Cloud Computing Concepts

CS 3132

Dr. Anand Kumar Mishra

NIIT University

Building Cloud Computing Environments

Building cloud computing environments

- The creation of cloud computing environments encompasses both the development of applications and systems that leverage cloud computing solutions and the creation of frameworks, platforms, and infrastructures delivering cloud computing services
  - Application development,
  - Infrastructure and system development,
  - Computing platforms and technologies

Building cloud computing environments - Application development

- Applications that leverage cloud computing benefit from its capability to dynamically scale on demand
  - Web applications
  - Resource-intensive applications

Building cloud computing environments - Application development

- Web applications
  - Enterprise applications that now leverage the Internet as the preferred channel for service delivery and user interaction
  - An enterprise application (EA) is a business software system that orchestrates a specific operation
    - Accounting and Billing
    - Business Intelligence
    - Customer Relationship Management
    - Enterprise Content Management, Point-of-Sale Software

Building cloud computing environments - Application development

- Resource-intensive applications
  - By resource-intensive software we mean program code which efficiently uses abilities of multiprocessor systems and large amount of memory
  - Either data intensive or compute-intensive applications
    - In both cases, considerable amounts of resources are required to complete execution in a reasonable timeframe
  - These large amounts of resources are not needed constantly or for a long duration
  - Example: Scientific applications can require huge computing capacity to perform large-scale experiments once in a while, so it is not feasible to buy the infrastructure supporting them
    - In this case, cloud computing can be the solution

Building cloud computing environments - Application development

- Cloud computing provides a solution for on-demand and dynamic scaling across the entire stack of computing
- This is achieved by –
  - **providing** methods for renting compute power, storage, and networking
  - **offering** runtime environments designed for scalability and dynamic sizing
  - **providing** application services that mimic the behavior of desktop applications but that are completely hosted and managed on the provider side
  - All these capabilities leverage service orientation, which allows a simple and seamless integration into existing systems

Building cloud computing environments - Infrastructure and system development

- Objective- to understand technology used under this development
  - **Distributed computing** is a foundational model for cloud computing because cloud systems are distributed systems
  - **Web 2.0** technologies constitute the interface through which cloud computing services are delivered, managed, and provisioned
  - **Service orientation** is the underlying paradigm that defines the architecture of a cloud computing system
  - **Virtualization**

Building cloud computing environments - Computing platforms and technologies

- Development of a cloud computing application happens by leveraging platforms and frameworks that provide different types of services, from the bare-metal infrastructure to customizable applications serving specific purposes
  - Amazon web services (AWS)
  - Google AppEngine is a scalable runtime environment mostly devoted to executing Web applications
  - Microsoft Azure is a cloud operating system and a platform for developing applications in the cloud
  - Force.com - for developing social enterprise applications
    - The platform is the basis for SalesForce.com, a Software-as-a-Service solution for customer relationship management