Implementation of GIS using Cloud paradigm

GIS514
Term_122
Paper presentation

BY: TAHA H.ALHAGE
INSTRUCTOR: DR. BAQER AL-RAMDAN

Outline

- INTRODUCTION

  What cloud computing is
  - Motivation/objectives
  - Methodology
- LITERATURE REVIEW
  - Cloud layers
  - Cloud types
  - GIS cloud , why it is needed, & Architecture
- Examples (case studies)
- Findings
- Conclusion

Introduction

- Geographic information systems (GIS) is a collection of tools that:
  - **captures,**
  - **stores,**
  - **analyzes,**
  - **manages,**
  - **and represent the data that connected to certain geographical location.**

Motivation

- **GIS is a useful and works well when made available to as many people as possible in every place with low implementation cost and less resources.**

Cloud Computing can offer:

- **Availability**
- **Data base sharing**
- **Low Cost**

Objective & Methodology

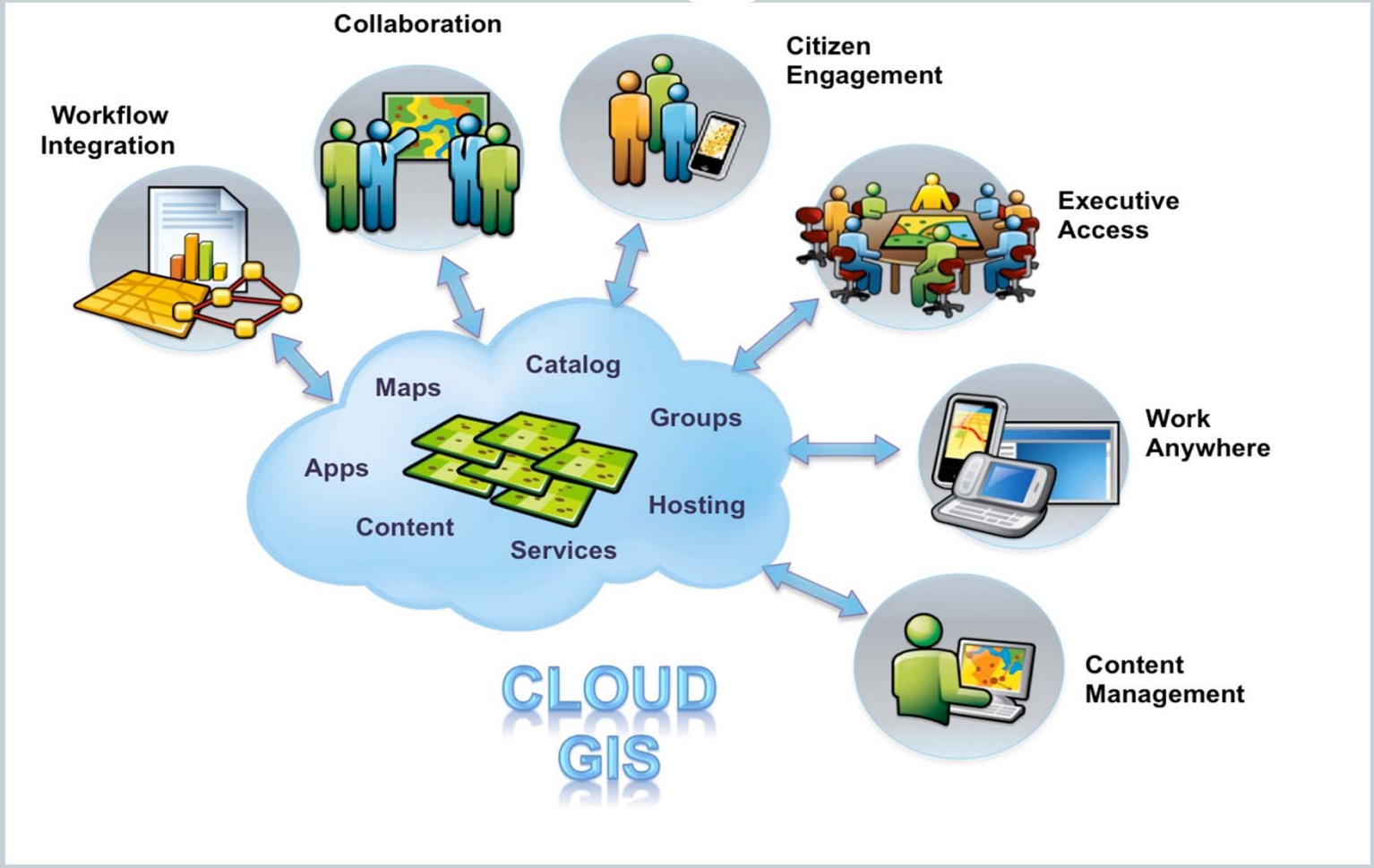
Objective: discuss the concept of cloud computing and how GIS makes use of this paradigm and what are the benefits it might provide to GIS

