

The Power of Cloud Computing



Cloud computing is no longer a cutting-edge solution for application delivery. Since emerging around the turn of the century, cloud computing has evolved to touch almost every daily aspect of our lives.

Businesses across industries have adopted cloud solutions to varying degrees to address a range of needs. As more organizations look toward digital transformation, Cloud Computing services will play a significant role in modernizing businesses. For many, cloud solutions offer a competitive advantage and are the answer to a rapidly changing work environment.

Cloud is on the Rise

At this point in time, you'd be hard pressed to find an organization that doesn't use at least one cloud-based solution. Accelerated by the global pandemic, cloud computing is capturing more IT budget and dramatically changing the way organizations have operated for decades.

According to Gartner, the necessary transition to hybrid and remote work has increased the call for on demand and scalable models, which in turn have enabled organizations to "rapidly accelerate their business transformation plans."⁽¹⁾ This growth has proven that cloud adoption is on the rise, evolving to meet the needs of its market.

Gartner further predicts that by 2025, 80 percent ⁽²⁾ of enterprises will shut down their traditional data centers and 85 percent will adopt a cloudfirst stance ⁽³⁾. This shift may explain why Gartner believes that just one year later (by 2026), public cloud spending will exceed 45 percent of all enterprise IT spending (up from less than 17 percent in 2021) ⁽⁴⁾.

What is Cloud Computing?

What we commonly call "the cloud" is an interconnected network of remote virtual servers that deliver services, manage data and run applications.

According to the NIST, Cloud Computing solutions display the following essential characteristics.



On-Demand Self-Service:

An admin or orchestration tool can make changes with minimal to no human interaction from the service provider.



Broad Network Access:

Capabilities are available over the network, web, portal, etc. through multiple devices and tools. Think of a ride-share app (Uber/Lyft) that you hail from your smartphone.



Resource Pooling:

Server clusters are configured in a multi-tenant fashion that enables access to the pooled resources of the clustered compute power.



Rapid Elasticity:

Resources are elastically provisioned and released by an administrator manually or by an automation and orchestration tool.



Measured Service:

This includes storage, CPU, memory, bandwidth and active user account resources. The usage of these resources can be measured, monitored, controlled and reported to ensure transparency for both the service provider, MSP and customer.



Cloud Computing Deployment Models

A deployment model is how resources are distributed within the cloud, which differ based on an organization’s structural needs. These models are outlined below, as defined by the NIST.

Colocation

Colocation (also known as colo) is fairly similar to traditional on-premises (also known as on-prem) data centers. Simply put, privately owned servers and networking equipment live in a building owned and maintained by a colocation service provider. You still have access to your hardware, but the day-to-day operations and maintenance (including physical security, building utilities, backup systems, etc.) are handled by the provider.

Colocation allows organizations to place their servers in diverse locations (to get data closer to end users and maintain business continuity) while taking advantage of the cost savings of not having to house and maintain equipment.

All public cloud deployment models for Cloud Computing are housed inside of a Data Center or Colo facility. By 2025, it’s predicted that 80% of infrastructure strategies will integrate on-premises, colo and edge delivery. This is a massive leap from the 20% documented in 2020. ⁽⁵⁾

Private Cloud

Private cloud is the practice of virtualizing your on-prem data centers. You convert your physical servers into Virtual Hosts, clustered together via a Hypervisor like VMware vSphere with storage clusters like EMC, NetApp and Pure Storage. This creates a resource pool of CPU, memory and storage for the customer to deploy virtual machines (VMs) as needed by application or business unit.

This cloud infrastructure is used exclusively by one organization and business units that are associated. It can be managed and operated by either that business, a third-party service provider or both simultaneously. Hosting can be held on the customer’s site, with the provider or at a third-party colocation facility.

Community Cloud

This cloud infrastructure is used exclusively by a community of customer organizations with similar concerns (such as the mission, security requirements, policy and compliance considerations). One or more of these organizations could be the owner and operator of the infrastructure. For hosting, the service could be on a customer premise, with the provider or at a third-party colocation facility.

