Best Practices in Business Recovery: Colocation or DRaaS?

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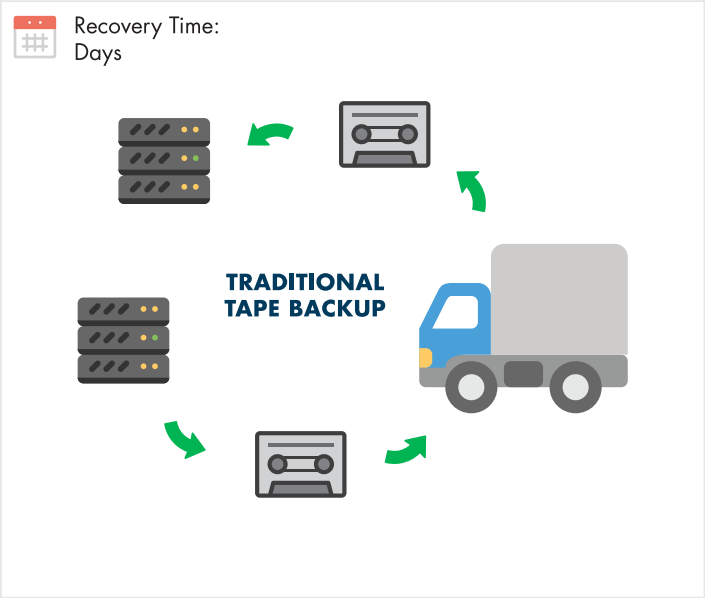
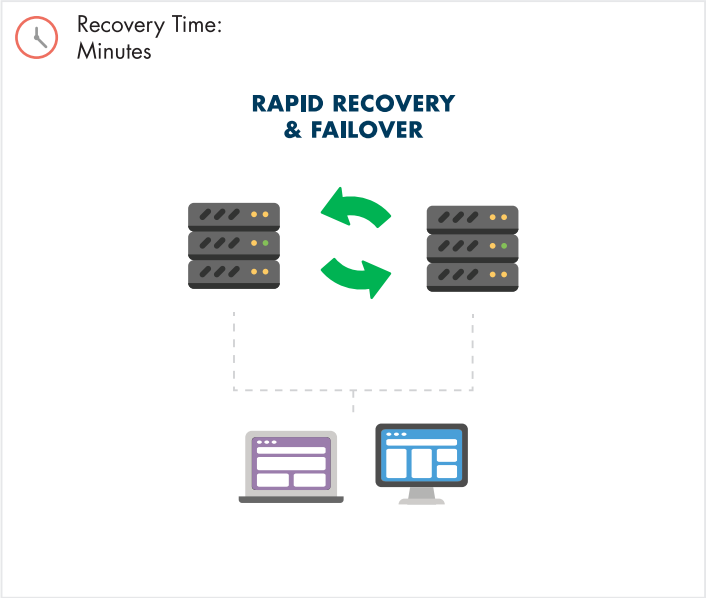
Introduction

In the not-too-distant past, protecting an organization's data meant shipping backup tapes offsite so that the tapes would be protected against data center disasters such as fire. Today this approach is completely inadequate. To remain competitive today, organizations must not only protect their data, but also ensure business continuity. In short, mission-critical workloads need to be able to failover to an alternate location where they can continue to run even if the primary datacenter is destroyed.



The old ways of tape backup are being replaced...



...by new technologies for rapid recovery and failover

What Are the Options?

Today there are a variety of options for failing workloads over to an alternate location. The two primary options when setting up a secondary disaster recovery facility are to use colocation or to use Disaster Recovery as a Service (DRaaS). Most of the other options that are available are variations of these two methods.

COLOCATION VS. DRAAS: WHICH OPTION IS BETTER?

Colocation could probably best be thought of as data center rental. There are a number of different colocation centers in existence and each has its own way of doing things. As a general rule, the colocation company provides data center infrastructure such as power, cooling, cabling, Internet connectivity, etc. The colocation center's customer rents either floor space, rack space, or physical hardware within the colocation center. Colocation is typically marketed as a cost-effective alternative to building a remote data center since the cost is shared by those organizations that lease space within the colocation facility.

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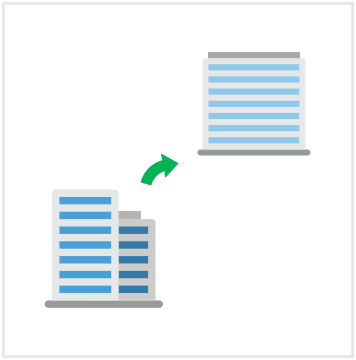
In contrast, DRaaS is a cloud-based disaster recovery solution. DRaaS customers replicate virtual machines (and in some cases, even physical servers,) to a cloud service provider in a way that allows the organizations to failover to and then run their virtual machines in the cloud in the event of a disaster.

