

Building Successful Blockchain Infrastructure

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01

Understanding the Ecosystem

There are countless creators in the IT universe that are currently building blockchain ecosystems, both in the front-end and the back-end space. Infrastructure strategy is fundamental to building a viable blockchain offering, and there is a range of key variables that will determine infrastructure success.

This guide will help front- and back-end creators to build effective infrastructure strategies, optimise their spend and be prepared for regulatory and compliance challenges, as well as looking into some technological considerations in greater depth.

By the end of this guide, you should have a foundational understanding of not only strategic considerations such as the importance of reversibility in cloud, basic regulatory and compliance requirements, but also the benefits and challenges of public cloud, bare metal and hosted private cloud technologies, enabling you to build a successful blockchain infrastructure that matches the overall ethos of the blockchain ecosystem itself: secure, distributed, and transparent.



“Understanding infrastructure variables will help keep your costs and management overhead low, without compromising on efficiency, flexibility, or regulatory oversight.”

OMAR ABI ISSA

Global Director for Blockchain, Web3, and AI

► Creators in the front-end space

Many innovators working in the front-end space are Software-as-a-Service providers and software houses. Many specialise in decentralised applications (Dapp) and exchanges (Dex) creation, as well as Decentralized Finance (DeFi) applications consumed by large fin-tech and fin-ops companies, or even Decentralized Autonomous Organizations (DAO). Use cases for blockchain technology have also surged in gaming, the metaverse (VR/AR/XR), Internet of Things (IoT), art, NFT's, and AI.

► Creators in the back-end space

There are also many creators innovating in the back-end space. This includes mining pools – large clusters equipped with highly powerful, efficient, multi-GPU based dedicated servers. Staking businesses are similar but less resource intensive. They operate nodes equipped with cryptocurrency assets that ensure the legitimacy of transactions. These businesses are operating blockchain validation on Proof of Stake (PoS) networks.

Companies such as Blockchain-as-a-Service (BaaS) providers also fall under this umbrella. Their expertise involves utilising ready-to-connect services. They have ready-to-go solutions that are based on nodes equipped with a specific software stack that are interoperable with the P2P network. These solutions may also be based on automation nodes (API) that are ready to be integrated with both front-end and back-end software layers.





The choices businesses make during the early-stage development of their infrastructure setup can accelerate the chances of success.

Many blockchain companies offer the back-end network itself, whether it's a private blockchain solution, such as Hyperledger fabric, or the public blockchains, such as Ethereum network. Some networks are offering inter-Blockchain communication protocols (IBC), such as Cosmos. There are companies that operate in both front-end and back-end spaces. They usually have comprehensively designed private blockchain solutions, often in industries such as retail and logistics. These businesses are known as System Integrators (SI's). They usually own the hardware in their datacentres and build the front-end software layer, as well as tailoring the back-end functionality. This is mostly offered as a service for businesses. Discussing private solutions, however, is limiting as they may be decentralized over several countries or continents. Solutions may also be limited to decentralization among a few nodes in a single datacentre, depending on the use case.

02

Infrastructure Strategy Variables

Building a sustainable blockchain database is one thing, but building one that is efficient, cost-effective, and compliant is another. This process requires careful planning, and an understanding of how underlying infrastructure impacts the success of your blockchain company.

OPEX vs. CAPEX

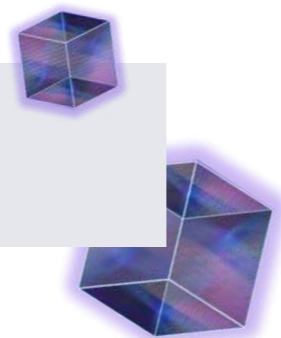
Increasingly, companies opt for OPEX expenditure, rather than the traditional CAPEX model. This is largely because CAPEX requires the company to invest large capital sums up-front. The OPEX model allows for higher elasticity, especially in the start-up and scale-up phase, where companies are limited on budget. The OPEX pricing model offers transparent operational costs for infrastructure.

Cloud-based infrastructure products are not only available as monthly expenditure costs, but they are highly scalable. Cloud helps contain management overheads and improve efficiency.

OPEX allows companies to decrease financial risk, by removing the need to invest in infrastructure that doesn't meet the demand requirements. The flexibility of cloud services unlocks the need for minimal users per profitable project, providing the ability to set the margin per end-user or consumer. This allows early stage blockchain adopters to maximise cost effectiveness with just a small pool of users. OPEX is key for businesses with high level of uncertainty or volatility from a demand perspective.

