Modern Data Architecture

Alexey Grishchenko

Pivotal

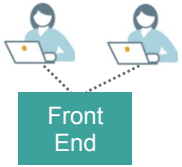
Pivotal Confidential–Internal Use Only

About me

Enterprise Architect @ Pivotal

- 7 years in data processing
- 5 years with MPP
- 4 years with Hadoop
- Spark contributor
- http://0x0fff.com

How it started…



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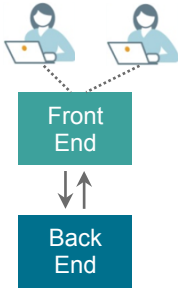

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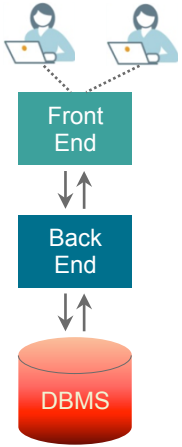

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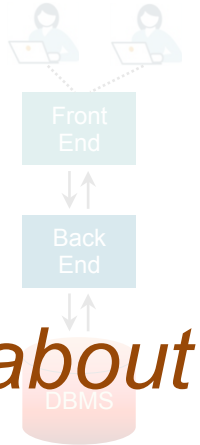
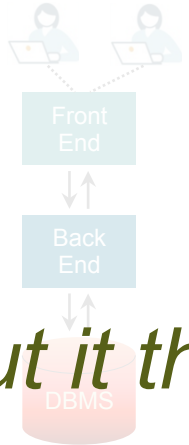


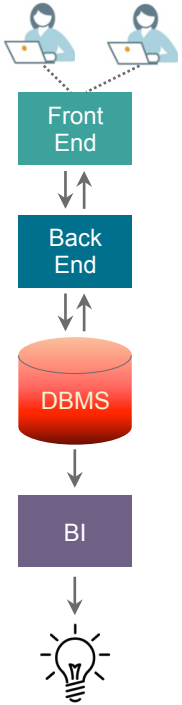
What about BI?

How it started…



Just put it there!

How it started…



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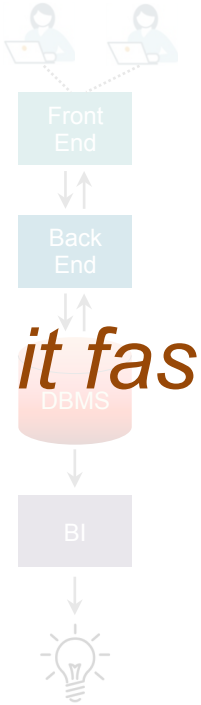
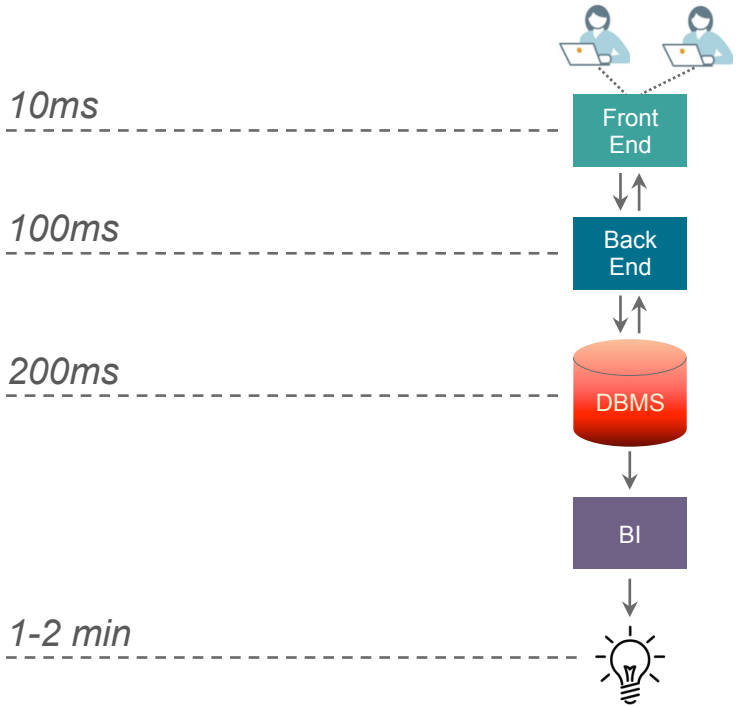


Was it fast?

How it started…



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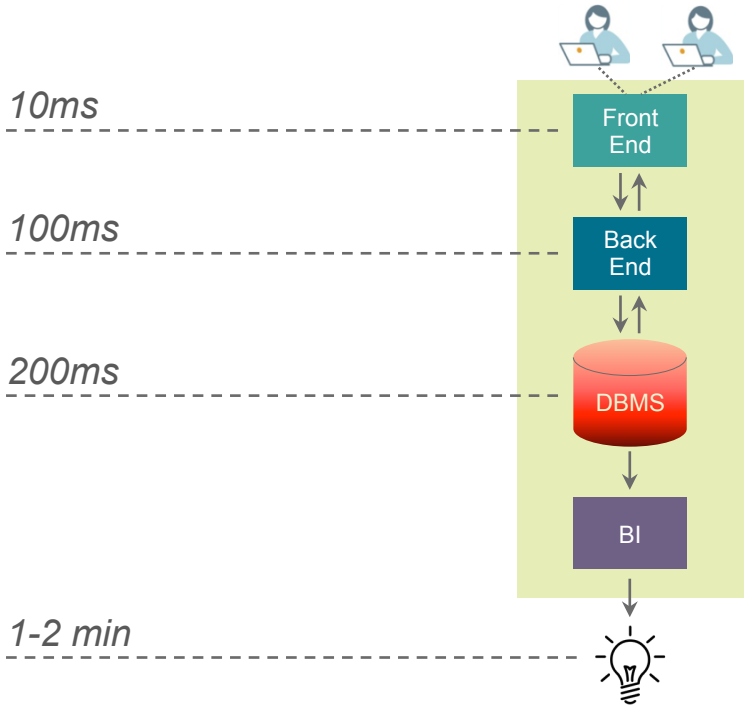
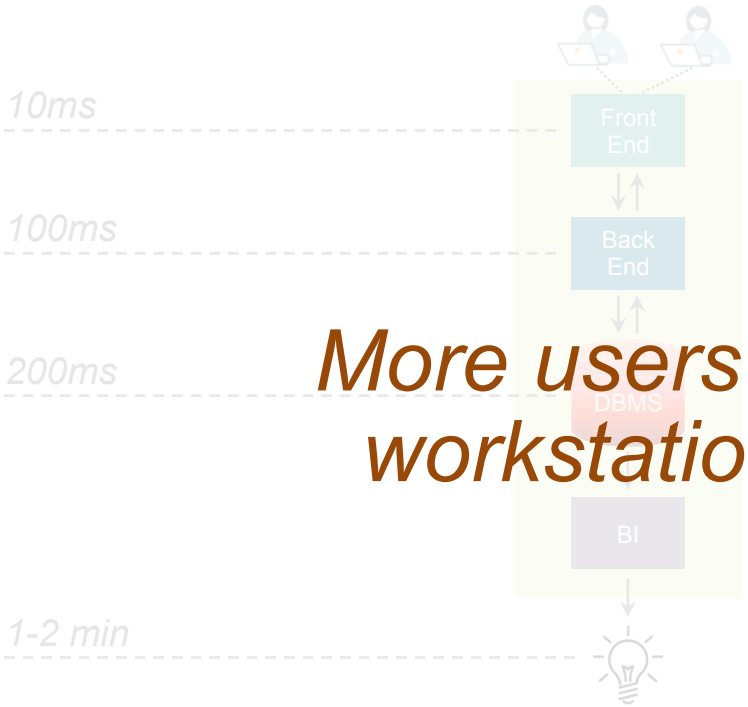


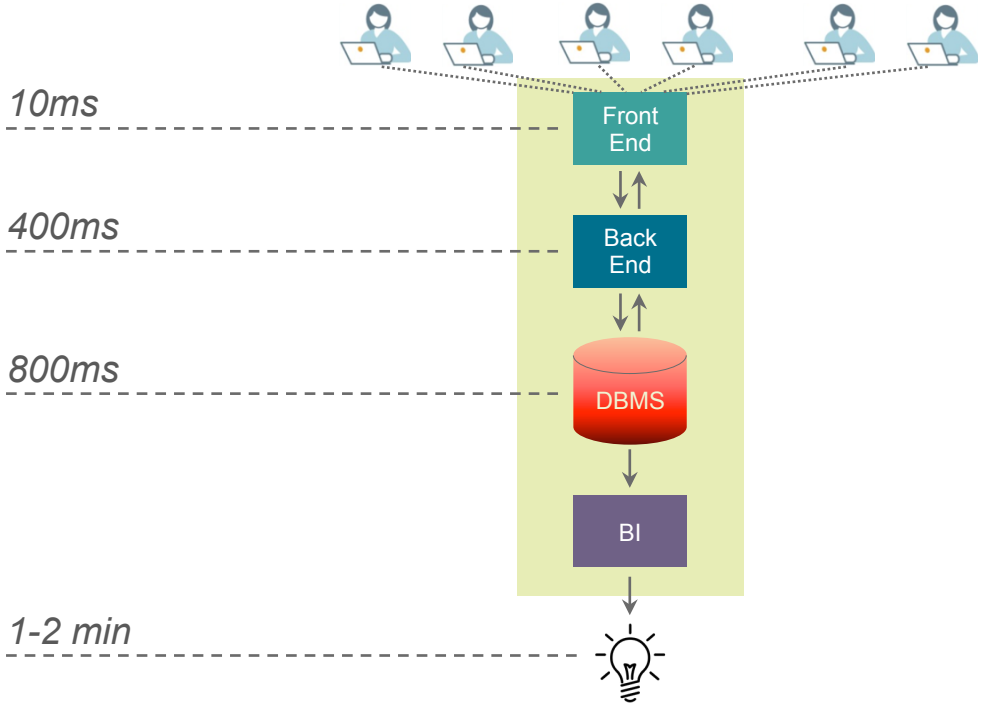
yes, single server…

First Issues



More users got workstations

First Issues



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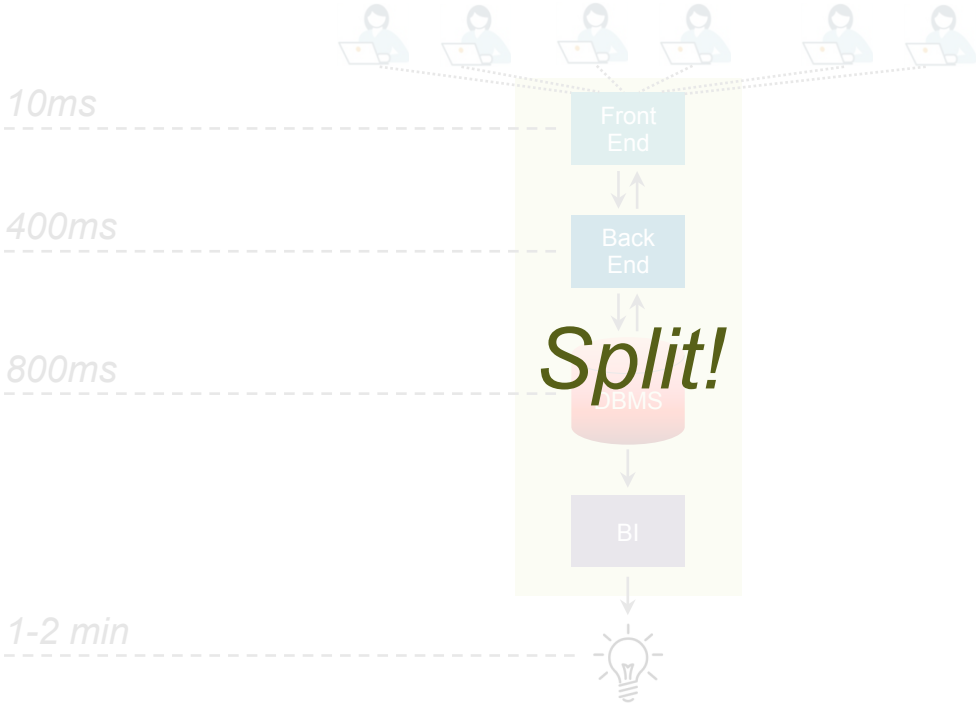

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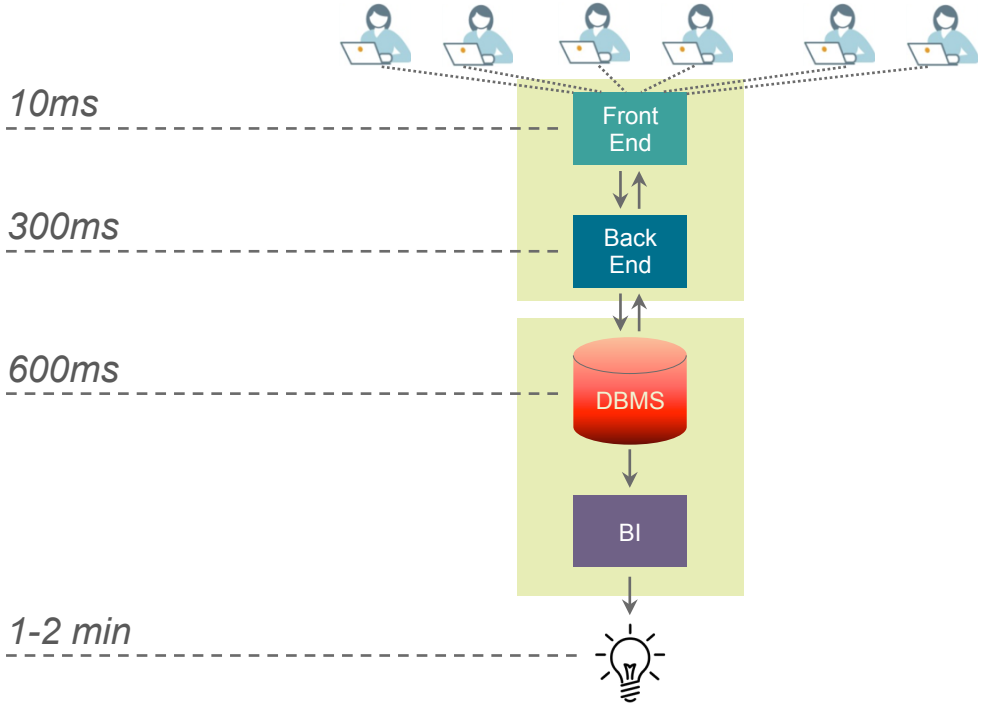

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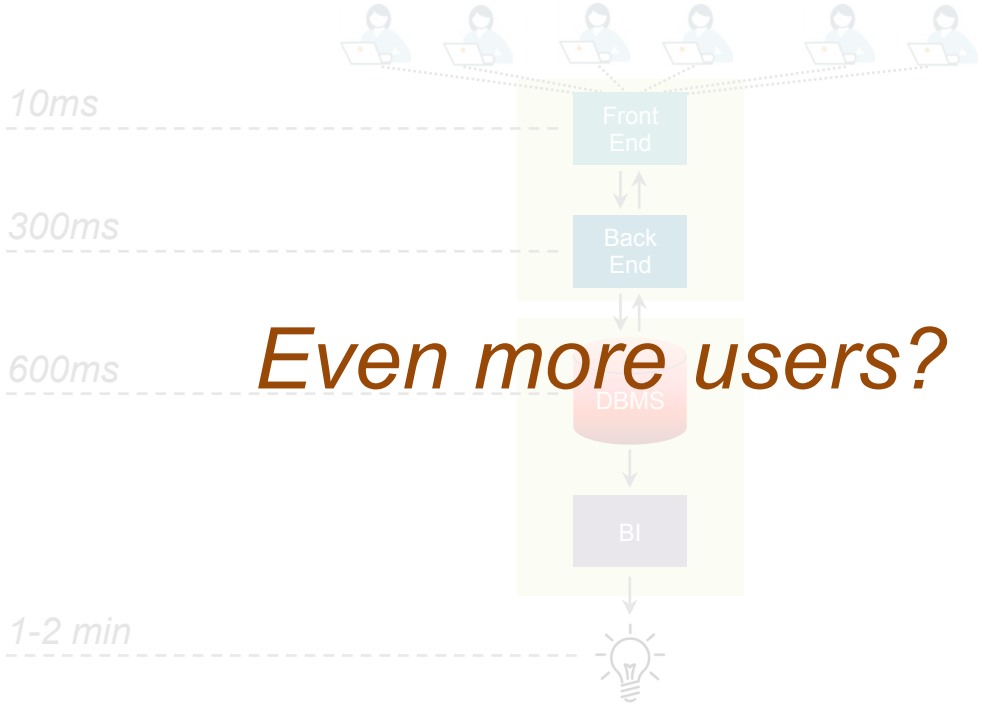
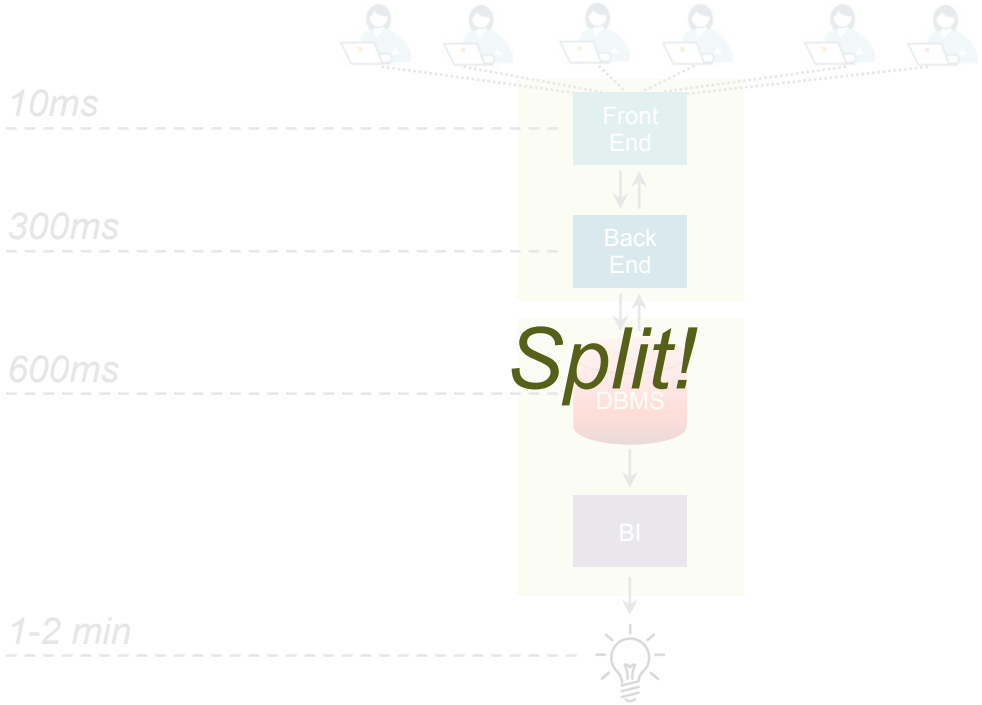


Even more users?

First Issues



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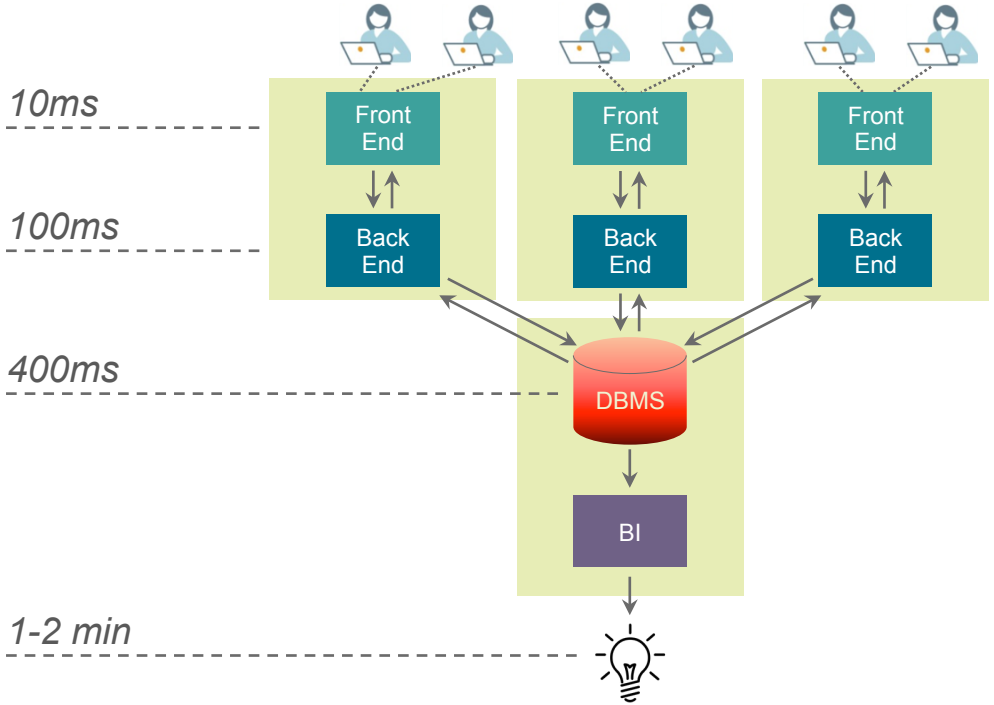

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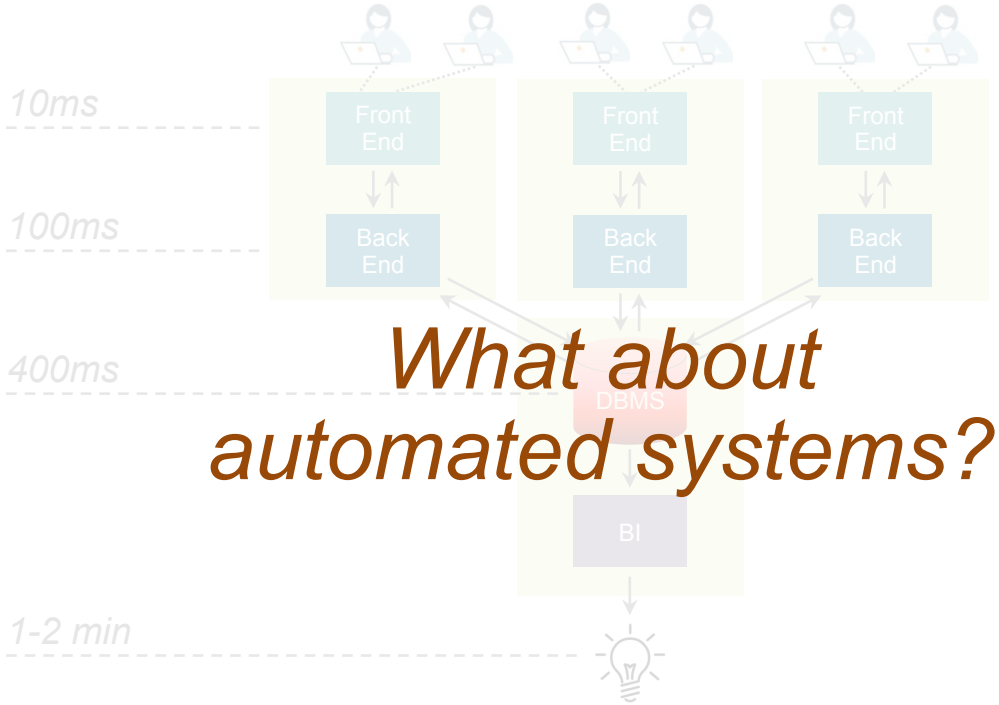
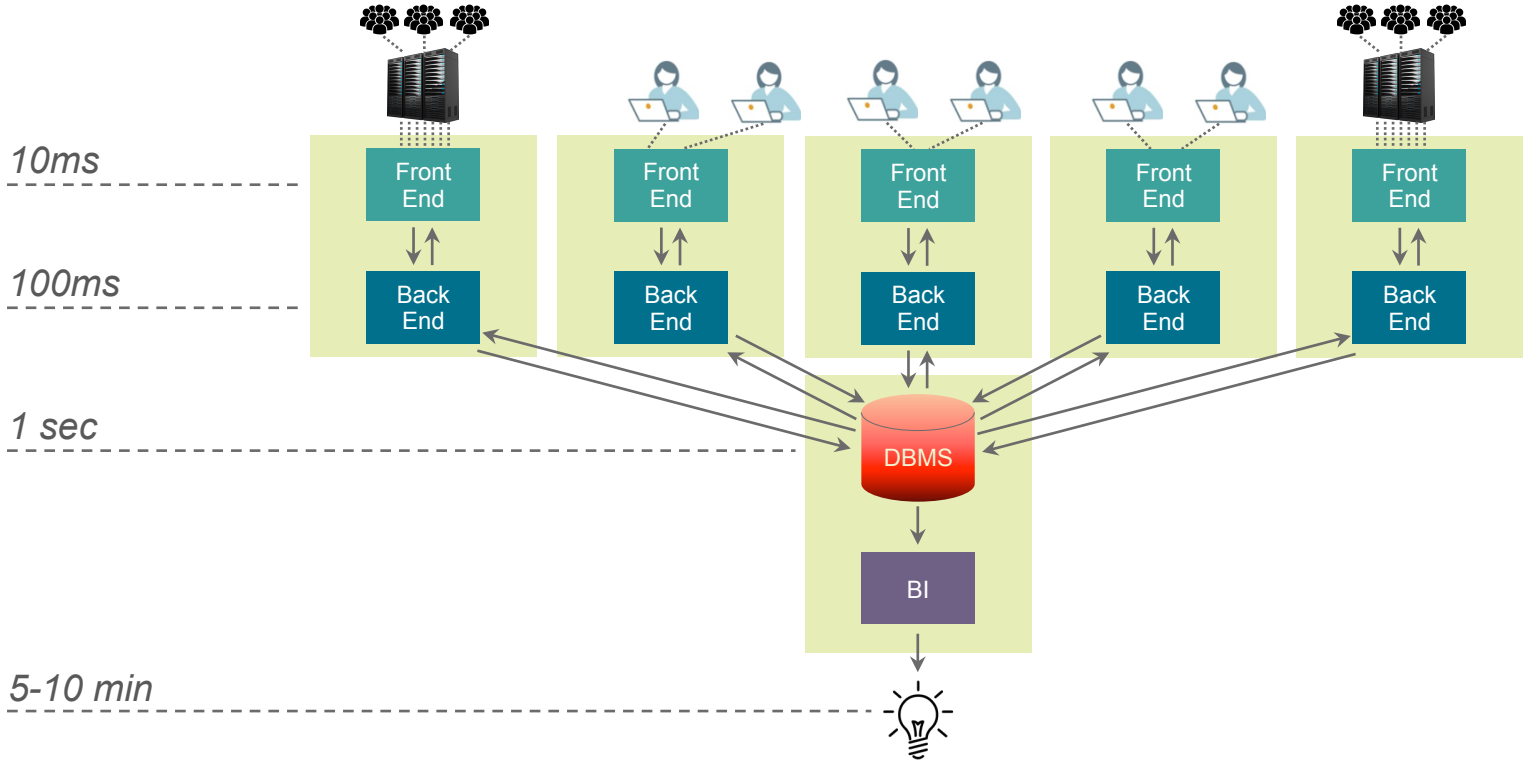


What about automated systems?

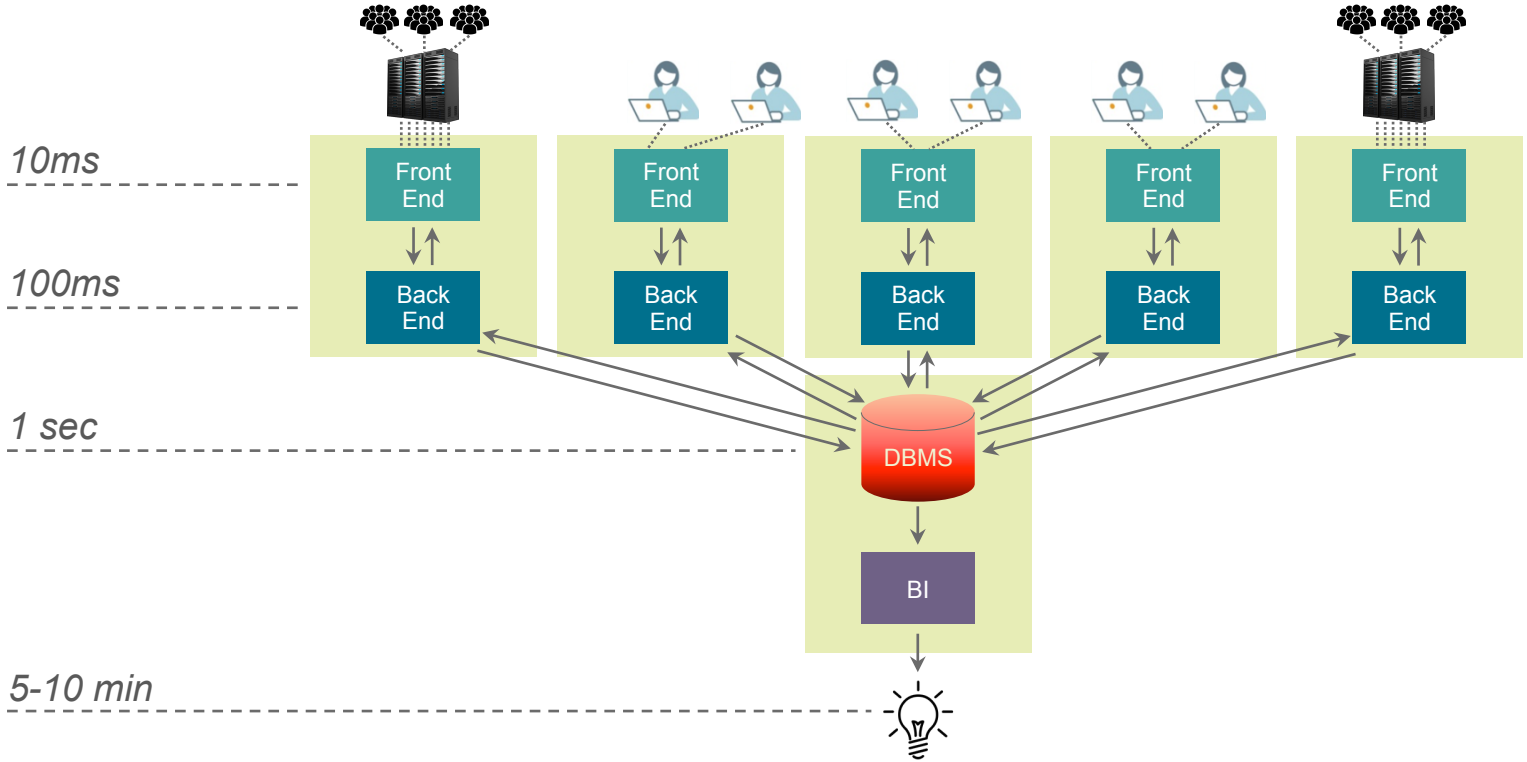
First Issues



First Issues

Database, please, live!

