Outline: Dreams and fears of a database consultant

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I will be presenting a talk with above title at the engineering offsite on May 13th. The point is to enlighten the MongoDB engineering with a field point of view, to help them appreciate which features are important in a database like MongoDB.

Comments from SAs, CEs and TSEs are welcome **until end of Thursday, May 4**. I'd like to aggregate input from the field team so that this could reflect a bit more than my own opinion.

(I'll build an impress.js slide deck out of this outline later.)

- Title slide
  - About me
- People
  - The field team
    - Solution Architects
    - Consulting Engineers
    - Technical Services Engineers
- Solution Architect
  - aka Pre-Sales Consultant
  - What we do
    - Attend sales calls and meetings
    - Help prospect evaluate MongoDB, until the point of paying
      - Migrate some functionality from old app to MongoDB
      - Meet a performance goal
      - Demo Ops Manager
    - Account management
    - Evangelism
  - What I dream about
    - Do the PoC that helps sales rep close the largest deal in company history (> 1M ACV).
    - While helping customer replace an old Oracle Exadata / DB2. Saving 10MUSD in the migration and enabling them to scale 100x.
      - Note: In 2013 this would have been Couchbase / Cassandra. And we would have lost.
  - What I fear
    - A bug or missing functionality prevents successful PoC.
    - Note: Handling demos without hitting all the bugs is part of the job!
  - Lifestyle
    - Sample calendar page
    - Travel photo

- ■ Sample Facebook post
  - ● Good Morning HighLoad++. Morning meeting with our translators went like this:
    Translator: So Henrik, I see you have 2 talks after each other. Are they a sequel?
    Henrik: No, they are different topics. In fact, they are No-sequel.
    Bruce Momjian and Alvaro Hernandez from PostgreSQL burst into quite a violent laugh attack at that point
- ○
- ● Consulting Engineer
  - ○ Trivia: Most customers prefer buying consulting over support
  - ○ What we do
    - ■ Health checks
    - ■ Architecture & design
      - ● For developers (application architecture, schema design, etc.)
      - ● For operations teams (cluster topology to meet scale/HA/DR requirements, backup, monitoring, security, etc.)
    - ■ Fixing performance / other issues customer has
    - ■ Dedicated consulting engineer
      - ● Regular MongoDB expertise and assistance throughout the lifecycle of a project
      - ● Building MongoDB as a Service within the Enterprise
    - ■ Training
  - ○ What I dream about
    - ■ Customer had query running for hours, trashing the servers. After adding indexes and optimizing the aggregation pipeline, it now completes in 3 seconds. (12000 X improvement & is a true story)
    - ■ Optimized DB to avoid expensive HW upgrade. Saved the customer 1MUSD.
  - ○ What I fear
    - ■ Last month I taught customer how to use covering indexes. Today's GA release announcement says new query planner doesn't use covering index scans. When they upgrade, my queries will suck. (True story, MongoDB 2.6.)
  - ○ Lifestyle
    - ■ Like SA, but:
      - ● Meet less customers / week
      - ● Away from home more
- ● Technical Services Engineer
  - ○ aka Support Engineer
  - ○ What we do
    - ■ Turn unhappy customers back into happy customers!
    - ■ Analyze and respond to customer issues in Jira

- - - ■ Often real problem is something else than customer thinks it is
      - ■ We do phone calls. We help with operating system issues…
      - ■ Mini health checks, limited schema refactoring, and limited index strategy suggestions.
      - ■ Named TSE
      - ■ Proactive support
      - ■ Community support
    - ○ What I dream about
      - ■ Customer had deleted all their data. MongoDB tried to prevent them from doing that, but they tried really hard, and eventually deleted all their data. Working as a team, around the clock, for 9 weeks, we managed to restore 100% of customer data. (True story)
    - ○ What I fear
      - ■ A bug in MongoDB takes down production systems on a weekend when I'm on call.
    - ○ Lifestyle
      - ■ Don't get to travel
      - ■ But we have bacon and tim tams
      - ■ Weekend responder
      - ■ Even after shift ends, they still follow up on their tickets
      - ■ When you make a bug, they take care of the mess
      - ■ Hug your nearby TSE

Part 2: What we do with the product

- ● Note: These things are important, but not to a SA/CE
  - ○ Easy to use
  - ○ Easy(ish) to scale / HA
  - ○ Developers love the API
  - ○ Agile
  - ○ Security (finance, government)
- ● Query optimization
  - ○ explain()
  - ○ add missing index
  - ○ 50% of problems are this!
  - ○ MongoDB: This was always great in MongoDB!
- ● Joke version...
  - ○ The other 50% you can tell them they should buy more RAM
- ● Application level changes
  - ○ Story: Oracle DBA buys more IOPS, MySQL DBA refactors your application code
- ● MongoDB specific notes (my gut feeling):

- ○ Index tuning still a thing, but maybe less than 50%. Possibly document based model + CRUD is easier to get right.
  - ○ More training to first time users
- ● More advanced index strategies
  - ○ Compound primary key
  - ○ Clustered primary key
    - ■ Not to mention clustered secondary keys (Tokutek)
    - ■ For a document database clustered keys have an advantage over covering keys: it's the only way of knowing all fields are in the index.
  - ○ Covering indexes
    - ■ Note: Must include shard key to work!
- ● Different database products / engines
  - ○ Right tool for the right job
  - ○ Storage engines is a powerful concept: separates client API vs DB science
- ● #MonitoringLove
  - ○ Travel lightly
    - ■ mtools, timeseries.py
  - ○ Ops Manager?
    - ■ Typically don't have root access
    - ■ Takes too much time and HW to install for a 2-3 day engagement
    - ■ Sampling granularity mostly too sparse for real troubleshooting
  - ○ mongod has always been good at providing metrics!
- ● Things that are NOT important
  - ○ Performance for 3.2 improved 2x (on a standalone instance without oplog)
    - ■ >99% of users use replication
  - ○ Most users DON'T use sharding
    - ■ But they feel good knowing that they can if they have to
  - ○ CPU bound benchmarking
    - ■ Math in aggregation framework would be an exception, but I doubt we're at that level yet!
- ● Things that are important
  - ○ Upgrade incompatibilities
  - ○ Online upgrades
  - ○ Stable performance is more important than top performance
    - ■ aka No Suprises
  - ○ Backups
  - ○ Would be nice if find() and aggregate() supported the same operators
- ● What do I fear
  - ○ When I can't solve a problem with configuration / application change
    - ■ Note: undocumented config option is better than no configurability.
      - ● Our WT integration is cool in this regard!
  - ○ Backwards incompatibility in new release: It used to work, now it doesn't.

- ○ Democratic decision making: I'm an expert. Sometimes the majority is wrong. Trust me.
- Special thanks to
  - ○ Those writing the MongoDB manual. I'm a heavy user!