zenlayer

Empower Global Interactive Applications with Zenlayer Edge Compute

Exploring edge computing trends, challenges, and emerging use cases

Contents

Background

Edge computing emerged in the 1990s when companies began strategically distributing compute nodes close to global users to lower bandwidth costs and streamline content delivery. Today, edge computing is a critical enterprise technology and supports an ever-growing number of use cases, such as the internet of things (IoT), e-learning, gaming, enterprise SaaS, and blockchain, among others. IDC recently identified over 150 use cases for edge computing across different industries. Edge computing enables low-latency data transfers while lowering costs and improving security and reliability. And for these reasons, edge computing is gaining mainstream adoption. Roughly one-third of companies plan to adopt edge computing technologies or are already planning for it, while almost one-quarter intend to increase their usage.

Zenlayer is at the forefront of the edge computing movement, offering a robust portfolio of on-demand edge cloud services in over 280 global PoPs and expertise in fast-growing emerging markets like Southeast Asia, South America, the Middle East, and Africa. With Zenlayer's global edge cloud services, businesses can instantly improve digital experiences for users with ultra-low latency and worldwide connectivity on demand.

This white paper explores:

- **Top benefits of edge computing Reduce operational costs**
- **Emerging trends in edge computing**
- **What is Zenlayer Edge Compute?**
- **Benefits of Zenlayer Edge Compute**
- **Common edge computing use cases**
- **Customer success stories**

Top benefits of edge computing

Reduce operational costs

Data center and networking costs are increasing due to higher network traffic and compute workloads. With edge computing, it is possible to transfer computational functions off the core network, reducing bandwidth and saving money.

Scale rapidly

Organizations often struggle to expand into strategic global markets due to a lack ofinfrastructure and regulatory barriers. Edge computing eliminates costly and time-consuming network builds, making it fast and easy to expand internationally.

Enhance security

Edge computing processes most data locally, which helps improve security by lowering the amount of data that flows into the cloud and reducing potential data exposure.

Improve application performance

Companies must ensure seamless digital experiences to attract and maintain customers. Edge computing reduces issues like latency and jitter to boost application performance. This in turn leads to happier customers, fewer complaints, and stronger profits.

Emerging trends in edge computing

Edge AI

Organizations across all industries are looking for opportunities to leverage artificial intelligence (AI) and machine learning (ML) to boost productivity, increase automation, improve customer experiences, and reduce risk.

This is driving demand for edge AI, which enables real-time data processing and high-performance computation with minimal latency. With edge AI, most data is stored on nearby servers and devices as opposed to cloud data centers. According to Grand View Research, the global edge AI market was valued at $14.7 billion in 2022 and is on pace to continue expanding at a compound annual growth rate (CAGR) of 21% through 2030. The CAGR for the Asia-Pacific region is even higher at 26.1%.

Double-digit market growth

According to a report from ResearchAndMarkets, the edge computing market will grow from $53.6 billion in 2023 to $111.3 billion by 2028 at a compound annual growth rate of 15.7%. The report mentions the rising use of bring your own device (BYOD) policies in business and technological evolution as key market drivers, along with risingdemand for low-latency processing and real-time, automated decision-making solutions. In addition, it mentions Asia-Pacific as the best market for edge computing investments for the forecasted period.

According to the IBM Institute for Business, 91% of global executives expect their

organization to implement edge computing by 2025. And 84% believe edge applications will positively impact operational responsiveness and bring significant business benefits.

Accelerating innovation and revenue opportunities

A new report from Accenture reveals that edge computing is accelerating innovation and creating new revenue opportunities for companies that evolve from ad hoc to integrated cloud, data, and AI strategies.

In a survey, 81% of respondents say that edge computing will be essential for remaining competitive in the future. And 81% believe that failing to act quickly can lock them out from the full benefits of the technology.

Unlocking value from 5G

Many organizations are investing in 5G to streamline data collection, power IoT devices, and enhance digital experiences. Under optimal conditions, 5G is about 10 times faster than 4G. But while 5G can provide fast local connectivity, the technology doesn't account for compute or storage. Most businesses still run supporting functions through a central data center, which creates latency and reduces network performance.

Looking forward, more companies will augment 5G deployments with edge computing. This approach can reduce latency and help companies generate stronger ROI from their 5G rollouts. Edge computing also helps with use cases like virtual and augmented reality and self-driving cars, which require processing heavy amounts of real-time data with minimal latency.

Securing the network perimeter

From a cybersecurity perspective, edge computing creates a larger attack surface for hackers to access sensitive data. As companies move from centralized data centers to distributed frameworks, they must rethink their security strategies and look for new ways to fortify their endpoints.

