

Cloud Hypervisor.

Also known as virtual machine monitors (VMMs), are software or hardware components that enable the creation and management of virtual machines (VMs) on a physical host machine. The key is to enable hypervisor virtualization. In its simplest form, a hypervisor is specialized firmware or software, or both, installed on a single hardware that will allow you to host multiple virtual machines. This allows physical hardware to be shared across multiple virtual machines. The computer on which the hypervisor runs one or more virtual machines is called the host machine.

Virtual machines are called guest machines. The hypervisor allows the physical host machine to run various guest machines. It helps to get maximum benefit from computing resources such as memory, network bandwidth and CPU cycles.

Advantages of Hypervisor

- **Server Consolidation:** Hypervisors allow multiple virtual machines to run on a single physical server. This consolidation maximizes resource utilization, reducing the need for additional hardware and saving on power and cooling costs.
- **Resource Isolation:** Hypervisors provide strong isolation between virtual machines. Each VM operates independently, with its own operating system and application stack, preventing one VM from affecting or compromising others.
- **Efficient Resource Allocation:** Hypervisors dynamically allocate CPU, memory, and storage resources to VMs based on demand. This ensures optimal resource utilization and performance without manual intervention.
- **Faster Provisioning:** VMs can be provisioned, cloned, and scaled much faster than physical servers. This agility allows for rapid deployment of new services and applications.

Types of Hypervisors in Cloud Computing

There are two main types of hypervisors in cloud computing.

➤ **Type I Hypervisor**

A Type I hypervisor operates directly on the host's hardware to monitor the hardware and guest virtual machines, and is referred to as bare metal. Typically, they do not require the installation of software ahead of time.

This type of hypervisor is powerful and requires a lot of expertise to function well. In addition, Type I hypervisors are more complex and have few hardware requirements to run adequately. Because of this it is mostly chosen by IT operations and data center computing.

Type 1 hypervisors are deployed directly over the host hardware. Direct access to the hardware without any underlying OS or device drivers makes such hypervisors highly efficient for enterprise computing. The implementation is also inherently secure against OS-level vulnerabilities.

Examples of Type I hypervisors include Oracle VM Server for Xen, SPARC, Oracle VM Server for x86, Microsoft Hyper-V, and VMware's **ESX/ESXi**.

➤ Type II Hypervisor

It is also called a hosted hypervisor because it is installed on an existing operating system, and they are not more capable of running more complex virtual tasks. People use it for basic development, testing and simulation.

Type 2 hypervisors run as an application over a traditional OS. Developers, security professionals, or users who need to access applications only available on select OS versions often rely on type 2 hypervisors for their operations.

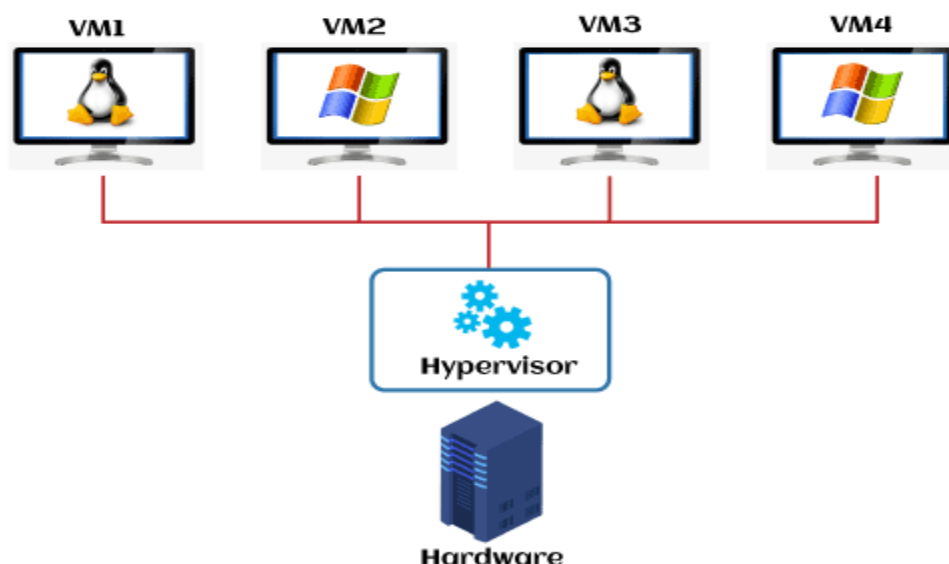
If a security flaw is found inside the host OS, it can potentially compromise all running virtual machines. This is why Type II hypervisors cannot be used for data center computing, and they are designed for end-user systems where security is less of a concern. For example, developers can use a Type II hypervisor to launch virtual machines to test software products prior to their release.

