Lesson 1.2: Spark DataFrames

DISTRIBUTED COMPUTING WITH SPARK SQL

Spark DataFrames

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Slide 2: Welcome Back!

Welcome Back!

Basic Spark architecture: driver and executors

Spark DataFrame

Brief history of Spark

Slide 3: Learning Objective

Learning Objective

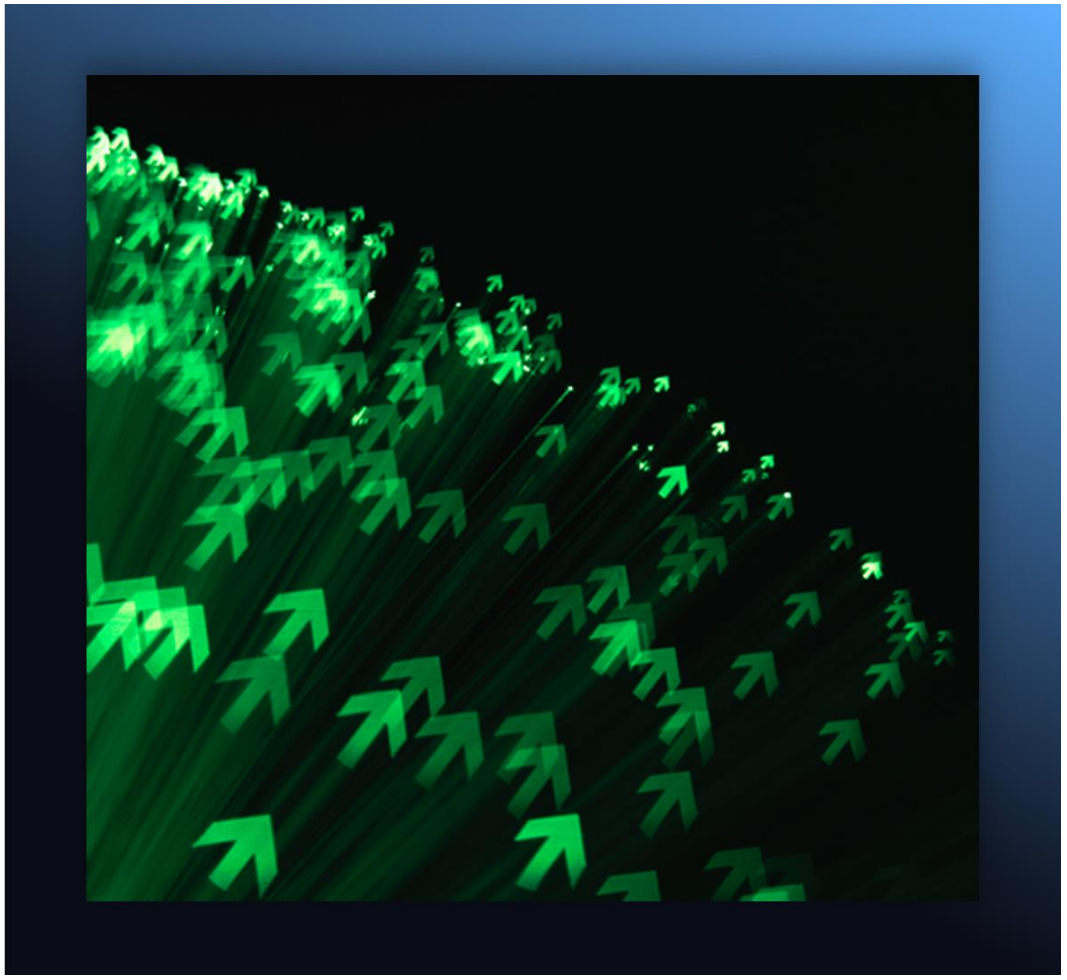
Explain the difference between RDD and DataFrame API within Spark

