CLOUD COMPUTING

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Application of Cloud Computing in Gaming Industry

Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centers available to many users over the Internet.

Gamers often struggle with the high cost of equipment as an initial outlay for their gaming experience. And that's before they shell out for games! The fact is that now Cloud computing is so predominant, it's actually more difficult and expensive to set up with physical games. Read on for a break-down of the benefits that led to Cloud computing's success.

A movement known as game streaming uses third-party cloud computing services to provide video games online. This concept is similar to YouTube and other online video-streaming sites. The difference between game streaming and video streaming is that gaming streams fully-licensed video games on PCs, hand-held devices, and console systems

Benefits of Cloud Technology for the Gaming Industry

Security

The industrial level security used by cloud computing companies prevents external interruptions such as hacking. In Cloud systems, the information is stored inside a virtual storage space and which makes the platform safer than other traditional applications.

Compatible With Devices of Any Type

Using the highly scalable cloud platform, High-end games can be played even on lower-end machines. The limitation caused by memory requirements, graphic capacity and processing power diminishes with cloud solutions and thus provides users, an exceptional gaming experience.

Reduced Costs

In traditional models of gaming, the companies are required to pay more for bandwidth when the traffic in the system is high. This usually happens when companies have released a new gaming title. In normal traffic periods, gaming companies use about 10 percent of server space and bandwidth and reserve the remaining 90 percentage. The cloud systems follow a 'pay as you go' payment strategy in which gaming companies pay only for the resources which they have utilized.

Easy Access to Games

Even cloud is an advanced technological concept, it is easy to implement, and allows the user to access the games from any device from any location without even downloading and configuring applications.

No More Piracy

Unlike in other systems, the physical gaming software is not available to the market which avoids the chances of piracy. Instead of the physical computers, the gamers play games in cloud servers with an access on their personal computers. So cloud diminishes the chances of unauthorized manipulation and interruptions and maintains the novelty of the game.

Availability of More Devices

Rather than depending on the "consoles", cloud computing supports the usage of multiple devices such as smartphones, laptops, palm-held devices, desktops, etc. The game players can enjoy the games from anywhere in the world without even carrying the console. Through the support of cloud computing, game players can enjoy their moments with a broader range of devices which belong to their routine usage.

Immediate and Dynamic Backend Support

Compared to traditional applications, in terms of the storage capacity, cloud applications are more flexible and scalable. This makes gaming companies to provide information to the gamers as soon as they log into their account. Cloud computing platforms help gamers to perform the functions, such as saving the game or protecting it from regular access without any difficulties. The immediate response and regular access provide gamers more delightful experience and upkeep their satisfaction levels.

Access to Multiple Games

Cloud provides the gamers the chance to play multiple games at a time. This helps companies to generate more revenue and gamers to get a delighting experience. It makes the gaming sector more dynamic by bringing active involvement of the gamers and the providers. Indeed, it forms a scenario where highly innovative and constructive contributions happen.

SaaS vs PaaS vs IaaS Cloud Services and Key service providers for the same

SaaS: Software as a Service

Software as a Service, also known as cloud application services, represents the most commonly utilized option for businesses in the cloud market. SaaS utilizes the internet to deliver applications, which are managed by a third-party vendor, to its users. A majority of SaaS applications run directly through your web browser, which means they do not require any downloads or installations on the client side.

SaaS Delivery

Due to its web delivery model, SaaS eliminates the need to have IT staff download and install applications on each individual computer. With SaaS, vendors manage all potential technical issues, such as data, middleware, servers, and storage, resulting in streamlined maintenance and support for the business.

SaaS Advantages

SaaS provides numerous advantages to employees and companies by greatly reducing the time and money spent on tedious tasks such as installing, managing, and upgrading software. This frees up plenty of time for technical staff to spend on more pressing matters and issues within the organization.

