

Cloud Computing

Supporting Enterprises Enhance
IT Capabilities and Business Agility

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Abstract

Cloud computing is a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using internet technologies, according to Gartner, Inc.

Cloud computing can help organizations with an adequate amount of storage and processing power. The collaboration, scalability, flexibility, and cost effectiveness are some of the advantages that can be realized by properly understanding the power of cloud computing.

Introduction

The cloud-based capabilities are playing a crucial role in driving the operational excellence as the business world is becoming increasingly connected, mobilized, and digitalized. This white paper talks about the role of cloud in business, types of cloud, scalability, Pay-As-You-Go model, security, and advantages.



Overview of Cloud Computing

Cloud computing is one of the emerging trends in the IT industry. It provides organizations with the ability to store, access data and programs over the internet while reducing the usage of their physical computer hardware and software.

It has equipped with many capabilities such as attributes (elastic, on-demand), service models (Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and deployment approaches (Public, Private and Hybrid).

It can consolidate components (compute, storage and network), so that the capacity needs can be dynamically modified to match changing system workloads.

The value proposition of cloud computing also includes instantaneous resource availability. It uses this principle to be readily recycle and repurpose resources into quality computing needs. It also offers organizations with a subscription-based operating cost model, which is a payment structure that enables them purchase or subscribe to a vendor's IT services for a specific period for a set price.

Typically, subscribers commit to the services on a monthly or an annual basis. These offerings allow organizations mitigate their upfront costs of building a local data centre by using the vital services needed to run the business.

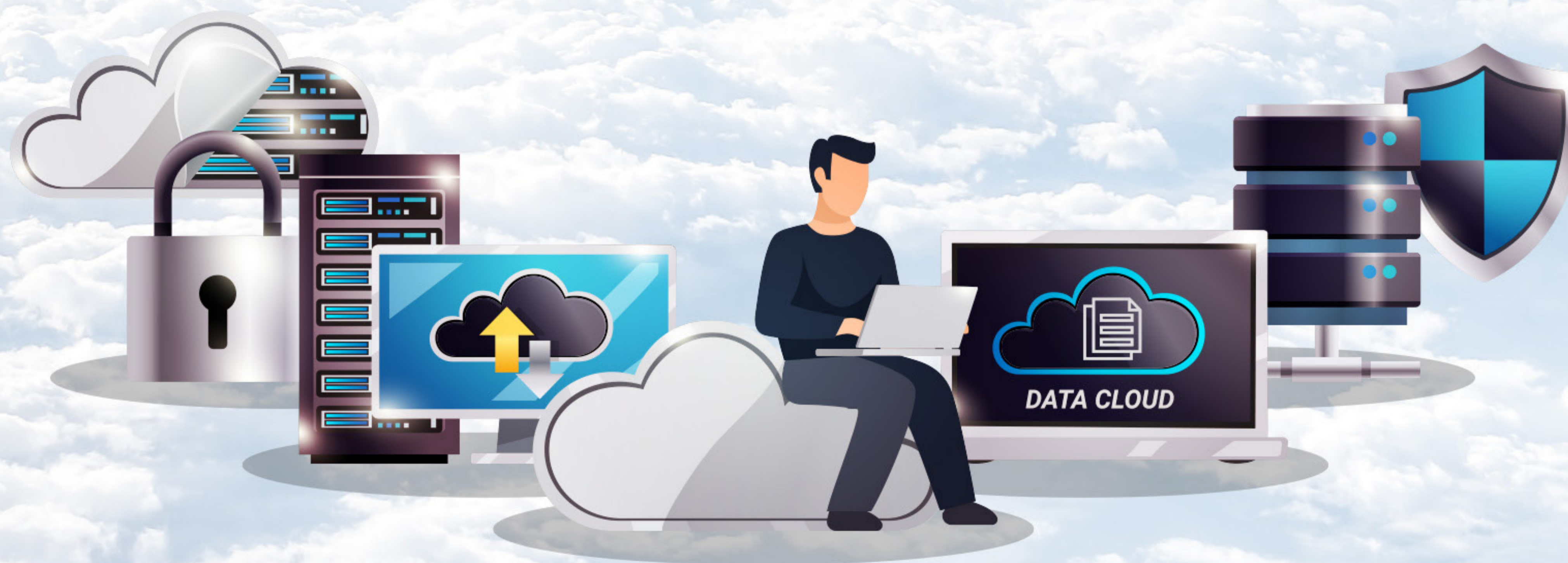


Why Choose Cloud Computing for Business ?