Slide 4: Evolution of Spark

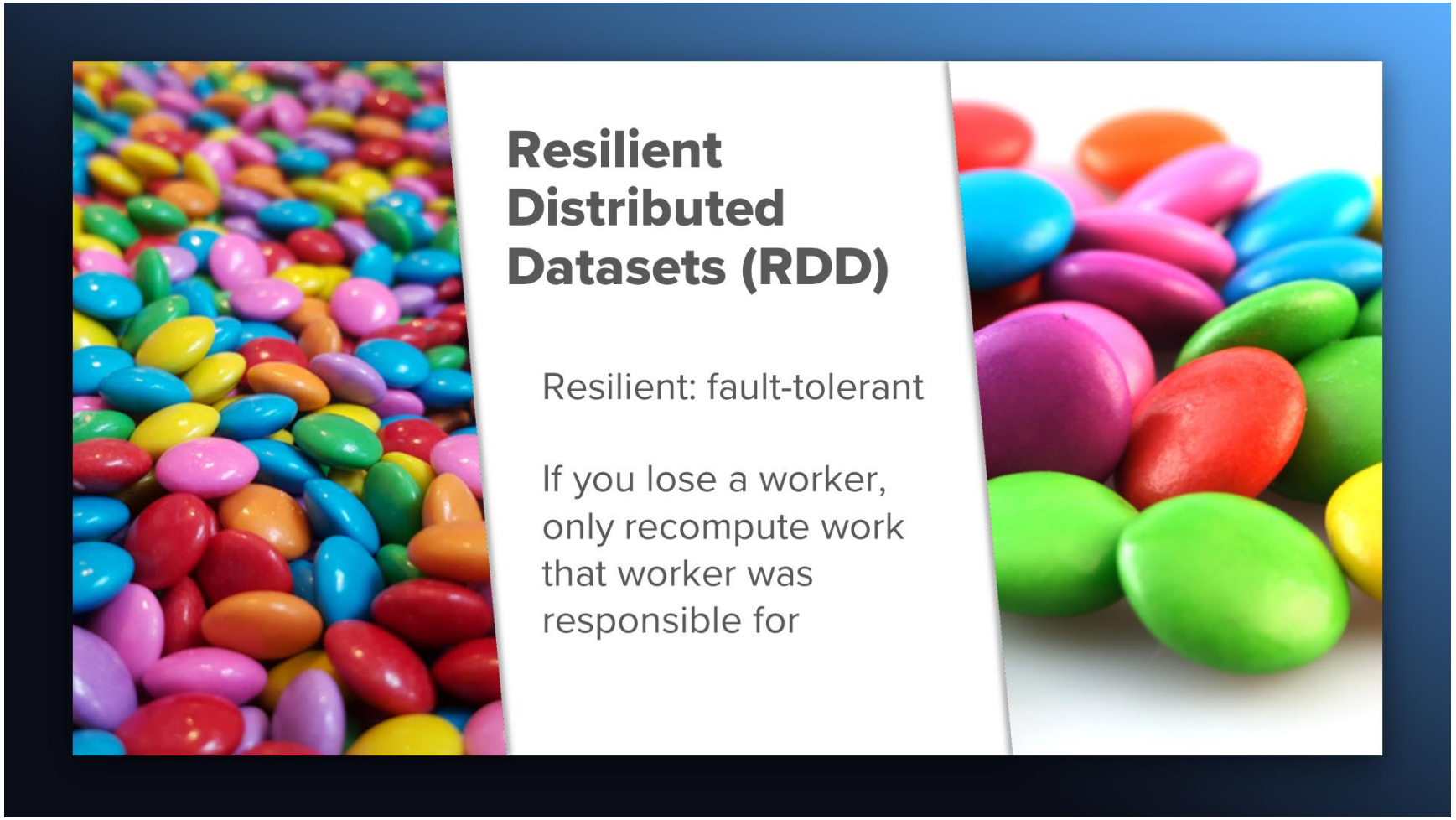
Evolution of Spark

Resilient Distributed Dataset (RDD)

