Good luck :)

CS4504
In class assessed small exercise (30 mins) (30 marks)
Thurs March 28th 2013
Cloud Computing

1. Give an overview of Cloud Computing. [12 marks]

Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing encompasses any subscription-based or pay-per-use service that, in real time over the Internet, extends IT's existing capabilities e.g.

- you're an executive of a large company,
- you're job includes making sure employees have what they need to do their job,
- you have to buy each employee a computer each, however you also have to buy specific software or software licences to supply them with the tools they need,
- whenever you hire, you must get another computer and more software or make sure your current software license allows another user,
- this leads to stress and shit

Cloud computing solves this problem. Instead of installing a suite of software for each computer, you'd only have to load one application. That application would allow workers to log into a Web-based service which hosts all the programs the user would need for his or her job. Remote machines owned by another company would run everything from email & word processing to complex data analysis programs.

There's a good chance you've already used some form of cloud computing. If you have an e-mail account with a Web-based email service like Hotmail, Yahoo! Mail or Gmail, then you've had some experience with cloud computing. Instead of running an e-mail program on your computer, you log in to a Web e-mail account remotely. The software and storage for your account doesn't exist on your computer, it's on the service's computer cloud.

Types of Cloud Computing Service (Rich's Answer)

- IaaS(Infrastructure as a Service), PaaS(Platform as a Service) and SaaS(Software as a Service).
- IaaS: The consumer uses resources that you'd find on a PC, processing power, memory, networking, middleware etc and has full control over the machine. (With some limitation) Example: Amazon EC2
- PaaS: The consumer uses a hosting environment for their applications (EG Java JVM found in Google App engine) they have full control over their applications but limited control over the hosting environment. Example: Google App Engine
- SaaS: The consumer uses an application but has absolutely no control over the system it's running on or the hosting environment. Example GMail.

2. Discuss the three most important technical (i.e. non-financial) advantages that cloud computing has to offer a user/client. [9 marks]

- Large data available anywhere
    - Storing information in the cloud gives you huge storage capacity which is ultimately available from any device with an internet connection. This is extremely convenient for a variety of reasons. eg. no need to sync data between devices.
- Backup and Recovery
    - Since all your data is stored in the cloud, it is much safer than if it were backed up on a physical device. Most cloud services also provide a way of retrieving previous versions of your data, hence making the entire process of backup and recovery much simpler than other traditional methods.
- Computation Power (Rich's Answer)
    - Cloud computing provides nearly unlimited computational power allowing CPU intensive tasks to be carried out quickly in the cloud when required, using traditional methods a company would be required to have all this CPU power on standby but they may only use it for 2% of the time.

3. Discuss the three most important technical difficulties faced by the provider of cloud computing services. [9 marks]

- Security and Privacy
    - The main challenge to cloud computing is how it addresses the security and privacy concerns of businesses thinking of adopting it. The fact that the valuable enterprise data will reside outside the corporate firewall raises serious concerns.
- Reliability and Availability
    - Cloud computing services need to be available around the clock and also need to be very reliable in the sense that the service does not have frequent downtime or errors restricting service use.
- Reduced Flexibility & Limited Features
    - Special customizations are not possible e.g. you can't insert a document created in another application into a Google Docs spreadsheet. Companies are restricted to the services & features of these services that are available by the cloud provider.