



## Data Center Management Focuses on Efficiency to Balance Increasing Demand for IT Services with Stagnant Budgets

---

**While the slowing economy appears to have little effect on demand for IT services, it is driving improvements in energy efficiency and resource utilization**

---

With the global economy in a downturn, there has never been a greater focus on cost savings and operational efficiency. The results of the 2009 Aperture Research Institute (ARI) survey show that data centers will be challenged more than ever during the next two years under these new conditions. While 73 percent of data center managers expect demand for IT services to increase, more than half predict there will be no increase in their budgets.

Where budgets stagnate and fall, data centers will need to find new ways of doing more with less. Data center managers will look at ways to squeeze more from their existing resources, with 80 percent of those surveyed saying they can create at least 10 percent additional capacity through better management of existing assets. Thirty percent of those surveyed said they could find an additional 20 percent. There is likely to be a revitalized focus on tools that provide insight into resource allocation and use.

Data centers will also look to green initiatives to help manage their operating expenses, with 87 percent of those surveyed having a green initiative in place and the majority expecting to continue or intensify these efforts.

---

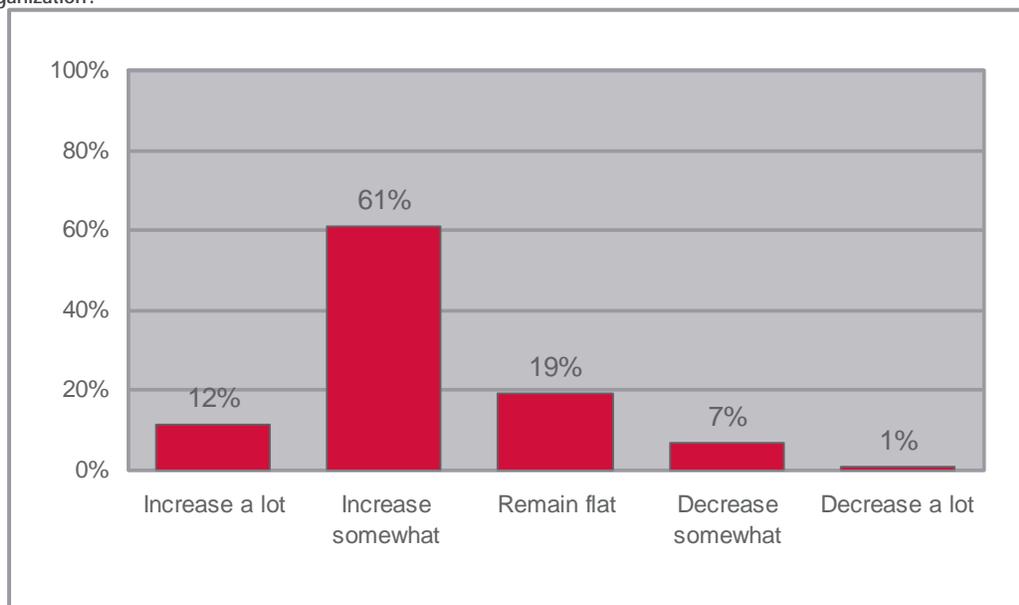
© 2009 Aperture, Inc. All rights reserved. Reproduction and distribution of this publication in any form without prior written permission is forbidden. The information contained herein has been obtained from sources believed to be reliable. Aperture disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although this research may discuss legal issues related to the information technology business, Aperture does not provide legal advice or services and its research should not be construed or used as such. Aperture has no liability for errors, omissions or inadequacies in the information contained herein or for interpretations thereof. The opinions expressed herein are subject to change without notice.



### The Economic Downturn's Effect on IT Service Demand

While the current economic climate will inevitably cause many businesses to shrink, it appears that this will have little effect on the demand for IT services. The 2009 ARI survey of more than 100 data center managers found that – despite the slowdown – only eight percent expect to see a drop in the demand for IT services during the next two years. Only 19 percent expect demand to remain flat, leaving a majority who believe demand will continue to rise. Indeed, of the 73 percent who expect demand for IT services to increase, 12 percent expect it to increase significantly.