Organizations are increasingly using Secure Access Service Edge (SASE) to strengthen security at the edge of the network. SASE is a cloud-based IT framework that combines network security tools and software-defined networking through a single dashboard. For example, SASE can provide access to services like cloud DDoS protection, virtual private networking, and data loss prevention. Gartner predicts that by 2024, up to 40% of enterprises will adopt SASE strategies.

What is Zenlayer Edge Compute?

Zenlayer helps businesses harness the power of edge computing for improved performance, scalability, and reliability. With Zenlayer edge compute, customers can choose from flexible bare metal and virtual machine (VM) services — each offering unique advantages.

Bare Metal

Zenlayer Bare Metal combines the high-performance computing power of physical — or non-virtualized — single-tenant cloud computing servers with the flexibility of the cloud, resulting in an optimal user experience with maximum scalability. Customers can instantly access on-demand dedicated servers and set up, add, or remove servers across different regions through the user-friendly zenConsole. In addition, Customers can connect servers to other regions and public clouds, for a completely interconnected solution.

Zenlayer partners with leading public clouds like AWS, Azure, Google, Alibaba, IBM, and Tencent, and supports additional connections through Zenlayer Cloud Interconnect Partners including Equinix, Megaport, CoreSite, and others.
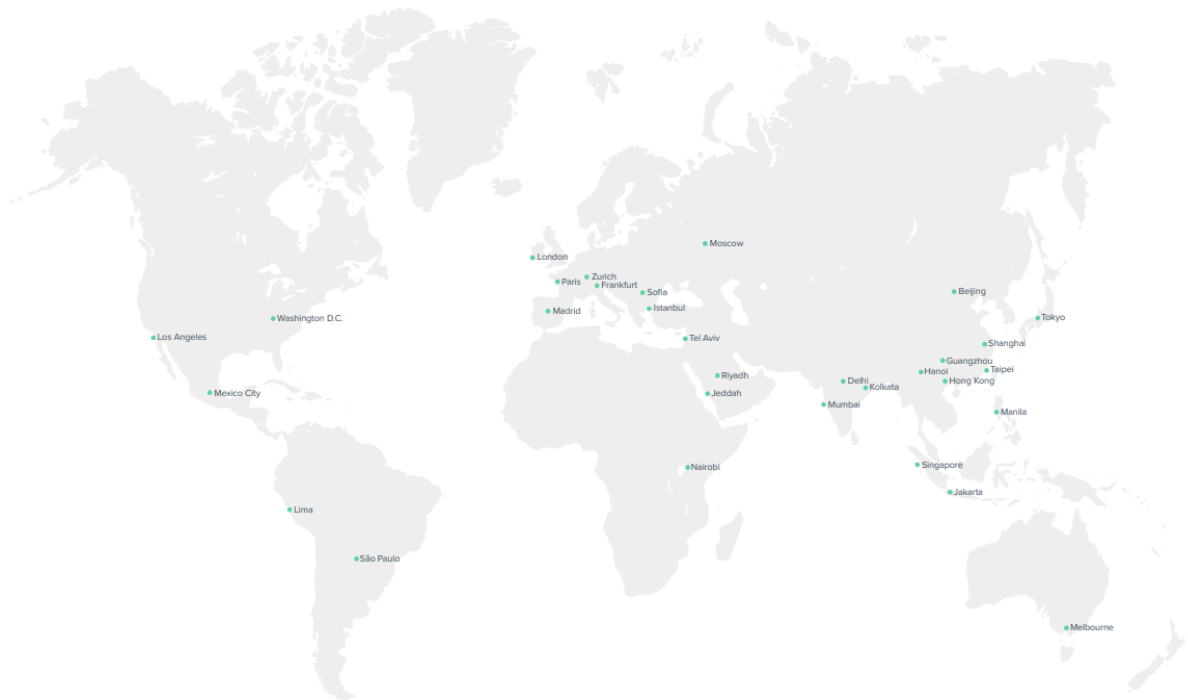

Zenlayer Bare Metal Global Coverage

Virtual Machines

[Zenlayer Virtual Machine](#) (VM) provides businesses with flexible and easily scalable compute capabilities and an elastic, reliable way to deploy applications near their end users worldwide.

Built on Zenlayer Bare Metal, Zenlayer VMs provide users with high-performance and cost-effective instances that can be deployed in minutes. Users can leverage security groups and network isolation to easily build various applications on Zenlayer VMs.

Zenlayer Virtual Machines Global Coverage

Benefits of Zenlayer Edge Compute

On-demand access in over 110 cities

Businesses can rapidly and effortlessly deploy on-demand, pre-configured, and fully optimized bare metal servers across over 110 cities and 50 countries throughout Asia, Africa, Europe, North America, and South America.

