UniFCloud:
a Cloud Based DFS

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Motivations and Goals

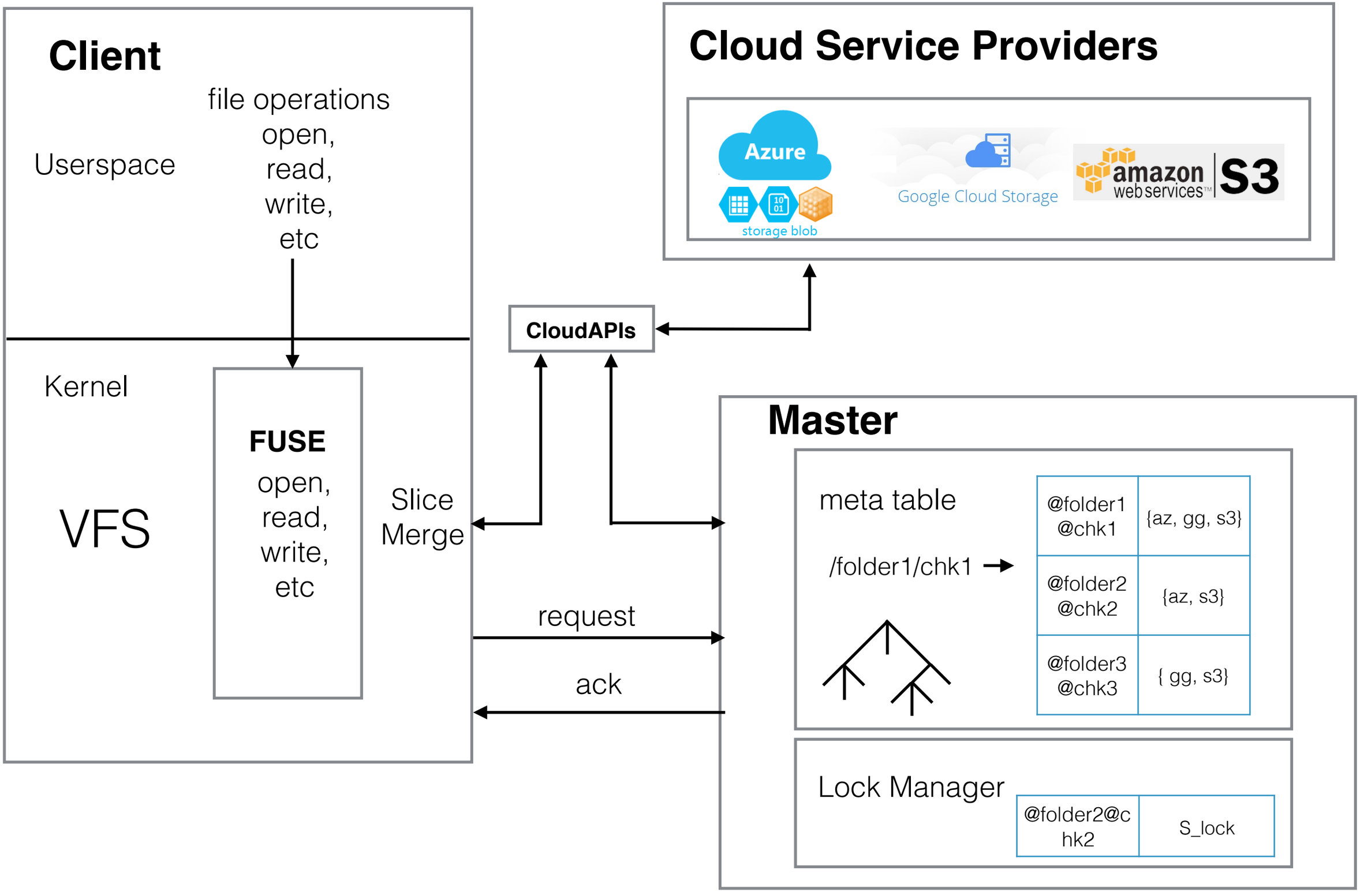
- **Facts**:
  - Cloud storages are popular: google drive, dropbox, amazon S_3, etc
  - Sensitive information may be leaked if the cloud is compromised
  - Multiple clouds per user
    - frequently used ones are heavily occupied while others vacant
- **Motivations**:
  - Need a unified cloud managing tool
  - Take advantages of capacities of all available clouds
- **Goals**:
  - Build a unified cloud management tool
  - Build a fault-tolerant DFS (distributed file system) combining all clouds
  - Enhance security by only storing partial information on each cloud

Related Work

- Cloud API Library (python): libcloud. apache. org
- FUSE (filesystem in userspace)
- Related research works:
  - GFS [1]: files on chunk servers, master stores meta data
  - CYRUS [2]: utilized different clouds' performance levels and capacities to achieve high performance in latency, reliability and privacy
- Existing commercial products
  - Jolicloud [3]: unified, file manipulation
  - Otixo [4]: unified, file sharing and encryption