KVM, VMware Server and Workstation, Microsoft Virtual PC, Oracle VM VirtualBox, and QEMU are popular type 2 hypervisors.

Hypervisors, their use, and Importance

A hypervisor is a process or a function to help admins isolate operating systems and applications from the underlying hardware.

Cloud computing uses it the most as it allows multiple guest operating systems (also known as virtual machines or VMs) to run simultaneously on a single host system. Administrators can use the resources efficiently by dividing computing resources (**RAM, CPU, etc.**) between multiple VMs.



A hypervisor is a key element in virtualization, which has helped organizations achieve higher cost savings, improve their provisioning and deployment speeds, and ensure higher resilience with reduced downtimes.

Why use a hypervisor?

Hypervisors simplify server management because VMs are independent of the host environment. In other words, the operation of one VM does not affect other VMs or the underlying hardware.

Therefore, even when one VM crashes, others can continue to work without affecting performance. This allows administrators to move VMs between servers, which is a useful capability for workload balancing. Teams seamlessly migrate VMs from one machine to another, and they can use this feature for fail-overs. In addition, a hypervisor is useful for running and testing programs in different operating systems.

However, the most important use of hypervisors is consolidating servers on the cloud, and data centers require server consolidation to reduce server sprawl. Virtualization practices and hypervisors have become popular because they are highly effective in solving the problem of underutilized servers.

Virtualization enables administrators to easily take advantage of untapped hardware capacity to run multiple workloads at once, rather than running separate workloads on separate physical servers. They can match their workload with appropriate material resources, meeting their time, cost and service level requirements.

Need of a Virtualization Management Tool

Today, most enterprises use hypervisors to simplify server management, and it is the backbone of all cloud services. While virtualization has its advantages, IT teams are often less equipped to manage a complex ecosystem of hypervisors from multiple vendors. It is not always easy to keep track of different types of hypervisors and to accurately monitor the performance of VMs. In addition, the ease of provisioning increases the number of applications and operating systems, increasing the routine maintenance, security and compliance burden.

In addition, VMs may still require IT support related to provisioning, de-provisioning and auditing as per individual security and compliance mandates. Troubleshooting often involves skimming through multiple product support pages. As organizations grow, the lack of access to proper documentation and technical support can make the implementation and management of hypervisors difficult. Eventually, controlling virtual machine spread becomes a significant challenge.

Different groups within an organization often deploy the same workload to different clouds, increasing inefficiency and complicating data management. IT administrators must employ virtualization management tools to address the above challenges and manage their resources efficiently.

Virtualization management tools provide a holistic view of the availability of all VMs, their states (running, stopped, etc.), and host servers. These tools also help in performing basic maintenance, provisioning, de-provisioning and migration of VMs.

Key Players in Virtualization Management

There are three broad categories of virtualization management tools available in the market:

- Proprietary tools (with varying degrees of cross-platform support): VMware vCenter, Microsoft SCVMM
- **Open-source tools: Citrix XenCenter**
- Third-party commercial tools: Dell Foglight, Solar Winds Virtualization Manager, Splunk Virtualization Monitoring System.

Features of Cloud Computing

Cloud computing is becoming popular day by day. Continuous business expansion and growth requires huge computational power and large-scale data storage systems. Cloud computing can help organizations expand and securely move data from physical locations to the 'cloud' that can be accessed anywhere.

Cloud computing has many features that make it one of the fastest growing industries at present. The flexibility offered by cloud services in the form of their growing set of tools and technologies has accelerated its deployment across industries. This blog will tell you about the essential features of cloud computing.



1. Resources Pooling

Resource pooling is one of the essential features of cloud computing. Resource pooling means that a cloud service provider can share resources among multiple clients, each providing a different set of services according to their needs. It is a multi-client strategy that can be applied to data storage, processing and bandwidth-delivered services. The administration process of allocating resources in real-time does not conflict with the client's experience.