Spark 1.3 – DataFrame – more functionality and optimizations

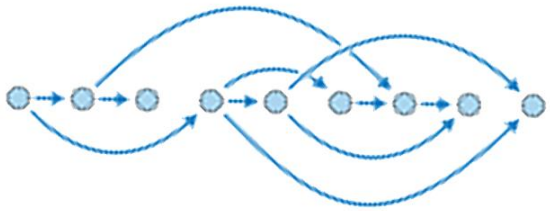


Slide 5: Resilient Distributed Databases (RDD)



Slide 6: Resilient Distributed Databases (RDD)

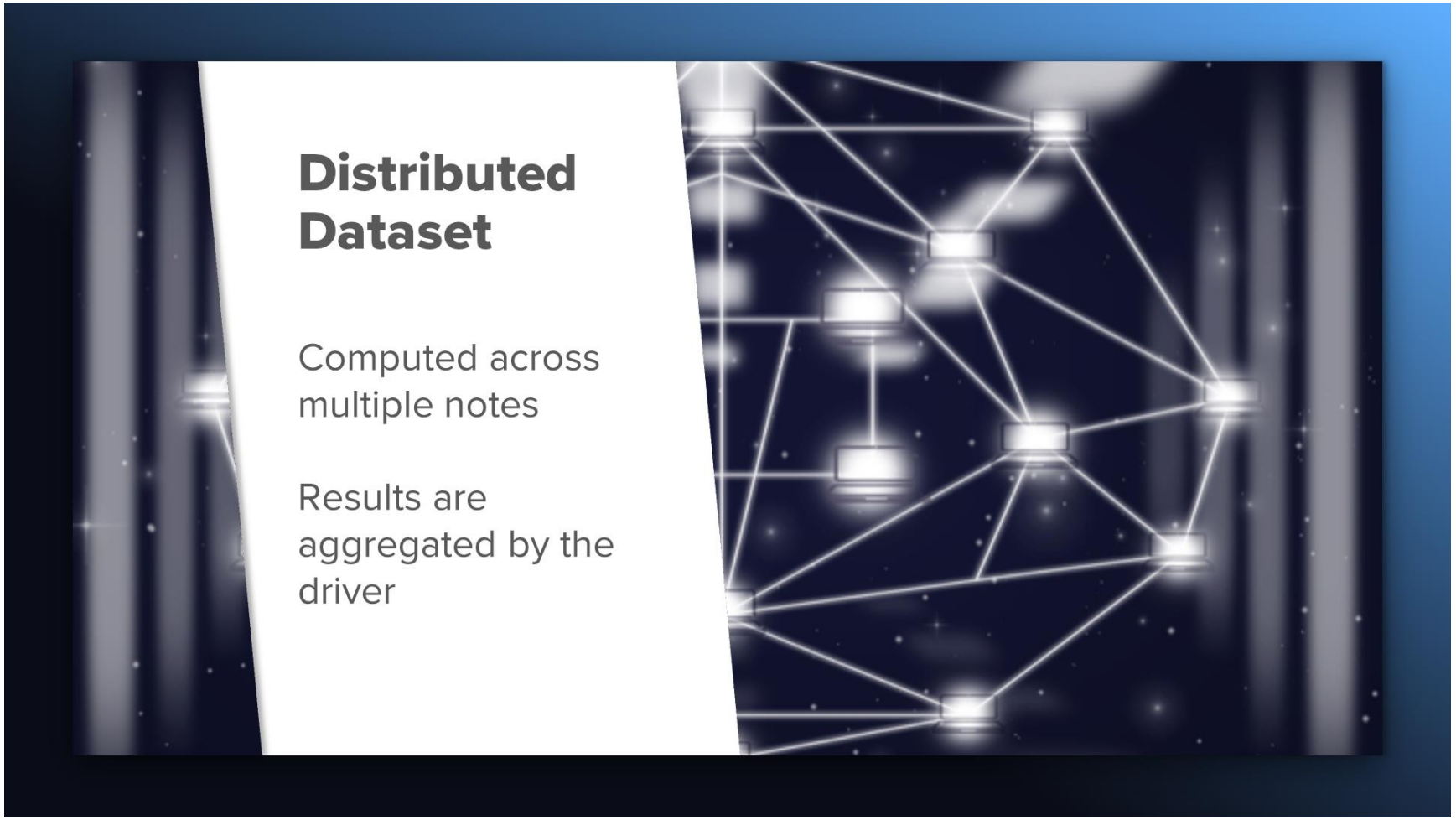
Directed Acyclic Graph



Series of transformations to apply to your data

However, you cannot change any of the transformations that came before you in this graph

