BullSequana Edge

BullSequana Edge sets paths to a low carbon digital future

Atos

In the coming years, all companies are likely to be subject to strict rules on CO₂ reduction. In this context, they will have to work to reduce their energy footprint. It is an opportunity to develop a susbtainable and resilient business while reducing energy expenditure. To address this challenge, the use of Edge Computing can be effective in reducing the energy footprint of digital.

4 reasons why BullSequana Edge is an eco-friendly server

Maximum inference capability while maintaining a minimum power consumption

AtoS
75w T4 card

Competitors
300w RTX card

Reduce the pressure on network bandwidth

Data processed...

in the cloud
0.8 kWh/GB

at the edge
0 kWh/network

Indeed, BullSequana Edge combines a large IT capacity in a small volume, with a power usage that will not exceed 380W with its two T4s GPU cards included. In this way, the machine offers high computing power with minimum energy consumption.

The inference capacity of the machine, thanks to two AI acceleration capabilities provided by Nvidia T4s and its low power supply, which offers a power density around 1.73 Tops/w[1] (Tops is TeraOperations per second, results provided from int8 test from Nvidia).

In contrast to RTX 5000 inference card, used in some servers, with a ratio about 0.67 Tops/W.

In addition, the singular performance/power consumption ratio allows operators to deploy multiple applications in the same machine. Thus, only one BullSequana Edge server is required for the same set of operations in comparaison with an edge server composed of an RTX card. The overall consumption of energy will be lower with a fleet of BullSequana Edge than with competitors edge servers without T4 Nvidia GPUs.

Also, BullSequana Edge enables parallelization solutions such as software containerization. It means that one BullSequana Edge server can combine a larger set of operations than old legacy machines, which were previously used for each application at low capacity.

Moreover, BullSequana Edge can be easily implemented in container racks to replace the old legacy infrastructure, which is less optimal in terms of energy consumption.

In a digital ecosystem, it is relatively difficult to accurately measure the amount of energy used by the network.

Nevertheless, a few serious studies have been conducted to determine an order of magnitude[2]. This study from The Shift Project explains that the transfer of 1GB of data through the mobile network would consume about 0,8 kWh of energy. Generally, this network consumes more than cable and wifi networks, which would be closer to 0,3 kWh for 1GB of data transfer. These figures are not an absolute truth, can vary depending on many parameters, but it can give an idea of what the network consumes. Unlike a remote private cloud system, the Edge can be installed on-site, directly in the same network than the sensors used to collect the data. This means that the pressure on bandwidth will be lower. It will be possible to conserve bandwidth between a production site and a private cloud system for other uses or even not use it at all and reduce the energy consumption of the network infrastructure.

[1] Nvidia Turing Architecture whitepaper, 2018
[2] Lean ICT Materials, The Shift Project, 2018

Save space on the floor & cooling-less infrastructure

Works with its efficient stand-alone system

A significant part of the energy of companies is due to the consumption of their digital ecosystem. Machine rooms often take up a large amount of space in which IT-related electricity consumption does not account for the entire energy balance of the room. For example, data centers use additional power sources such as an external cooling system.

Several studies have been carried out on the PUE of company-run data centers.

One of the most complete is conducted every year by the "Uptime Institute"[3], which surveys thousands of companies worldwide. In 2019 the average PUE was around 1,67 which means that for every 100W of IT, companies used 67W of auxiliary power such as air conditioning.

Thanks to its independence from these other external systems, the Edge Servers can solve this problem: Edge Servers are coming with relaxed operating temperature specifications (0°C to +48°C), which means that the operator does not need to deploy an external air conditioning solution.

Edge as an opportunity to spare energy costs

Decentralized architectures can save between 14 and 25% of energy consumption compared to centralized architecture

When data is much closer to where it is generated, it consumes few energy as data doesn't travel back and forth to the central cloud.

Additionally, studies have been conducted to compare the energy impact of different architectures (Edge computing and centralized architectures).

The results show that under certain conditions, decentralized architectures can save between 14 and 25% of energy consumption compared to a completely centralized architecture[4].

Less energy consumption means less energy-related expenses. Giving the energy cost saving is difficult to obtain since the electricity bill can vary depending on the country in which the energy is consumed.

For example, if we consider an Edge that runs 24/24 7/7 a year at a 60% load, then it will have cost about 300€/year of electricity in France and 400€/year in Germany.

Nevertheless, in overall cost savings in decentralized architectures are higher than in centralized systems wherever it is implemented.

In this context, the use of Edge Computing seems to be relevant and can save a significant part of the consumption and thus reduce the bill.

[3] Uptime Institute's Data Center Survey, 2019
[4] Ehsan Ahvar, Anne-Cécile Orgerie, Adrien Lebre. Estimating Energy Consumption of Cloud, Fog and Edge Computing Infrastructures. IEEE Transactions on Sustainable Computing, IEEE, 2019, pp.1-12. ff10.1109/TSUSC.2019.2905900ff. ffhal-02083080f

About Atos

Atos is a global leader in digital transformation with 110,000 employees in 73 countries and annual revenue of € 12 billion. European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos|Syntel, and Unify. Atos is a SE (Societas Europaea), listed on the CAC40 Paris stock index.

The purpose of Atos is to help design the future of the information space. Its expertise and services support the development of knowledge, education and research in a multicultural approach and contribute to the development of scientific and technological excellence. Across the world, the Group enables its customers and employees, and members of societies at large to live, work and develop sustainably, in a safe and secure information space.

Find out more about us
atos.net
atos.net/career

Let's start a discussion together