

# Powering a data center

Data centers are expected to run 24/7, meaning they need a lot of power and water to be maintained. Data centers have three parts: server halls, power supply and cooling infrastructure.

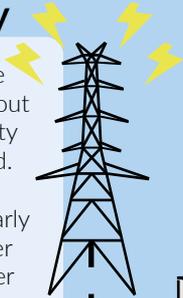
## Power supply

Data centers are responsible for about 1% of all electricity used in the world.

Examples of regularly used utility power sources are power grids, solar energy, wind energy and diesel fuel.

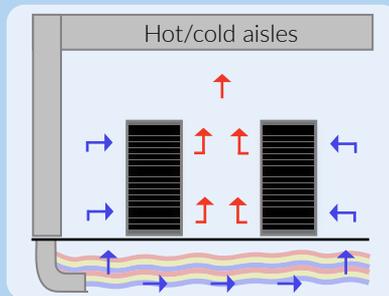
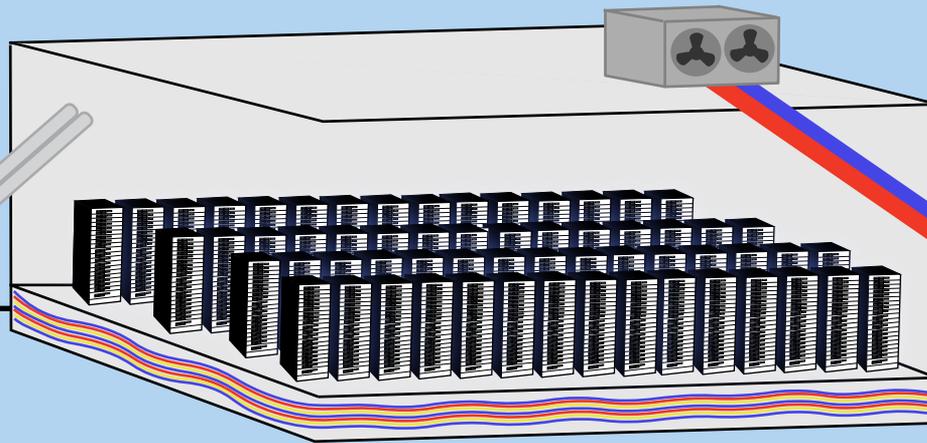
In 2022, global data center energy use was 240-340 TWh. One terawatt is enough to power the U.S. for 2.5 days.

The generator yard, often diesel-powered, creates a redundant power source to offset the demands of data center energy requirements.

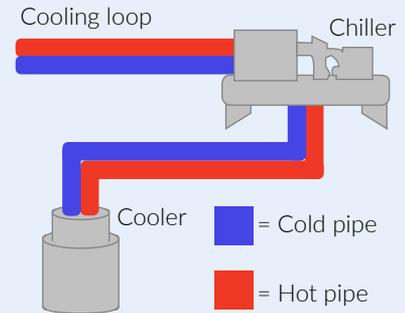


## Server hall

The server cabinets, which hold all the data being processed, stand in rows with thousands of racks. Servers are responsible for processing computerized functions like requests on websites, meaning searching for a restaurant or online shopping. These rows are prone to overheating, requiring massive amounts of water and energy to stay cool and functioning.

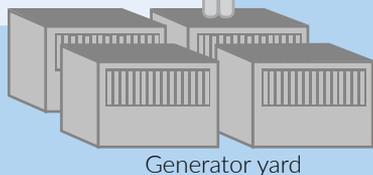


The implementation of hot and cold air aisles is crucial to the cooling of the computer chips. Cold air is filtered through the floor, while hot air is drawn through the cooling loop. Most server halls are built on raised floors for more effective circulation of treated air as well as improved cable storage.



## Cooling Infrastructure

Cooling distribution units utilize water to regulate, maintain and distribute coolants to keep machines from overheating. In most data centers, water runs through a cooling loop connected to the HVAC system, through a chiller and into the industrial coolers. Data center chillers are capable of processing 1,050 tons of water compared to the average residential air conditioners that handle 3-5 tons of water.



Generator yard