Bearing in mind the current economic climate, how do you predict demand for IT services will change over the next two years within your organization?



The growth in demand for IT services is a positive for companies and the economy as a whole. Through effective use of IT, companies are able to increase productivity and become more competitive, helping economies grow. Research by the American Council for an Energy Efficient Economy found that for every extra kilowatt-hour that has been demanded by information and communication technologies (ICT), the US economy increased its overall energy savings by a factor of about ten<sup>1</sup>. In the current economic downturn, investments in IT can help accelerate recovery, and can strengthen companies and economies.

### The Economic Downturn's Impact on IT Budgets

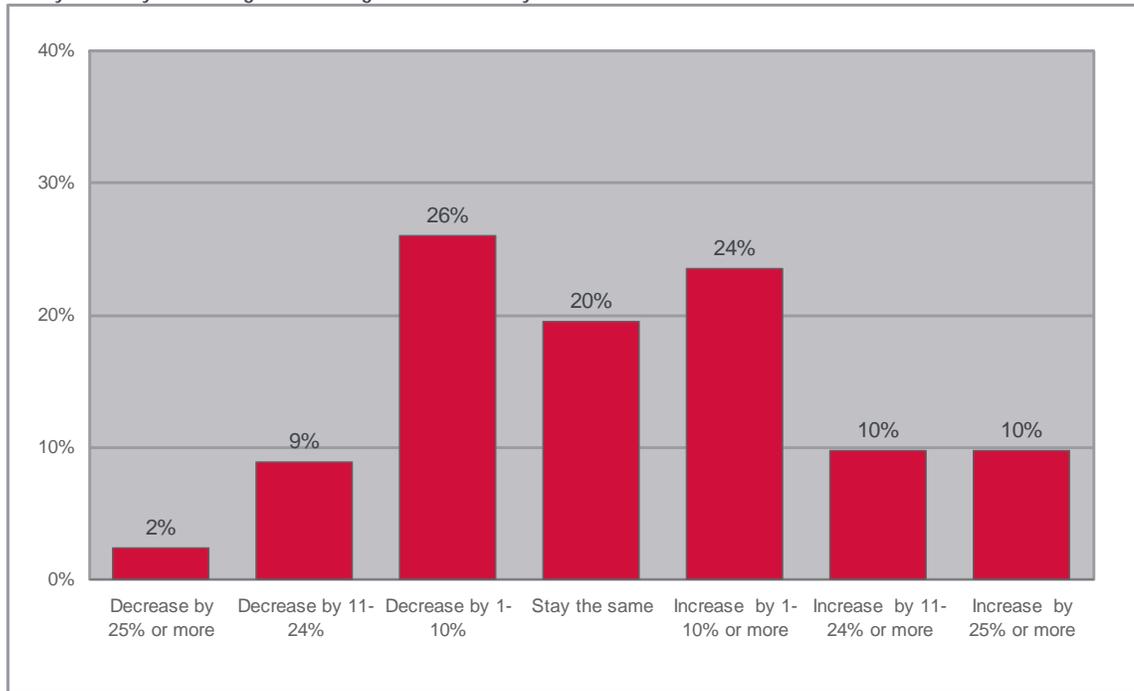
As many suspect, the current economic climate is having a significant impact on budgets. While 73 percent of respondents to the 2009 ARI survey expect demand for IT services to rise, only 44 percent expect to see any increase in their budgets during the next two years. More than half of those (54 percent) expect that increase to be less than 10 percent.

Thirty-seven percent of those surveyed expect their IT budgets to fall, with 26 percent predicting a drop of up to 10 percent; 11 percent of those surveyed foresee even greater cutbacks.

