BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (RAJ)
I SEMESTER 2020-2021
ASSIGNMENT-2

Course No.: CS/SS G527 **Course Title:** Cloud Computing
Deadline: 22nd September **Maximum Marks:** 40 (10%)

Note:

- **Group of maximum two students**
- **Deliverables: (a) Source code (b) Design document containing rationale behind design choices**

P1. Design and Develop a storage system with the following requirements.

- The data to be stored is e-commerce shopping cart. User may access shopping from multiple places. Admin uses this data for analysis.
- The system replicates its data using leaderless replication. Every data item has at least two copies. The system supports eventual consistency through read-repair mechanism.
- The data is partitioned and stored. Use CRUSH hash function. Secondary indexes must be supported. Any mapping is updated and retrieved using Zookeeper coordinator service.
- Client contacts a gateway. Gateway runs in at least two instances. Gateway identifies replicas and partitions. Gateway is responsible for updating replicas and read-repair. It also takes care of balancing the partitions.
- The system should provide high write-availability (i.e. low latency writes). For identifying concurrent writes, it uses version vectors.
- In case of concurrent writes, gateway should send relevant information to the client.
- The following should be offered as REST API for the client/browser.
    - Add/delete/update/list items in shopping cart for user
    - List shopping carts for admin. Admin can query based on product attributes.

Note: Keeping the difficulty of creating a cluster in the present situation, you can use containers instead of VMs. The dataset is available here. You can insert more entries for better testing.

Deliverables:

- Brief Design Documents in design.doc/.pdf (should include overall design, components and their roles, product table schema, user table schema and shopping cart schema)

- Code in folder named Code
- Modified dataset
- Screenshots of the demo
- Group.txt containing idno and names of group members

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