Cloud computing came into action when the organizations were in the quest for ways to decrease their hardware costs, enhance efficiency in data processing, and keep everything global. It enables organizations easily access their data from anywhere at any time.

Thus, they need not to carry those sensitive hard disks anymore with access credentials to their cloud server. There were a lot of challenges while implementing this technology in the beginning, but today, it is powerful enough. Increasingly, organizations of all sizes are embracing cloud capabilities, which makes it clear that cloud computing is undeniable.

Still, many professionals have one common question running in their minds, that is - Why are many businesses moving to the cloud? It is simply because cloud computing can improve efficiency, cash flow and provide many more benefits.



Below are some of the reasons why organizations are considering cloud as the next big thing for them.



Flexibility

Cloud computing provides flexibility to the employees in their work practices. They can connect to their virtual office and access files while they are off-site using web-enabled devices such as smartphones and laptops.

It also helps in simultaneously sharing files over the internet, supporting both internal and external collaborations.

Scalability

One of the key reasons why many organizations embrace cloud is because of scalability. Organizations can decide what they intend to use and pay only for it. The on-premise systems are provided on a contract, but organizations can get something better resources at a better price from the cloud vendors.

With cloud computing, a growing or shrinking organization can scale its services up or down whenever it needs.

Cost Savings

Almost all the organizations look to reduce expenses without losing productivity, cloud computing can be the solution for them.

There are no upfront investments for hardware or software, because it provides a utility model wherein organizations are enabled to only pay for what they use by subscribing to the service, reducing the capital expenditure/CAPEX.

It can also save the infrastructure installation time and money, providing organizations a competitive advantage.

The organizations that are equipped with adequate capital, prioritize investing in a robust disaster recovery strategy, but the organizations that lack the required cash and expertise, approaching cloud can be the right move. Because, cloud providers focus on regular backup and recovery activities as well.

Automatic Software Updates

When vendors know their platforms well, mostly they also know when their platforms need to be updated. Typically, the vendors receive feedback from the customers, which helps them tune the services accordingly.

This is one of the key advantages of cloud computing as vendors keep their cloud platforms up-to-date for the organizations and release regular software updates that include security-related patch updates.

Thus, organizations can reduce concerns about spending time in maintaining the system themselves, enabling them focus on the things that matter for their business.

Furthermore, with a cloud solution in place organizations need not to pay extra for these upgrades.

Anytime, Anywhere Access

The cloud technology helps an organization's employees access their crucial data, programs or anything stored in the cloud from any web-enabled devices at any time from any location. Whether they are in a business meeting, at a hotel, traveling or on a vacation.

Transparency

Cloud computing can improve transparency in the organization and transparency can improve accountability also.

Instead of waiting for a sales executive to call or e-mail the managers with results of a sales meeting, the management team can see it in real time everything that has been happening in every department of their organization. They can even provide this transparency to their customers if necessary.

Disaster Recovery and Backup

The organizations that are equipped with adequate capital, prioritize investing in a robust disaster recovery strategy, but the organizations that lack the required cash and expertise, approaching cloud can be the right move. Because, cloud providers focus on regular backup and recovery activities as well.

With business's data safely stored on secure data centers instead of an organization's server room, organizations can be back at work on their laptops or smartphones if they have an internet connection in the times of power shortage due to unpredictable reasons.

Security

Cloud providers always endeavour to bring in their new and improved service offerings for the organizations of all sizes.

This means they always intend to increase their customer reach and they cannot overlook ensuring security to their offerings from cyber thieves. Many cloud providers follow all types of defensive measures like filtering, patch management, and cryptography techniques.

This helps them protect their clients' data and maintain them as a long-term customer.

What are Public, Private and Hybrid Clouds?



Public Cloud



Private Cloud



Hybrid Cloud

Cloud computing comes in three forms: public cloud, private cloud and hybrid cloud.

These clouds are also called as deployment models that becoming as an imperative tool for organizations of all shapes and sizes.

That is because, these clouds offer different advantages like scalability, flexibility, security, cost-effectiveness, and time-saving.

“While public cloud usage will continue to increase, the use of private cloud and hosted private cloud services is also expected to increase at least through 2017,” according to Gartner, Inc.

Private Cloud

Private cloud provides flexibility, scalability, automation, and monitoring. In a private cloud, the cloud computing solutions are dedicated to a single organization.