Both colocation and disaster recovery as a service can be viable options for ensuring business continuity. When properly implemented, both solutions achieve the goal of allowing workloads to be transitioned to a remote location in times of disaster. Neither solution however, is 100% superior to the other in every situation. Although DRaaS is often the better of the two methods, colocation and DRaaS each have their advantages and disadvantages. As such, it is critically important for IT professionals to recognize the differences between the two approaches and to choose the option that is the best fit for their own organization.



A secondary DR site using colocation means renting space in another facility to host duplicate hardware and software

DRaaS means using the cloud as a secondary DR facility, but without having to duplicate hardware and software

The Benefits of Colocation

The colocation benefit that is most often cited is cost savings. Simply put, leasing space in a shared data center costs less than building your own data center. Another nice benefit is that someone else maintains the building, monitors power consumption and building temperature, and handles various other low-level maintenance tasks. There may be other benefits beyond cost savings, but these benefits are not applicable to every colocation facility because each provider has its own unique service offerings.

Organizations that choose to lease colocation space generally find that the colocation provider uses a secure facility and offers high speed connectivity. Some of the higher-end colocation centers may also provide redundant power, a dedicated support staff, and a solid service-level agreement (SLA). When it comes to colocation, however, you generally get what you pay for. Higher-end services might be a better fit for an organization's needs, but these services tend to come at a premium that can easily offset any anticipated cost savings.

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Colocation Costs and Challenges

In spite of the many advantages offered by colocation, there are also a number of cost factors and other challenges to consider prior to making the commitment to use a colocation service.

One challenge with using a colocation service is that it is a bit like leasing real estate. If, for example, your organization were going to lease an office building, you would typically have to commit to a multi-year lease. Colocation services are typically handled in a similar manner. Even though your organization isn't leasing an entire building, it is leasing space within the building. As such, the colocation service will typically require a multi-year contract.

Signing a multi-year lease might not be a problem in and of itself, but doing so can limit your options. If your organization needs to lease additional space within the colocation facility, that extra space might or might not be available when the need arises. If the space is available, there is a good chance that you will have to pay more for the space than what you are paying for your existing lease since some colocation services raise their rates each year.

Another issue with using a colocation service is that you may or may not get to choose your own hardware. Most colocation services require customers to purchase their own server hardware (although some services will lease hardware to customers at an extra cost). Even so, the colocation service may require your organization to purchase a specific make and model of server hardware.

If that seems odd, then consider that one of the benefits to using a colocation service is that someone else handles all of the mundane data center monitoring tasks. That being the case, the colocation service may insist that their customers all use a specific brand of server that is known to work with the out-of-band monitoring software used by the facility.

If your administrator likes HP servers, but their colocation lease requires the organization to purchase Dell servers you might at first regard this as a minor annoyance. However, there can be some very real consequences to the requirement depending on how the colocation environment is being used.

Assuming that your organization's goal is to be able to fail virtual machines over to the colocation facility in the event of a disaster, hardware selection can be an issue. Some hypervisors will only allow a virtual machine to fail over if the source and destination servers are using a common CPU architecture. If a colocation facility insists on a specific hardware type, then the hardware might make failover more difficult than it would otherwise be.

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The argument could be made that DRaaS providers do not allow their customers to select hardware either and that at least some colocation facilities leave hardware selection to the customer's discretion. It is important to remember however, that a DRaaS provider's entire business model is based around disaster recovery and the provider is therefore likely to be ready to help its customers work around any compatibility-related issues that could get in the way of a successful failover.

Another major disadvantage to colocation is that colocation is tied to a physical location. The colocation center's customers lease rack space or floor space within a specific building. This isn't necessarily a problem in and of itself. After all, the hardware has to be located somewhere. The problem is that very often the colocation center is located in close proximity to the organization's primary data center.

The average cost for a colocation service is somewhere between $1,500 and $2,000 per rack per month (not counting the cost of purchasing or leasing server hardware).

There are of course advantages to using a nearby colocation center. The biggest of these advantages is probably low latency, which can be very helpful if a production workload ever needs to be run in the colocation center. Even so, using a nearby colocation center puts an organization at risk of an outage in the event of a regional disaster. Hurricane Sandy provided a perfect example of this. Many New York-based companies use colocation centers located in New Jersey. Hurricane Sandy impacted both New York and New Jersey and caused significant outages.

