

# WiscAFS

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# Design

- Specify server IP, local cache directory, and local mount-point when starting FUSE client
- Protocol Buffers (protobuf) specify serialization for data through gRPC
- Use streams through gRPC to write data to/from the server
- Local file caching uses SHA1 hashing to name file
  - Avoids need to mirror directory structure
  - Collisions have very very very low probability of occurrence
- Table tracks open files locally
  - Write back to server only invoked when file dirty

# Benchmark

- Tested using two Ubuntu AWS EC2 instances
- filemicro\_createfiles.f
  - "closefile1 7940ops 132ops/s 0.0mb/s 0.104ms/op [0.013ms - 31.143ms]
  - readfile1 7940ops 132ops/s 1.9mb/s 0.131ms/op [0.020ms - 28.481ms]
  - openfile1 7942ops 132ops/s 0.0mb/s 75.926ms/op [13.814ms - 270.243ms]
  - 79.871: IO Summary: 244966 ops 4082.146 ops/s 1316/132 rd/wr 20.5mb/s 24.420ms/op"
- filemicro\_delete.f
  - "finish 501ops 125ops/s 0.0mb/s 0.0ms/op 40us/op-cpu [0ms - 0ms]
  - limit 0ops 0ops/s 0.0mb/s 0.0ms/op 0us/op-cpu [0ms - 0ms]
  - deletefile1 515ops 129ops/s 0.0mb/s 96.2ms/op 5126us/op-cpu [9ms - 135ms]
  - 34510: 23.068: IO Summary: 515 ops, 128.733 ops/s, (0/0 r/w), 0.0mb/s, 0us cpu/op, 0.0ms latency"
- filemicro\_rread.f
  - "finish 1ops 0ops/s 0.0mb/s 0.0ms/op 0us/op-cpu [0ms - 0ms]
  - write-file 2ops 1ops/s 0.0mb/s 16.4ms/op 10000us/op-cpu [0ms - 32ms]
  - 16609: 6.397: IO Summary: 2 ops, 1.000 ops/s, (1/0 r/w), 0.0mb/s, 40000us cpu/op, 16.4ms latency"

Demo

# Takeaways

- Permissions are very very annoying
- Testing takes a long time
- Debugging and tracing debug statements is a mess
- FUSE is cool

Questions?

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