2. On-Demand Self-Service

It is one of the important and essential features of cloud computing. This enables the client to continuously monitor server uptime, capabilities and allocated network storage. This is a fundamental feature of cloud computing, and a customer can also control the computing capabilities according to their needs.

3. Easy Maintenance

This is one of the best cloud features. Servers are easily maintained, and downtime is minimal or sometimes zero. Cloud computing powered resources often undergo several updates to optimize their capabilities and potential. Updates are more viable with devices and perform faster than previous versions.

4. Scalability And Rapid Elasticity

A key feature and advantage of cloud computing is its rapid scalability. This cloud feature enables cost-effective handling of workloads that require a large number of servers but only for a short period. Many customers have workloads that can be run very cost-effectively due to the rapid scalability of cloud computing.

5. Economical

This cloud feature helps in reducing the IT expenditure of the organizations. In cloud computing, clients need to pay the administration for the space used by them. There is no cover-up or additional charges that need to be paid. Administration is economical, and more often than not, some space is allocated for free.

6. Measured And Reporting Service

Reporting Services is one of the many cloud features that make it the best choice for organizations. The measurement and reporting service is helpful for both cloud providers and their customers. This enables both the provider and the customer to monitor and report which services have been used and for what purposes. It helps in monitoring billing and ensuring optimum utilization of resources.

7. Security

Data security is one of the best features of cloud computing. Cloud services make a copy of the stored data to prevent any kind of data loss. If one server loses data by any chance, the copied version is restored from the other server. This feature comes in handy when multiple users are working on a particular file in real-time, and one file suddenly gets corrupted.

8. Automation

Automation is an essential feature of cloud computing. The ability of cloud computing to automatically install, configure and maintain a cloud service is known as automation in cloud computing. In simple words, it is the process of making the most of the technology and minimizing the manual effort. However, achieving automation in a cloud ecosystem is not that easy. This requires the installation and deployment of virtual machines, servers, and large storage. On successful deployment, these resources also require constant maintenance.

9. Resilience

Resilience in cloud computing means the ability of a service to quickly recover from any disruption. The resilience of a cloud is measured by how fast its servers, databases and network systems restart and recover from any loss or damage. Availability is another key feature of cloud computing. Since cloud services can be accessed remotely, there are no geographic restrictions or limits on the use of cloud resources.

10. Large Network Access

A big part of the cloud's characteristics is its ubiquity. The client can access cloud data or transfer data to the cloud from any location with a device and internet connection. These capabilities are available everywhere in the organization and are achieved with the help of internet. Cloud providers deliver that large network access by monitoring and guaranteeing measurements that reflect how clients access cloud resources and data: latency, access times, data throughput, and more.

Benefits of Cloud Services

Cloud services have many benefits, so let's take a closer look at some of the most important ones.

(a) Flexibility

Cloud computing lets users access files using web-enabled devices such as smartphones and laptops. The ability to simultaneously share documents and other files over the Internet can facilitate collaboration between employees. Cloud services are very easily scalable, so your IT needs can be increased or decreased depending on the needs of your business.

(b) Work from anywhere

Users of cloud systems can work from any location as long as you have an Internet connection. Most of the major cloud services offer mobile applications, so there are no restrictions on what type of device you're using.

It allows users to be more productive by adjusting the system to their work schedules.

(c) Cost savings

Using web-based services eliminates the need for large expenditures on implementing and maintaining the hardware. Cloud services work on a pay-as-you-go subscription model.

(d) Automatic updates

With cloud computing, your servers are off-premises and are the responsibility of the service provider. Providers update systems automatically, including security updates. This saves your business time and money from doing it yourself, which could be better spent focusing on other aspects of your organization.

(e) Disaster recovery

Cloud-based backup and recovery ensure that your data is secure. Implementing robust disaster recovery was once a problem for small businesses, but cloud solutions now provide these organizations with the cost-effective solutions with the expertise they need. Cloud services save time, avoid large investments and provide a third-party experience for your company.

Conclusion

Various features of cloud computing are helping both the host and the customer. A host also has various advantages, which benefit the customers. These days, the organization is in dire need of data storage. The previously mentioned features of cloud computing make it a popular choice among various organizations across industries.

