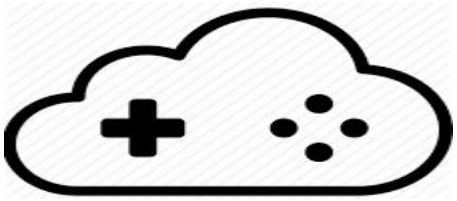
Cloud Computing and Gaming



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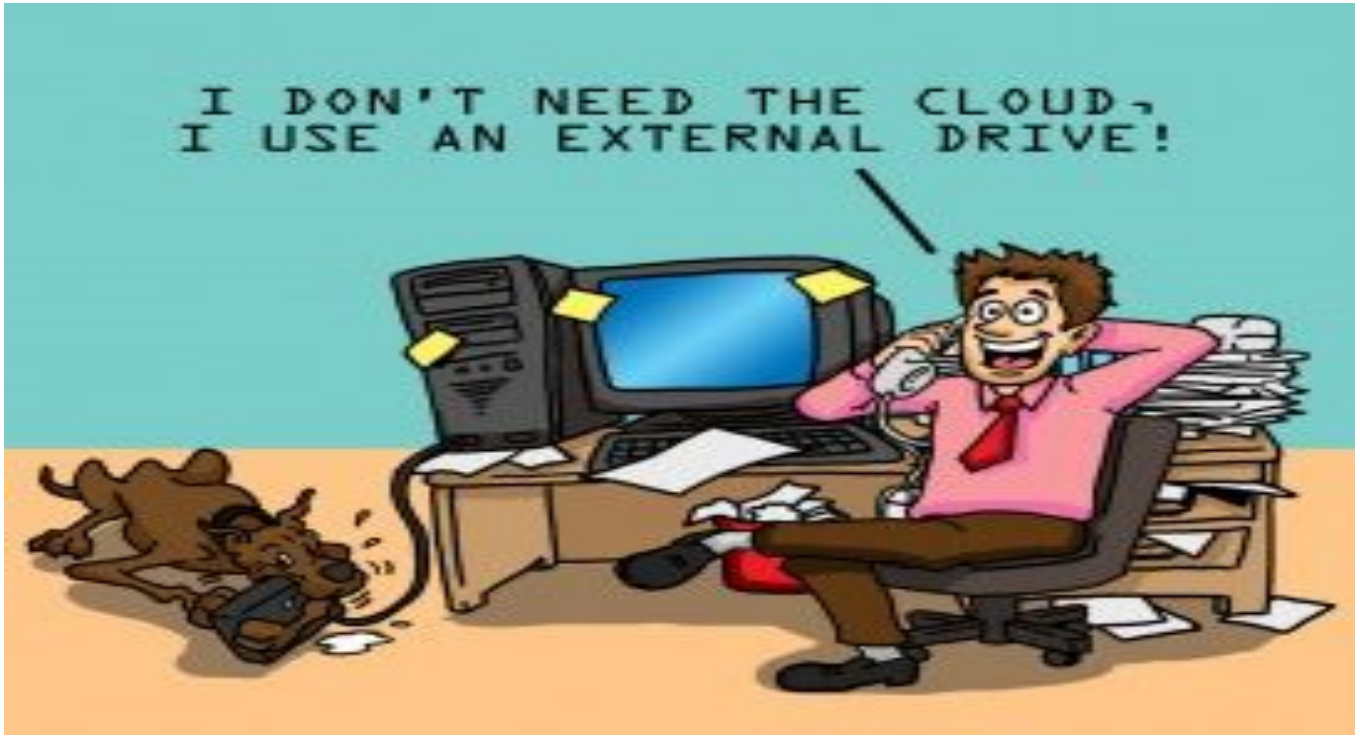
Are we using the cloud yet?



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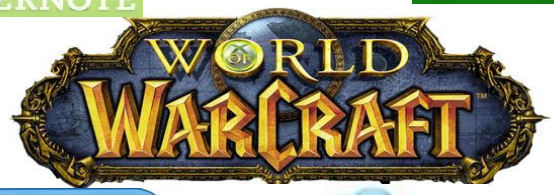



Introduction

What is cloud computing?