Public Cloud

The Public Cloud service models are:

- ▶ Infrastructure-as-a-Service (IaaS)
- ▶ Platform-as-a-Service (PaaS)
- ▶ Software-as-a-Service (SaaS)

These models will be discussed more in depth in the Cloud Computing Service Models section below.

To identify the right solution among IaaS, PaaS, SaaS and other cloud service models, an expert can offer support on understanding your available infrastructure, IT staff resources, cost considerations and cloud security needs.

The cloud infrastructure is provisioned for open, public use. While a system may be owned, managed and operated by an organization, it will be hosted at the site of the Cloud Services Provider.

Hybrid Cloud

The Cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability.

An example of this is combining a customer's VMware based Private Cloud instance with a Cloud Services Provider's Public Cloud instance for cloud bursting, enabling workload load balancing between clouds or support of workloads that do not run on a cloud but are part of the customer's production applications.

Hyperscalers

Hyperscalers are a subset of public cloud made up of massive cloud service providers. This includes Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), IBM Cloud and Oracle Cloud Infrastructure (OCI), among others. Like the rest of public cloud, these models offer customers access to managed infrastructure and compute services, just on a larger scale.

These solutions are extremely feature rich, allowing customers to choose the services that best fit their needs and scale with demand. ⁽⁶⁾

Bare-Metal Cloud

Bare-Metal Cloud is a public cloud solution in which the customer rents hardware from their service provider.

This service offers hardware and resources without installed operating systems or a virtualization infrastructure. This allows the customer to access physical and virtual servers as needed, regardless of location or length of time.

In most cases, these software solutions are not the main mission of a business. Getting access to a well-built solution as a service frees up time and resources for an organization to focus on their main drivers rather than building and maintaining supporting solutions.





Cloud Computing Service Models

A Service Model is the framework in which you or your Cloud Service Provider manage your services. Below are four popular tenants of Cloud Computing service models available to businesses, classified by general commonalities and uses.

Infrastructure as a Service (IaaS)

Infrastructure as a Service (IaaS) is one of the most common uses of cloud computing because it is the crux of what many cloud service providers offer. With IaaS, someone else manages the physical infrastructure that handles your compute needs (CPU, RAM, memory, storage, network, systems, infrastructure). This is the basic service provided by public cloud providers, hyperscalers and third-party private cloud management services. It shifts fundamental infrastructure deployment and maintenance to someone else while allowing you to reap the benefits.

Platform as a Service (PaaS)

Sometimes called Managed Cloud, In PaaS the Cloud Service Provider provides and manages the compute resources, such as processing (vCPU), memory, storage, networks and operating system (OS) in which the customer can deploy consumer-created or common applications. These applications are created using coding, libraries, services and tools supported by the provider.

The customer does not manage or control the underlying cloud infrastructure but has control over the deployed applications and configuration settings for the application hosting environment and associated tools.

Software as a Service (SaaS)

Software as Service (SaaS) is such a big part of the solution landscape that we'd be remiss not to mention it. SaaS solutions provide organizations with vital applications (everything from company-wide email and collaboration tools to department-specific solutions like CRMs, HR software, etc.) without having to:

- ▶ Build proprietary apps in house
- ▶ Install software locally on every device
- ▶ Constantly maintain and update applications, including new versions and important security patches (on every device)

Other Popular “as a Service” Solutions

There are several other popular “as a service” solution areas delivered via cloud. Many organizations have several of these solutions in place or are transitioning to cloud services as legacy systems sunset.

- ▶ Desktop as a Service (DaaS): Virtual desktops that allow secure access to corporate desktops, applications and data from any device
- ▶ Unified Communications as a Service (UCaaS): A common cloud-based replacement for legacy telephony and communication systems
- ▶ Contact Center as a Service (CCaaS): A modern replacement for outdated call centers that provides a more seamless experience over multiple communication channels, including phone, text, chat and social media
- ▶ Security as a Service (SECaaS): A range of managed security services that help organizations address the increasingly complex security risk landscape

Benefits of Cloud Computing

Cloud Computing services offer flexibility and reach that is difficult to obtain with traditional on-prem solutions. It also presents a spending model that allows organizations to manage IT budgets differently. The benefits of cloud computing are specifically tailored to meet today's business needs and user expectations.

