

Advancing capacity planning at big xyt

As concerns over climate change and its adverse effects grow, innovation and technological change have been at the forefront of solutions for reducing greenhouse gas emissions. **big xyt** – a member of Sustainable Trading – is working to improve trading technology efficiency, with its approaches to saving energy and resource use from servers, through hardware monitoring and virtualisation.

Common practice: Trading and hardware overconsumption

The trading industry's complex systems and high-intensity technology use large amounts of energy and natural resources, at times unnecessarily. Many servers are idle or in reduced performance states for much of the time – with average utilisation between only 10 and 20%.¹ Current practice in the financial markets trading industry normalises adding more hardware when a capacity issue is identified, resulting in further increases in resource use. Most Greenhouse Gas emissions that are released from a server's lifecycle are associated with server use, but they are also released in production, manufacturing, and disposal phases², creating negative impacts through embodied emissions. Generally, it is most efficient and less resource-intensive to run workloads on as few servers as possible.³

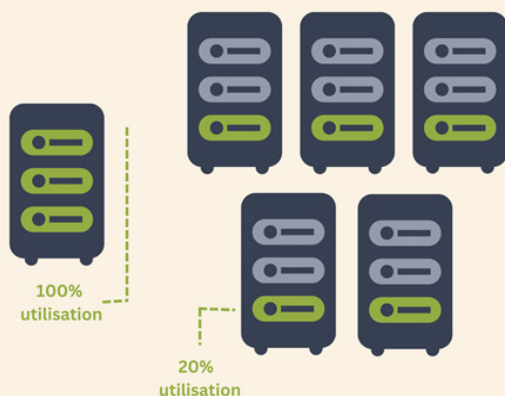


Figure 1: In a simplified example, two scenarios are presented. One uses 1 server, and one uses 5 to perform the same tasks.

Setting Best Practice around capacity planning

To address issues surrounding energy and resource waste in the industry, Sustainable Trading participants formed a working group which focuses on practices for reducing the environmental footprint of trading technology. One of the groups' objectives was to minimise waste through hardware capacity planning – including a Best Practice to ensure the smarter and more efficient use of servers. As a member of the group, big xyt was a part of the development of the practice and is a noteworthy example of its implementation.

Capacity planning at big xyt

As a company, big xyt processes large amounts of data, and as data volumes increase over time, more computing power and storage is required to handle them. This issue exists in many industries and a common solution is to increase available computing power (i.e. buy more servers). Software and service usage changes over time, and there is a tendency to upscale if there are not enough assets. However, in practice, hardware is very rarely scaled down when the usage drops. In alignment with the Sustainable Trading Best Practices, big xyt has a distinctive approach to minimising energy and resource use: they focus on hardware pools and monitoring to allow for effective re-use, re-purposing or decommissioning of the hardware.

1) Hardware monitoring

big xyt has been able to maintain efficient practices by monitoring their hardware and subsequently updating their software. Through monitoring and retention of historical information on processing times and resource consumption, big xyt can identify if an increase in required computing power or storage is in line with increasing data volumes. Identification of applications or workloads that are generating a large amount of load – and therefore consuming excess resources (e.g. CPUs) – allows for big xyt to find a less resource-intensive solution or to improve the efficiency of the software code.

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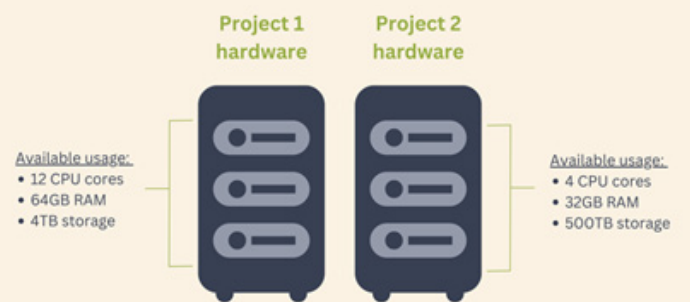
Focusing on the efficient use of servers has had a positive impact across the business, as optimising server usage not only saves costs but also improves efficiencies. By standardising the technology stack, timelines for project delivery and upgrades are significantly reduced, and the improved infrastructure ensures costs remain stable and predictable when additional workloads or new data centres are required.

Wieslaw Nosal, Co-founder and COO, big xyt

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2) Hardware virtualisation

big xyt has also implemented hardware virtualisation with the use of containerisation and Kubernetes, where a shared hardware pool is re-used across different projects to combine workflows. An example scenario can be seen in Figure 2. By documenting the requirements for both projects, it becomes clear that the hardware required for Project 1 could be shared, making the hardware from Project 2 obsolete or re-usable. As a result, fewer machines are used to perform the same amount of work, resulting in reduced resource use and a lower environmental footprint.



INDICATIONS	PROJECT 1 REQUIREMENTS	PROJECT 2 REQUIREMENTS
CPU	3-4	2-3
RAM	40GB	~8 GB
STORAGE	2TB	0 GB
WORKLOAD TYPE	Overnight batch	24/7 microservice

In another example, a project requires “high availability” for a service implemented by software. In this circumstance, it’s common for three operational nodes (servers) to be used to ensure availability. However, at big xyt, the shared resource pool allows high availability to be provided for multiple services from a reduced server footprint rather than requiring triplicated hardware for each service. While this requires a specific approach to software design to make sure that the service can run on distributed servers, the benefits can be significant, as virtualisation can result in the need for fewer servers. Combining different services also allows for the introduction of efficient redundancy and flexible high availability.

Through its innovative approach to capacity planning, big xyt stands out as an environmentally conscious organisation in the financial markets trading industry. Co-founder and COO of big xyt, Wieslaw Nosal, shares that “focusing on the efficient use of servers has had a positive impact across the business, as optimising server usage not only saves costs but also improves efficiencies. By standardising the technology stack, timelines for project delivery and upgrades are significantly reduced, and the improved infrastructure ensures costs remain stable and predictable when additional workloads or new data centres are required.” big xyt’s contribution to the development and implementation of the Sustainable Trading Best Practices can serve as guide and inspiration for others in the industry to initiate positive change.

¹ <https://journal.uptimeinstitute.com/server-efficiency-increases-again-but-so-do-the-caveats/>
² <https://www.ibm.com/downloads/cas/75EXOKDJ#:~:text=The%20analysis%20of%20the%20carbon,or%20end%2Dof%2Dlife>
³ <https://greensoftware.foundation/articles/sustainable-systems-mastering-the-tradeoff-between-high-server-utilization-and-ha>

About Sustainable Trading

Sustainable Trading is a non-profit membership network, dedicated to transforming environmental, social and governance practices within the business operations of the financial markets trading industry. The organisation runs a series of workstreams where firms contribute to the development of best practices for operational challenges faced by the industry. Through adoption of the best practices and utilisation of a standardised measurement framework, members can improve their businesses, demonstrate progress towards E, S & G goals and positively impact the wider industry. To find out more, visit: sustainable-trading.org