SaaS Characteristics

There are a few ways to help you determine when SaaS is being utilized:

- Managed from a central location
- Hosted on a remote server
- Accessible over the internet
- Users not responsible for hardware or software updates

When to Use SaaS

SaaS may be the most beneficial option in several situations, including:

- Startups or small companies that need to launch ecommerce quickly and don't have time for server issues or software
- Short-term projects that require quick, easy, and affordable collaboration
- Applications that aren't needed too often, such as tax software
- Applications that need both web and mobile access

SaaS Limitations and Concerns

- **Interoperability.** Integration with existing apps and services can be a major concern if the SaaS app is not designed to follow open standards for integration. In this case, organizations may need to design their own integration systems or reduce dependencies with SaaS services, which may not always be possible.
- **Vendor lock-in.** Vendors may make it easy to join a service and difficult to get out of it. For instance, the data may not be portable–technically or cost-effectively–across SaaS apps from other vendors without incurring significant cost or inhouse engineering rework. Not every vendor follows standard APIs, protocols, and tools, yet the features could be necessary for certain business tasks.
- **Lack of integration support.** Many organizations require deep integrations with on-premise apps, data, and services. The SaaS vendor may offer limited support in this regard, forcing organizations to invest internal resources in designing and managing integrations. The complexity of integrations can further limit how the SaaS app or other dependent services can be used.

- **Data security.** Large volumes of data may have to be exchanged to the backend data centers of SaaS apps in order to perform the necessary software functionality. Transferring sensitive business information to public-cloud based SaaS service may result in compromised security and compliance in addition to significant cost for migrating large data workloads.

- **Customization.** SaaS apps offer minimal customization capabilities. Since a one-size-fits-all solution does not exist, users may be limited to specific functionality, performance, and integrations as offered by the vendor. In contrast, on-premise solutions that come with several software development kits (SDKs) offer a high degree of customization options.

- **Lack of control.** SaaS solutions involves handing control over to the third-party service provider. These controls are not limited to the software–in terms of the version, updates, or appearance–but also the data and governance. Customers may therefore need to redefine their data security and governance models to fit the features and functionality of the SaaS service.

- **Feature limitations.** Since SaaS apps often come in a standardized form, the choice of features may be a compromising tradeoff against security, cost, performance, or other organizational policies. Furthermore, vendor lock-in, cost, or security concerns may mean it's not viable to switch vendors or services to serve new feature requirements in the future.

- **Performance and downtime.** Because the vendor controls and manages the SaaS service, your customers now depend on vendors to maintain the service's security and performance. Planned and unplanned maintenance, cyber-attacks, or network issues may impact the performance of the SaaS app despite adequate service level agreement (SLA) protections in place.

Examples of SaaS

These are several popular examples of SaaS, including: Google GSuite(Apps), Dropbox, Salesforce, Cisco WebEx

PaaS: Platform as a Service
Cloud platform services, also known as Platform as a Service (PaaS), provide cloud components to certain software while being used mainly for applications. PaaS delivers a framework for developers that they can build upon and use to create customized applications. All servers, storage, and networking can be managed by the enterprise or a third-party provider while the developers can maintain management of the applications.

PaaS Delivery

The delivery model of PaaS is similar to SaaS, except instead of delivering the software over the internet, PaaS provides a platform for software creation. This platform is delivered via the web, giving developers the freedom to concentrate on building the software without having to worry about operating systems, software updates, storage, or infrastructure.

PaaS allows businesses to design and create applications that are built into the PaaS with special software components. These applications,

sometimes called middleware, are scalable and highly available as they take on certain cloud characteristics.

PaaS Advantages

No matter the size of your company, using PaaS offers numerous advantages, including:

- Simple, cost-effective development and deployment of apps
- Scalable
- Highly available
- Developers can customize apps without the headache of maintaining the software
- Significant reduction in the amount of coding needed
- Automation of business policy
- Easy migration to the hybrid model

PaaS Characteristics

PaaS has many characteristics that define it as a cloud service, including:

- Builds on virtualization technology, so resources can easily be scaled up or down as your business changes
- Provides a variety of services to assist with the development, testing, and deployment of apps
- Accessible to numerous users via the same development application
- Integrates web services and databases

When to Use PaaS

Utilizing PaaS is beneficial, sometimes even necessary, in several situations. For example, PaaS can streamline workflows when multiple developers are working on the same development project. If other vendors must be included, PaaS can provide great speed and flexibility to the entire process. PaaS is particularly beneficial if you need to create customized applications. This cloud service also can greatly reduce costs and it can simplify some challenges that come up if you are rapidly developing or deploying an app.

PaaS Limitations and Concerns

- **Data security.**Organizations can run their own apps and services using PaaS solutions, but the data residing in third-party, vendor-controlled cloud servers poses security risks and concerns. Your security options may be limited as customers may not be able to deploy services with specific hosting policies.
- **Integrations.**The complexity of connecting the data stored within an onsite data center or off-premise cloud is increased, which may affect which apps and services can be adopted with the PaaS offering. Particularly when not every component of a legacy IT system is built for the cloud, integration with existing services and infrastructure may be a challenge.