- In the simplest of term:

  “Cloud computing is the new way to deliver and use services on a shared IT infrastructure on-demand”.

Factors contributing to growth of Cloud Computing

- Mobile application development
  - Apps for conferences, marketing campaigns etc.
  - Fast time to market
  - Provision and decommission quickly
- Choice of programming languages
  - Web: Java, JavaScript, PHP
  - Mobile: Android: Java; iOS: Swift, Objective C
- Integrate with existing systems
  - Data is in multiple places (public, private, traditional data center)
  - Existing systems might not scale at the same level as cloud applications
- Composed of services
  - Composition model that is used to assemble services together
  - Predefined and pre-tested
- Scale and management
  - Embedded manageability of services and applications

Cloud Computing: Benefits for Developers

- Readily available sandbox and production environments
  - Free-trial
  - Pre-built boilerplates and solutions
  - Easy to create and tear-down
  - Environment setup in minutes, not days
- Choices
  - Programming languages
  - Runtimes
  - Databases
  - Services
- Securely connect to existing applications and data
  - Integration services
- Scalable infrastructure

Taking Gaming into the ‘Cloud’

Gaming-as-a-Service (GaaS)

Taking Gaming into the 'Cloud'

- **WHY?**

Traditionally:

- Computer games come in boxes or via Internet download
- Gamers have to install to play
- Installation process may be tedious
- Gamers may find PCs less powerful to achieve high visual frame rates
- Consequently, gamers have to routinely upgrade PCs to play latest games

Gaming as a Service (GaaS)

GaaS = Streaming video games from the web just like any other streaming media:

- **Games are built, powered and/or hosted using cloud computing technologies**
  - **Any-device gaming:** multi device gaming on any PC, Mac, tablet, smartphone or TV.
  - **Click-to-play simplicity**: Anytime access to a library of gaming titles and saved games in the cloud. Play or continue games from any device, anywhere.
  - **Less hassle:** No new hardware. No complicated setup. No game discs. No digital downloads. No game installations. No game patches.

What is Cloud Gaming?

- Online gaming that supports direct and on-demand streaming of games through thin clients (e.g. Mobile devices and TV set-top boxes).