- **Methodology**: review the literature of GIS and Cloud computing and presenting three live case studies

Cloud Computing

- Cloud computing, a term which has become popular in recent years.
- described as the evolution of **on-demand** information technology services and products.

Literature Review: What is Cloud Computing



Literature Review: What is Cloud Computing

- Cloud computing is a paradigm which can serve every industry that provides or consumes software, hardware, and infrastructure.

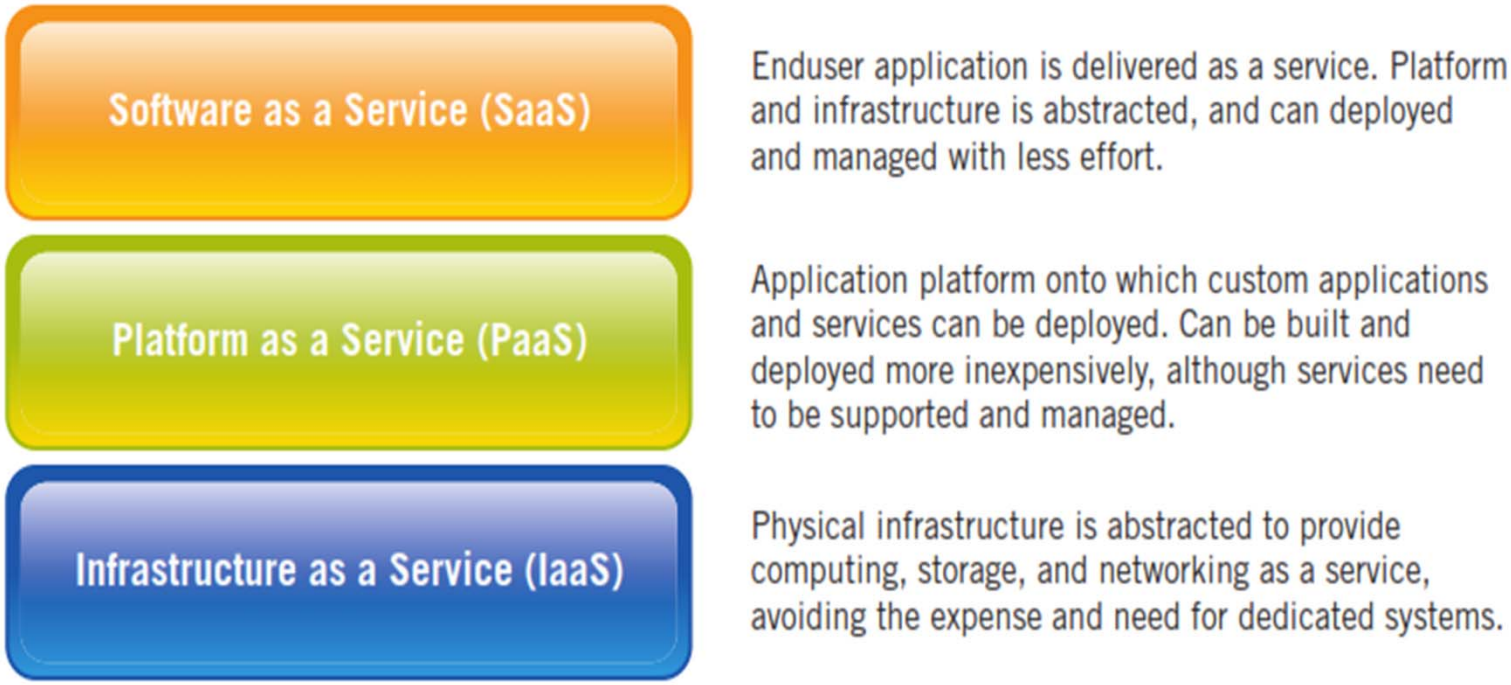
- Cloud Computing described as a highly scalable computing resources provided as an external service via the internet

pay-as-you-go.

