Cloud Computing for Emerging Mobile Cloud Apps

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Abstract— The tutorial will begin with an explanation of the concepts behind cloud computing systems, cloud software architecture, the need for mobile cloud computing as an aspect of the app industry to deal with new mobile app design, network apps, app designing tools, and the motivation for migrating apps to cloud computing systems. The tutorial will review facts, goals and common architectures of mobile cloud computing systems, as well as introduce general mobile cloud services for app developers and marketers. This tutorial will highlight some of the major challenges and costs, and the role of mobile cloud computing architecture in the field of app design, as well as how the app-design industry has an opportunity to migrate to cloud computing systems with low investment. The tutorial will review privacy and security issues. It will describe major mobile cloud vendor services to illustrate how mobile cloud vendors can improve mobile app businesses. We will consider major cloud vendors, such as Microsoft Windows Azure, Amazon AWS and Google Cloud Platform. Finally, the tutorial will survey some of the cutting-edge practices in the field, and present some opportunities for future development.

Keywords*: Mobile App Design; Mobile Cloud Computing; Cloud Architecture; Mobile Security; Mobile Privacy.*

Outline: This is a 3-hour tutorial composed of lecture, active learning, case study review, and discussion; the session is divided into the following sub-sessions:

- Session 1 (60 minutes):
  - Background and an introduction to cloud computing, mobile cloud computing and software architecture
  - Mobile cloud computing services
  - Security and privacy in mobile cloud computing
  - Future cloud-based apps
- Break (20 minutes)
  - Session 2 (60 minutes)
    - Review major cloud vendor services for mobile cloud-based apps, programming tools, subscription rates and platform capabilities
    - Migration data and apps to mobile cloud computing systems
    - Big data and mobile cloud-based apps
    - Advantages and disadvantages of cloud-based apps
    - Future work in mobile cloud-based apps
  - Discussion and Q&A (40 minutes)

I. Instructor Information

A. Speaker Bio

Speaker Bio*:* Mehdi Bahrami is working in the Cloud Lab at University of California, Merced and is a senior member of the IEEE. He is a recipient of the achievement award in recognition of contributions to the field of Cloud Computing from WorldComp Congress 2014. He has more than 10 years of software industry experience and more than 5 years of teaching experience in the field of computer science. He has published several technical papers in the areas of Cloud Computing Architecture. He served as the editor-in-chief of the Journal of Soft Computing and Software Engineering. He is an editor and reviewer for several international computer science journals, including Springer journals. He also served as a technical program committee member for several international IEEE computer science conferences. He served as featured speaker in several international conferences including IEEE conferences. He has extensive experience with software engineering and developing distributed software applications in diverse platforms, such as Web-based, Windows-based, and Android-based systems. Prior to this tutorial at IEEE MobileCloud'15, Mehdi was a featured speaker and a panelist at SCSE'13 in San Francisco State University, IEEE ITMC'14 in Chicago, WorldComp'14 in Las Vegas, IEEE SMC'14 in San Diego, and SCSE'15 at University of California, Berkeley.

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C. Instructor Research Area

Cloud Architecture, Cloud Computing Security, Big Data, Software Engineering, Software Architecture.

II. Background of lecturer for this tutorial

As a featured tutorial speaker, Mehdi Bahrami presented Cloud Computing Software Architecture at the SCSE 2013 conference, which was held at San Francisco State University on March 1, 2013. He was also a featured tutorial speaker at the WorldComp Congress 2013, Las Vegas, He was a featured tutorial speaker at the IEEE ITMC 2014, Chicago, and IEEE SMC 2014, San Diego .

This tutorial at the 2015 IEEE Mobile Cloud Computing aims to provide a specific case study for mobile app design, tools, and its implementation in mobile cloud computing systems. In particular, the tutorial will review the advantage of start-up companies for designing and developing apps in the cloud computing systems. This tutorial will compare features and architecture between traditional models and the emerging field of mobile cloud computing for designing mobile apps.

III. Introduction

This tutorial aims to provide basic and advanced features of mobile app design in mobile cloud computing system for students (undergraduate and graduate) and researchers who are interested in designing mobile apps, tools, infrastructures from both academia and industry.

The outcome of this tutorial will provide the understanding of the following concerns: “When do we need mobile cloud computing for designing mobile apps, tools and the infrastructures of online mobile apps?”, “How does mobile cloud computing improve the process of app design, tools and marketing?”, “What are the pros and cons of mobile cloud computing for designing apps, tools and infrastructures?”, “How does mobile cloud computing relate to improvement of app industry?”. In addition, this tutorial will discuss opportunities and challenges of deploying an online app by cloud computing. Finally, the tutorial will present some case studies of both sides of mobile cloud vendors and consumers as best practices in the real world. The tutorial aims to provide a viewpoint of start-up mobile app design companies, if they employ mobile cloud computing for their infrastructure and it will review cost-effective models.

IV. Tutorial timeline

This tutorial is divided into the following sections:

1. Introduction (30-35 minutes)

This section will consider motivations, goals, the definition of cloud computing, cloud architectures, mobile and computer applications, platforms and how these definitions are important for designing mobile apps.

2. Cloud Computing and General Services (30-35 minutes)

This section will consider different services of the mobile cloud computing systems, such as SaaS, PaaS and IaaS. The section will discuss the pros and cons of each service for mobile cloud computing and the requirements for designing an app.

3. Mobile Cloud Service for Mobile Apps (30-35 minutes)

This section will provide a definition and requirements for designing and developing infrastructures for offline and online apps. This section will introduce the implementation of cloud databases and cloud computing for designing apps.

4. Case Study of Apps in Cloud Computing, Cloud Vendors and Implementation Theories (30-35 minutes)

This section will consider different and important case studies of mobile apps design in industry and science fields. Also, this section will consider the key mobile cloud vendors services, such as Microsoft, Google, Amazon, open-source cloud services and open-source tools.

5. Best Practice of Migration to the Cloud (20-25 minutes)

This section aims to review best industrial app practices of the migration from traditional IT infrastructures to mobile cloud computing.

6. Conclusion and Review (30-35 minutes)

This section will review the opportunities and challenges of designing apps in mobile cloud computing systems. Then for the conclusion, the audience will be encouraged to think about the problems and opportunities for their ideas about apps design in mobile cloud computing.

References

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