Cloud computing is intrinsically OPEX-based. Organisations can simply pay for what they need rather than making large, up-front investments in technology. This is especially important in the testing and development phases, when businesses may need to test a proof of concept for a few days, a few hours, or even a few minutes. However, it is important to recognise the differences between cloud service providers and their offerings to make sure this meets the needs of your business.

OPEX spend is key for businesses with high level of uncertainty or volatility from a demand perspective



Companies should choose a cloud provider based on key attributes, including:

Criteria	What should you look for	Why is this important?
Hybrid/multi-cloud strategy enablement	Interoperable solutions that enable you to interconnect different products and services. Including the ability to connect to solutions from other providers, as well as any on-premises or colocation setup.	Interoperable blockchain solutions open the door to higher decentralisation of blockchain networks as well as robust disaster recovery options.
Compliance measures	A contractual commitment to broad regulations such as GDPR, as well as sector compliance that meets the requirements of specific industries.	Regulatory pressure surrounding blockchain is likely to intensify. Depending on your sector you may require industry-specific compliance certification.
Transparency in pricing	There should be no charge for ingress and egress traffic.	Ingress and egress traffic refer to data moving in and out of the cloud. Without a guarantee of zero charge, your monthly billing may become unpredictable.
Openness and reversibility	This should include the careful choice of cloud products that embrace open-source values.	This is crucial for future migrations, and multi cloud strategies, as well as decreasing business risk.
Security, scalability	Robust security solutions and tools, such as anti-DDoS protection included as standard. Hardware encryption solutions such as Intel Software Guard Extension (SGX). Solutions built to be scalable from the ground up.	Companies working in blockchain often deal with security threats which demands a robust security response from the infrastructure layer. As they grow, blockchain technologies rely on enterprise grade security to meet their increased workload.
Service Level Agreements (SLAs).	Expect no less than a Service Level Agreement (SLA) of 99.9% infrastructure uptime.	The SLA provides consumers with a guarantee on uptime rates. This means the provider must compensate a customer for any downtime that may occur beyond the SLA agreement, improving the reliability of the overarching solution built for the end consumer.

At an infrastructure level, there are a range of viable cloud technologies that cater to blockchain infrastructure requirements, including:

BARE METAL

A dedicated server gives the user total flexibility to design the software layer, so you get the control you need to design and manage your machine. With cloud-based bare-metal servers, the hardware is maintained by the provider. The solution is delivered with networking features such as enhanced public connectivity bandwidth options, and private vLAN connectivity, helping you meet clustering, and scalability requirements.

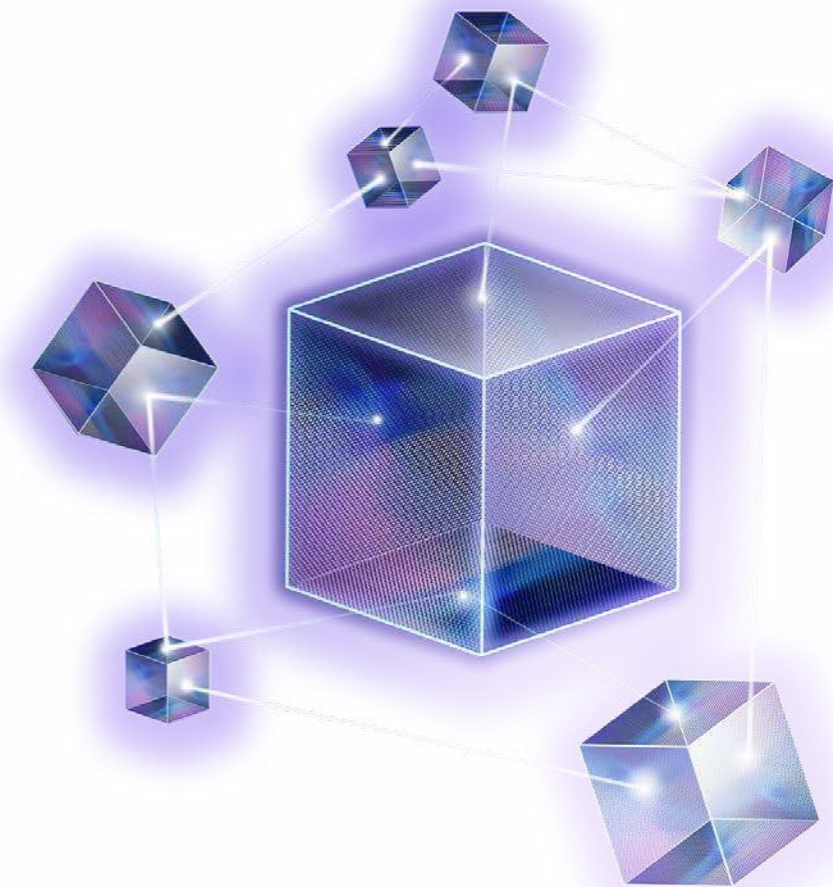
Additionally, there are built-in hardware capabilities that are a great fit for enhanced blockchain security, such as Intel Software Guard Extension (SGX) and more recently Trust Domain Extensions (TDX) as well as AMD's Secure Encrypted Virtualization (SEV) allowing servers equipped with specific chipsets for confidential computing based on hardware encryption.