Literature Review: Cloud Computing Characteristics

- There are several variations on the definition of cloud computing.
- But any agreed upon cloud should include the following aspects:
- Elasticity: scale up and quickly scale down
- Multi-tenancy
- Economics: use only what you need at a time when you need it (no waste of resources)
- Abstraction: Hide Complexities (OS)

Cloud Computing Service Layers:

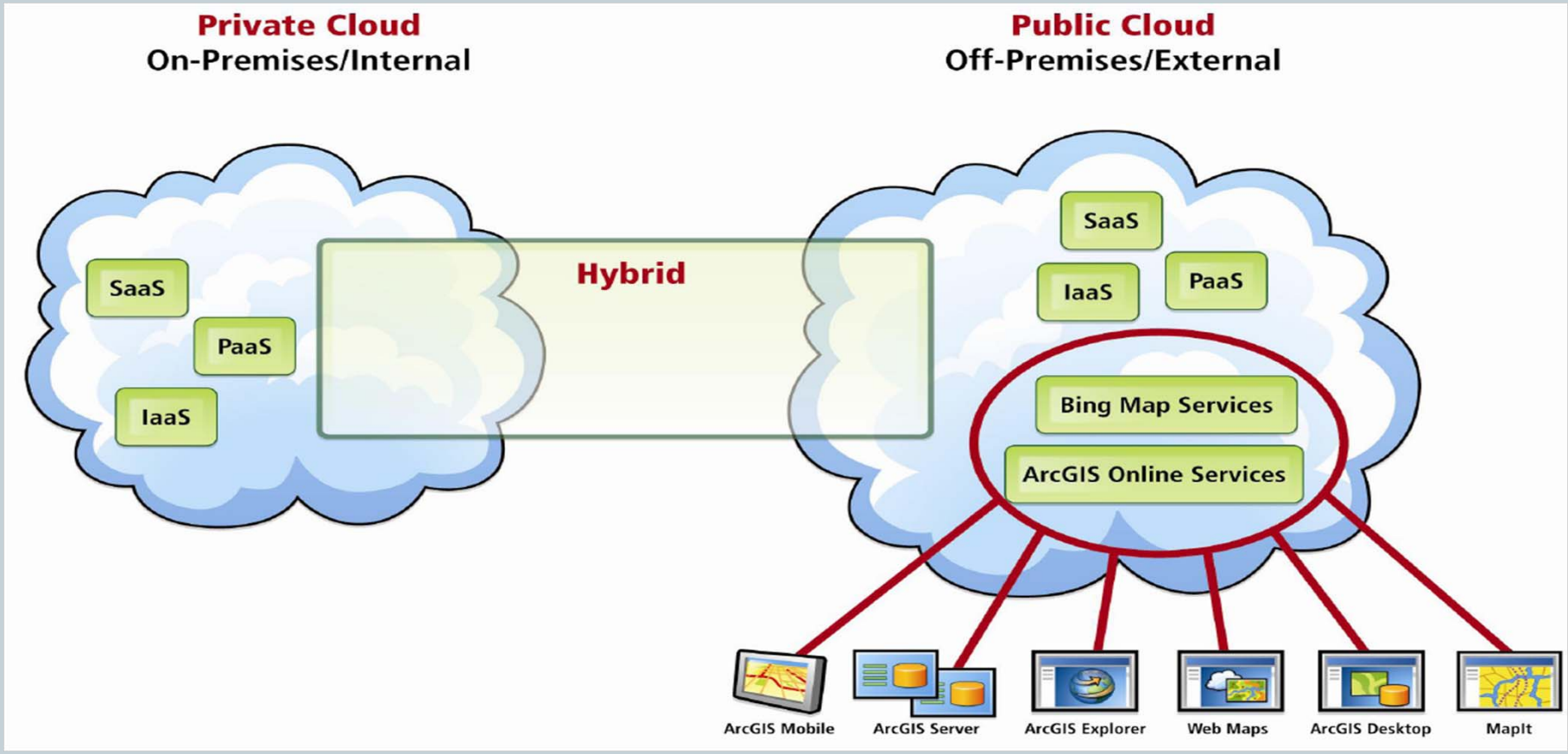


- Figure 1 illustrate the Cloud computing service Layers .