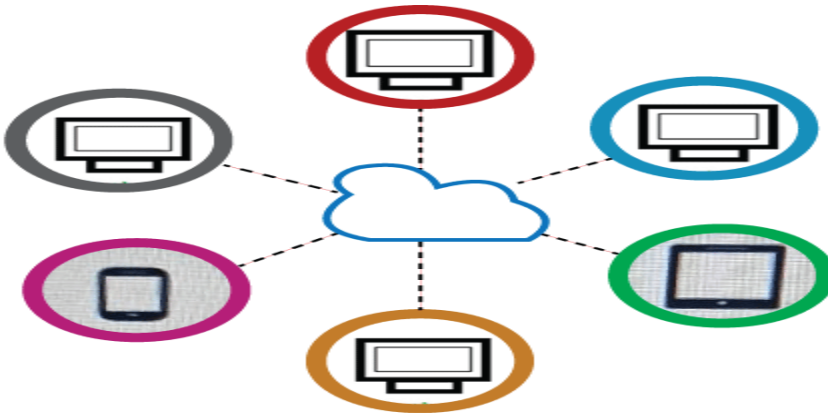
Cloud computing and the Internet of Things.

The key difference between Cloud Computing and the Internet of Things is that Cloud Computing provides hosted services over the Internet. In contrast, the Internet of Things connects surrounding smart devices to the network to share and analyze decision-making data.

Cloud computing and the Internet of things are modern technology. The acronym for the Internet of Things is IoT. Cloud computing provides the tools and services needed to build IoT applications. Moreover, it helps in achieving efficient and accurate IoT-based applications.

What is Cloud Computing?

Organizations need time and budget to scale up their IT infrastructure. On-campus, expanding IT infrastructure is difficult and requires more time. Cloud computing provides an optimal solution to this problem. Cloud computing services consist of virtual data centers that provide hardware, software, and resources when needed. Therefore, organizations can directly connect to the cloud and access the required resources. It helps reduce the cost and scale up and down as per the business requirements.



There are two types of models in cloud computing called the deployment model and service model. Deployment models describe the access type to the cloud. These types are public, private, community and hybrid. First, the public cloud provides services to the general public.

Secondly, the private cloud provides services for the organization. Third, the community cloud provides services to a group of organizations. Finally, a hybrid cloud is a combination of public and private clouds. The private cloud performs critical activities in a hybrid while the public performs non-critical activities.

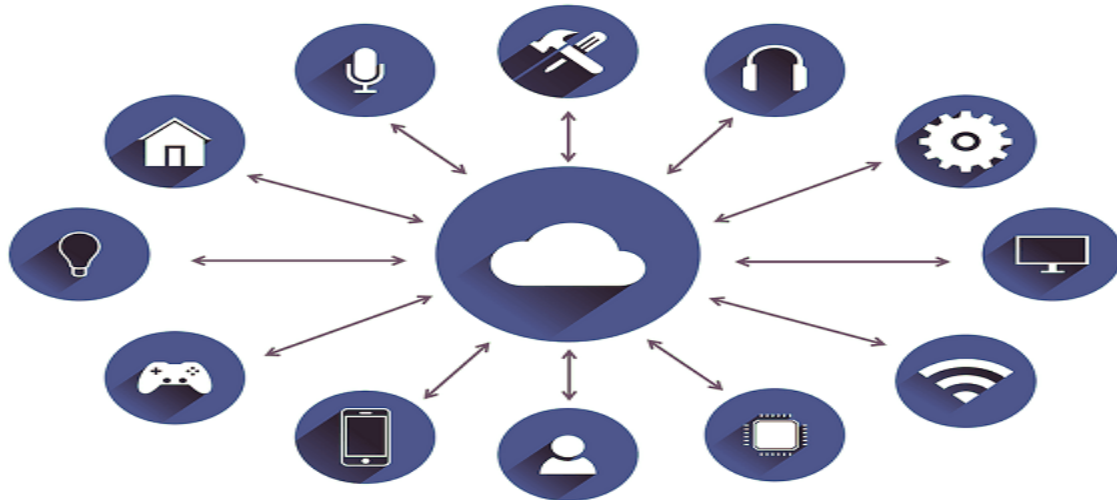
IaaS, PaaS, and SaaS are the three service models in cloud computing. Firstly, IaaS stands for Infrastructure as a Service. It provides access to basic resources such as physical machines, virtual machines, and virtual storage. Secondly, PaaS stands for Platform as a Service. It provides a runtime environment for the applications. Lastly, SaaS stands for Software as a Service. It allows end-users to use software applications as a service.