First Issues



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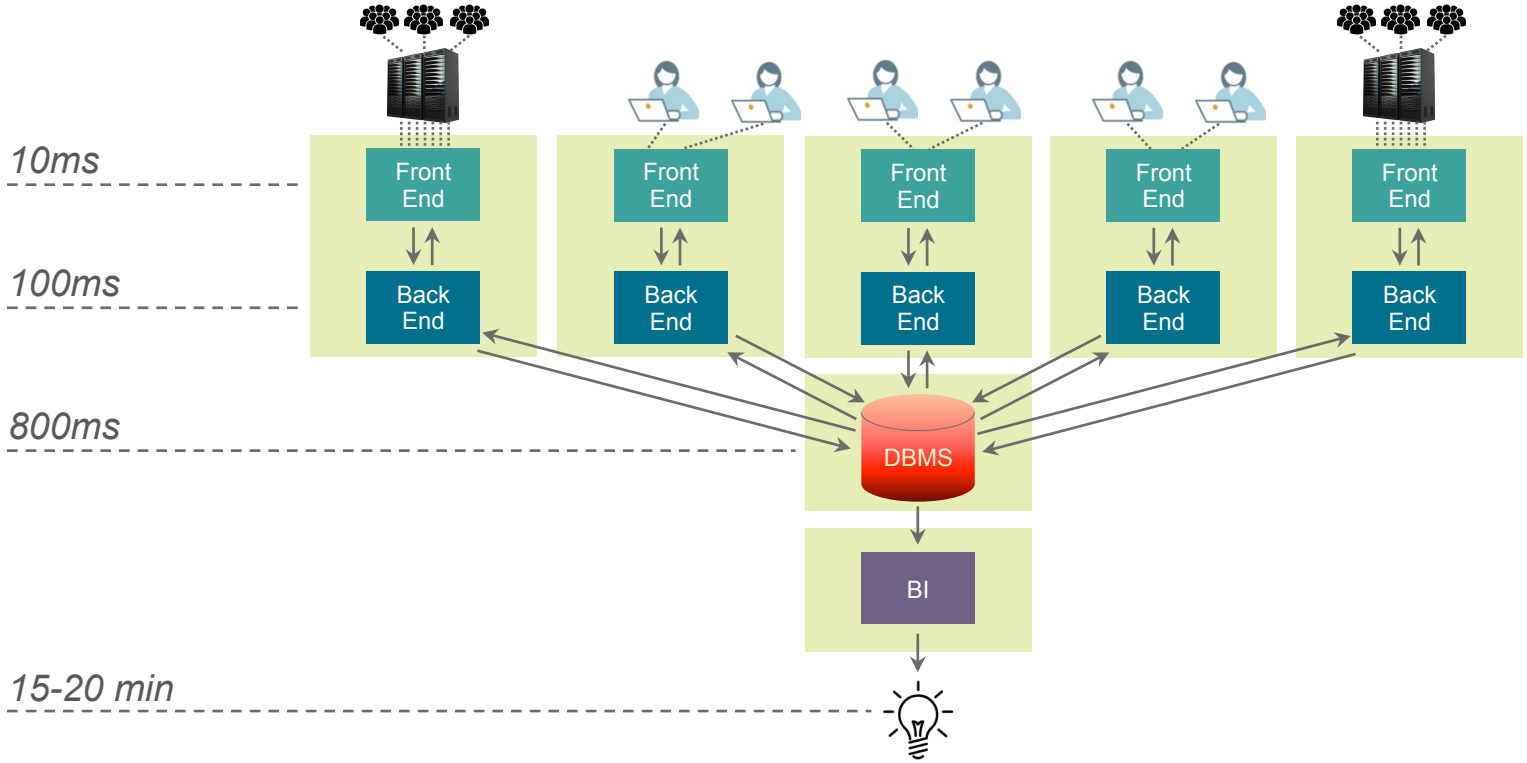
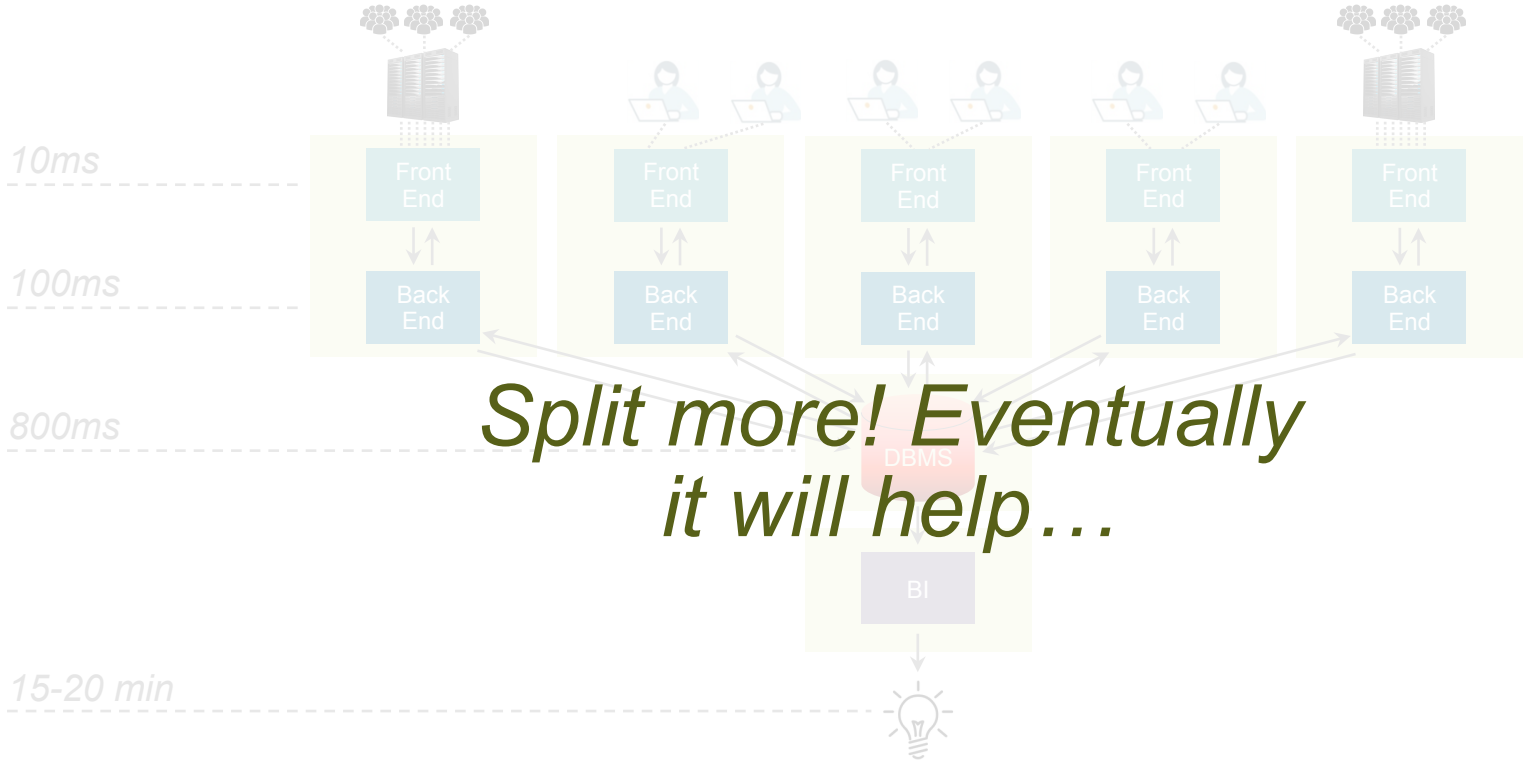


First Issues

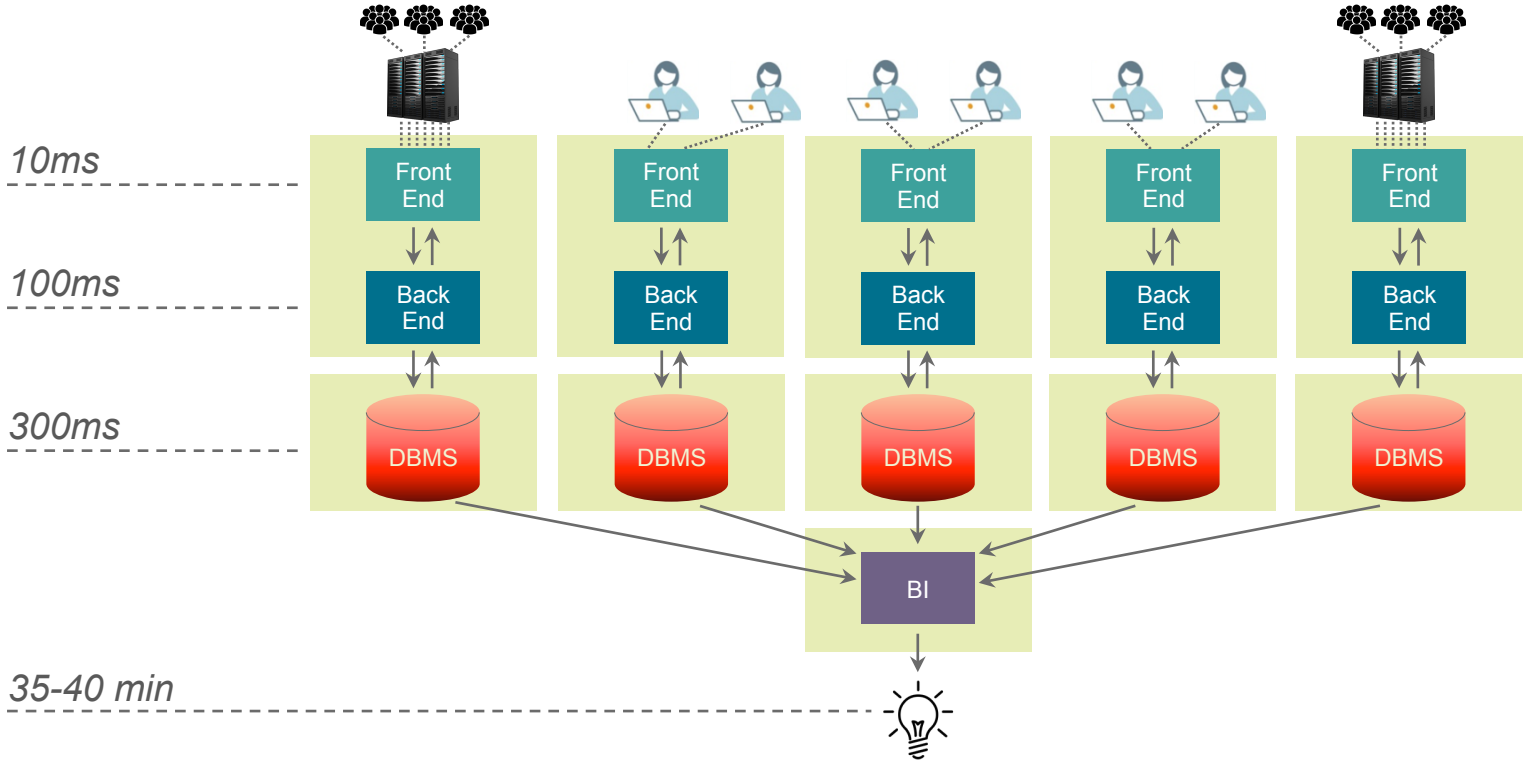
What if "split" didn't help this time?

First Issues



Split more! Eventually it will help…

First Issues



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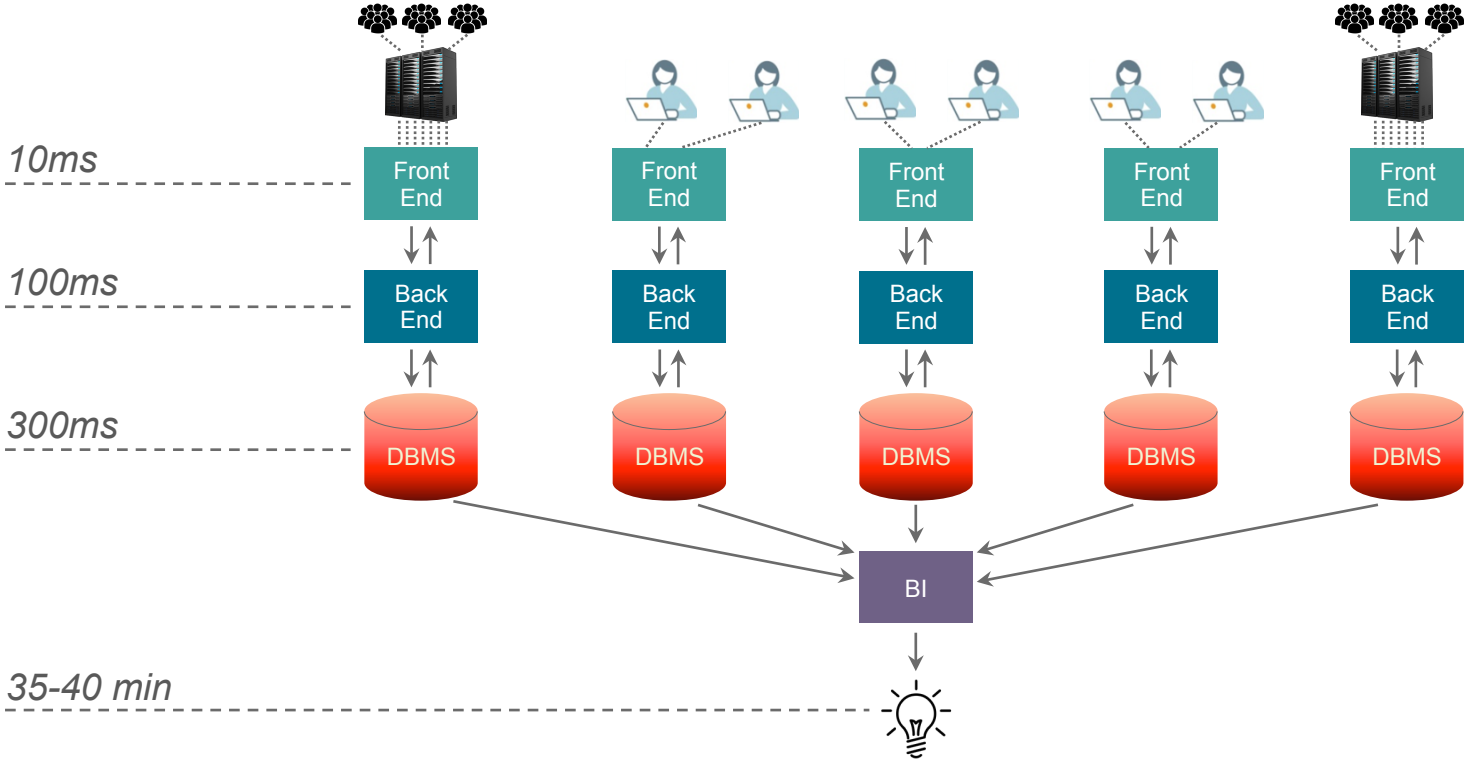

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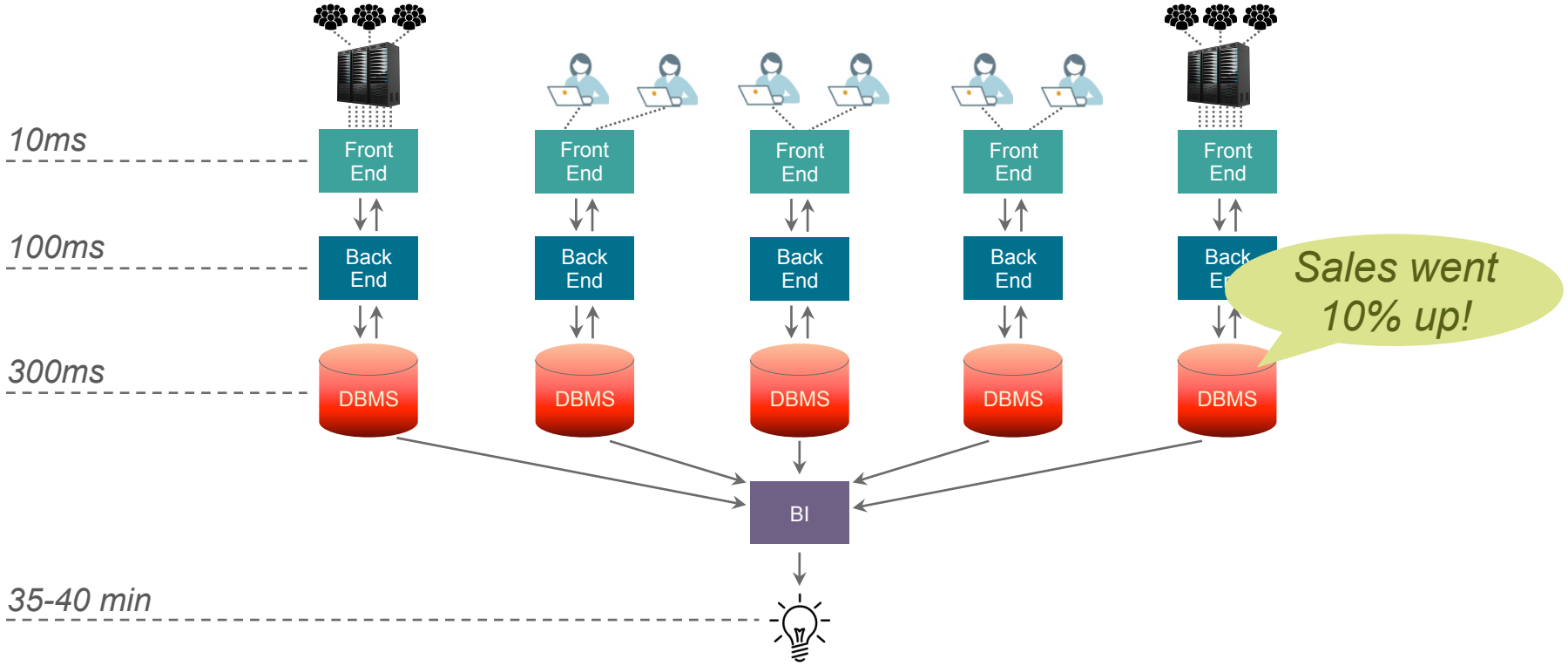

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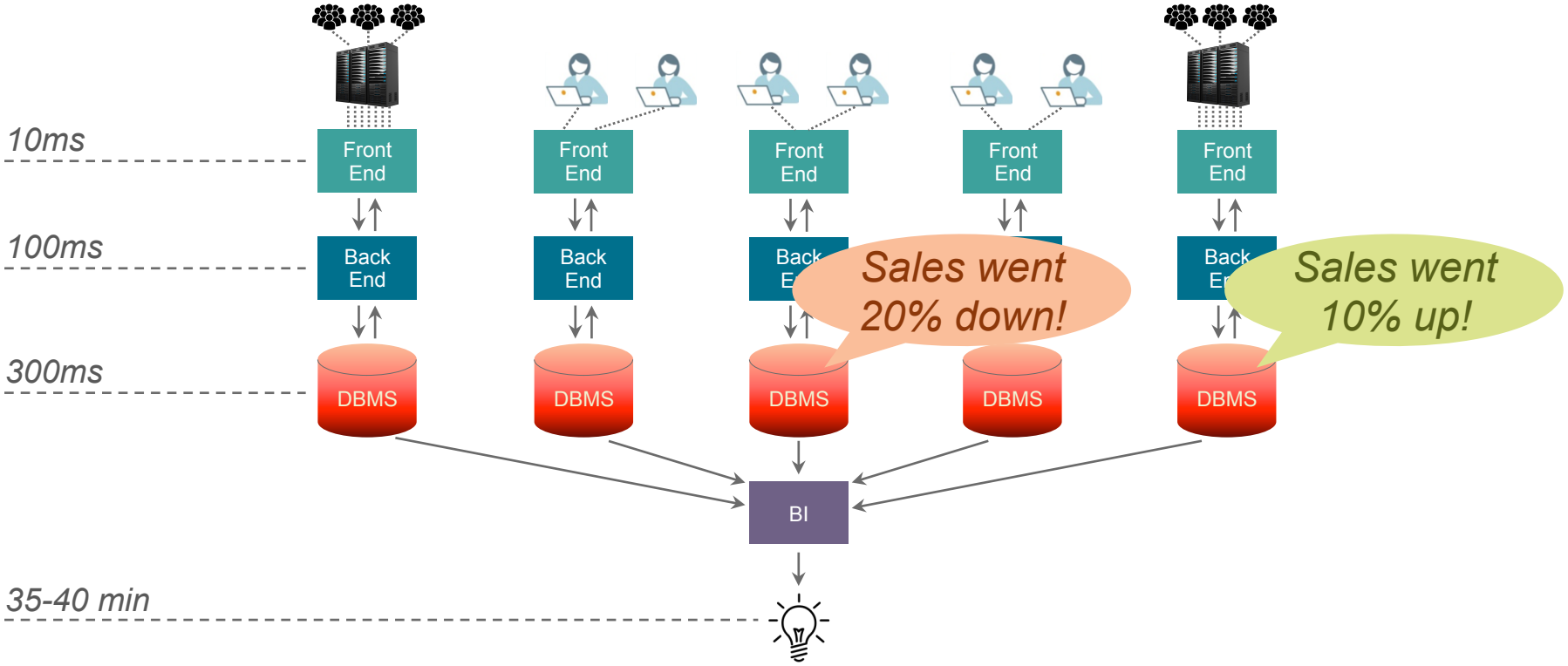

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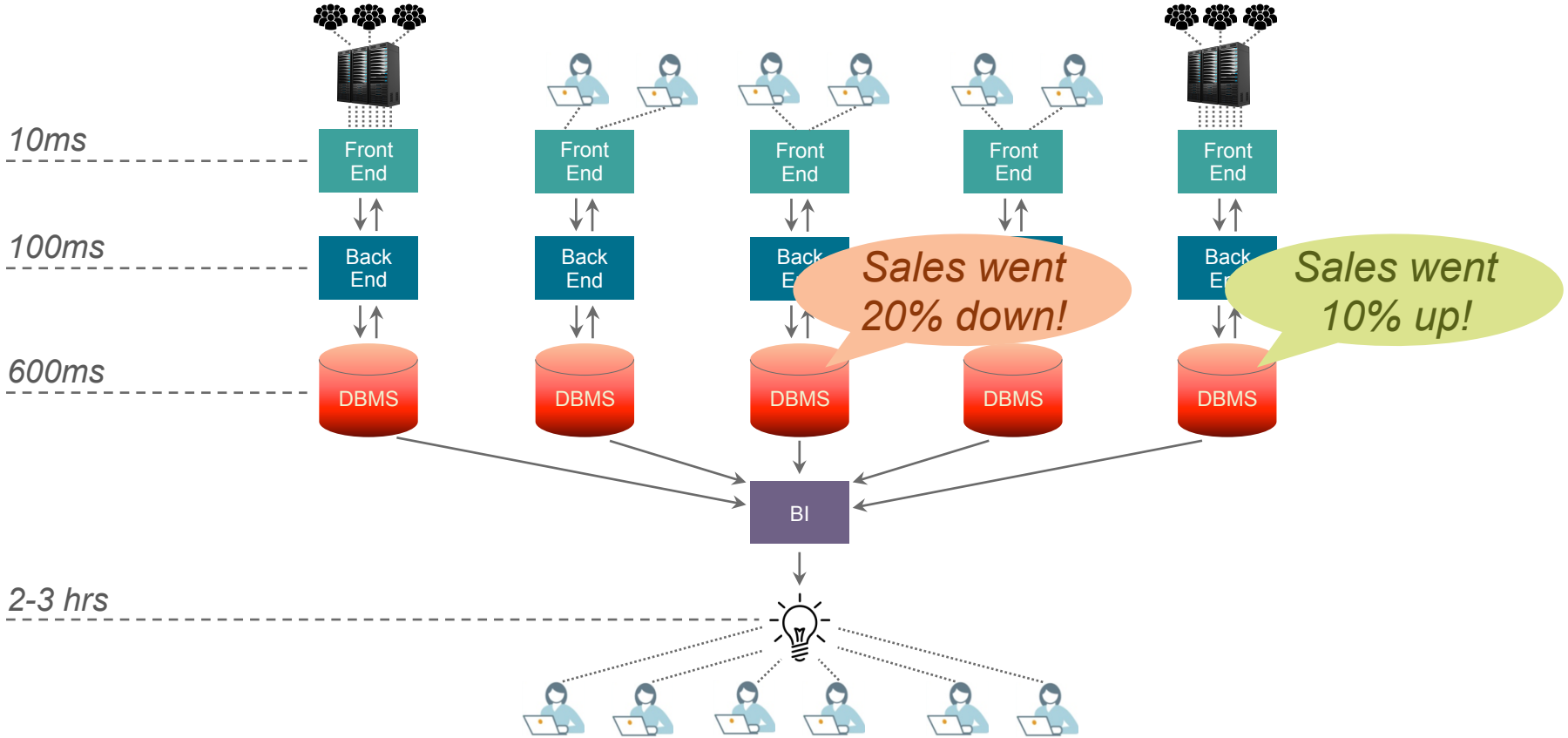

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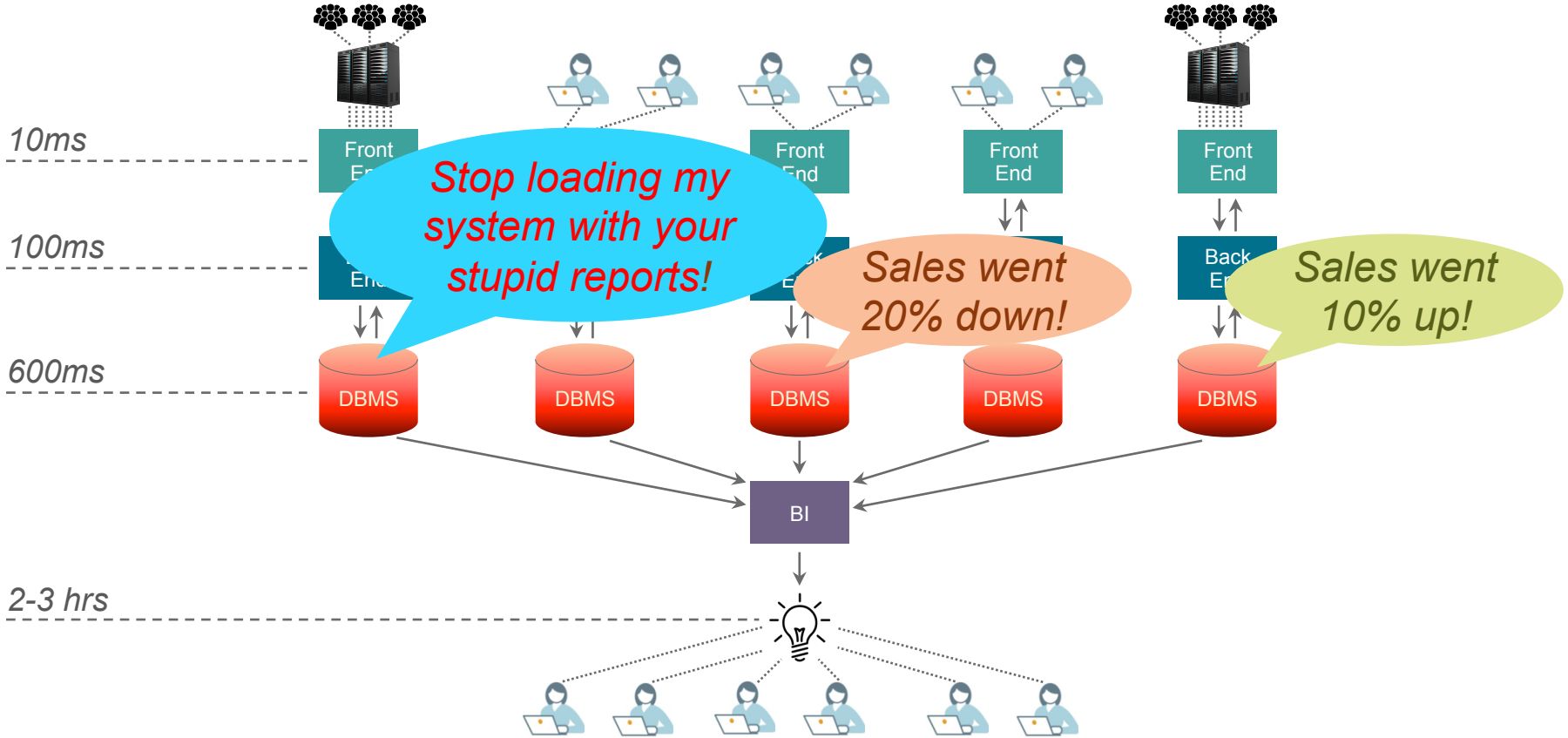
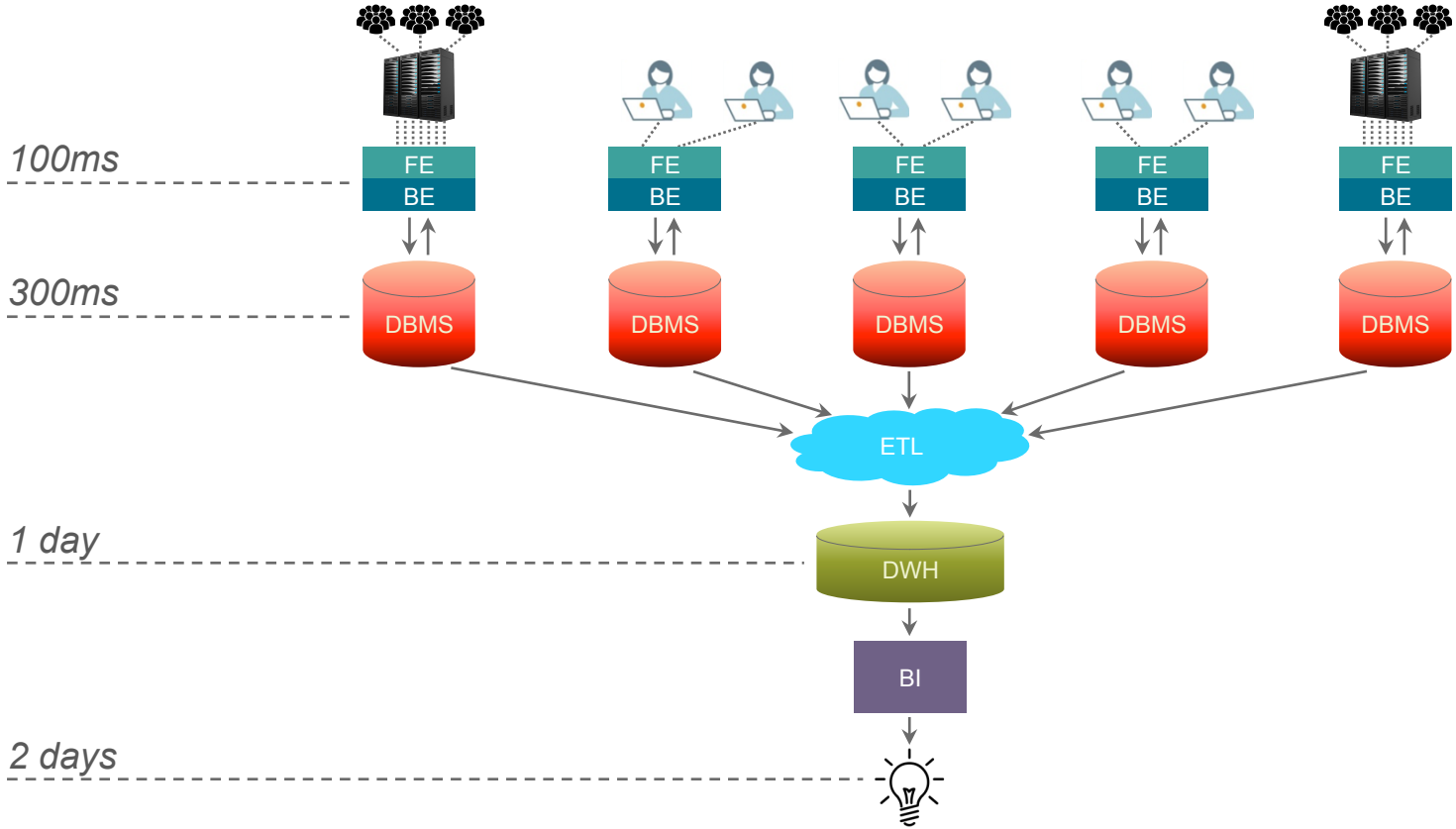


The Era of Data Warehouse



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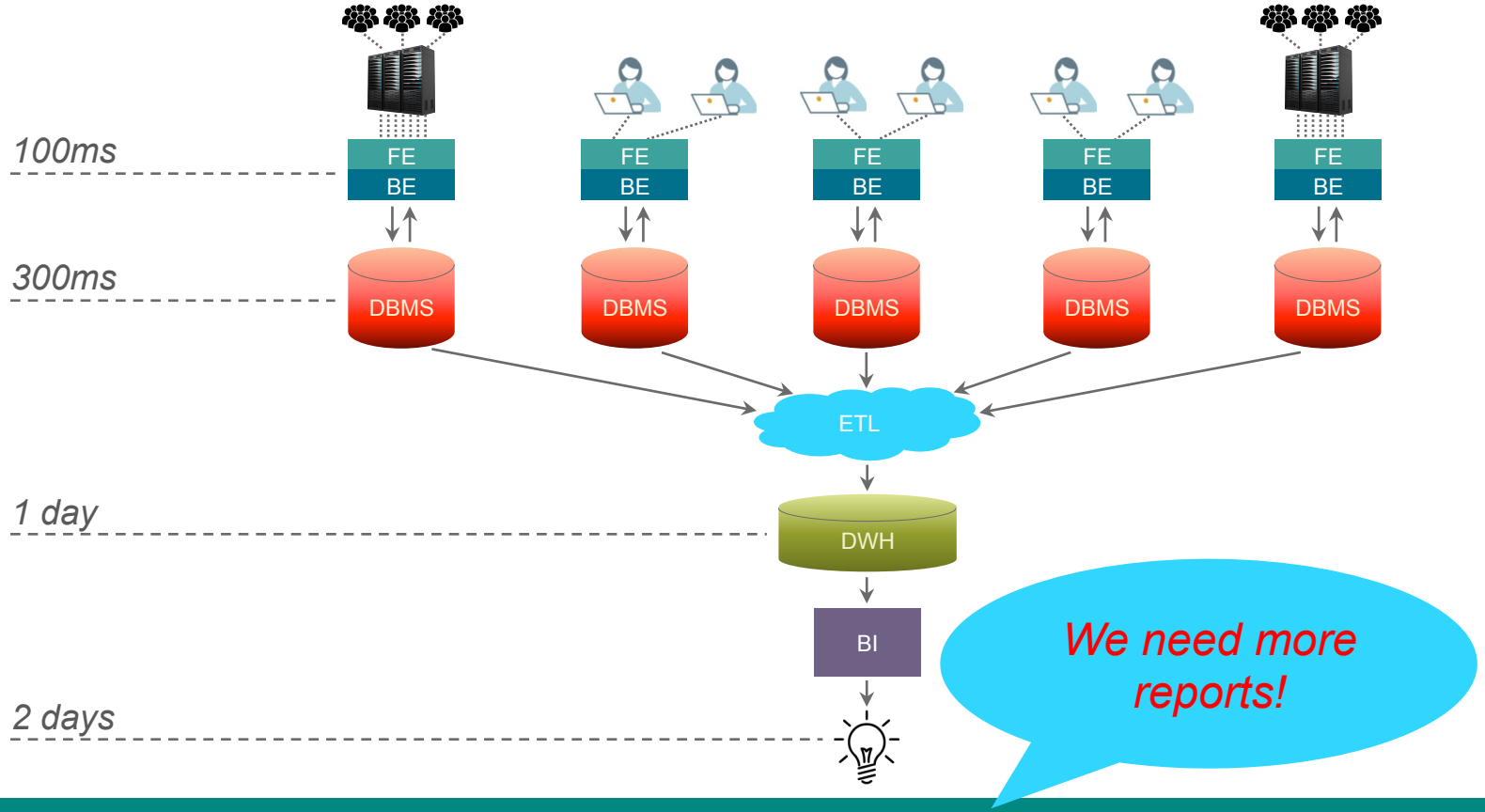