<sup>1</sup> "Information and Communication Technologies: The Power of Productivity," John A. "Skip" Laitner and Karen Ehrhardt-Martinez, American Council for an Energy-Efficient Economy, February 2008

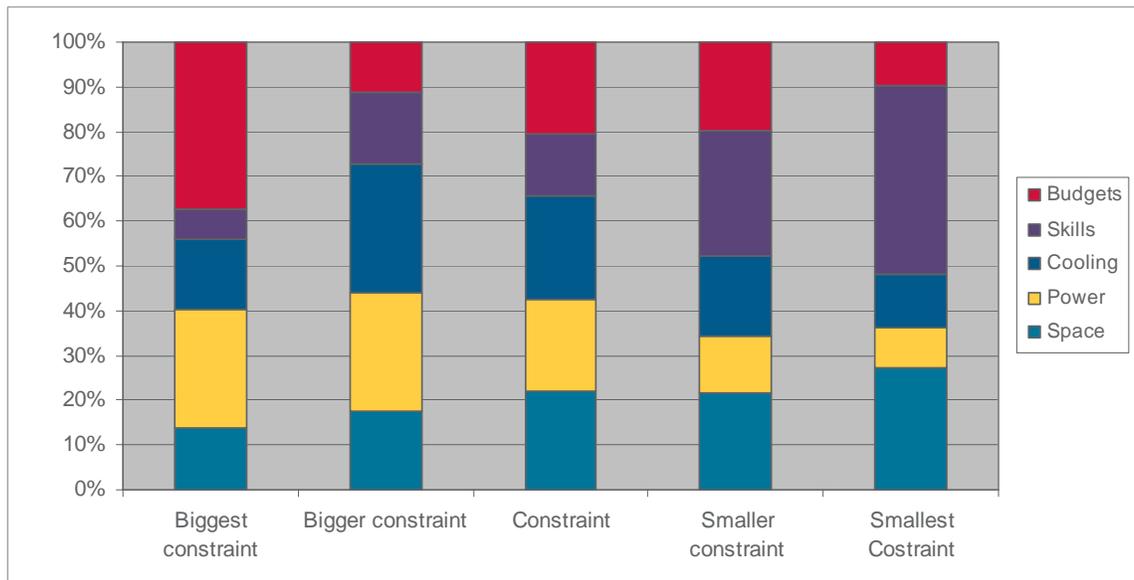


How do you think your IT budget with change in the next two years?



Based on these results, we see a clear shift towards budgets being an increasing constraint on the data center, along with physical resources such as space, power and cooling. Typically, these physical resources are often seen as hard limits on data center capacity because they are slow and expensive to upgrade.