Overall, cloud computing offers many advantages. It is highly efficient, reliable, flexible, and cost-effective. It allows applications to access and use resources in the form of utilities. In addition, it provides online development and deployment tools. One drawback is that there can be security and privacy issues.

What is the Internet of Things?

The Internet of Things connects all nearby smart devices to the network. These devices use sensors and actuators to communicate with each other. Sensors sense surrounding movements while actuators respond to sensory activities. The devices can be a smartphone, smart washing machine, smartwatch, smart TV, smart car, etc.

Assume a smart shoe that is connected to the Internet. It can collect data on the number of steps it can run. The smartphone can connect to the Internet and view this data. It analyzes the data and provides the user with the number of calories burned and other fitness advice.



Another example is a smart traffic camera that can monitor congestion and accidents. It sends data to the gateway. This gateway receives data from that camera as well as other similar cameras. All these connected devices form an intelligent traffic management system. It shares, analyzes, and stores data on the cloud.

When an accident occurs, the system analyzes the impact and sends instructions to guide drivers to avoid the accident.

Overall, the Internet of Things is an emerging technology, and it will grow rapidly in the future. Similarly, there are many examples in healthcare, manufacturing, energy production, agriculture, etc. One drawback is that there can be security and privacy issues as the devices capture data throughout the day.

Which is better, IoT or cloud computing?

Over the years, IoT and cloud computing have contributed to implementing many application scenarios such as smart transportation, cities and communities, homes, the environment, and healthcare.

Both technologies work to increase efficiency in our everyday tasks. Cloud computing collects data from IoT sensors and calculates it accordingly. Although the two are very different paradigms, they are not contradictory technologies; They complement each other.

Difference between the Internet of things and cloud computing

Meaning of Internet of things and cloud computing

IoT is a network of interconnected devices, machines, vehicles, and other 'things' that can be embedded with sensors, electronics, and software that allows them to collect and interchange data. IoT is a system of interconnected things with unique identifiers and can exchange data over a network with little or no human interaction.

Cloud computing allows individuals and businesses to access on-demand computing resources and applications.

Internet of Things and Cloud Computing

The main objective of IoT is to create an ecosystem of interconnected things and give them the ability to sense, touch, control, and communicate with others. The idea is to connect everything and everyone and help us live and work better. IoT provides businesses with real-time insights into everything from everyday operations to the performance of machines and logistics and supply chains.

On the other hand, cloud computing helps us make the most of all the data generated by IoT, allowing us to connect with our business from anywhere, whenever we want.

Applications of Internet of Things and Cloud Computing

IoT's most important and common applications are smartwatches, fitness trackers, smartphones, smart home appliances, smart cities, automated transportation, smart surveillance, virtual assistants, driverless cars, thermostats, implants, lights, and more. Real-world examples of cloud computing include antivirus applications, online data storage, data analysis, email applications, digital video software, online meeting applications, etc.

Internet of Things vs. Cloud Computing: Comparison Chart

Internet of things	Cloud Computing
IoT is a network of interconnected devices that are capable of exchanging data over a network.	Cloud computing is the on-demand delivery of IT resources and application via the internet.
The main purpose is to create an ecosystem of interconnected things and give them the ability to sense, touch, control, and communicate.	The purpose is to allow access to large amounts of computing power virtually, and offering a single system view.
The role of IoT is to generate massive amounts of data.	Cloud computing provides a way to store IoT data and provides tools to create IoT applications.

Summary

While IoT and cloud computing are two different technologies that aim to make our daily lives easier, they are not contradictory technologies; They complement each other. The two work in collaboration to increase efficiency in our daily tasks.

The basic concept of IoT is connectivity, in which physical objects or things are connected to the web - from fitness trackers to smart cars and smart home devices. The idea is to connect everything to the Internet and control them from the Internet. Cloud computing helps to manage the IoT infrastructure.

Cloud Computing Examples

Cloud computing is an infrastructure and software model that enables ubiquitous access to shared storage pools, networks, servers and applications.