PUBLIC CLOUD

Public Cloud solutions are well-suited to the needs of blockchain companies. The technology's underlying bare-metal resources are shared with more than one business, on top of which the cloud service provider has built the product itself.

Public Cloud solutions enable users to increase efficiency through automation. For example, when using Public Cloud services Hypervised via open-source software, such as OpenStack, users can - using the OpenStack CLI, Terraform, or Ansible - achieve this for VM-based automation and management.

There are also specialised orchestration tools like Kubernetes, with a fully managed master node layer and automations. This form of cloud-based infrastructure, known as Managed Kubernetes, is often used by blockchain developers because it decreases the time-to-market as well as the need for hardware maintenance. By harnessing the right technologies, DevOps talents can spend more time focusing on proper R&D.



HOSTED PRIVATE CLOUD

Hosted private cloud platforms help tackle the pain point of shared resources. Unlike Dedicated Servers, which are Infrastructure as-a-Service (IaaS), Hosted Private Clouds are more likely to be Platform as-a-Service (PaaS) solutions. These clusters are equipped with specialised Hypervisor solutions, from companies such as Nutanix, and VMware. They specialise in building software that manages underlying infrastructure. These solutions include integrated, ready-to-use features offering capabilities such as infrastructure management and monitoring, custom virtualised networking, automation, plus disaster recovery and backup options.

These solutions offer improved redundancy features, such as service uptime due to high availability. This improves fault tolerance as the product itself is designed with a minimum of two hosts. If one of the underlying nodes goes down, the overall infrastructure is still operable. In short, hosted private cloud can be designed so that there is no single point of failure.

Cloud-based Platform as-a-Service solutions are best suited to the blockchain industry. More specifically, hosted private cloud products offer orchestration tools to develop private containerised environments. VMware and Nutanix offer orchestration products, such as Tanzu or Nutanix Kubernetes engine. These solutions are fully scalable, secure, and private.

03

A cloud provider built on the Blockchain technology ethos

OVHcloud is a different kind of cloud provider, built on the same ethos and principles as the blockchain ecosystem. We offer secure, distributed, transparent infrastructure which is already being used by leading blockchain organizations around the world. We support all sizes of blockchain companies, from small, founder-led businesses to mid-size consultancies and builders, as well as enterprise deployments.

OVHcloud has 450,000 servers in 44 data centers on 4 continents. We are committed to open-source technologies, championing initiatives like OpenStack. We offer a wide range of cloud infrastructure options across different territories, including a separate business in the US, giving us the ability to ensure true data sovereignty for the companies we work with. We have custom-built solutions for blockchain organizations including technology for Solana validators that ensures that network traffic is not misidentified as a DoS attack.

Our billing is transparent and easy to understand, and we're also committed to sustainability. We use watercooled servers in every data center we own, making us more efficient than most other companies. Because of our commitment to sustainability, there are a small number of blockchain applications that we don't support, including Proof of Work and mining applications.

We have a unique industrial model, where all of our servers are assembled and disassembled in two factories in France and Canada. This gives us the power to re-use and recycle components into our affordable, lower spec server ranges including KimSufi and SoYouStart. We make sustainability easy for you too. For most of our offerings, you can download a carbon calculator at the end of the month or year, which tells you the exact impact of your cloud usage, including the 'share' of its operational impact, like running our office locations. This transparency and fairness is an integral part of our business.

