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THE DATA CENTER CONSOLIDATION ACTION PLAN

ServerLIFT®

"It is not the strongest of the species that survive nor the most intelligent but the one most responsive to change."

This quote, often attributed to Charles Darwin, was actually Leon Megginson in 1963. He was attempting to summarize Darwin's thought as it applied to business. It tells us that it is not the survival of the strongest, as had been declared, but, rather, the survival of those who can adapt.

Nowhere does this hold true more than in the IT industry, where change occurs daily. Accelerating technologies challenge IT managers to constantly keep ahead -- not as a just a function of their jobs, but as a function of their company's survival. Technology is becoming more agile, smaller, and cooler. Meanwhile it's far more powerful than the technology we used last year or the year before.

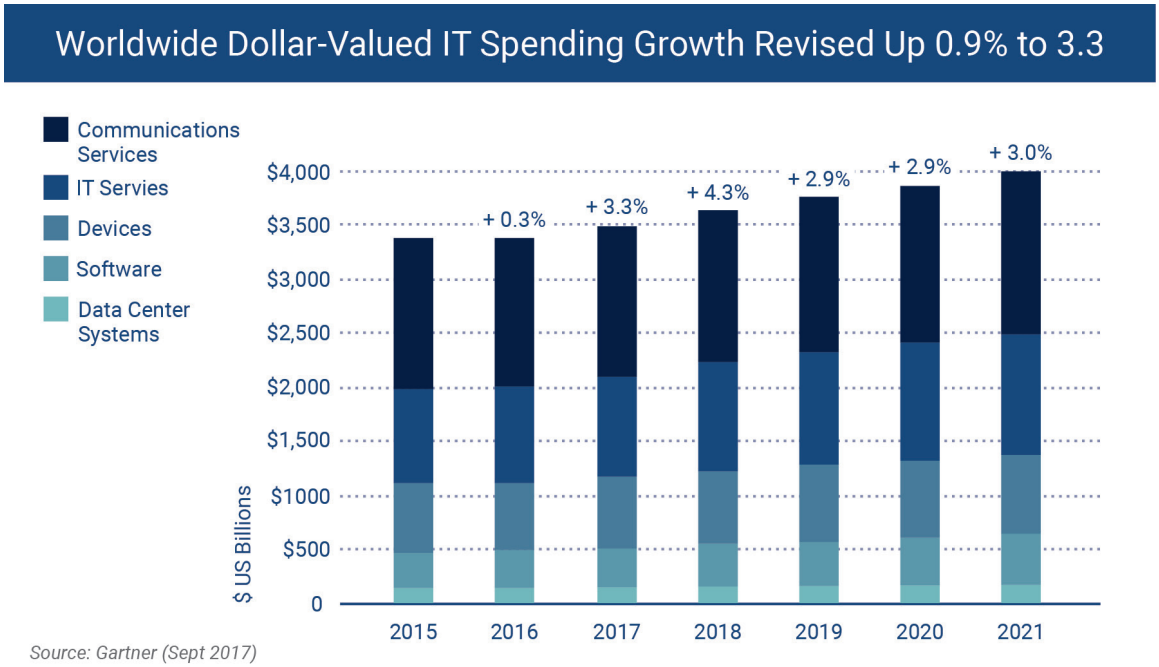
CONSOLIDATION IN DATA CENTERS TODAY.

These attributes are often glaring in the modern data center where space, cooling and power must be equally balanced to optimize assets. This brings about a need to constantly change, configure, update, and evaluate data assets on both the physical and digital levels. The result is a faster, better, and more efficient data room that is more condensed than ever before.

The leading indicator of major technology trends, the Gartner Worldwide IT Spending Forecast projects worldwide IT spending to total $3.7 trillion in 2018, increasing 4.3% from that of 2017, with an estimated cost of $3.5 trillion. Even so, we find that optimization of that space is paramount. According to DataCenterPost,

> *"Over the past 10 years, data center design density has increased ... 100 to 150 W per square foot and/or fewer than 5kW per cabinet. The recent proliferation of virtualization and cloud implementation has accelerated a move toward even higher density environments."*

In 2017, many companies sought data center consolidation mechanisms through mergers and acquisitions, and purchasing, building, or leasing real estate with fewer square feet to house their data centers and reduce overall costs.



Source: Gartner (Sept 2017)

The U.S. Government Leads Data Center Consolidation

The U.S. government will continue to lead the trend in data center consolidation, according to federal news source, ExecutiveGov. The U.S. Senate proposal to extend, for two-years, the Federal Information Technology Acquisition Reform Act (FITARA). The Act demands continued federal data center consolidation and modernization, migration of federal systems to cloud computing platforms, and expansion of shared services. The initiative, falling short of its goal in 2017, will likely continue.