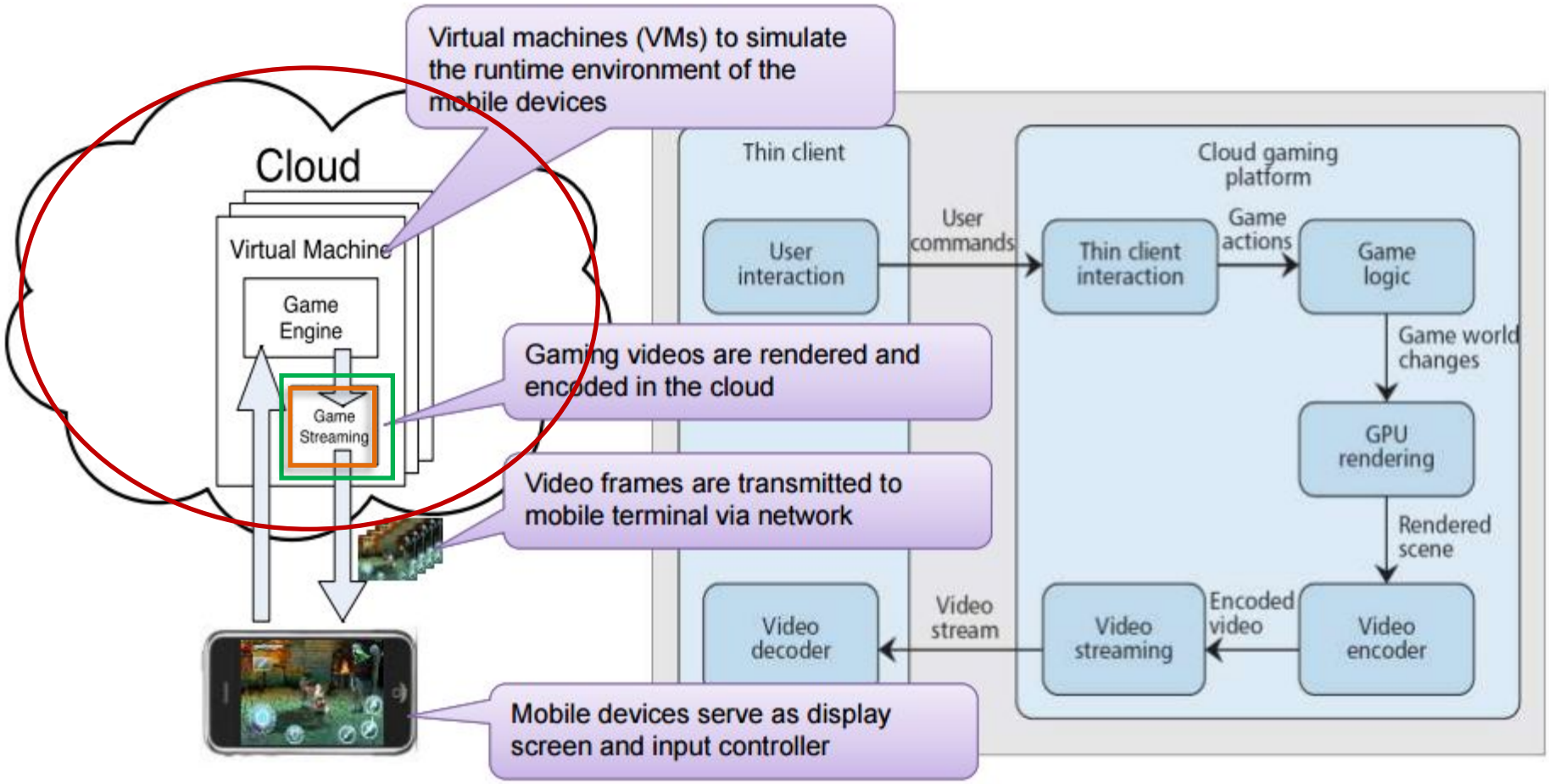
What is Streaming?

- Transporting pixels to client through the network
- Interactive graphics = low latency (i.e. small delay times)

Architectural Concept of Cloud Gaming:

- Computer games run on powerful cloud servers.
- Gamers interact with the game via networked thin clients.
- Gamers can play the latest computer games anywhere and anytime.

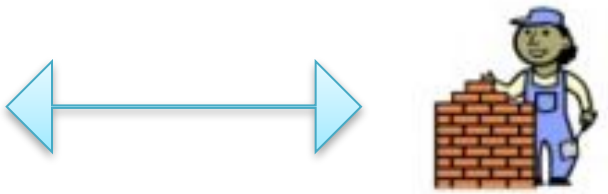
Cloud Gaming Architecture



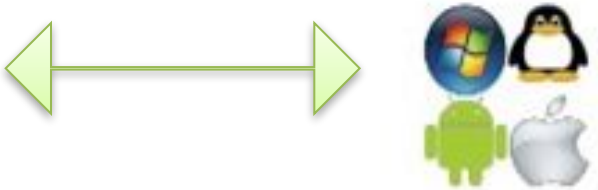
Characteristics of Cloud Gaming

There are four major characteristics of Cloud gaming, which are as follows:

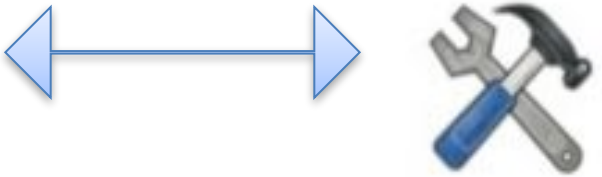
- **Extensibility**: Developers can follow their programming interfaces.



