

25 YEARS ANNIVERSARY
SICT

HA NOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

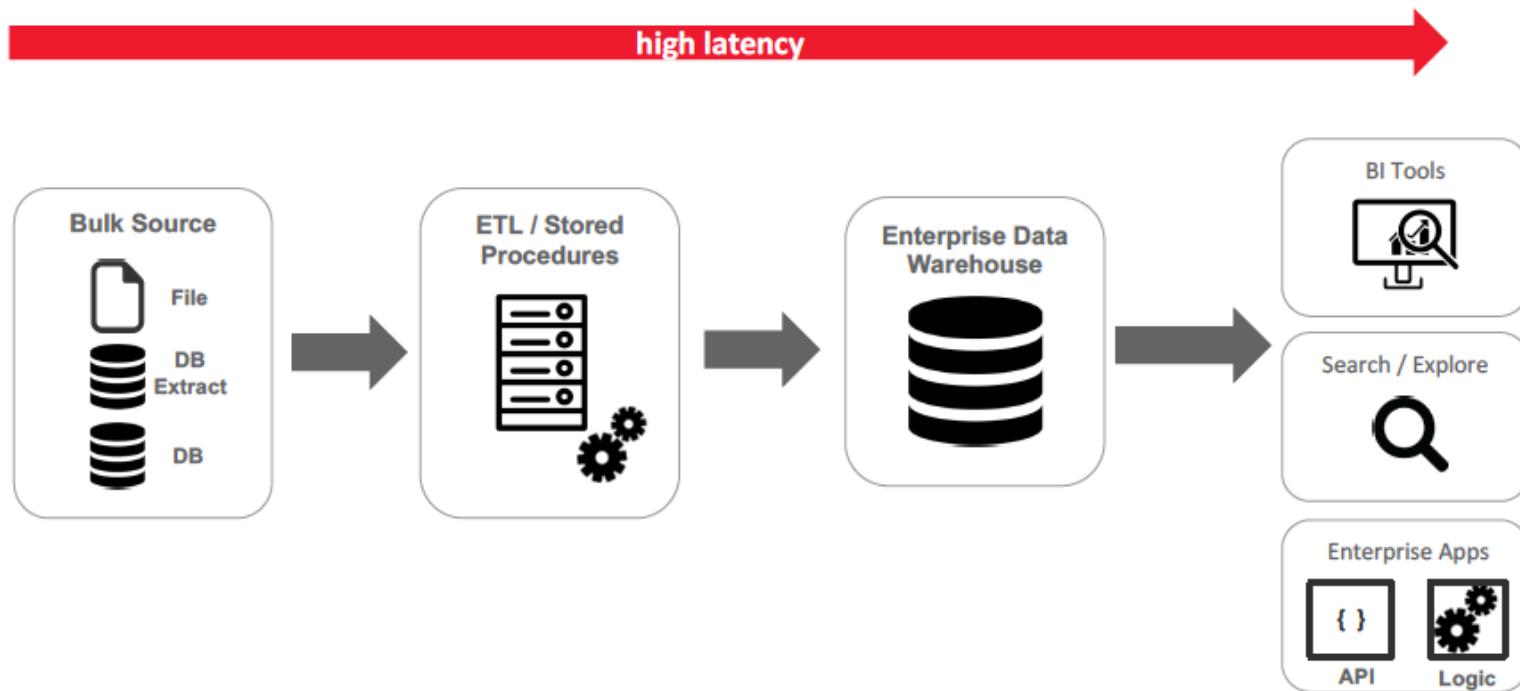


HA NOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

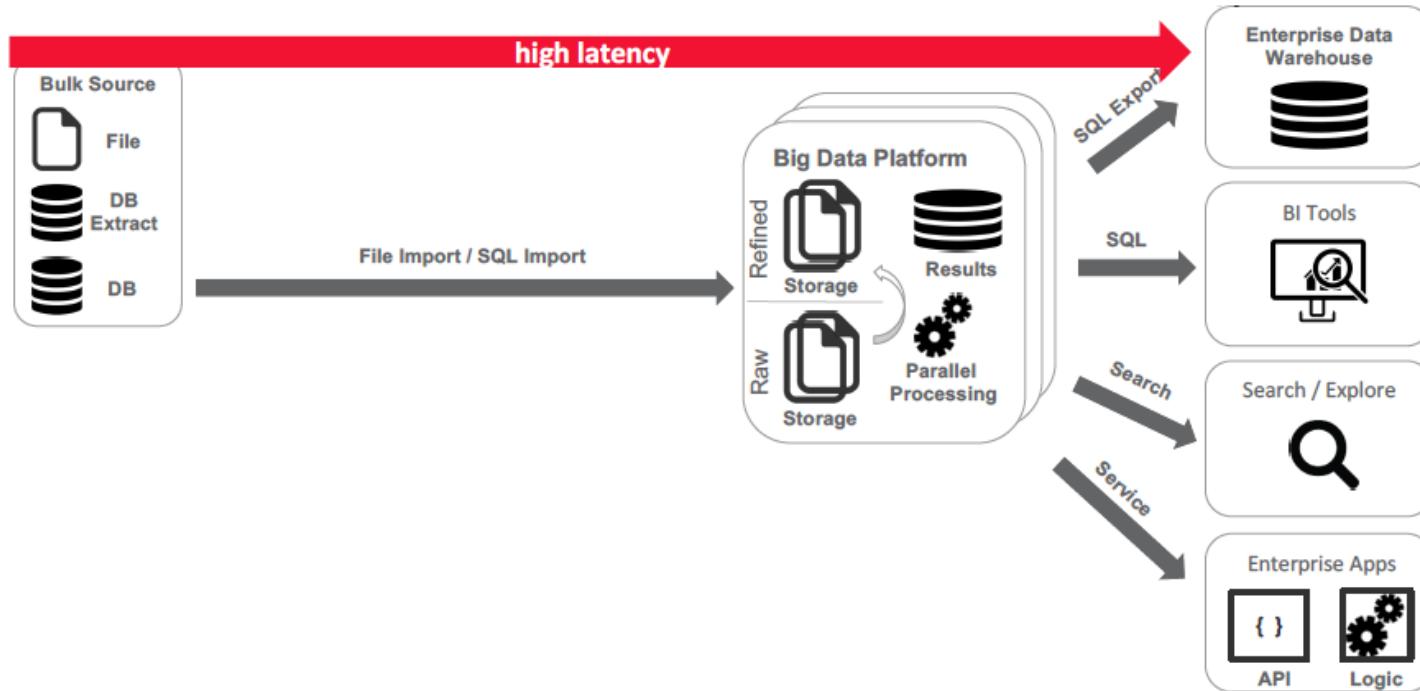
Chapter 8

Big data architecture

