

A Briefing
from GBC's
Research Analysts
February 2013

The Common Pitfalls of Federal Data Center Consolidation and How to Make it Work for You

In an effort to reduce energy usage and IT costs, federal leadership has mandated the closing of hundreds, possibly thousands, of data centers across the country. Current agency projections intend to close almost 1,200 data centers by 2015.¹ Closing data centers is only half the battle though, as the Federal Data Center Consolidation Initiative (FDCCI) calls to not only shutter data centers, but make existing ones more efficient.² The need for data center optimization is spelled out in the FDCCI, and agencies are required to provide regular updates on energy savings and virtualization progress. But recent reports have noted that some agencies are struggling to optimize data centers, and are instead focusing efforts on consolidation alone.

Ultimately, these efforts are about cutting costs. Cost savings estimates vary, but agencies speculate these efforts will save \$2.4 billion from 2011 to 2015 and another \$820 million in cost avoidances,³ while the President's budget predicts \$3 billion in operational savings.⁴ These numbers may further be increased as agencies continue to conduct more thorough inventories of IT assets. The reality is that consolidation alone doesn't guarantee that costs will drop, but it does present the opportunity to lower costs. Even before consolidation, agencies must conduct a sound inventory of assets, and consolidation itself must be properly managed in order to avoid major challenges such as energy usage and data management issues. Proper planning and optimization will be necessary if agencies are to realize their hope for cost savings.

The Pitfalls of Consolidation

Energy Usage

Federal agencies collectively consume approximately 12 billion KWh of electricity per year.⁵ For comparison, the average nuclear plant in the United States produces about 12.2 billion KWh in 2012. This massive electricity consumption results in appropriately massive energy bills. The EPA estimates federal data centers total \$450 million in electricity costs to operate annually.⁶ Consolidation can take out a significant chunk of those costs. The Department of Energy (DoE), for example, estimates it can save about 16 percent on its total electricity bill with consolidation, a figure which if averaged across agencies, would represent a \$72,000,000 reduction in operating costs alone.⁷

One reason many agencies are struggling to realize these cost savings is that, in many case, consolidation entails relocating servers to larger locations and closing smaller centers. Data centers typically consume about 100 to 200 times as much electricity as office spaces, and increases in electricity costs from can quickly eat into savings from consolidated real estate or hardware reductions.⁸ Properly planning energy efficient designs is vital to avoiding quickly

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escalating energy bills. The Government Accountability Office (GAO) reported in July 2012 that 15 agencies had trouble determining their energy consumption levels.⁹ Without a baseline understanding of where electricity consumption is occurring, agencies will find it difficult to identify opportunities to eliminate waste. The remaining data centers must be energy efficient, or else gains from consolidation will be eaten up by growing electricity costs.

Data Management Costs

In 2012, the amount of data worldwide passed 2.7 zettabytes, and every two years, the amount of data created worldwide is expected to double.¹⁰ With this explosion, the storage and bandwidth requirements to manage such data have also expanded. Consolidation may eliminate unnecessary servers and units, but it has no effect on slowing the growth of agency-managed data. Computing power tends to double every two years, so in theory agencies consolidating data centers should be able to keep up with data growth. However, this will likely necessitate purchasing new, upgraded machines every few years, and with current budget projections, agencies are unlikely to have funding to invest in many new units for several years.

The problem of data management thus becomes a question of efficiency. The average utilization of a federal agency server is approximately 30 percent currently.¹¹ Some reports place utilization levels as low as five percent for some units.¹² As centers are consolidated, managers need to work to improve server utilization levels to keep costs down. Costs can be erroneously high by maintaining unnecessary servers that must be cooled and powered. In this way, without proper data management and server utilization, consolidation can end up cutting into savings.

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Overcoming Pitfalls and Managing Consolidation

Program management and planning, or the lack thereof, can also drive up the costs of consolidation. Managing consolidation costs effectively requires significant insight into current operations, something many agencies are currently lacking. In the most recent round of audits, all but one agency submitted incomplete data center operations information to the GAO.¹³ Without these insights, agencies are unable to plan effectively or ascertain if any gains are realized in the end.

The lack of insight into data center operations has already limited leaders' ability to plan and manage consolidation. Seven agencies have reported technical challenges with planning a migration strategy, leading to struggles achieving consolidation goals. Because of planning and other challenges, 70 percent of all agencies have not yet met requirements of their basic consolidation plans.¹⁴ Though consolidation is inherently a cost saving measurement, without proper management and planning, it too can end up being costly.

Making Consolidation More Efficient

Server consolidation is essentially a process that migrates high use applications to new or virtualized servers, and discards extraneous hardware in order to cut costs. Before any migration can occur, managers must quantify what to move and ensure that end-user experience will be improved after consolidation. An understanding of how certain applications are operating is essential to ensuring they are migrated to the optimal server environment and in the appropriate way. Investing in tools that give visibility into network operations can give insight that may save money in the long run. This minimizes risks, down time, and the potential for high back end costs from a lengthy migration.

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Using energy efficiency practices can help drive down costs during and after consolidation. Even basic energy saving practices can have a drastic effect. It may seem intuitive, but many agencies are having trouble staying energy efficient, and are paying for it. In an internal audit, the Department of Energy found that 26 percent of its data center floor space was vacant or inappropriately used.¹⁵ In addition, the DoE found that 43 of its 77 data centers were not employing basic energy-saving practices.¹⁶ There are many opportunities for reducing energy consumption, such as aligning servers to conduct air through the facility, using perforated floor tiles to bounce cold air back at servers, or incorporating lower power consuming IT resources. Even simple measures can have drastic effects over time.

Finally, simplifying management can greatly reduce the total cost of ownership of data centers. In many agencies, those who run data centers have no part in managing the budget – power bills are typically outsourced through the General Services Administration (GSA) – and so they have no incentive to find cost savings. Rather than prioritizing energy efficiency, consolidation planners too often focus entirely on reducing the real estate footprint in lieu of improving energy efficiency. Realigning priorities and incentives by giving budget authority and responsibility to data center managers can change energy consumption habits and office culture. Finding cost savings should not be a responsibility for top level managers alone. Appropriately incentivizing mid- and low-level managers can be the greatest way to reduce budgets.

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A Personal Guide for Success

There are three hallmarks of a successful consolidation: ensuring maximum infrastructure uptime, dramatically reducing operations costs while improving current infrastructure, and enabling new technology by accelerating deployments and reducing risks. To reach these goals, managers will need to understand how their data centers and applications are operating, which applications will perform successfully where and how to get them there, and how to best improve energy efficiency without sacrificing performance.

To help agencies get there, Brocade has the technical expertise and knowledge of data center operations managers will need to plan and execute as successful migration. Using open standards, Brocade is able to give managers end-to-end visibility, something proprietary technology struggles to do. Through a “measure, move, prove” approach, Brocade helps managers assess which applications to migrate, effectively migrate those applications, and prove they are performing up to standards post-migration. Ultimately, energy efficient and consolidated data centers must be built with technical expertise from the ground up, through green measures and proven practical designs. There is no cost savings substitute for the best technical expertise, and as the industry leader in technical solutions, Brocade can keep costs low before, during, and after migration.

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Brocade

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