Constraints on the data center

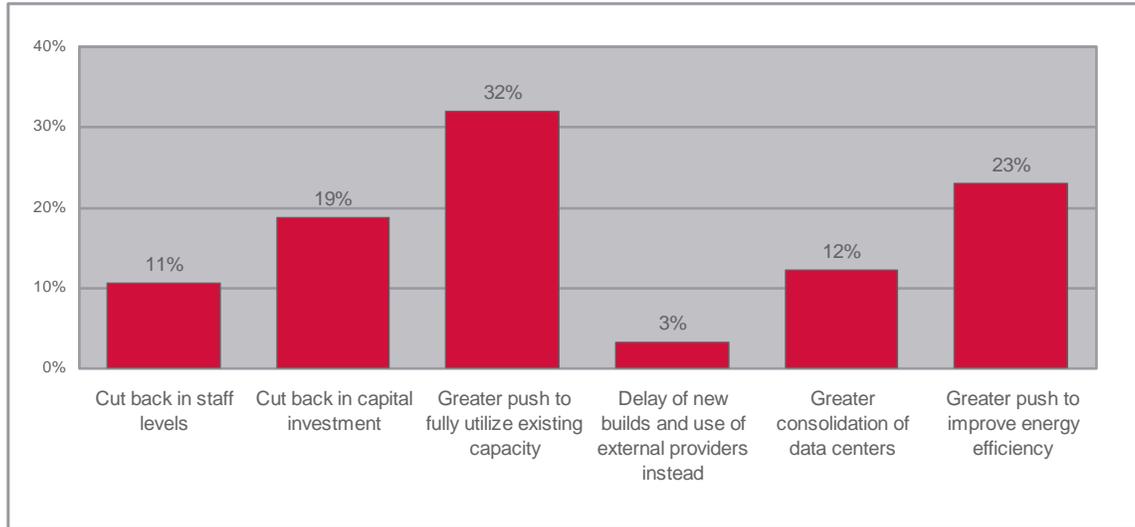




### Meeting the Challenge

So how is data center management meeting the combined challenge of rising IT demand and tightening budgets? From the survey results, it appears that they are focusing efforts on increasing the utilization and efficiency of existing resources. Thirty-two percent said they would push harder to fully utilize existing capacity, while 23 percent said they would intensify their efforts to improve energy efficiency. It appears that cost control will play a lesser role, with 19 percent stating that they plan to cut back on capital investment, and only 11 percent saying they will cut staff levels.

How do you think the economic downturn will most affect your data center?



### Increasing Resource Utilization in the Data Center

Risk management and mitigation is a high priority in the data center, but this can result in resources being overprovisioned. A previous ARI survey<sup>2</sup> found that only 38 percent of data center managers believed their configuration information (documentation) is 90 percent accurate. A quarter (26 percent) thought their data was only 75 percent accurate. Without accurate information on the equipment and physical resources, it is impossible to accurately match capacity with demand. As a result, data centers often provision excessive power or cooling to hedge their risks. This is similar to a financial budget: when insight and information is weak, more resources must be set aside as a contingency.

In this year's ARI survey, many data center managers agree that there is an opportunity to obtain greater value from their existing assets through better management. About 30 percent of respondents seem confident they could squeeze more than 20 percent additional capacity from their existing resources. Another 25 percent of the respondents say they could find an additional 11-20 percent capacity. Only four percent of the respondents feel they did not have any additional capacity that could be unlocked through better management.

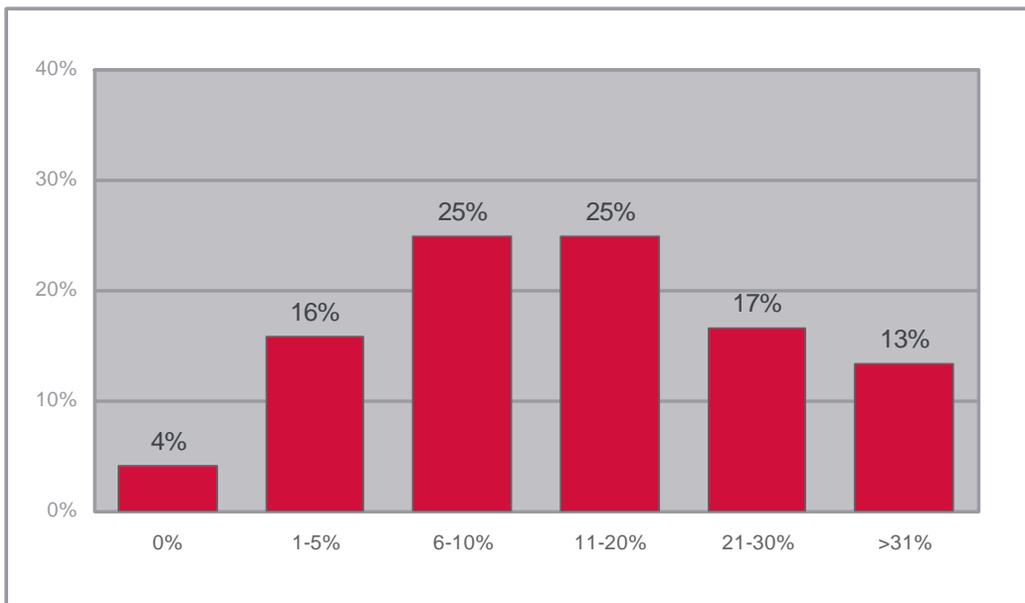
Of all those surveyed, 80 percent believe that they can unlock at least 10 percent additional capacity. A capacity increase of this magnitude could enable a company to defer a data center build for up to a year and realize significant savings. For example, the Uptime Institute in a recent white paper estimated that the cost of building a 20,000 square-foot Tier IV data center (at 3.0 kW/rack) to be about \$56 million.<sup>3</sup>

<sup>2</sup> "ITIL is Gaining Momentum but the Data Center is Slow to Adopt," Aperture Research Institute, April 2007

<sup>3</sup> "Cost Model: Dollars per kW plus Dollars per Square Foot of Computer Floor," Uptime Institute, 2008



How much extra capacity do you think you could squeeze out of your existing data center through better management of your existing assets?