- **Vendor lock-in.** Business and technical requirements that drive decisions for a specific PaaS solution may not apply in the future. If the vendor has not provisioned convenient migration policies, switching to alternative PaaS options may not be possible without affecting the business.
- **Customization of legacy systems.** PaaS may not be a plug-and-play solution for existing legacy apps and services. Instead, several customizations and configuration changes may be necessary for legacy systems to work with the PaaS service. The resulting customization can result in a complex IT system that may limit the value of the PaaS investment altogether.
- **Runtime issues.** In addition to limitations associated with specific apps and services, PaaS solutions may not be optimized for the language and frameworks of your choice. Specific framework versions may not be available or perform optimally with the PaaS service. Customers may not be able to develop custom dependencies with the platform.
- **Operational limitation.** Customized cloud operations with management automation workflows may not apply to PaaS solutions, as the platform tends to limit operational capabilities for end users. Although this is intended to reduce the operational burden on end users, the loss of operational control may affect how PaaS solutions are managed, provisioned, and operated.

Examples of PaaS

Popular examples of PaaS include AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, Google App Engine, and OpenShift.

IaaS: Infrastructure as a Service

Cloud infrastructure services, known as Infrastructure as a Service (IaaS), are made of highly scalable and automated compute resources. IaaS is fully self-service for accessing and monitoring computers, networking, storage, and other services. IaaS allows businesses to purchase resources on-demand and as-needed instead of having to buy hardware outright.

IaaS Delivery

IaaS delivers cloud computing infrastructure, including servers, network, operating systems, and storage, through virtualization technology. These cloud servers are typically provided to the organization through a dashboard or an API, giving IaaS clients complete control over the entire infrastructure. IaaS provides the same technologies and capabilities as a traditional data center without having to physically maintain or manage all of it. IaaS clients can still access their servers and storage directly, but it is all outsourced through a "virtual data center" in the cloud.

As opposed to SaaS or PaaS, IaaS clients are responsible for managing aspects such as applications, runtime, OSes, middleware, and data. However, providers of the IaaS manage the servers, hard drives, networking, virtualization, and storage. Some providers even offer more services beyond the virtualization layer, such as databases or message queuing.

IaaS Advantages

IaaS offers many advantages, including:

- The most flexible cloud computing model
- Easy to automate deployment of storage, networking, servers, and processing power
- Hardware purchases can be based on consumption
- Clients retain complete control of their infrastructure
- Resources can be purchased as-needed
- Highly scalable

IaaS Characteristics

Characteristics that define IaaS include:

- Resources are available as a service
- Cost varies depending on consumption
- Services are highly scalable
- Multiple users on a single piece of hardware
- Organization retain complete control of the infrastructure
- Dynamic and flexible

When to Use IaaS

Just as with SaaS and PaaS, there are specific situations when IaaS is most advantageous.

Startups and small companies may prefer IaaS to avoid spending time and money on purchasing and creating hardware and software. Larger companies may prefer to retain complete control over their applications and infrastructure, but they want to purchase only what they actually consume or need. Companies experiencing rapid growth like the scalability of IaaS, and they can change out specific hardware and software easily as their needs evolve. Anytime you are unsure of a new application's demands, IaaS offers plenty of flexibility and scalability.

IaaS Limitations and Concerns

Many limitations associated with SaaS and PaaS models – such as data security, cost overruns, vendor lock-in and customization issues – also apply to the IaaS model. Particular limitations to IaaS include:

- **Security.** While the customer is in control of the apps, data, middleware, and the OS platform, security threats can still be sourced from the host or other virtual machines (VMs). Insider threat or system vulnerabilities may expose data communication between the host infrastructure and VMs to unauthorized entities.
- **Legacy systems operating in the cloud.** While customers can run legacy apps in the cloud, the infrastructure may not be designed to deliver specific controls to secure the legacy apps. Minor enhancement to legacy apps may be required before migrating them to the cloud, possibly leading to new security issues unless adequately tested for security and performance in the IaaS systems.

- **Internal resources and training.** Additional resources and training may be required for the workforce to learn how to effectively manage the infrastructure. Customers will be responsible for data security, backup, and business continuity. Due to inadequate control into the infrastructure however, monitoring and management of the resources may be difficult without adequate training and resources available inhouse.
- **Multi-tenant security.** Since the hardware resources are dynamically allocated across users as made available, the vendor is required to ensure that other customers cannot access data deposited to storage assets by previous customers. Similarly, customers must rely on the vendor to ensure that VMs are adequately isolated within the multitenant cloud architecture.

