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A Guide to Cloud Computing

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Introduction

Cloud computing has completely transformed the IT industry and changed what IT resources mean in the business language. The cloud is a convenient and cost-effective way for organizations to access and utilize computing resources and services. Many organizations consider cloud adoption a top investment priority. For this reason, more and more companies and entrepreneurs are quickly implementing cloud solutions as their primary enterprise IT strategy. This trend is so dominant that Gartner predicts that worldwide end-user spending on public cloud services will surpass $1 trillion by 2027.

Over the last few years, the world "cloud" has been a buzzword in just about every business sector. But despite the cloud's popularity, there is still a lot of misinformation out there surrounding the technology and intentions behind this relatively new concept. Many business leaders still have pressing questions about how cloud computing works, its actual benefits, and the options available when it comes to cloud adoption and implementation.

Throughout this comprehensive guide, we'll be answering these questions and more while addressing some of the main business concerns about cloud computing. Read on to learn what cloud computing is exactly, and what it means to both small and large businesses.

> **"...by 2027, worldwide end-user spending on public cloud services will surpass $1 trillion."**
>
> **– Gartner**

How Cloud Computing Works

The word "cloud" simply refers to the internet. Cloud computing is a way to use computing hardware and software over the internet. Instead of having physical computers, servers, data centers, and workstations, the cloud makes it possible to utilize the same equipment online. So, you can store your data on cloud storage, and run processes, ERPs, and other programs on virtual servers hosted online. Essentially, it's like accessing a digital office or workplace via the internet.

From a technical perspective, things are a bit more complicated than that; there are several sophisticated protocols and algorithms put in place to control variables like user management, machine virtualization, security, and resource sharing. But as the end-user, there is no need to worry over the clockwork and mechanisms behind the scenes – that's the service provider's job.

Cloud service providers are responsible for running and maintaining both the physical and virtual environments of the cloud. Most providers charge a monthly or annual subscription fee for cloud access and usage depending on the service package and terms of the user agreement.

This is the basic premise of the cloud computing business model – sparing, of course, plenty of technical details and jargon, some of which we'll get to later.

The Benefits of
Cloud Computing

Cloud computing offers benefits like...

Cost Efficiency: Reduces the need for on-premises hardware and infrastructure, lowering capital expenditures. Users pay only for the resources they use.

Scalability: Easily scale resources up or down based on demand, allowing businesses to adapt quickly to changing needs without overcommitting resources.

Flexibility and Accessibility: Access data and applications from anywhere with an internet connection, facilitating remote work and collaboration.

Automatic Updates: Cloud providers manage software updates and maintenance, ensuring users have access to the latest features and security patches without extra effort.

Disaster Recovery and Backup: Many cloud services offer built-in data backup and recovery options, enhancing data protection and minimizing downtime in case of failures.

Improved Collaboration: Teams can work together in real time, sharing documents and projects seamlessly, regardless of location.

Security: Cloud providers invest heavily in security measures and protocols, often offering better security than many organizations can afford to implement on their own.

Performance and Reliability: Major cloud providers offer high levels of uptime and performance, often with multiple redundancies to ensure continuous availability.

Innovation: Access to advanced technologies like artificial intelligence, machine learning, and big data analytics without the need for significant upfront investment in hardware.

How to Choose the Right Cloud Environment

There are a few different ways to deploy cloud resources in your business. You have a choice of a public cloud, private cloud, hybrid system, or multi-cloud approach. Every implementation model is unique, and each comes with its own benefits and limitations. We'll discuss the various cloud deployment methods in detail to differentiate between them.

Public Cloud

Public clouds are the most common method of cloud implementation. When people talk about cloud services, they are often referring to public clouds. In a public cloud, the hardware, network facilities, software, and other computing resources are owned and hosted by a third party known as a cloud service provider.

We've already touched on cloud service providers in this guide. The provider is responsible for supporting the entire infrastructure – the servers, data centers, and enabling software. The end-users, in this case, the organizations subscribed to the cloud services, share the same physical and virtual resources. User accounts or "renters" are separated virtually, not physically. Renters can access and manage their accounts via web browsers and apps. The features and specs you get on a public cloud depend on the service package you pay for.

Public clouds are low-cost solutions for delivering general cloud-based services such as web-based emails, hosted and business applications, development environments, and online storage to businesses of all sizes.

Pros and Cons of Public Clouds

The most attractive benefit of using a public cloud is the low upfront cost. On top of that, you only pay the services you need in manageable installments. The cloud provider does all the maintenance and servicing to ensure the resources stay live. There is also nearly unlimited scalability on most public cloud platforms.

The main letdown of public clouds is the limited control over the shared cloud environment. Every characteristic of the cloud service, including security standards, available resources, and performance specs, depends on whatever systems the provider has in place. Another downside is the highly abstracted interface and seemingly generic structure of public cloud services.

