CAS 781 Assignment 4

Please do three of the following six problems, related to your presentations. You cannot do your own. If you have any questions about a problem, please contact the person who wrote the problem (if you need their contact info, let me know).

1. (Deemah) For the paper that she presented, why is a 95% VCPU/PCPU ratio considered overpopulated?

2. (Baran) The paper that he presented compares two search (placement) algorithms for better network flow paths. These two algorithms are Global First Fit and Simulated Annealing. In most cases SA has better results than the GFF. However, both of the algorithms have their pros and cons. Explain the pros and cons of both algorithms.

3. (Zhewei) Are there any difficulties of operating sustainable DCs with green energy (wind, solar, e.g.) and how can these difficulties be overcome?

4. (Solmaz)

   (a) What is the superiority of GFS (Google File System) as compared to other distributed file systems?

   (b) Why are Heartbeat messages essential in GFS?

   (c) What will happen if the primary master shuts down?

5. (Hanane)

   (a) List the disadvantages of using the data partitioning and replication techniques discussed in the paper to achieve data security and survivability in cloud computing systems.

   (b) Does using the erasure coding technique, which was discussed in class, address the disadvantages listed in (a)? If yes, explain how.

6. (Parshia) Harmony is a Heterogeneity Aware Resource MONitoring and management sYstem that performs Dynamic Capacity Provisioning (DCP) in heterogeneous data centers. The paper introduces two different heuristics for solving the integer relaxation of DCP. Discuss the pros and cons of each of the heuristics, the reason they perform differently in various environments and state a few situations where one of them would outperform the other.