the political issues that usually arise in IT consolidation projects.

Dealing with Political Realities: Best Practices

<table>
<thead>
<tr>
<th>Issues</th>
<th>Best Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership/control</td>
<td>• Management sponsorship</td>
</tr>
<tr>
<td>Higher cost</td>
<td>• Use internal references</td>
</tr>
<tr>
<td>Vendor/product preferences</td>
<td>• Mutually agreed-on SLAs</td>
</tr>
<tr>
<td>Service levels</td>
<td>• Cross disciplinary team</td>
</tr>
<tr>
<td>Support</td>
<td>• Designated liaison to address their concerns</td>
</tr>
<tr>
<td>Agility</td>
<td>• Understanding of benefits</td>
</tr>
<tr>
<td>Loss of power/prestige</td>
<td></td>
</tr>
</tbody>
</table>

Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?

Departmental politics is the No. 1 problem in IT infrastructure consolidation — for example, trying to get a department to give up "its" local servers and centralize that functionality into a data center some distance away. Implicit in our best practices above is a concerted effort to remove emotional aspects from decision making, and a recognition that business decisions are a negotiated give-and-take.

Understanding business people's points of view and issues helps — as does taking the high ground of an objective approach to doing what is best for the company, and working out the details and policies to best achieve that goal. Lastly, there are related nontechnical realities that must be taken into account, such as regulations and union employment issues.

Action Item: Include plans in consolidation projects to satisfy departmental needs by removing the reasons for wanting separate I&O.
Best Practices in Data Center and Server Consolidation

Tactical Guideline: Develop an impact analysis on how your consolidation project will impact storage, networks, backup and lockdown windows, business continuity plans and operational procedures to ensure no surprises down the road.

**Big Server Consolidation Projects — You Must Do Your Homework**

**Hardware configuration decisions**
- How many variations?
- How many vendors?
- Life cycle status?

**Operating system decisions**
- Single or multiple OSes?
- What versions/release levels?

**Subsystems/applications**
- Similar products winners and losers
- Contracts?

**Don’t consolidate what you don’t need**
**Chargeback methodologies**
**Impact on multiyear contracts**

---

**Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?**

Preparation is critical when undertaking a massive server consolidation project. Too many projects get derailed when the rush to start precludes detailed planning. It is critical to get a complete inventory — first determine the make, model and serial number of every server, warranty/maintenance/depreciation/lease status. Document current performance/usage metrics, volatility and historical and projected growth trends.

Document the operating system version/release level, middleware (such as DBMS) and application software, and involve both software development and software support teams to learn of any hidden dependencies or contractual limitations or plans for decommissioning or modernization. A virtualized environment can mitigate the need to standardize on version/release levels though there are benefits to standardization. Be aware of any apps that have to potential to behave badly when operating in a virtualized environment. Do your best to ascertain the politics of vendor preferences when doing vendor consolidation. Alert affected customers that consolidation doesn’t necessarily mean all constituencies see chargeback costs decline. An impact analysis would include storage impact, backup windows, lockdown windows, changes to business continuity plans, and operational procedure changes.
Best Practices in Data Center and Server Consolidation

How Do You Decide What to Consolidate?

Technology view
- For example, everything more than three years old?

Environment view
- For example, sweep all test/dev; leave production untouched

Application view
- By workload type

Location view
- Don’t leave until the room is empty!

Which workloads not to virtualize — to date

Process/physical constraints: Branch applications (retail, manufacturing), physical devices, USB! Real-time applications, time stamp and abstraction don’t mix!

Transactional constraints: I/O-intensive — Requires more hardware assistance initially, with direct-path I/O (for throughput) and eventually multipath I/O (for concurrency), which is still the biggest virtualization challenge.

Commercial and support constraints: Licensing, support and break/fix require parallel universes for production and testing/development.

Check your constraints today: Easier done in test/development than production — but remember test/development budgets/costs.

Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?

There are multiple approaches that can be taken when deciding which servers to consolidate in large projects. One approach is to look for older, less efficient technology first. A second approach is to focus by workload type — such as e-mail servers. A third approach is to first focus on “nonproduction” servers such as test and development, quality assurance, etc. These three approaches all have merit but can still have a scattershot affect - if the goal is to buy back space they should be coupled with an approach that tackles a data center or a specific section of the data center until all the physical assets are consolidated.

The advances in virtualization make it a key ingredient in server consolidation. That said, organizations should recognize that not everything can or should be virtualized today. For example:

Workloads/applications with physical/process constraints: This class of applications requires a physical hardware event to take place/be guaranteed or recorded with a specific time stamp. This physical commitment, we believe, will restrict process-constrained applications to be virtualized.

Workloads/applications with transactional constraints: This class of applications is driven by overall high use and/or the lack of ability of I/O-intensive workloads to be virtualized. From 2011 through 2014, as the capabilities of hardware assistance for virtualization improve and become more broadly deployed, I/O-bound workloads/applications will increasingly be virtualized.

Workloads/applications with commercial/support constraints: This class of applications is restricted by commercial agreements already bound in the application portfolio. Although we believe many of these issues can be overcome by the efforts of the vendors’ independent software vendors, the issues continue to inhibit the total number of applications that can be virtualized in production and require more investment in the test/development phase for virtualization projects.
Tactical Guideline: Without setting proper expectations, a consolidation project, despite meeting the goals of the IT organization, runs the risk that it will be perceived by senior management as having failed.