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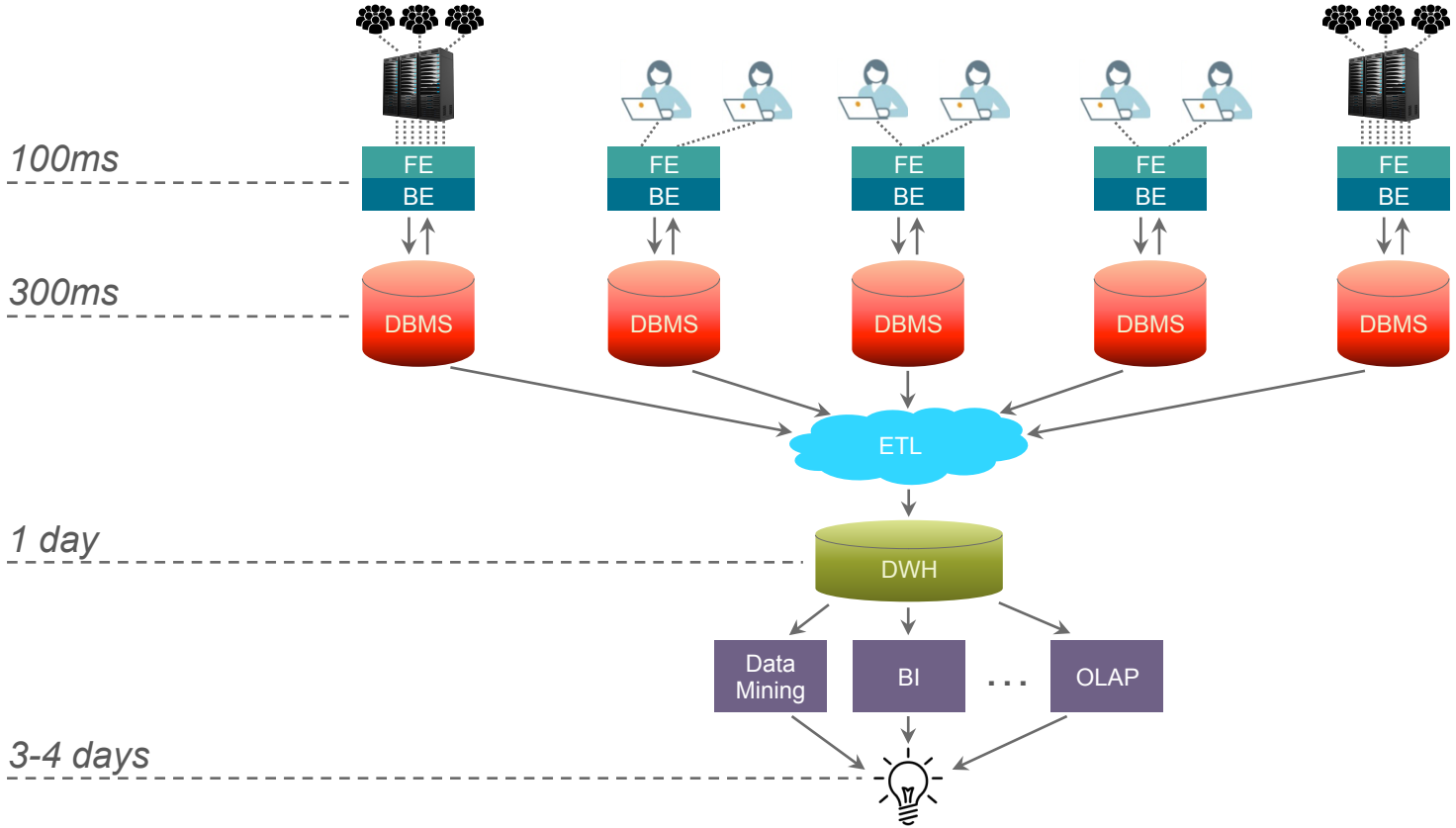

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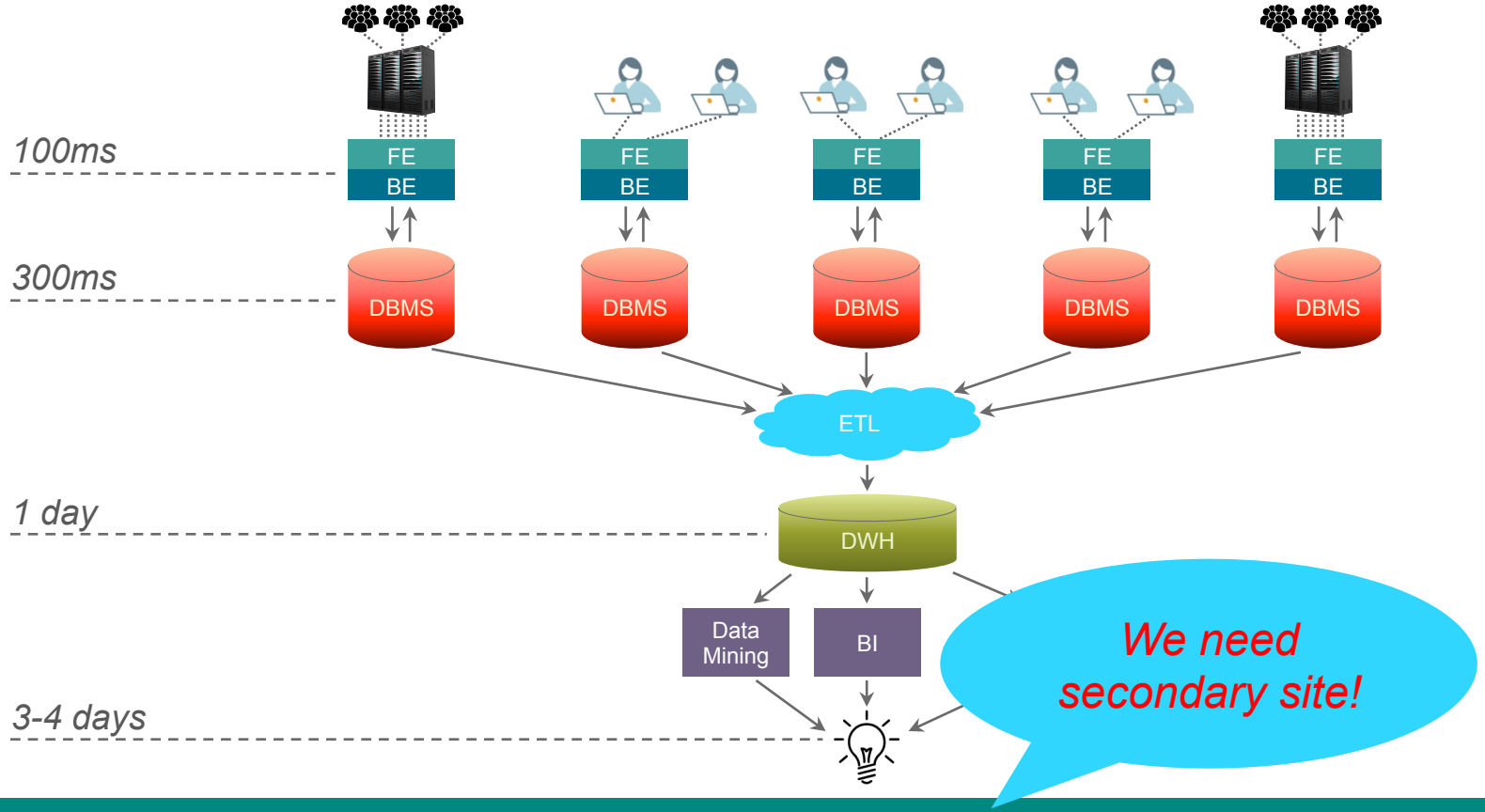

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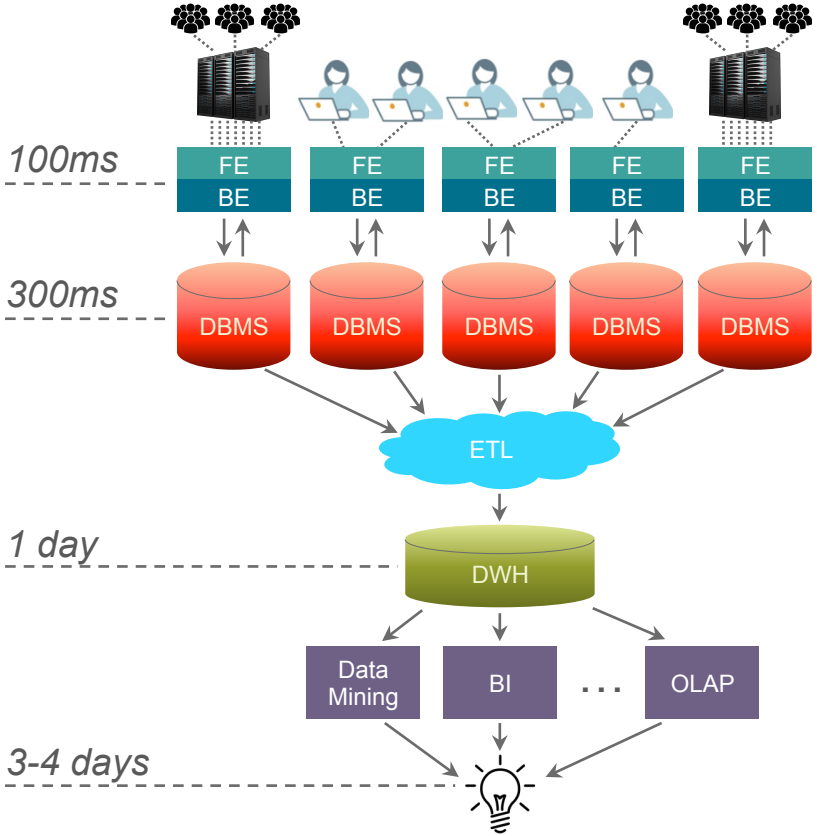

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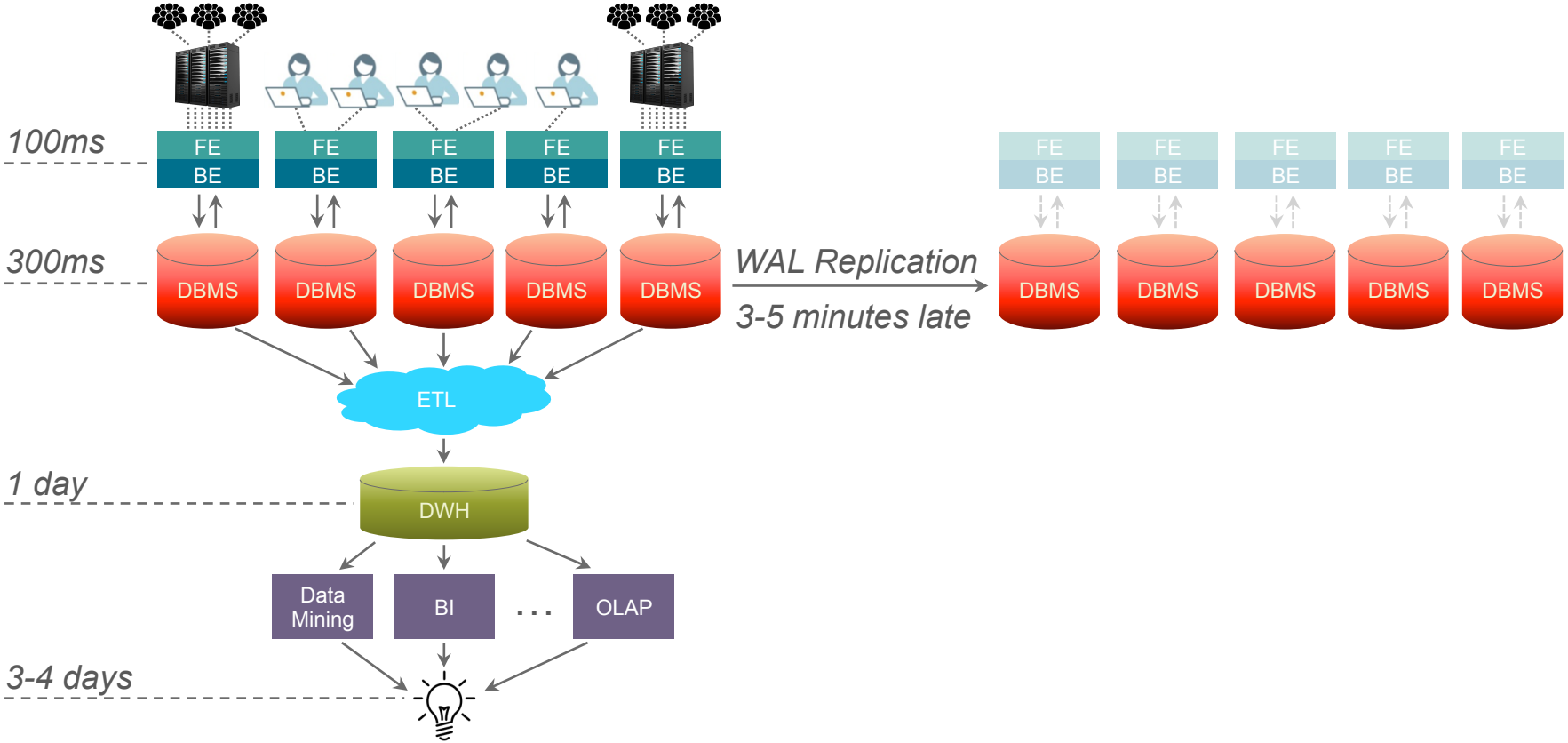

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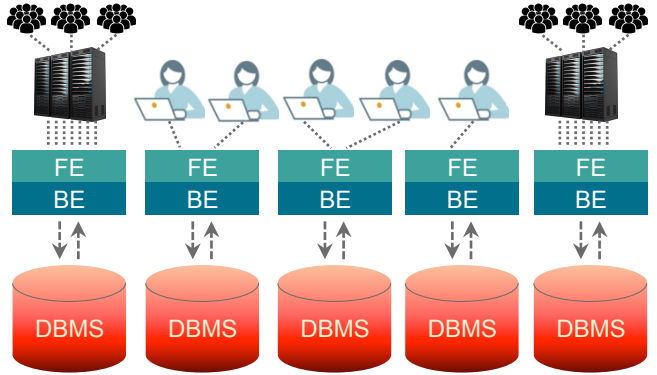

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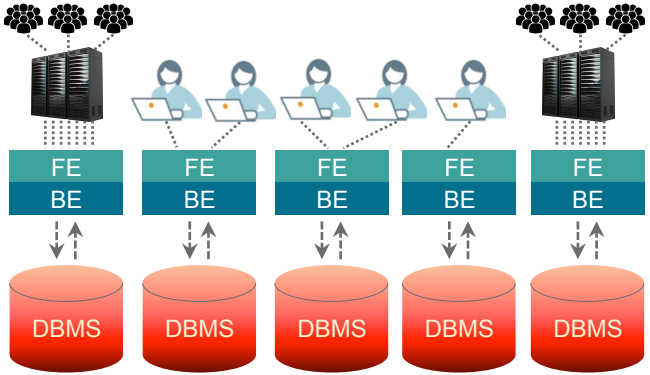
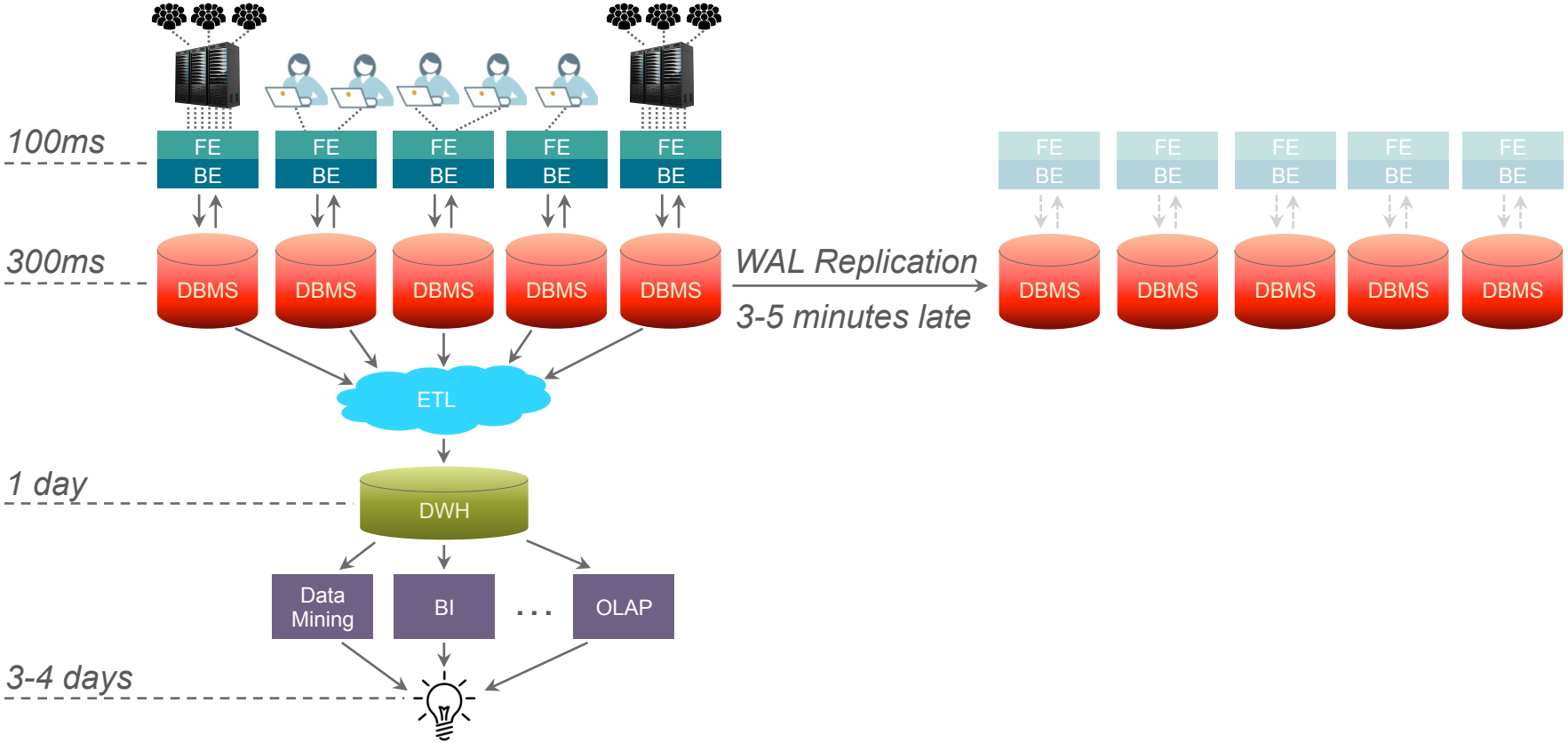


Where is our DWH? We need this data now!

The Era of Data Warehouse



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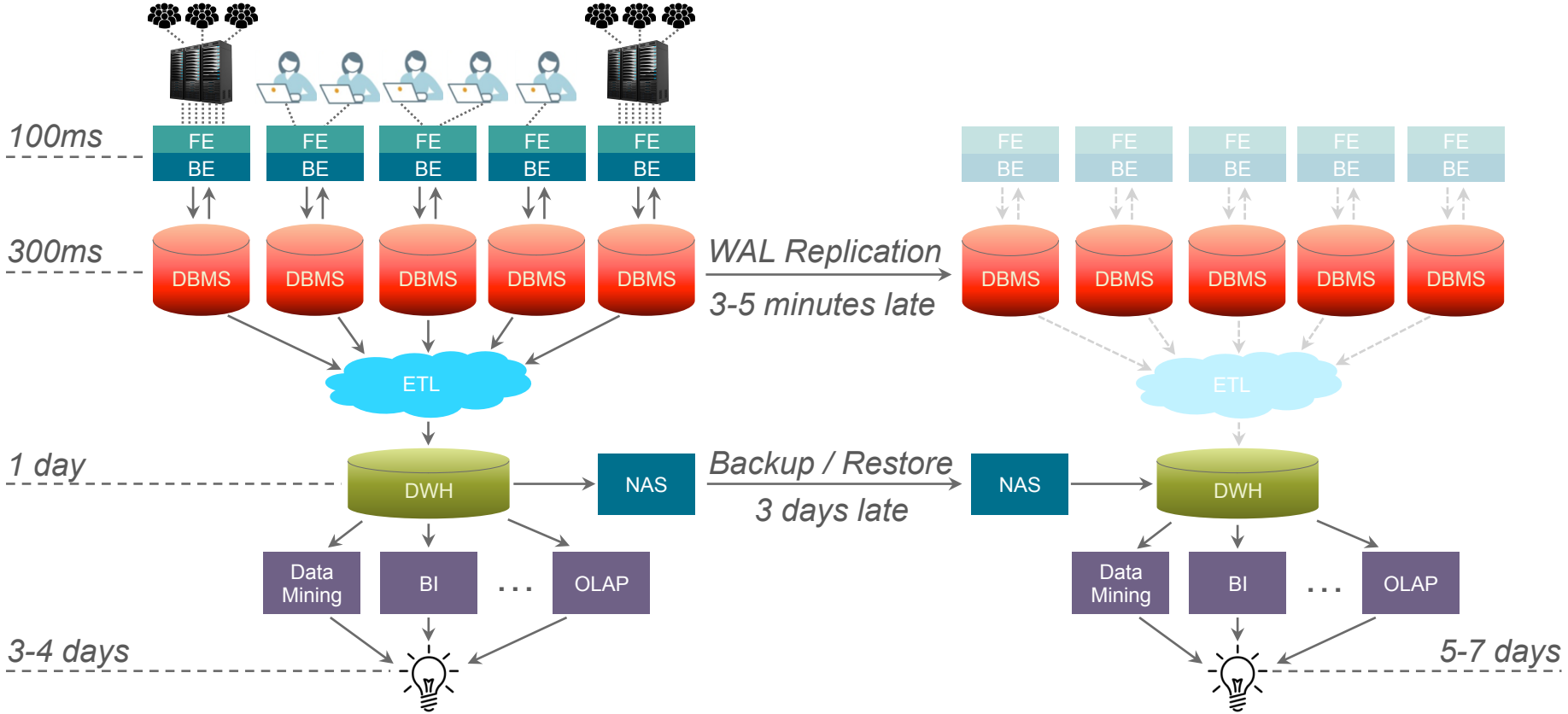

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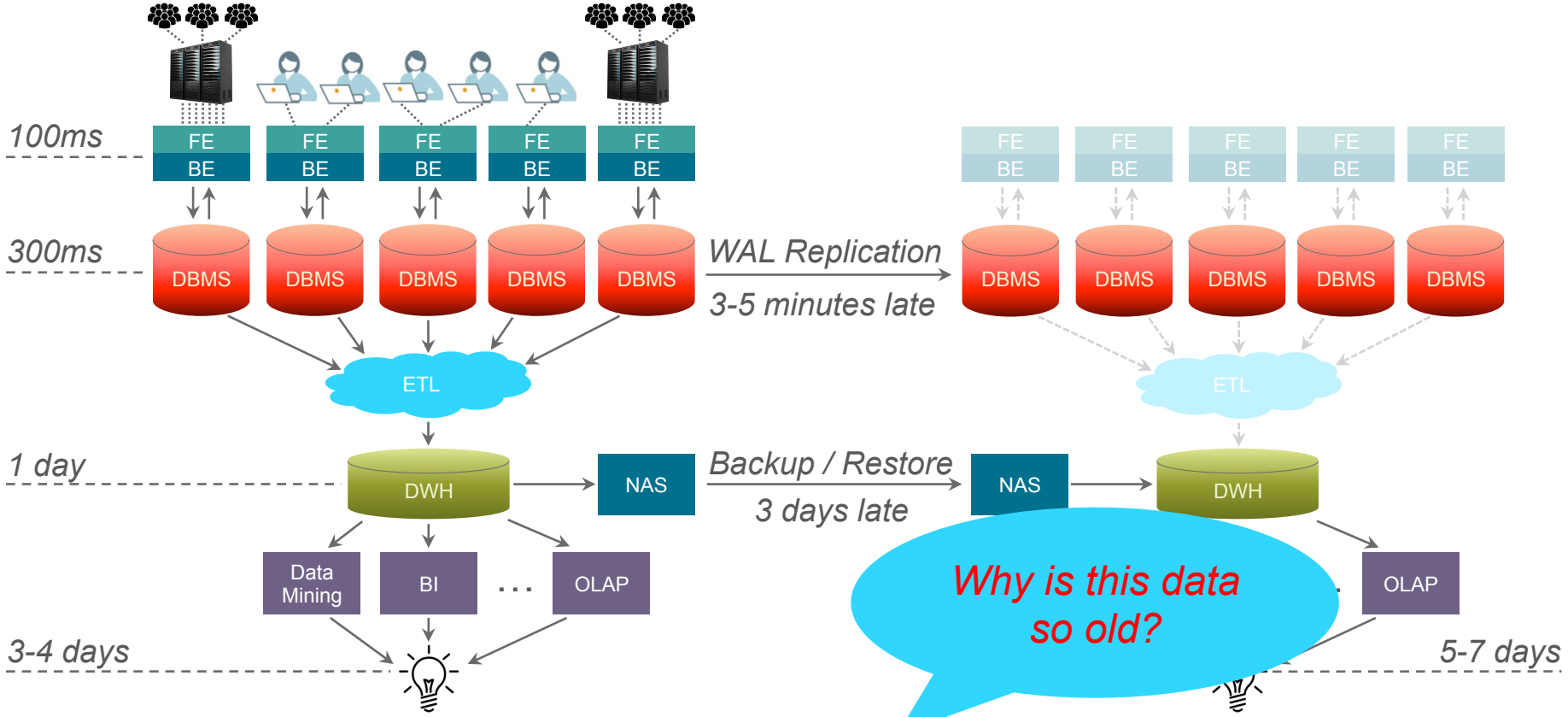
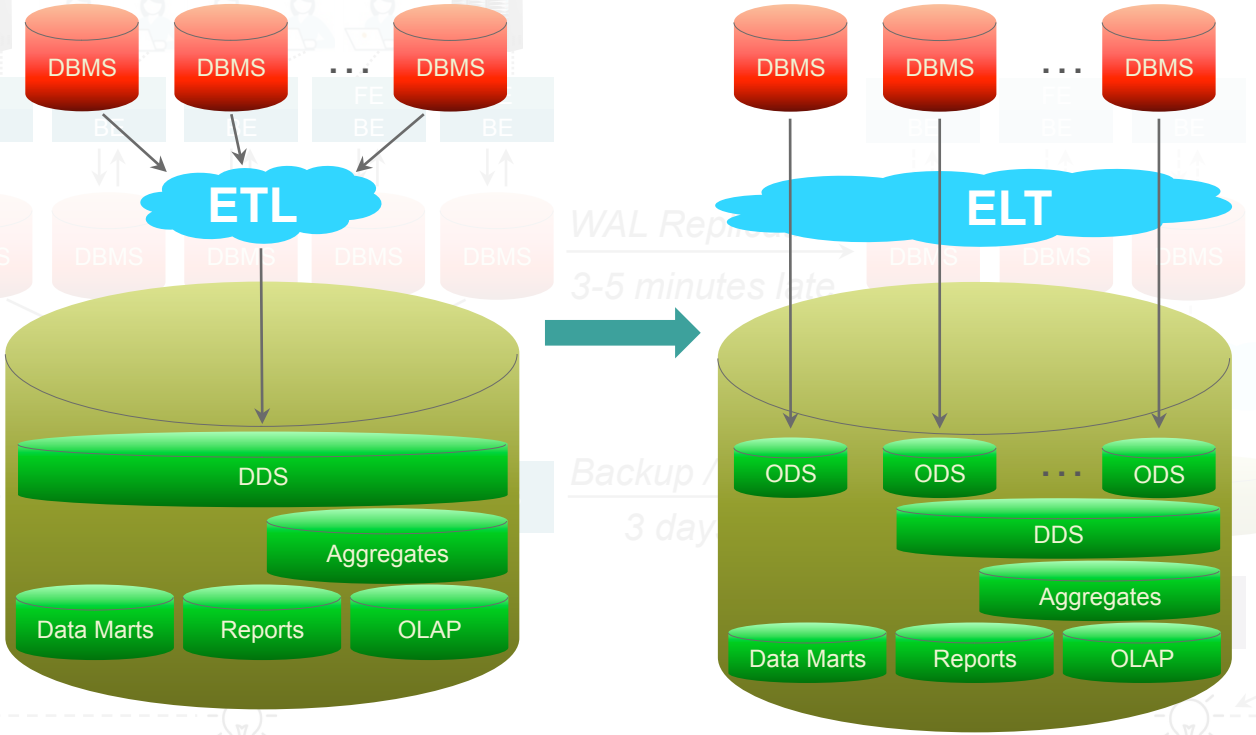


The Era of Data Warehouse

Advanced Architecture – ELT



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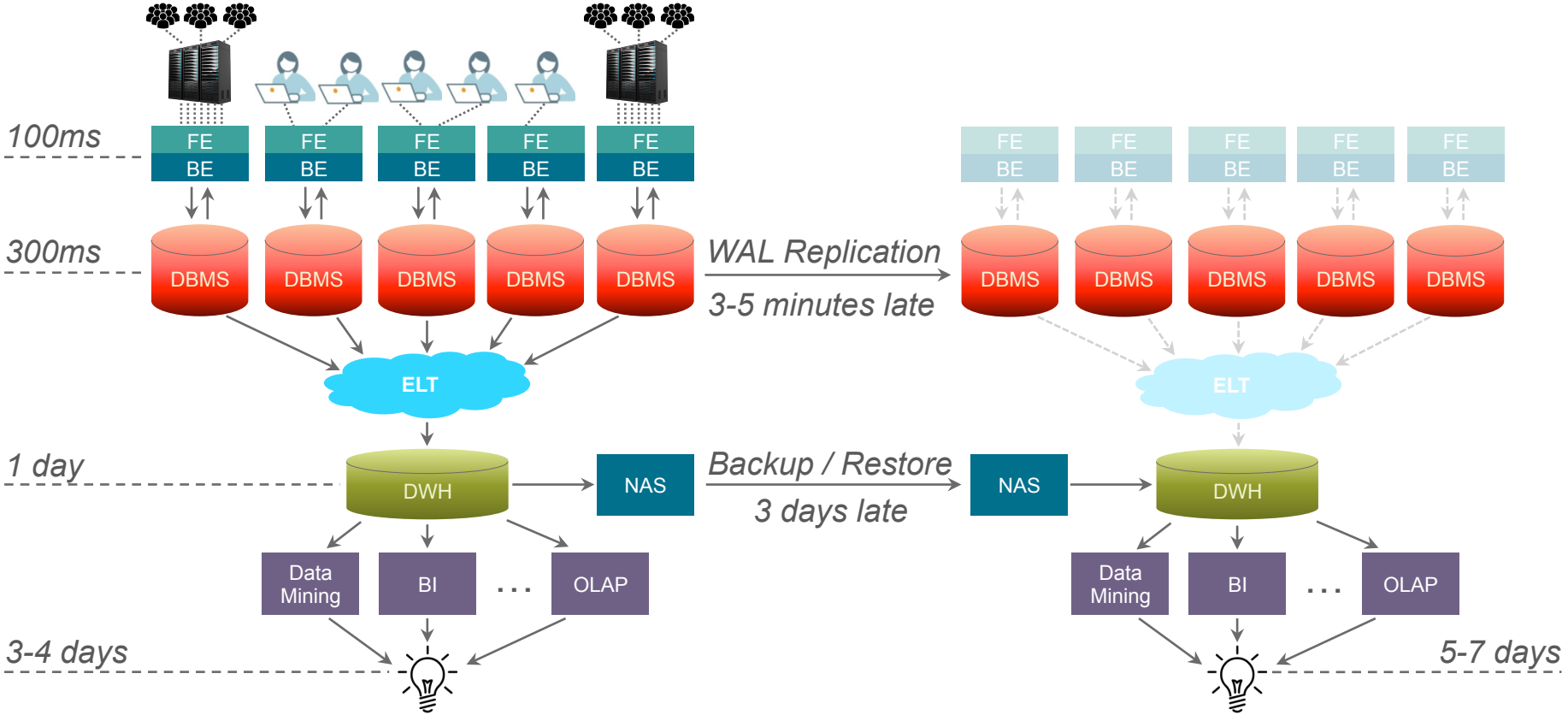
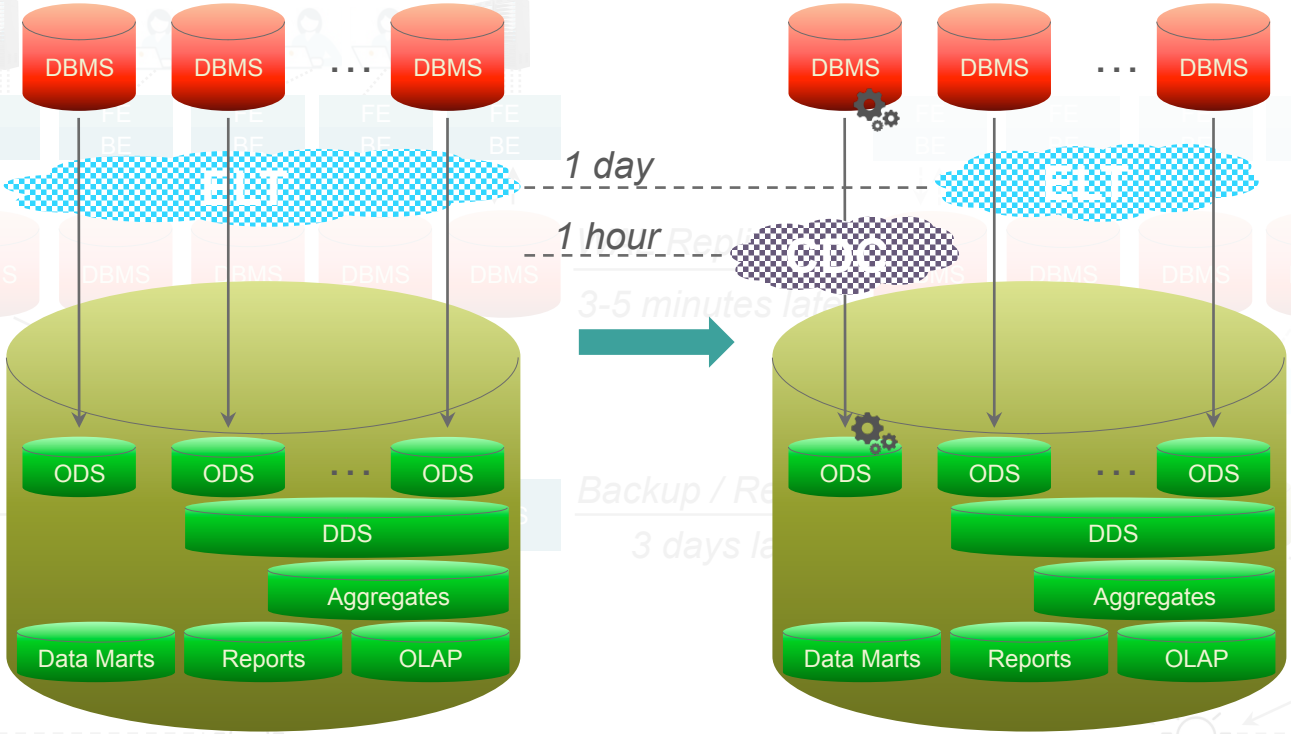