Cloud Advantages

- Lower Total cost of ownership
- Increased availability
- Faster application delivery
- Flexible model
- Enables collaboration and community computing
- Improved business continuity
- Rental pricing model

Cloud Types



- Figure 2 illustrates the Cloud deployment models

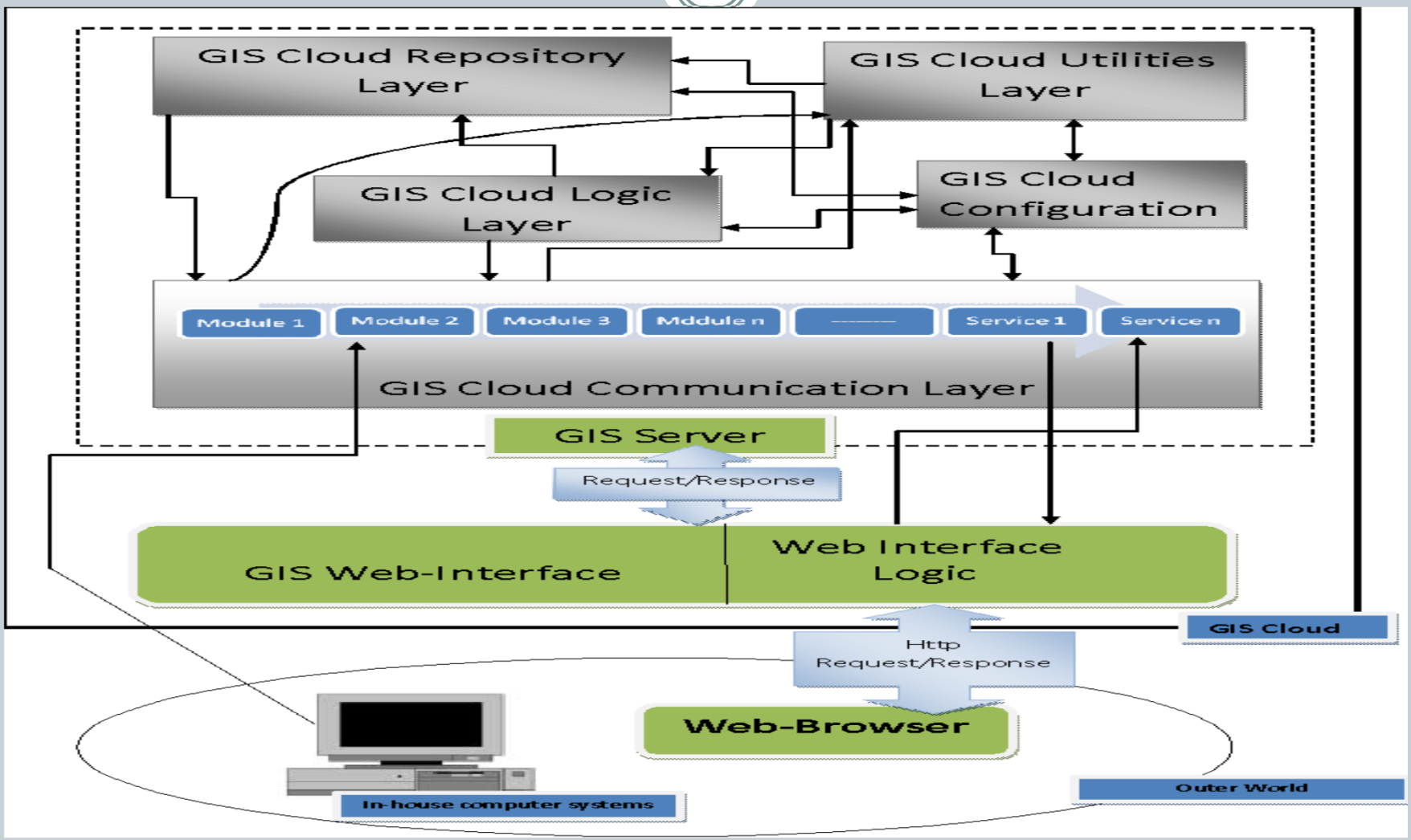
GIS Cloud

Why?

