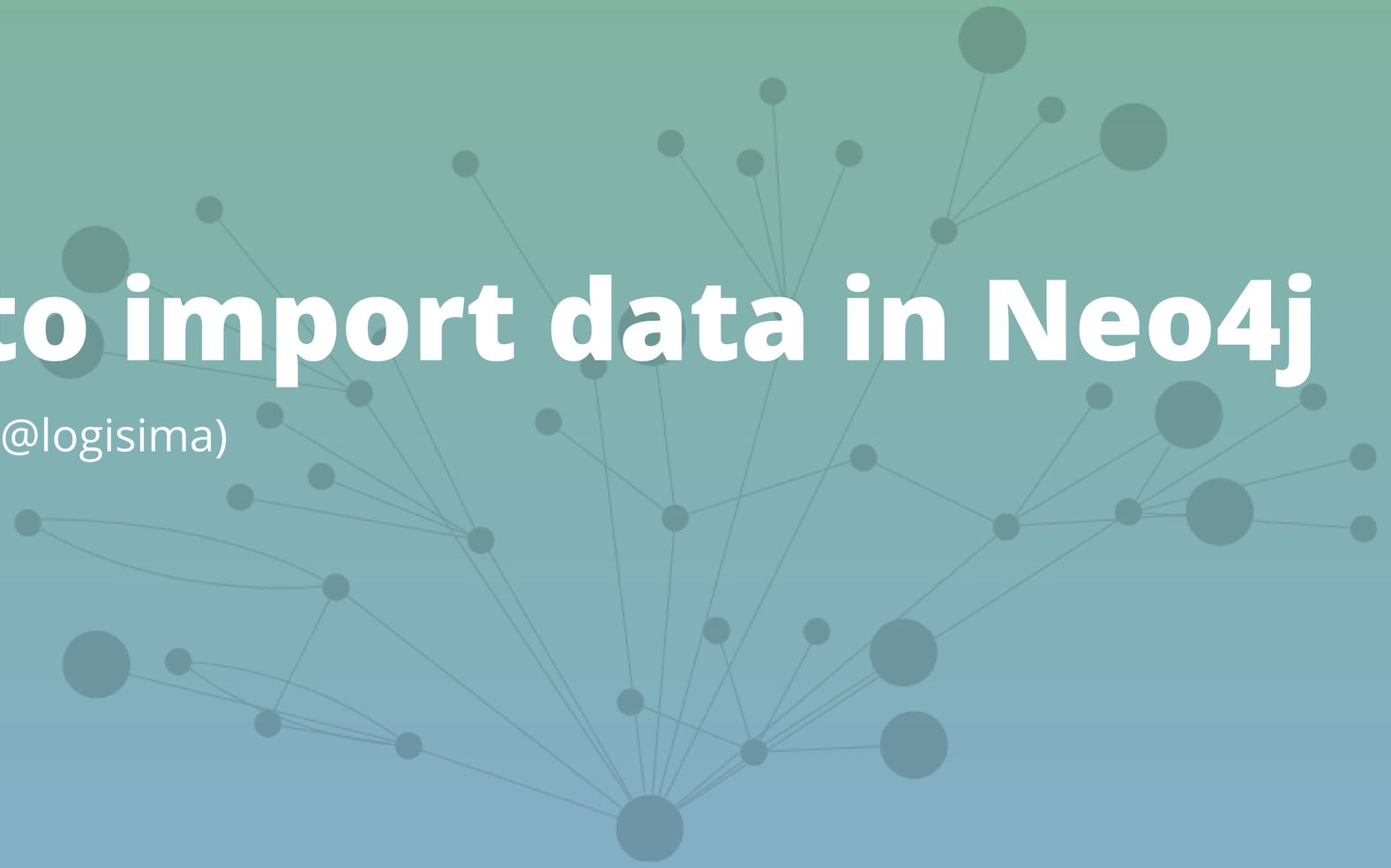
How to import data in Neo4j

Benoit Simard (@logisima)

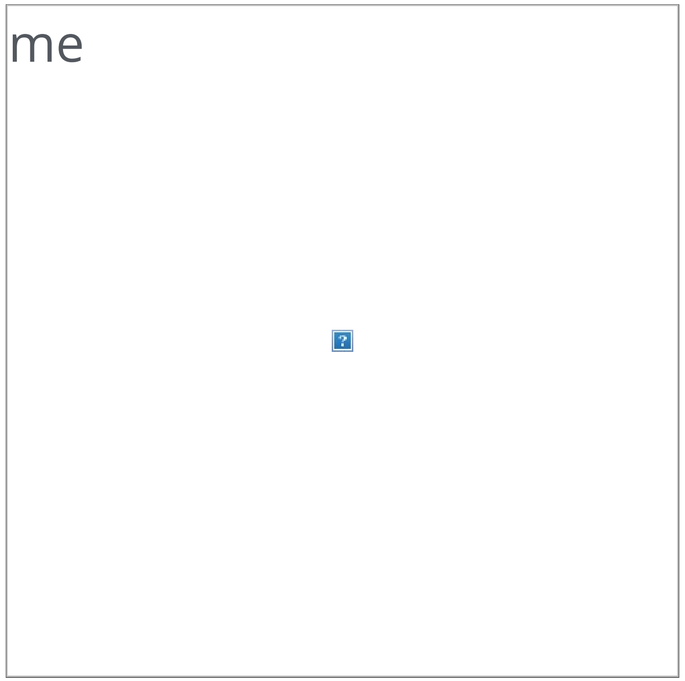


neo4j

Who I am

neo4j

Benoit Simard



- Neo4j consultant for 3 years
- Mainly on the french territory
- Web developper, addict to graph & open data
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Some Reminders