Slide 7: Distributed Dataset



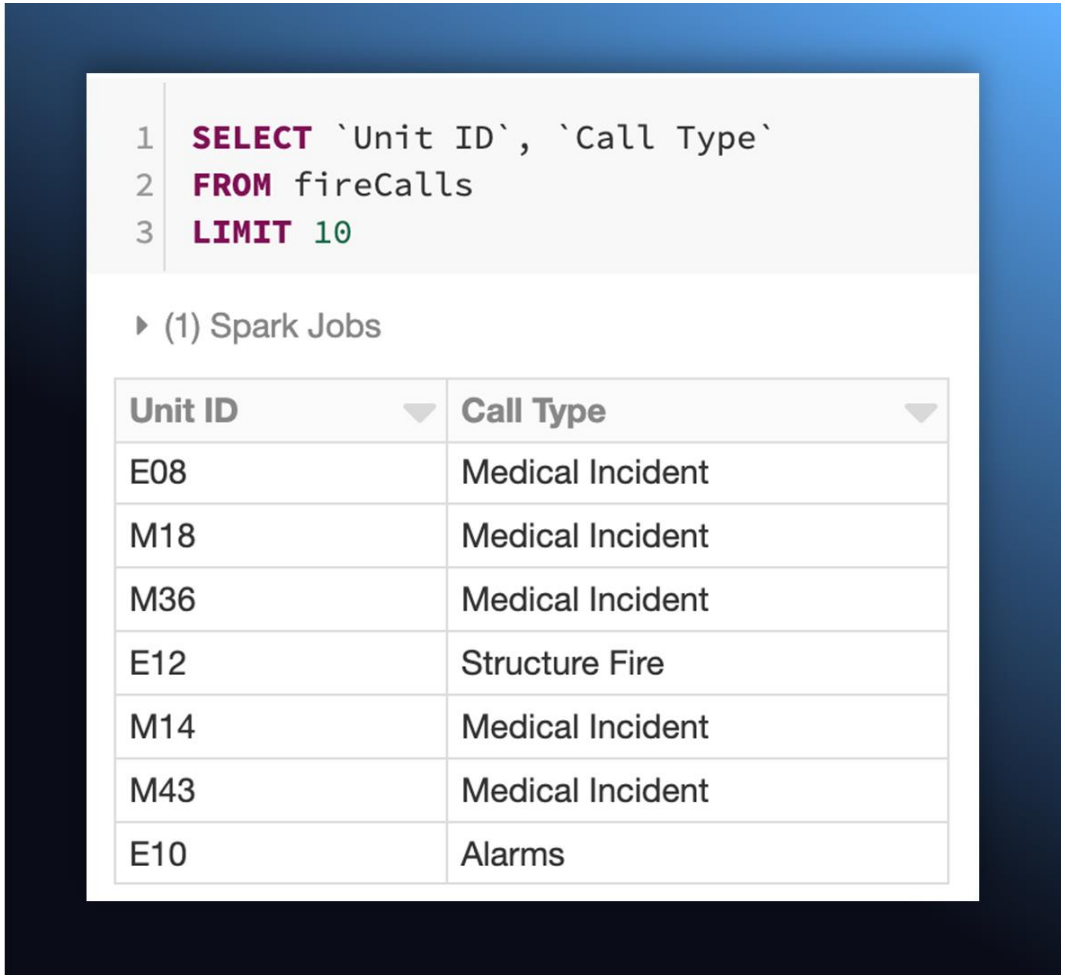
Slide 8: Why This Matters

Why This Matters