- **Providing Application Infrastructure**
- **Transparency (Hiding complexities)**
- **Simplifies Database sharing and availability.**

- **Cost reduction**
  - **implementation cost**
  - **Support & maintenance**
  - **Easier Data Conversion & Presentation**

GIS Cloud Architecture



The Google App Engine GAE

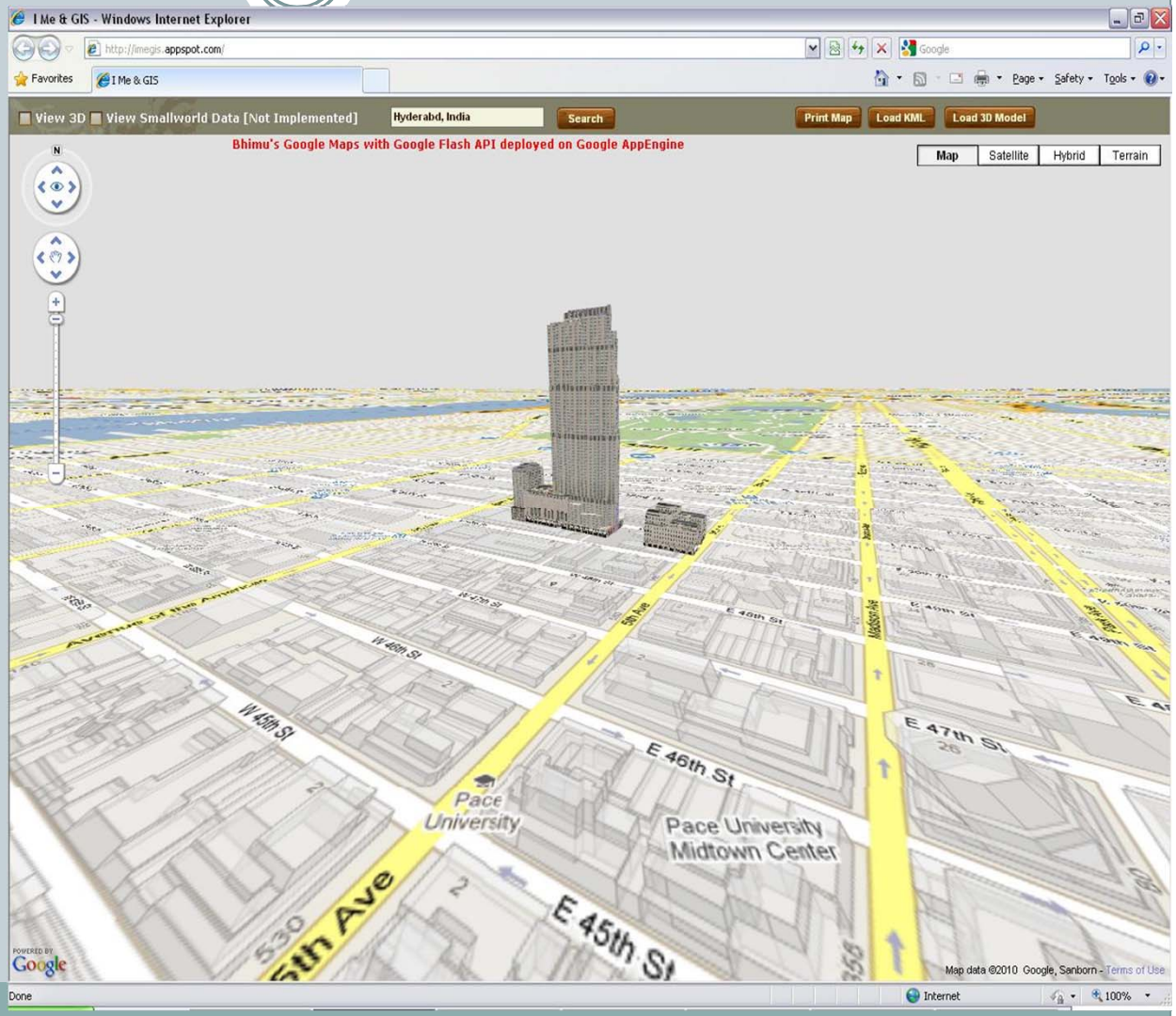
- **GIS cloud by Google corporation**
- Application can be run across multiple servers.

  " Distributed systems "
- Engine offers automatic scaling for web applications—as the number of requests increases for an application.
- **The low cost and automated scalability make GAE an attractive target for investment.**

GAE

GIS application running on the browser

hosted on the cloud & accessed everywhere



Case study 2:ArchGIS

- Provided by Esri corporation.
- Esri Uses the cloud in 2 ways:
- 1- The ability to deploy ArcGIS server on Amazon shared cloud
- 2- ArcGIS.com ,a web site offering tools and data for GIS application.

