ZELLA DC

WHAT'S NEXT FOR CLOUD COMPUTING?

What is a distributed cloud?

Distributed cloud basics you need to know

The pressure on organizations to uncover real-time insights, provide AI-fueled customer service, and foster a remote and hybrid work environment has driven them to find innovative ways to keep up with the competition. The traditional on-demand, metered access to cloud computing no longer meets the needs of dynamic, modern companies.

Distributed cloud architecture provides organizations with the optimal data placement and computing processes to help them accomplish their company goals. The growth of the internet of things (IoT) and edge computing, in particular, are pushing organizations toward distributed cloud deployments. The distributed cloud is the next generation of cloud computing and allows businesses to retain the advantages of cloud computing while extending its range and use cases.

In this white paper, we will be discussing the basics of the distributed cloud architecture, including what it is, its benefits, everyday use cases, and how micro data centers are critical for the distributed cloud model.

What is a distributed cloud?

Distributed cloud is a public cloud service that lets you run your architecture across multiple locations. It spreads the workload across interconnected servers in appropriate geographically-dispersed areas to meet the application's needs. As such, it is the first cloud architecture that utilizes the physical location of the cloud as a part of its definition.

In short, distributed cloud runs the cloud across multiple locations such as:

- A third-party or colocation center hardware
- Public cloud data center
- Public cloud providers infrastructure

Distributed cloud delivers the public cloud wherever you need it, whether on-premises in your own data center or in a public data center that belong to the cloud provider. This model of cloud deployment resolves certain management and operational inconsistencies that organizations run into in the hybrid and multicloud environment.

There are a number of requirements that may require an organization to adopt a distributed cloud model:

Regulations
An increase in certain laws, such as GDPR and CCPA, requires that data stay in the user's country. When these locations are not supported by a public cloud provider, the distributed cloud is essential for compliance.

Reliability
Organizations look for reliability beyond regional or national site redundancy to help them mitigate the risks of large-scale outages.

Location
In the cases where latency is minimized, and bulk data transfers are necessary, maintaining data close to the preferred location is critical.

Security
Maintaining data within an organization's private data center can help reduce the chances of a breach.

As AI applications move large amounts of data to the edge to be as close as possible to users, moving cloud resources to the edge increases AI performance. Distributed cloud provides the best foundation for this edge computing to drive IoT, AI, and telecommunications.

How distributed cloud works

Distributed cloud takes the concept of distributed computing, a common way to maximize computing efficiency. While distributed computing spreads application components to different network computers, distributed cloud disperses the entire compute stack of a public cloud provider where organizations need it.

Through the distributed cloud model, organizations extend the capabilities of the provider's centralized cloud through distributed micro-cloud satellites. At the same time, providers retain critical control over operations, governance, security, updates, and reliability of the distributed infrastructure. In addition, organizations have access to both centralized cloud services and the satellites in a single cloud and can manage it all in one place.

Multicloud, Hybrid cloud & Distributed cloud – what's the difference?

To help manage the needs and increased demands organizations face, there are three common cloud computing architectures: distributed cloud, multicloud, and hybrid cloud. Although they are sometimes used interchangeably, there are critical differences between the three architectures.

While each model seeks to give users more of the advantages of the cloud, the distributed cloud is the latest generation that provides organizations with more control in one single pane.

The other cloud architecture struggles to provide a single solution to various cloud providers. For example, take Kubernetes. Although it is essentially the same open-source project, every major cloud provider supports its own unique Kubernetes service. That makes it challenging to create a Kubernetes cluster because they all have different environments, experiences, and ops teams with different skill sets. It can result in inconsistency that ops teams may struggle to handle. On the other hand, the distributed cloud architecture enables organizations to navigate multicloud environments and access all resources on one cloud from a single control plane.

> **Multicloud** is when organizations use multiple different public cloud services from various providers. They utilize services such as SaaS, IaaS, and PaaS and use third-party hosts like Amazon, Google, or Microsoft. This requires organizations to operate in combination with multiple cloud environments to meet all of their cloud needs.

> **Hybrid cloud** combines the public and private cloud to provide a more agile architecture over multicloud. It enables companies to maintain their legacy companies to maintain legacy apps on-premises while experimenting with new applications of the cloud. It allows organizations some part of the processing, architecture, and administration, but the rest is in the public vendor's hands.