DataFrame inherits RDD properties (resilient + distributed) plus metadata

Metadata

- Number of columns
- Data types



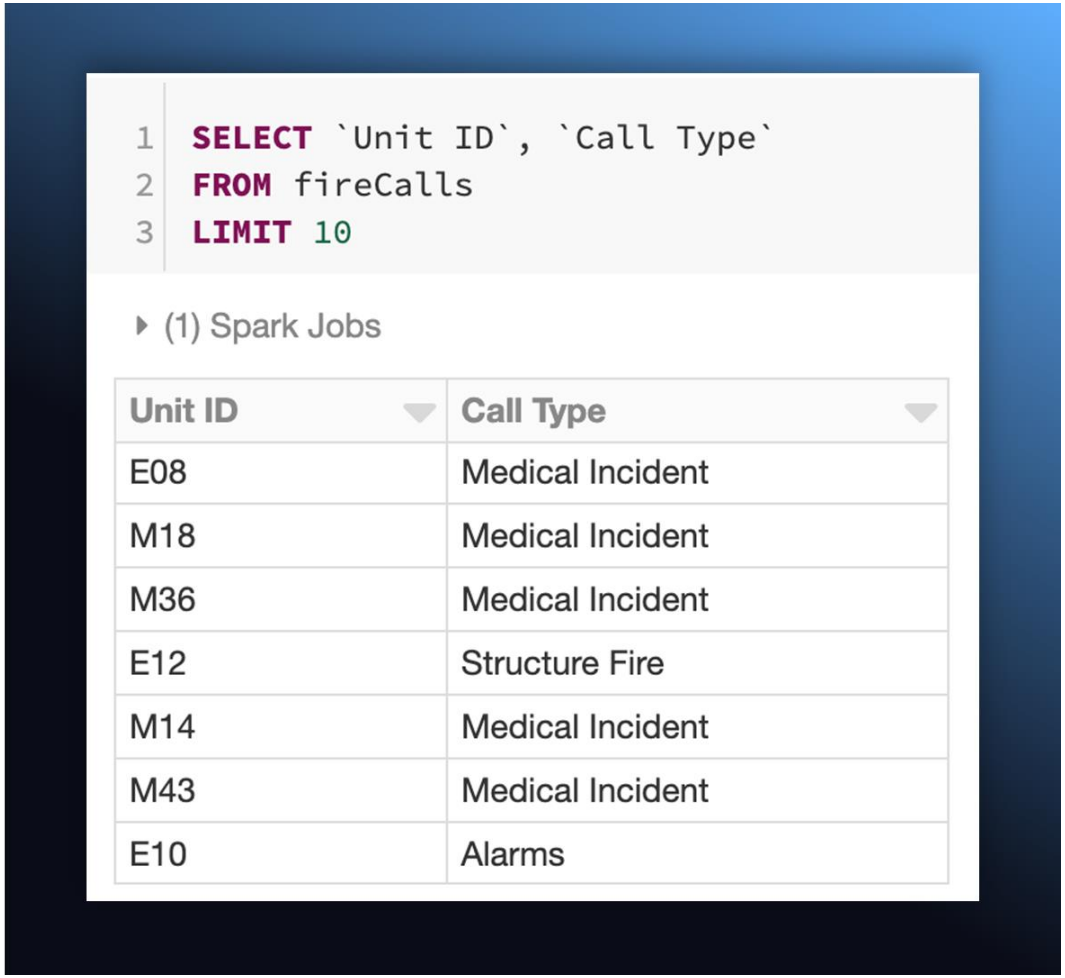
Slide 9: DataFrame

DataFrame

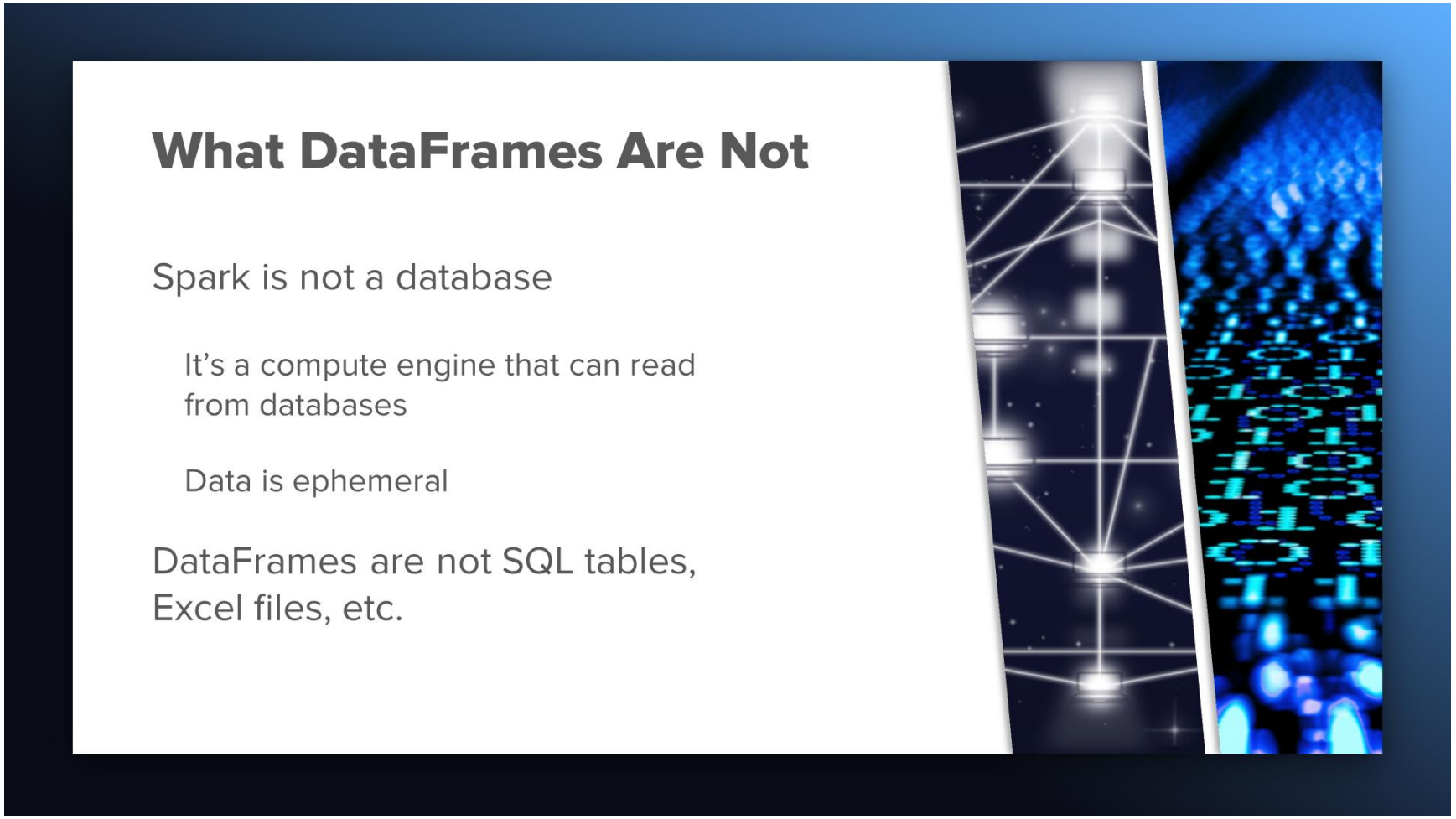
Highly optimized beyond RDDs