Advanced Architecture – CDC



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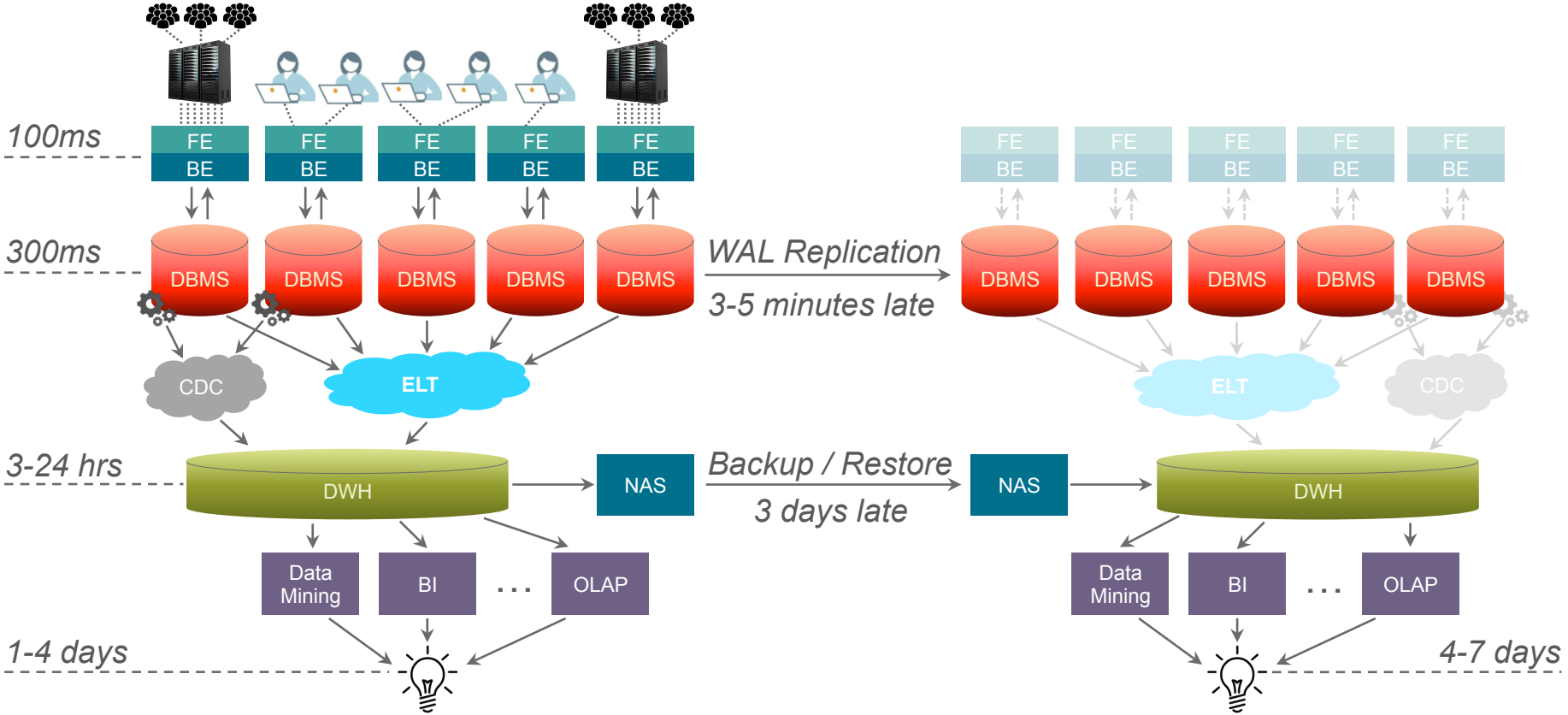

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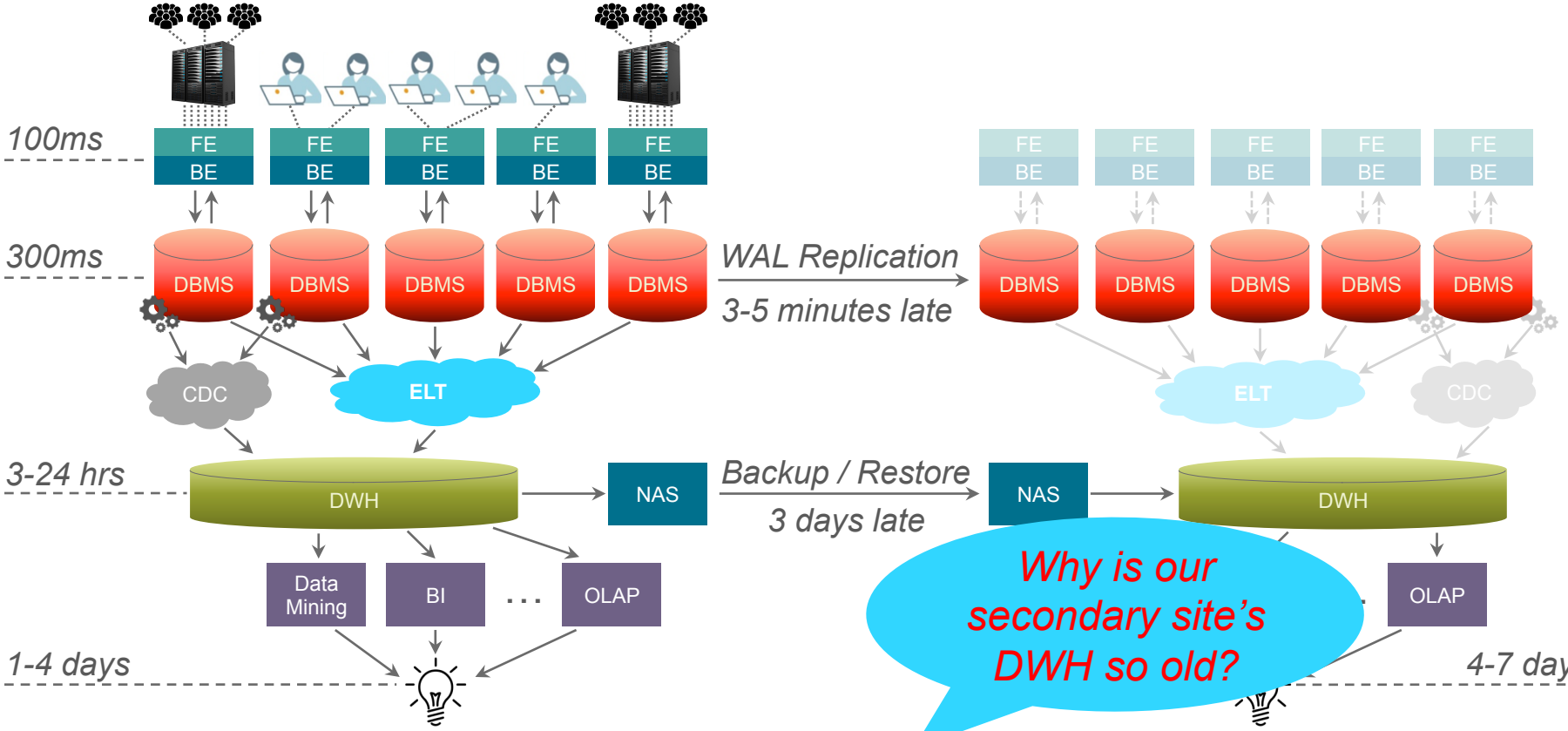
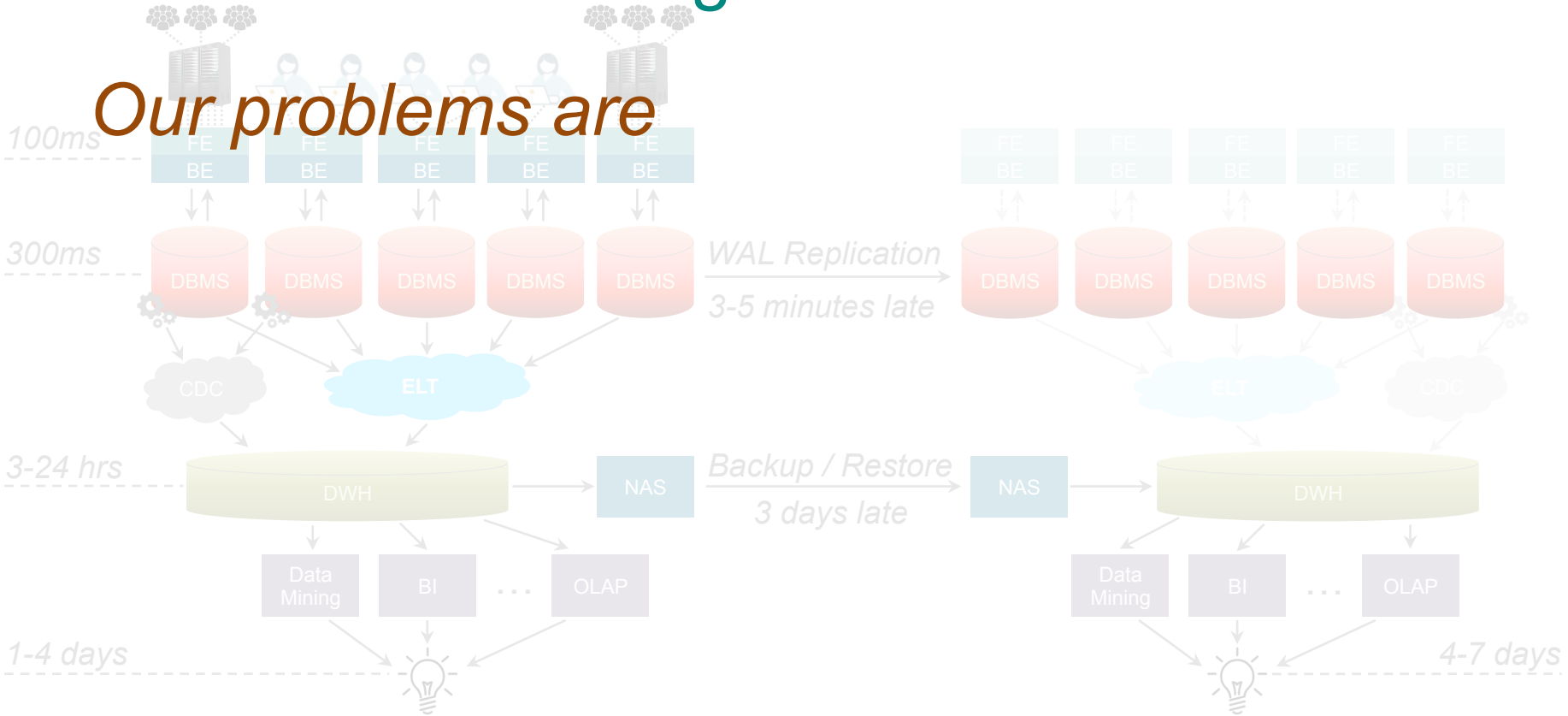


Moving Forward

Moving Forward

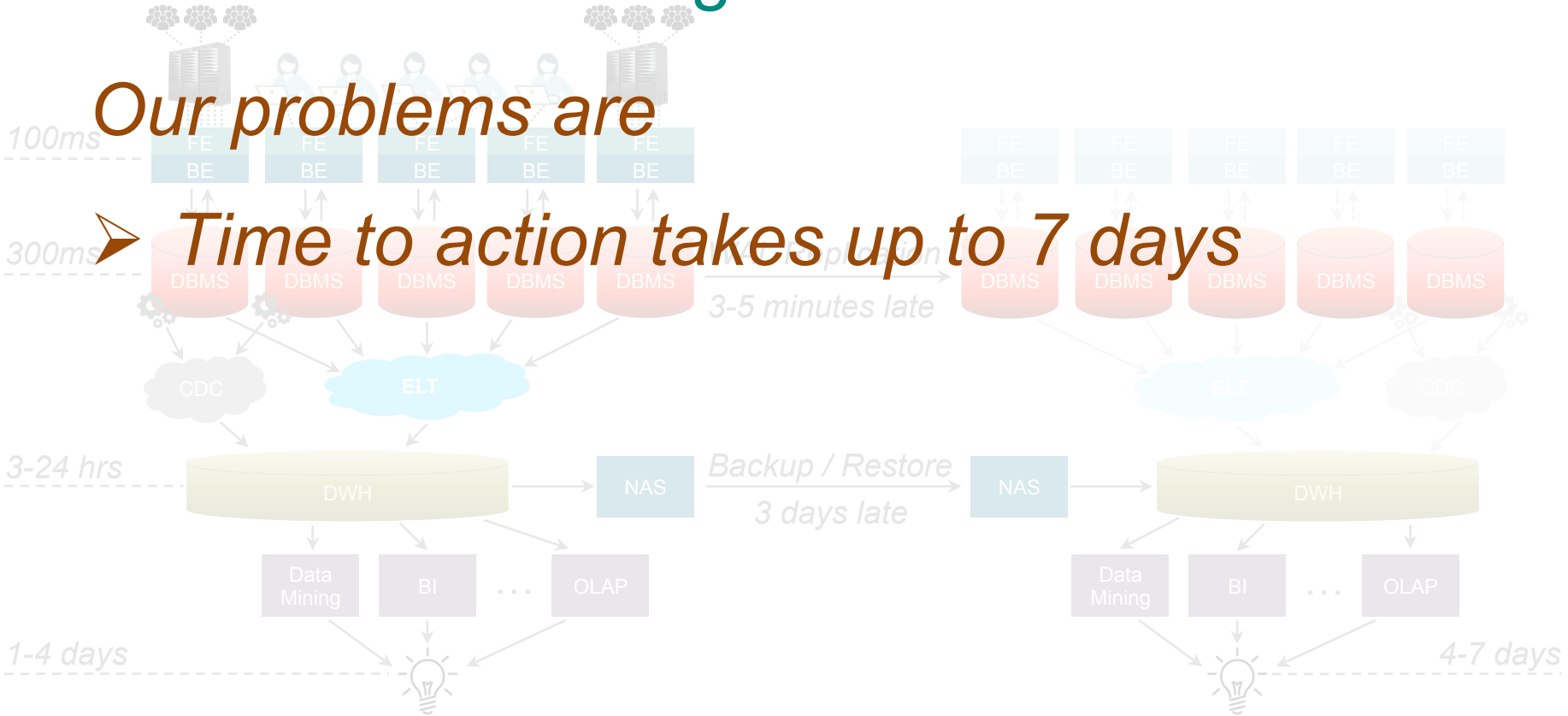
Our problems are



Moving Forward

Our problems are

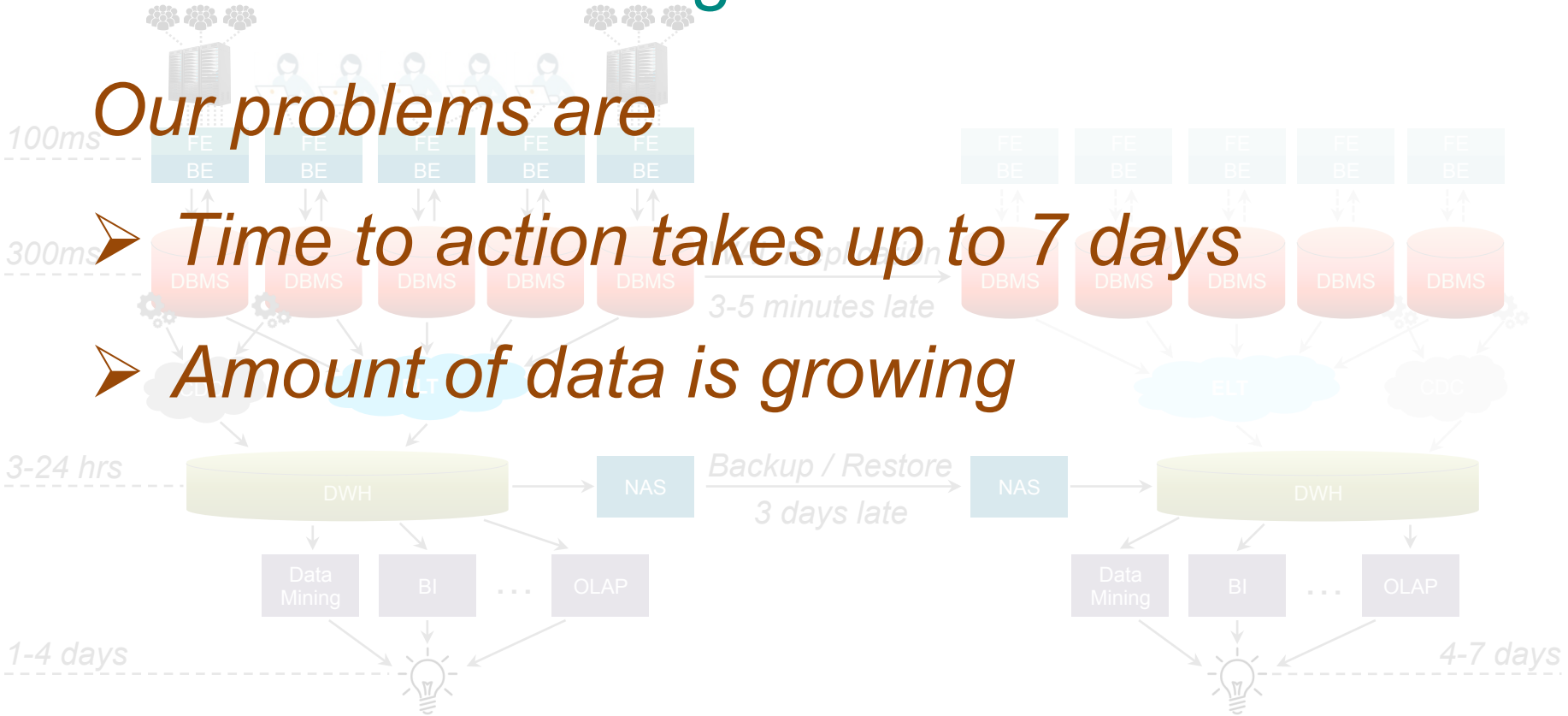
- *Time to action takes up to 7 days*



Moving Forward

Our problems are

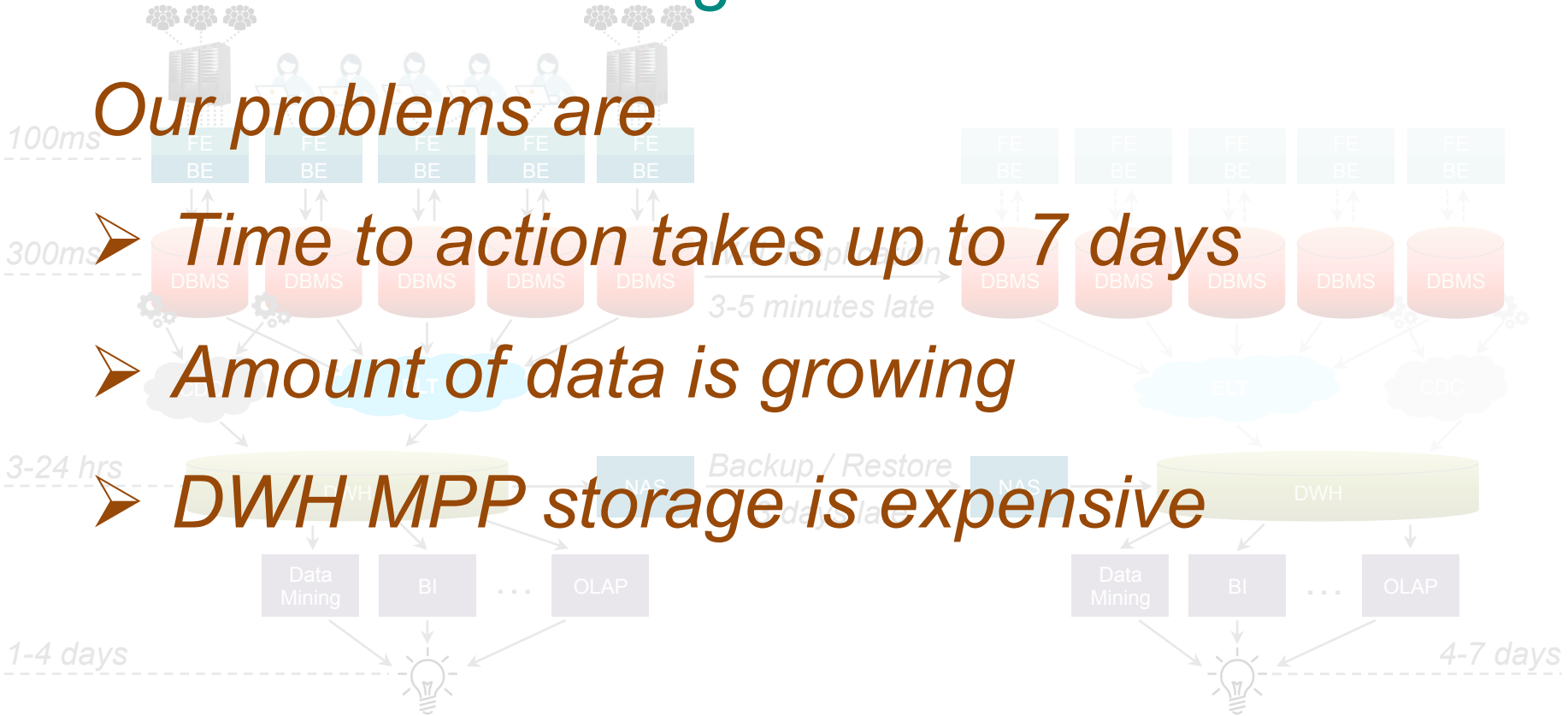
- *Time to action takes up to 7 days*
- *Amount of data is growing*



Moving Forward

Our problems are

- *Time to action takes up to 7 days*
- *Amount of data is growing*
- *DWH MPP storage is expensive*

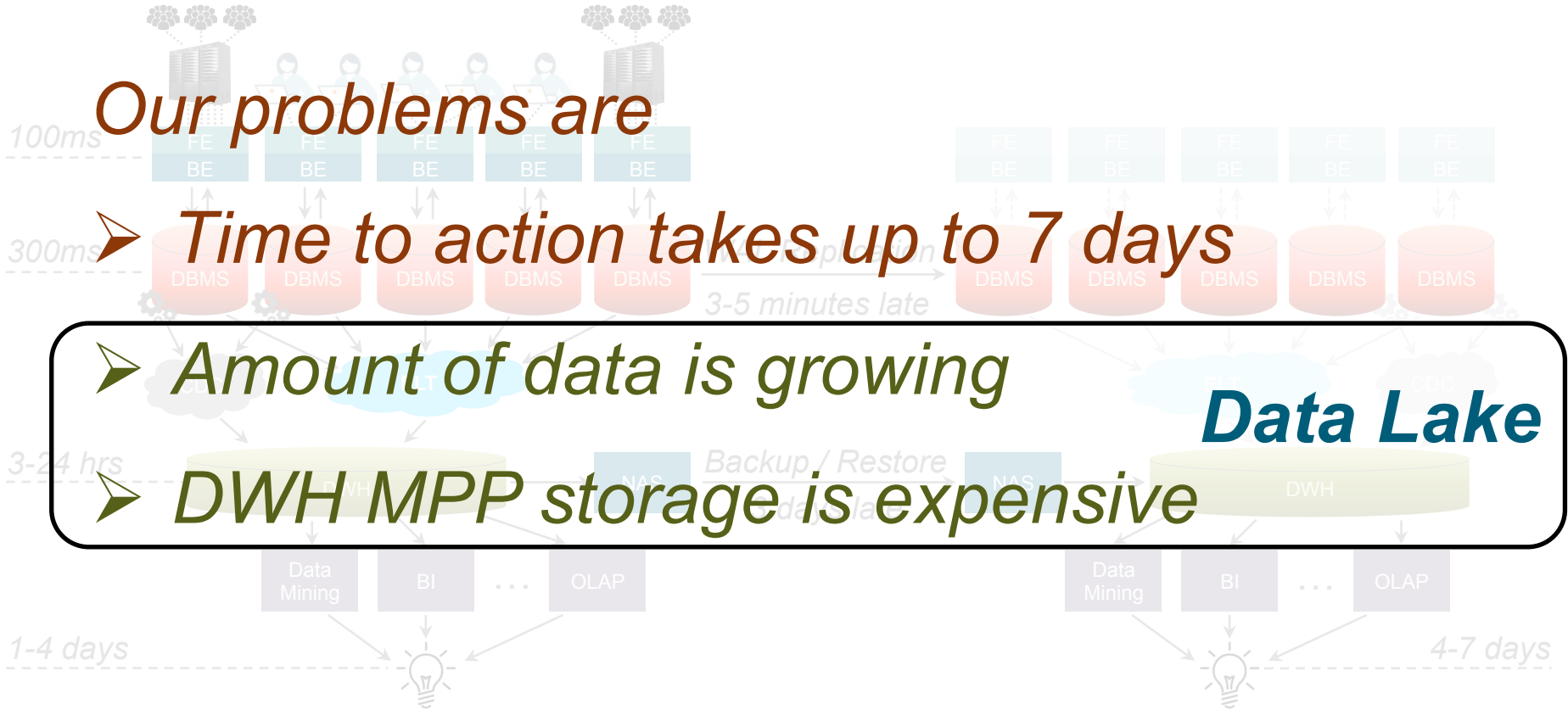


Modern Architectures

Our problems are

- *Time to action takes up to 7 days*
- *Amount of data is growing*
- *DWH MPP storage is expensive*

Data Lake



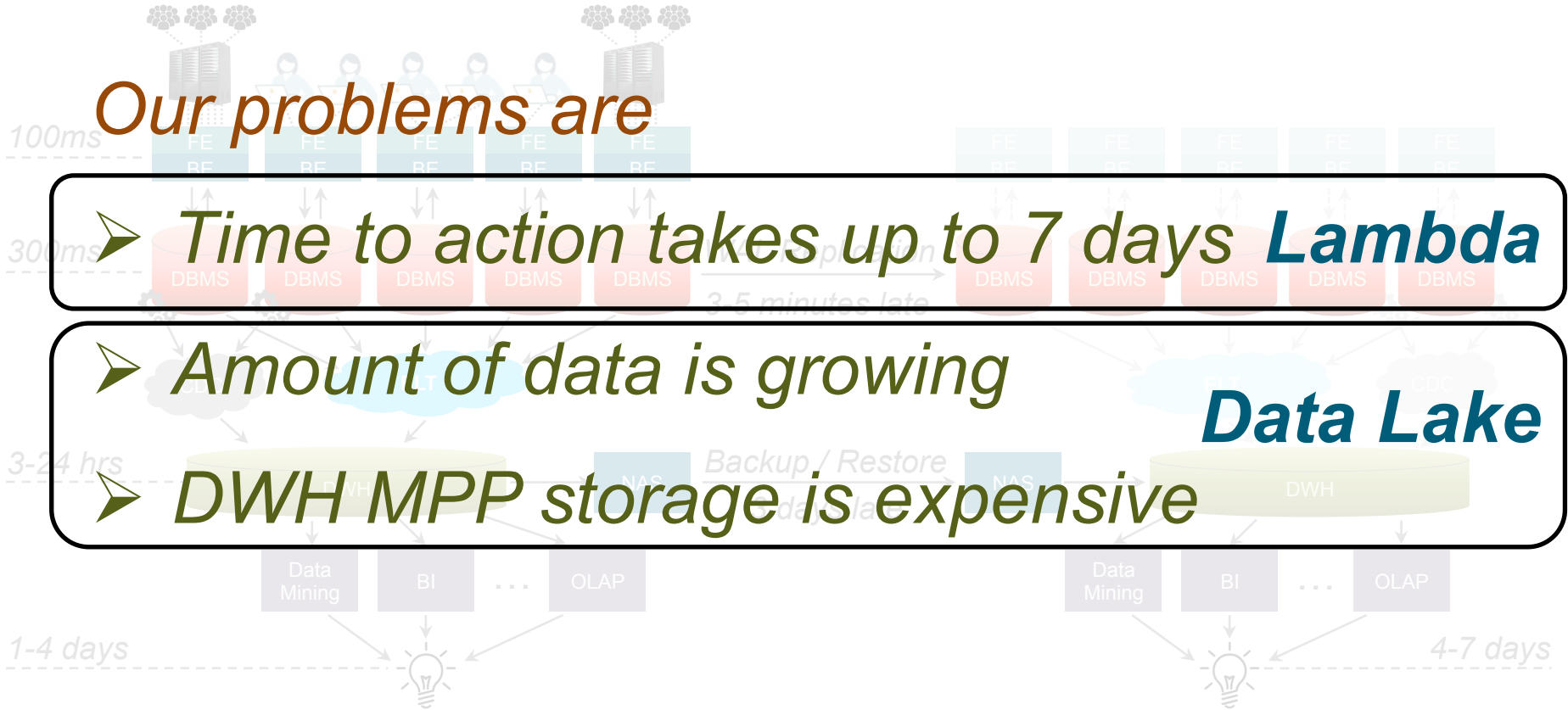
Modern Architectures

Our problems are

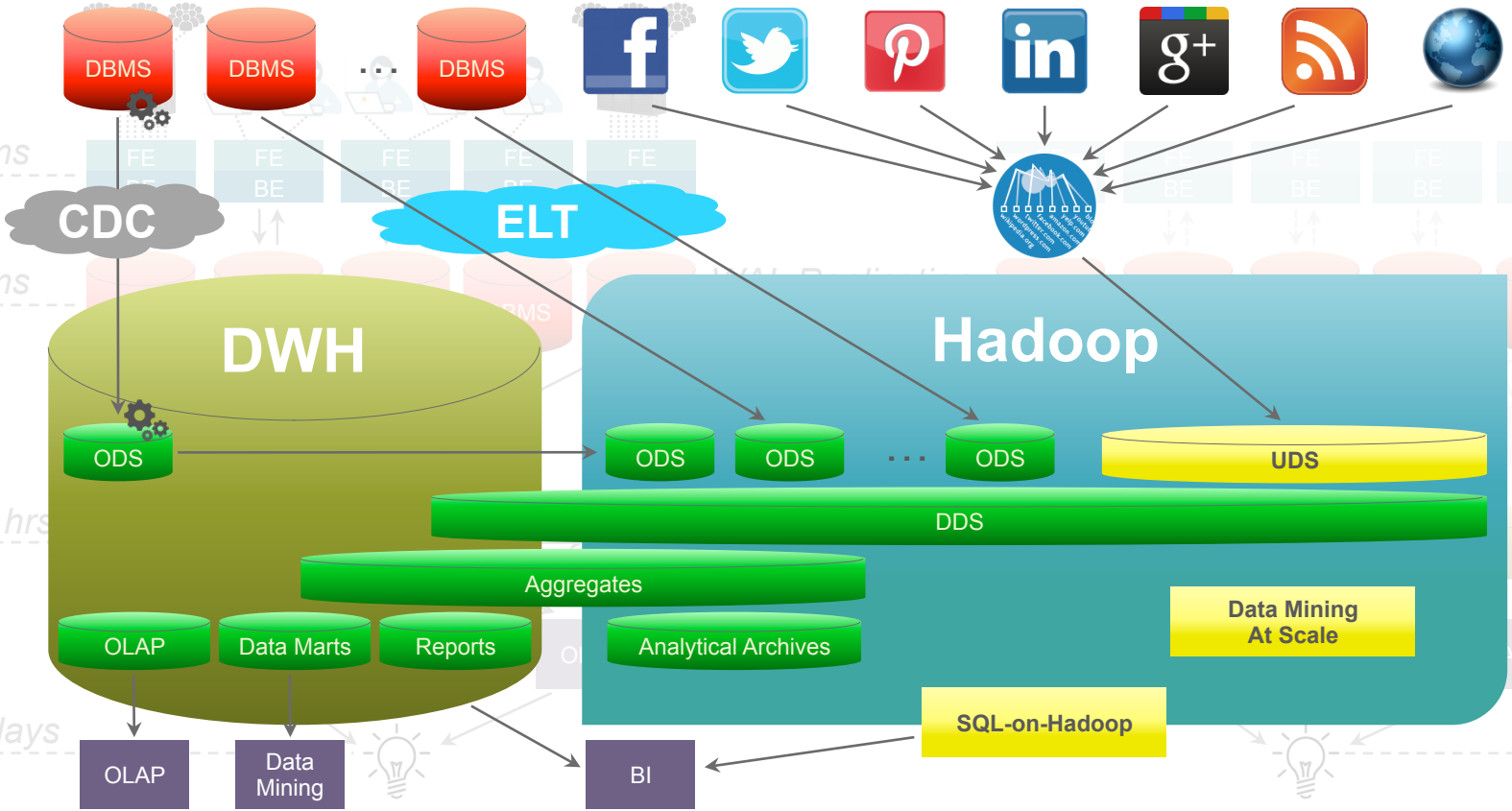
- *Time to action takes up to 7 days* **Lambda**

