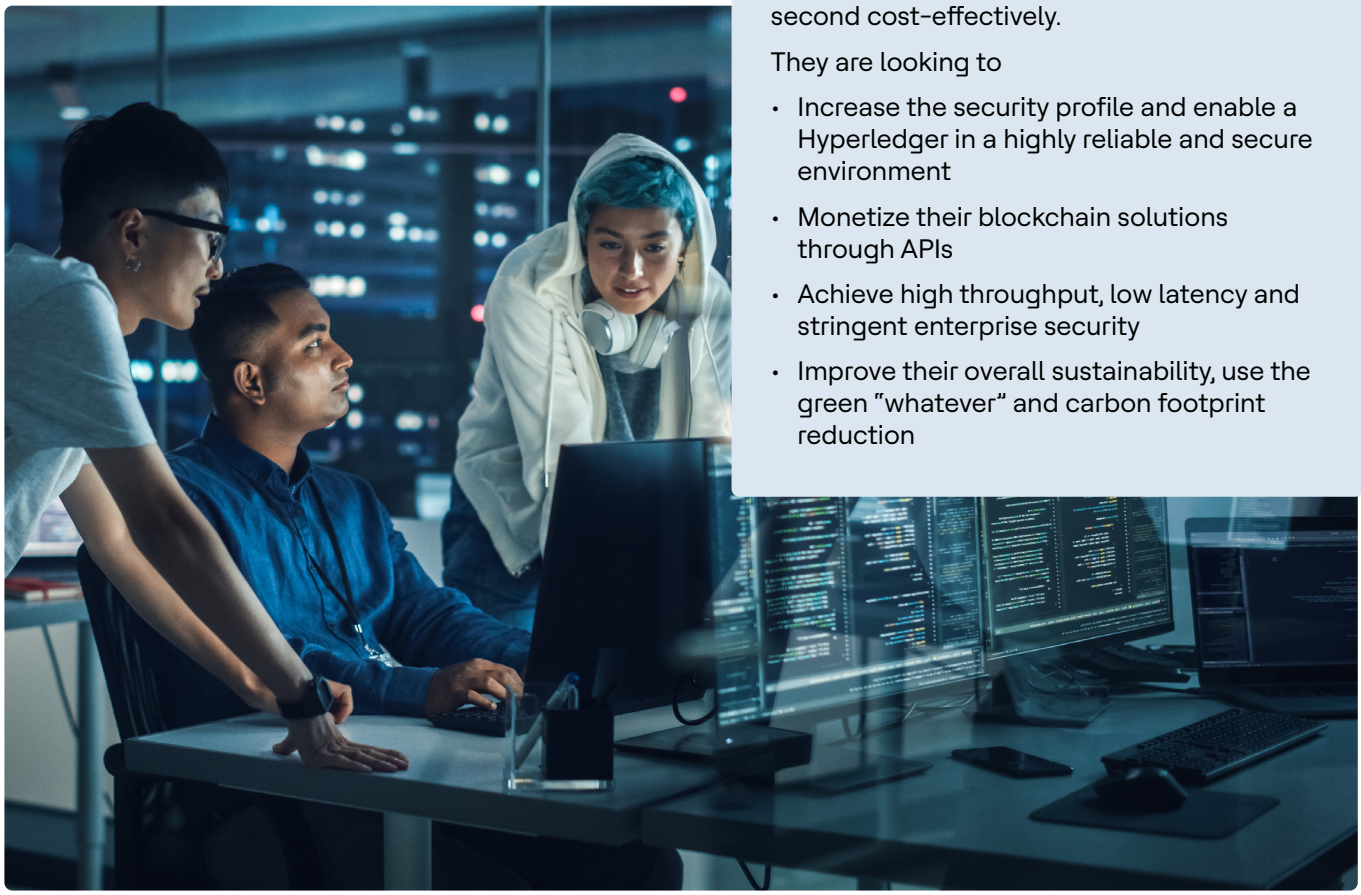
HCLTech | Red Hat | IBM

Enabling **high-speed** blockchain transactions cost-effectively

An innovative software house transforms business operations with next-gen technology

About the customer

The customer is an innovative software house working on Fintech, blockchain and AI, founded in 2018. They are a leading blockchain technology start-up company based out of Sweden.