Mostly, the private cloud is used by the large organizations that concern about security and compliance and keep their assets within the firewall.

A private cloud is more expensive and more secure when compared to public cloud.

Public Cloud

A public cloud is a scalable, cost-effective approach to using online storage and services.

Service providers offer resources such as applications (Software-as-a-Service) and a storage space to the general users on a public cloud, also known as multi-tenanted cloud.

Examples of public cloud providers include: Amazon Elastic Compute Cloud (EC2), IBM's Blue Cloud, Sun Cloud, Google AppEngine and Windows Azure Services Platform. The hardware, application and bandwidth costs are covered by the provider.

However, there are some limitations, the public cloud may not be suitable for every organization.

The model can limit configuration, security, and SLA specificity. Couple of advantages of public cloud are: Cost Effectiveness and On-demand Scalability.

Hybrid Cloud

With organizations increasingly looking to take the advantage of off-premise resources, the hybrid cloud is often considered as a delivery model that allows them make the most of their investments.

The usage of both private and public clouds together is called hybrid cloud, which allows placing data and applications in any of the cloud as per the need and frequency of use.

Hybrid cloud can help organizations respond quickly and deliver IT resources to the end users.

Public cloud is ideal for less-sensitive operations and private cloud for business-critical operations.

There are some advantages that driving the adoption of a hybrid cloud like control over data, cost effectiveness and the combined networks for quickly responding to fast changing business needs.



Cloud Service Providers

The cloud market is rapidly growing with cloud service providers as they are continuing to add crucial capabilities to their stack, making cloud-based services ever more attractive for organizations. For the most part, cloud service providers can support their customers' cloud goals. Below are some of the top cloud service providers and some of their offerings.

Cloud providers	Amazon Web Services	Microsoft Azure	Google Cloud Platform	Rackspace
Some of the Features	<p>Elastic Computing</p> <p>Controlled Instances</p> <p>Integrated with the AWS platform</p> <p>Auto Scaling</p>	<p>Built-in virtual networking and load balancing</p> <p>Hybrid consistency with on-prem systems</p> <p>Deploy any workload and any language on nearly any OS</p> <p>Support for Java, Node.js, PHP, Python, .NET, and Ruby</p>	<p>Industry-leading local SSD performance</p> <p>Custom Machine Types</p> <p>Billed in minutelevel increments</p> <p>Built-in load balancing, health checks, and application logging</p>	<p>Support for outlining and implementing cloud workloads at scale</p> <p>Fully redundant networking</p> <p>Service backed by in-house support</p> <p>Provision in minutes via an OpenStack API</p>

Some of the Features	Complete Resource Control	Auto Scaling	Instant and automatic scaling based on need,	Mix and match with virtual cloud servers
	Fast Deployment	Automated OS and application patching	Security Scanner automatically scans and detects common web app vulnerabilities	Pay by the minute
Made for	cost-effective cloud tools for business operations, high scalability and availability	enterprise clients familiar with Microsoft products, robust development and deployment.	developers seeking a streamlined cloud ecosystem for development	powerful managed hosting with various managed services.
Not for	users seeking open-source, operating without internal management	managed cloud, or those unfamiliar with Microsoft products.	user seeking a managed cloud platform, simple cloud-based tasks.	complete cloud ecosystems, interconnected PaaS and IaaS.
Ease of Use	4/5	4/5	4/5	4/5
Pricing	Pay-as-you-go	Pay-as-you-go	Pay-as-you-go	No free trial, 1GB \$4/mo., Pay-as-you-go
Uptime	99.95%	99.95%	99.95%	99.999%

Note: Service offerings and pricing could change from time to time by the provider, please check respective sites for updated information.

What Does Scalability Mean in Cloud Computing?

The businesses that are growing at a rapid pace, they need a growth in their resources too. The storage space, the bandwidth, and everything need to be growing.

The on-premise systems take a long time to get updated with changing requirements, the organizations that choose cloud computing can get preferred infrastructure in a short time, almost in some moments.

Cloud-based services are ideal for businesses with growing or fluctuating bandwidth demands.

Cloud computing offers organizations the opportunity to scale their computing resources whenever they deem it necessary.

This can be done by either increasing or decreasing the required resources, meaning that they need not to pay for the resources which they are not utilizing.

This ability to alter plans because of fluctuation in business size and needs is one of the major benefits of cloud computing, particularly when organizations are experiencing a sudden growth in demand.

For small and medium-sized enterprises (SMEs), this scalability provides a huge advantage.