- *Amount of data is growing*
- *DWH MPP storage is expensive*

Data Lake



Modern Architectures – Data Lake



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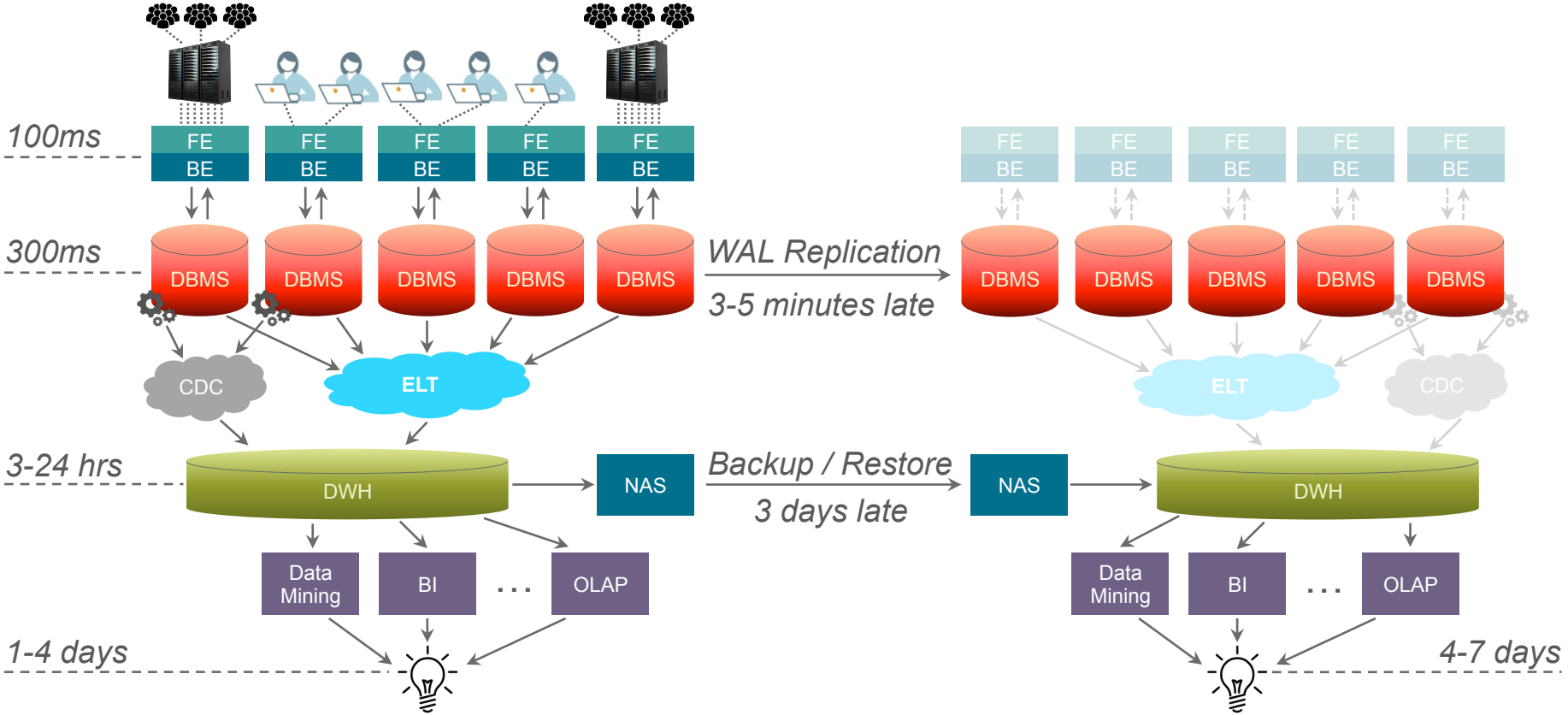

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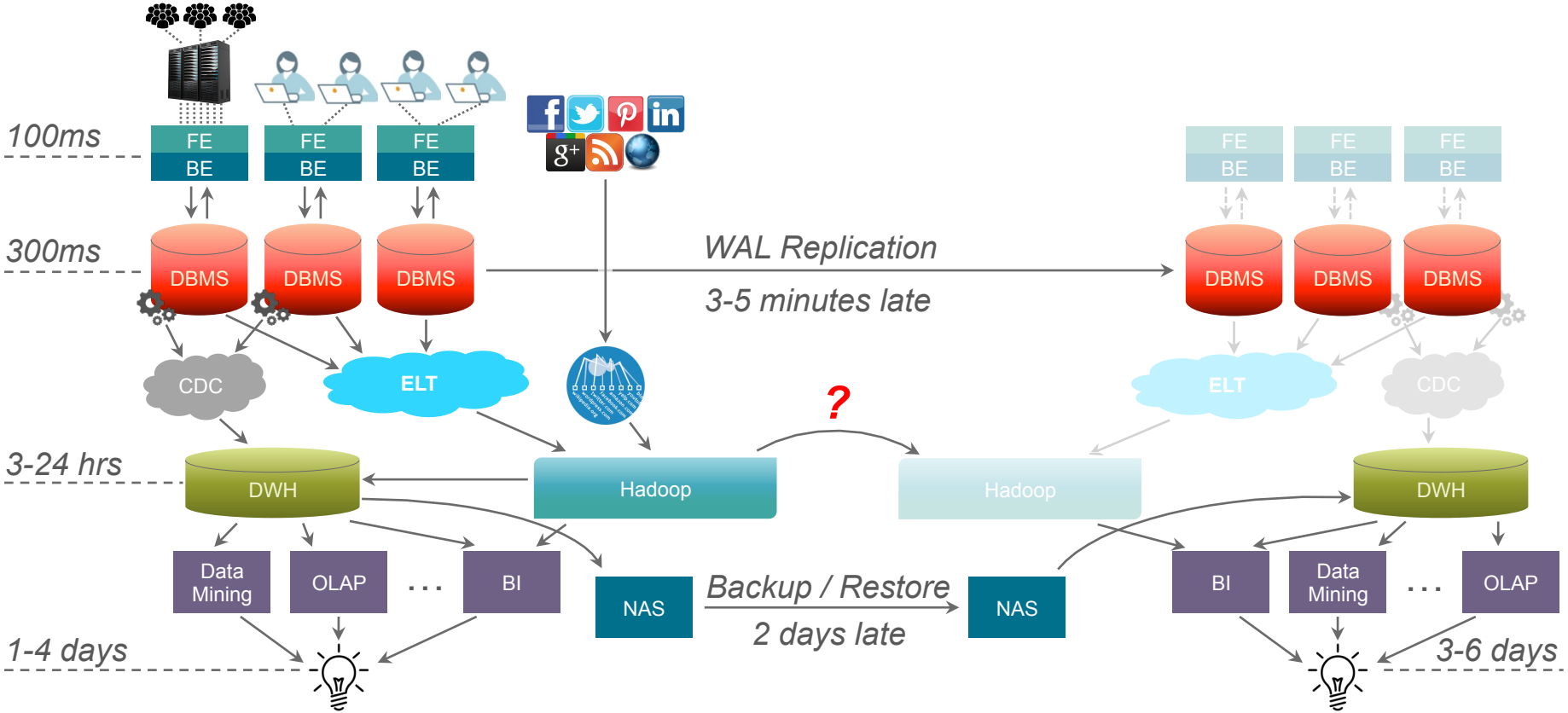
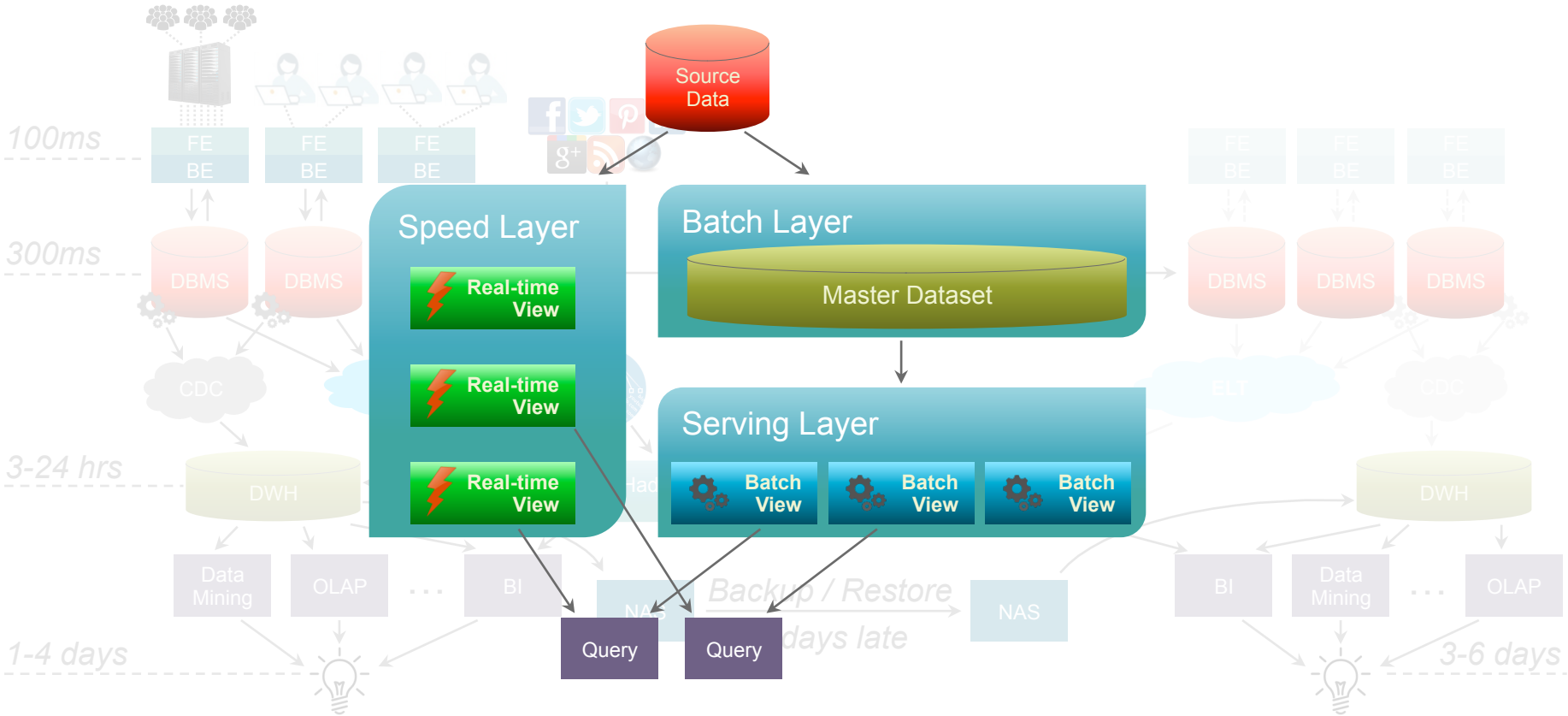
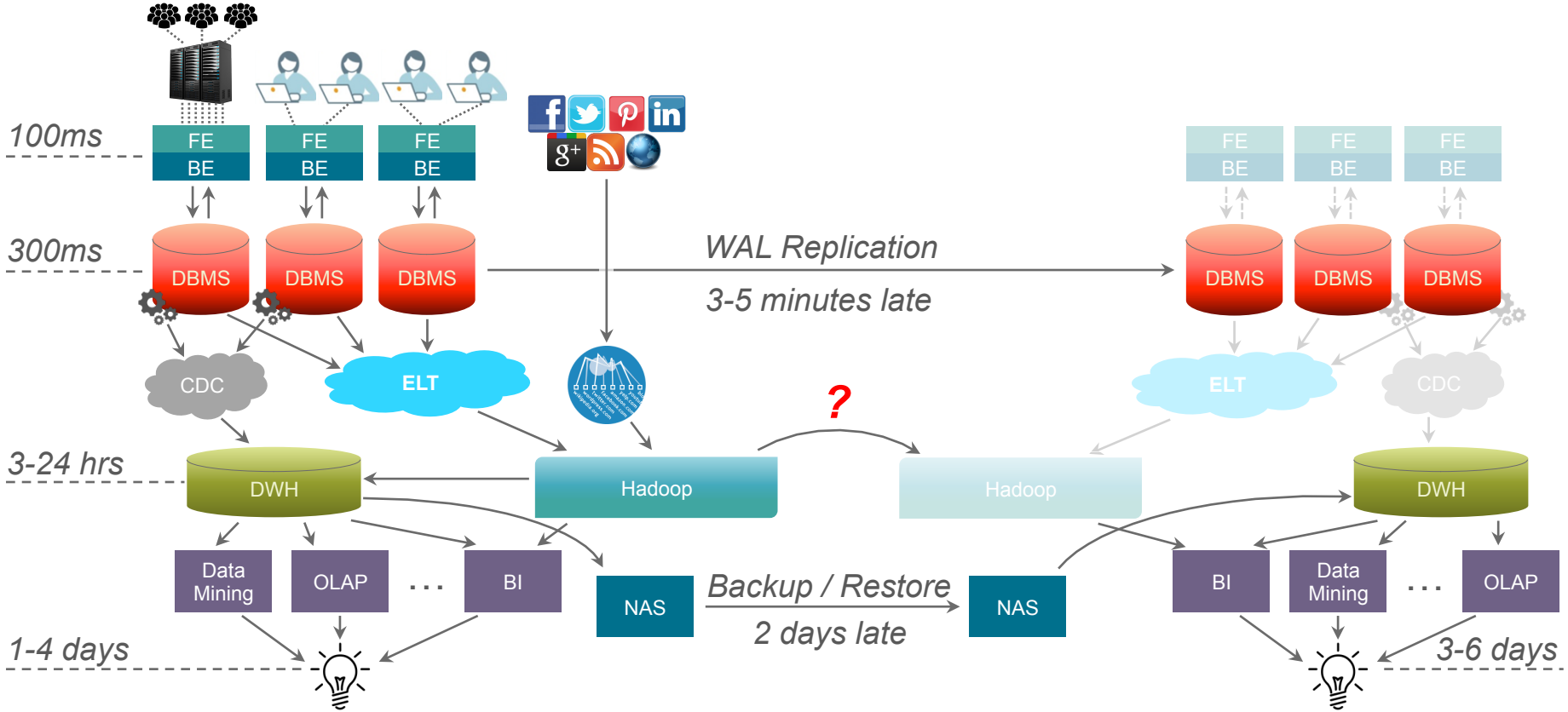


Modern Architectures – Lambda



Modern Architectures – Lambda



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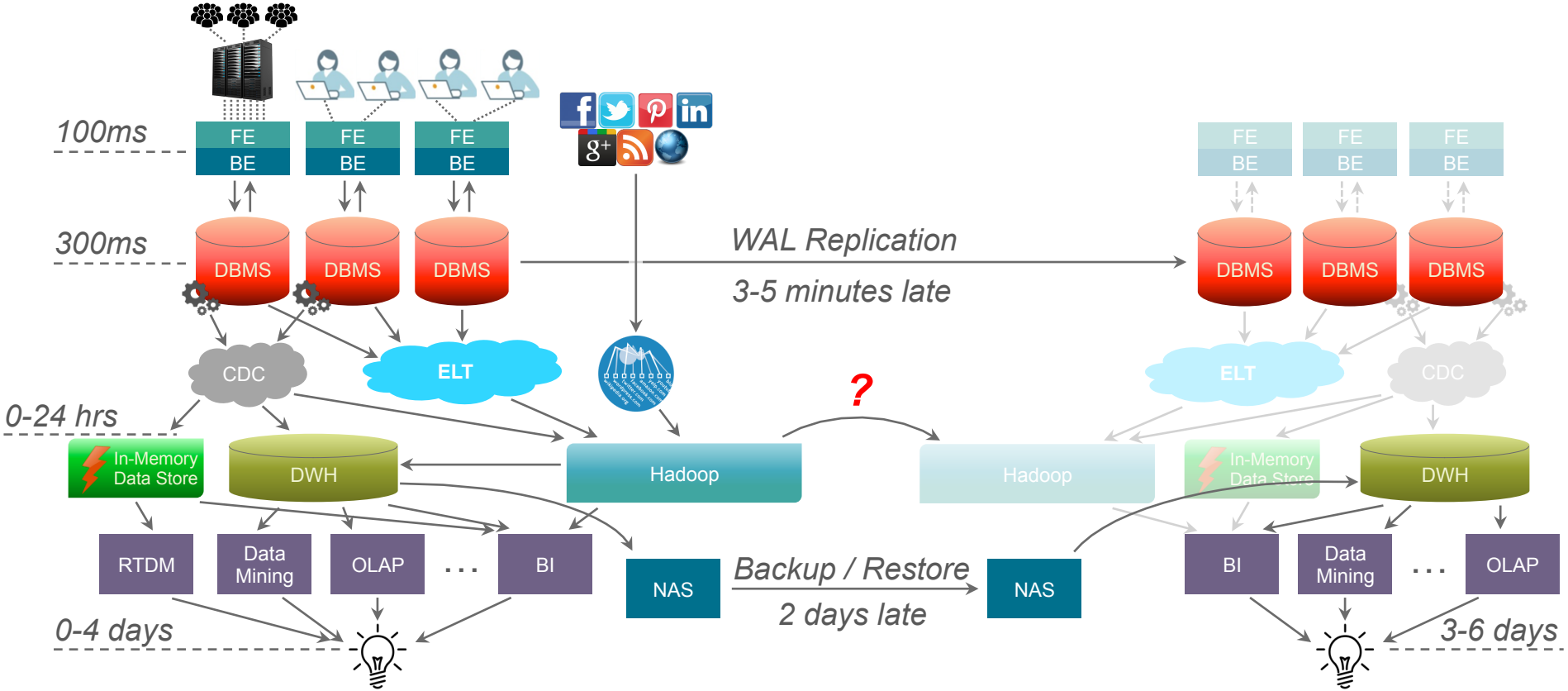
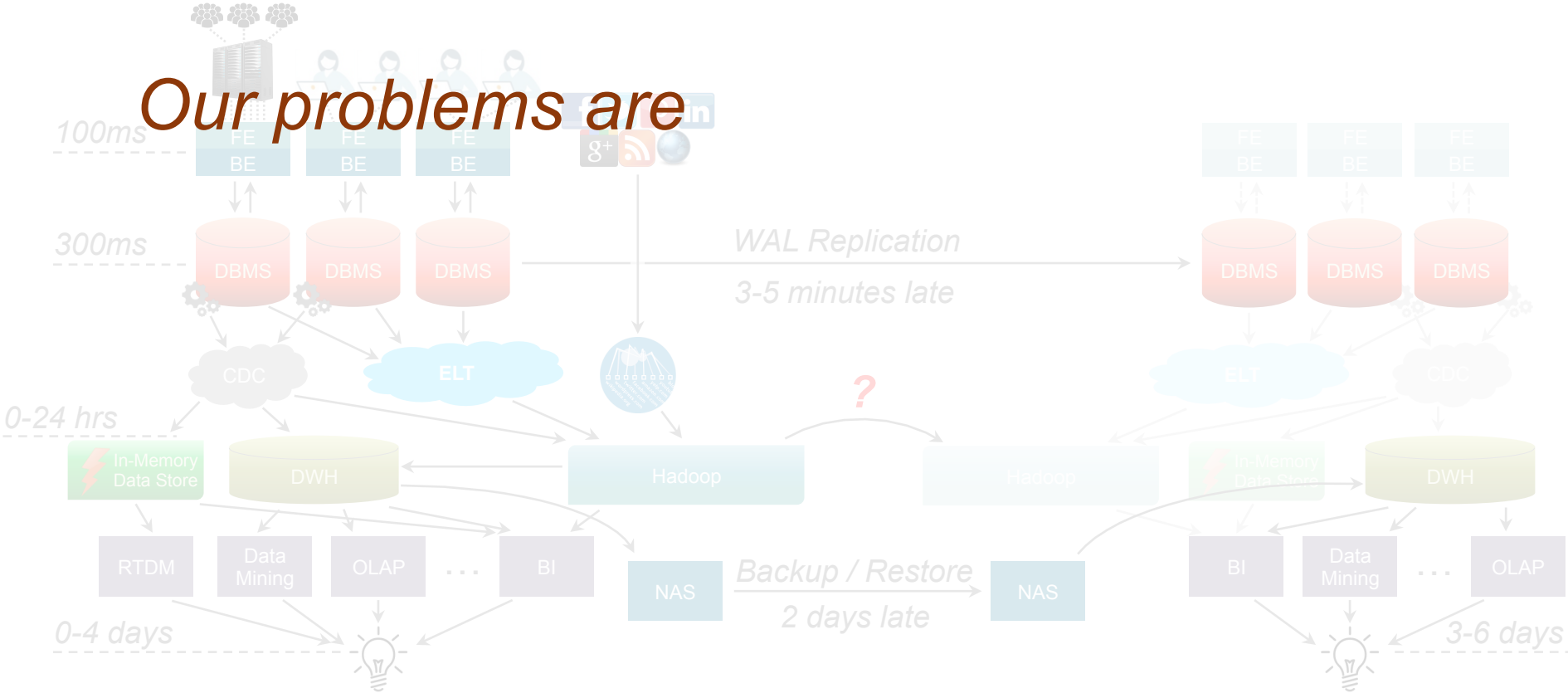


Modern Architectures

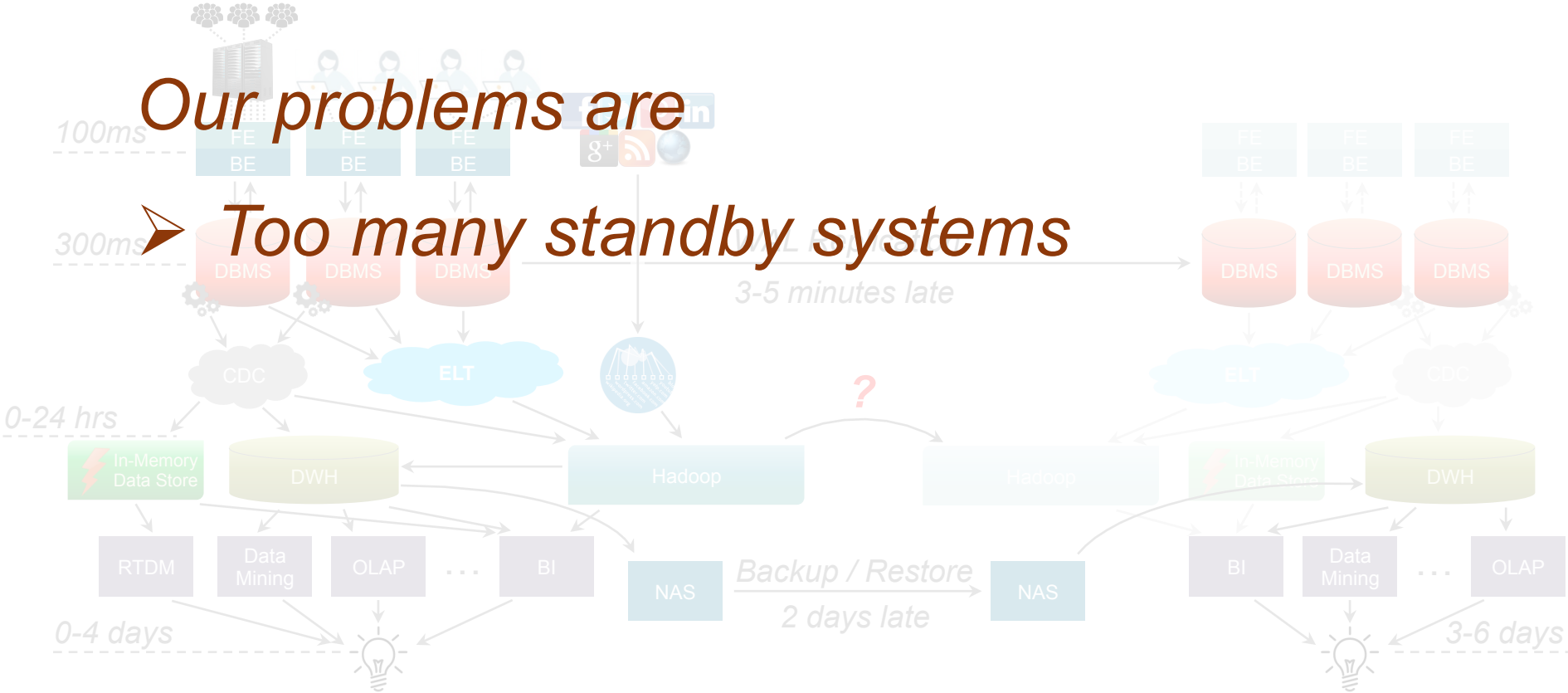
Our problems are



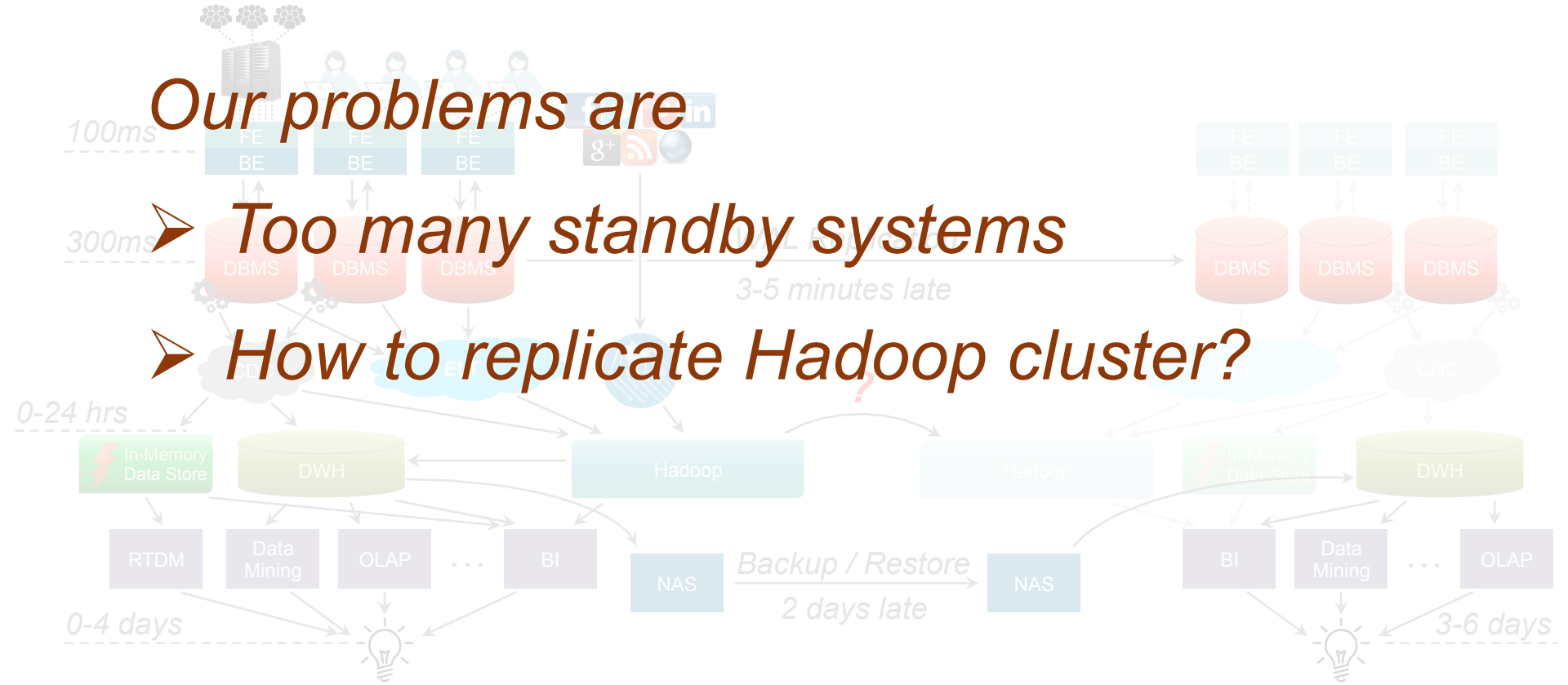
Modern Architectures

Our problems are

- *Too many standby systems*



Modern Architectures



Our problems are

- *Too many standby systems*
- *How to replicate Hadoop cluster?*

Modern Architectures

Our problems are

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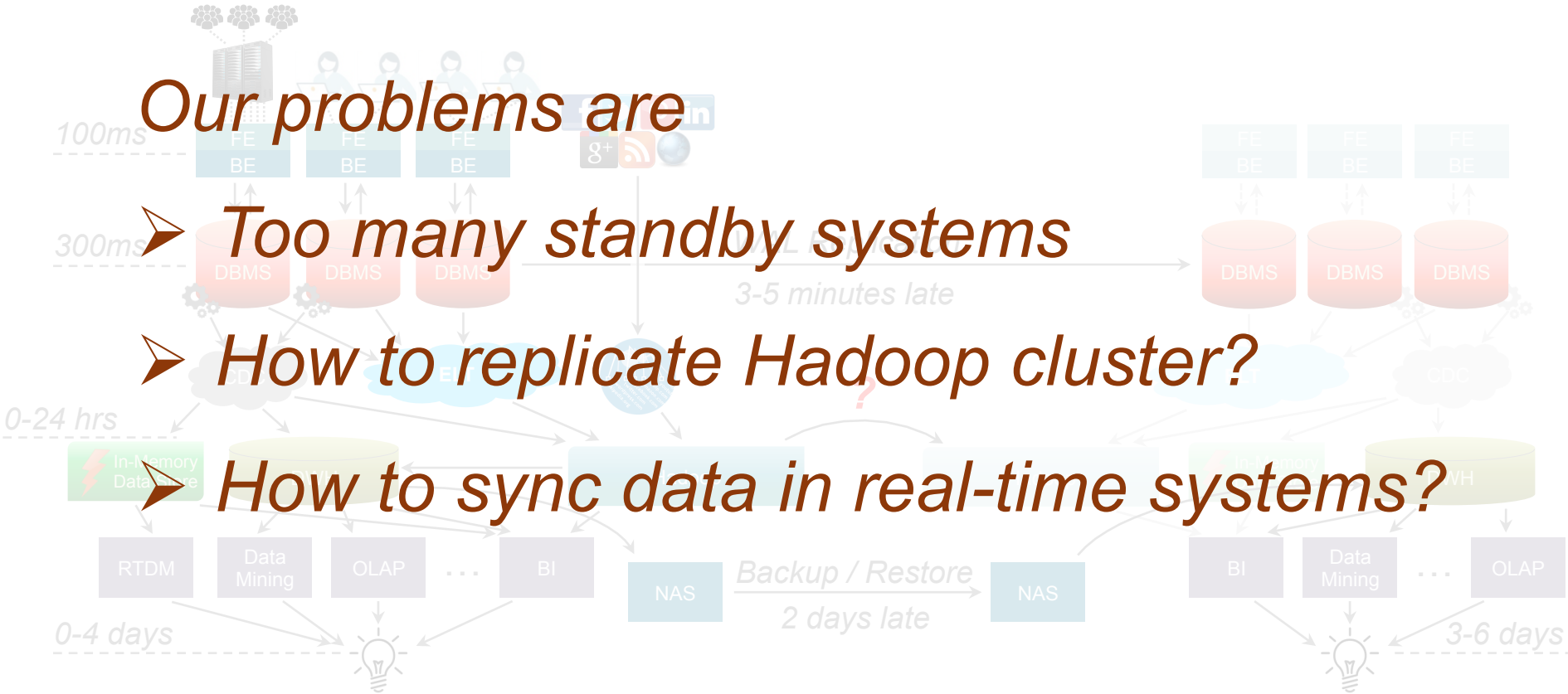
- *How to replicate Hadoop cluster?*
- *How to sync data in real-time systems?*



