

Cloud Computing – The Future of Computing Services

Cloud computing has rapidly increased in popularity among companies in recent years. The term cloud computing refers to “the flexible provision of data storage, applications, or services over the Internet” (West et al., 2019). Simply put, when one uses cloud computing, they access data and programs over the Internet rather than through their local computer storage, like their hard drive.

Prevalence of Cloud Computing – who uses it and why?

Over the past few years, businesses have grown to embrace cloud computing and have sought to incorporate it into their organizations. “Companies are now starting to ask not whether they should think about cloud computing but what types of cloud computing models are best suited to solve their business problems” (Horwitz et al., 2012).

Benefits of Cloud Computing

Various benefits of cloud computing services include: “on-demand computing resources, elastic scaling, elimination of up-front investment, reduction of operational expenses, and establishing a pay-per-usage business model for information technology and computing services” (Azodolmolky et al., 2013). Here are the main benefits in detail:

- *On-demand*: cloud services are easily accessible when requested.
- *Elastic scaling*: Businesses can scale up or down in terms of storage and service capacity.
- *Reduction of operational expenses*: instead of paying expensive server costs and for data storage space, cloud storage is relatively less expensive for businesses. Switching to the cloud also reduces the burden on IT technicians because they don’t have to manage these servers extensively anymore (West et al., 2019).

Disadvantages of Cloud Computing

The main disadvantage for cloud computing is *downtime*. Cloud services are Internet-based, so outages aren’t uncommon and may occur for unknown reasons. There are a few common ways to minimize downtime in cloud services.

At the minimum, organizations should design and implement a disaster recovery plan that reduces recovery time and gets their business up and running as soon as possible after an outage. To be more proactive and reduce the chances of an outage, one can purchase a dedicated connection, which would maximize predictability and minimize latency. However, purchasing a dedicated connection is expensive. As another option, organizations can rent space at a colocation data facility from larger cloud service providers with several points of presence. Internet service providers can then provide dedicated access from a company’s premises to the point of presence where the data is located (West et al., 2019).

Security is also a strong concern in cloud computing, storing data and files on external providers brings inherent security risks. To combat this, organizations should implement tiered levels of security, ranging from physical security (locks on doors so that computers can’t be accessed), network design security (firewalls that have packet-filtering techniques), and encryption (the last means of security). They could also switch to a private cloud so that your data is securely accessible only by the company.

Cloud Services in Cloud Computing

Cloud service models are categorized by “the types of services they provide” (West et al., 2019). The NIST (National Institute of Standards and Technology) developed a standard definition for each category. As one goes higher up in the modeling hierarchy, the vendor is responsible for providing more computing services. The three main services offered are *IaaS (Infrastructure as a Service)*, *PaaS (Platform as a Service)*, and *SaaS (Software as a Service)*.

IaaS (Infrastructure as a Service) refers to “the capability that is provided to the consumers to provision processing, storage and networks, and other fundamental computing resources where they are able to deploy and run arbitrary software” (Azodolmolky et al., 2013). In other words, services like hardware, storage space, and processing power are provided by the cloud service provider. Virtual servers and devices like HVDs (Hosted Virtual Desktops) are also provided. The user is then responsible for everything else. IBM and Digital Ocean’s IaaS services are used by companies like Slack, American Airlines, and AppLift to scale their products and make cloud product development more efficient.

Next, PaaS (Platform as a Service) providers deliver middleware services as well as software development and deployment tools to users in addition to IaaS services. PaaS enables users to develop customized web applications using existing platforms made available by the service provider, which allows for more flexibility and faster deployment (*15.4 Computer Networks and Cloud Computing*. 2016). Heroku is a well-known PaaS service, and it allows developers to work in a wide variety of programming languages including Ruby, Perl, and Java. Famous companies like Lyft, Macy’s, Toyota, and Soundcloud all use Heroku’s PaaS services (Daley, 2021).

Finally, SaaS (Software as a Service) allows users to access applications using an online interface that is easily accessible across various devices. This is the full capability of cloud services, as “the vendor provides every level of support from network infrastructure through data storage and application implementation” (West et al., 2019). The user is only required to access the services through their own interface. Salesforce and Amazon Web Services (AWS) mainly provide SaaS models for organizations (Daley, 2021). Common SaaS models include online email services such as Gmail and Yahoo.

Organizations are also allowed to customize cloud services for their business needs through XaaS (Everything or Anything as a Service). The “X” represents an unknown in the acronym.

Conclusion

Cloud computing is a fast-growing technological industry in the world today. The global cloud computing market is projected to reach \$623.3 billion by 2023 from \$272 billion in 2018 (Galov, 2020). Although there are various concerns with cloud computing, including downtime and privacy, many businesses hope to see improvements in these areas, in cloud service capabilities, and in conjunction with IoT (Internet of Things) quality as the industry continues to progress.

References

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