



White Paper: Best Practices in Data Center Assessment

What's at stake?

As day-to-day business and compliance requirements place pressure on firms to secure and protect critical data and equipment, many companies face challenges about how to power, cool, and secure their IT systems.

Some large firms build and manage their own data centers. For most small and medium firms, colocating their servers in an independent facility is usually a better solution—such outsourcing avoids a sizable investment in infrastructure. It is often preferable to locating servers at the firm's own site, with the resulting impact on office space, power, and Heating-Ventilation-Air Conditioning (HVAC) systems, as well as any security, business continuity, or regulatory compliance issues.

Once the decision to collocate equipment has been made, a data center must be chosen. This is one of the most important decisions a business can make. From everyday performance to recovery in case of disaster, the stakes couldn't be higher: the health and survival of the business itself.

This white paper assumes a decision has been made to collocate. Now your search is on for the best data center to meet your needs. We shall discuss several factors that merit consideration, in order to help you make an informed decision that minimizes risks while maximizing reliability, all with an eye toward cost effectiveness.

Location: not too close, not too far

An ideal data center location provides both easy accessibility and a reasonably safe distance from potential local disasters at your business location.

Your data center should be near enough for your IT staff to make occasional visits. How often is "occasional?" That depends on your particular needs, and on whether you choose to take advantage of value-added services that allow data center staff to perform routine tasks (see "Remote Possibilities" sidebar). Certainly you want your people to be able to drive to the facility, spend a few hours, and drive back all within one business day.

However, a data center should not be too close to your offices. The reason: disaster recovery. If a natural or man-made disaster strikes, it's bad enough when your company's offices are closed; you don't want your data center affected, too.

Even if backup power keeps the data center running (as well it should), you may want access to the facility in the event of a disaster. Transportation to/from your offices may be difficult, so you ideally want your data center located far enough away for it to be available and accessible.

Key factors to consider in a data center:

- *Convenient location*
- *Multiple levels of security*
- *Carrier neutrality with cross-connections to the carrier of your choice*
- *Multiple bandwidth options, including dark fiber connectivity*

Every data center location comes with unique hazards. A facility may be in a region known for earthquakes, or perhaps in a flood plain. Perhaps it's too close to an electrical tower that generates electromagnetic interference. Make sure you understand how a data center's location can affect a server environment.

Also, as you are about to learn, location may impact connectivity options within and beyond the data center.



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Connectivity: keeping it flexible

Whether you require a private data network, access via the Internet, or both, your business needs high-speed, dependable connectivity, which ultimately means redundant high-speed connections.

Naturally, you want that connectivity at a reasonable cost. One thing to be aware of is a data center that is not carrier-neutral -- that is, a data center where only a select few providers are available and thus customers are limited in choice.

A carrier-neutral data center offers substantial advantages. A firm can typically enjoy the convenience of continuing the relationship with its current telecom provider. The firm can easily establish redundancy and create custom-designed connectivity. And the firm can obtain competitive pricing.

What about firms that build their own data centers? They may have a large up-front investment in infrastructure, but at least they enjoy cost-effective connectivity, right? Not necessarily. The facility may not be located at a hotspot for connectivity. That is, it may still be in area dominated by only one or two carriers. Now the company has both an expensive data center and expensive connectivity, making the cost situation even worse.

Of course, it's possible that the firm could arrange for—and pay for—their preferred carrier to run fiber to the facility, but that just makes the initial investment even greater. The ideal solution is to collocate in a data center that provides flexibility and cost-effective options—from facility-provided redundant, blended bandwidth, to multiple provider cross-connections, to dark fiber access.

The quality of the connectivity is a factor as well. Be sure to consider the fiber running into and out of the building, the fiber connections for the metropolitan area beyond—including redundancy for all fiber.

What percentage of uptime should you expect? Providers use Service Level Agreements (SLAs) to guarantee availability. These typically range from 99% to 99.999% availability. Look for the

SLA that best meets your needs and make sure you understand what it covers. Data centers that offer "five nines" or 99.999% are sufficiently confident in their service to guarantee a high degree of availability.

Remote possibilities:

You may wish to choose a facility that offers "remote hands" technical support. Such a service may be more economical than having members of your own staff travel to the facility to manage common system administration tasks.