Modern Architectures

Our problems are

- *Too many standby systems*
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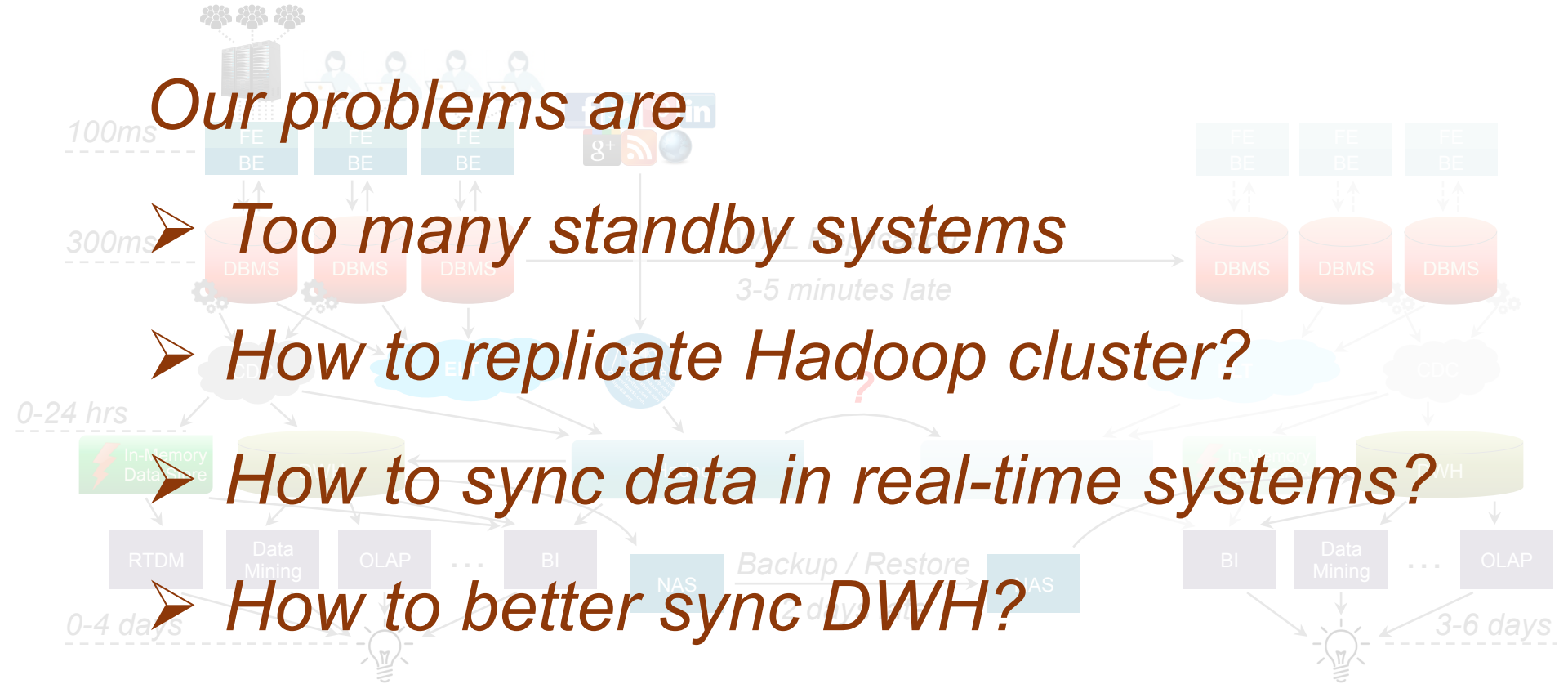
- *How to sync data in real-time systems?*
- *How to better sync DWH?*



Modern Architectures

Our problems are

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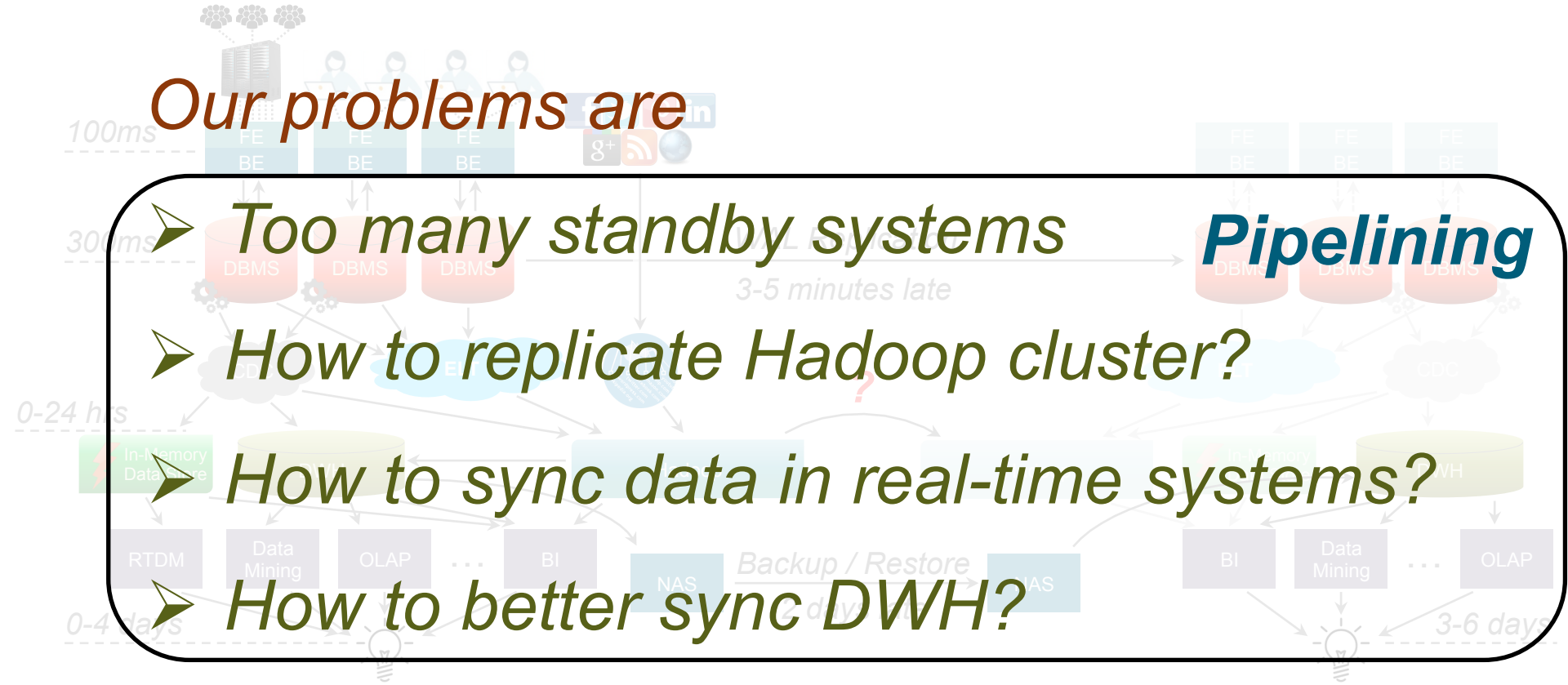
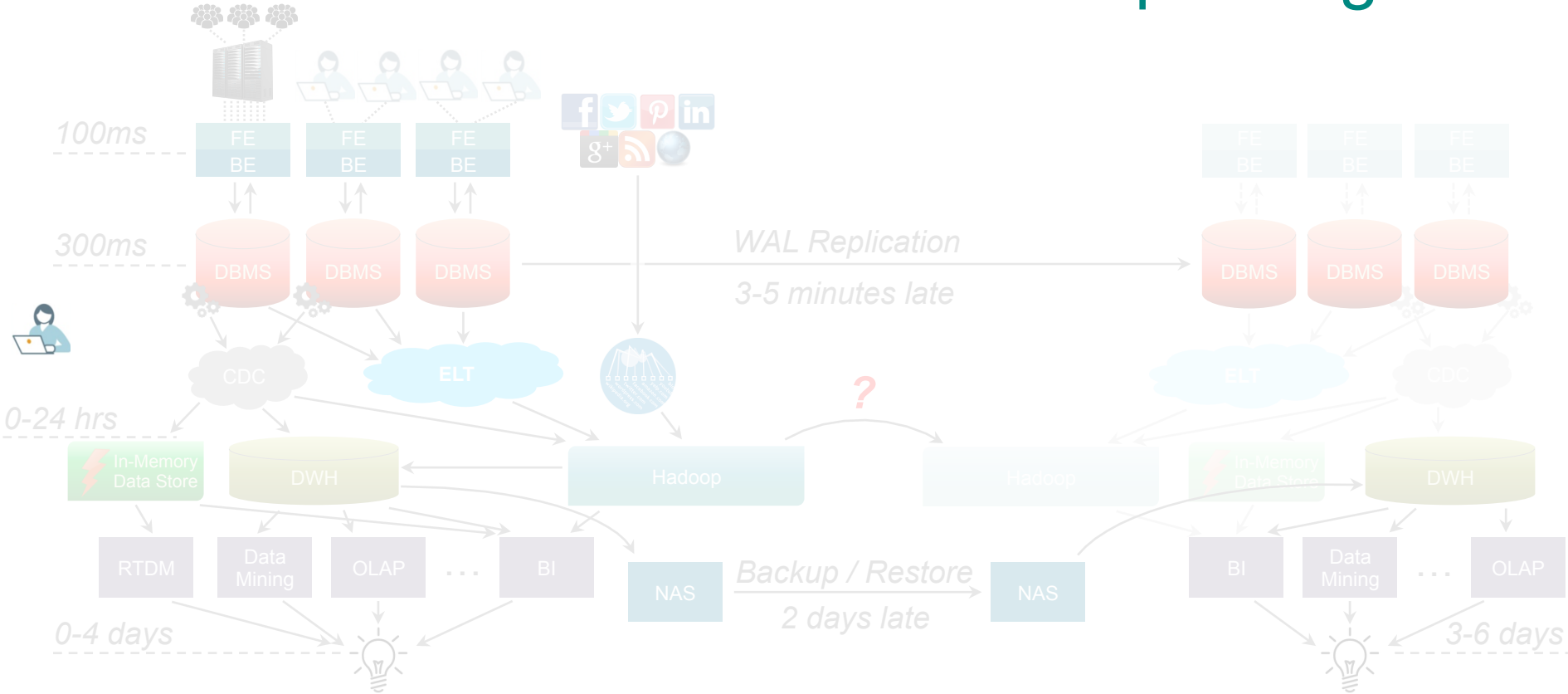
Pipelining



Modern Data Architecture – Pipelining



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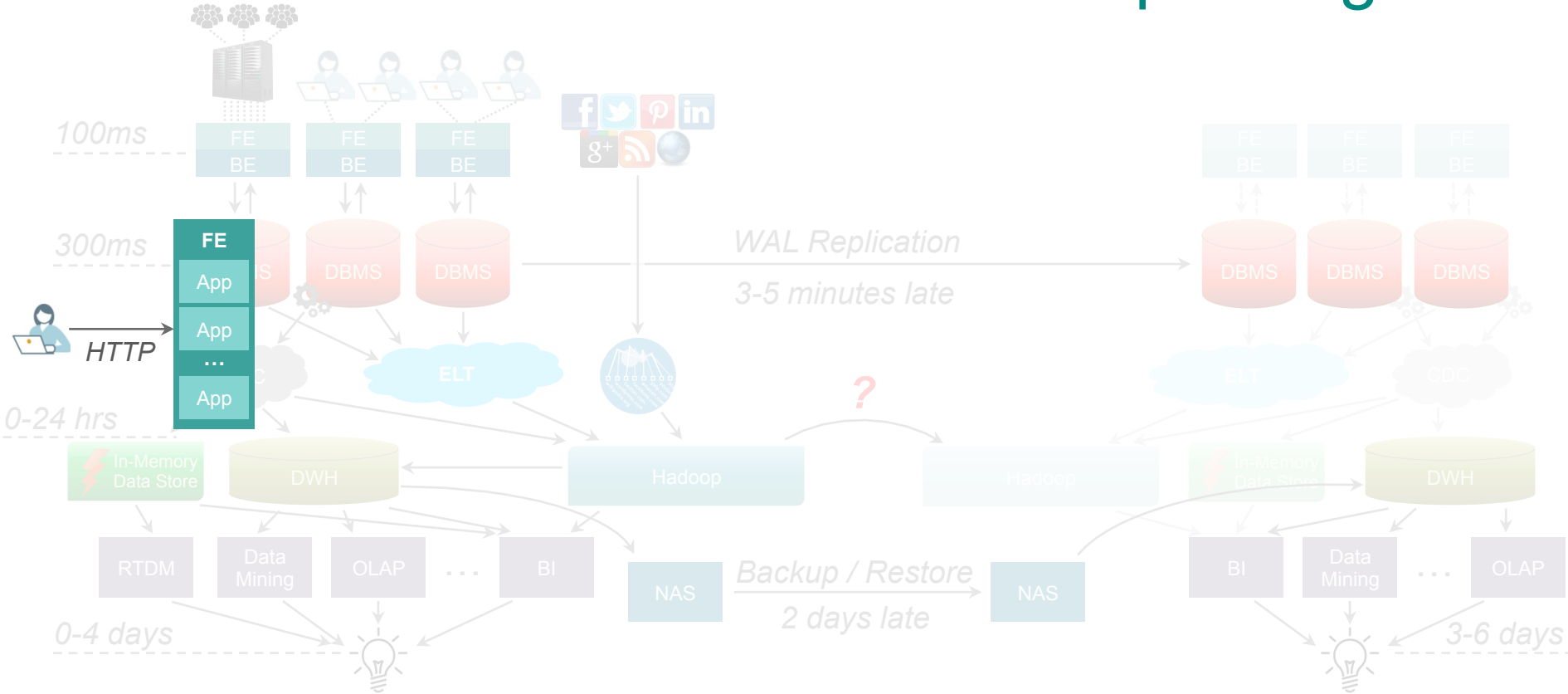

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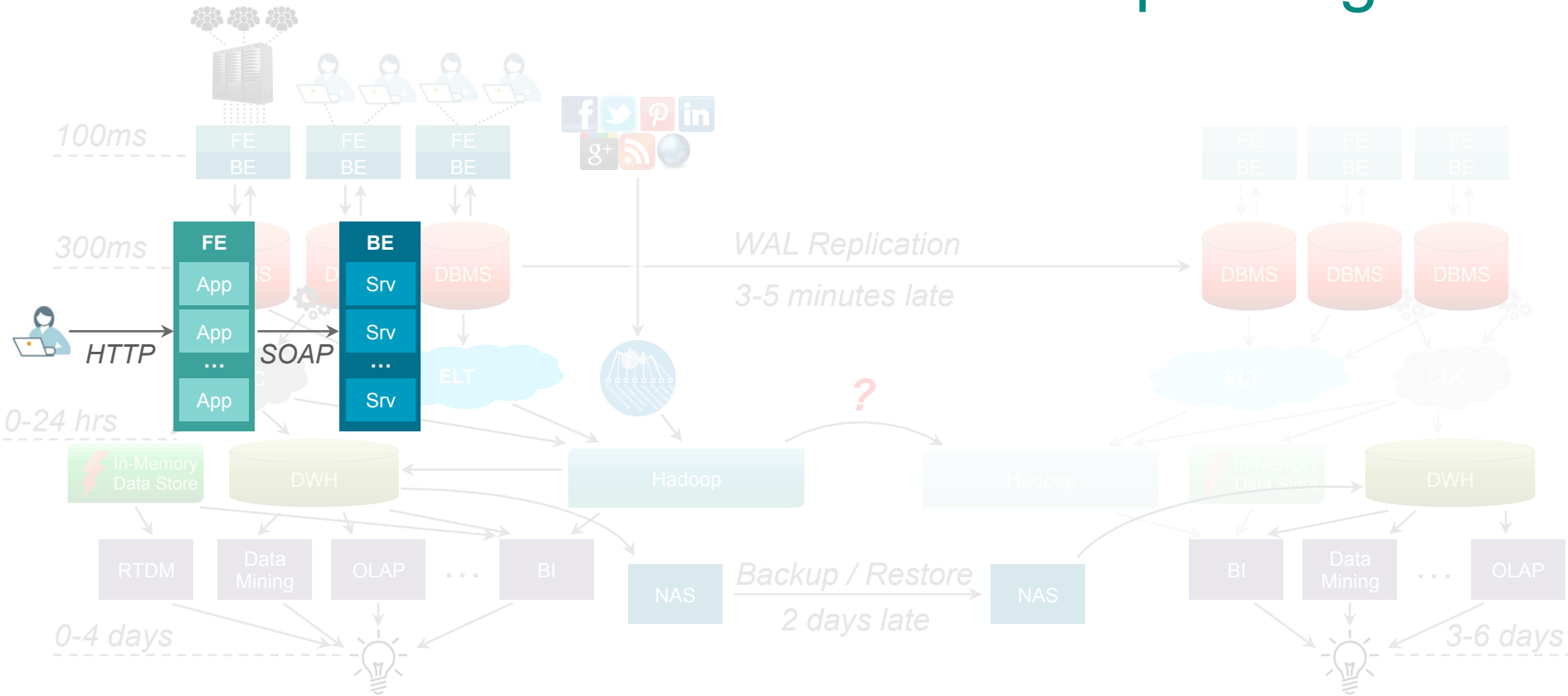

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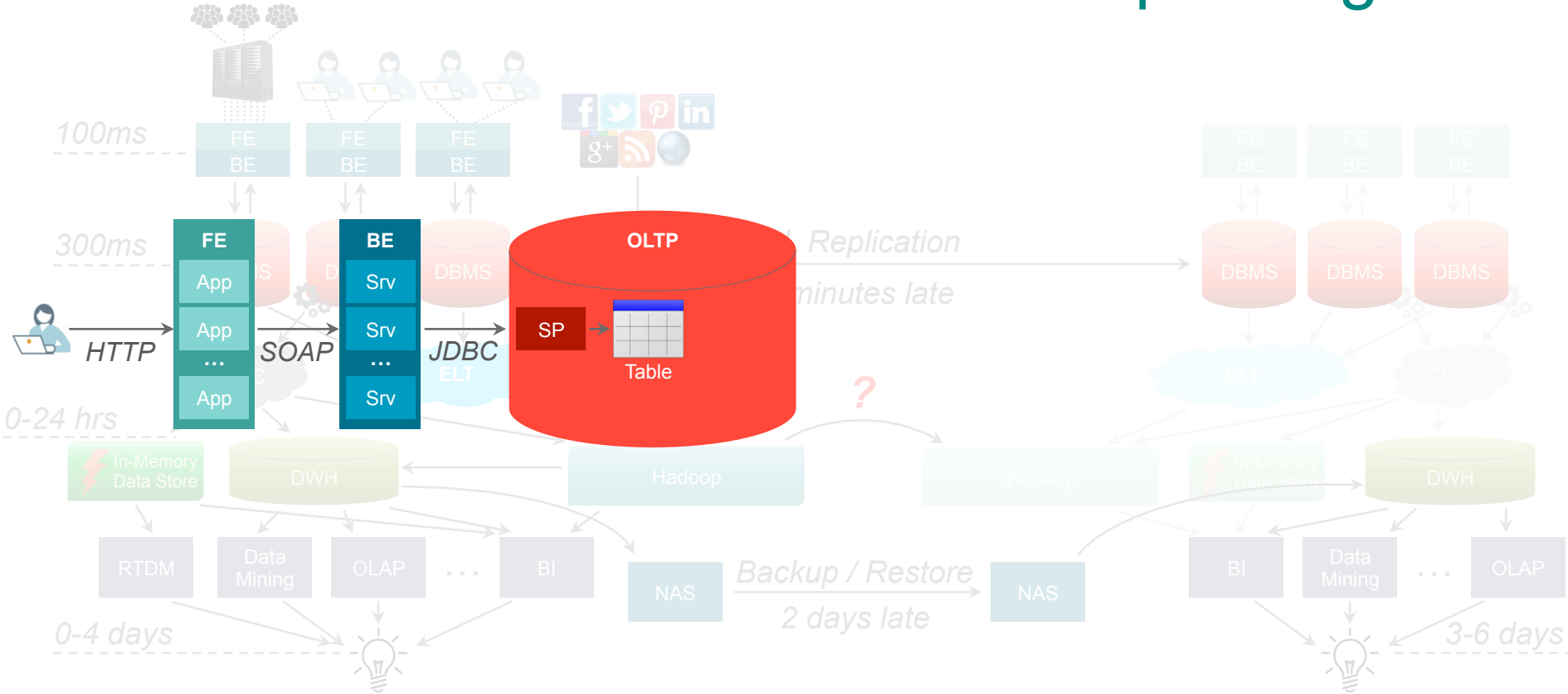

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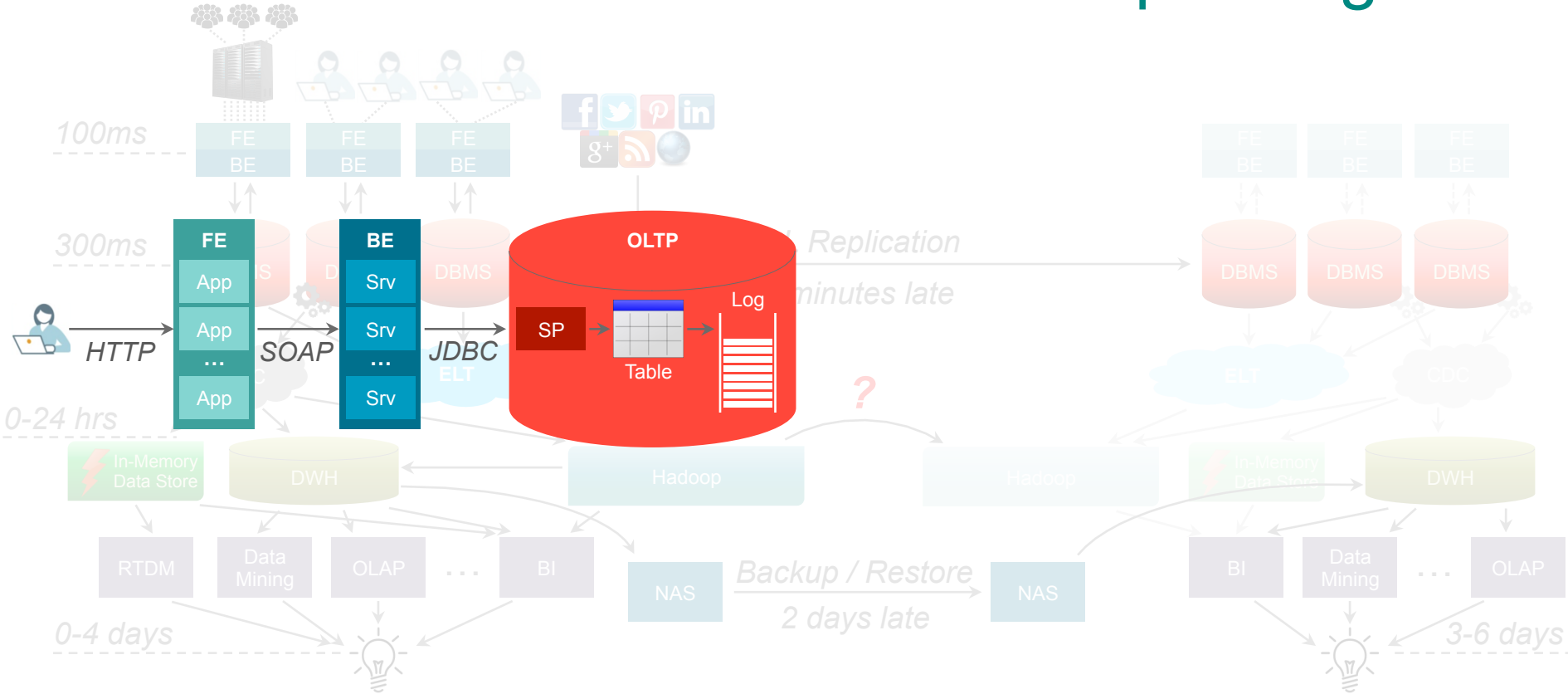

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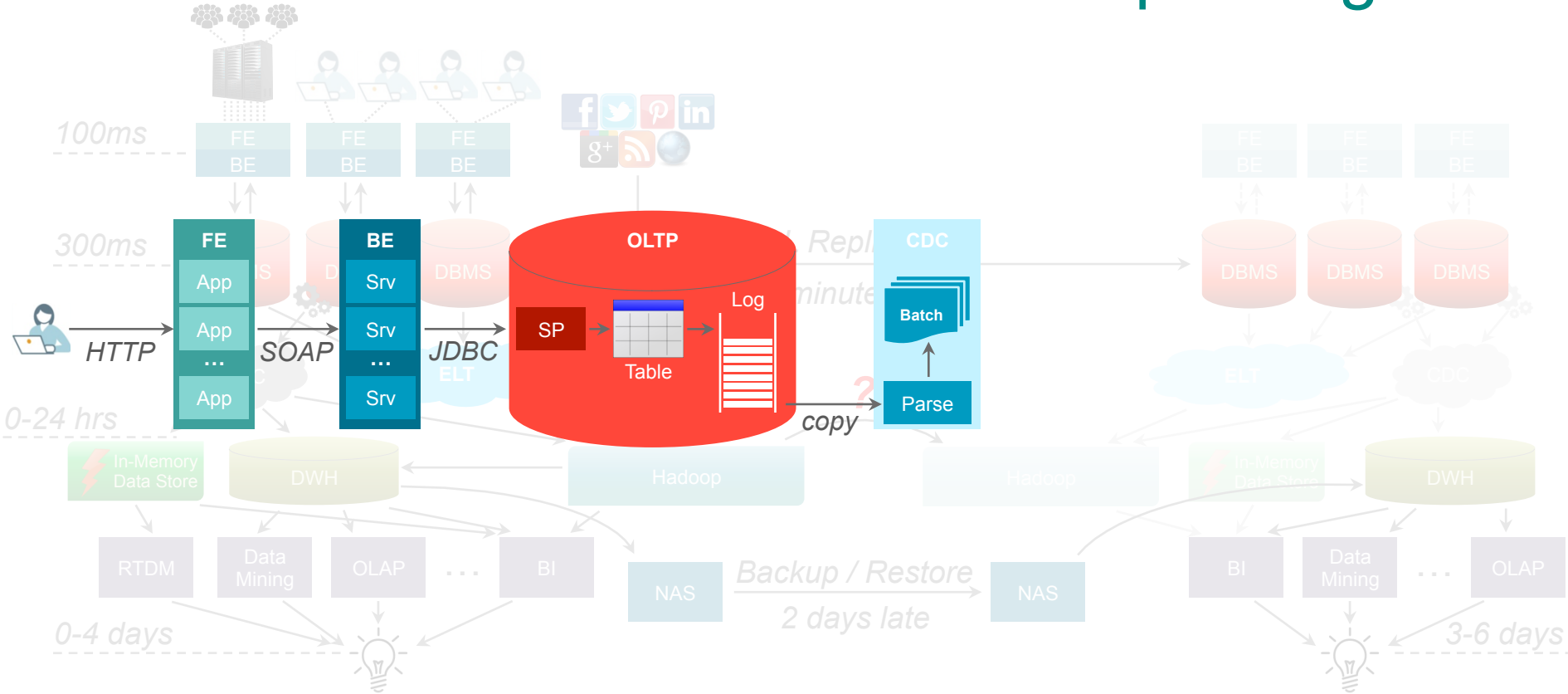

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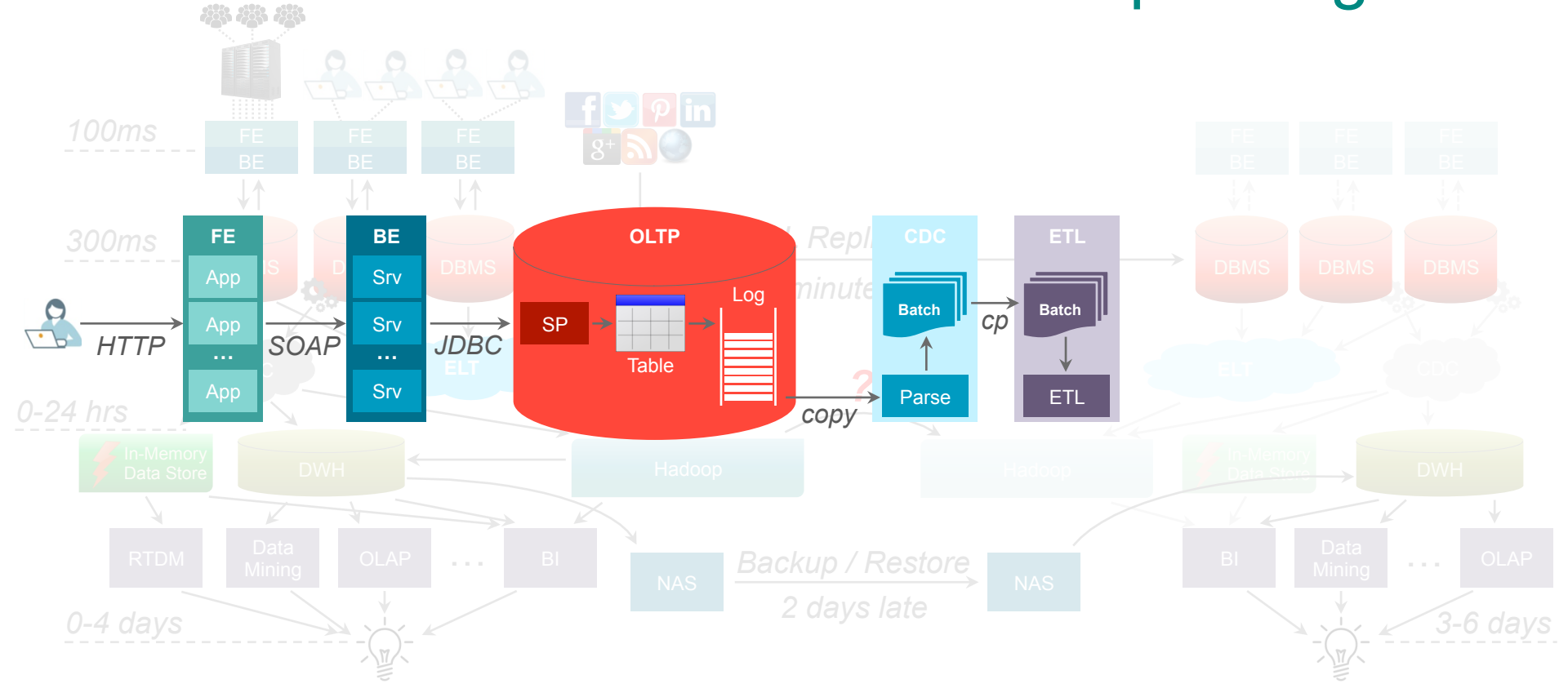

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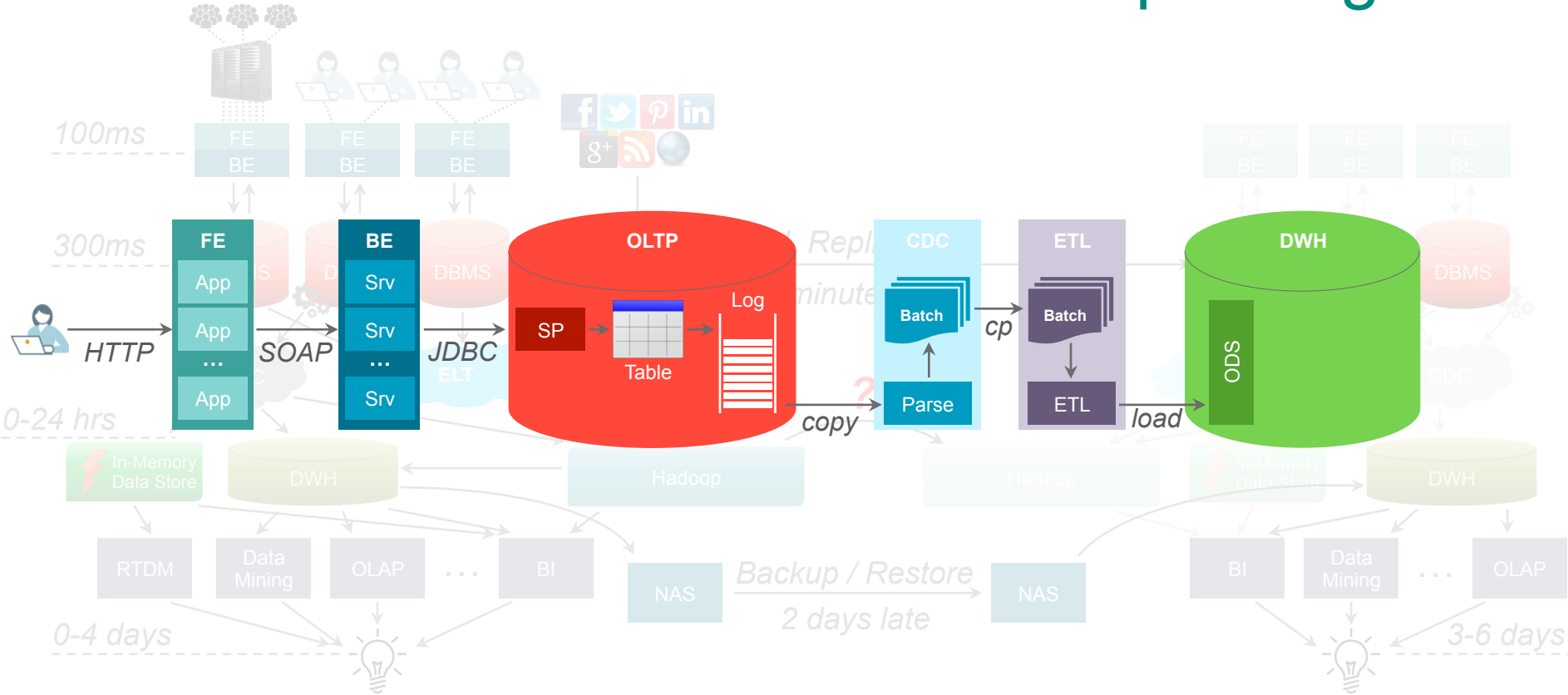

