GitHub ElasticSearch
Incident Review
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Outline

- Review GitHub ElasticSearch Outages
- Deeper dive into some ES internals
- Q&A about operational aspects of ES
whoami

- Paul Smith - Senior Engineering Manager @ Aconex
- Long time user of Lucene (8 years)
- ES @ Aconex for last 18 months
- @tallpsmith
Caveat

- Based on the original GitHub Outage Blog Post
- An understanding of what goes on in ElasticSearch
- Some experience with Lucene/ES learnt the hard way
- Blog is not 100% clear – good chunk of tea leave reading
ElasticSearch

- Brilliant out-of-the-box experience
- Almost all settings sane, and useful pre-configured values
- Some important cluster settings specific to your environment are important
GitHub

- Grateful for the blog post
- Non-trivial cluster, good learnings for all the community
The Outages
The Outages

- Outage #1 - Cold cluster start recovery failure
- Outage #2 - Discovery/Recovery & probable Split Brain
- Outage #3 - Pilot Error
#1 - Cold Start

- High load during the startup
- Speculation – this may have caused nodes to drop out of the cluster
- Not enough information really
#2 - Discovery/
Split brain

- Classic symptoms of a Split Brain
  - Nodes not responding to discovery ping
  - Failure to contact master will result in master election
#3 - Pilot Error

- Mixing 2 major version of ElasticSearch & Java
- ES is backwards compatible within minor versions (ie. 0.20.1 & 0.20.2 is fine)
- Refuses discussion with incompatible major versions
  - split-brain-esque
Recommendations
Cluster

- `discovery.zen.minimum_master_nodes` MUST be set
- No-one likes a Split Brain!
- Good I/O platform! - disk & network
  - otherwise replication & recovery could swamp you
- ES is light on I/O normally, but recovery is special
Memory

- Lucene loves RAM - just like a DB
- 50% Java, 50% page cache
- Set Java Heap Min/Max to the same
  - eliminate cold process mem allocs
  - eliminate process memory fragmentation
- Use Java 7 or at least Java 6 u26+
Recovery settings

- How long should ES wait for a ‘reasonable’ view of the cluster?
  - recover_after_nodes & expected_nodes
  - recover_after_time: not the droid you’re looking for
Q&A

- Fire Away!
Appendix

- GitHub Blog Post: https://github.com/blog/1397-recent-code-search-outages
Thank You!