Automatic Database Management System Tuning Through Large-scale Machine Learning

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DB / AI Bootcamp

Outline

- DBMS Configuration “knobs”
- Problem
- Solution for this paper (Ottertune)
- Main idea for this paper
- Model for this paper

DBMS Configuration “knobs”

Server (Database)

MySQL

PostgreSQL

ORACLE

Configuration knobs

DBMS

Expert DBA

Client (User)

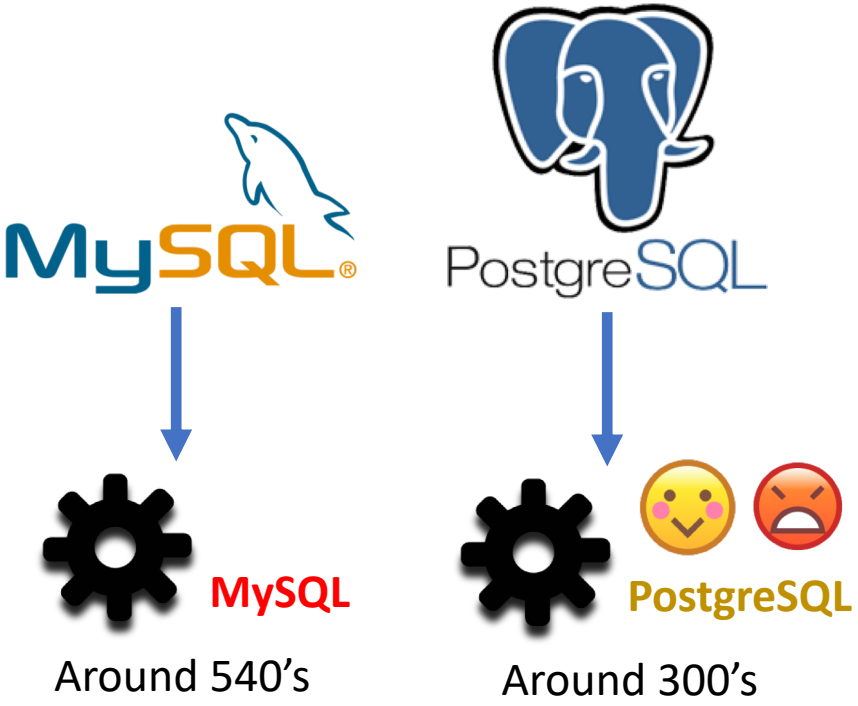
Problem

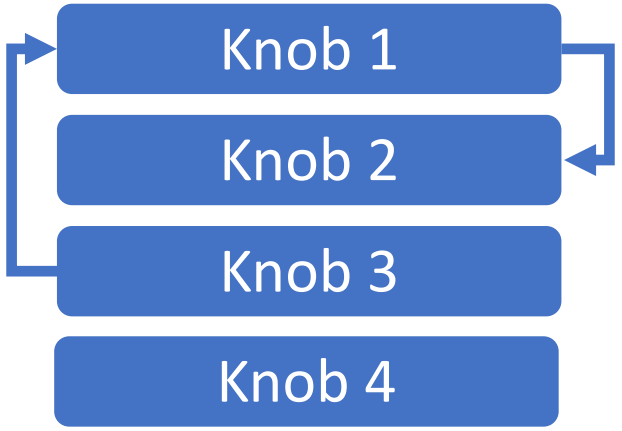
Is there any general solution to determine the knobs ? **No !**