Traditional BI infrastructures



Hadoop solves Volume and Variety – not Velocity



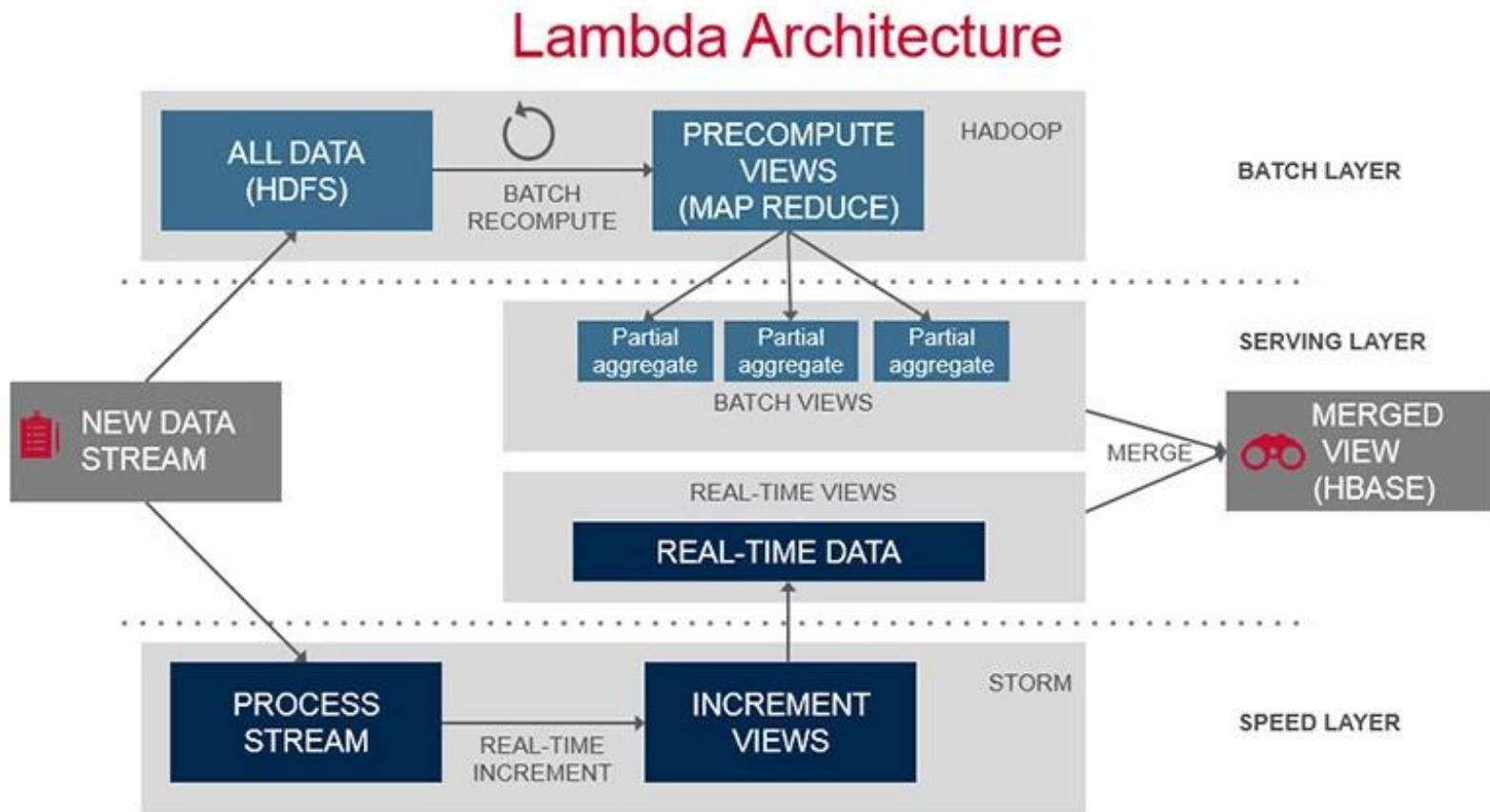
Lambda Architecture

- A data-processing architecture designed to handle massive quantities of data by taking advantage of both batch and stream processing methods.
- Spark is one of the few data processing frameworks that allows you to seamlessly integrate batch and stream processing
 - Of petabytes of data
 - In the same application

I need fast access
to historical data
on the fly for
predictive modeling
with real time data
from the stream