**Best Practices — Setting Proper and Realistic Expectations**

- Upfront costs
- Time to recover costs
- Replaced server disposition
- Changes to procedures
- System management benefits
- Staff elimination vs. reassignment
- Impact on the service-level agreement
- Time to complete project
- Time commitment of project staff
- Knowing when enough is enough

**Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?**

A critical step in a server consolidation project is setting proper expectations, especially with upper management. Some successful consolidation projects have been perceived as failures because expectations were improperly set in many areas. The saying "it takes money to make money" is true in consolidation, and it's important to understand the upfront costs compared with the time required to recover costs. The disposition of replaced servers can have a significant effect on TCO savings. The effects of changes to procedures such as disaster recovery must be determined, and system management improvements must be quantified. Savings attributed to staff reductions must be clearly examined, because personnel often aren't dismissed, but rather moved to other functions. Positive and negative service-level changes must be understood. For example, bandwidth may become an issue as servers are consolidated to fewer central sites. Because most members of a consolidation team have other responsibilities, management must understand the time commitment involved with the project. The effect of trying to consolidate too much must be communicated with the understanding that it may reduce return on investment (ROI) or service and agility.

**Action Item:** Set realistic expectations with senior management for the desired cost savings and improved service levels to be derived from server consolidation, as well as the effort needed to achieve results.
Tactical Guideline: Get agreement on metrics for service levels and measure service received before consolidation begins to avoid unwarranted complaints based on feelings that consolidation hurts performance.

Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?

Because many enterprises are challenged to establish how well they executed on their goals at the end of the consolidation project, we recommend a more formal and high-visibility process. Begin by gaining clear agreement among the IT organization, business departments and senior managers regarding the project's objectives and priorities. Is cost paramount? Can service levels be relaxed to achieve the reductions? Are there other goals? Next, choose metrics that will prove the project's effectiveness. They should be shared upfront, in addition to projections of what results the project will deliver. This is the commitment to which you will be held. During the project, interim results should be published widely, as well as every change in direction or new fact that's discovered. This avoids surprises and disappointments, enables participants to reverse recent decisions that jeopardized the original goals, and helps sustain support from outsiders. Finally, use the metrics, commitments and documented changes to build a strong proof of success when the project ends. A strong effort to justify and track will pay off in much higher satisfaction from senior managers and business departments. Be sure to get agreement on what metrics measure service levels and the assumptions on which they are based. Then measure service levels before consolidation begins. If not you are open to complaints, even if levels are met.

Action Item: Establish objectives and goals for the consolidation project at its start; set metrics tied to the objectives, track results, and declare success at the end of the project.

David Coyle

MEX38L_120, 10/11
Best Practices in Data Center and Server Consolidation

Strategic Guideline: Consider server consolidation not as a one-time project, but as a way of designing and running all new applications. Virtualization will become the standard environment in the future.

Establish Best Practices and Procedures for Ongoing Consolidation

Fixing the past does not necessarily fix the future.

- Understand that virtualization will become the standard operating environment.
- Ensure that the design of new applications will allow them to run in a consolidated environment from the beginning.
- Use the ability to run in a consolidated environment as a decision factor for selection of new application packages.
- Install standard, controlled methods for implementation of virtual servers to protect from virtual-server sprawl.

Key Issue: What best practices and processes should you follow when consolidating and rationalizing your server infrastructure?

Most enterprises have focused on consolidating their environments to help solve their current dilemma. This is called "backward consolidation." It is important also to consider solutions that will stop server sprawl from happening in the first place. Plan for consolidation as you look at new application development — that is, "forward consolidation." Forward consolidation generally will have a greater ROI. The ability to run in a consolidated environment should be a design factor for applications in development and be a major selection criterion when purchasing application packages. Consider that virtualization will become the standard operating environment.

Action Item: When looking for new applications, explore an application's ability to run with other applications based on its design and independent software vendor (ISV) support policies, and use this as a selection criterion.
Recommendations

- **Start with** logical and physical consolidation before attempting rationalization.
- **Clearly understand** objectives for server consolidation, and design simple and clear metrics that match objectives to measure success.
- **Perform** comprehensive preplanning and research.
- **Work on** identifying and handling internal political problems before they start to affect your consolidation project.
- **Create** project sponsors at all levels, including senior management.
- **Do not add** to the consolidation project's scope in the middle of the project, because it will add to time and may lower ROI.
- **Do not rush** the project, and put contingency time into the plan.
- **Establish** good communication with all levels, and use input from users.
- **Re-evaluate** progress at each milestone, and check assumptions.
- **Document** lessons learned to aid future projects.
- While virtualization is not the "cure all" for server consolidation, it should be a major part of a consolidation project.
Related Gartner Research

→ Data Center Facility Location Selection Criteria
  John R. Phelps (G00170643)

→ How to Close a Data Center
  Bill Malik and David Cappuccio (G00166795)

→ A Checklist for Data Center Relocation
  David Cappuccio and John R. Phelps (G00170738)

→ Major Fallacies of Server Consolidation Projects Exposed
  John R. Phelps and Mike Chuba (G00205515)

→ Avoiding the 10 Pitfalls That Can Derail a Server Consolidation Project
  John R. Phelps and Mike Chuba (G00205230)

For more information, visit Gartner Solution Central or e-mail us at solutioncentral@gartner.com.