SMEs that use cloud resources effectively, they can be freed up from large up-front payments for hardware and software, making operational costs minimal.

While this benefit is evident to SMEs, the larger businesses may find it difficult to use the scalability advantages. The reason can be that the inability to reset the infrastructure in a short span as they cannot see any downtime.

Understanding a Pay-As-You-Go Utility Model

Simply put, Pay-As-You-Go (PAYG) is a utility computing model that enables organizations pay based on the amount of resources that they have used.

An investment in a complete traditional on-premises or in-house infrastructure may not be very beneficial whereas cloud computing has the capability to provide the custom-made infrastructure curtailing the upfront capital expenditure.

Under this model, infrastructure components like software, storage, and development platforms can be provisioned for the usage and the invoice is made based on the usage of all these components. This mechanism is called utility computing.

Prior to the advent of cloud computing, users had only one way to run their applications or programs that is using the physical computers and servers present within the premises of their organization.

But now, the users can perform all their computation tasks, remotely, by using the advantage of pay-as-you-go model. For many businesses, performing tasks on cloud is becoming highly affordable.

Some of the players in this PAYG space are: Amazon EC2, Flexiscale, GoGrid, Joyent, AppNexeus, RightScale, IlasticServer, and more.

Cloud services are delivered on a fixed or a subscription-based pricing model. The model allows an organization purchase a service for a set payment for a set period of time, basically on a monthly or annual basis.

The three main categories of cloud computing services include IaaS, PaaS, SaaS, and each one offers a different form of the pay-as-you-go model.

Infrastructure as a Service (IaaS)

Host



Platform as a Service (PaaS)

Build



Software as a Service (SaaS)

Consume



Infrastructure as a Service (IaaS)

In this category, required infrastructure would be provided and users are enabled to pay on a per-use basis, typically by the hour, week or month.

Some cloud providers also charge based on the amount of virtual machine (VM) space is used. The IaaS vendors include: IBM, Hewlett-Packard, Microsoft and Amazon Web Services.

Platform as a service (PaaS)

In this category, the organizations may find prices based on application/user or gigabyte of memory consumed per hour.

Microsoft offers a per-minute pricing model for its PaaS that stops the meter when users stop a VM, while preserving the VM state and configuration. PaaS vendors include: Google, Oracle Public Cloud and Windows Azure.

Software as a Service (SaaS)

In this category, pricing can be based on features, storage capacity or on a per-user basis. Vendors include: Salesforce.com, NetSuite and Microsoft Dynamics.

The Infrastructure as a Service (IaaS) market has been growing more than 40 percent in revenue per year since 2011, and it is projected to continue to grow more than 25 percent per year through 2019.

By 2019, the majority of virtual machines (VMs) will be delivered by IaaS providers.

By 2020, the revenue for compute IaaS and Platform as a Service (PaaS) will exceed \$55 billion — and likely pass the revenue for servers, according to Gartner, Inc.

Is Cloud Computing Secure?



With growing emphasis on digitization, access to the data is becoming more important than the physical location of data.

The cloud-based service providers typically focus on security and governance elements.

Increasingly, they are focusing on vulnerability testing so that they could offer a reliable and uninterrupted service to their customers.

IT security providers are also gaining momentum as the business world is becoming more and more digital.

They are increasingly called on to ensure the right level of IT security policies for the cloud infrastructure and the virtual machines.

