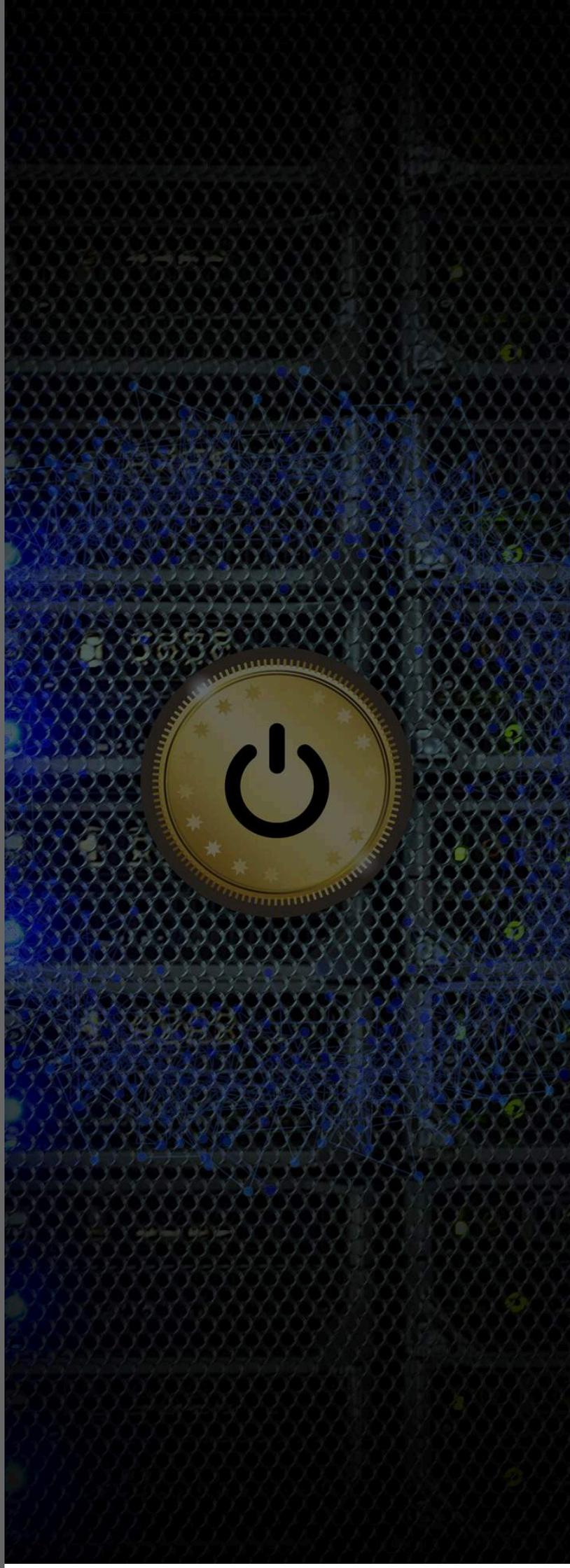# 5 things

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DATA CENTER

for

CRYPTOCURRENCY
AND BLOCKCHAIN
APPLICATIONS
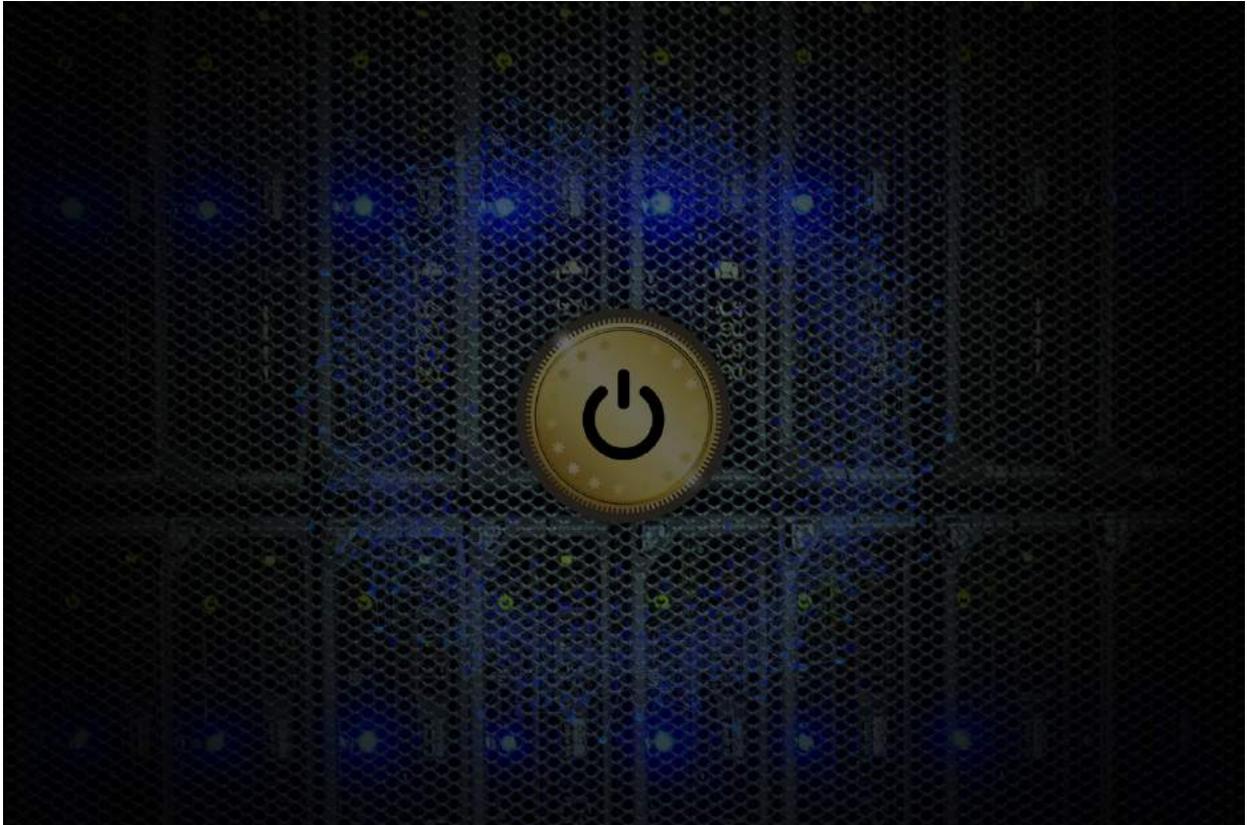
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5 Things to Look For in a Data Center for Cryptocurrency and Blockchain Applications

As cryptocurrency mining and blockchain infrastructure mature, it's becoming more important to think about how to scale operations to be more efficient. At this point, just about everyone has heard of Bitcoin, and Ethereum is increasingly mainstream with major financial institutions investing in Ethereum-based application development. Seasoned miners are now diversifying their portfolio with lesser known alt coins such as Litecoin, Monero, Zcash along with even more esoteric coins issued through ICOs (Initial Coin Offerings). Each coin has its own strengths and

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weaknesses, but one thing all these miners can agree onis you are going to use A LOT of power. Recent estimates from <u>Digiconomist</u> suggest that power costs comprise approximately one-third of the anticipated yearly income from mining. Simply put, power management is profitability. On a small scale, mining and blockchain infrastructure operations can be highly efficient, but profits in absolute terms are limited. Once these operations scale to a meaningful size, other crucial considerations such as stable network, efficient high-density cooling and physical security become increasingly important.

The right data center can help. In this guide we'll share 5 things that we think are critical for the miner looking to scale as they consider a data center as part of their strategies.

LOCATION

Data Center Co-Location, Location Location…..