It allows data processing on a privately-owned cloud or on a third-party server. This creates maximum speed and reliability. But the biggest advantages are its ease of installation, low maintenance and scalability. In this way, it grows with your needs.

IaaS and SaaS cloud computing has been skyrocketing since 2009, and it's all around us now. You're probably reading this on the cloud right now.

For some perspective on how important cloud storage and computing are to our daily lives, here are 8 real-world examples of cloud computing:

Examples of Cloud Storage

Ex: Dropbox, Gmail, Facebook

The number of online cloud storage providers is increasing every day, and each is competing on the amount of storage that can be provided to the customer.

Right now, Dropbox is the clear leader in streamlined cloud storage, allowing users to access files through their application or website on any device with up to 1 terabyte of free storage.

Gmail, Google's email service provider, on the other hand, offers unlimited storage on the cloud. Gmail has revolutionized the way we send email and is largely responsible for the increasing use of email across the world.

Facebook is a mixture of both in that it can store an infinite amount of information, pictures and videos on your profile. Then they can be easily accessed on multiple devices. Facebook goes a step further with its Messenger app, which allows profiles to exchange data.

Examples of Marketing Cloud Platforms

Ex: Maropost for Marketing, Hubspot, Adobe Marketing Cloud

Marketing Cloud is an end-to-end digital marketing platform for customers to manage contacts and target leads. Maropost Marketing Cloud combines easy-to-use marketing automation and hyper-targeting of leads. Plus, making sure email arrives in the inbox, thanks to its advanced email delivery capabilities.

In general, marketing clouds fill the need for personalization, and this is important in a market that demands messaging to be "more human". So communicating that your brand is here to help will make all the difference in closing.

Examples of Cloud Computing in Education

Ex: SlideRocket, Ratatype, Amazon Web Services

Education is rapidly adopting advanced technology as students already are. Therefore, to modernize classrooms, teachers have introduced e-learning software like SlideRocket.

SlideRocket is a platform that students can use to create and submit presentations, and students can also present them over the cloud via web conferencing. Another tool teachers use is RataType, which helps students learn to type faster and offers online typing tests to track their progress.

Amazon's AWS Cloud for K12 and Primary Education is a virtual desktop infrastructure (VDI) solution for school administration. The cloud allows instructors and students to access teaching and learning software on multiple devices.

Examples of Cloud Computing in Healthcare

Ex: ClearDATA, Dell's Secure Healthcare Cloud, IBM Cloud

Cloud computing allows nurses, physicians and administrators to quickly share information from anywhere. It also saves on costs by allowing large data files to be shared quickly for maximum convenience. This is a huge boost to efficiency.

Ultimately, cloud technology ensures that patients receive the best possible care without unnecessary delay. The patient's status can also be updated in seconds through remote conferencing.

However, many modern hospitals have not yet implemented cloud computing, but are expected to do so soon.

Examples of Cloud Computing for Government

Uses: IT consolidation, shared services, citizen services

The US government and military were early adopters of cloud computing. Under the Obama administration to accelerate cloud adoption across departments, the U.S. The federal cloud computing strategy was introduced.

According to the strategy: "The focus will shift from the technology itself to the core competencies and mission of the agency."

US Government's cloud includes social, mobile and analytics technologies. However, they must adhere to strict compliance and security measures (FIPS, FISMA, and FedRAMP). This is to protect against cyber threats both domestically and abroad.

Cloud computing is the answer for any business struggling to stay organized, increase ROI, or grow their email lists. Maropost has the digital marketing solutions you need to transform your business.

Cloud Computing Jobs

Cloud computing touches many aspects of modern life, and there is a great need for cloud professionals. Learn about the skills and education required for a cloud computing career.

Cloud professionals are in high demand, and as the reliance on remote access continues to grow, so are talented IT professionals.

Cloud computing is a system of databases and software, typically operating in data centers and warehouses. This enables users and businesses to access digital information over the Internet from anywhere, rather than having physical servers in a network closet in the back office. Cloud computing businesses need less IT provides. Overhead costs, especially for small businesses and startups that may not have the capital to invest in extensive on-premises I.T. Department.

Interacting with cloud technology is involved in almost every aspect of modern life, whether as a consumer or in an IT environment.

