

*I researched and wrote this white paper for a Bay Area high-tech company. Since the paper has not been published yet and is still protected under a NDA, I redacted the company's name and some key marketing text from one section.*

## **Responding to the Data Center Crisis: The Build or Buy Dilemma**

**By**

**Melanie Wise, Principal  
Wise Exposition**

### **Executive Summary**

Nearly half of US businesses will run out of capacity in their data centers within the next two years, and so they must decide whether to build new centers or colocate within multi-tenant centers. This white paper offers a framework for making this vital decision by discussing issues ranging from acquiring real estate and supplying power, cooling and security to managing the costs of future expansion.

### **The Data Center Crisis**

Businesses worldwide are about to face crisis points. Data centers, the backbone of IT operations, are nearing capacity. In a recent survey by Uptime Institute over a third of the respondents reported that their data centers would run out of physical capacity within 24 months.<sup>1</sup> In a similar study by Aperture Research Institute (ARI), 43% of the 100 enterprise data managers surveyed reported an immediate need for more physical space.<sup>2</sup>

In response to the decreasing amount of real estate within centers, more and more companies have implemented high density computing. ARI found that 87% of the organizations surveyed are using blade servers.<sup>3</sup> While blade servers offer more storage in a smaller footprint, they use

---

<sup>1</sup> Brill, Kenneth G. "Special Report: Data Center Capacity and Energy Efficiency Survey." Uptime Institute. March 14, 2008.

<sup>2</sup> "Capacity Crisis: Data Centres Running Out of Space and Are On Power Overload; High Density Devices to Blame." Aperture Research Institute. April 30, 2007.

<sup>3</sup> *ibid*

ten times more power than conventional servers and generate substantially more heat, which means increased cooling costs. San Francisco research firm, Datacenter Dynamics, recently reported that the average power usage in data centers has increased by more than 300% over the last ten years <sup>4</sup> while

Uptime Institute found that approximately 40% of their respondents would exceed their power and cooling capacity in two years.<sup>5</sup>

In short, nearly half of US businesses are at an IT crossroads. With their current data centers at space, power and cooling capacity, technology decision makers must decide whether to build new centers or buy colocation services. They must consider issues ranging from acquiring real estate and supplying power, cooling and security to managing the costs of future expansion.

The first step in determining how to meet these increasing technology needs is to carefully analyze the costs and benefits of building a new data center against those of buying colocation services.

### **Building vs. Buying**

Before beginning a new data center construction project, decision makers should consider the following:

#### **1. Time to Market**

It takes 2–3 years to plan and build a new data center. Many businesses will exceed capacity in their existing centers before a new center can even be constructed. On the other hand, if a business chooses to outsource, they can colocate within a data center almost immediately.

---

<sup>4</sup> Collett, Stacy. “How to Build It.” *Computerworld*. June 2008.

<sup>5</sup> Brill, Kenneth G. “Special Report: Data Center Capacity and Energy Efficiency Survey.” Uptime Institute. March 14, 2008.

## **2. Capital Investment in Real Estate and Core Infrastructure**

Building a new data center requires finding and investing in the appropriate site (one with proximity to fiber, power, and technical personnel) and investing in critical infrastructure. According to market analysis firm IDC, “new data center space costs at least \$1500 per square foot.”<sup>6</sup> Decision makers must consider not only these initial costs of real estate and construction, but also the full, ongoing costs of power, HVAC, security, technical support and maintenance. Of course, when businesses choose to outsource their data center operations, there are no construction costs. Also, when colocating, operating expenses are lower due to vast economies of scale.

## **3. Capacity**

Planning a new data center with adequate square footage, power and cooling requires knowing with certainty how much capacity the business will need in the next 3–10 years. If the center is too big, the cost of each rack will be higher. If the center is too small, the business will run out of space and lose the cost-savings realized through economies of scale. However, colocating in a data center offers scalability and flexibility. An organization can scale up or down to meet the demands of its business, while paying only for the space it uses.

## **4. Security & Asset Control**

The costs of installing and maintaining security systems in a new data center as well as managing those systems and personnel must be considered. The best data center providers make securing your network a top priority by providing multi-level, on-site security 24 x 365.

## **5. Redundancy**

Mission critical operations require redundancy. This can mean incurring the development and maintenance costs of building at least two data centers. Leasing space in more than one data center is a less expensive alternative.

---

<sup>6</sup> Thibodeau, Patrick. “How to Pay for It.” *Computerworld*. June 2008.

## **6. Staffing**

A new data center will require personnel to operate it. Such engineers are in high demand. In fact, *The New York Times* recently reported that it takes an average of eight months to find a qualified data center administrator. Such a short supply increases salary costs. According to the *Times*, a data manager “with only a degree from a two-year college can command a \$100,000 salary.”<sup>7</sup> However, when outsourcing, businesses can choose data centers that are already fully staffed. Economies of scale come into play once again, reducing the burden of increased salaries.