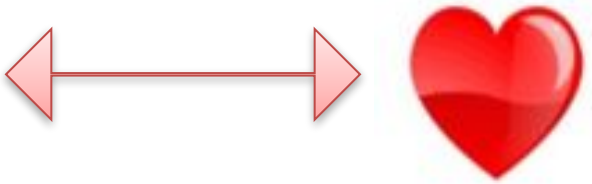
- **Portability**: Games should be available for portable devices.



- **Configurability**: Games should be easy to configure.

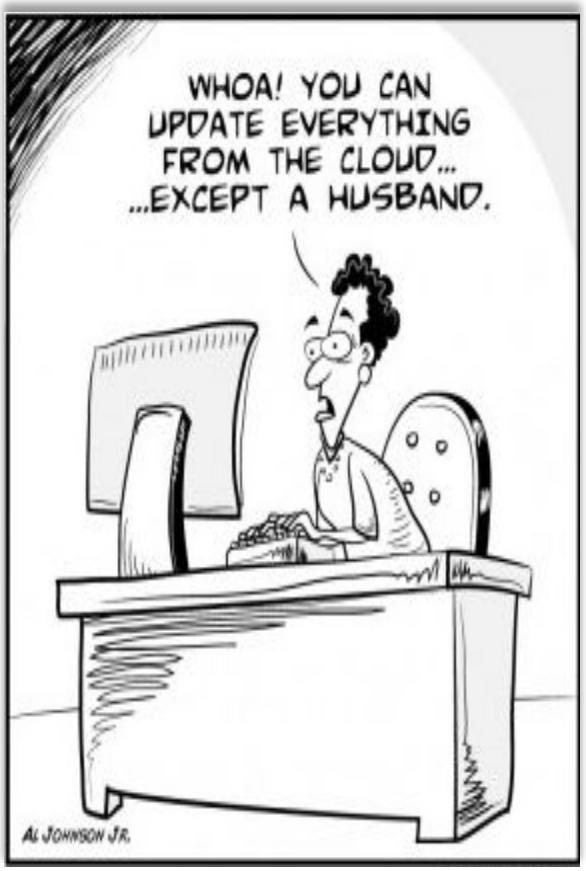


- **Openness**: All the details of the game should be made open and publicly available



Cloud Gaming Advantages

For Publishers/Developers	For Gamers
No piracy	Mobility
Flexible Business Model	Ubiquity
High performance hardware	Instant Play
Controlled Software	
Game Update	



Future Trend in the Gaming Industry

What role will 'Cloud' play in restructuring of the gaming industry?

- Cloud gaming is a better way to deliver high-quality gaming experience, with potential to open new business opportunities.
- More flexibility for gamers: pause game at home and continue on **mobile device** en route
- Transform game software retail to service provisioning:
  - Pay-per-use,
  - pre and post-paid, or
  - monthly subscription

Use Case: Cloud Gaming Infrastructure

Situation: John is in need of a Gaming Infrastructure with high performance

- Looking to develop and launch new games faster.
- Need to build and develop backend service quickly and easily.
- Required exceptional network performance.
- Globally scale upon game success.

Generally, gamers expect:

- Faster deployment cycles.
- No-lag game play.
- Flawless user experience.

Solution – Host games on cloud Infrastructure-as-a-Service (IaaS)

Benefits:

- Order servers with choice of processors, HD configuration, RAM speed etc.
- Select core servers, storage, RAM and deploy.
- Scale storage infrastructure on-demand while controlling cost.