Better management of equipment and physical resources can enable the data center to operate closer to its maximum designed capacity. With insight into where and how resources are being utilized, it is possible to optimize resource allocation and put the contingency capacity into active service.

#### The Impact of the Downturn on Green Initiatives

Green initiatives can be seen in a number of different ways. At the Aperture Research Institute, we define a green initiative as any steps taken to reduce a company's carbon footprint. This could require the company to spend money, or result in savings through improved energy efficiency.

The current economic downturn is driving green initiatives to focus more on the tangible cost savings that can be realized through increased energy efficiency. Energy prices have been rising, and power consumption in the data center has been a key driver of costs there. By improving energy efficiency, data centers can cut their operating expenses and better meet increasing demand at a time when budgets are flat.

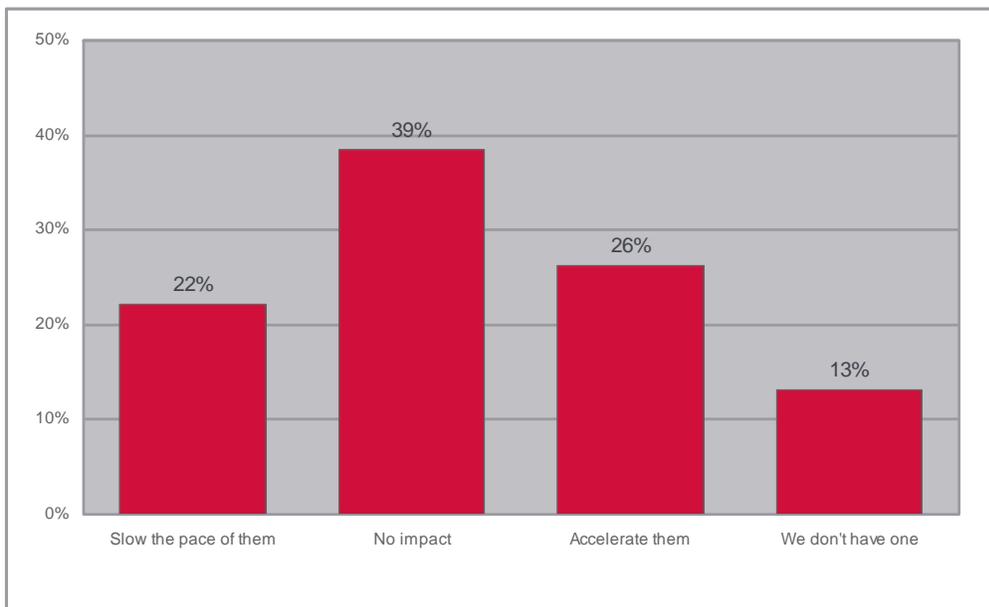
Of those surveyed, 87 percent currently have a green initiative in place. Only 22 percent of data center managers believe that the downturn will slow the pace of green initiatives. The largest group of respondents (39 percent) does not expect the economic slowdown to have any impact, while 26 percent expect to intensify efforts to go green.

These results are consistent with those published by Forrester Research in its December 2008 green IT enterprise survey. The research firm concluded that "the slowing economy will not derail efforts to make IT operations more efficient and less environmentally harmful. In fact, of the responding companies that are changing the pace of their green IT activities in response to the economic outlook, those going faster outnumber those slowing down by 2 to 1<sup>4</sup>.

<sup>4</sup> "Market Overview: A Slowing Economy Won't Slow Down Corporate Green IT Initiatives," Christopher Mines with Ellen Daley and Christina Lee, Forrester, December 2008



If you have green or energy efficiency initiatives, how will the economic downturn affect those initiatives?