Another disadvantage to colocation is the cost. Colocation is often marketed as a cost-effective alternative to building a secondary datacenter, and when viewed solely in terms of startup cost, colocations are almost always cheaper than building a new data center. Even so, colocations can easily cost more than a secondary data center in the long run.

If an organization chooses to build a new data center, there will always be operational costs but the building will eventually be paid for. Because colocation services are leased however, the colocation will never be paid for. In fact, the price of the colocation will likely increase each time the lease is renewed.

The cost of colocation services varies widely and there are a number of factors that can affect the cost. According to some sources, the average cost for a colocation service is somewhere between $1,500 and $2,000 per rack per month (not counting the cost of purchasing or leasing server hardware). The cost can be significantly higher in large cities such as New York or Chicago or in densely populated downtown areas with high real estate and power costs.

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Best Practices in Business Recovery: Colocation or DRaaS?

Determining the total cost of using a colocation center tends to involve a lot of work. Unlike DRaaS, which tends to use simple, flat-rate pricing, colocation costs can vary based on a number of different factors. Some of the factors that can impact the cost of colocation might include:

- Lease cost
- Resource consumption (some colocation facilities bill customers for their power consumption and Internet bandwidth usage)
- Hardware rental
- Fees for performing failover testing, overall maintenance, and emergency procedures including disaster declarations

TYPICAL COST FACTORS FOR COLOCATION

FACILITY	• IT Space • Power • Cooling
MAINTENANCE	• Staff • Service Fees
IT COSTS	• Hardware • Software • Connectivity

It is also worth noting that the money spent on leasing a colocation facility really only covers infrastructure (and in some cases utility) costs. Other data center related costs do not go away simply because a colocation facility is being used. According to Gartner[1]:

- Hardware refreshes, maintenance, and upgrades represent 33% of the total annual costs
- Personnel represent an average of 42% of data center TCO
- Software licenses account for 19% of the total costs
- Energy prices (which may be charged back to the customer) average $0.09 per kilowatt hour

Determining the total cost of using colocation can be somewhat difficult since each colocation center uses its own pricing model. For example, some colocation centers issue chargebacks for consumables such as power and Internet bandwidth consumption, while others include such costs into the lease.

Estimating the total cost of using colocation means examining the lease cost, cost for consumables, and the same types of costs (such as storage and servers) that are incurred in any other data center. Gartner[2] estimates the annual cost of hardware, software, staff, facilities, and BC/DR for a data center as:

- Storage - $4,876 per terabyte
- Wintel Servers - $8,260 per physical server
- Host costs per port - $111
- Data center switch costs per port - $500
- Unix Servers - $23,520
- Cost per OS instance - $6,349

These numbers obviously vary based on a number of factors including geographic location, hardware density, server type, storage type, and network topology. Even so, these numbers clearly illustrate the fact that the total cost of using a colocation center is far more expensive than "just" the lease price.

[1] Use a TCO Model to Estimate the Costs of Your Data Center, Gartner, 2012

[2] Use a TCO Model to Estimate the Costs of Your Data Center, Gartner, 2012

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In some situations, it may be less expensive to build your own data center than to use a colocation service. Data centers are typically categorized into availability tiers.

TIER	AVAILABILITY	AVERAGE ANNUAL DOWNTIME
1	99.6%	28.8 hours
2	99.75%	22 hours
3	99.98%	1.6 hours

A Gartner report[3] found that at an average colocation price of $1,500 per rack per month (including power), colocation is less expensive than building a new data center for Tier 2 and Tier 3, but the construction of a new Tier 1 data center is less expensive than colocation.

Disaster Recovery as a Service Benefits

On the surface, DRaaS appears to be very similar to colocation. Both solutions allow workloads to failover to a remote data center in the event of a disaster. There are also a number of similarities between colocation and DRaaS with regard to the technologies they used. Even if the service offerings are somewhat similar, however, the way that the services operate could not be more different.

One of the major benefits to using DRaaS rather than using a colocation service is that DRaaS is cloud based. As such, there are usually no major capital expenditures for hardware or software. With any disaster recovery platform, there may be things that you need on premise such as a cloud storage gateway, but you will not have to purchase servers to be used in the cloud provider's data center.

Another advantage to using a cloud-based solution is that the service is turnkey. Because you do not have to acquire hardware or provision servers, the service can be operational in a relatively short amount of time. Conversely, making effective use of colocation services requires extensive planning.

As a general rule, DRaaS tends to be much more flexible than colocation. Each cloud service provider has its own way of doing things, but many DRaaS providers allow their customers to choose the level of protection that they require. Some customers may require little more than remote backup capabilities, while others need the ability to fail workloads over to the cloud in the event of a disaster.

