

How Green is the Internet?

The Carbon Footprint of Cloud Computing

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Introduction

Cloud computing has revolutionised the digital world, enabling seamless data storage, processing, and communication. However, its environmental impact is often overlooked. Data centres, the backbone of cloud computing, consume vast amounts of electricity and contribute significantly to global carbon emissions. This article examines the carbon footprint of cloud computing, backed by data, and explores sustainable solutions.

Energy Consumption and Carbon Emissions

Data centres currently consume about **1% of global electricity demand** and contribute approximately **2% of global greenhouse gas emissions**. With the rapid expansion of cloud services, emissions could reach **1.9 gigatonnes of CO₂ per year by the end of 2025**. To put this into perspective, cloud computing emissions exceed those from commercial flights, which account for about **2.4% of global emissions**.

The Environmental Costs of Data Centres

The energy-intensive nature of data centres stems from two primary factors:

1. **Server Operations** – Millions of servers run continuously, requiring substantial electricity.
2. **Cooling Systems** – Maintaining optimal temperatures for servers demands additional power.

A study by the French think tank, [The Shift Project](#), shows that watching **30 minutes of Netflix** generates approximately **1.6 kg of CO₂**, equivalent to driving **6 kilometres** in a car. Cryptocurrency mining, another cloud-based activity, has a carbon footprint comparable to that of **New Zealand**, producing **36.95 million tonnes of CO₂ annually**.

Efforts Toward Sustainable Cloud Computing

Tech giants are taking steps to reduce their environmental impact:

- **Renewable Energy Adoption:** Companies like Google and Microsoft are transitioning to carbon-neutral data centres powered by solar and wind energy.
- **Energy-Efficient Hardware:** Innovations in server technology reduce power consumption.

- **Carbon Offset Programs:** Some cloud providers invest in reforestation and carbon credit programs to balance emissions.

What Users Can Do to Help

While major cloud providers work towards sustainability, individuals and businesses can also take action:

- Choose cloud services committed to green energy policies.
- Optimise data storage and usage to reduce demand on data centres.
- Support policies promoting sustainable IT infrastructure.

Conclusion

Cloud computing is an indispensable part of modern life, but it comes with environmental costs. The industry must continue innovating to balance efficiency with sustainability, and users must remain aware of their digital carbon footprint. The future of cloud computing should not only be fast and reliable, but also green.