Data center managers need to understand that they can only manage what they measure. Therefore, if they want to increase energy efficiency within the data center, they need to be able to gather and process accurate data on power consumption, and express that data in a meaningful way.

The Green Grid, an industry group focused on data center efficiency, has proposed 'power usage effectiveness' (PUE) as a way to measure the energy efficiency of a data center. It's calculated by dividing the amount of power entering a data center by the power used to run the computer infrastructure within it. PUE is a good measure of infrastructure efficiency, but it does not take into account the efficiency of the IT load. If the IT load is inefficient, it is still possible to have a good PUE by right-sizing the power supplied to match that of the inefficient load.

There are a number of alternative metrics, such as compute units per second per watt (CUPS/W) published by Emerson Network Power, which focus on IT output per unit of energy input. CUPS takes account of improved IT performance as well as improvements in energy efficiency. The US Environmental Protection Agency (EPA) estimates that US data centers will increase their total electricity consumption from 61 billion kilowatts in 2006 to 100 billion kilowatts by 2011. However, that number only tells half the story. Along with energy efficiency, it is also important to factor in computing efficiency – how much processing work that electricity buys at 2011 'prices'. Emerson's CUPS metric does this.

The Aperture Research Institute encourages further initiatives to develop metrics that will enable data centers to accurately benchmark and track progress towards greater energy efficiency in the data center.

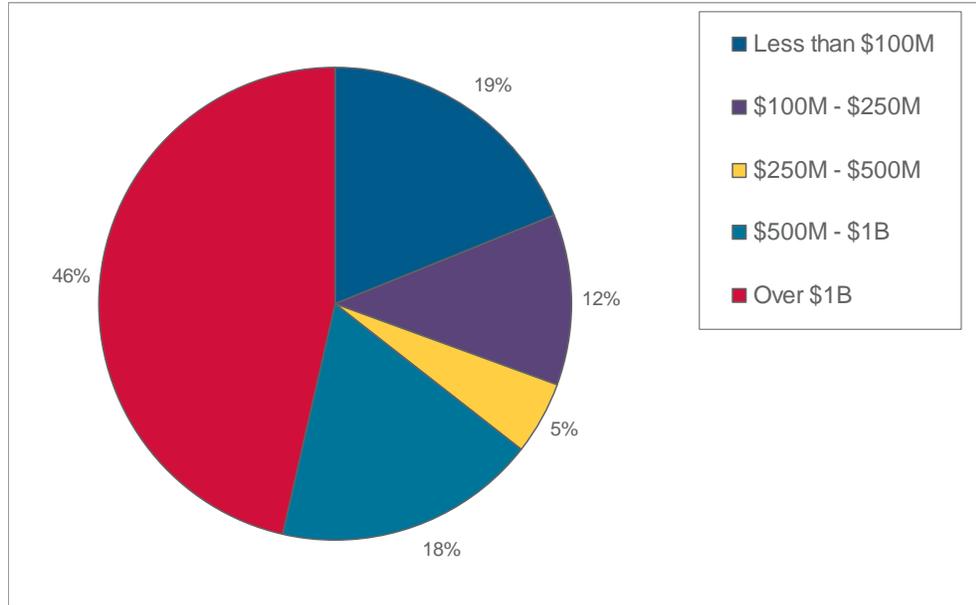
"The companies with the best chance of emerging from the current economic downturn and strongly positioned to compete are those that invest in tools that enable them to gain actionable insight into their resource allocations," agreed Andrew Fanara, Team Leader for the EPA. "This information will enable them to make smart decisions that will result in cost savings and operational efficiency."



