Exercise Sheet 6

Exercise 1 (Different persistent Storage Solutions for the High Throughput Cluster)

For exercise sheet 5, you implemented with the infrastructure services of the Amazon Web Services (AWS), a highly available High Throughput Cluster of virtual web servers. One part of this task was to attach a persistent storage volume to each web server instance. All storage volumes contained identical data.

Not for all possible scenarios, it is the optimal approach, when all instances have EBS volumes with identical content attached.

1. Investigate other approaches and summarize their advantages and drawbacks. The focus of your investigation should be the aspects availability, cost, throughput, scalability and complexity of the different approaches.
2. Implement at least one of the solutions you investigated.

Be prepared to present the results of your investigation and demonstrate your implemented solution(s) live during the exercise session.

Exercise 2 (Financial Aspects)

As CEO of a young IT company (start-up), you face the challenge of implementing the IT infrastructure, your business requires. Since your products are primarily web services, you require a highly available and elastic infrastructure, because when you go live, you will have only few customers and it is unclear, when the number of customers will increase. The following components are absolutely required:

- 2 web servers. Each instance needs to be equipped with at least 2 (virtual or physical) CPU (cores) and 4 GB main memory.
- A load balancer to distribute incoming requests to the web servers, according to their utilization.
- 25 TB, persistent storage for the web servers.
- A relational database (dedicated, physical server or instance or cloud service) for user data and log data which stores 10 GB of data.
- 5 GB internal data transfer per month.
- 100 GB external data transfer per month.

- Every week you do a full backup of the 25 TB persistent storage. Backups which are older than 4 weeks, will be erased. This means you need to store up to 100 TB backup data.

The venture capital, you collected to start a business from your family, friends and banks is very limited. For this reason, try to implement the required infrastructure as inexpensive as possible. Your infrastructure should be able to handle in an elastic way, a growing or decreasing number of customers in the future.

Your task is to do a cost analysis for these implementation scenarios:

1. Calculate the monthly costs, when you realize the required infrastructure with the Amazon Web Services (AWS).
2. Calculate the monthly costs, when you realize the infrastructure with traditional hosting offerings. Check the websites of at least a single well-known hosting provider to investigate their pricing.
3. Calculate the monthly costs, when you buy the required physical hardware and run it for yourself in your company. Check the websites of at least a single well-known hardware vendor to investigate the pricing.

Be prepared to demonstrate your cost analysis during the exercise session.