Finally, we're committed to innovation. In addition to our commitment to blockchain, we offer a number of AI-specific IaaS and PaaS solutions, as well as offering quantum solutions so that whatever your future plans, we can support you.





OVHcloud **Startup Program**

The OVHcloud Startup Program is focused on giving startups and scale-ups the boost they need to thrive.

Free cloud credits and hands-on technical support help our program participants to accelerate what they do by using our secure, reliable, and cost-efficient cloud, whether they're in the early stages of building an MVP or scaling up to sell more products later down the line. Think of the program as a supportive path from ideation to growth. We want to make sure startups and scale-ups have everything they need at every step. On joining the OVHcloud Startup Program, businesses choose between two tiers based on their growth stage: Start and Scale.

Start: Ideal for early-stage startups developing a proof of concept and beginning their journey. Support includes €10,000 worth of free cloud credits and 6 hours of one-on-one consultations with an engineer to build on our cloud.

Scale: Designed for scale-ups looking to refine their offering, grow their user base, and expand. Support includes up to €100,000 worth of additional cloud credits and up to 20 hours of strategic support.

04

OVHcloud in Practice

BWARE LABS

Bware Labs partners with OVHcloud to deliver one of the fastest blockchain API platforms on the market

The background

Bware Labs delivers a powerful blockchain infrastructure built to meet the challenges of Web3. The company aims to play a major role in blockchain adoption worldwide, offering a growing ecosystem of products designed for successful Web3 innovation.

Bware Labs' flagship product – Blast – is one of the world's fastest blockchain API platforms. Using hundreds of globally distributed third-party node providers, Blast offers instant access to the most relevant networks in the blockchain space, enabling Web3 developers to meet their infrastructure needs and start building in just a couple of clicks. Other products in the Bware Labs ecosystem include Faucets, Snapshots, and support for AppChains on Avalanche and Polygon. As a reliable and secure platform, Bware Labs can also support blockchain projects as a validator and bridge operator. It is trusted by 18 blockchain providers to secure their networks, with over 10k active delegators and a total locked value of \$300m.

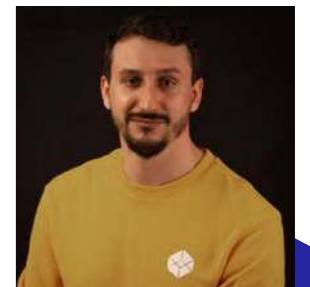
The challenge

To host Blast, Bware Labs was using a virtual private server (VPS) solution from a major cloud provider. However, as Blast started gaining traction with customers, the hosting solution needed to be scaled-up to cope with demand – leading to a rapid increase in infrastructure and network costs, as well as decreased performance. Bware Labs therefore required an alternative hosting solution that could be scaled easily, whilst optimising cost and performance.



“Our collaboration with OVHcloud has been very fruitful since we started using the platform and we are especially thankful to our account manager. We are always happy to collaborate with professional individuals and companies, and OVHcloud offers such a possibility.”

FLAVIAN MANEA
CEO at Bware Labs



The solution

As VPS hosting shares its resources with multiple users, this can reduce performance, so Bware Labs needed to replace its VPS solution with a dedicated hosting solution. Adopting dedicated hosting would enable Blast to better handle increased traffic, whilst also offering more control around security and scalability. After testing products from several major cloud providers, Bware Labs found the perfect solution in OVHcloud Advance Dedicated Servers – a powerful range of servers designed for hosting complex and critical infrastructure.

Built on next-generation components, Advance Servers deliver high-performance and high-speed connectivity. They contain Intel® Software Guard Extensions (SGX) hardware for increased data protection, and network-boosting features, such as Link Aggregation, to reduce the risk of downtime during peak traffic. Advance Servers also contain ultra-fast NVMe storage, which is built to handle complex workloads.

These capabilities made Advance Servers ideal for hosting Blast, which needed the capacity to scale-up, whilst also ensuring consistent speed and performance for its users. The addition of Intel SGX technology would also protect user data from theft and corruption, keeping it secured within an isolated, encrypted enclave.