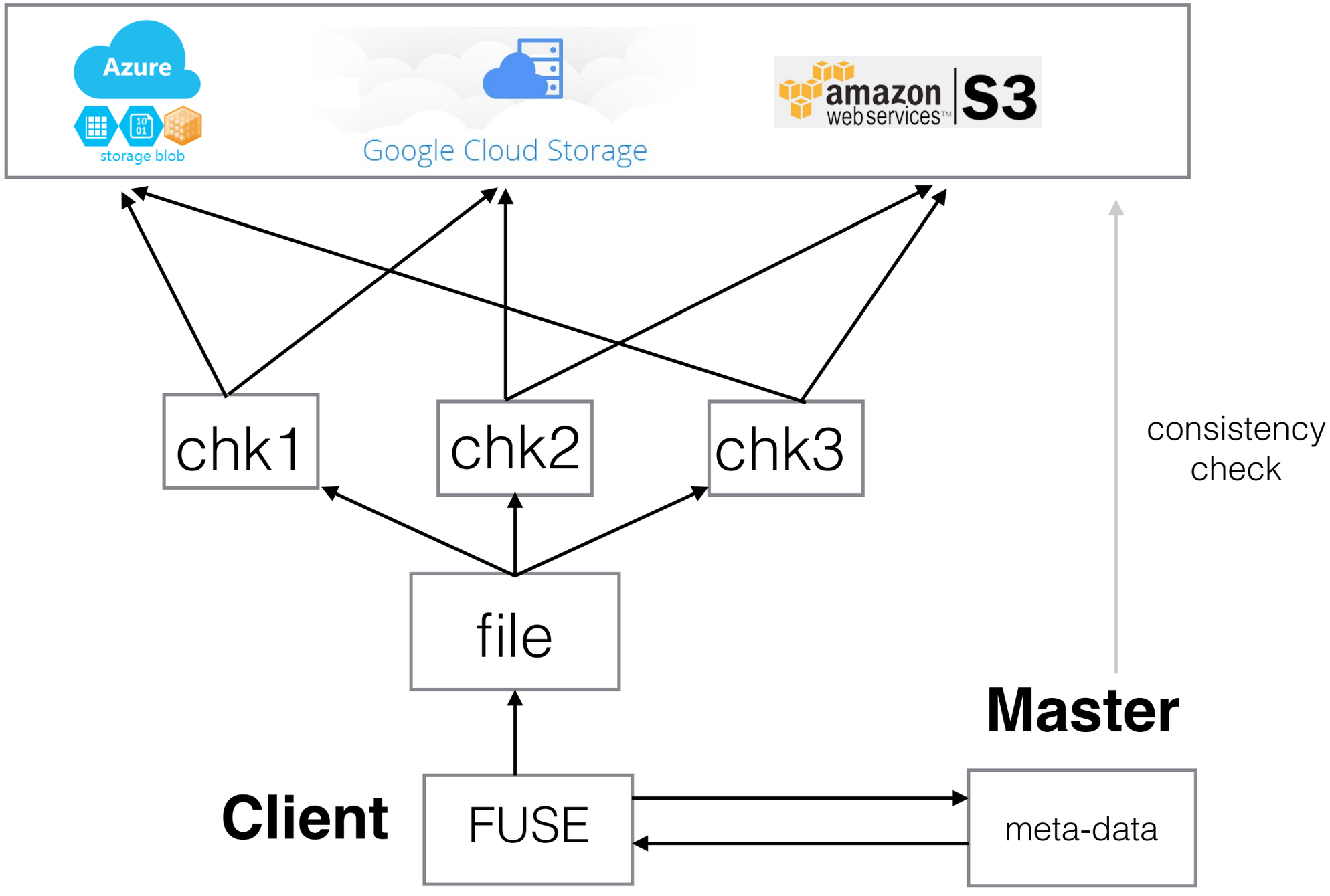
[1] Ghemawat, Sanjay, Howard Gobioff, and ShunTak Leung. "The Google File System." Proceedings of the Nineteenth ACM Symposium on Operating Systems Principles SOSP 03
[2] Chung, Jae Yoon, Carlee JoeWong, Sangtae Ha, James WonKi Hong, and Mung Chiang. "Cyrus." Proceedings of the Tenth European Conference on Computer Systems EuroSys 15
[3] Jolicloud: https://www.jolicloud.com. Web. 09 May 2016
[4] Otixo https://www.otixo.com. Web. 09 May 2016.

System Architecture



Partial Replication

- **Each file is divided into chunks**
- **Each chunk is uploaded to N-1 clouds**



Testing and Evaluation Plan

- Schedule

Week 8	Cloud Component testing
Week 9	Fuse level testing
Week 10	System testing
Week 11	Evaluation and measurement testing

- Test Case and Evaluation Metrics
  - Correctness of functionalities(scripts)
  - Latency measurement
  - Good Files size for distributing

Evaluation Results