The Google File System

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Summary

The paper is about google's distributed large scale file system and its various extensions. They have taken various principles (assumptions) for this system which they expect to deliver. Robustness, sustained bandwidth, file size min to be 100MB etc. It has support for important atomic operations. Architecture consists of client, master and chunkservers. Chunk size is an architectural choice. Overall the architecture is built upon a relaxed consistency model, data integrity using chunkservers and also support usage of diagnostic tools.

For the performance several micro benchmarks are used on specifically designed GFS cluster.

Pros

- Robust that too on such a large scale
- Large file storage
- Large streaming reads
- Single master which simplifies design
- Instant snapshot feature of the filesystem.
- Large Scale Garbage Collection support
- Location independent namespace which helps in load balancing and fault tolerance.

Cons

Overall it is a really good implementation and which google uses itself as per the authors, its Google Lol, one does not expect much drawbacks then. However still, some problems pointed itself by the authors are

- Garbage collection has some delay, it's only done when the master is free.
- Writes are slower than what the demand is however this has not been a major problem in practice.
- Tradeoff for latency.
- No cache below the filesystem (that is technically a drawback but not much because practically they do not need this).
- Supports only m to 1 queues.