On the consumer side, the lack of physical media such as CDs, DVDs and video games has led to the rise of on-demand streaming services. This requires remote storage options that can support delivering large amounts of data accurately and quickly. in I.T. In the field, advances in artificial intelligence, machine learning and IoT compatibility have driven enterprises to seek the agility and flexibility of the cloud.

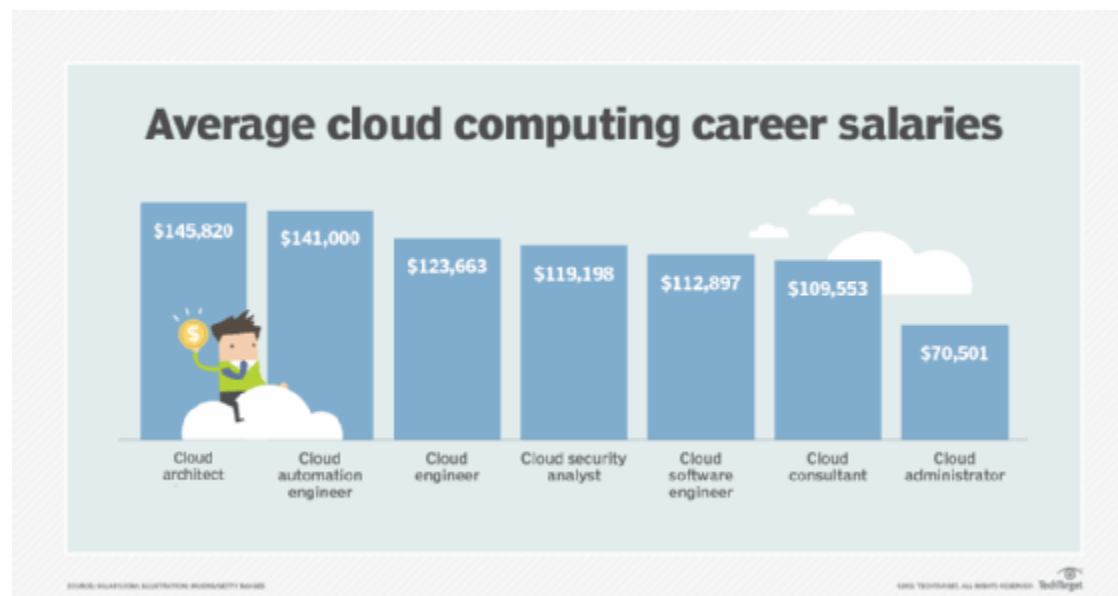
Such a complex system requires specific knowledge and skills, requiring specific training and requirements.

Cloud computing career requirements

Regardless of what stage of your career you're in, the skills required for cloud computing are the same. You'll need a solid foundation in:

- **Programming languages.** Specific languages include Java, JavaScript, and Python.
- **Database management and programming.** Those familiar with SQL, NoSQL, and Linux will have the advantage.
- **Artificial intelligence and machine learning.** These two technologies aid businesses' agility and efficiency by processing and analyzing patterns, making insights based on that data and facilitating faster, more accurate decision-making.
- **Understanding and experience with cloud technologies and providers.** These vendors include Amazon Web Services (AWS), Google Cloud Platform, Microsoft Azure, and Oracle.

As with any I.T. specialty, you also need to be curious, analytical, and willing to stay on top of rapidly changing user needs that drive technological innovation.



Top cloud computing careers

1. Cloud administrator

These experts manage a company's cloud presence and infrastructure. They develop, enforce and update policies for how employees and users access cloud services, establish security protocols and policies, monitor and ensure uptime, and assess the need for technology updates.

Education requirements: Bachelor's degree in computer science, management information systems (MIS), or related field; plus three to five years' experience in systems or I.T. administration.

2. Cloud architect

Think of cloud architecture as the framework within which all other cloud technologies operate. This is the "house" frame, and all the cloud-specific subspecialties like flooring, plumbing, drywall, and finishing. A cloud architect is a general contractor who designs and implements a company's cloud computing strategies. They ensure that everything stays on track and on budget and that the company smoothly transitions to cloud operations.

Education requirements: Bachelor's degree or higher in computer science, information systems, or a related field. Some companies require or give preference to those holding a master's degree or MBA.