Lambda architecture

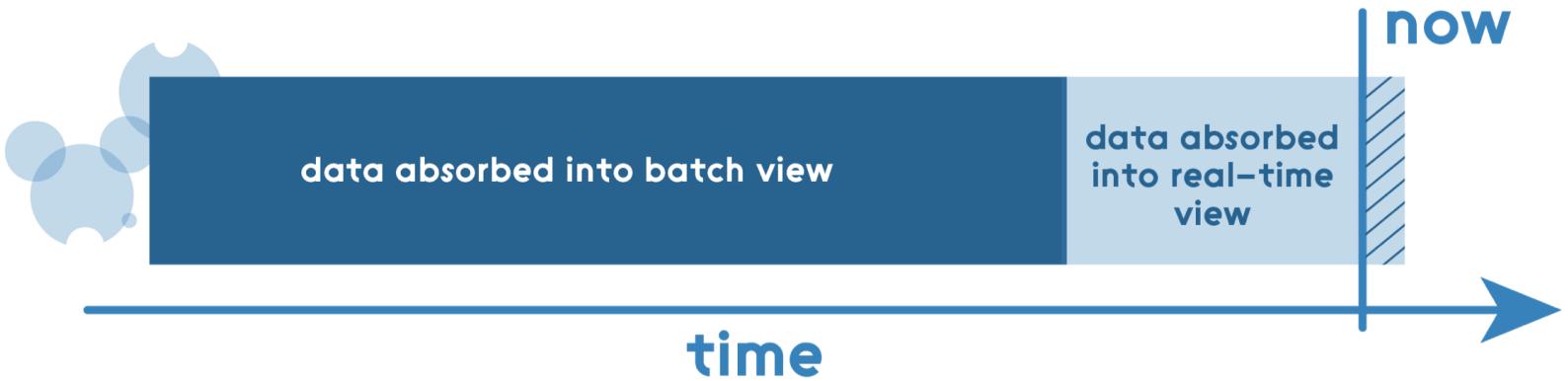


Relevance of data

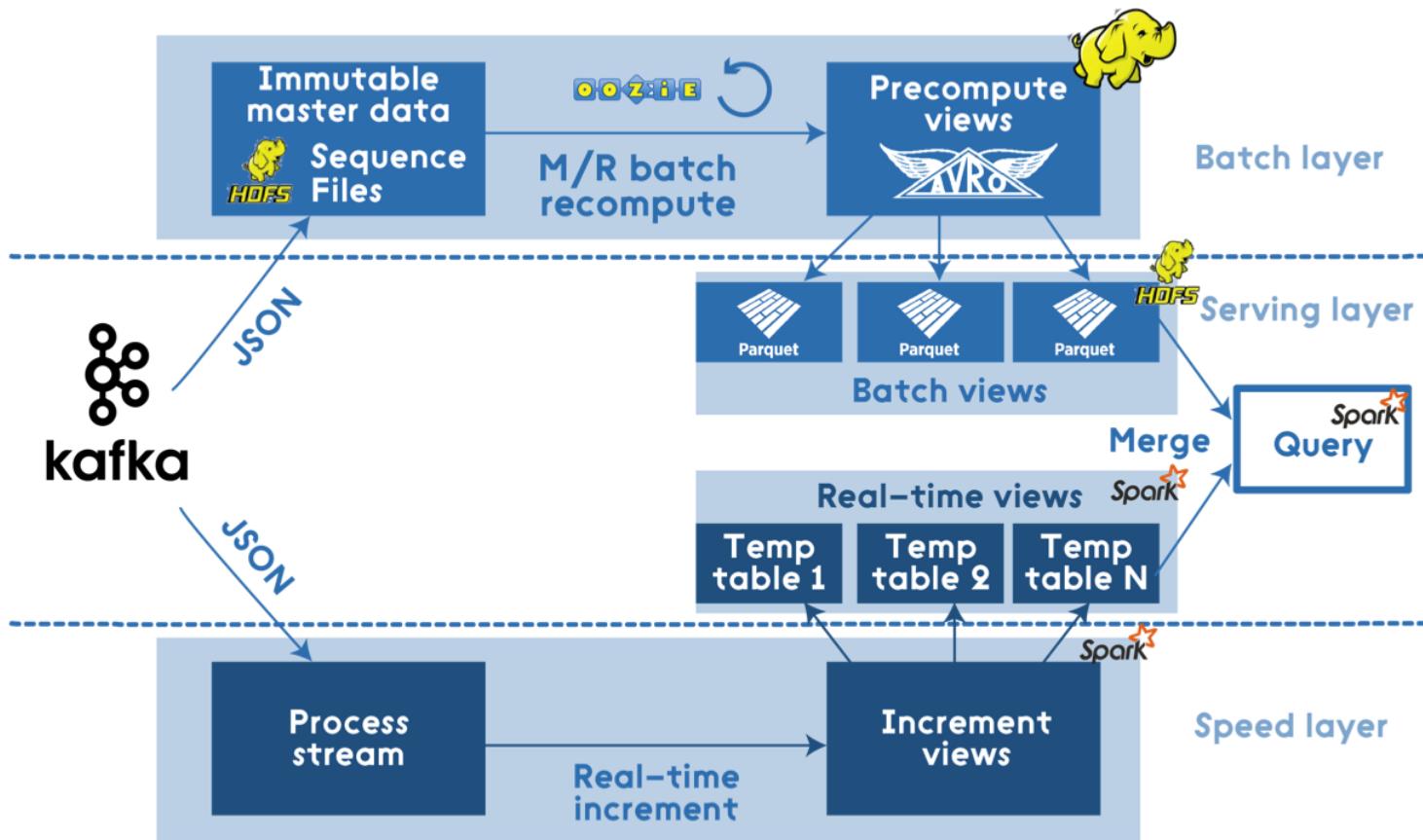
query = function(batch view, real time view)