Customer needs

The customer is looking to run a modern application with high IO requirements on a multi-cloud container platform to enable high-speed blockchain transaction rates per second cost-effectively.

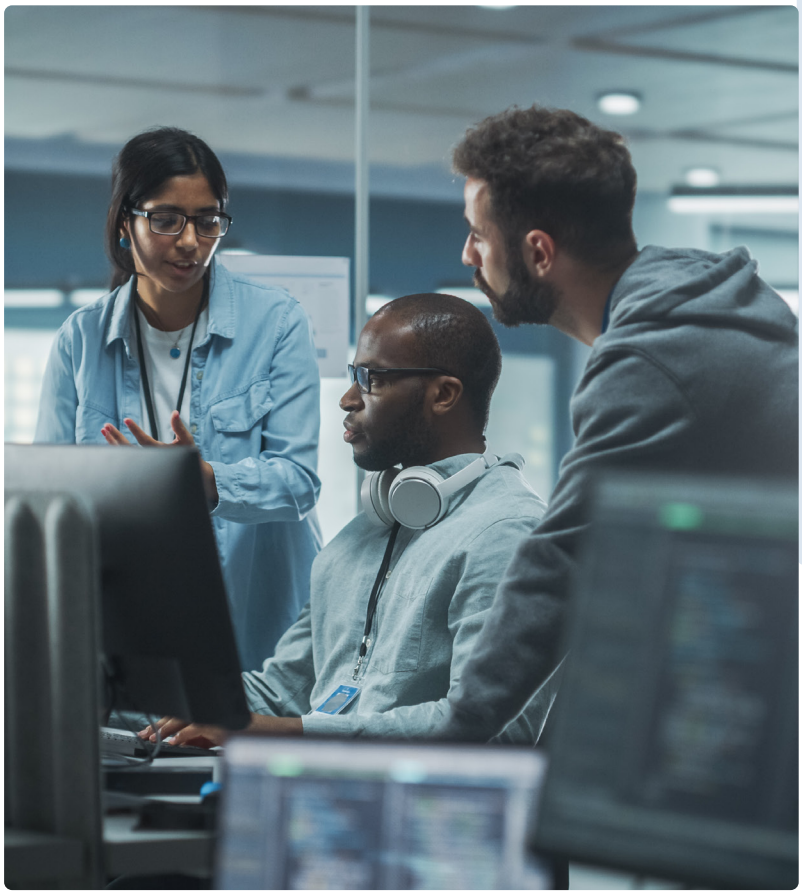
They are looking to

- Increase the security profile and enable a Hyperledger in a highly reliable and secure environment
- Monetize their blockchain solutions through APIs
- Achieve high throughput, low latency and stringent enterprise security
- Improve their overall sustainability, use the green "whatever" and carbon footprint reduction

Our solution

HCLTech understood the customer requirement in terms of performance and security and suggested the Mainframe as the underlying infrastructure to run a container platform for applications with high-performance needs.

HCLTech understands that the mainframe is not just a legacy solution but is also an integral part of the customer's multi-cloud strategy. As part of our solution, we have