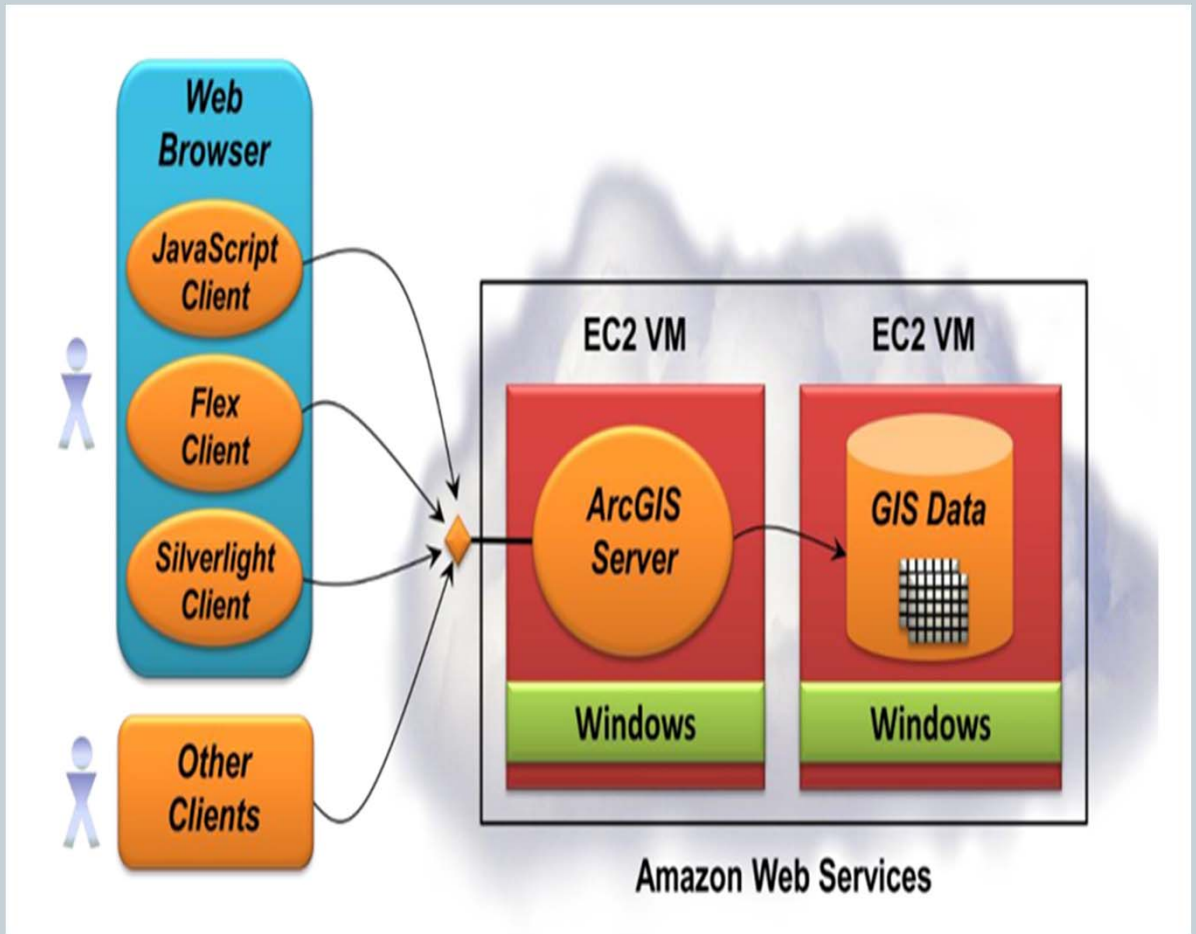
ArchGIS

- With Arch GIS you can:

- **Adding items(maps,data,layers,files,apps,tools)**
- **Adding web maps**
- **Adding files from your computer**
- **Adding items from the web**
- **Adding applications**

