PROGRAMMING CLOUD SERVICES FOR MOBILE APPLICATIONS (CSE-635)

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The course

- Regular Elective for Winter semester
- 4 Credit
- Counts towards Mobile Computing Specialization (M.Tech.)
- Pre-requisite
  - *Mobile Computing*
  - *Operating Systems*
  - *Computer Networks*

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The course

- The course is about learning to program and build mobile cloud services.
  - *The course assumes that you have a strong programming background in Android programming and network programming.*
  - *The course also assumes that your fundamentals in Operating Systems and Computer Networks are strong.*
    - You should be comfortable in concurrency, synchronization, socket programming, networking protocols etc.
- The course will be programming heavy and throughout the course, you will be doing different programming assignments ON YOUR OWN.

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Basics

- The course Website:

https://www.usebackpack.com/iiitd/w2016/cse635

- Teaching and Learning
  - *A part of the course will also involve 'Flip class-room' technique.*
  - *There will be regular presentations by students, including students of the class, on different Cloud Programming Technologies in this course.*
  - *The classes will only introduce a technology; an assignment will follow that will be needed to be completed for learning*
  - *Students will be expected to OVERCOME programming challenges ON THEIR OWN*

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Books

- Rest in Practice: Hypermedia and Systems Architecture
  - *Publisher: Shroff/O'Reilly*
- RESTful Java with JAX-RS 2.0
  - *Publisher: O'Reilly*
- Developing RESTful Services with JAX-RS 2.0, WebSockets, and JSON
  - *Publisher: PACKT*
- Building a RESTful Web Service with Spring
  - *Publisher: PACKT*
- WebSocket
  - *Publisher: O'Reilly*

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Evaluation

- Tentative Evaluation
  - *Frequent programming assignments: 45 marks*
  - *Presentation on Technology: 7.5 Marks*
  - *Presentation on Research: 7.5 Marks*
  - *Project: 10 marks*
  - *Mid-sem and End-Sem exam: 30 Marks*
- Strict anti-plagiarism policy
  - *Moss reporting more than 50% match will be taken as a cheating case*
  - *First Instance: grade reduction*
  - *Second Instance: F*

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Setting up your Environment

- Amazon AWS for all Cloud work
  - *Set up an AWS instance (free tier) and use it whenever you need a server functionality*
  - *It should remain up all the time – so that TAs can mark your assignments*
- GitHub for all code repository
  - *Set up a private repository*
  - *Add the instructors and TAs to it*
  - *TAs will only mark the code which has been checked into the repository*

