

# Cloud system architecture design

## Description of the assignment

The company has launched a new system project that includes a Front End of a Web site where customers view the company's products and can select a product that interests them and order it. The order is transferred to the Back End which processes it and places the order for the customer. All information about the company's products, costs and orders are centralized in a database server to which both the Front End and the Back End refer.

The expected load on the system is defined in the table below with different data for each group. The data will include, among other things: the number of customers expected to be connected to the site during peak hours and on average. With the expected activity data for each customer, traffic load, CPU consumption, the expected load on the storage and the database.

A. You must design a basic system without considering durability that includes a WEB server, an End-Back server, and a database (one computer of each type). You must select for the system machine and disk sizes and types that are appropriate for the expected load on each of the computers in the system (including the database) and calculate the expected network traffic. After completing the design, you must calculate the monthly cost of the system using the cost calculator.

B. The next step in the exercise is to make the system a resilient system in which no matter what happens (within the limits of reason), users will continue to receive service.

After completing the design of the durable system, the monthly cost of the durable system must be calculated using the cost calculator.

C. In the next phase of the exercise, the company expects the demand for the system to increase much more than expected. You must improve the robust design so that it can automatically handle any changing load (within reason).

## **The process and stages of work on the assignment**

Each group, according to the specifications it received, will do the following:

- (1) According to the data, calculate the size and parameters of each of the three computers (part A)
- 2) Calculate the expected monthly costs for the system described in Part A using the cost calculator.
- 3) Perform a break-even point analysis of each of the system's components and find an architectural solution for each of the problems (Part B).
- (4) Calculate the expected monthly costs for the sustainable design (Part B) using the cost calculator.
- (5) Improve the architecture of the resilient system so that it can function without any sensible load change (Part C).

## **The form of submission**

(1) and submit a document describing the architecture and all parameters of the computers in the section 1 (Part A).

Icons for understanding the drawing can be found at AWS Architecture Icons ([amazon.com](https://aws.amazon.com/architecture/icons/)). It is recommended to use a drawing tool like PowerPoint, but Word and Visio or diagrams.net ([draw.io](https://draw.io)) will also do the job.

When drawing and planning, don't forget details such as network connections and security of the network and resources.

(2) Document the costs of sections 2 and 4 and attach separately the cost calculator reports for each

One of two architectures of parts A and B.

(3) A document describing the architecture of Section 3 (Part B).

(4) A document describing the architecture of Section 5 (Part C).

For all groups:

Every action the user takes on the site will result in the transmission of K10 bytes to the user's browser.

Only actions from the last two months should be saved on disk and in the database.

Once a month, a backup will be made that will transfer all of the previous month's activity to the backup and delete it from the disk and database.

Backups must be kept for 3 years and then they can be deleted.

Choose a machine type based on load and economic considerations.

# Project Parameters for My Group

Group	A	B	C	D	E	F	G
22	2750	4500	90	21	5	20	0.000008

Parameters for Group 22 :

A – Number of users on average per minute = 2750

B – Peak number of users per minute = 4500

C – Number of actions per user = 90

D – Amount of data written to the WEB disk per action = 21 KB

E – Amount of data written to the Backend disk per action = 5 KB

F – Amount of data written to the Database per action = 20 KB

G – vCPU usage per action = 0.000008