### Survey Methodology

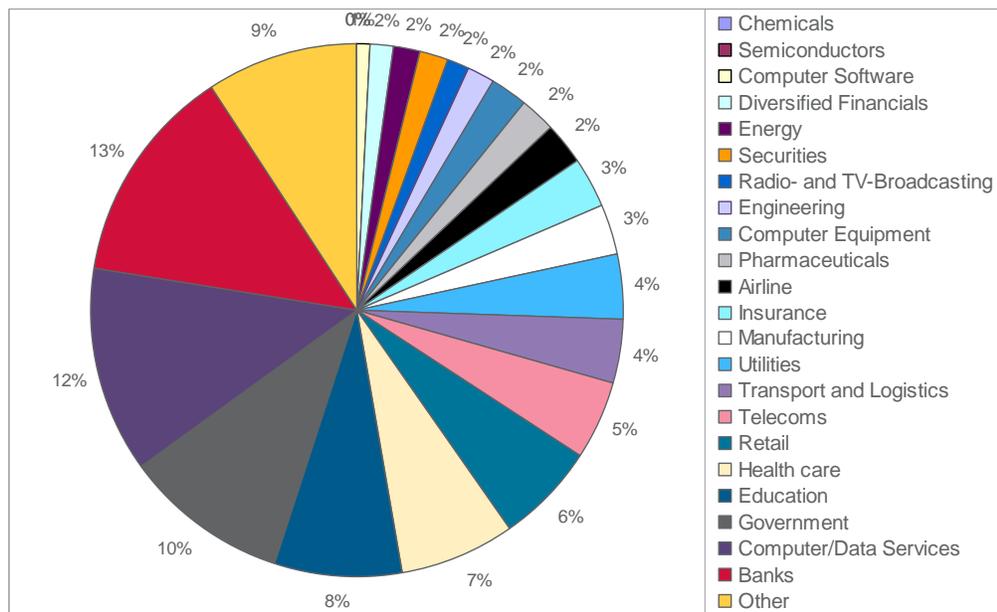
More than 100 data center professionals and executives from a variety of industries participated in this online survey. Survey participants were solicited from an industry database of Aperture customers and prospects. The charts below illustrate the demographics of companies that took part in the survey.

Annual revenue of participating organizations



The chart below shows the cross section of types of businesses that participated in the survey. It includes companies across various vertical industries and ranges from smaller businesses to Fortune 100 companies.

Primary industry of participating organizations





### Conclusions

Data center managers expect the demand for IT services to continue to increase during the next two years, despite the current economic downturn. This rise in IT services will help drive greater productivity throughout companies, countries and economies. However, budgets are not expected to rise in line with the demand for IT services, meaning that data center management will need to find new ways to do more with less.

“The companies with the best chance of emerging from the current economic downturn strongly positioned to compete are those that invest in tools that enable them to gain actionable insight into their resource allocations,” said Andrew Fanara, U.S. EPA ENERGY STAR products program manager. “This information will enable them to make smart decisions that could result in cost savings and operational efficiency.”

Two approaches will be key: 1) increasing utilization of existing resources, and 2) increasing energy efficiency in the data center. With both of these approaches, it is vital to have accurate and complete management information.

Thirty percent of managers surveyed by ARI say they thought they could squeeze an additional 20 percent or more capacity out of their data centers by improving their ability to manage current resources. This dormant resource will have been allocated as a contingency to hedge against the risk of insufficient resources because there isn't enough insight into what resources are actually required. Improved management can enable data centers to operate much closer to their designed capacity, while managing risk and delivering the required availability.

For energy efficiency initiatives to be successful, data centers will need to be able to accurately benchmark progress and gather precise data on power usage within the data center. These metrics must be calculated with more precision and tracked over time, enabling accurate comparisons to be made and conclusions to be drawn from the analysis.

The Aperture Research Institute is dedicated to providing the market with current information and trends on enterprise data centers. The ARI plans to publish new research notes on a quarterly basis. To read the latest research findings, visit [www.apertureresearchinstitute.org](http://www.apertureresearchinstitute.org).



#### CORPORATE HEADQUARTERS

Aperture Technologies  
9 Riverbend Drive South  
Stamford, CT 06907  
tel 203.357.0800  
800.346.6828  
fax 203.357.0809

#### EUROPEAN HEADQUARTERS

Aperture Technologies  
288 Bishopsgate  
London EC2M 4QP  
United Kingdom  
tel +44 (0)20 7959 3024  
fax +44 (0)20 7959 3030

