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The Growing Energy Demands of Data Storage

By Rob Bellingham on May 10, 2022



Awareness provides the power to adapt for the better. As digital becomes ever more immersive, there is a hidden cost of technology directly impacting the environment around us. The energy demands of modern-day data storage are incredibly vast. The question is: How can we address the consequences of this?



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Data is critical to delivering excellent customer service. By storing increasing amounts of consumer data, companies can offer a richer experience with improved flexibility and accessibility. In many cases, consumers now expect this level of service as standard.

Storing and exchanging the 2.5 quintillion bytes of new data created every day requires an immense amount of electricity and, rather bizarrely, water – so let's look at how and why that is.

Data Storage Options

There are two fundamental ways that a company stores its data. With the traditional local storage method, it is stored on their own servers, hard disks, and infrastructure. This method requires energy and – crucially – budget and manpower to maintain.

Alternatively, the more modern option is to outsource data storage to a [cloud](#) provider. This provides businesses with massive financial savings and efficiency gains, allowing them to store vast amounts of data on accessible devices.

It's a term that is used across many applications, but what actually is the cloud?

What Is the Cloud?

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As more firms make the switch, this amount is forecasted to grow to \$380 billion by 2028.

What Are the Differences Between Traditional Data Storage and the Cloud?

Although both traditional and cloud methods store data, they do so in different ways. Traditional data storage is usually based on-site and needs electricity for:

- Physical hard disk drives
- Servers
- Network switches
- Routers
- Computer monitors

With traditional infrastructure, everything – from maintenance to updates and troubleshooting – is the owner's responsibility. This is often a huge and onerous task.

Choosing the cloud for data storage, on the other hand, does away with this maintenance requirement. By working with an established cloud provider, companies effectively outsource the purchasing and upkeep of their data storage equipment.

They also benefit from the provider's state-of-the-art technology and security of service level agreements – providing backup should something go wrong.

Cloud providers can offer these guarantees because they run data centers optimally. They are not NAS servers sitting in dusty cupboards (we've all seen them). Data centers have thousands of servers and storage devices sitting in rows. They are all kept in highly managed environments that ensure the correct power, temperature, and humidity for peak performance.

While these conditions safeguard devices, the vast amounts of energy being used for the data storage comes at an environmental cost.



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- 43% to power servers
- 43% on cooling, redundancy, and power provision systems

A Google data center in Arizona uses over 1 million gallons of water a day for cooling its servers. Consequently, the future could lie elsewhere as RND projects assess the viability of building data centers underwater (how very James Bond).

With only 11% of power being used to power data storage devices, it's only natural to question the green credentials of data centers.

Is the Energy Consumption Worth It?

To understand how data centers might reduce their carbon footprint, it's important to ask:

- Will customers accept an inferior product or less robust quality guarantees?
- Will companies reduce the amount of data they store?
- Will cloud providers and data centers offer a worse-quality product to reduce electricity consumption?
- Are there currently any viable alternatives in this data-hungry world?

The answer to all of the above is likely "no." Without rapid unforeseen advancements in CPU and disk storage technologies, power consumption will remain high.

That being said, it is important to mention that there have been significant advances in data hardware and storage techniques in recent years. As data centers move away from SATA to NVMe, using SSD hardware means better performance, less energy, and more reliability.

So, what is the answer to reducing the energy requirements for our data storage further? Green data centers are an obvious solution.

A green data center aims to achieve carbon neutrality by using only renewable energy, managing its



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As such, data storage needs will continue to increase, testing providers' green credentials. With emerging technologies like [artificial intelligence \(AI\)](#) and cryptocurrency adding to the enormous demand for energy resources, green data centers will become even more crucial for the planet.

However, as individuals, there are steps we can all take that can minimize the negative impact of this on ourselves and the planet. Removing the waste of email clutter, deleting unimportant photos saved to the cloud, and being mindful of your own personal data collection online are all small ways we can reduce our personal data waste.

Meanwhile, initiatives such as [Digital Cleanup Day](#) really help to demonstrate the simple steps we can make as individuals by simply being more organized with our data.

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