# **Cloud Computing**

**Cloud computing definition**

In simple terms, cloud computing allows you to rent instead of buy your IT. Rather than investing heavily in databases, software, and hardware, companies opt to access their compute power via the internet, or the cloud, and pay for it as they use it. These cloud services now include, but are not limited to, servers, storage, databases, networking, software, analytics, and business intelligence.

Cloud computing provides the speed, scalability, and flexibility that enables businesses to develop, innovate, and support business IT solutions.

**Cloud computing basics**

When a company chooses to “move to the cloud,” it means that its IT infrastructure is stored offsite, at a data center that is maintained by the [cloud computing provider](https://www.gartner.com/doc/reprints?id=1-1ZKVOIQV&ct=200730&st=sb). An industry-leading cloud provider has the responsibility for managing the customer’s IT infrastructure, integrating applications, and developing new capabilities and functionality to keep pace with market demands.

For customers, cloud computing offers more agility, scale, and flexibility. Instead of spending money and resources on legacy IT systems, customers are able to focus on more strategic tasks. Without making a large upfront investment, they can quickly access the computing resources they need—and pay only for what they use.

**Cloud computing benefits**

There are several trends pushing business—across all industries—toward the cloud. For most organizations, the current way of doing business might not deliver the agility to grow, or may not provide the platform or flexibility to compete. The explosion of data created by an increasing number of digital businesses is pushing the cost and complexity of data center storage to new levels—demanding new skills and analytics tools from IT.

Modern cloud solutions help companies meet the challenges of the digital age. Instead of managing their IT, organizations have the ability to respond quickly to a more fast-paced and complex business landscape.

Cloud computing provides a superior alternative to traditional information technology, including these areas:

* Cost—eliminate capital expenses
* Speed—instantly provision space for development and testing
* Global scale—scale elastically
* Productivity—increased collaboration, predictable performance, and customer isolation
* Performance—better price/performance for cloud native workloads
* Reliability—fault-tolerant, scalable, distributed systems across all services

**Types of cloud computing**

There are three types of clouds: public, private, and hybrid. Each type requires a different level of management from the customer and provides a different level of security.

**Public cloud**

In a public cloud, the entire computing infrastructure is located on the premises of the cloud provider, and the provider delivers services to the customer over the internet. Customers do not have to maintain their own IT and can quickly add more users or computing power as needed. In this model, multiple tenants share the cloud provider’s IT infrastructure.

**Private cloud**

A private cloud is used exclusively by one organization. It could be hosted at the organization’s location or at the cloud provider’s data center. A private cloud provides the highest level of security and control.

**Hybrid cloud**

As the name suggests, a [hybrid cloud](https://www.oracle.com/cloud/hybrid-cloud/what-is-hybrid-cloud/) is a combination of both public and private clouds. Generally, hybrid cloud customers host their business-critical applications on their own servers for more security and control, and store their secondary applications at the cloud provider’s location.

**Multi cloud**

The main difference between hybrid cloud and [multi cloud](https://www.oracle.com/cloud/multicloud/what-is-multicloud/) is the use of multiple cloud computing and storage devices in a single architecture.

**Cloud computing services**

There are three main types of cloud services: software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS). There’s no one-size-fits-all approach to cloud; it’s more about finding the right solution to support your business requirements

**SaaS**

[SaaS](https://www.oracle.com/applications/what-is-saas/) is a software delivery model in which the cloud provider hosts the customer’s applications at the cloud provider’s location. The customer accesses those applications over the internet. Rather than paying for and maintaining their own computing infrastructure, SaaS customers take advantage of subscription to the service on a pay-as-you-go basis.

Many businesses find SaaS to be the ideal solution because it enables them to get up and running quickly with the most innovative technology available. Automatic updates reduce the burden on in-house resources. Customers can scale services to support fluctuating workloads, adding more services or features they grow. A modern cloud suite provides complete software for every business need, including [customer experience](https://www.oracle.com/cx/what-is-cx/), [customer relationship management](https://www.oracle.com/cx/what-is-crm/), [customer service](https://www.oracle.com/cx/service/what-is-customer-service/), [enterprise resource planning](https://www.oracle.com/erp/what-is-erp/), [procurement](https://www.oracle.com/erp/what-is-procurement/), [financial management](https://www.oracle.com/erp/what-is-financial-management-system/), [human capital management](https://www.oracle.com/human-capital-management/what-is-hcm/), [talent management](https://www.oracle.com/human-capital-management/what-is-talent-management/), [payroll](https://www.oracle.com/human-capital-management/payroll/what-is-payroll-software/), [supply chain management](https://www.oracle.com/scm/what-is-supply-chain-management/), [enterprise planning](https://www.oracle.com/scm/what-is-supply-chain-management/), and more.