We all know the old adage in real estate: location, location, location.

Ray Kroc the founder of McDonalds built his business not only by selling hamburgers, but by building his hamburger restaurants in the best locations possible. He famously said "We are in the real estate business, not the hamburger business".

So, is real estate location all that important in the digital age of internet, virtualized cloud computing and colocation?

You betcha, even if you are located out of state or overseas and you may never have the need to physically visit… here are a few reasons why location, location, location still can mean the most to you and your mining operation when considering Data Center Colocation Services.

- **Convenient Highway and Airport accessibility** - Look for data centers that are conveniently located near major cities, but not necessarily in the city. You can get great connectivity in a major city, but you can also get the same connectivity outside the major city (and outside the 30 mile blast zone – especially when considering Disaster Recovery). These data centers will generally cost less and give you the same services as the more expensive city data centers. Also, being outside the city allows for other conveniences like the ease from all the traffic and congestion.

- **Abundant availability of telecommunications infrastructure** - Rich high speed connectivity. That's what everyone wants. Look for data centers that offer lit telecom services such as AT&T, Cogent, Comcast, Level 3, Zayo and other providers such as municipal and state fiber

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providers. In addition, look for port connections speed up to 10Gig to multiple eyeball networks and content providers. You may not need all that bandwidth, but it shows the capability of the data center.