Always use DataFrames where possible

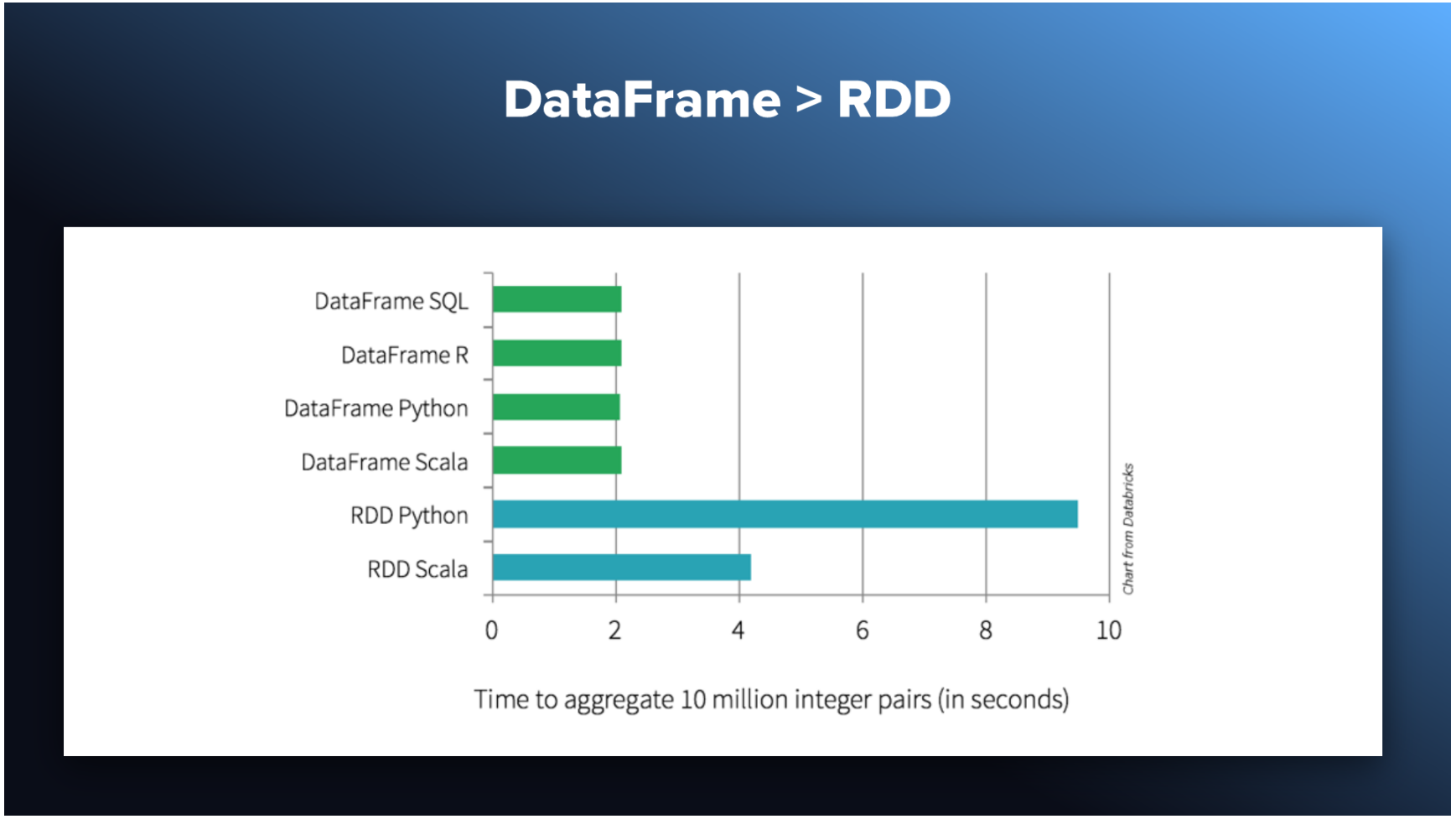
Spark SQL commands execute against DataFrames