not standardized

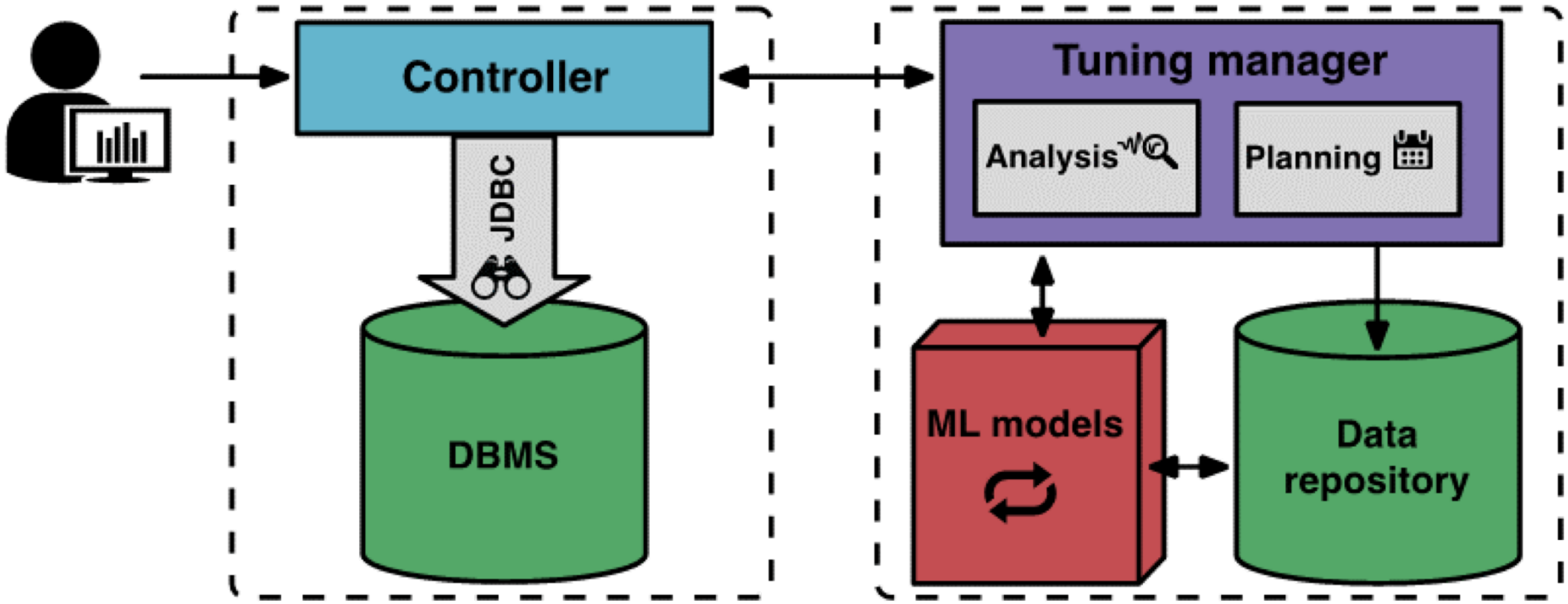
not independent

not universal





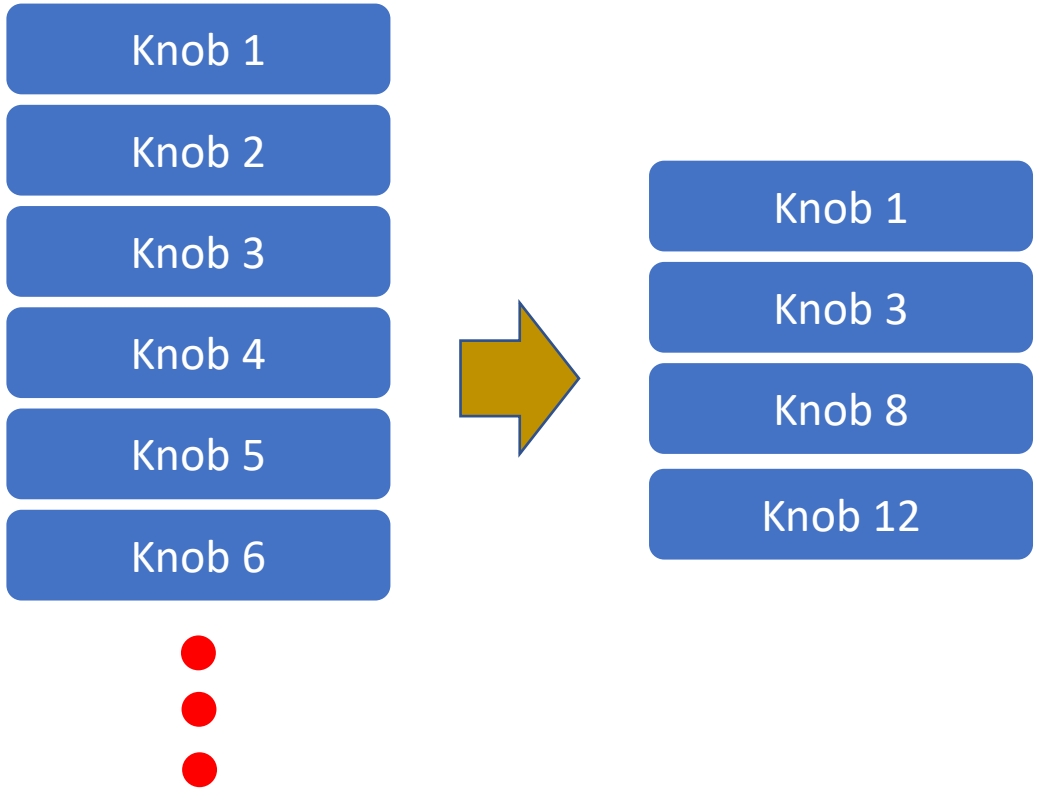
Solution for this paper (Ottertune)