•**Location of utilities and access to power -** Ask about the option of the data center's multiple upstream power grid providers for the least in cost and highest in availability. Make sure they have plenty of available power at the data center.

• **Lowest risk for weather related natural disaster events-** Yes, there are hurricanes, tornadoes, cold, wind and snow, but none of these should negatively affect the operations of your mining operation if you colocate at the right data center. Look for strategically located data centers outside of a flood plain and earthquake study; engineered to withstand a direct tornado hit and ideally no chance of tsunami or hurricanes moving through the data center's location. Cold is good for data centers, and more moderate climates have an advantage over half of the year by chilling your services with the cold air from the great outdoors. All while working to save you money in the process!

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POWER/COOLING

A data center is only as good as its infrastructure.

A data center is only as good as its staff and infrastructure. American businesses lose up to 50 billion dollars annually due to power failures, and as cryptocurrency and blockchain mining operations continue to scale and mature, power concerns are top of mind. If you can't tolerate interruptions to your operation (and you can't) then redundant 2N utility feeds is a must. Remove power outage from your list of worries. A data center with 2N utility can provide electrically isolated independent circuits to your equipment and if wired correctly the odds of keeping your gear online are definitely in your favor at 99.999%.

POWER

Tier III and IV data centers are designed to handle a loss of one or more utility feeds for an extended period of time. How long? Does it even matter? The answer is absolutely! Storms can take down a power grid for days and even weeks. A good data center should have redundant standby generators, redundant fuel suppliers, and a minimum of 24 hours of fuel at full load. These generators should be load tested at least once a month to ensure they will work when needed.

Maintaining power to essential operations and equipment is critical. Always ensure the data center of your choice is utilizing double or delta conversion redundant UPS systems. A UPS acts as a filter between the electrical power grid and your IT gear cleaning up the power and delivering computer grade voltage to the DC floor. UPS systems are highly reliable but require specialized maintenance personnel to operate properly. Be

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sure the data center utilizes professional maintenance staff for inspections at least twice a year.

Data centers rely on batteries or kinetic energy storage modules (flywheels) to provide DC power to a UPS system when a utility failure occurs. These are not your typical car batteries and data centers can have hundreds or even thousands of them. They need to provide enough power to the UPS systems to allow the generators to start and connect to the critical loads. Always ask how often these battery banks are tested, inspected, and replaced. A serious data center is monitoring every battery 24/7/365 and will use a professional testing company a minimum of two times a year.

COOLING

Mining rigs aren't going to fit a typical data center's rack - are they willing to customize a solution for you?

Cooling methods can vary quite a bit in data centers. Choose a data center that operates an environmental condition that ensures high reliability while maintaining maximum efficiency. They should at a minimum follow the ASHRAE standards and guidelines for temperature and humidity control and have redundant cooling in place. This should ensure your gear is happy and should keep your expensive IT equipment within warranty standards.

Mining rigs aren't going to fit a typical rack layout most data centers use on a day to day basis. Are they willing (and capable) to come up with a custom cooling solution for your needs? Second to being down due to losing power is constantly losing GPUs from burning them out. Not only are you losing money by not optimizing your rig, but we all know the expense behind replacing them. That is, if you can even find them.

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CONNECTIVITY

The old adage "Time is Money" is still true in the cryptocurrency world, and now we can add "Your Network Connectivity is Money" to that. A solid network connection is a small but vital part of any mining or transaction environment. After spending tens or hundreds of thousands of dollars on a top of line mining operation, you don't want to be crippled by sub-par networking that leaves your miners disconnected and unable to get new work units. And if you're a business using cryptocurrencies or DAO contracts for your operations, you can't transact business if you can't connect. While you don't need much bandwidth for cryptocurrency operations, ensuring you have reliable bandwidth is worth the cost of a little research.

These low bandwidth high reliability needs play well into finding a data center with a strong network offering that can make your life easier by

You don't want your top-of-the-line mining operation to be crippled by sub-par networking that leaves your miners disconnected.

handling all the heavy lifting for you. Sure, it can be more expensive than just buying bandwidth, but saving the headache of running your own routers, arranging your own cross connects, and finding your own transit providers can easily make up the cost difference of doing it yourself and more. Ask questions about their infrastructure design, how to get hooked up redundantly on their in-house network, and how they obtain access to the wider internet. Look for a provider who has multiple physical connections to redundant providers, not just one that has redundant local connections. Reliability, resiliency, and redundancy are the keys here, so ask them to explain how they provide all three. Security can also be important, and a DDoS can be just as bad a

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down link in the mining business, so ask about what protective measures they take. Find out if they are willing to customize their offering or provide specific filtering to better protect your network, and if they can provide any dedicated anti-DDoS protections for your links. IPv6 can make connecting your miners easier, so inquire about support and allocation policies.