Build hybrid clouds

Zenlayer Bare Metal lets customers build high-performing hybrid clouds by connecting bare metal and public clouds through Zenlayer's leading global private network. Zenlayer

Bare Metal bypasses the public internet, enabling smoother connections and optimal network performance.

Custom configurations

Some businesses require advanced server customization. Zenlayer makes it possible to build and deploy servers around custom specifications.

Global coverage

Zenlayer's 95+ Tbps global network and presence near data centers in key cities and emerging regions allows businesses to deploy applications close to users for better experiences and minimal latency.

Seamless integration

Zenlayer VMs can be interconnected with Zenlayer Bare Metal instances via layer 2 or layer 3 connections to form an easily manageable and cost-efficient intranet. Customers can start small then easily scale up as their business grows without paying for hardware upgrades and replacements.

Zenlayer VMs integrate seamlessly with additional Zenlayer products and services including Zenlayer Cloud Networking, Zenlayer Global Accelerator, and others to provide a comprehensive, hassle-free computing and networking solution.

High customizability

Unlike providers who only offer tiers of fixed specifications, Zenlayer VMs are highly customizable, ranging from 1vCPU 1GB to 64vCPU 128GB. Custom CPU, storage, and memory specifications are available to meet unique business needs.

Disaster recovery

Physical, on-premises recovery plans can be cost-prohibitive to build out for startups and smaller organizations. Instances on Zenlayer VMs can be quickly and easily backed up to another machine, independent of server specifications, for quickly restoring and resuming operations after a disaster.

Optional cloud backup with built-in fault tolerance

Zenlayer offers cloud storage backup as an add-on service for extra redundancy and maximum availability. Zenlayer can create three replications of an instance that can be quickly restored in the event of any disruption. Zenlayer also monitors all host servers for potential problems. If any issues surface on a particular server, its hosted instances will be automatically migrated to a working server to help prevent disruptions to your service and user experience.

Quick and easy provisioning

All Zenlayer Bare Metal and VM locations are now available on zenConsole for simple and instant provisioning.

WOW service

Zenlayer services come with 24/7 live technical support that responds to inquiries within 15 minutes and resolves 95% of trouble tickets within four hours.

Common edge computing use cases

Streaming media

Zenlayer provides ultra-low latency media and entertainment experiences while supporting multiple architectures including video-on-demand (VOD), short-form video, live streaming, and interactive game streaming. Zenlayer also offers custom video transcoding, global content acceleration, support for large file distribution, security protection, and more.

Real-time communication (RTC)

To achieve high-quality RTC video transmissions, businesses need to have the right supporting resources and infrastructure in place. There are a variety of challenges that can impact the quality and reliability of real-time video communication, such as network congestion, bandwidth limitations, and infrastructure misconfigurations. Rushing into an RTC deployment without taking these factors into consideration can result in poor data transmissions and negative user experiences.

Zenlayer offers a leading RTC infrastructure solution that leverages the company's massively distributed edge nodes, private and dedicated network backbone, and acceleration capabilities. Customers can use Zenlayer's RTC solution to expand effortlessly, enhance network reliability, improve operational efficiency, and enjoy flexibility in RTC infrastructure-building scenarios.

Ecommerce

Ecommerce providers face numerous hurdles when expanding into overseas markets — like limited edge infrastructure, poor digital performance at the edge, slow and unreliable cloud synchronization, and high consumer expectations.

Edge cloud helps ecommerce providers by eliminating issues like jitter, latency, and packet loss while boosting user satisfaction. This helps ecommerce providers produce happier customers, fewer complaints, and better reviews.

Gaming

[Game developers](#) face similar challenges and pressures when serving global players and must strive to minimize performance issues and enable seamless in-game experiences.

Zenlayer helps game providers minimize user latency, game lag, and input delay and streamline cutting-edge AR & VR gaming infrastructure. [Gaming companies](#) can also use Zenlayer to deploy blockchains as non-fungible tokens (NFTs) or digital in-game assets, enable high-quality collaborative multiplayer gaming experiences, enhance game server security, and support cash shops and microtransactions.

Blockchain

Zenlayer's bare metal infrastructure and low-latency cloud networking helps ensure the high performance needed for [blockchain scalability](#).

Zenlayer deploys servers built on and with software stacks optimized for [3rd Generation Intel Xeon Scalable processors](#) with high transactions per second (TPS) at the edge. These server processors deliver AI acceleration as well as faster vector processing and operations in cryptography.

Zenlayer is the blockchain partner of choice for RPC node operators, blockchain IaaS and PaaS, validators and other blockchain participants, and proof-of-stake (PoS) chains.

Virtual private networks (VPN)

The [global VPN market](#) is becoming increasingly competitive, making it difficult for providers to attract and retain customers. [VPN providers](#) can use Zenlayer Bare Metal and VMs to help enhance the security of their services. Intel's AES-NI-based hardware accelerates secure data encryption and decryption, meaning servers and network connections can be encrypted at rest and in transit to keep user traffic private end-to-end.