With over 33 datacentres worldwide, OVHcloud offers a robust global infrastructure, enabling its customers to benefit from high availability in multiple locations. This was perfect for Bware Labs, as Blast has a distributed architecture and hundreds of users worldwide. To connect this architecture to its Advance Servers, Bware Labs used OVHcloud's vRack Private Network, which offers a simple platform for connecting and managing complex architecture, whilst retaining availability and shielding traffic from the internet. This would deliver further network resilience for Blast as it scaled, whilst also ensuring protection for user data.

For these solutions, OVHcloud offers a transparent pay-as-you-go billing structure, which can be monitored easily via control panel. This flexible commercial model would enable Bware Labs to control costs as it scaled and avoid paying for unnecessary resources. To ensure rapid business continuity in the event of an incident or downtime, Bware Labs also opted for Business Support, which delivers 24/7 technical support and a guaranteed first response within 30 minutes.

The result

Partnering with OVHcloud enabled Bware Labs to deliver Blast – one of the fastest blockchain API platforms on the market. This high-performance solution required a powerful platform for success, which Bware Labs found in OVHcloud's portfolio of solutions.

Advance Servers delivered the performance Blast needed to handle peak traffic, whilst OVHcloud's global datacentre footprint and vRack Private Network delivered fast, secure and resilient network availability. This, combined with a transparent commercial model, ensured Blast was able to scale cost-effectively, whilst maintaining speed and performance.

Bware Labs and OVHcloud look forward to a continued partnership, with plans to work together on expanding the reach of Blast and to further the empowerment of Web3 developers worldwide.

SUPER PROTOCOL

The background

Super Protocol is one of the world's first decentralised and confidential cloud computing protocols – the next generation of clouds designed specifically with Web3 needs in mind. Super Protocol is built as a decentralised network of confidential computing nodes, welcoming compute providers to join the community and monetize their confidential computing resources. The clients' code and data are protected by Intel® SGX confidential computing hardware, which isolates data inside an encrypted enclave to protect it from OS and hypervisor breaches. No one – not even the owner of the server – has access to the code and data in use inside the enclave, making it safe for clients to use third party servers.

The challenge

Super Protocol started the ongoing process of expanding its decentralised confidential infrastructure, which requires high-performance servers with Intel SGX confidential computing technology. This has been a particular challenge for Super Protocol, as Intel SGX-enabled servers are in high demand due to the rapidly growing market for confidential computing.

The solution

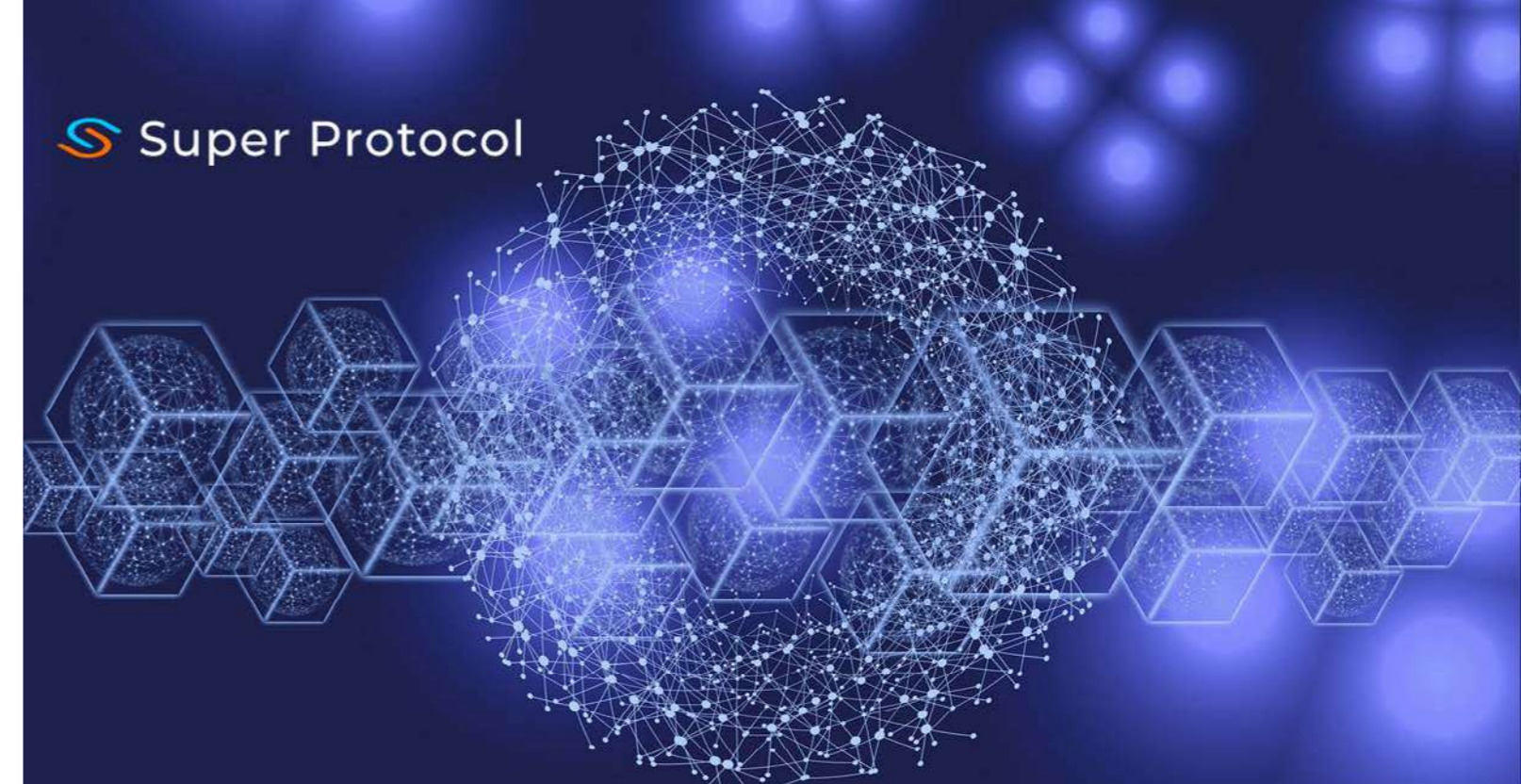
Confidential computing compatibility, price and performance were the main requirements set by the Super Protocol team. Based on these requirements, Super Protocol chose OVHcloud and adopted the following solutions:

- OVHcloud Public Cloud
- OVHcloud Managed Kubernetes
- OVHcloud Advance-6 Dedicated Servers

Super Protocol was able to access OVHcloud Public Cloud services via the OVHcloud Start-Up Program, which offers free cloud credits, training and marketing support for start-ups.

Joining this program enabled Super Protocol to expand its testnet and staging infrastructure to OVHcloud's trusted cloud, which features transparent PAYG billing, guaranteed resources, automated backup, load balancer and anti-DDoS protection.

Super Protocol also spent credits on OVHcloud Managed Kubernetes – a fully managed service that enables IT teams to create and deploy containers, without having to worry about management and maintenance. This service was used to handle external requests as part of the testnet cluster. As Super Protocol is built on confidential computing technology, it needed bare metal servers with Intel SGX-enabled processors, as well as the power to handle heavy workloads. After testing servers offered by other major cloud providers, Super Protocol found the perfect solution with OVHcloud



Advance-6 Dedicated Servers. Built on Intel SGX and 3rd Gen Intel Xeon Scalable Processors, these powerful servers were able to process Super Protocol computation orders in just 6 minutes and 22% faster than other providers.

As OVHcloud offers its Advance-6 servers in multiple geolocations, Super Protocol was also able to benefit from the highest possible availability and as a starting point chose Canada, Germany and UK. The servers were deployed across Super Protocol's testnet, staging and development clusters, and connected to the public cloud services using OVHcloud's vRack private network.

The result

Thanks to its partnership with OVHcloud, Super Protocol was able to expand the capacity and reach of its decentralised confidential network. OVHcloud Bare Metal servers delivered the high-performance and confidential computing capabilities it needed, whilst OVHcloud Public Cloud provided a scalable, secure and reliable cloud. Managed Kubernetes added further value, helping to drive efficiency by removing the burden of container management.

“We are very excited to work with OVHcloud, they are a reliable and high-performing partner. They have seamlessly delivered the growth of Super Protocol’s confidential computing infrastructure on which the future of Web3 is being built.”

YULIA GONTAR

COO at Super Protocol



As all this infrastructure is hosted in multiple geolocations, Super Protocol can also rest assured that there will be high availability and no downtime – essential when processing demanding Web3 workloads for its customers.

05

OVHcloud for Blockchain

With an ever-increasing number of businesses working in the blockchain industry, new creative ways of powering blockchain services are starting to appear. The choices businesses make during the early-stage development of their infrastructure setup can accelerate the chances of success.