Private Cloud

This is a cloud platform whose every resource is reserved exclusively for one organization or business. You can have a private cloud located on the company's premises or hosted on an off-site third-party facility. The owner acquires and sets up all the necessary hardware and software that build a private cloud system. Alternatively, one can rent an already established, dedicated cloud platform from a third-party cloud provider.

If you owned a private cloud, you'd also be responsible for maintenance, servicing, updating, and upgrading the systems. You can do this with an in-house IT team or an independent managed services provider (MSP).

Private clouds appeal mostly to financial institutions, government agencies, and large corporates looking for a highly tuned cloud environment with unlimited control. A private cloud also makes sense to companies looking to store sensitive data and applications on the cloud while adhering to stringent data security requirements and policies.

Pros and Cons of Private Cloud

A private cloud offers your business more control and flexibility in customizing the services, performance, and security details. But all that freedom and exclusivity comes at a price. The cost of establishing and running a private cloud is incredibly high compared to what you'd pay for a similar public cloud service. And although private clouds are also scalable, many companies underutilize their clouds, which lowers IT efficiency in the long run and further builds up to the already high IT cost.

Hybrid Cloud

A hybrid cloud configuration is a compromise between public and private cloud platforms. It's a cloud adoption approach that combines both public and private cloud environments – a complex model that's the best of both worlds. In a hybrid cloud, you can have different sets of data and applications residing on either a public cloud or a dedicated private cloud.
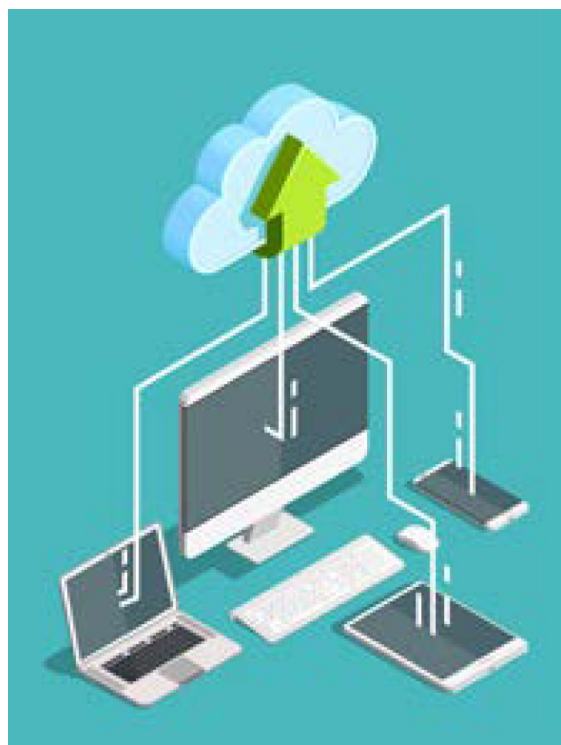
Hybrid clouds are preferred by businesses with unique operations that make use of both private and public clouds. For instance, sensitive transactions can run on a private cloud, while high-volume applications run on the public cloud. This configuration also makes "cloud bursting" possible, where applications running on a low-capacity private cloud can automatically "burst" through to the large-capacity public cloud following a seasonal spike in IT performance demands in the business.

Multi-Cloud

Multi-cloud deployment is where an organization signs up to more than one cloud service provider at the same time. This usually means that the client uses the different cloud services and platforms for different purposes. This arrangement only makes sense if your business has a variety of unique IT requirements that one service provider cannot meet. However, buying multiple services from different providers may end up costing a lot and may not be entirely necessary anyway. It might be more economical to make a few compromises on a comprehensive cloud package and stick to one provider.

> **"94 percent of enterprises use cloud computing."**
>
> **– Flexera**

Choosing a Cloud Service Model

Cloud computing is a rather general term that encompasses several different technologies with particular functionalities. There are three main types of cloud computing service models. Each model is unique in terms of the level of abstraction, allowable customization and control, and the variety of supported uses.

The models are stacked upon each other, with the ones in the lower levels offering more versatility than those at the top. The level of abstraction increases up the stack until the topmost layer becomes a highly specialized service.

Infrastructure as a Service (IaaS)

IaaS is the most fundamental cloud computing service model. It provides a completely virtualized computing infrastructure that includes storage, processing, network, and software facilities over the internet. With an IaaS model, you can install, run, and configure any operating system, middleware, and high-level software applications. You also have access and control over the data storage system, where you can manipulate and organize the actual directories and files.

Basically, IaaS is similar to accessing a real server or workstation over the internet, only that it's not technically a physical computer but a virtual machine.