Additionally, deploying compute at the edge drastically shortens the distance between VPN servers and where user traffic originates, minimizing the chances of interceptions, intrusions, and other malicious acts.

Customer success stories

Case one: Global VPN service provider expands to APAC

Customer overview

The client is a global VPN service provider that offers services to protect user privacy and secure access to geo-restricted sites and content. The client also offers other privacy and security products for businesses and consumers.

Due to rising levels of censorship from governments and other entities, particularly in developing markets, users from heavily geo-restricted countries are increasingly turning to VPN services to browse the web. The client saw this demand spike in emerging markets and wanted to extend their success to APAC. In addition to growing their user base, this expansion would also enable the client to enrich its service by offering existing users additional location choices.

Solutions

Zenlayer Bare Metal PoPs

The client initially deployed two VPN PoPs using Zenlayer Bare Metal. Upon seeing the speed at which Zenlayer was able to set up the servers and favorable test results, the client decided to partner with Zenlayer to deploy additional VPN PoPs in Beijing, Hong Kong, Kaohsiung, Tokyo, Seoul, Singapore, Manila, and Moscow.

Aggregate bandwidth model

The client switched from unpredictable data transfer pricing to a more predictable aggregate bandwidth model, which helped them cut costs with unmetered bandwidth billing. Zenlayer's pricing model not only helped the client simplify and improve cost efficiency, but also allowed them to shift traffic between underutilized and overloaded servers to minimize downtime and conserve bandwidth.

Pay-as-you-go pricing

Zenlayer's pay-as-you-go model with 95% burstable bandwidth gave the client more agility to scale their operations, and helped prevent them from overcommitting to higher bandwidth tiers out of the fear that sudden spikes of traffic would accrue huge financial penalties down the road.

Solution results
- Client successfully expanded into APAC and added more locations
- Zenlayer simplified and reduced costs with a 95% burstable aggregate billing model

- Zenlayer's geolocated servers offer 15% lower latency on average compared to other local providers
- Zenlayer's network blend of the best local carriers in APAC ensures stable VPN performance and maximum availability

Case two: Zenlayer enhances real-time interaction for ZEGO

Customer overview

ZEGO is an audio and video cloud-service provider that helps global enterprises rapidly acquire stable and high-quality live streaming capabilities in more than 200 regions. To better serve their 500+ million users, ZEGO used Zenlayer to quickly deploy and connect 22 core and edge PoPs in Europe, North America, South America, and Southeast Asia.

The solution: Core and edge PoPs

Zenlayer quickly deployed and connected 22 core and edge PoPs in Europe, North America, South America, and Southeast Asia. This established a stable, low-latency, dedicated network; access to the best local carriers, particularly important in emerging markets; and an improved end-to-end interactive audio and video experience for users around the world in complex network environments.

Solution results

- User satisfaction increased by 35%
- Zenlayer reduced latency by 25%
- Operation and maintenance costs dropped by 30%
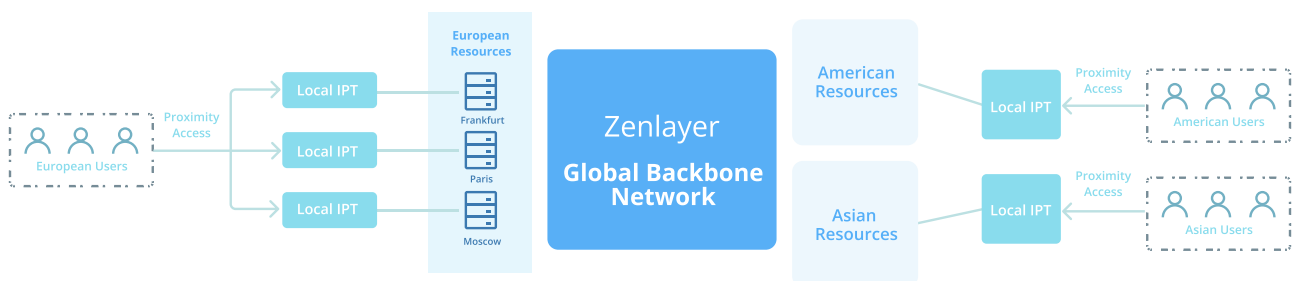
Unlock the value of edge computing with Zenlayer

If your enterprise is considering edge computing, it's important to work with a provider that offers global reach, local support, and instant access to any location.

Zenlayer is the global leader for edge computing in emerging markets, with a deep presence across the world's fastest-growing regions like **China**, **Southeast Asia**, Africa, and Latin America — along with developed markets like **North America** and Europe.

To learn more, please reach out to **info@Zenlayer.com**.