BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (RAJ)
I SEMESTER 2019-2020
ASSIGNMENT-2

Course No.: CS/SS G527 **Course Title:** Cloud Computing
Deadline: 31st October **Maximum Marks:** 40 (10%)

Note:

- **To be done in a group of maximum four members.**
- **Submit your assignment on http://nalanda.bits-pilani.ac.in as a single ZIP file**
- **Deliverables: (a) Source code (b) Design document containing rationale behind your design choices.**
- **Book your demo slot here (4th to 7th Nov):** https://docs.google.com/spreadsheets/d/1B08BzyiZE8AV-9qqCdJtjvmA0p_dxkF53h0KbM0hoJE/edit?usp=sharing

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In this assignment, you are required to develop a REST-based API for an object-based storage service for the following requirements.

- User should be able to create/delete a bucket
- User should be able to create/delete files in a given bucket

The API should return the following in a JSON object:

- Success or failure
- Vector clocks of all replicas
- Node number where the write took place (in case of write)

The implementation of the object storage system should have the following characteristics as explained in Dynamo paper.

- Data is partitioned and replicated using consistent hashing. Number of nodes (VMs) should be at least 3.
- High availability for writes using vector clocks with reconciliation during reads. Consistency is facilitated by object versioning using vector clocks and application-level conflict resolution in case of conflicts
- Temporary failures in replicas is handled by sloppy quorum technique and hinted hand-off.
- Failures of nodes is detected by a gossip based distributed failure detection.

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