FED4FIRE

SKILLED
any skill anywhere

European Commission

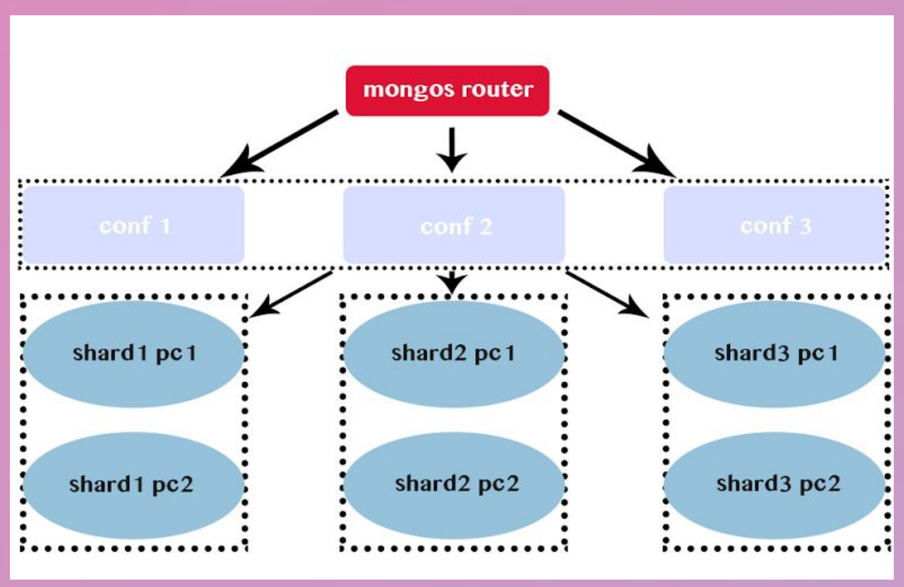
GOALS

- Manage to create a platform that would be more stable, scalable, and that would be able to evolve while the number of users was increasing.
- Balance the request load.
- Create a decentralized server infrastructure.
- Create a new algorithm, based on geographic coordinates, to satisfy requests from the app users.

CHALLENGES

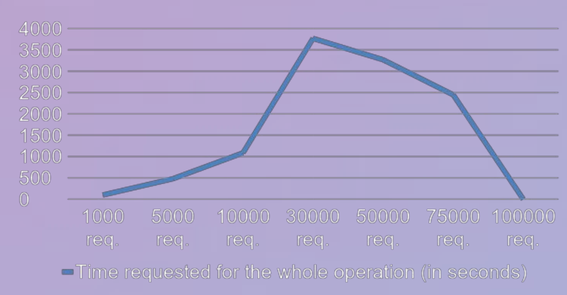
- Adopt a non-relational model (MongoDB-like) instead of a relational one.
- Stress the system with big data flows.
- Study how to shard a data cluster basing on GPS coordinates.

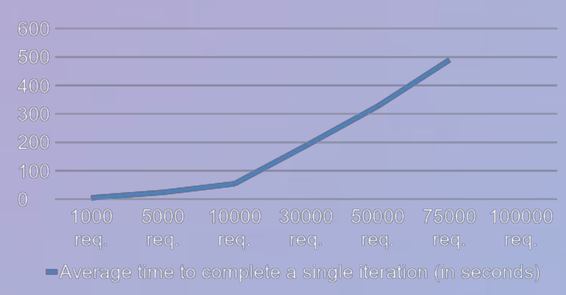
DEMO SETUP

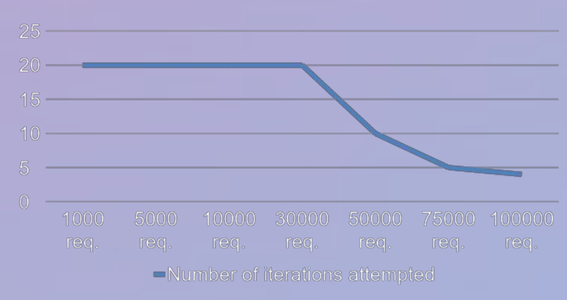


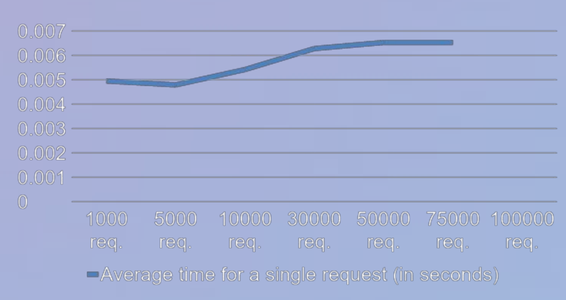
NR mongoDB php

RESULTS









MORE RESULTS

Number of requests per iteration	% ok	Time requested (in seconds) for the whole operation	Number of iterations attempted	Average time to complete one iteration (in seconds)	Average time for a single request (in seconds)
1.000	100%	99	20	4.95	0.00495
5.000	100%	479	20	23.95	0.00479
10.000	100%	1085	20	54.25	0.00542
30.000	100%	3769	20	188.45	0.00628
50.000	100%	3269	10	326.9	0.00653
75.000	100%	2448	5	489.6	0.00653
100.000	0%	N/A	4	N/A	N/A

Number of requests per iteration	% ok	Time requested (in seconds) for the whole operation	Number of iterations attempted	Average time to complete one iteration (in seconds)	Average time for a single request (in seconds)
100.000	0%	N/A	1	N/A	N/A

- We executed several tests on these machines. Each test performs a certain number of iterations of requests. An iteration is a sequence of n requests (executed serially) sent by the client to the mongos router.
- As said before, a request is a call that incorporates several steps:
  - the random generation of geographical coordinates (latitude and longitude)
  - the random choice of a “competence” from an array within the test scripts
  - the selection of “users” within the DB that “possess” that “skill”
  - the generation of JSON document to be saved in the DB
  - saving the document in the DB

CONCLUSIONS

- The Fed4FIRE architecture is a very solid one
- The system is far more scalable than the original one because now it’s very easy to increase the shard number or the replication grade
- It’s very simple to implement this algorithm despite of its powerfulness

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