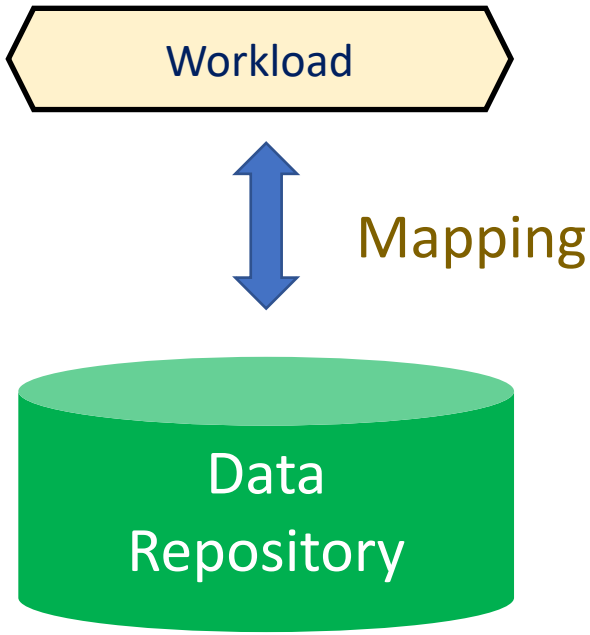
Reference site : https://aws.amazon.com/cn/blogs/china/tuning-your-dbms-automatically-with-machine-learning/

Main idea for this paper

1. Select the most impactful knobs



2. map previously unseen database workloads to known workloads



Main idea for this paper

3. Recommend knob settings that improve a target objective

- [x] Use the new knobs
- [ ] Remain the old ones

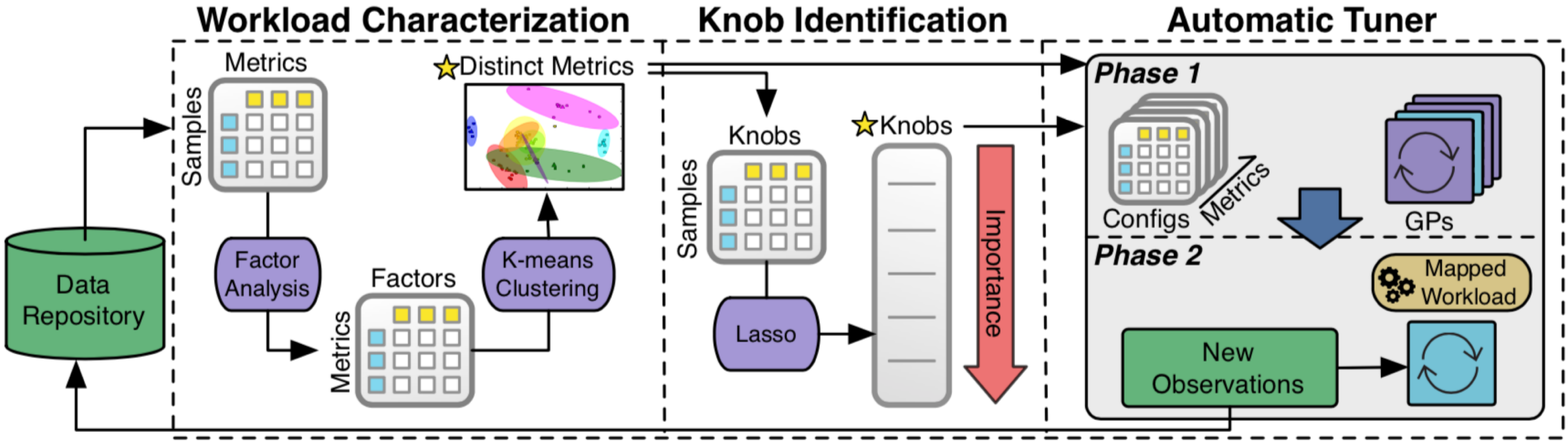
Model for this paper

Metrics (outer metrics) :
Latency, Throughput
Metrics (inner metrics) :
Num of block for read,
Num of used page…

Training a ML model to make better knobs

Input : Number of metrics for a workload

Output : next predicted knobs



Some Reference sites

- https://aws.amazon.com/cn/blogs/china/tuning-your-dbms-automatically-with-machine-learning/
- https://github.com/cmu-db/ottertune
- https://www.jianshu.com/p/0360c27d6421

My Suggestions

You can refer to Vanillacore project to figure out some DBMS configurations in vanilladb.properties