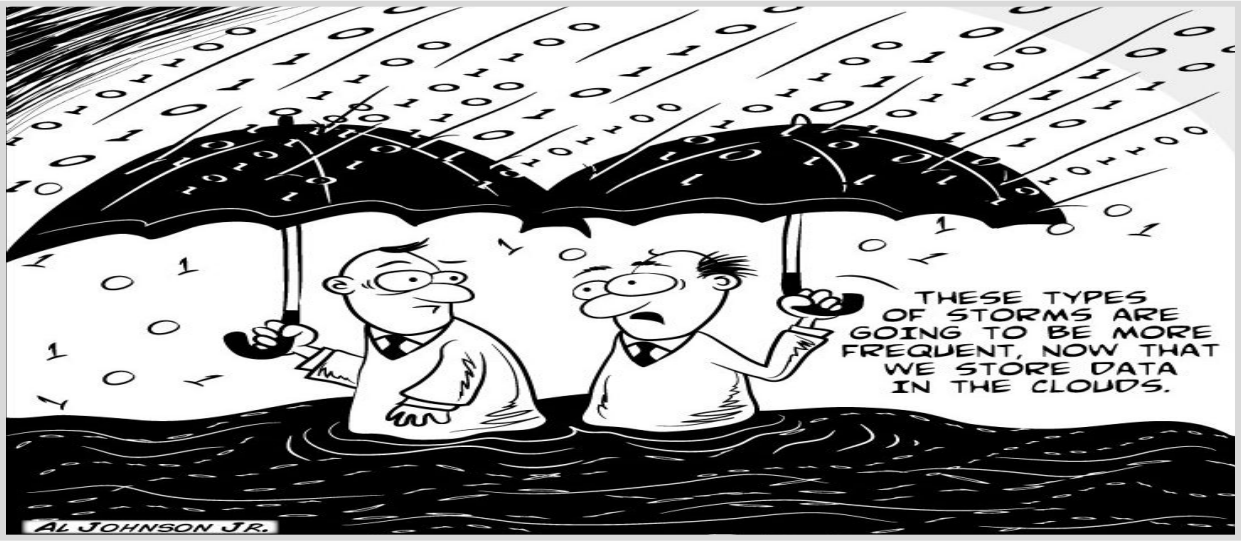
Cloud and Mobile Computing

- Cloud computing is a disruptive change in the IT industry
  - New computing model that is different from traditional IT computing models
  - Based on virtualization, high-speed Internet connectivity
  - Mobile access
- Demand for dynamic and responsive IT infrastructure
  - Short-duration application lifecycle
  - Requires new processes, application design, and development environment

Mobile Cloud Computing (MCC)

Mobile Cloud Computing (MCC)

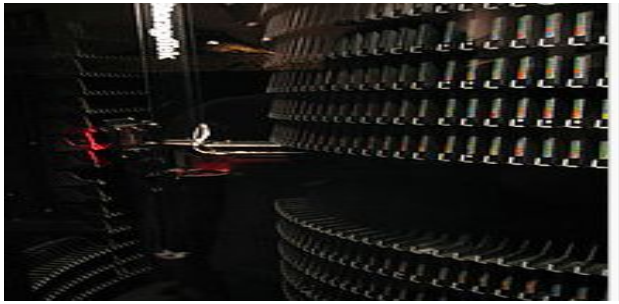
At its simplest, refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device



MCC Advantages

- Extending battery lifetime

- Increased data storage capacity and processing power



- Improved reliability

Application of MCC

- Mobile Gaming
- Mobile Learning
- Mobile Commerce

Mobile Gaming

- Mobile game (m-game) is a potential market generating revenues for service providers
- M-game can completely offload game engine requiring large computing resource (e.g., graphic rendering) to the server in the **Cloud**, and gamers only interact with the screen interface on their devices.

Future of Cloud Computing

- Overall, the development of cloud computing has introduced a new level of convenience, cost reduction, flexibility and agility.

- In particular, cloud gaming can be seen as an entrance to fundamental multi-media system challenge.
  - ✔ Gamers perspective: frees gamers from indefinite computer upgrade; anywhere game play etc.
  - ✔ Developer and Manufacturers : Allows dev. to support multiple platforms; reduces production cost and piracy etc.

- However, looking to the future, application of cloud computing for games will be driven by several factors including user preferences and business priorities.

- Moreover, delays in adapting the current law to the cloud era may impede success of this technology.

CLOUD GAMING ROCKS!