Flexibility

Cloud Computing services fundamentally offer organizations more options and flexibility.

Companies not only get to choose their preferred cloud delivery models. They can also flex much faster with changing demand (because — in most cases — the business does not own and maintain the computing infrastructure).

Companies are also realizing that not all data, applications and workflows need to be housed in the same environment. In fact, choosing the correct environment for each use case improves performance and cost. Embracing cloud solutions allows organizations to make more nuanced decisions about where each element lives. This is a popular approach, with more than 90 percent of enterprises now using a multi-cloud strategy. ⁽⁸⁾

Cost Savings

While managing on-prem servers and services is CapEx (capital) driven, cloud compute solutions shift IT budget to OpEx (operational) spending. This makes cloud solutions easier to budget for and manage. No more costly upfront bills for infrastructure implementation or replacement. Instead, organizations can flex cloud solutions based on need. It's a highly scalable solution that means infrastructure isn't underutilized or that companies aren't rushing to add infrastructure to meet increased demand. When well-managed, cloud compute services represent great cost savings potential.

Faster Data Delivery

Between consumer expectations for fast load times and a workforce footprint that is more dispersed than ever, making sure data gets to end users fast has never been more important or challenging. Cloud solutions allow businesses to take advantage of data centers around the world, housing data closer to end users. Coupled with solutions like Content Distribution Networks and emerging edge computing services, cloud computing allows for faster data delivery and reduced network latency. For businesses, this means happier customers and more productive remote employees.

Better Collaboration

The way the world works has fundamentally changed in the last few years. Employees no longer sit in one centralized office. Even before the pandemic, increasing remote and hybrid work models changed the way we collaborate with peers. Cloud services like video conferencing, chat and document sharing (often provided as Unified Communications as a Service, or UCaaS) enable employees to work together and collaborate from anywhere in real time, promoting productivity and easing frustration.

This has become increasingly important as more employees continue to work remotely (a trend that is likely to last a while, according to a Fall 2021 Gallup poll) ⁽⁹⁾. Ensuring employees have easy access to the same apps and data regardless of location will be paramount to business success. Cloud solutions are the best way to provide for and manage this need.

Easier Maintenance & Security

One of the biggest benefits of adopting Cloud Compute services is that businesses no longer have to implement and maintain infrastructure and compute services in house. On-prem solutions require large up-front costs to implement, and expensive in-house expertise to design, build and maintain. Even solutions that come on a disc (like old OS updates) would need to be manually installed on each individual device. Cloud solutions make deployment, management and updates infinitely easier.

Cloud solution providers are also constantly monitoring the security risk landscape and adjusting accordingly, something you likely don't have the time or resources to monitor and address in house at the same level. While each solution would be a piece of what your company does, it is the entire focus (and expertise) of the cloud service provider, meaning they can give it more dedicated attention.

Conclusion

Cloud Compute is an incredibly broad field that offers a range of services and benefits to fit just about any business need. Organizations not only have their choice of services but can also determine the best cloud delivery model (or combination thereof) to meet specific application and data use cases, or security and compliance requirements. Moving forward, as more organizations embrace cloud computing and digital transformation, it will be a competitive advantage that no company will be able to ignore.

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(2) Gartner, "The Data Center is (Almost) Dead," 2019.

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(3) Business Insider, "Why companies are flocking to the cloud more than ever," 2021.

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(4) Gartner, "Gartner says four trends are shaping the future of public cloud," 2021.

<https://www.gartner.com/en/newsroom/press-releases/2021-08-02-gartner-says-four-trends-are-shaping-the-future-of-public-cloud>

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<https://csrc.nist.gov/publications/detail/sp/800-145/final>

(7) ITIC, "ITIC 2020 Global Server Hardware, Server OS Reliability Report," 2020.

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(8) Flexera, "Cloud Computing Trends: 2021 State of the Cloud Report." 2021.

(9) Gallup, "Remote Work Persisting and Trending Permanent," 2021.

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