real time view = function(real time view, new data)

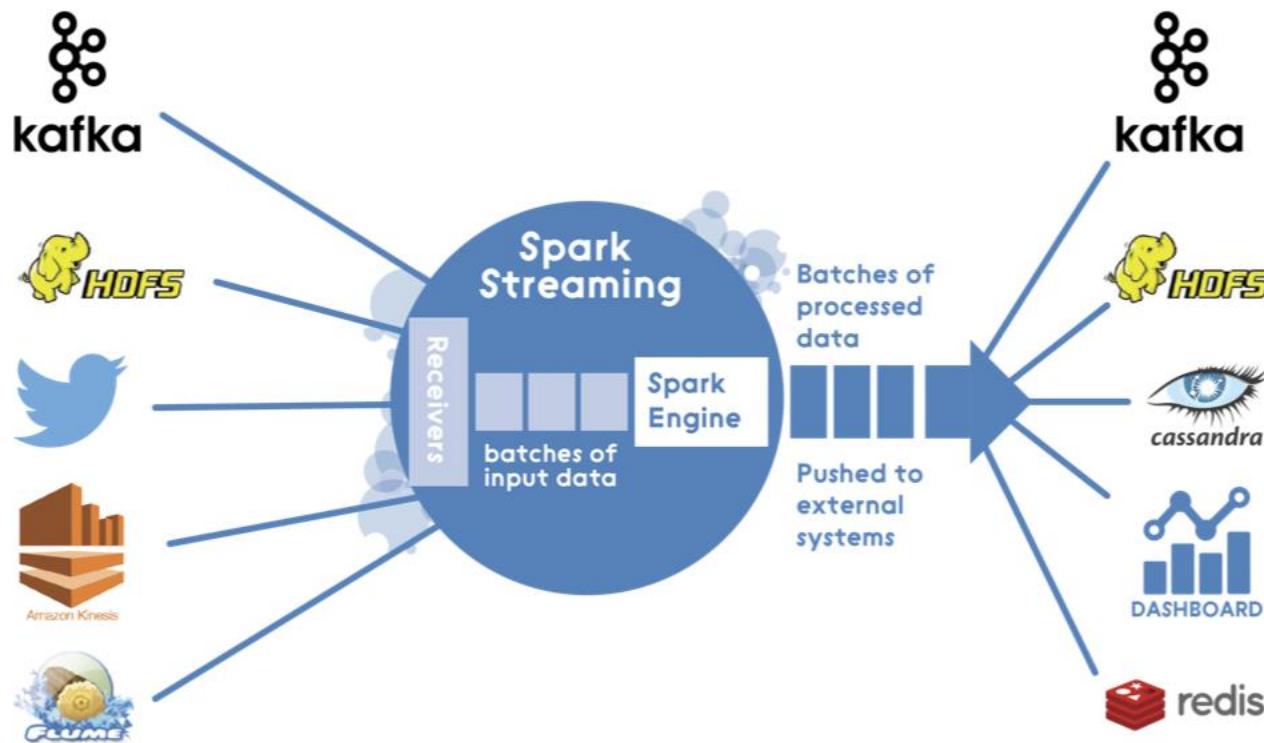
batch view = function(all data)