DRaaS providers also tend to provide their customers with dynamic scalability. Colocation services generally require customers to lease rack space for a predetermined amount of time. Consequently, the customer must accurately estimate their resource requirements so that they do not lease resources that they never use, but also do not lease insufficient resources. DRaaS on the other hand, is a cloud-based service and hardware resources can be allocated (or de-allocated) as an organization's needs change.

[3] Technology Overview for Data Center Colocation Services, Gartner, 2014

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Best Practices in Business Recovery: Colocation or DRaaS?

Perhaps the greatest benefit to using DRaaS is the expertise that comes with the service. While it is true that the more reputable colocation services provide their customers with 24 / 7 technical support, that support may only cover customer's ability to remotely access the server resources that they are leasing. In contrast, the support that tends to be included in a DRaaS subscription is much more specialized.

Colocation services rent rack space. Period. The service's customers can use this rack space for whatever purpose they choose. In other words, colocation services are suitable for general purpose IT. Yes, disaster recovery is one of the more popular uses for colocation, but it is not the only use. Conversely, DRaaS providers specialize in one thing – disaster recovery.

If an organization chooses to use a colocation center as a remote disaster recovery site then the organization's IT staff must have sufficient knowledge to be able to monitor the remote resource, perform failovers when necessary, recover data, and perform failbacks (among other things). Even though such tasks might not be overly difficult, it can be hard for the IT staff to remain proficient in handling such tasks if failovers only occur a couple of times a year.

A DRaaS provider's entire business model revolves around disaster recovery. The provider's staff deals with disaster recovery on a daily basis and therefore has the kind of expertise that can only come from frequent hands-on experience. If a customer needs help with disaster recovery then a DR specialist can assist them with their data recovery efforts. The DRaaS provider may even be able to assist their customers with disaster recovery planning.

DRAAS BENEFITS

No major capital expenditures for hardware/software

Turnkey service

Flexibility

Dynamically scalable

Predictable costs and more affordable

Level of support

Expertise of service provider

Another advantage to DRaaS is that pricing usually scales to match the size of the data center that is being protected. Like other cloud services, DRaaS customers are charged based on the resources that they consume. As such, DRaaS services are often accessible to small and mid-sized organizations that may not be able to afford the cost of a colocation service. DRaaS provides such companies with an affordable option for protecting mission-critical systems against disaster.

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Disaster Recovery as a Service Costs and Considerations

As is the case with colocation, there are some potential issues to consider prior to adopting DRaaS. The first issue isn't so much an issue with DRaaS itself, but rather with the way that some providers choose to implement it. Not all DRaaS providers are created equally. Some providers are known to overcommit their network resources. For example, a provider may have a hundred subscribers, but only have enough resources to handle fifty simultaneous failovers. The provider assumes that there is no way that all of their customers will be impacted by an issue simultaneously and therefore assumes that it is safe to overcommit resources. This isn't to say that you should avoid using DRaaS, but rather that you should make sure to use a reputable provider.

Another potential issue is geographic location. As previously explained, being tied to a specific geographic location can be the Achilles heel of colocation centers if they are not far enough away to insulate their customers from regional disasters. Smaller cloud service providers can suffer from the same problem. After all, the cloud service provider's data center has to be located somewhere. Because a DRaaS provider's entire business model centers around providing disaster recovery services to its customers, the DRaaS provider should ideally have at least two data centers that are located in different regions from one another to protect customers against outages.

Of course cost is also a consideration for those considering DRaaS. DRaaS is almost always less expensive than colocation both in terms of startup costs and monthly costs. The startup costs tend to be much lower for DRaaS than for colocation because DRaaS providers do not generally require their customers to purchase server hardware. The ongoing, month-to-month costs are often considerably less expensive as well because DRaaS operates on a different business model than colocation. While colocation involves a long-term lease, DRaaS is more service oriented. Most DRaaS providers bill customers based on the resources that they consume rather than billing customers for the physical real estate that they occupy.

Although DRaaS is generally less expensive than colocation, there are exceptions. For instance, if an organization ever has to fail over to the cloud environment or if they have to perform a large-scale recovery then the very nature of that recovery operation means that the organization will be consuming more storage, compute, memory, I/O, and network bandwidth resources than they normally would. When evaluating DRaaS providers it is important to fully understand their pricing model and how you will be charged for uses outside the normal operations and what additional fees, if any, are applicable in case of high usage and disaster recovery operations.