ACID Database

- Transaction are **all** or **nothing**
  - Retry mechanism
- **Lock manager** : locks nodes and relationships during a transaction
  - You can spend a lot of time to wait a lock or even worse to have a dead lock.
- Everything is sequentially written into the **transaction log**
  - You need a good hard drive

Cypher / Query plan

- Cypher is a declarative language, like SQL
- Need to be parsed (AST)
- Interpreted by an optimizer to create its query plan
- Query plan is then executed

All those operations take times, so you have to parameterized your queries

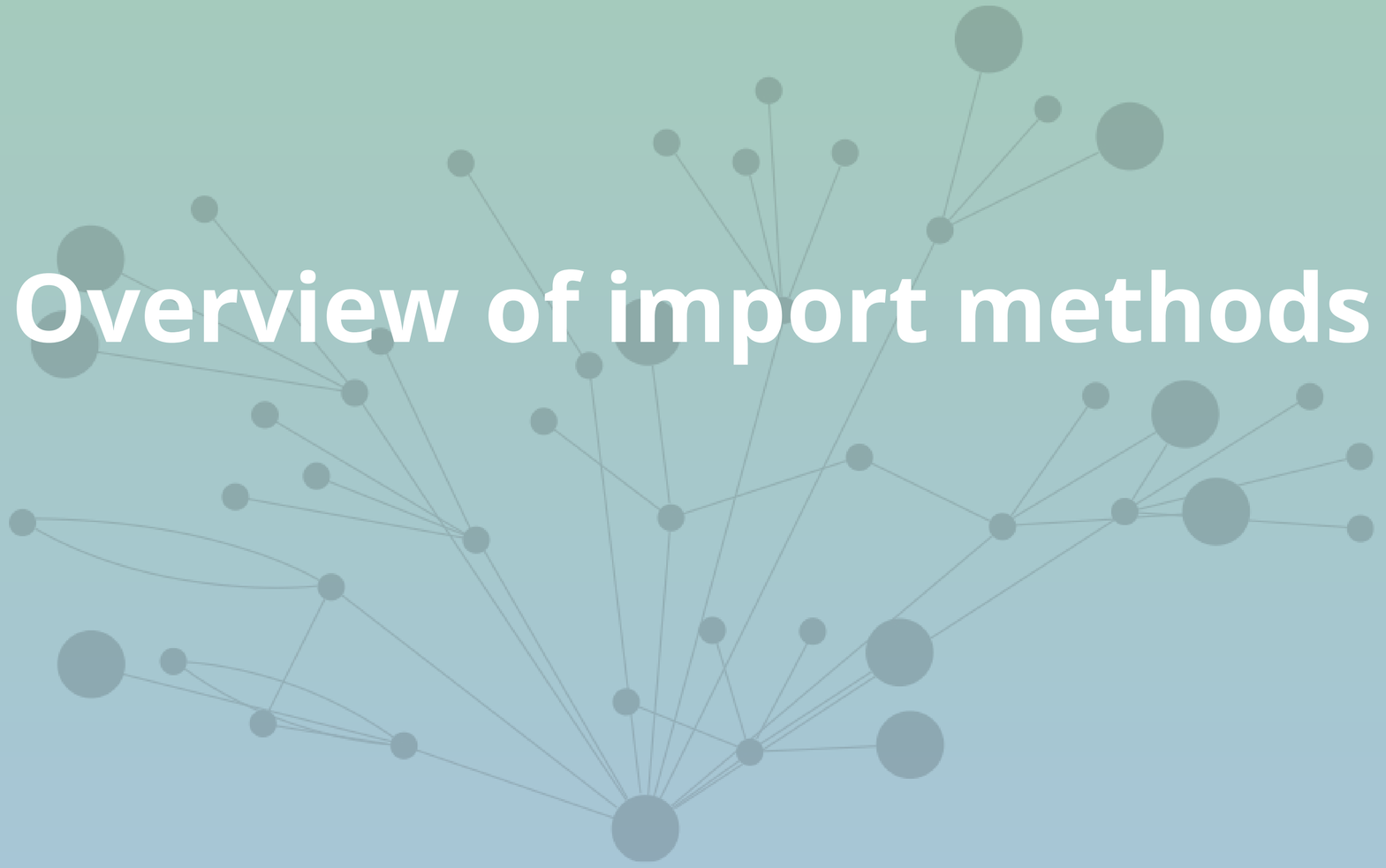
Neo4j will be able to reuse a query plan from its cache.