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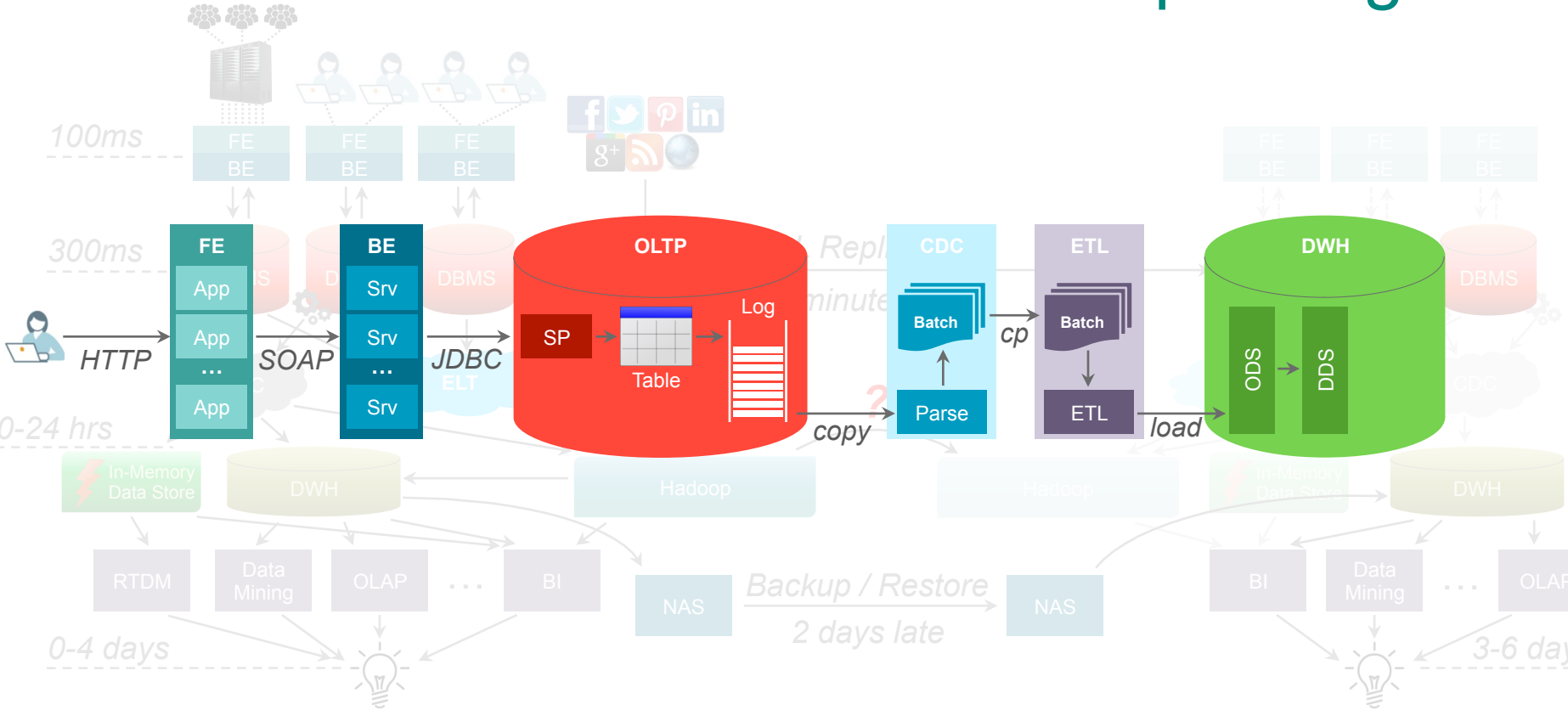

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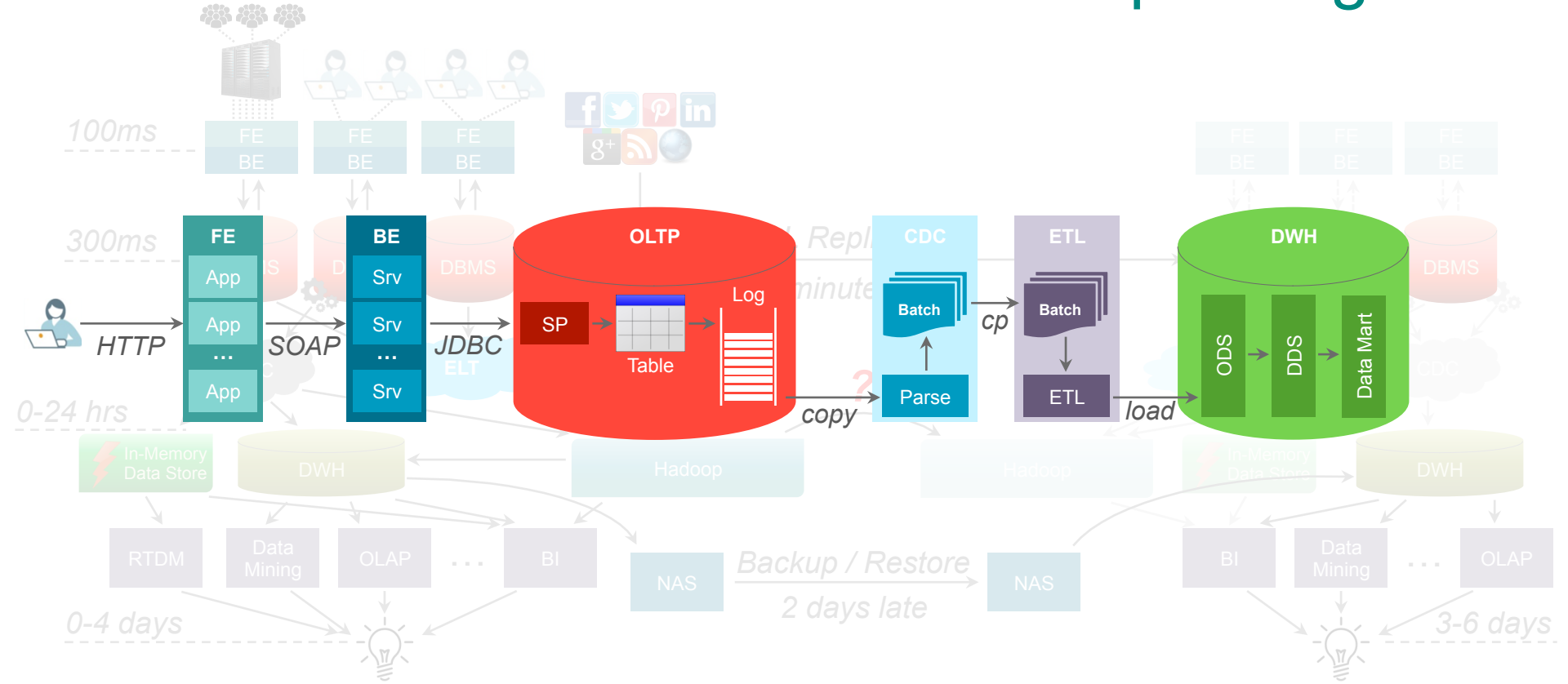

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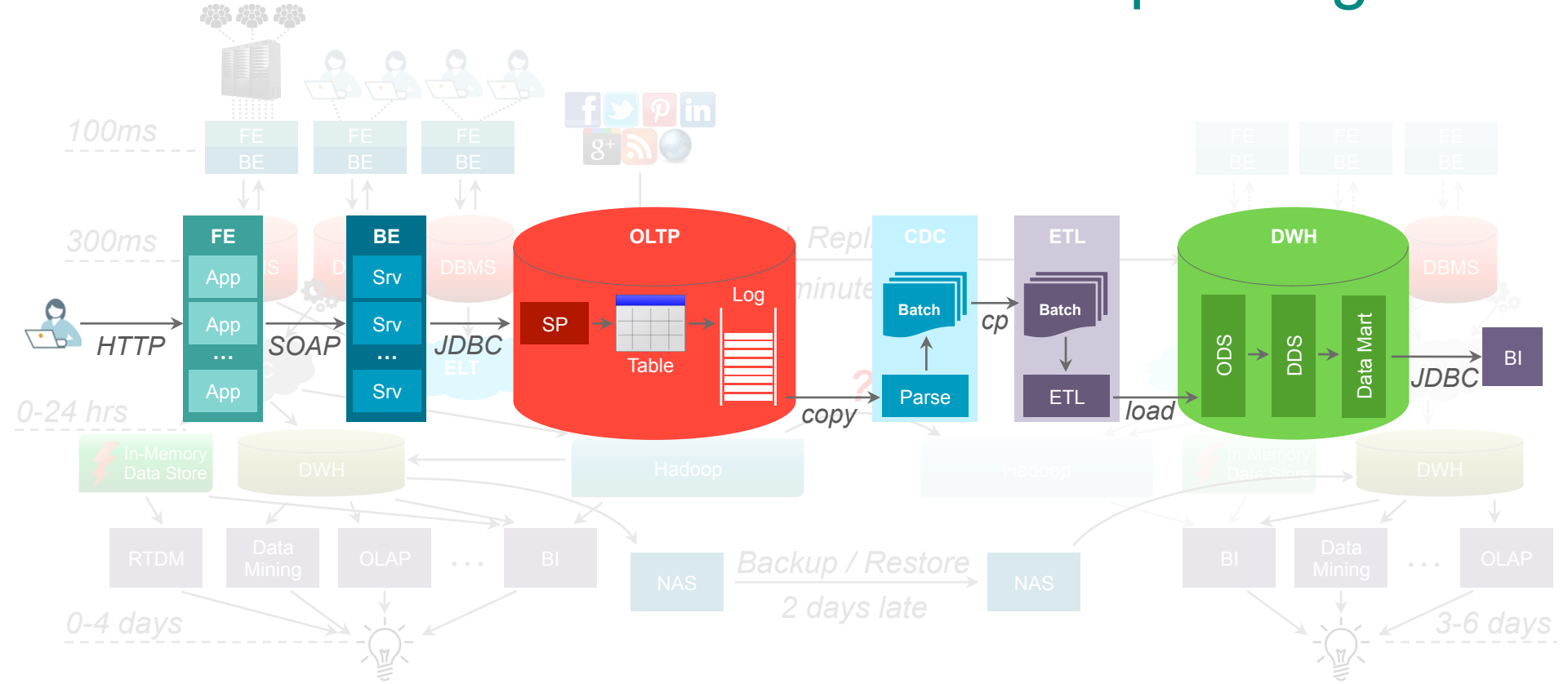

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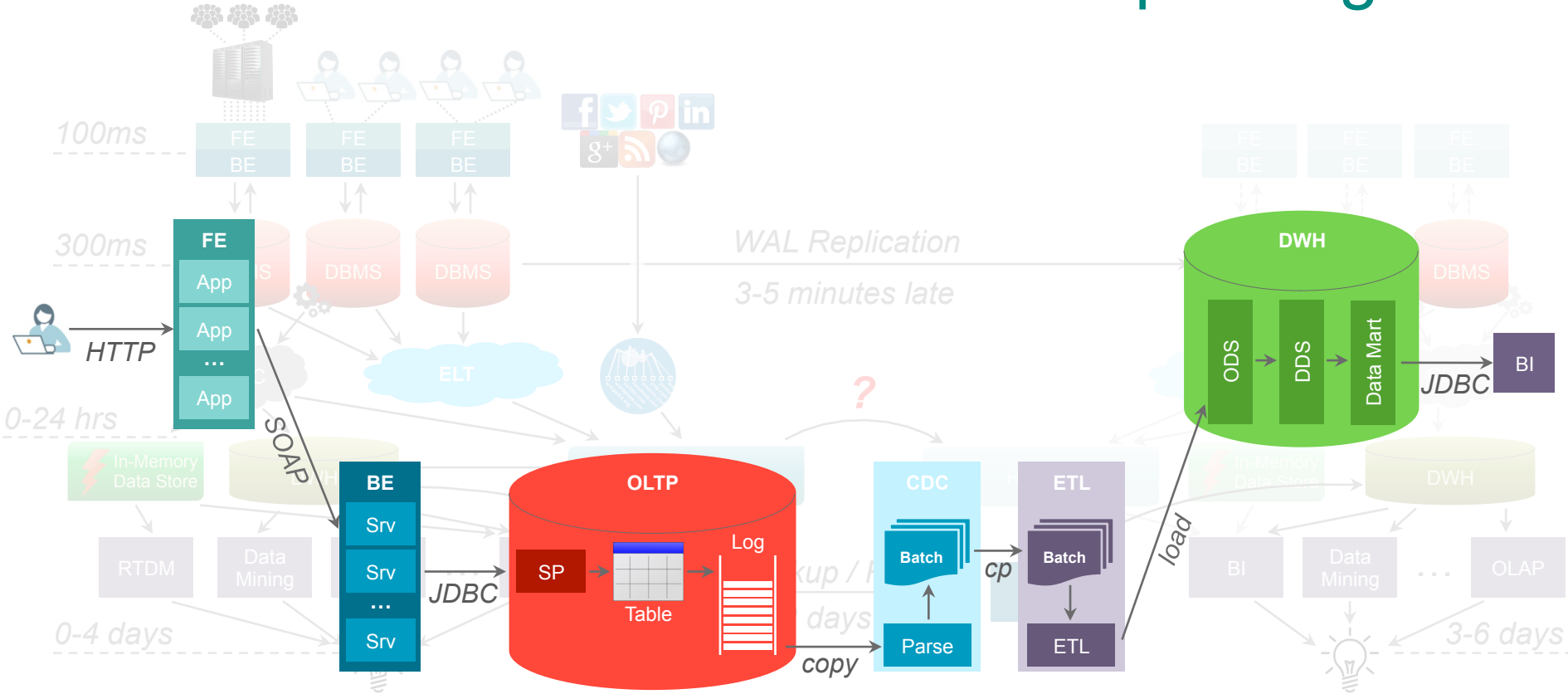

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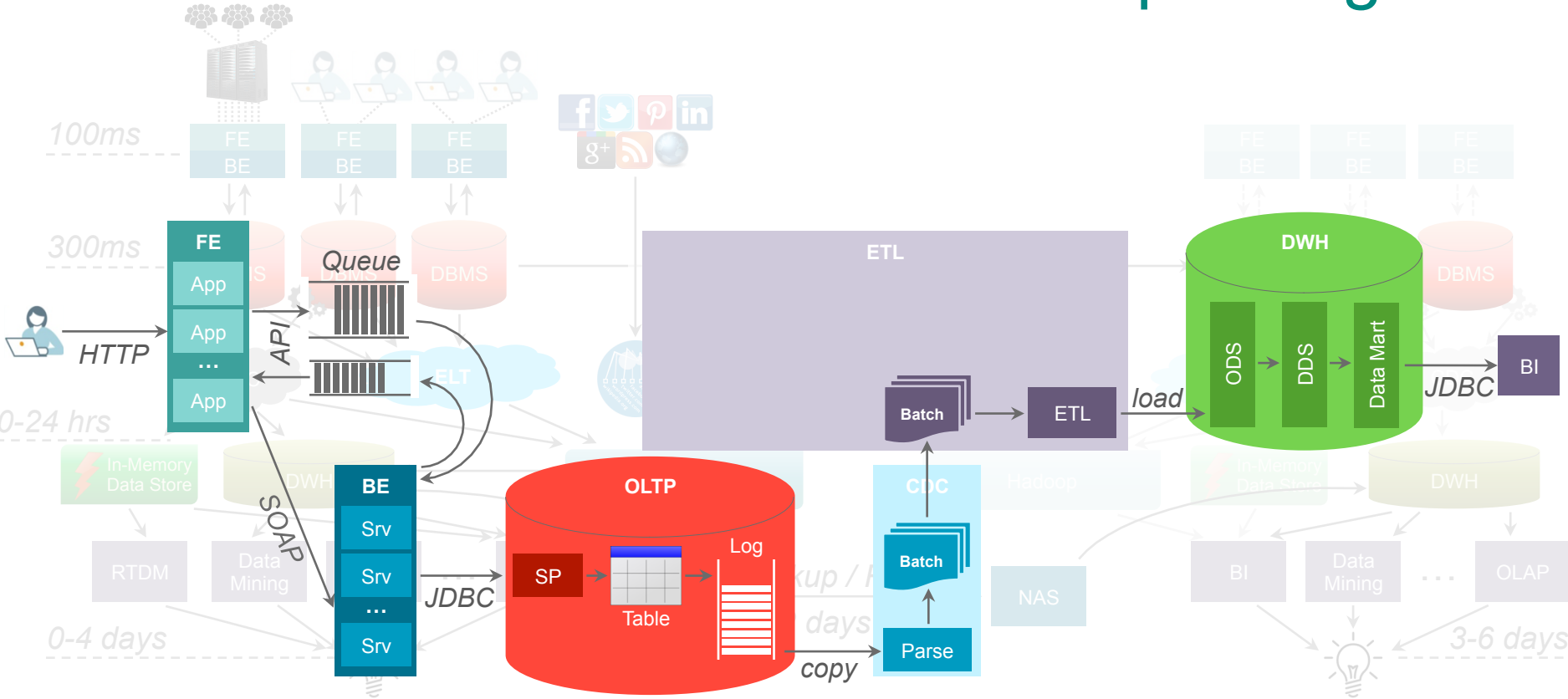

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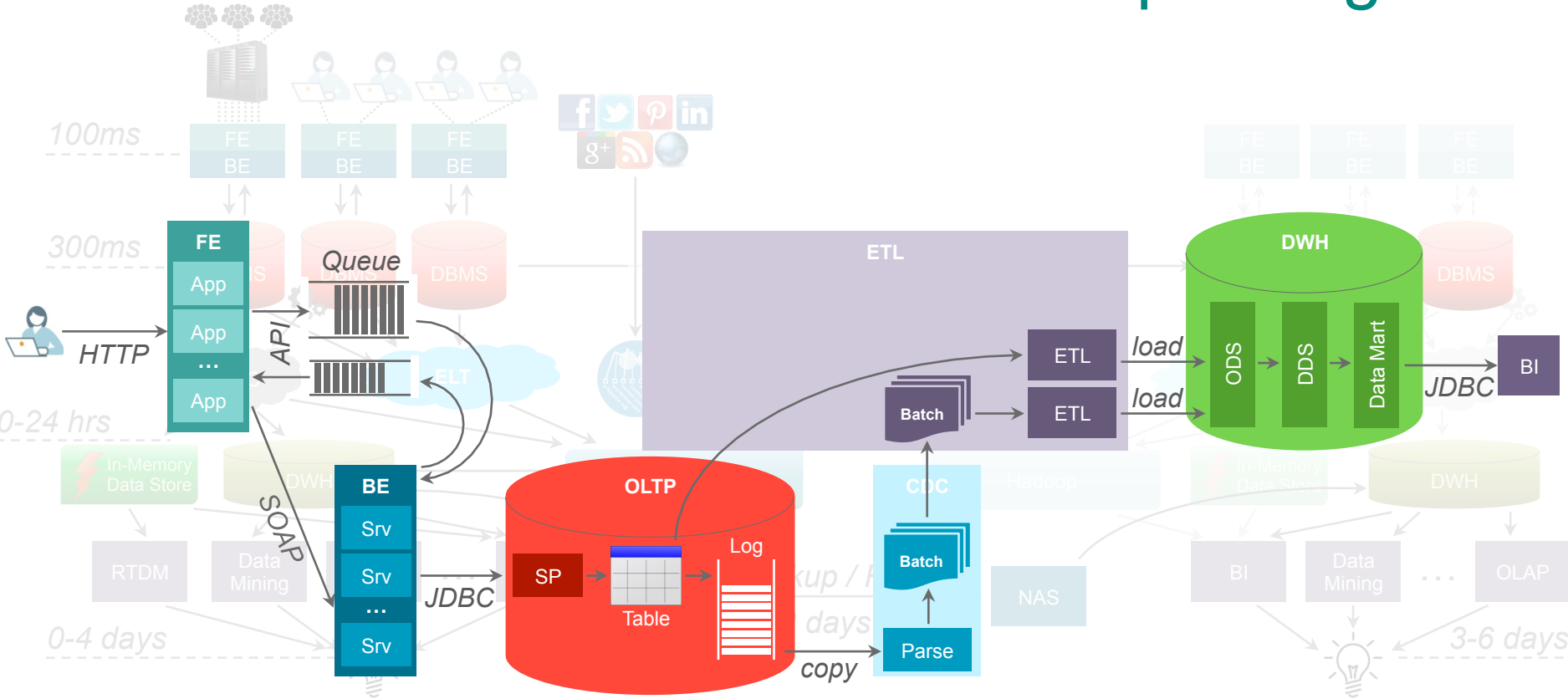

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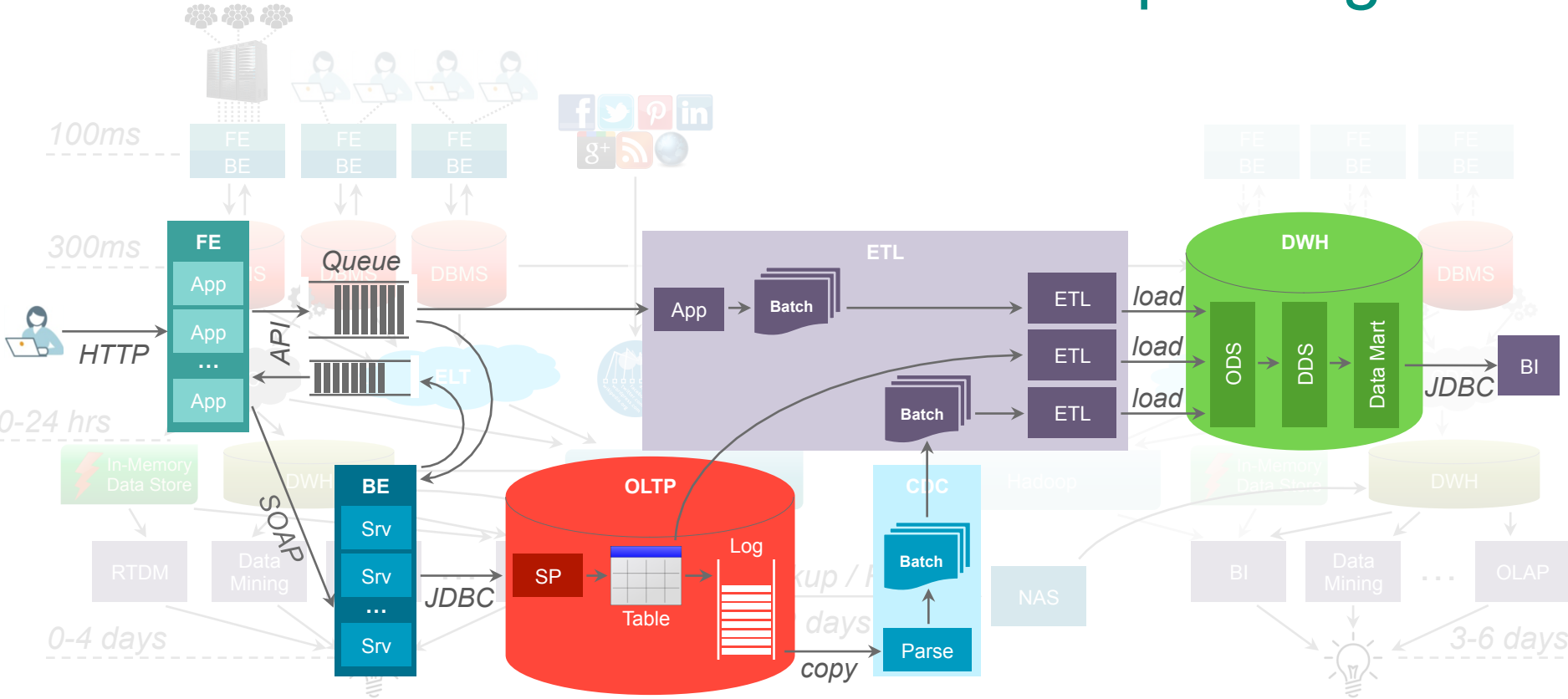

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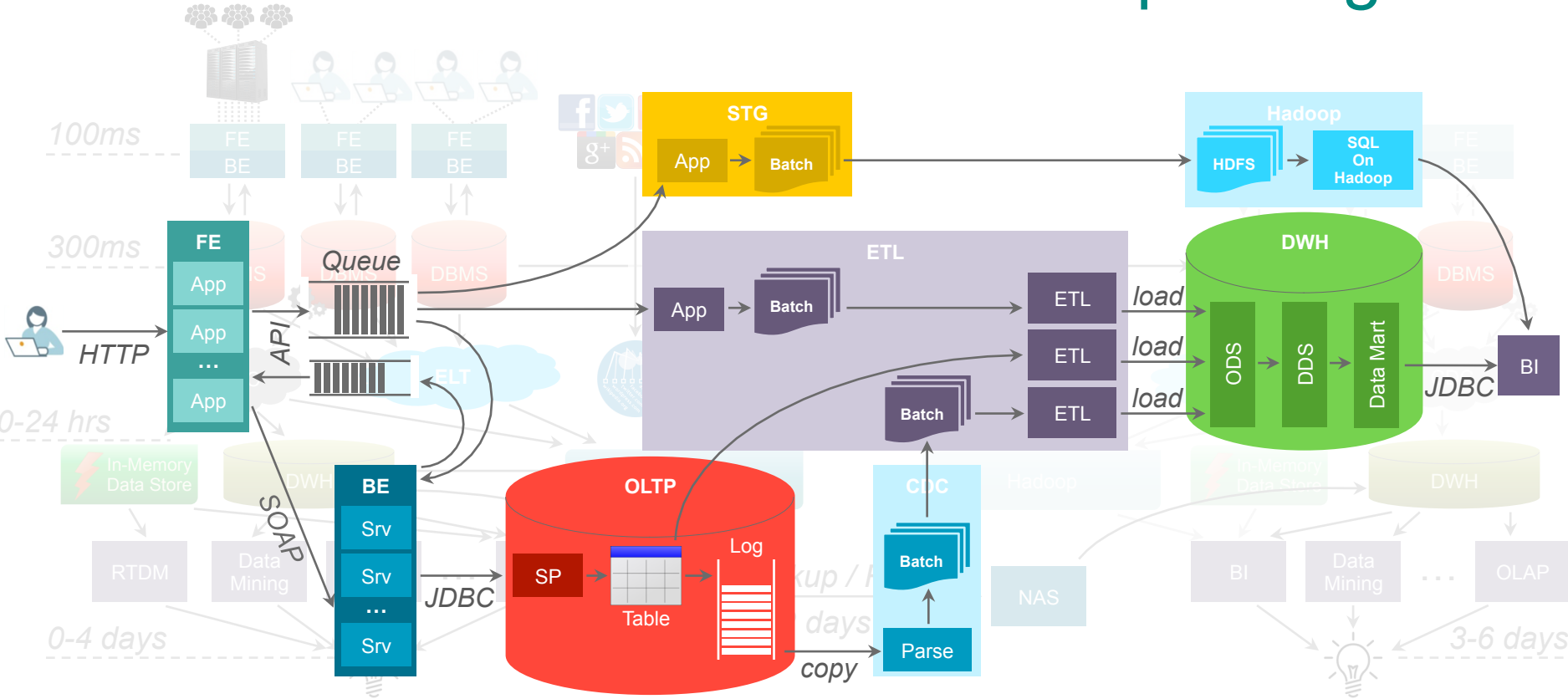

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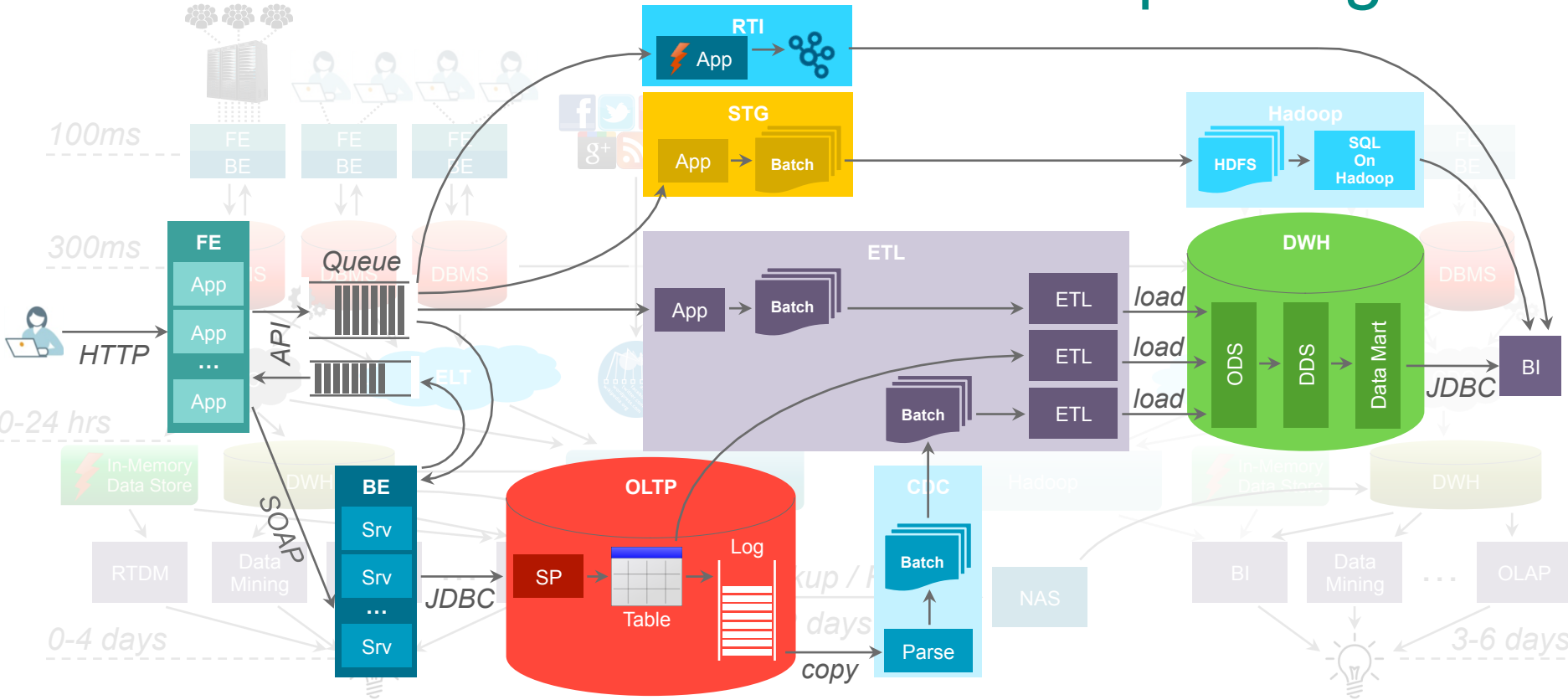

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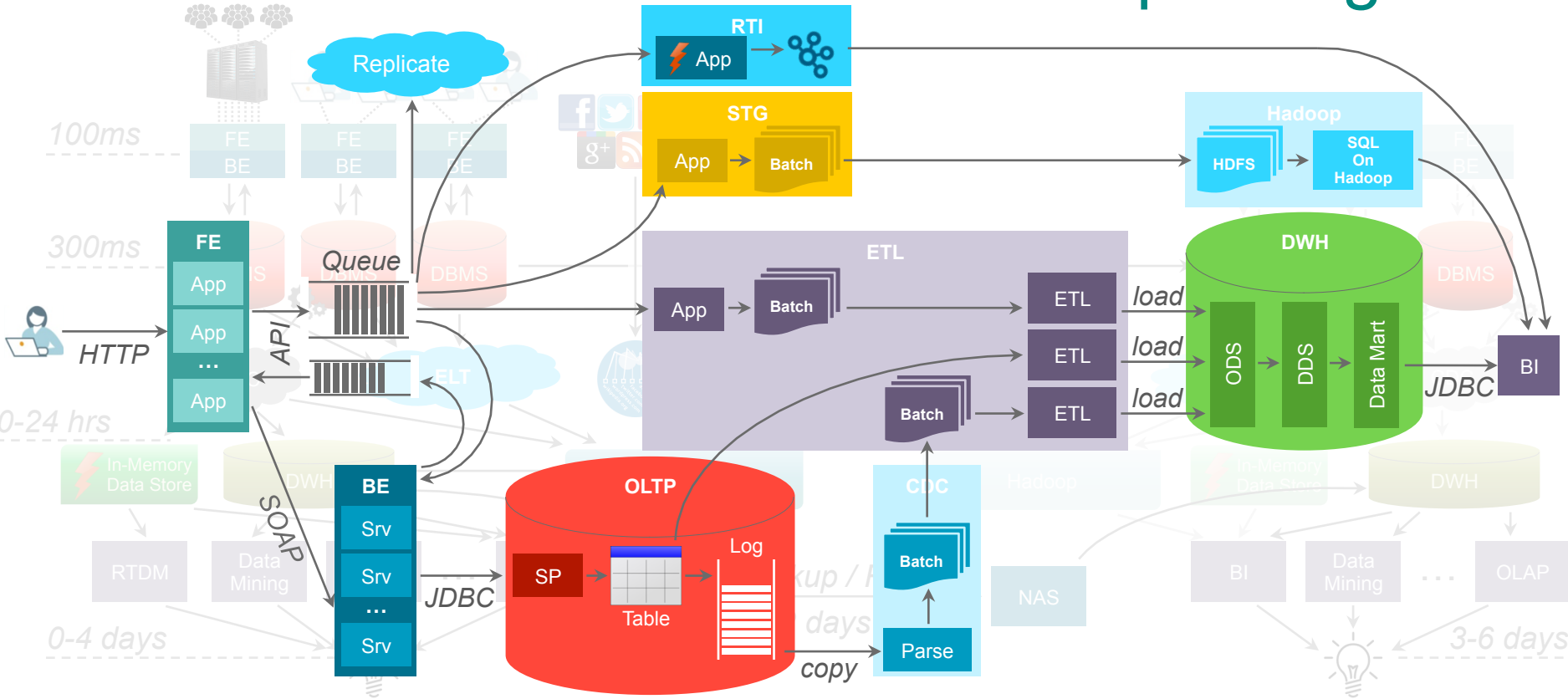