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DRaaS and other cloud-based services tend to comparatively inexpensive because most cloud providers rely on shared infrastructure. A cloud provider's server may handle workloads for multiple customers simultaneously, which keeps any one customer from having to pay for the full cost of the infrastructure. The disadvantage to this cost structure is that larger customers may have such a large footprint that it becomes impossible for them to share cloud resources with other customers, thereby driving up the price. Even in these situations however, the cost of DRaaS still tends to be lower than that of using a colocation service.

KEY CONSIDERATIONS WHEN CHOOSING A DRAAS PROVIDER

- Does the provider use flat-rate pricing for VMs or for host servers?
- Is the provider able to protect your physical servers?
- Does the provider charge you for DR testing?
- Does the provider charge for failovers in which you must temporarily operate workloads in the cloud?
- Is there a fee for data recovery operations?
- If a failover does occur, how easy will it be to fail back?
- Does the provider have multiple data centers, and where are they? Will my organization be protected against regional disasters?

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Which Solution Is Better?

No two organizations have exactly the same requirements, but in most cases DRaaS is going to be the better of the two options. When properly implemented, DRaaS and colocation provide similar capabilities. Both can be used for data recovery and can be configured to allow an organization to fail workloads over to a remote location in the event of an outage, but DRaaS tends to be significantly less expensive.

It isn't just the cost that makes DRaaS the better choice. DRaaS providers specialize in disaster recovery and are therefore able to help their customers with disaster planning and can assist with recovery incidents if necessary. Although colocation centers also provide their customers with support, colocation centers tend to be general purpose and the support staff may not necessarily have the same level of expertise as a dedicated disaster recovery specialist.

Another consideration is disaster recovery testing. Although DR testing is possible in a colocation facility, the DR team must be careful to not accidentally impact the production environment. Furthermore, many colocation facilities require disaster recovery testing exercises to be scheduled in advance and require that their own team be involved in the testing process. Naturally, this comes at a cost.

The use of a colocation facility may also require the purchase of additional software licenses. Replication software is not included as a part of a colocation facility lease, and must therefore be licensed. Licenses may also be required for server operating systems and you may need extra licenses to allow line of business applications to run in the colocation facility.

Finally, although colocation facilities can be used to host standby copies of your virtual machines, a synchronized VM copy might not fully meet your organization's disaster recovery needs. Additional hardware and software will likely be required in order to implement backups, data archiving, and data lifecycle management.

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COLOCATION VS. DRAAS: QUICK GUIDE		
	COLOCATION	DRAAS
CAPEX	High	N/A
Time to deploy	Weeks/Months	Hours/Days
Length of contract	Multi-year commitments	Monthly, quarterly, annual terms
Control over solution setup	High degree of control	Lower control
Recovery Time Objectives	Seconds (if setup involves fiber channel or similar connectivity to the colocation center)	Minutes to hours (depending on the SLA with the provider)
Ongoing costs	High	Relatively Low

About the Author

Brien Posey is a 14 time Microsoft MVP with over two decades of IT experience. Prior to going freelance, Posey was CIO for a national chain of hospitals and healthcare facilities. He has also served as a network engineer for the United States Department of Defense at Fort Knox, and has worked as a network administrator for some of the largest insurance companies in America.

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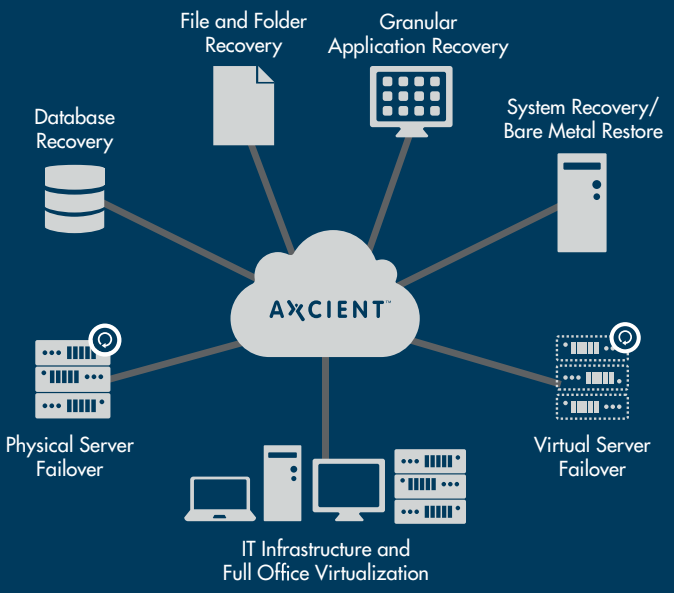

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