## **7. Core Business Focus**

Building a data center means shifting a company’s resources – its time and expertise – away from its core business. Outsourcing, however, frees up those resources.

## **8. Energy Demands**

Data centers are consuming energy at such an increasing rate that for the first time, the Environmental Protection Agency (EPA) is developing benchmarks to help measure their energy consumption.<sup>8</sup> In response, new data center construction projects must be designed for efficiency. While implementing green initiatives and conservation measures may save money in the long run, they may also increase the complexity and capital investment of a data center construction project. Some larger centers are consuming so much power that they cannot be fully supported by the local grids. In such cases, the data center construction project must include providing a primary source of power generation. When outsourcing, the colocation provider is responsible for solving these energy challenges.

## **9. Construction and Operation Costs**

---

<sup>7</sup> Lohr, Steve. “Demand for Data Puts Engineers in Spotlight.” *The New York Times*. June 17, 2008.

<sup>8</sup> Thibodeau, Patrick. “EPA Moves to Help Put Data Centers on an Energy Diet.” *Computerworld*. March 24, 2008.

After considering the issues outlined above, decision makers will need to estimate the costs of building and maintaining a data center versus buying colocation services. A recent study found that the average start-up costs for a SMB to build a data center are 1800% higher than those for buying colocation services, while the annual recurring costs are 130% higher when building versus buying.<sup>9</sup> Since each business has unique technology requirements, it's impossible to make standard cost comparisons. But the list of expenses below (while not comprehensive) provides a starting place for estimating the costs to a business. When considering a new data center construction project, businesses should plan for the following expenses:

- Room or Building Construction
- Electrical Systems
- Static Discharge Protection
- HVAC Mechanical
- Fire Suppression
- Physical Security Systems
- Cross-Connect Installation
- Cabinets
- Cage Build-Out & Installation
- Contingency
- Architect & Engineering Fees
- Project Manager Fees
- Annual Leasing Fees
- Maintenance
- Center Staffing
- Security Fees
- Property & Liability Insurance
- Interest on Capital Expense
- Property Taxes

---

<sup>9</sup> Baltimore Technology Park. "Case Study: Building Your Own Data Center vs. Buying Colocation Services." 2007

However, when colocating in a data center, only these expenses are standard:

- Cross-connect installation
- Cross-connect fee
- Cabinets
- Cage build-out & installation

### **Choosing the Best Data Center Provider**

If after considering all the costs and benefits associated with building a data center versus buying colocation services, decision makers choose outsourcing – the next step is finding a data center provider.

*[This section has been deleted as it is protected under a non-disclosure agreement.]*

### **Conclusion**

The build vs. buy decision is arguably the most urgent issue facing IT decision makers today. While each organization will have a unique set of circumstances and needs, the nine considerations previously discussed can provide a useful framework for making this critical decision. Most business will find that colocating is the most cost-effective solution while also providing valuable networking and peering opportunities. Businesses who choose to outsource should consider colocating with XXXX, the leading global provider of network-neutral data center and interconnection services.

## References

Brill, Kenneth G. "Special Report: Data Center Capacity and Energy Efficiency Survey." Uptime Institute. March 14, 2008.

Cane, Alan. "Is Your Data Centre Up to Speed?" *Financial Times*. April 2, 2008.

"Capacity Crisis: Data Centres Running Out of Space and Are On Power Overload; High Density Devices to Blame." Aperture Research Institute. April 30, 2007.

"Case Study: Building Your Own Data Center vs. Buying Colocation Services." Baltimore Technology Park. 2007.

Collett, Stacy. "How to Build It." *Computerworld*. June 2008.

"Data Centers Are Aging, Unsited for New Technologies, and Businesses Are Slow to Respond, Says New ARI Survey." Aperture Research Institute. December 17, 2007.

"Down on the Server Farm." *The Economist*. May 22, 2008

Grant, Jeremy. "Rush to Co-location Proves Every Microsecond Counts." *Financial Times*. June 2008.

Hamm, Steve and Kerry Capell. "It's Too Darn Hot: The Huge Cost of Powering – and Cooling – Data Centers Has the Tech Industry Scrambling for Energy Efficiency." *Business Week*. March 31, 2008.

Lohr, Steve. "Demand for Data Puts Engineers in Spotlight." *The New York Times*. June 17, 2008.

Mapp, Fred. "Building vs. Outsourcing Your Data Center." i/o Data Centers. 2007.

McAssey, Jim. "Do You Really Know All Your Space and Juice Options?" The W Group. 2008.

Norton, William B. "The Internet Data Center Build v. Buy Decision." Equinix. November 1999.

Price, Michelle. "Technology: Crunch Time for Data Centres." *The Banker*. May 2008.

Scheier, Robert L. et. al. "Your Next Data Center." *Computerworld*. June 2008.

Thibodeau, Patrick. "EPA Moves to Help Put Data Centers on an Energy Diet." *Computerworld*. March 24, 2008.

—"How to Pay for It." *Computerworld*. June 2008.