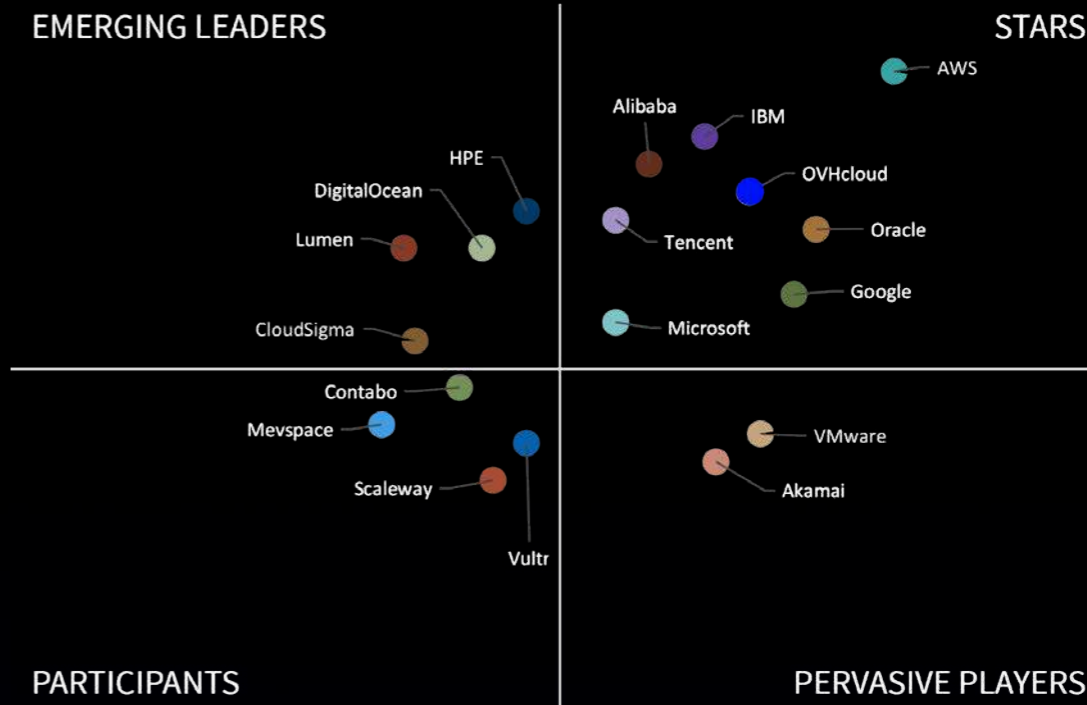
The most popular infrastructure approach involves buying either semi-managed or fully managed cloud products with ready-made software layers, additional functionalities to enhance networking management. Integrated automation features, monitoring, as well as out-of-the-box backup solutions and functionalities can be added to ensure high availability, such as disaster recovery options. It is vital for companies to consider infrastructure strategies, such as the multi-product, multi-cloud, or hybrid-cloud. Getting these early-stage decisions right will reduce infrastructure management, giving teams the flexibility to focus their energy and talents on R&D.

Bare-metal servers usually come with root access, and cloud-integrated security layers, but they can be highly demanding in terms of the internal workforce required to build and maintain the right infrastructure functionality.

It is a challenge to estimate ingress and egress traffic for infrastructure when working with the major cloud service providers, and this represents a real pain point for every company operating blockchain infrastructure. Most cloud service providers charge additional fees that are then added to the cost of the infrastructure itself. This lack of predictability makes it almost impossible to estimate the infrastructure operating costs.

Many key variables need to be considered before technical decision-makers decide on their ideal infrastructure setup, these include:

- **Infrastructure strategy** - The connectivity and interoperability of products and services
- **Financial strategy**- Including your decision on OPEX vs CAPEX
- **Transparency** - Your providers approach to data traffic fees and predictable billing
- **Compliance** - Readiness for future regulatory requirements



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Markets and Markets 2024 'Blockchain Market Global Industry Forecast to 2029' report