Neo4j configuration hints

https://neo4j.com/docs/operations-manual/current/reference/configuration-settings

- **cypher.min_replan_interval :** The minimum time between possible cypher query replanning events (10s).
- **cypher.statistics_divergence_threshold :** The threshold when a plan is considered stale (0.75).
- **dbms.query_cache_size :** The number of Cypher query execution plans that are cached (1000).

Overview of import methods



Method 1 : Cypher LOAD CSV

http://neo4j.com/docs/developer-manual/current/cypher/clauses/load-csv/

Methode 1 : Resume

Most

- Plain Cypher
- Transactionnal
- Really easy to put in place
- Batch your transaction for you
- Fast for up to 10 Million of entities
- Based on CSV files : no flux with the IS, easy to generate

Least

- You can **NOT** do a lot of extract / transformation (just what cypher can do)
- Slow for an initial import with a lot of data.

Method 2 : Plain Cypher (like in SQL)

- Again, use **Parameterized queries**
- **Batch** your transactions
- Use the **`WITH … UNWIND` pattern** : less network traffic and can be usefull to refactor some queries in one (so reused of the query plan).

Method 2 : Resume

Most

- Plain Cypher
- Transactionnal
- A lot of freedom

Least

- You have to write a lot of code
- Slow for an initial import with a lot of data.

Method 3 : Neo4j import tool

https://neo4j.com/docs/operations-manual/current/tools/import/

You can import really fast a huge amount of data with this tool. It bypass some Neo4j internal mechanisms (like transaction) to be super fast.

Most

- Really really fast
- Perfect to initiate a database
- Easy to use (just one command line)

Least

- Can only intialize a database (offline and empty database)
- No transaction
- Strict format for the CSV files

Method 4 : Batch Inserter

https://neo4j.com/docs/operations-manual/current/tools/import/

You can import/update a lot of data into a Neo4j database.

Most

- Fast
- Can initiate and update a database

Least

- Mono-threading
- Nedd to write some java code
- No transaction
- Database must be offline

To resume

Method	For init/ update	Transactionnal	Size	Rapidity	Easy of use
LOAD CSV	BOTH	TRUE	< 10M	* * *	* * * * *
Cypher queries	BOTH	TRUE	No limit	* * * *	* * *
Import tool	INIT	FALSE	No limit	* * * * *	* * * *
Batch Inserter	BOTH	FALSE	10M - 50M	* * *	* *

Talend

Neo4j components

Project

http://sim51.github.io/neo4j-talend-component/

Will be part of the next version of Talend studio

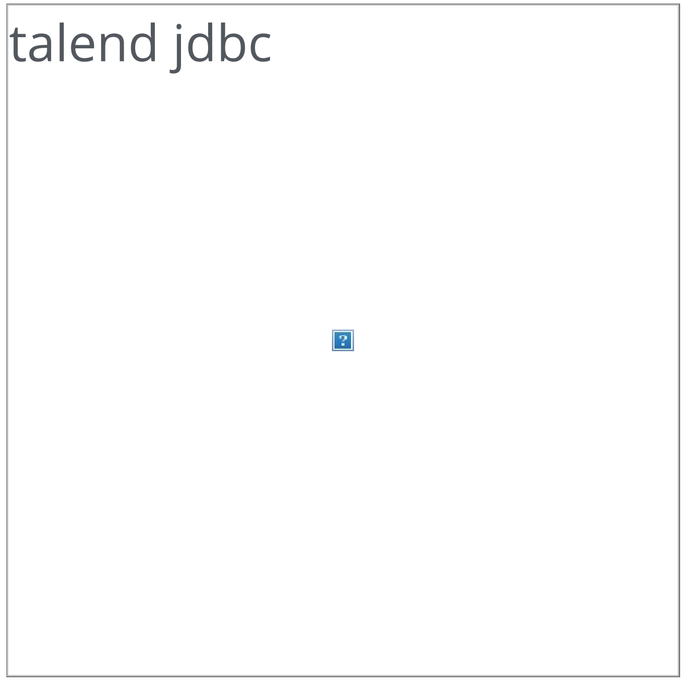
Focus on

- Neo4j import tool
- Batch Inserter mode

JDBC Component

Talend has some JDBC components and Neo4j has an official JDBC Driver : **http://neo4j-contrib.github.io/neo4j-jdbc/**

You can use the component tRow to insert data into Neo4j, but there is one lack : you can't specify the batch size ⇒ autocommit or one big transaction.



Questions to ask

Questions

- Where the data come from ?
- Is there more than one data sources ?
- Do you need to enhance some data with an other datasource ?
- Do you have some security restrictions in your IS (firewall, DMZ, ...) ?
- What is the amount of data you want to import at once ?
- How long should take an import ?
- Do you only need to initiate the database ?
- All the writes to Neo4j come from the ETL ?
- How many process do you want to do ?