Support may include simple services such as rebooting servers, power cycling equipment, visually inspecting indicator lights, and so on, as well as round-the-clock technical support. Tape rotation and storage, either on-site or off-site, may be offered as well.

More complex services may include installation of customer hardware and software, system administration to solve complex problems, and post-incident analysis and repair.

Power supply: capacity and redundancy

Your data center must have the power capacity to handle fully-loaded racks of equipment. Determine whether 20-amp, 30-amp, or greater power is needed, or if you want DC power. The electrical system of the facility should have redundant design and distribution—the technical term is N+1 redundancy—so that a problem within the facility doesn't interrupt your service.

It goes without saying that the entire data center should have a backup power supply—specifically, transitional UPS battery power during the switch to a gasoline- or diesel-powered generator, with automatic switching from primary to backup power as needed.

Ask how often the generator is tested, how long it can run without refueling, and if a refueling contract is in place.



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Environmental controls, fire suppression, flooding

Sufficient HVAC capacity is necessary to maintain a climate-controlled environment in which electronic equipment generates great amounts of heat. The facility should have multiple HVAC units that will maintain the proper environment even if one unit fails. Cool air is typically delivered through raised flooring with vented tiles.

Fire suppression should be designed for a data center. For example, a dry-pipe, pre-action fire protection system uses sprinklers attached to pipes filled with pressurized air and connected to a fire-detection device. When the device senses a fire, the air is released, allowing the water to flow through the pipes as with a wet-pipe system. If the device should fail, the sprinklers can still be activated by heat.

Flood protection should include a water detection system below the flooring, so that immediate measures can be taken in the event of flooding.

Security outside and inside

The security of the physical facility is as important as the security of your data within it. Certainly the facility should be monitored around the clock, either in person or remotely, with interior and exterior surveillance cameras, a silent alarm system, and automatic notification of authorities. The facility should be anonymous—that is, lacking signage that would attract attention. And the management should respect your company's request for confidentiality.

Access should be restricted to authorized data center personnel and clients. Within the facility, access to each tenant's hardware should be restricted as well; a combination lock is typically sufficient. Suites, cages, and/or cabinets may be locked.

Flexible space and cabling

Most data centers offer a variety of physical server space—cabinets, cages, and suites (any or all of which can be locked). You will want to inquire about availability and lead times, not

only for immediate needs, but also in case of future expansion.

Some facilities also offer the option of client work space built out to specifications, if you expect your visiting IT staff to need such space.

Power cables usually run under the floor (raised for HVAC purposes; see above), while data cables are typically routed through overhead trays.

Taxing issues:

Another factor that impacts data center cost is taxes. Your company will be installing a large amount of expensive capital equipment that typically has personal property tax consequences.

Some data centers are located in special enterprise zones that offer a substantial reduction in personal property taxes. Be sure to inquire about this and any other financial incentives for colocation in a particular area.

Cost considerations

The cost of colocation in a data center can vary widely, depending on such factors as availability in a particular market and the level of service provided. Some areas have a severe shortage of capacity while others may have new facilities. The difference in cost may warrant selecting a data center in a nearby city instead of one's own city.

Keep in mind that cost also includes connectivity, as explained in the section above. Ideally your facility will offer redundant, high-speed bandwidth and will be carrier-neutral for ultimate flexibility.



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Conclusion

In today's electronic world, every business is an ebusiness, which means every business has reason to locate critical hardware in a dependable off-site facility.

As stated at the beginning, choosing a data center is one of the most important decisions your business can make. Even a temporary outage at your office shows the importance of colocation.

Security, redundancy, reliability, scalability, choice of connectivity, and location—these are the keys to a complete colocation solution. If you wish to explore these issues further, we invite you to contact Philadelphia Technology Park, located in Philadelphia Navy Yard.

To schedule a facility tour or to obtain additional information, visit us online at:

<http://www.philadelphiatechnologypark.com>

call us toll free at **(800)506-7993**

or email us at:

sales@philadelphiatechnologypark.com

Additional Resources:

Philadelphia Technology Park offers other white papers to assist in your colocation and data center decisions:

- Business Continuity and Regulatory Compliance: How Colocation Can Help
- Making the Case for Colocation
- Building Your Own Data Center vs. Buying Colocation Services

For complimentary copies of any of these white papers in PDF format, visit:

<http://www.philadelphiatechnologypark.com/index/white-papers>