Philadelphia Technology Park℠

The Premier Data Center for Colocation in the Mid-Atlantic Region

Case Study: Building Your Own Data Center vs. Buying Colocation Services

Introduction

As the technology requirements of organizations continue to grow, so do their data center needs. Many businesses of all types and sizes must consider how best to manage their critical IT equipment -- whether to build and maintain their own data center or to buy colocation services from a data center provider.

Philadelphia Technology Park (PTP), a premier data center for colocation in the Mid-Atlantic Region performed a study that examines the costs for small- to medium-sized (SMB) organizations of colocating their key IT systems at a third-party data center versus building or expanding an in-house solution.

Because the technology needs of organizations vary greatly, and an SMB with "typical" IT needs does not exist, PTP chose to analyze a scenario in which a medium-sized, Mid-Atlantic-based company needs 20 server cabinets and plans to grow by 50% (for a total of 30 cabinets). Thus, 1,120 total square feet of space and 43 watts of power per square foot were estimated.

Results

PTP's study found that general room construction with a modern power design, including an advanced electrical system, Heating-Ventilation-Air Conditioning (HVAC), fire suppression and security systems, would cost about $562,000 to build. This figure rises to over $707,000 when costs such as contingency (10%), architect and engineering fees (6%) and a project manager consultant (10%) are factored in. In addition, annual recurring costs to maintain such a facility (utilities, bandwidth, maintenance, personnel, insurance, taxes) could total around $270,000.

For the same hypothetical company in this situation, PTP's research found that colocating IT infrastructure within a data center would necessitate roughly $39,000 in startup costs, with recurring annual fees estimated near $206,000.

Making a Build vs. Buy decision? Consider the following factors:

- Real Estate
- Core infrastructure
- Data center operations

Real Estate:

- Availability and cost
- Proximity to fiber and choice of providers
- Space size and scalability
- Commitment - contract vs. lease
- Time to market

Core Infrastructure:

- Heating, Venting, Air Conditioning (HVAC)
- Security components (manned, access, surveillance)
- Power infrastructure
- Fire suppression

Data Center Operations:

- The 3 P's - Pipe, Power, Ping
- Security
- Maintenance
- Monitoring
- Staffing

Build vs. Buy Results:

START-UP COSTS	ANNUAL COSTS
Build = $752,542.00	Build = $270,292.31
Buy = $39,300.00	Buy = $206,400.00

Buying colocation services can be a cost-effective alternative for many businesses.

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Assumptions

To illustrate an example for a medium-sized, Mid-Atlantic Region-based business, PTP's analysis focused on a company that currently needs 20 server cabinets (size 42-U) and plans to grow by 50%, for a total of 1,120 total square feet of space and 43 watts of power per square foot. Additional assumptions are indicated in the table below. Prices are as of December 2006 and assume a one-year contract at a Greater Philadelphia-area colocation facility, such as Philadelphia Technology Park.

