Distributed Systems: Google App Engine

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December 2014

1 GAE Exercise 3.2

We delegate asynchronous tasks to the back end during quote confirmation. Quote creation and collection are user involved tasks and should return results as soon as possible. Quote confirmation is less user involved and can block under heavy concurrent loads.

We decided to persist the data and pass a reference between front and back end. This to alleviate the load on the queue. Like this we can keep metadata about the process state or the success of the batch. We can then delete the processed batch later on.

2 GAE Exercise 3.3

We utilised transactions to considerably reduce the chance of bringing the system into an illegal state. Batches are completed in an all or nothing fashion. There is however a small critical section in CarRentalCompany: confirmQuote(Quote quote). In the unlikely event that two confirmations cross on the same car no ReservationException is raised. We can remedy this by testing the state of the system before committing. This does not limit parallellism.

You can find our deployed GAE Application here:
`http://crc-wouters-ariens.appspot.com/`

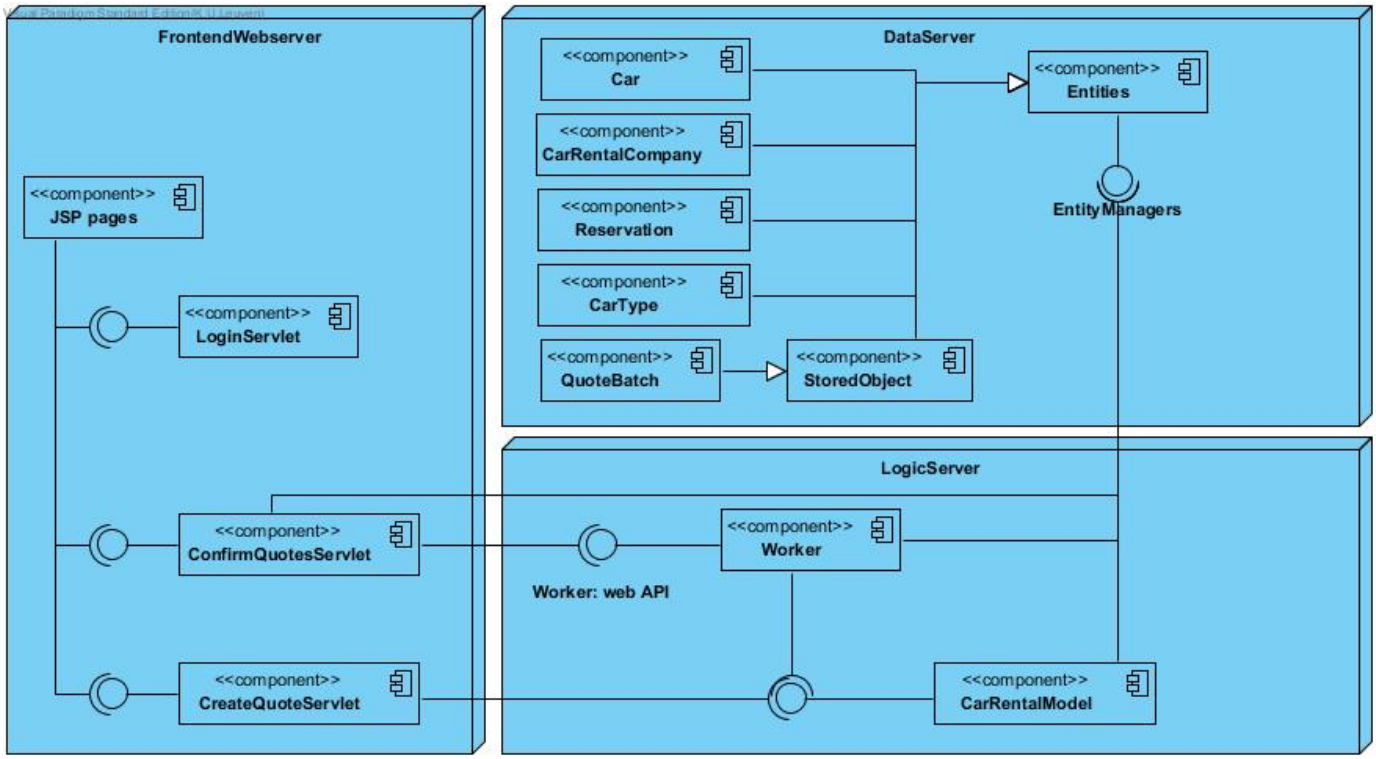

Figure 1: Deployment Diagram

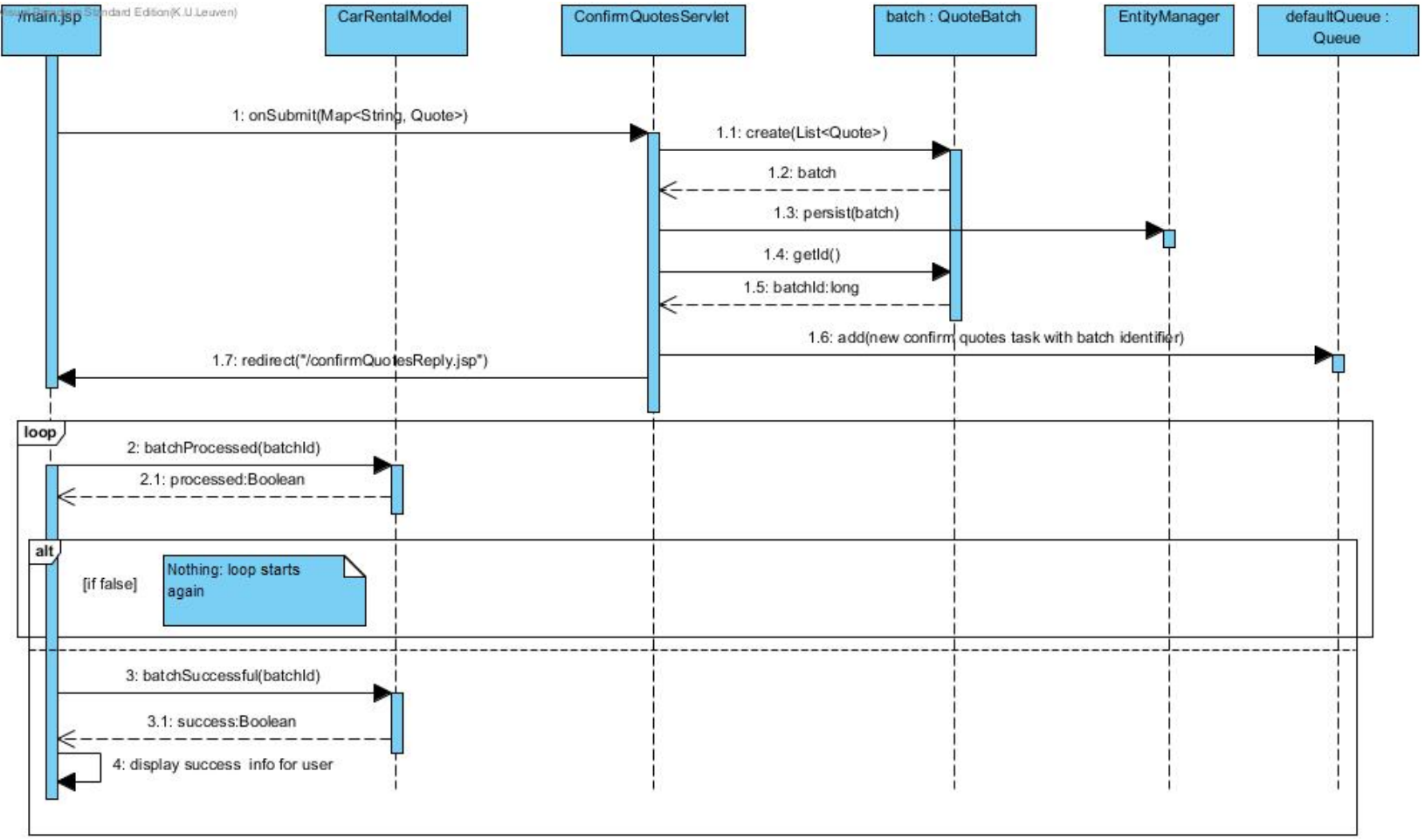

Figure 2: Sequence Diagram: Front-end (synchronous)

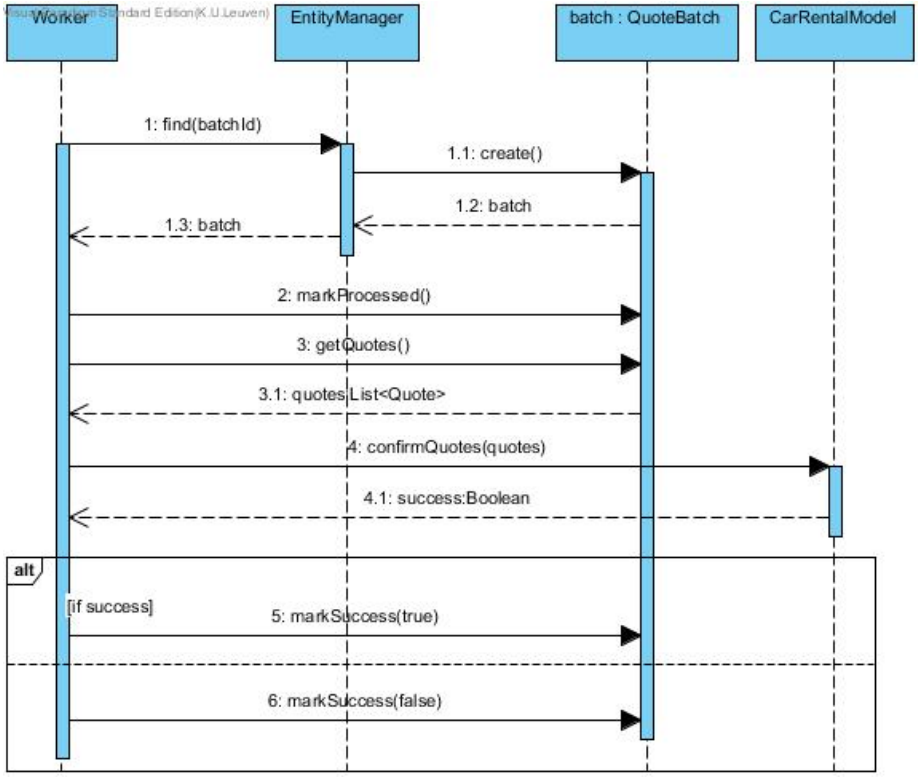

Figure 3: Seqeunce Diagram: Back-end (asynchronous)