**PaaS**

[PaaS](https://www.oracle.com/cloud/what-is-paas/)gives customers the advantage of accessing the developer tools they need to build and manage mobile and web applications without investing in—or maintaining—the underlying infrastructure. The provider hosts the infrastructure and middleware components, and the customer accesses those services via a web browser.

To aid productivity, PaaS solutions need to have ready-to-use programming components that allow developers to build new capabilities into their applications, including innovative technologies such as [artificial intelligence (AI)](https://www.oracle.com/artificial-intelligence/what-is-ai/), [chatbots](https://www.oracle.com/chatbots/what-is-a-chatbot/), [blockchain](https://www.oracle.com/blockchain/what-is-blockchain.html), and the [Internet of Things (IoT)](https://www.oracle.com/internet-of-things/what-is-iot/). The right PaaS offering also should include solutions for analysts, end users, and professional IT administrators, including [big data](https://www.oracle.com/big-data/what-is-big-data/) analytics, content management, [database management](https://www.oracle.com/database/what-is-a-cloud-database/), systems management, and [security](https://www.oracle.com/security/cloud-security/what-is-cloud-security/).

**IaaS**

[IaaS](https://www.oracle.com/cloud/what-is-iaas/) enables customers to access infrastructure services on an on-demand basis via the internet. The key advantage is that the cloud provider hosts the infrastructure components that provide compute, [storage](https://www.oracle.com/cloud/storage/what-is-cloud-storage/), and [network](https://www.oracle.com/cloud/networking/what-is-cloud-networking/) capacity so that subscribers can run their workloads in the cloud. The cloud subscriber is usually responsible for installing, configuring, securing, and maintaining any software on the [cloud native](https://www.oracle.com/cloud/cloud-native/what-is-cloud-native/) solutions, such as database, middleware, and application software.

## How cloud computing fosters innovation

Cloud customers benefit from automatically having the latest innovations and emerging technologies built into their IT systems, because the cloud provider takes on the work of developing new capabilities and features.

It’s about the speed of innovation. With the right cloud provider, customers can leverage a modern cloud computing architecture to innovate faster, increase productivity, and lower costs. Better yet, choosing a cloud provider that offers an integrated cloud (SaaS, PaaS, and IaaS) architecture gives businesses the ability to move from operations to innovation and deliver new apps and services, including the use of innovative technologies such as artificial intelligence (AI), chatbots, blockchain, and the Internet of Things (IoT). Companies can harness the abundance of data to gain predictive insights into their businesses and ultimately drive better outcomes for their customers.

## How cloud security builds trust

Moving to the cloud removes the headaches and costs of maintaining IT [security](https://www.oracle.com/security/cloud-security/what-is-cloud-security/). An experienced cloud provider continually invests in the latest security technology—not only to respond to potential threats, but also to enable customers to better meet their regulatory requirements.

The best cloud providers invest in every layer of cloud security as part of their overall design across global data center regions. Such a multilayer secure cloud approach offers security at the level the customer’s business requires.

## How the cloud connects business processes

Business processes describe how work is done from beginning to end. They are a good way to describe how people are working together today, how they would like to work together ideally, and how their work will be shaped with the introduction of new cloud technology. With an integrated cloud solution, organizations are better equipped to manage and assess the costs and benefits of technology projects.

For organizations that struggle with disconnected business processes and data silos, the cloud offers a way to transform their business operations. With the cloud, there’s no need reinvent the process wheel. Complete cloud application suites are not modular but instead are connected, eliminating data silos and enabling integration and intelligent business decisions.

Finding a cloud provider that provides all three layers of the cloud—in connected and unprecedented ways—is essential. Moreover, businesses need a complete, integrated platform with intelligent solutions at every layer.

## How cloud consumption works

From an end-user perspective, cloud consumption means either using a cloud application or consuming cloud infrastructure. Regardless of resource location, however, understanding infrastructure resource usage and consumption remains critical, because it represents an organization’s ability to serve customers, innovate, and lower operational expenses.

Consumption is defined as the act of using a resource. This concept seems simple enough when applied to the cloud, but implementation differs by service providers. Understanding what exactly it means to consume a resource adds to the complexity. The best cloud providers will help their customers clearly understand the cost of their cloud services and what they can expect to pay for consuming those services.

## Why cloud computing remains elusive to some

Many organizations today are still deciding whether to migrate their on-premises workloads to the cloud. For most organizations, the promise of trouble-free, cloud-based information systems remains an elusive goal. Although cloud technology is pervasive, today’s installations primarily consist of new applications in private clouds managed by in-house IT staff. Most enterprise applications and infrastructure still remains on premises, although that is rapidly changing.

However, IT leaders often hesitate to move critical applications into the hands of cloud service providers—partly because they don’t see a clear migration path for entrenched legacy assets, but also because they aren’t sure whether public cloud services are ready to meet enterprise needs. They are right to be skeptical: Most public cloud offerings are characterized by insufficient deployment choices, limited compatibility between on-premises and cloud systems, and a lack of enterprise-level management capabilities.