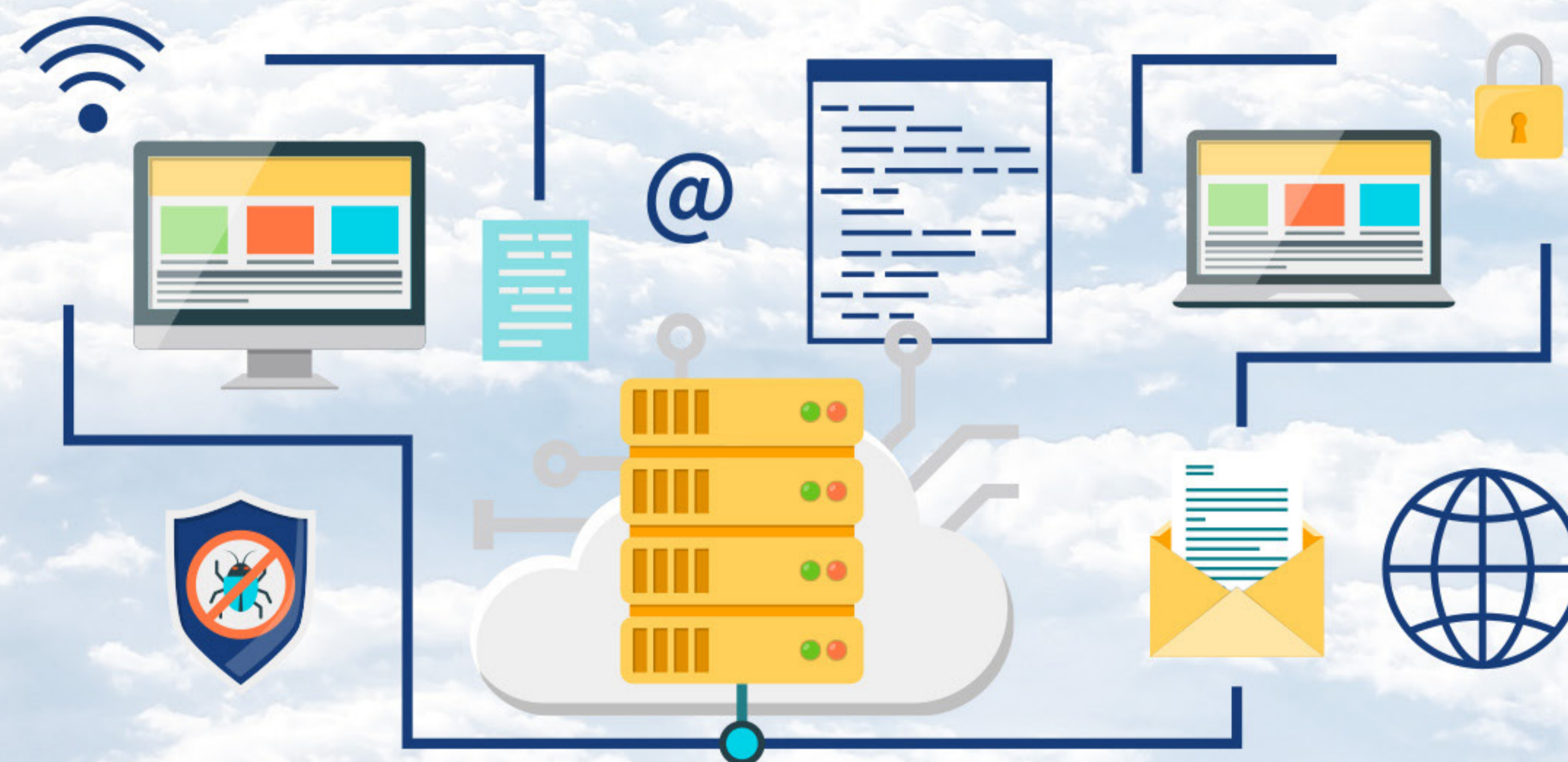
However, asking cloud providers about the IT security policy that they have implemented in their offerings can be a relevant consideration.

Cloud Computing Advantages to Businesses

Updating Facebook status, and checking bank balance on the phone are a couple of examples of cloud computing. Cloud computing is one of the ways to increase efficiency and improve cash flow.

Below are some of the advantages that cloud computing can offer.

- » Scalability - scale up or down cloud capacity based on the needs.
- » Cost - pay-as-you-go model can help keep capital and operational expenses to a minimum.
- » Software - with SaaS, the latest versions of the applications are made available as soon as they are released.
- » Availability - most cloud providers offer their services with 99.95% uptime.
- » Access - data and applications are available to the users no matter where they are in the world.



Conclusion

Cloud computing can provide an adequate amount of storage and processing power. It can enable new ways to access information, analyze data and connect people from any anywhere in the world.

With additional cloud resources are always at the ready, organizations can mitigate the purchase of assets for sporadic intensive computing tasks.

Users from around the world can collaborate on the same tasks in real time. If they need more processing power, cloud can provide it.

The key point here is the proper understanding and the usage of cloud that can enable organizations tap into computing power and obtain the advantage of collaboration, scalability and flexibility at lower costs.





info@veritis.com



1-877-VERITIS (283-7484)



972-753-0033



US Corporate Headquarters

1231 Greenway Drive
Suite 1040
Irving, TX 75038



India Headquarters

#607, 6th Floor,
Ashoka Bhoopal Chambers,
S P Road, Begumpet
Hyderabad - 500003, India.
Phone no: 040 42211730

For more information, contact info@veritis.com

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