Exam Preparation Assignment n.1

Description of the UC: Credit Card (CC) Transaction for a Bank

Every CC transaction has to be approved by checking the CC is valid, the POS is valid, the money amount is valid (for single transaction and for other limits such as monthly or daily limits), check if suspect, if the POS type requires a second identification step, to run that step and check complete successfully, issue OK or abort storing the attempt.

Non-Functional Requirements (NFR):

NFR-1 The average number of transactions per second (TPS) is 1.000.
90% of the time the peak is below double of the average.
The maximum peak that the system must handle is the double of the 90% peak.

NFR-2 The system must ensure a HA at 99.999%.

NFR-3 In case of a disaster, such as Earthquake or flooding in the Data Center site area, the system functionality must be restored and be able to provide Production and Non-Production capabilities and at least 50% of the Dev and Test Capabilities.

NFR-4 The Development team has available an environment that is half the size of the full Production environment.

NFR-5 Before putting in production any new release of software a complete round of functional test must be completed. The Test environment is the same size of the development environment.

NFR-6 Before putting in production any new release of software a complete round of performance test must be completed stressing the system at TPS peaks.

NFR-7 The Software is written in Java and run on the selected Application Server
(See Assignment request).

NFR-8 The DB used by the system is the selected DB
(See Assignment request).

Assignment Request:

1. **Calculate the TCO costs for the environments required as per the NFRs provided over 5 years' time window for the two target platforms (x86 and LinuxONE)**
    a. Prepare a presentation with no more than 8 slides presenting the TCO
    b. Elaborate on what are the most impacting costs elements for each platform
2. Elaborate when one platform is more convenient than the other
    a. For which TPS the two platforms have similar costs?
    b. Create a chart that shows TPS on X axis and € on Y axis and has two lines representing the TCO for the 2 platforms. Make the chart for at least 5 TPS points, of which about half of the points have one platform TCO below the other and the other half of the points have that platform TCO above the other.
    c. What are other considerations on the convenience?

Warmup tasks

1. Find the price on Internet of two possible x86 servers with the following characteristics:
    a. Rack server
    b. At least 2 Intel Xeon Gold Processor
    c. At least 12 cores per processor
    d. At least 128 GB of RAM

    e. Suggestion: For the 2 servers configuration try to change the number of Processors and number of cores per processor

2. Find the price of two possible commercial **Java Application Servers**.
   Please report:
    a. Name
    b. Acquisition Cost
    c. Maintenance Cost and when it is applied
    d. Discount if available
    e. The unit of measure used to calculate the cost of this software (by core, Processor, Server, PVU, etc) and if there are conversion factors or price depending by range (such as up to 3 servers or up to 2 cores)

3. Find the price of two possible **Open Source Java Application Servers** that provide Premium support 7x24. Please provide the same info as previous item.

4. Find the price of two possible **commercial DB**.
   Please report:
    a. Name
    b. Acquisition Cost
    c. Maintenance Cost and when it is applied
    d. Discount if available
    e. The unit of measure used to calculate the cost of this software (by core, Processor, Server, PVU, etc) and if there are conversion factors or price depending by range (such as up to 3 servers)
    f. The prices of the Data replication tools

5. Find the price of two possible **Open Source DB** that provide standard support 7x24. Please provide the same info as previous item.