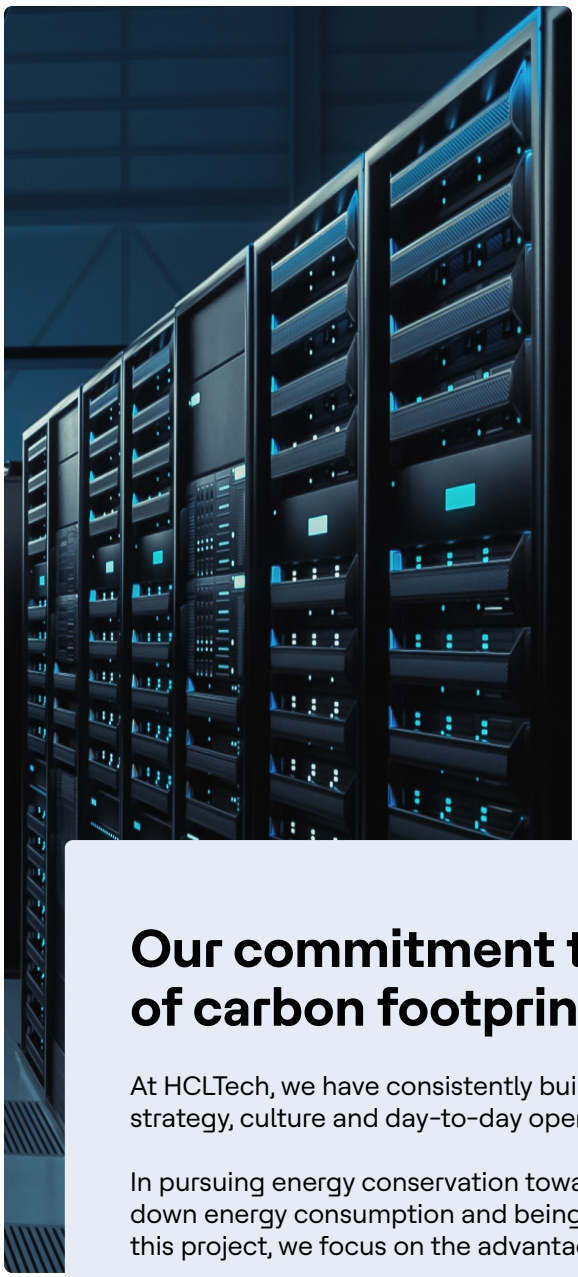


- Successfully delivered high-standard solution using blockchain software on an OpenShift containerized environment running on top of high-end hardware utilizing the IBM mainframe architecture with identical setup and z/VM systems running RedHat Linux servers
- Installed Hyperledger and the blockchain software on the RedHat OpenShift cluster environment, allowing the customer to install their code that innovatively uses blockchain and make the application available to external customers via an API gateway.
- Enabled customers to provide blockchain and AI as a service to deliver ease of use, scalability and security
- Sustainability gains through increased energy efficiency due to fewer systems doing the same work
- Agility and resiliency through unprecedented speed and scale - and extremely low latency

This project is a classic case of running non-monolithic microservices on the mainframe to achieve the required cost-effective outcome. This confirms that mainframe computers are essential to hybrid cloud and modernization strategies.

Tools and technology

IBM Mainframe LinuxONE	Red Hat OpenShift	Hyperledger	Blockchain
API	Red Hat Linux Servers	z/VM	



Customer benefits

1. Significant reduction in the energy consumption per server unity achieving their sustainability goals which is an average of 26 watts per server
2. Delivered the most secure and reliable setup by utilizing the banking-grade security within IBM mainframe architecture
3. The blockchain solution has peeked about 1000 transactions per second compared with market standards of 10-20 seconds per transaction
4. Enabled the best transaction throughput & settlement in the IBM Mainframe infrastructure

Our commitment to sustainability and reduction of carbon footprint

At HCLTech, we have consistently built sustainability principles and actions into our company's strategy, culture and day-to-day operations.

In pursuing energy conservation towards our sustainability goals, we are committed to bringing down energy consumption and being Greener, thus reducing the carbon footprint significantly. In this project, we focus on the advantages of energy consumption in two use cases:

a. Energy consumption of the nodes and storage disks
b. Energy consumption on cooling the CPUs

The solution comprises two IBM Mainframe machines where a total of 300-350 Linux on Z servers are hosted, having the app's density vary from node to node.

The numbers will prove the reduction
The total power consumption measured was about ~ 8000 Watts for at least 300 fully hardware redundant Linux servers, which would give around 25 Watts per server. Further, the disk utilization is 1 Watt per server, which offers about 26 Watts per server energy utilization, which is phenomenal and hard to beat.

Also, water cooling is much more effective on the cooling systems, about ten times.

In this case, the CPUs are internally water-cooled, whereas the X86 commodity, which is the most prevalent for underlying hardware infrastructure, doesn't come with this method. Therefore, the cooling consumption is also way lower.