3. Cloud automation engineer

As the world becomes increasingly automated, cloud automation engineers must build, implement and maintain this automation technology as it migrates to the cloud. This automation frees up human workers from repetitive tasks.

Education requirements: Bachelor's degree in computer science or information technology, specializing in artificial intelligence and machine learning.

4. Cloud consultant

A cloud consultant has extensive knowledge of cloud technologies and guides companies looking for cloud-based tools. Typically, this specialist will assess the needs of the company and suggest the best software and tools to meet that company's technical and budgetary needs. The consultant can help with the transition to the cloud by designing migration policies and selecting the appropriate platform. Consultants may sometimes be asked to help optimize a company's cloud presence, so they should have a general and in-depth knowledge of the major cloud platforms.

Education Requirements: Bachelor's degree in Computer Science or Information Technology. Since managerial skills are often required for this position, an MBA can lead to additional clients.

5. Cloud engineer

Cloud engineers are responsible for the managerial aspects of a company's cloud strategies. Engineers often work with architects to implement a company's cloud strategies. Still, they also perform the administrative task of negotiating with customers and vendors to keep everyone on task and within budget.

Education Requirements: Bachelor's degree or higher in computer science, information systems, or related field; Also, experience with programming languages such as Java and Python.

6. Cloud security analyst

Cloud security analysts have a responsibility to ensure the integrity and security of a company's cloud presence. They do this by assessing threats and strengthening defenses against them, preventing data breaches, securing data, and closing security gaps when breaches do occur.

Education Requirements: A bachelor's degree in cyber security, systems analysis, computer science, or information technology specializing in security analysis.

7. Cloud software engineer

Cloud software engineers work with programmers and related computer scientists to develop software that works in the cloud. These individuals are also typically responsible for upgrading, repairing, and maintaining the software they develop and the databases they operate.

Education Requirements: Bachelor's degree or higher in software engineering, computer science, information systems, or related field; As well as experience with programming languages such as Java and Python.

Tips to jump-start a cloud computing career

Now that you know about the available roles in cloud computing, it's time to pursue a career where you can put those skills into practice. Here are some tips to help you along the way:

1. Get a computer science or I.T. degree

It is important to understand that many companies do not require higher education. If you can prove that you understand and can meet the requirements of the job, you have a good chance of getting hired. However, if you have any prior I.T. Experience, a formal program can provide you with a solid foundation for adding skills and specialized knowledge. Listing a degree on your resume also shows employers that you have that foundation and can be committed to long-term projects.

2. Get additional training related to cloud computing

If a college degree isn't right for you, or if you already have an I.T. and want to shift to cloud-focused careers, there are countless options online for continuing education and training, including in-person classes and multi-part certification courses. In addition to learning the in-depth topics you'll need as a cloud specialist, these courses will show potential employers - or current ones if you want to move to a different position within your company - that you are dedicated to your craft and the ever-changing technological landscape.

3. Get certified

Vendors such as Amazon, Microsoft, and Google have certification programs to teach you the knowledge and skills needed for various cloud technologies. Earning a cloud certification will enable you to demonstrate to employers and clients that you understand the demands of cloud computing and have the knowledge and talent to meet them. It can also give you a bump in salary.

4. Get hands-on experience

Whether you go through a formal four-year college program or just take a class or two, nothing beats hands-on experience. If you're just starting to explore your options, sign up for an account with a cloud server -- such as AWS or Azure -- and experiment to get a solid grasp of the technology. If you already have I.T. area, see if you can get involved in more cloud-based projects to improve your existing cloud computing skills and develop new ones.

5. Build your portfolio

Once you have a few projects under your belt, even if you've completed them as samples and not for paying clients, put together a site to serve as your portfolio. This should include links to your various cloud projects and a summary of your education and experience. If you have testimonials from customers, be sure to include those as well.

6. Gather good references

When putting together your references, be selective. If you're starting out, consider adding one or two computer science or information technology professors who are familiar with your performance. If you have more experience, include former employers, coworkers, and clients who speak positively about your work.

7. Network

Whether you're actively looking for a job or just keeping an eye open for opportunities, there's no better way to get your next job than by networking. Attend business events and conferences, especially those focused-on cloud computing and where the companies you are most interested in have a strong presence. Tell others in your professional circle that you are exploring career options and ask if they will take you into consideration to see if they know of a suitable opening for you.