Build vs. Buy: Start-Up Costs

Description	Buy Colo	Build in-House	Assumptions & Notes
General room construction	Included	$39,200.00	Full height 1hr walls 24 ft high = $3.80/sq ft; Carpet = $10.67/sq ft; Raised access flooring 2,000# = $16.00/ sq ft; Prime & paint walls = $0.40/sq ft; ACT 2x2 ceiling = $3.75/sq ft. Total approx. $35/sq ft.
Electrical System	Included	$326,000.00	Assumed used Cummins 300 kva generator ($35,000); dual 400 kva UPS ($150,000x2); 3-panel, 42-cir PDU panel ($18,000); 800A breaker ($9000).
Static Discharge Protection	Included	$16,800	$15/sq ft, includes building lightning protection system and conductive flooring. Reflects cost stated for Tate Access Floors. (source:http://www.processor.com/editorial/article.asp?article=articles/p2815/07p15/07p15.asp&guid=)
HVAC Mechanical	Included	$80,000	Estimated 43 watts/sq ft, so total "sensible tons of air" = 13.59 tons. A 15-ton CRU floor-mount glycol with compressors is $40,000 and two are desired. (source:http://www.abrconsulting.com/Custom_Code_Pages/calc4.php).
Fire Suppression	Included	$67,200.00	Estimated $20/sq ft for multi-zoned, dry-pipe, dual Inter-locked pre-action fire protection system. Estimated $40/sq ft for FE-25 clean agent fire protection system.
Physical Security Systems	Included	$28,000.00	Industry estimates can be as high as $50/sq ft. $25/sq ft is used here.
Cross-Connect Installation	$300.00	$300.00	T-3 line at $300 NRC
20 Cabinets with 120 volt/20 amp circuit	$24,000.00	$13,000.00	For Buy: $1,200/cabinet For Build: $150/cabinet + $500/circuit
Cage build out & installation	$15,000.00	$0.00	Estimated cost
Design/Build Cost Subtotal	**$39,300.00**	**$606,500.00**	
Contingency	N/A	$56,170.00	Estimated at 10%
Architect & Engineering	N/A	$33,702.00	Estimated at 6%
Project Manager Consultant	N/A	$56,170.00	Estimated at 10%
Start-up Cost Total	**$39,300.00**	**$752,542.00**	

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Build vs. Buy: Annual Recurring Costs

Description	Buy – Colo	Build in-House	Assumptions & Notes
20 Cabinets with 120 volt/20 amp circuit + HVAC	$204,000.00	$66,516.72	For Build: • Circuits: 120v * 20 amps = 2400 watts. Reduced by 20% to reflect breaker limitations, so 120v * 16 amps = 1920 watts. 1920 watts x 20 circuits = 38,400 watts. • HVAC: 1 watt of HVAC per watt consumed by IT equipment = 38,400 watts • Grand Total = 76,800.00 watts • 76,800 watts x 24 hours/day x 30.5 days/month = 56,217,600 Total Watt-Hours (Wh) • 56,217,600 Wh/1000 Wh = 56,217.60 kilowatt-hour (kWh) • If an average power company charges $.0986/kWh then... 56,217.60 kWh x $0.0986/kWh = $5,543.06/ month, or $66,516.72/year
Cross-Connect Fee	$2,400.00	$0.00	T-3 line at $200 MRC
Floor space	$0.00	$15,680.00	$14.00/sq ft for Class C leased office space in Philadelphia
Maintenance	$0.00	$14,000.00	Estimated annual cost (generator, batteries, fuel, HVAC)
Data Center Professional	$0.00	$85,000.00	Estimated annual cost for salary + benefits
24x7 on-site security monitoring personnel	$0.00	$15,000.00	Estimate for shared service of some type such as Brinks
Property & liability insurance on facility	$0.00	$1,000.00	Estimated annual cost
Cost of money	$0.00	$56,619.36	(8% on capital expense)
Property Taxes	N/A	$16,476.23	Philadelphia property tax rate - $2.328/$100 assessed value (2005 Fiscal year)
Annual Recurring Cost Total	**$206,400.00**	**$270,292.31**	

Conclusion

While some businesses may have requirements that dictate that they build and maintain their own data center, for most businesses, it makes financial and business sense to consider colocation at a third party data center. As the PTP study shows, the start-up and recurring costs of buying colocation services can be much more cost-effective than building and supporting an in-house data center.

Advantages of Colocation

• Significantly reduced initial capital outlay • No need to focus on technology changes and upgrades to infrastructure • Enhanced security • Flexibility to grow or shrink as needed • Reliable power and cooling • Faster time to market • No need to staff, monitor, and maintain the facility • Access to a variety of network service providers

Contact Philadelphia Technology Park: (800) 506-7993 or sales@philadelphiatechnologypark.com

PTP can help you make a decision about how and where to manage your business-critical IT systems.