Examples of IaaS

Popular examples of IaaS includeDigitalOcean,Linode,Rackspace,Amazon Web Services (AWS),Cisco Metacloud,Microsoft Azure, andGoogle Compute Engine (GCE).

How AWS supports SaaS, PaaS and IaaS

Iaas – Infrastructure as a Service
it involve the use of cloud computing techonology . This manages the creation of virtual machines and decides on which hypervisor to start it, enables VM migration features between host ,allocated storage volumes and attaches them to Vms , usage information for billing and lots more.

Saas – Software as a Service
it is a software licensing and delivery model in which software is licenced on a subscription basis and is centrally hosted . It is sometimes referred to as "on-demand software ", and was formerly refered to as "software plus service ".

Paas – Platform as a Service
It a category of cloud computing service that provides a platform allowing customers to develop,run,and manage application without the complexity of bulding and maintaining the infrastructure typically associated with developing and launching app.

Some of aws clints are :
Netflix
- Reddit
- Imgur
- pinterest
- HTC
- The Weather Channel
- Dow Jones
- Nokia

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Cloud Computing vs Traditional Computing

Cloud computing is far more abstract as a virtual hosting solution. Instead of being accessible via physical hardware, all servers, software and networks are hosted in the cloud, off premises. It's a real-time virtual environment hosted between several different servers at the same time. So rather than investing money into purchasing physical servers in-house, you can rent the data storage space from cloud computing providers on a more cost effective pay-per-use basis.

The main differences between cloud hosting and traditional web hosting are:

Resilience and Elasticity

The information and applications hosted in the cloud are evenly distributed across all the servers, which are connected to work as one. Therefore, if one server fails, no data is lost and downtime is avoided. The cloud also offers more storage space and server resources, including better computing power. This means your software and applications will perform faster.

Traditional IT systems are not so resilient and cannot guarantee a consistently high level of server performance. They have limited capacity and are susceptible to downtime, which can greatly hinder workplace productivity.

Flexibility and Scalability

Cloud hosting offers an enhanced level of flexibility and scalability in comparison to traditional data centres. The on-demand virtual space of cloud computing has unlimited storage space and more server resources. Cloud servers can scale up or down depending on the level of traffic your website receives, and you will have full control to install any software as and when you need to. This provides more flexibility for your business to grow.

With traditional IT infrastructure, you can only use the resources that are already available to you. If you run out of storage space, the only

solution is to purchase or rent another server.If you hire more employees, you will need to pay for additional software licences and have these manually uploaded on your office hardware. This can be a costly venture, especially if your business is growing quite rapidly.

Automation

A key difference between cloud computing and traditional IT infrastructure is how they are managed. Cloud hosting is managed by the storage provider who takes care of all the necessary hardware, ensures security measures are in place, and keeps it running smoothly. Traditional data centres require heavy administration in-house, which can be costly and time consuming for your business. Fully trained IT personnel may be needed to ensure regular monitoring and maintenance of your servers – such as upgrades, configuration problems, threat protection and installations.

Running Costs

Cloud computing is more cost effective than traditional IT infrastructure due to methods of payment for the data storage services. With cloud based services, you only pay for what is used – similarly to how you pay for utilities such as electricity. Furthermore, the decreased likelihood of downtime means improved workplace performance and increased profits in the long run.

With traditional IT infrastructure, you will need to purchase equipment and additional server space upfront to adapt to business growth. If this slows, you will end up paying for resources you don't use. Furthermore, the value of physical servers decreases year on year, so the return on investment of investing money in traditional IT infrastructure is quite low.

Security

Cloud computing is an external form of data storage and software delivery, which can make it seem less secure than local data hosting. Anyone with access to the server can view and use the stored data and applications in the cloud, wherever internet connection is available.

Choosing a cloud service provider that is completely transparent in its hosting of cloud platforms and ensures optimum security measures are in place is crucial when transitioning to the cloud.

With traditional IT infrastructure, you are responsible for the protection of your data, and it is easier to ensure that only approved personnel can access stored applications and data. Physically connected to your local network, data centres can be managed by in-house IT departments on a round-the-clock basis, but a significant amount of time and money is needed to ensure the right security strategies are implemented and data recovery systems are in place.

Data Centers

data centers are bulding dedicated space within a building of group of buldings use store componestes such as telecommunication and storage systems

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