> **Distributed cloud** takes the physical location of the cloud into account to overcome some of the weaknesses of both multicloud and hybrid cloud. Data gathering and processing are localized to where the data is collected, and organizations have more power over how their resources are run.

The Benefits of the Distributed Cloud

As one of the more cutting-edge cloud architectures, distributed cloud helps meet the needs of modern organizations with an innovative solution. Companies choose to use distributed cloud structure for the number of benefits it provides:

Reduced latency

There are a number of reasons that distributed cloud results in faster processing. Its distributed nature leverages the computing power of multiple systems for any given task. Also, because it is physically closer to the data, it has more responsive communications.

Increased uptime

Downtime is a serious problem for businesses: the average downtime cost is $300,000 per hour. The distributed structure helps isolate crashed systems and even untether them completely from the main cloud. The use of local subnets helps provide redundancy from a crashed system and manages any damage.

Scalability

Growth is central to organizations, and they need technology that can keep up instead of being a barrier. Distributed cloud enables even rapid scale by allowing users to add VMs or nodes as they are required. It also helps enhance the cloud system availability overall.

Flexibility

Most companies will find the need to add new services at some point. Distributed cloud architecture makes it easier to install, deploy and debug them.

Cost-effective

Because companies can expand existing infrastructure without having to build it out physically and can deploy anywhere quickly with the same tools and personnel, organizations avoid many of the costs associated with other cloud models.

Simple

Most cloud models are complicated and require monitoring multiple clouds, processes, and systems. Distributed cloud simplifies cloud management by allowing users to control everything from a single dashboard.

In short, distributed clouds simplifies and streamline cloud management into a scalable, high-performance, and cost-effective model.

Use Cases of Distributed Cloud

The distributed cloud provides benefits across a number of industries. While each type of organization has different goals and challenges, the ability of the distributed cloud to lower costs, increase performance, and aid innovation makes it ideal for them.

Retail

The days of shopping malls, brick-and-mortar only stores, and the nuisances of in-person shopping are over. Buyers demand more convenient, omnichannel shopping experiences. They are also willing to drop loyalties and move their business to retailers that can provide it. Merchants need a flexible, scalable, and cost-effective cloud solution to help them give a superior customer experience and still be profitable.

From online shopping to virtual pay to retailor apps, plus the technology to maintain an always stocked and conveniently laid out store, companies need to have reliable data in real-time to meet customer expectations. Distributed cloud enables them to take advantage of an architecture that scales as they need, provides near-instantaneous feedback, and helps them lower overhead costs.

Manufacturing

Manufacturing is a competitive industry. Trying to keep up with large corporations on an international scale means that they need to enhance productivity, lower costs, and increase innovation. As a result, manufacturing increasingly relies on edge computing to reduce latency and improve the critical interoperability they need for enhanced productivity. As more organizations turn to smart manufacturing to remain competitive, they require the distributed cloud model to get the real-time insights and IoT performance they need to be profitable.

Farming

Farming is no longer filled with guesswork that long left farmers victim to outside forces. Smart farming techniques empower farmers with the insights and strategies they need for optimal production. Drones, 3D mapping, livestock monitoring, moisture sensors, and robotics are just a few of the ways farmers are getting critical information through technology.

All of these innovations in smart farming require relying on seamless, real-time data. The need cloud technology that reacts quickly to changing situations with minimal downtime in the most cost-effective manner.
A distributed farm model helps them lower lags in data collection that make or break their farm and lower overhead costs that eat away at their profits. The ability to collect data effectively and efficiently and respond to changes in real-time makes it ideal for them.

Education

Education relies on technology and innovation now more than ever. From smart boards to distance learning to the use of laptops and tablets to disseminate content, educators rely on real-time data to give students the critical information they need to learn. In addition to needing real-time access in the classroom, latency can be detrimental to the online tests and exams that are crucial in education.

Distributed cloud architecture ensures a seamless education experience that is vital to learning in the modern era. It improves performance so that everyone, teachers, administrators, and students, have access to the materials they need precisely when they need them.