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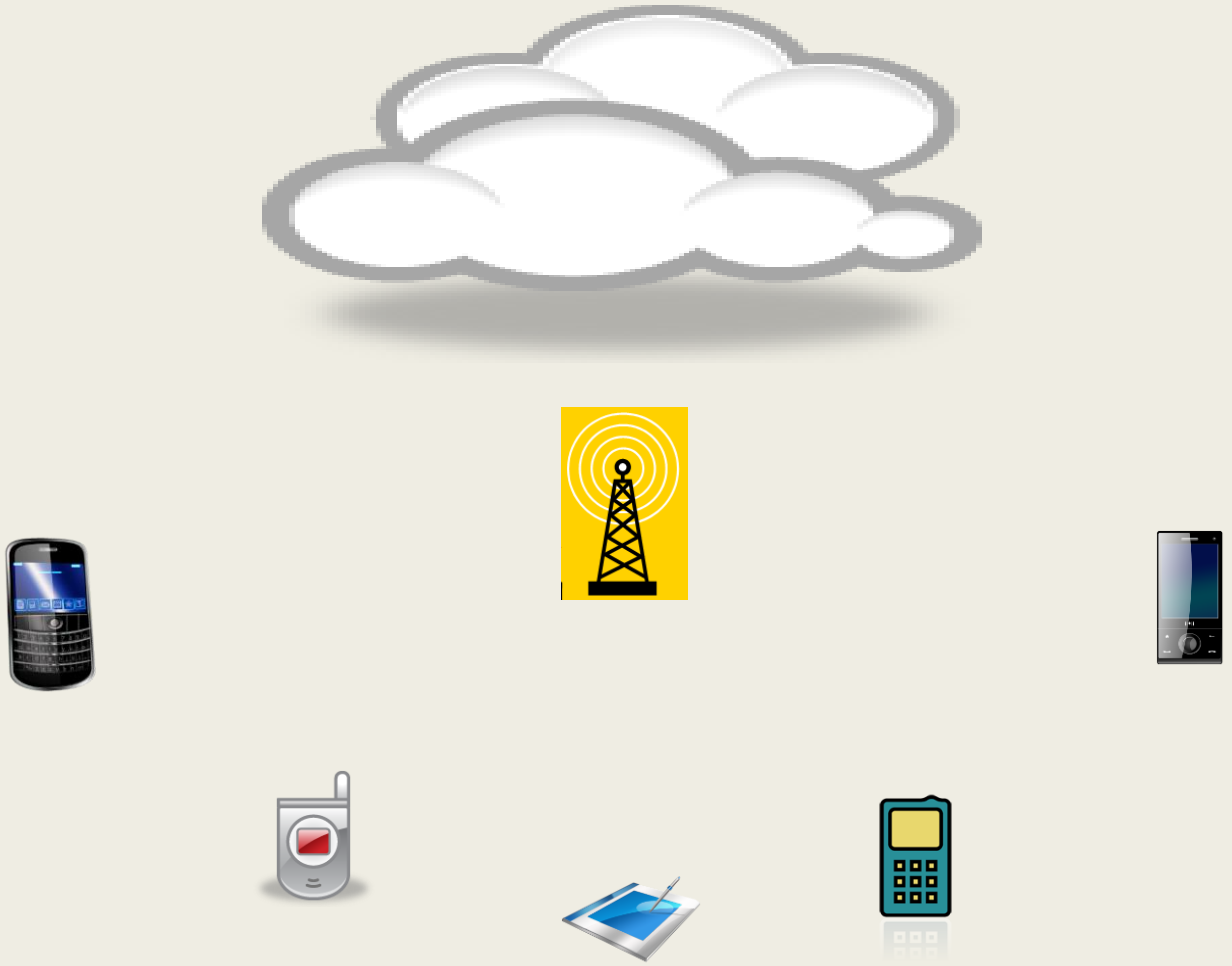
Mobile Cloud Systems



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Mobile Cloud Systems

- Mobile
  - *Portable*
  - *Personalized*
  - *Resource Constrained*
- Cloud
  - *Pervasive*
  - *No resource constrains*

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Technologies

- Server Frameworks: **Spring**, RoR, Python-Django…
  - *Spring MVC is the preferred platform by industry so far*
- Client applications: **Mobile**, desktop, web browsers,…
  - *Android*

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Applications

- Participatory Sensing
- Crowd Sourcing
- Multi-party applications

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Domains

- Healthcare
- Transport
- Energy
- …

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REST, HTTP, SOA

- REST
  - *An Architecture to create web services*
    - is not protocol-specific but uses HTTP.
    - SOAP and WS* also use HTTP as a transport protocol
- HTTP
  - *Synchronous, Request/Response protocol*
- SOA
  - *Designing a systems as a set of reusable, decoupled, distributed services.*

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RESTful Web Services

- The three questions [Roy Fielding]
  - *Why is the Web so prevalent and ubiquitous?*
  - *What makes the Web scale?*
  - *How can I apply the architecture of the Web to my own applications?*
- Answer: HTTP

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References

- Burke, Bill (2013-11-12). RESTful Java with JAX-RS 2.0. O'Reilly Media
- Rest in Practice: Hypermedia and Systems Architecture
  - *Publisher: Shroff/O'Reilly*
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