One objective of this project was to reduce energy use. According to the U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA),

> *"Data centers used about 61 billion kWh of electricity in 2006, representing 1.5% of all U.S. electricity consumption and double the amount consumed in 2000. It is projected that data center usage will exceed 100 billion kWh by 2011, or 2.5% of total U.S. electricity consumption."*

FITARA Goals

The overall goals of the Government-wide Data Center Consolidation Initiative are as follows:

- Consolidate data centers across the Federal Government in order to achieve cost savings, energy consumption reductions, optimal space utilization and improvements in IT asset utilization.

- Use automation, standardization and security 'hardening' of Hardware and Software platforms, including virtual hosts and virtual machines to improve upon the implementation and monitoring of NIST 800-53 controls and FISMA compliance.
- Define and monitor standard operational metrics across Agencies, achieve efficiency gains and realize operational cost savings by improving:
  - Server (CPU) Utilization (%)
  - Rack Space Utilization (%)
  - Rack Floor Utilization (%)
  - Power Usage / Square Foot
  - Power Usage Efficiency (PUE)
- Maintain cross-agency goals for highly available, scalable, and redundant data center infrastructure that will substantially reduce the Government's risk and provide for future IT growth.

The Federal Consolidation Plan

The Office of the Secretary adopted the following plan for their consolidation. It has also been adopted industry wide.

- **Phase 1 – IT Asset Inventory Baseline (incl. Preliminary Assessment & Quick Wins)**
  - Create an inventory of assets
  - Capture baseline metrics for utilization and energy
  - Determine a specific goal for future utilization for labor, energy, space and other similar criteria.
- **Phase 2 – Application Mapping**
  - Map all applications and their dependencies to other assets.
    - To servers
    - To databases and platforms
    - To Security
    - To SLA's
  - Segment architecture based on these dependencies

- **Phase 3 – Analysis & Strategic Decisions**
  - Perform energy and cost evaluations for different approaches
  - Identify the risk, alternatives, cost assumptions and business benefits
  - Make strategic technology and consolation decisions
    - How are assets being moved in the data center? Are you using a lifting device to expedite the moves?
    - How much can be facilitated with a cloud architecture?
    - Are there any new technologies which can be utilized that can replace larger and/or less efficient technologies?
      - Should these technologies be tested and evaluated before implementation?
      - Will a DCIM solution reduce the likelihood of a failure?
      - Are there any single points of failure that need to be addressed?
      - Keep in mind that often additional spending may be the most prudent path to saving money. The focus always needs to be on the overall goal of the plan, not the incremental cost of each piece of the plan.
- **Phase 4 – Consolidation Design & Transition Plan**
  - Design and test consolidation alternatives
  - Develop transition plans for energy use optimization and date center consolidation
  - Create a project plan
  - Consider hiring a consultant that can model your data center to review optimization with a computer model.
- **Phase 5 – Consolidation & Optimization Execution**
  - Execute virtualization, consolidation and migration plans
  - Execute energy, network, cooling and labor plans
  - Measure and report utilization cost savings metrics
- **Phase 6 – Ongoing Optimization Support**
  - Continue energy use optimization, virtualization and consolidation
  - Continue on-going monitoring and reporting of utilization and cost savings metrics

The plan involves a number of business units (Building Facilities, IT Facilities, IT Operations and IT Development) all working on the same plan with same overall objectives.

FITARA Phase Goals

The goal of each phase is to present a series of deliverables at the end of each phase:

Phase 1 – IT asset inventory
Phase 2 – Application Mapping
Phase 3 – Consolidation analysis and strategic investment decisions on standard platform and services
Phase 4 – Consolidation design and transition plan
Phase 5 – Consolidation execution and progress reports
Phase 6 – Semiannual metrics reports

Consolidation Means Optimization

Any plan for consolidation must also be a plan for optimization. Consolidations without the benefit of optimization will more than likely fall short of any current goals and also a missed opportunity to accommodate growth. If your plan is to consolidate due to underutilization of current assets, keep in mind that with growth, these assets will still need to scale.