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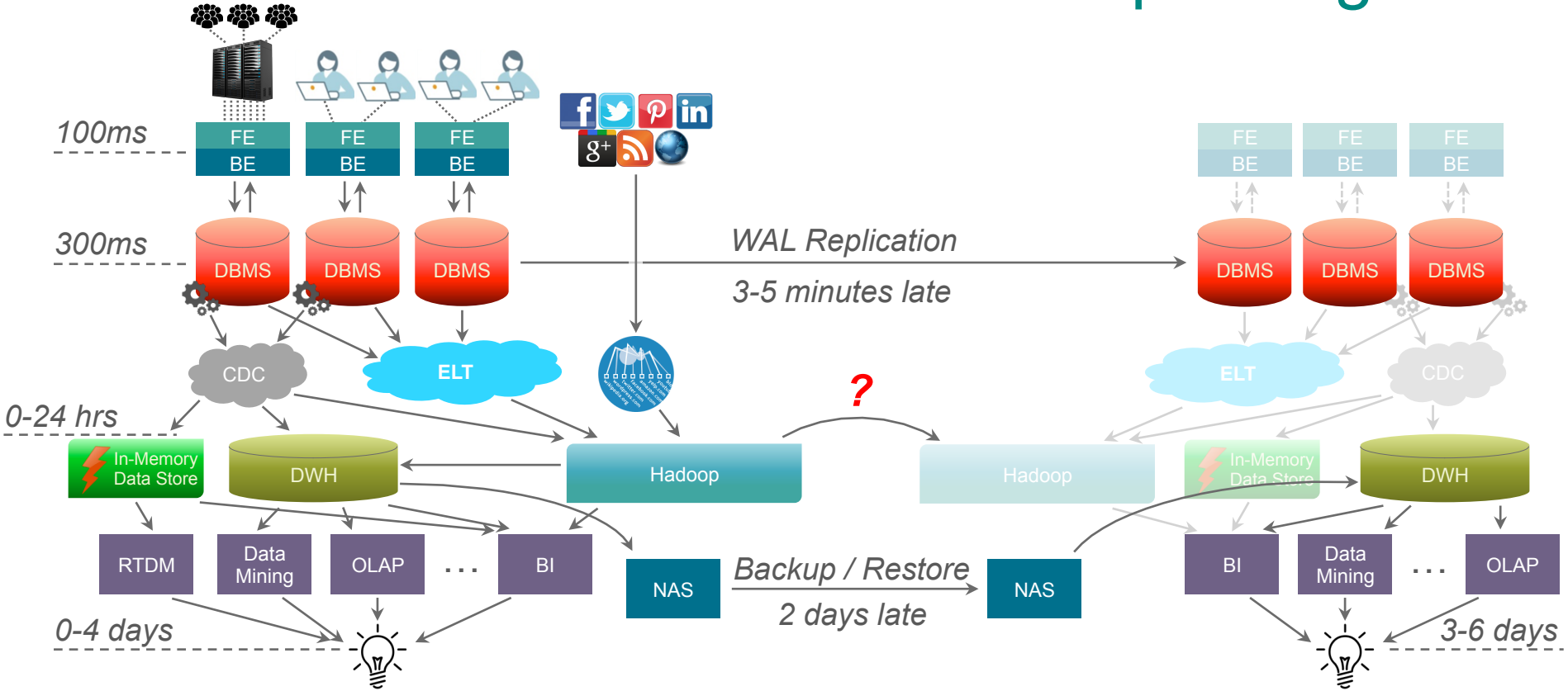

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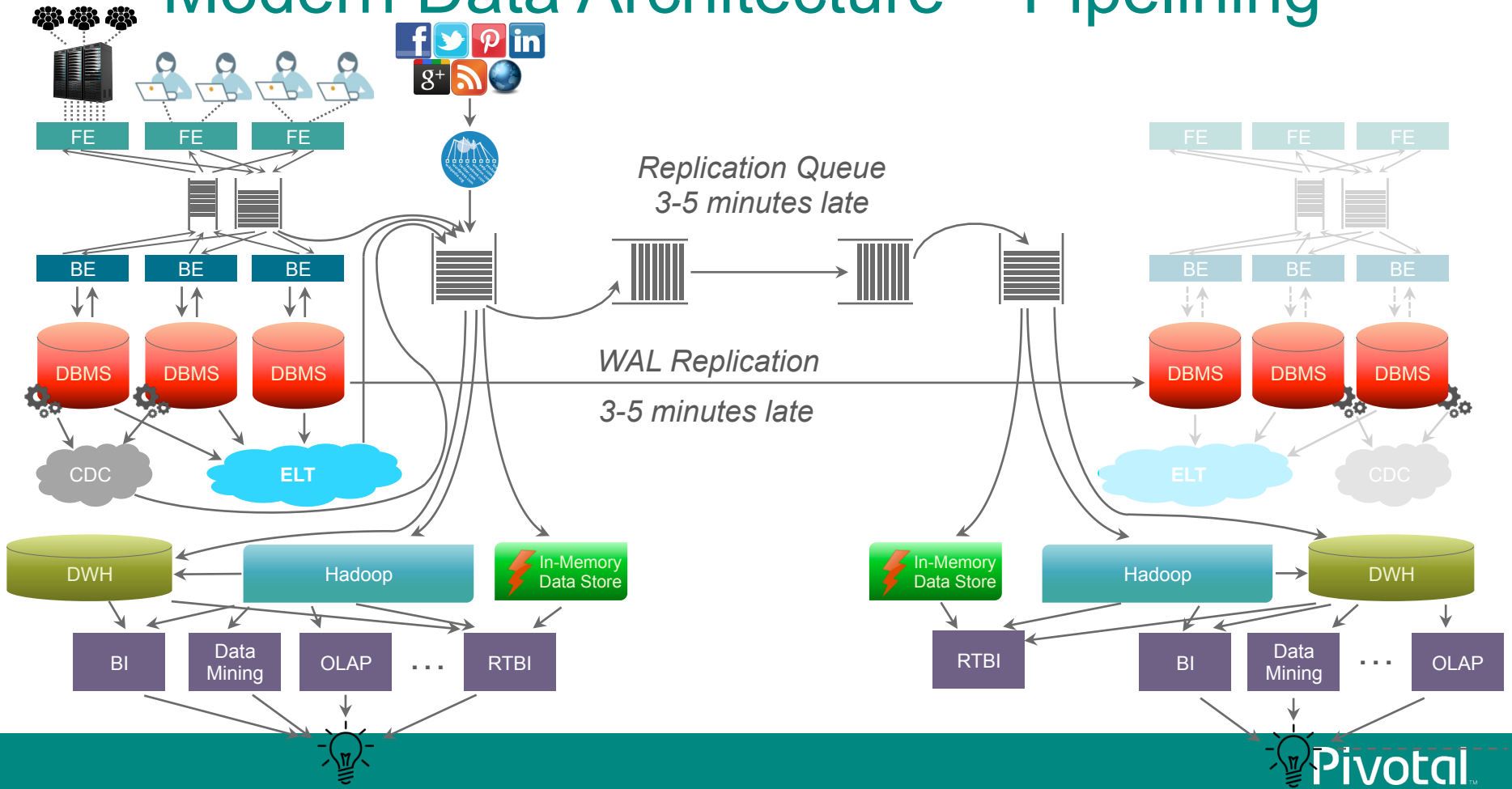
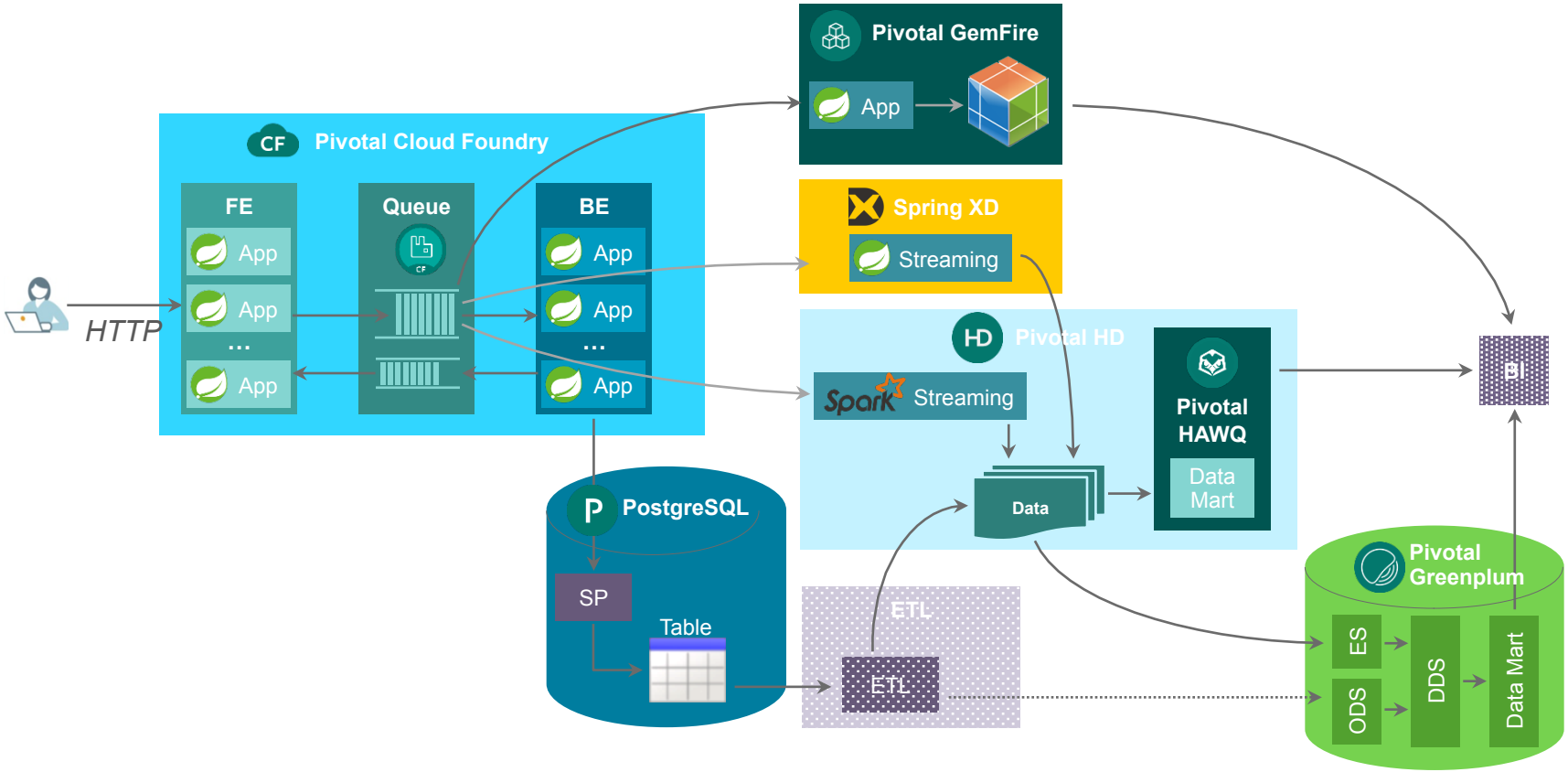
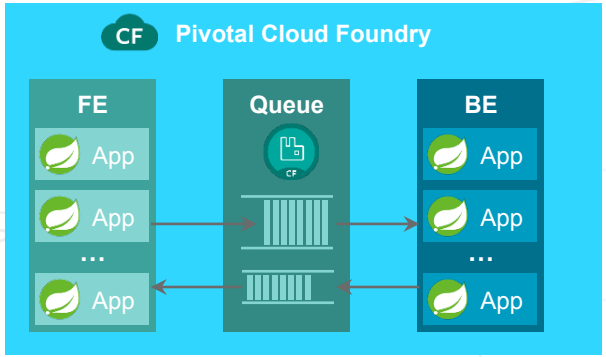


Pivotal and Modern Data Architecture

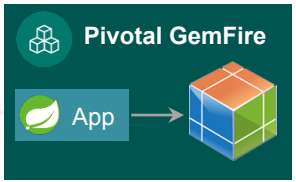


Pivotal and Modern Data Architecture



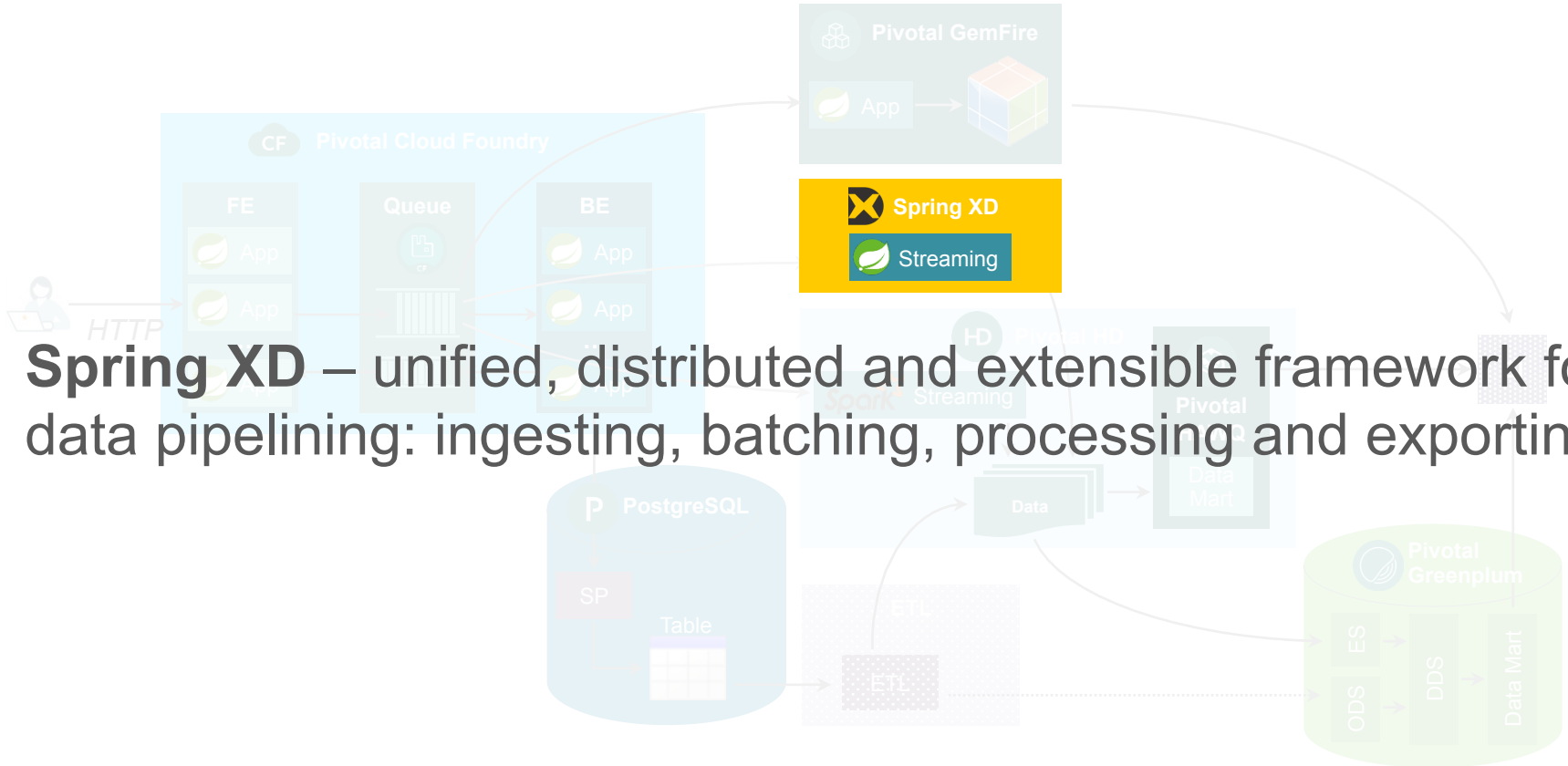
- **Pivotal Labs** – agile software development for next-generation applications
- **Pivotal Cloud Foundry** – PaaS for customer applications
- **RabbitMQ** – distributed message queue service on top of PCF
- **Spring IO** – foundation platform for modern applications

Pivotal and Modern Data Architecture



Pivotal GemFire and **Apache Geode (incubating)** – in-memory data grid enabling real-time data processing and real-time decision making for enterprises

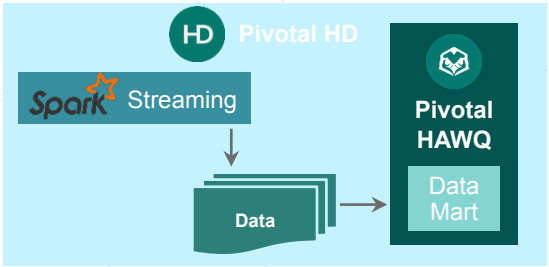
Pivotal and Modern Data Architecture



Spring XD – unified, distributed and extensible framework for data pipelining: ingesting, batching, processing and exporting

Pivotal and Modern Data Architecture

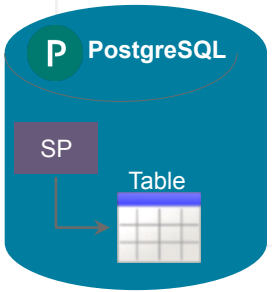
- **Pivotal HD** – leading Hadoop distribution based on ODP
- **Pivotal HAWQ** and **Apache HAWQ** (incubating) – bringing the power of MPP to the Hadoop cluster, best in class SQL-on-Hadoop solution



- **Apache Spark** – component of the Pivotal HD distribution, modern framework for distributed data processing

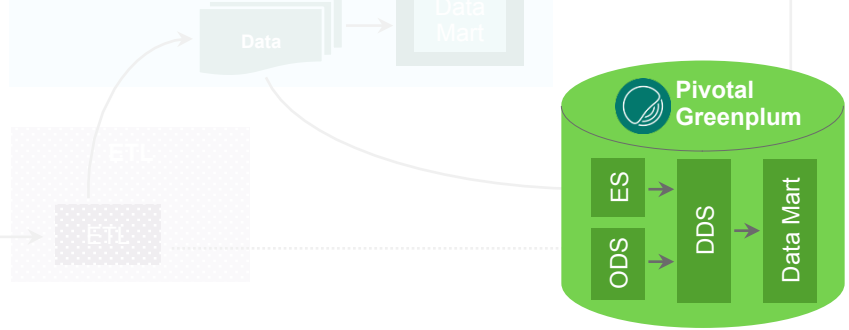
Pivotal and Modern Data Architecture

- **Pivotal PostgreSQL** – commercially supported by Pivotal open source distribution of PostgreSQL

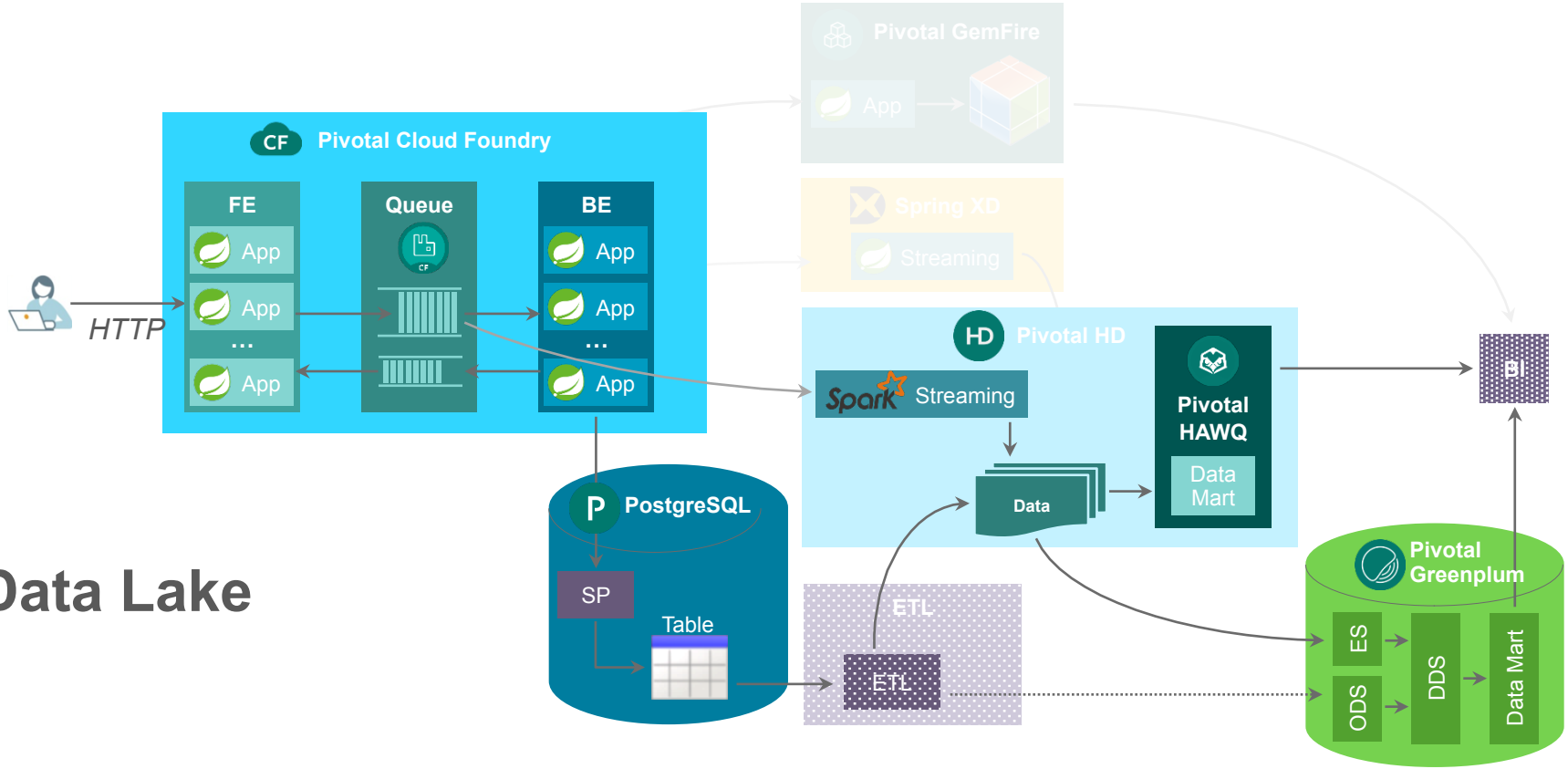


Pivotal and Modern Data Architecture

Pivotal Greenplum – leading analytical MPP database, foundation for the enterprise data warehousing systems and advanced analytics

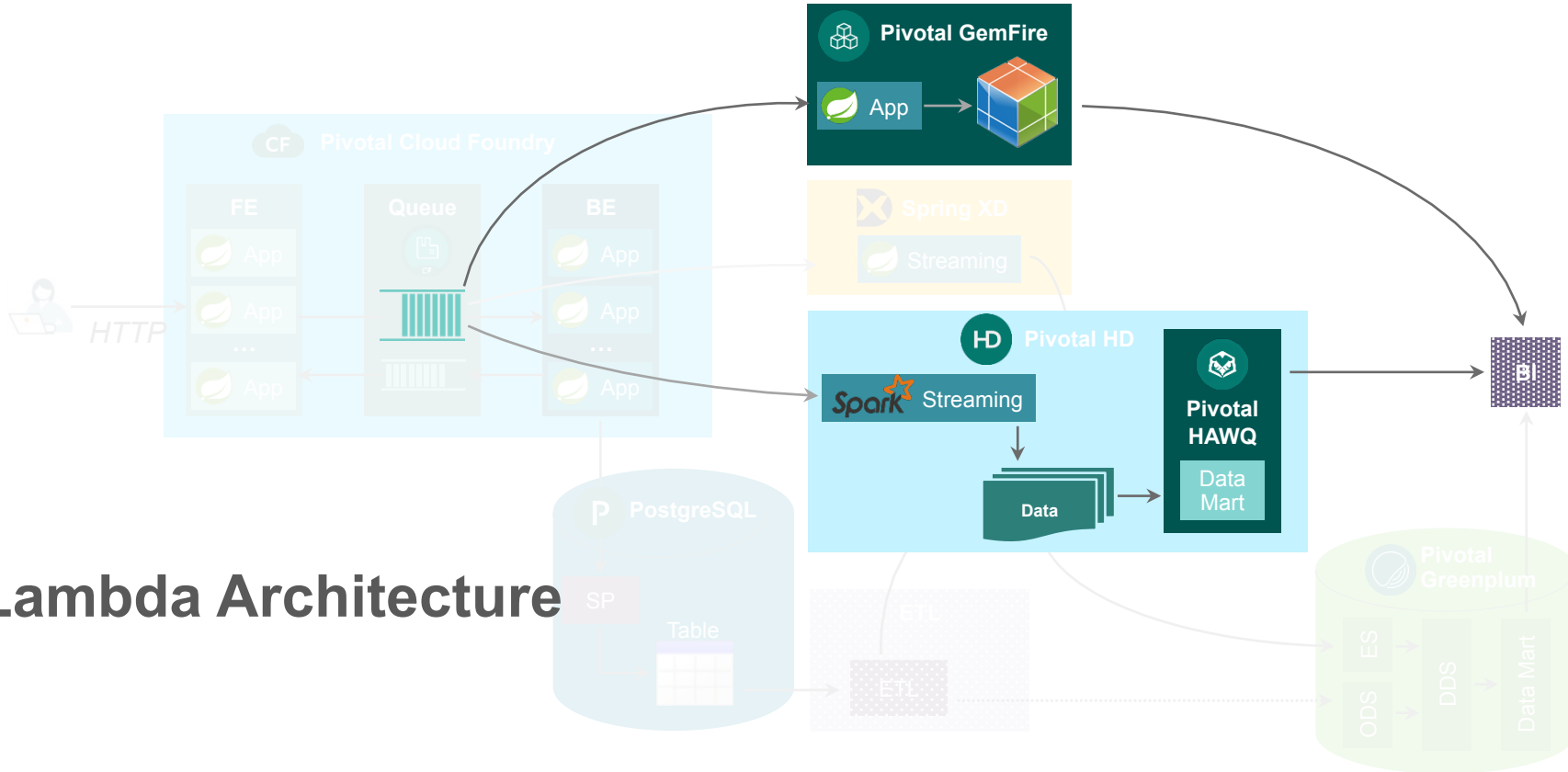


Pivotal and Modern Data Architecture



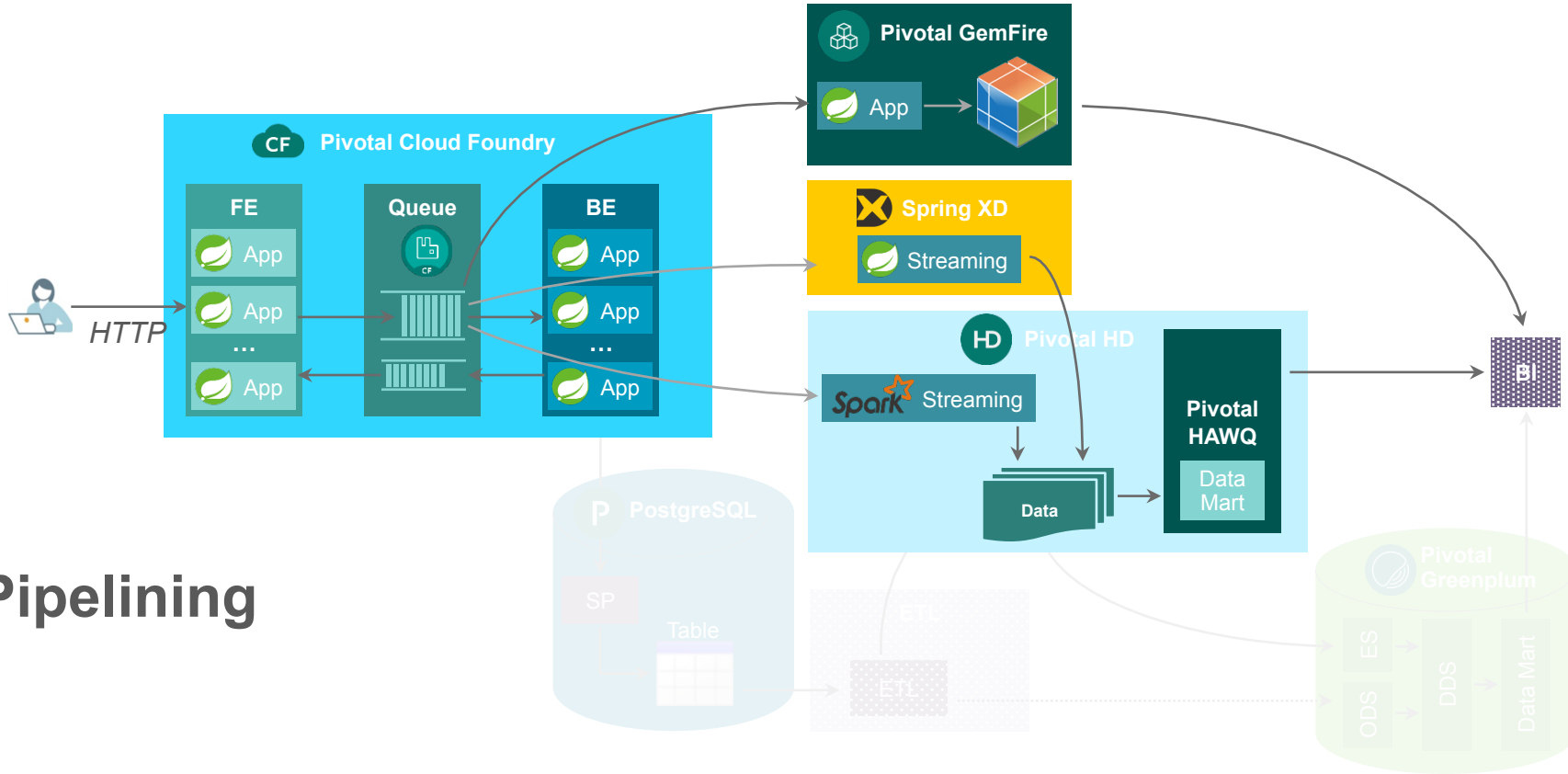
Data Lake

Pivotal and Modern Data Architecture



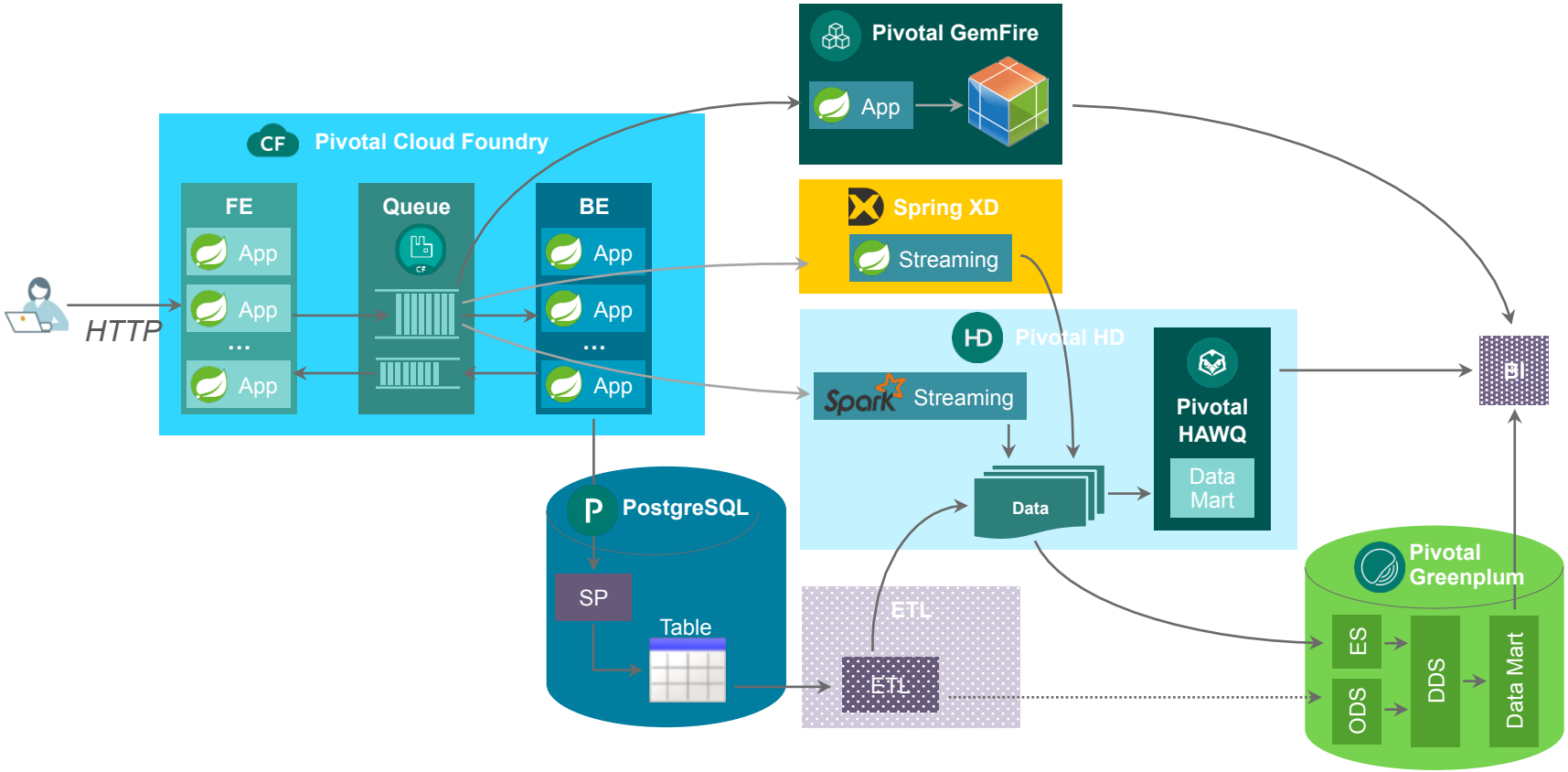
Lambda Architecture

Pivotal and Modern Data Architecture



Pipelining

Pivotal and Modern Data Architecture



Questions?

BUILT FOR THE SPEED OF BUSINESS