If you want to control everything yourself, and you might if you want greater certainty, higher levels of privacy, or just a desire to keep it all under your control, ask about which tier 1 (and possibly regional) networks are available at the data center. If you're already in other data centers or using one for office connectivity, are the same carriers available so you can leverage multi-site deals with those providers? Are there any on-site peering opportunities that you can take advantage of? If the data center provides internet services, find out how well they complement the direct offerings available in the facility. Do they provide BGP, and are there any specific costs associated with it? While their default offering is probably more expensive than the tier 1's you might go with directly, they can provide some additional redundancy with no effort on your part. Do they have any connection plans tailored to providing back up connectivity, out of band management, or bulk transit pricing? These can be well worth investigating, especially if the DC uses other carriers or transport than you plan on using.

In either case, a Data Center that understands more of what you're doing can better provide for your business. Do they have anyone on staff with cryptocurrency experience? Are they willing to help you customize things, or only providing out of the box solutions they provide anyone interested in rack space? As always, asking the right questions can help you determine a data centers value proposition, not just the bottom line figure. What they bring to the table and operate is as important as the price, so look into the

details that matter for your application and ensure they make sense for you.

PHYSICAL SECURITY

The key to physical security is to try to think like a criminal.

Physical security is one of the most important reasons to have your infrastructure in a data center. Some data centers are more secure than others. The key is to try to think like a criminal or someone who might have intentions of stealing your equipment.

Here are some things to look for and questions to ask when determining whether a potential data center has the right level of security.

- Are there any types of barriers from allowing entrance to the facility?

- Is there ample parking (not necessary for security, but important to know how much parking will cost you when need to visit the facility)?

- Is the neighborhood or location safe especially, when coming to the facility during the evening?

- Is there ample lighting outside?

- Is there anything outside the facility that could be potentially tampered with and cause issues inside the data center (Generators in the open, unlocked or faulty doors, etc.)?

- Is there another layer of security when you enter the facility (man trap or locked doors that need someone from inside the facility to open)?

- Is there a method of monitoring or sign in system for individuals entering the facility?

- Does the data centers have cameras (inside and outside)?

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- Are cameras located in all entry and exit points to the facility?

- Are there cameras inside the data center and how is it monitored?

- Does the data center keep video footage?

- If so, how long does the data center keep video footage?

- Are the cabinets lockable?

- Are there options to have increased security to gain access to the cabinet?

- How is access to certain critical infrastructure determined?

- How is access to the infrastructure only allow authorized personnel in the data center (such as the power and cooling infrastructure to the facility)?

These physical security questions can be answered through observation or asking the data center representative. It's important to know all the positive attributes and potential pitfalls related to security in data centers. If you're willing to put thousands of dollars of IT infrastructure in a data center, shouldn't you feel comfortable your equipment will be safe and secure?

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READY FOR ANYTHING

Meeting your needs should be the number one priority of a data center. Not just today, but in the future as well. Can the data center handle custom power and cab setups? Even if they can, well they be flexible and produce the optimal solution in what might not be the ideal situation? Can they see your vision and are they able to scale with you in the future? These are important questions to ask as they are directly related to your margins.

If there's a lack of attention to detail around a data center you're considering, beware.

A quick glance around a data center can tell you a lot about the data center's company culture. Are the bathrooms clean? What's the overall appearance of the place? If a data center isn't going to put effort into their own space, do you think they will with yours? If there's a lack of attention to detail around the data center then beware. This has most likely carried over to power, cooling, and network infrastructure and is indicative there are bigger issues beneath the surface.

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New Continuum Data Center is a multi-tenant, 80,000 square foot, purpose-built, Tier III+ data center in West Chicago, IL. We offer highly flexible colocation services to enterprises and small businesses, and our products range from basic colocation to private cages, private suites and secured data halls. New Continuum offers unique connectivity and peering solutions through our partnership with United IX, and our 2N power design can accommodate some of the highest density cabinet footprints. With efficient technologies and robust cooling infrastructure we can deliver leading edge PUEs. The New Continuum team has the experience and expertise to manage the needs of a diverse customer base. To explore how we can help you or arrange a complimentary tour, please visit www.newcontinuum.net, or call 877-432-2656.

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