ArchGIS

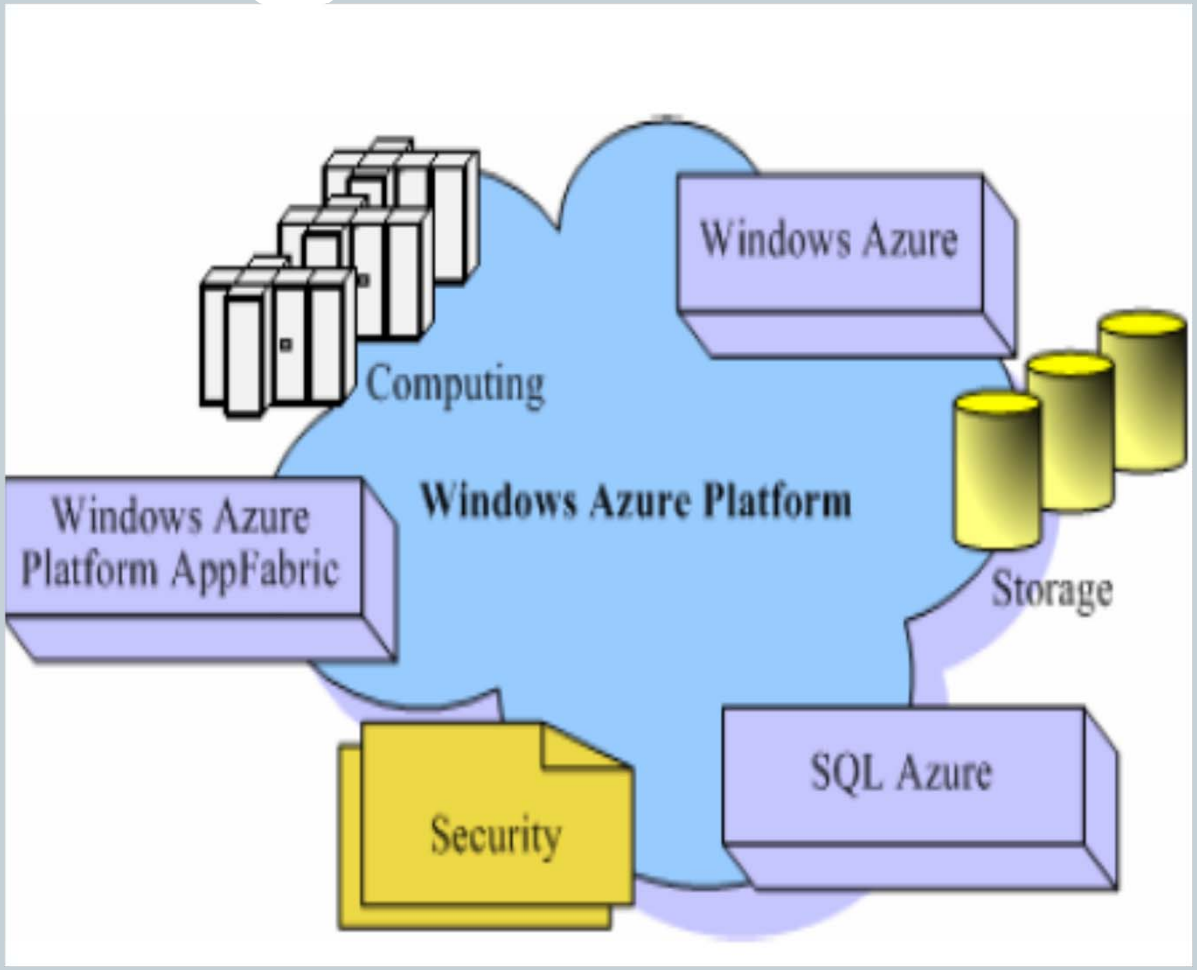
The deployment of ArchGIS on Amazon cloud



Case Study 3: **Microsoft GIS cloud (AZURE)**

- **Windows Azure**: provides platform
- **SQL Azure**: For Data services based on SQL-server

- **Windows Azure AppFabric**: cloud services for connecting applications running in the cloud



Findings from case studies

- According to the case studies , Cloud Computing has the ability to solve and overcome the challenges in GIS applications:

- Flexibility (scale up and down)
- Database sharing
- Resource management (DB update, DB recovery, S/W maintenance, staff)
- the high computing performance
- Budget.
- Availability (24/7 and location irrelevance)

Conclusion

- **Cloud computing is a promising paradigm makes use of the current IT technologies to provide the s/w, platform, infrastructure services worldwide**

- **We discussed the concept of CC:**
- **Layers**
- **Types**
- **Advantages**
- **How CC can be beneficial to GIS**
- **3 live examples(case studies)**

Future work

- **In the future, we will extend this study by discussing**

The security facet and the potential security issues of GIS cloud

This is important and critical for Private Organizations that use

private cloud type

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Thank you

Any Questions