Lambda architecture: one implementation



Spark streaming



Spark streaming

- Scalable, fault-tolerance stream processing system
- a streaming computation as: a series of very small, deterministic batch jobs
 - Chop up the live stream into batches of X seconds
 - Spark treats each batch of data as RDDs and processes them using RDD operations
 - Finally, the processed results of the RDD operations are returned in batches



Streaming landscape



Apache Storm

- True streaming, low latency - lower throughput
- Low level API (Bolts, Spouts) + Trident



Spark Streaming

- Stream processing on top of batch system, high throughput - higher latency
- Functional API (DStreams), restricted by batch runtime



Apache Samza

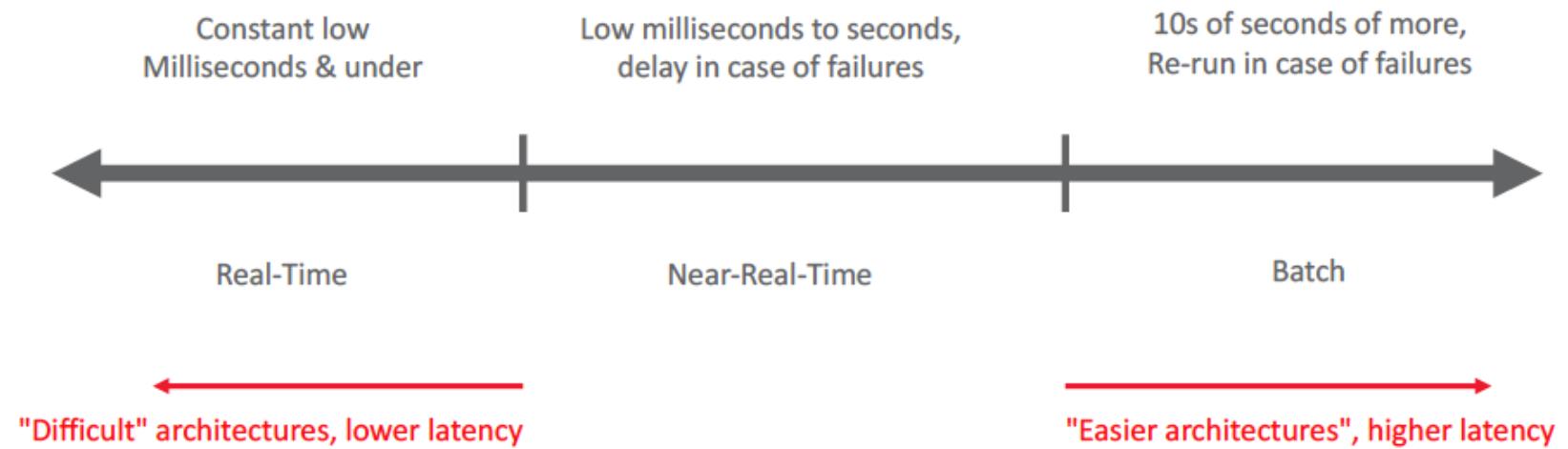
- True streaming built on top of Apache Kafka, state is first class citizen
- Slightly different stream notion, low level API



Apache Flink

- True streaming with adjustable latency-throughput trade-off
- Rich functional API exploiting streaming runtime; e.g. rich windowing semantics

Stream vs. Batch processing



References

- <https://github.com/OryxProject/oryx>
- <https://github.com/MicrosoftDocs/azure-docs/blob/master/articles/cosmos-db/lambda-architecture.md>
- <https://github.com/apssouza22/lambda-arch>
- <https://github.com/knoldus/Lambda-Arch-Spark>



25
YEARS ANNIVERSARY
SOICT

VIỆN CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

Thank you
for your
attention!!!