Four areas affect data center optimization, according to FITARA and need to be considered in unison with all teams involved:

- **Geographic Location** and real estate (asses disaster potential, access to labor, insurance, labor laws, cost/risk).
- **IT facility and energy use** (Consider alternatives for retrofitting existing space, upgrading power/cooling options)
- **IT Hardware Assets & Utilization** (Hardware Asset inventory and utilization - i.e. prioritize consolidation based on age/refresh schedule. Clarify best practices for safety and employee welfare as part of an ongoing efficiency plan for the movement of hardware assets)
- **IT Software Asset & Utilization** (Software Asset inventory and utilization metrics - i.e. prioritize by app usage/mission requirements)

Improve Data Center Efficiency and Capability to Reduce Costs

The primary goal of any Data Center Consolidation Initiative is to improve data center efficiencies and capabilities that will reduce costs. The related strategic objectives are summarized below:

1. Reduce Cost

- Reduce Energy Use
- Reduce Operational Costs such as labor
- Limit Long-term Capital Investments

2. Reduce Environmental Impact

- Reduce Power Consumption per Processing Capacity
- Optimize Cooling, Power Distribution, Cable Plant

3. Improve Efficiency & Service Levels via Automation

- Maintain Security: Availability, Integrity, Confidentiality
- Guarantee Performance: Redundancy, Load Balancing, COOP

4. Enhance Business Agility & Effectively Manage Change

- Implement Service Management Best Practices
- Implement Software Development Lifecycle Best Practices

Tactical Opportunities for Achieving Data Center Consolidation Initiative Goals

The tactical opportunities for achieving the goals of the Data Center Consolidation Initiative across all four key impact areas are multifaceted as illustrated in the table below:

Approach	Description	Potential Benefits	Rationale
Decommission	Turn off servers that are not being used or used infrequently (e.g. dedicated development environments)	• Cost savings • Energy efficiency • Labor efficiency • Reduces rack space and floor space requirements.	• As many as 88% of all servers may not be in use or underutilized

Consolidation	Move servers and assets to a few select data centers or within the same DC using a smaller footprint.	• Floor space savings cost • Operational cost savings • Increased server utilization • Energy Efficiency • Better utilization of labor resources	• **Over 20% of all corporate data centers and under 5,000 square feet. • ***Approximately 430 government data centers (out of approximately 3,000) are categorized as “closets” or small sized data centers (less than 1,000 square feet)
Virtualization	Consolidate servers through virtualization.	• Floor space cost savings • Increase infrastructure utilization • Energy efficiency	• **Server utilization is approximately 21% government wide. • In 2012 Gartner reported data center infrastructure utilization to be at 12%.
Cloud Alternatives	Move application functions to standard, vendor supported enterprise platforms or services.	• Floor space cost savings • Energy Efficiency • Operational cost savings • Reduced hardware and software cost • Improved service delivery	• Reduce operational costs. • Low impact security systems may be low risk candidates for cloud computing systems • Offers on demand scalability.

** McKinsey Report: Revolutionizing Data Center Efficiency, July 2008*
*** ServerLIFT® Corporation Thought Leadership Survey in Data Center Safety, 2014*
**** Data Center Consolidation Initiative - Agency Consolidation Plan Template*

In summary, the exercise of a data center migration or consolidation is a rare opportunity to upgrade and modernize your systems. Since the overall objective is to cut costs, many expenses associated with this project will be minimized when they can show a solid return on investment. In this case returns result from the entirety of the project.

Consider additional costs not associated with obvious assets, including:

- Reductions in bandwidth cost when local loops and cross connects are eliminated
- Reductions in labor when resources can be pooled in centralized locations
- Reductions in liability insurance when facilities are closed
- Reductions in labor cost when redundancies in tools, such as lifting devices and crash carts, diminish
- Reductions in troubleshooting time
- Reductions in physical security demands

Private Sector Consolidation

In the private sector, companies, likewise, seek means to reduce costs. In addition, many are finding that data center consolidation can also increase efficiency, facilitating optimal growth.

Consolidation, much like data center migration, requires detailed planning. The old carpenters' adage, "Measure twice. Cut once." applies well here. Planning and careful evaluation of the plan is critical to success. Adopting a phased approach ensures that deliverables are met, while allowing for the testing and evaluation of each phase before moving on the next.

Consolidation is not just about reducing cost, it's about efficiency. Efficient data centers contribute to the bottom line and increase employee morale. The key takeaway from this information is to take your time, plan well, and use the right tools for the job. Let your staff do what they do best, and, above all, provide them with the resources they need to allow them to do what they do best.

About ServerLIFT Corporation

ServerLIFT is revolutionizing the IT hardware industry worldwide with purpose-built, data center certified Data Center Infrastructure Handling (DCIH) solutions. ServerLIFT DCIH devices are built for precision, stability, and maneuverability in the data center. The most sophisticated data center operators in the world rely on ServerLIFT.

To find out more or to speak to one of our Solutions Specialists,
visit Serverlift.com or call (602) 254-1557