Iteration 3: Addressing Quality Attribute Scenario Driver

Step 2: Establish iteration goal by selecting Drivers

For this iteration, the focus is on QA2- Availability: No unexpected downtime/ expected downtime to be announced at 48 hours in advance. Downtime only during low-intensity hours, at most 4 hours/month.

Step 3: Choose One or More elements of the system to refine

Application server and Database server are chosen for refinement.

Step 4: Choose One or More Design Concepts that satisfy the selected Drivers

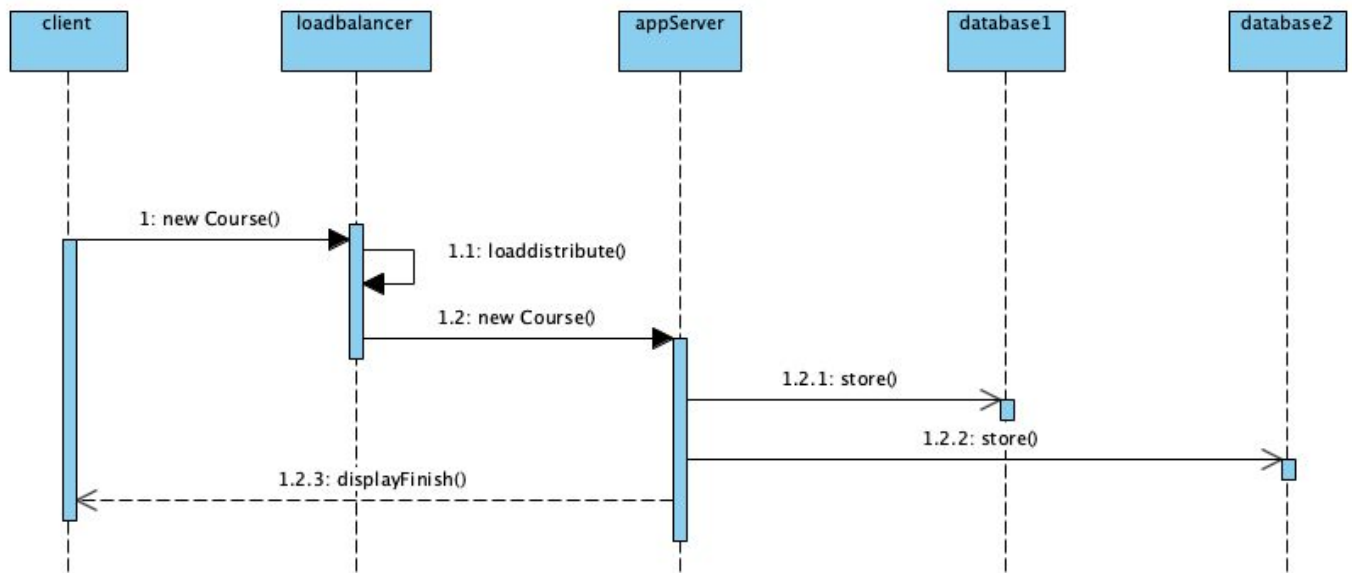| Design Decision	Rational
Apply active redundancy in application layer	This allows system to respond in the event of an application failure, by switching to a replica of the current operating application.
Replicating database	This reduces the dependency on one database. In the event of one database failure, there is always another backup to support the system operation.

Step 5: Instantiate Architectural Elements, Allocate Responsibilities, and Define Interfaces

Design Decisions and location	Rationale
Implementing another replicated version of the server	Beside being a backup plan, the second server helps distribute the workload of the original server. Loadbalancer is used to distribute the workload.
Utilizing AWS cloud service	Having a backup database in the cloud adds another safety layer upon current database.

Step 6: Sketch Views and Record Design Decisions
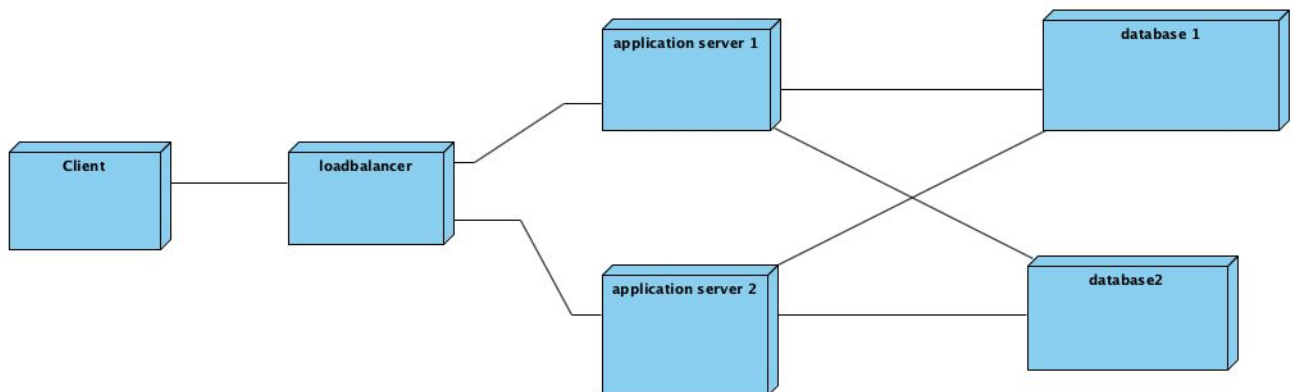
Element	Responsibility
Loadbalancer	Dispatches client requests to the 2 application servers.

client | loadbalancer | appServer | database1 | database2

1: new Course()

1.1: loaddistribute()

1.2: new Course()

1.2.1: store()

1.2.2: store()

1.2.3: displayFinish()

Above sequence diagram illustrates one instance of UC1: manage course, which is associated with QA2: availability as well, where loadbalancer is used to distribute tasks and 2 databases are exploited.

Step 7: Perform Analysis of current Design and review iteration Goal and Achievement of Design Purpose

Not Addressed	Partially Addressed	Completely Addressed	Design Decisions Made During the Iteration
		UC1	Design decision allows more complete course managing
		UC7	No relevant decision.
		UC8	No relevant decision.
	UC10		No relevant design decisions
		UC11	No relevant decision.
		UC13	No relevant decision.
		UC25	No relevant decision.
	QA-1		No relevant decision.
		QA-2	Replicated application server and database solve the issue.
	QA-5		No relevant decision
		QA-10	Replicated servers allow easy maintenance.
CON-1			No relevant decision
	CON-2		Distributed workload allows application to

			handle more requests.
		CON-4	Fully addressed.
		CRN-1	No relevant decision.
		CRN-2	No relevant decision
		CRN-3	No relevant decision.