IaaS is highly scalable, meaning businesses can re-adjust quickly to sudden changes. Through IaaS, the service provider frees the company from the responsibility of sourcing and maintaining physical computer systems.

Most businesses use IaaS as an inexpensive and reliable substitute for on-prem computers and servers. IaaS also serves as a cloud storage solution and dependable data backup and recovery system, especially for companies with vast volumes of data. In most cases, hosting websites, high-performance analytics tools, web-based applications, and data repositories is much cheaper and more convenient with IaaS than on conventional web hosts.

Platform as a Service (PaaS)

PaaS is a bit more specialized than IaaS. Instead of providing all the computing tools available through the cloud to users who then choose what to do with them, PaaS only provides the resources and environment needed to develop, manage, test, run, and update software applications. PaaS comes with all the necessary operating systems, middleware, database management systems, and software building tools that support application development throughout the entire software lifecycle.

PaaS provides a robust software development framework, saving developers the cost and hustle of buying and managing software licenses for sophisticated development tools. The service also abstracts the developer from the infrastructure beneath the development environment. The user, therefore, doesn't have to install and configure the various runtimes and development support structure. As a result, this cuts coding time and speeds up the software development process.

PaaS is ideal for businesses involved in software development and testing. It's also an excellent platform to run resource-intensive analytics tools for business intelligence, ERPs, and hosted communication systems like VoIP.

Software as a Service (SaaS)

Most people and businesses are familiar with the SaaS model of cloud computing. SaaS is the most abstracted and specialized way of using cloud services. SaaS refers to a

software application distributed and purchased on a subscription basis over the internet. Unlike IaaS and PaaS, SaaS allows you to rent an end-user application.

The vendor takes care of the software's hosting environment – the underlying servers, operating systems, and runtimes. You cannot access anything below the application's user interface. However, most enterprise SaaS applications are highly customizable and scalable to suit different business models and sizes.

Most SaaS applications are web-based, eliminating the need for users to download the application's .exe file or install additional support software on their systems. Many of these applications also process their data on the host system rather than the client's side. This allows even the most intensive apps to run on just about any internet-enabled device, including smartphones and tablets.

Big and small businesses alike can gain access to high-end enterprise software products affordably through the SaaS model. Since you don't actually buy the software license, the cost of using cutting-edge SaaS applications is inconceivably lower compared to purchasing equivalent off-the-shelf products. SaaS also promotes workplace mobility since applications can be accessed from anywhere.

The Takeaway

An MSP can help connect you to the cloud...

One of the easiest and most efficient ways to connect your business operations to the cloud is by working with a Managed IT Services provider like Bit-Wizards. We can help your organization become more resilient, efficient, and adaptable then ever with our cloud services. Our cloud offerings include:

- Cloud, Office 365, and application migrations
- Infrastructure optimization
- Site recovery
- Hybrid cloud server & network integration
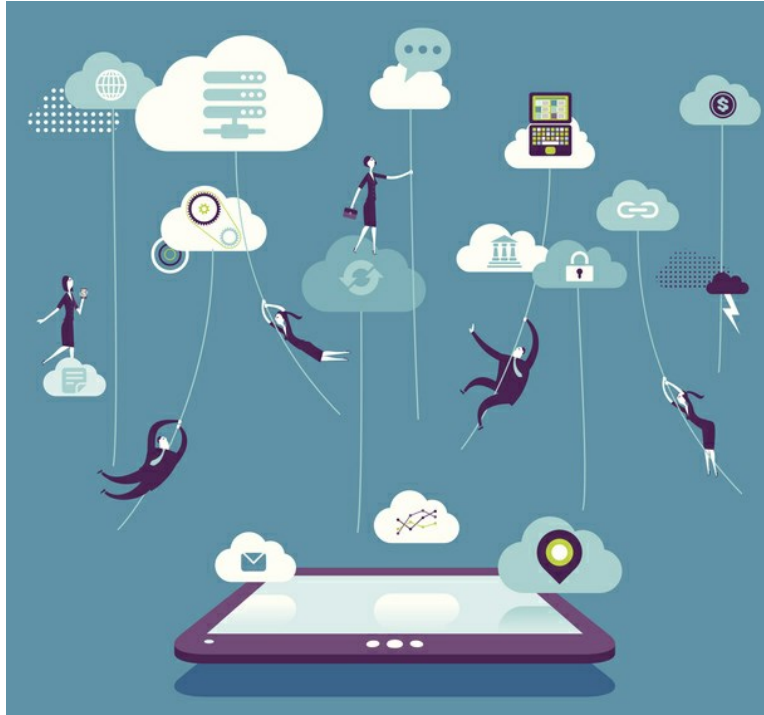- Managed hosting in Azure

Ready to connect your business to the cloud? Get in touch!

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