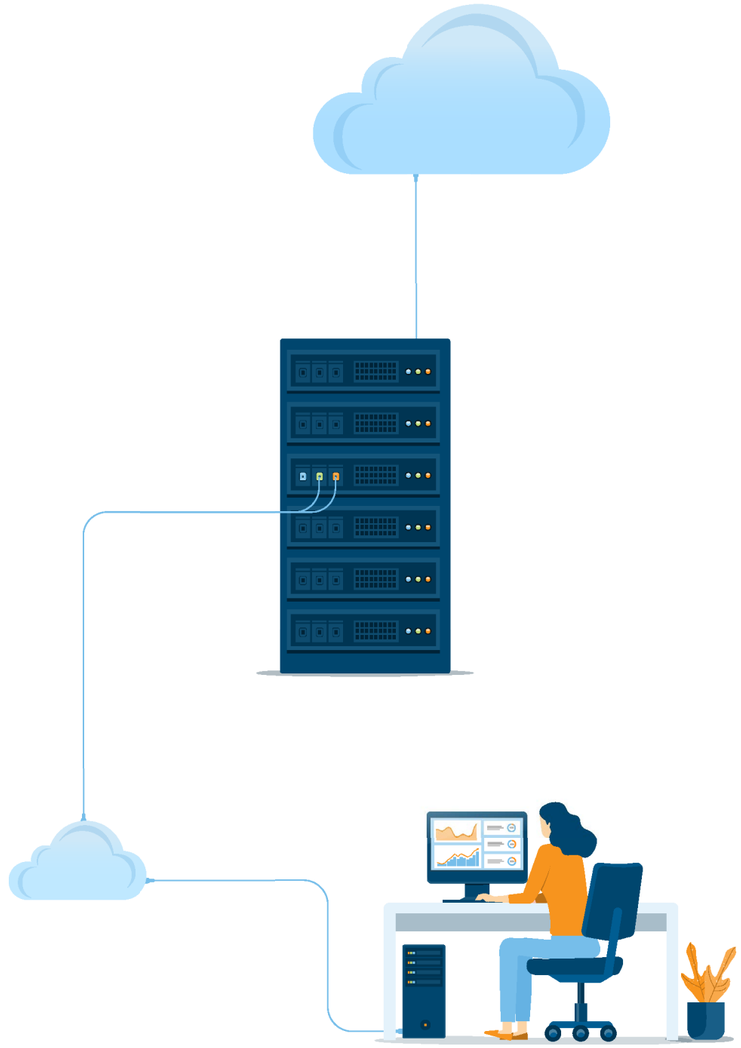
Why Micro Data Centres are Critical to a Distributed Cloud Architecture

Organizations embrace the decentralized cloud structure to remain competitive in today's digital business environment. It is exploding in popularity: Gartner predicts that most cloud providers will have a distributed presence by 2023.

Micro data centres (MDC) are critical to managing this distributed cloud environment. MDCs give companies control over where they physically keep their data. They help ensure speed, reduce latency, and enhance flexibility for those who want more control over their data than the typical public cloud provider offers.

Both MDCs and distributed cloud are essential to edge computing. Distributed cloud makes IoT, 5G, and content delivery possible with low-latency data storage and processing. However, traditional data centres (such as Microsoft Azure and AWS) were not built with these use cases and business needs in mind. They lack the flexibility, scalability, and speed that are required for these innovations to work as seamlessly as they were intended. MDCs empowers companies to adopt the distributed cloud by enabling them to physically put their data centre where it will provide the best value.

MDCs help fully realize the goals and benefits of the distributed cloud architecture. By bringing the computing power and storage resources closer to users, MDCs enable organizations to harness the distributed cloud to reduce overhead costs and deployment times with increasing scalability and resilience.



Facilitating Innovative Technology with Distributed Cloud

The distributed cloud structure enables organizations to harness the innovations that traditional cloud structures cannot support. Companies need a cost-effective, high-performance solution to gain an edge over the competition and meet consumer expectations. Distributed cloud architecture, combined with micro data centres, helps provide real-time access to data with the scalability and flexibility to stay agile in the future.

Distributed cloud helps companies implement and manage applications across all edge computing, on-premises, and public cloud environments. Micro data centres provide critical on-premises storage resources to improve speed and reduce overhead costs.

To learn more about micro data centres and how they can help you meet your IT and company goals, contact one of our experts to book a meeting.

ZELLA DC™

Over a decade ago Zella DC pioneered the micro data centre. Since then, our next-generation server room in a box have been proven to work in the harshest environments on earth. The result is a vendor-agnostic approach to software, hardware manufactured to global standards, and partners across six continents. zelladc.com

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Clinton is an industry expert on micro data centre construction, edge infrastructure deployments and operating mission critical infrastructure at the edge. He is in charge of all research and development projects and his experience spans from remote environments to metro areas and everything in between.