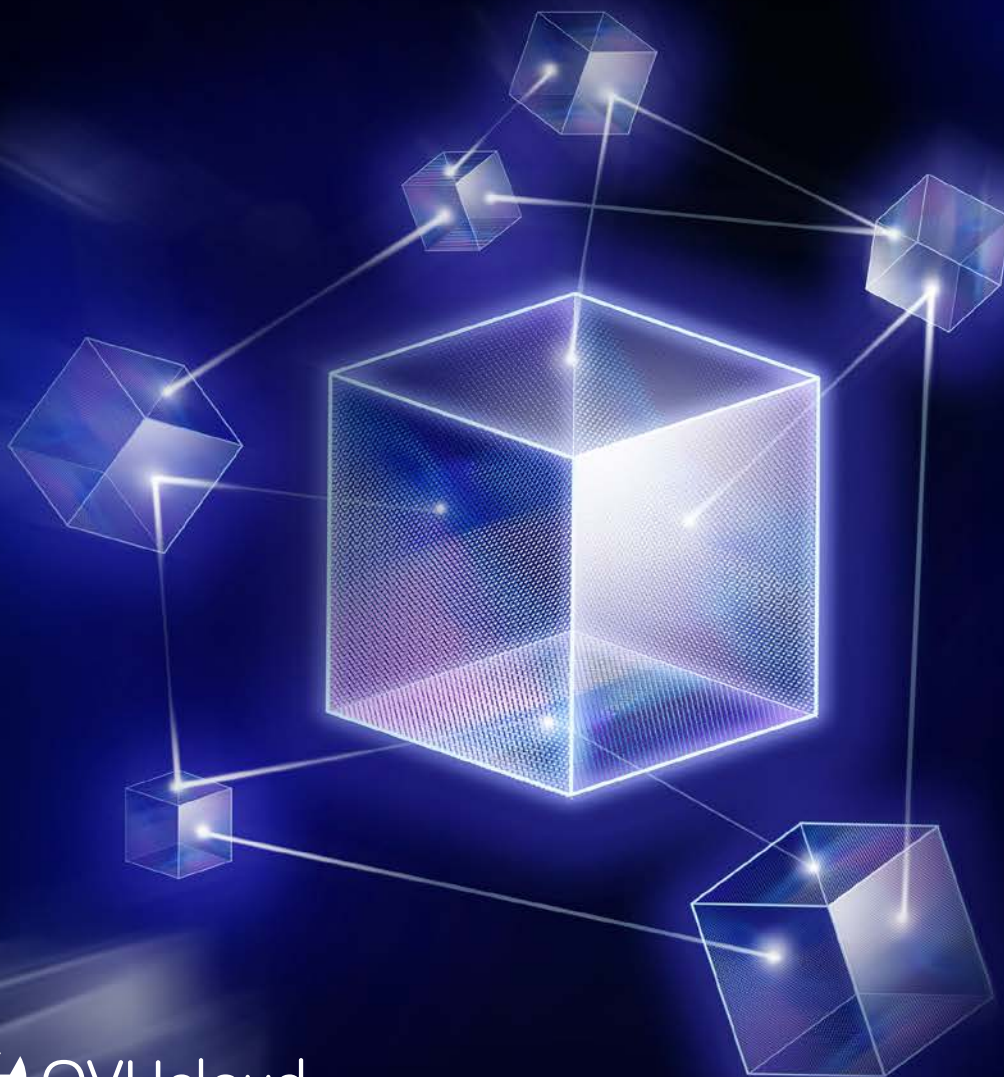
Markets and Markets identify OVHcloud as one of the star players that provide robust blockchain infrastructure and customised solutions. They possess innovative offerings and adopt growth strategies to achieve technological consistency in the blockchain space.



“Importantly, blockchain developers should partner with a provider who offers dedicated support. A strong partnership with your provider will ensure infrastructure supports your business ambition, while easing management overheads and keeping costs optimised.”

OMAR ABI ISSA

Global Director for Blockchain, Web3, and AI



About OVHcloud

OVHcloud is a global cloud player and the leading European cloud provider operating over 450,000 servers within 44 data centers across 4 continents to reach 1.6 million customers in over 140 countries. Spearheading a trusted cloud and pioneering a sustainable cloud with the best performance-price ratio, the Group has been leveraging for over 20 years an integrated model that guarantees total control of its value chain: from the design of its servers to the construction and management of its data centers, including the orchestration of its fiber-optic network. This unique approach enables OVHcloud to independently cover all the uses of its customers so they can seize the benefits of an environmentally conscious model with a frugal use of resources and a carbon footprint reaching the best ratios in the industry. OVHcloud now offers customers the latest-generation solutions combining performance, predictable pricing, and complete data sovereignty to support their unfettered growth.