Slide 10: What DataFrames Are Not



Slide 11: DataFrame > RDD

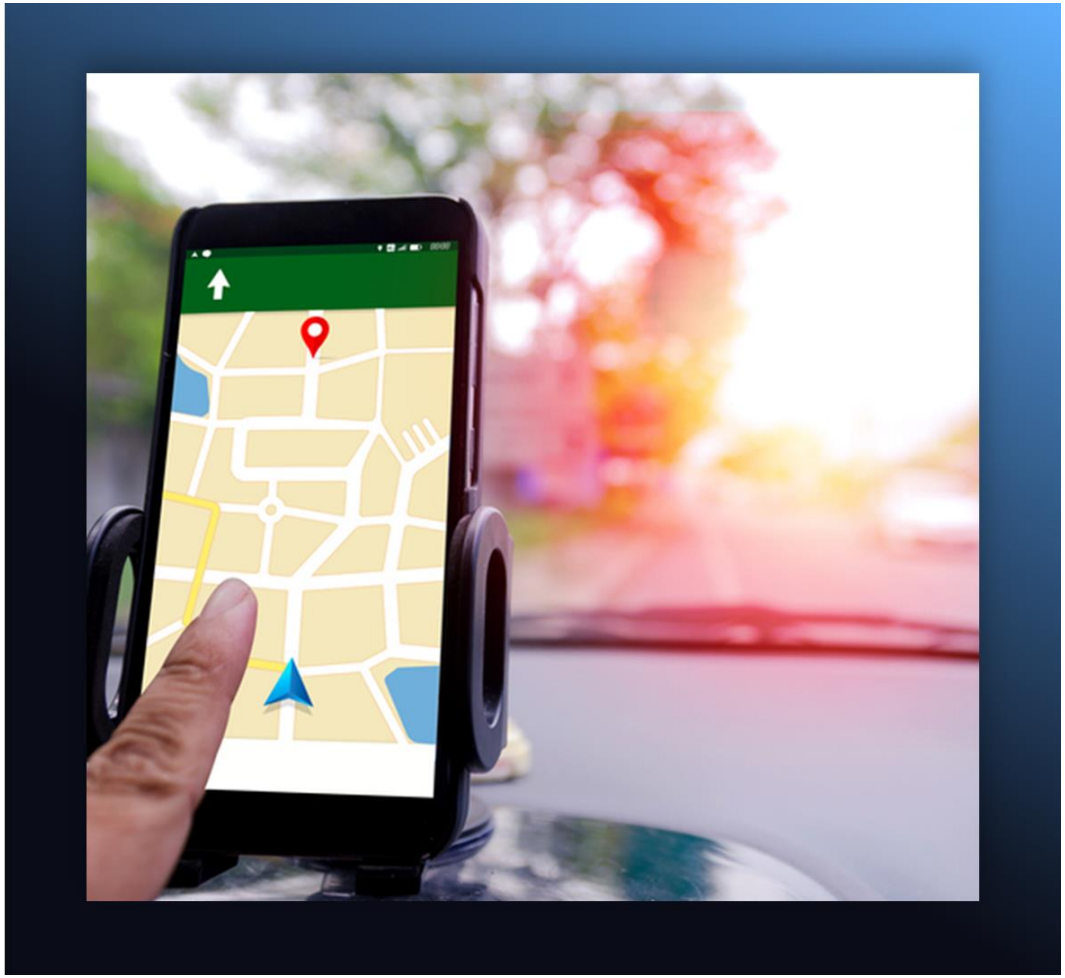


Slide 12: Spark DataFrame Execution

Spark DataFrame Execution: Catalyst

Google Maps Analogy:

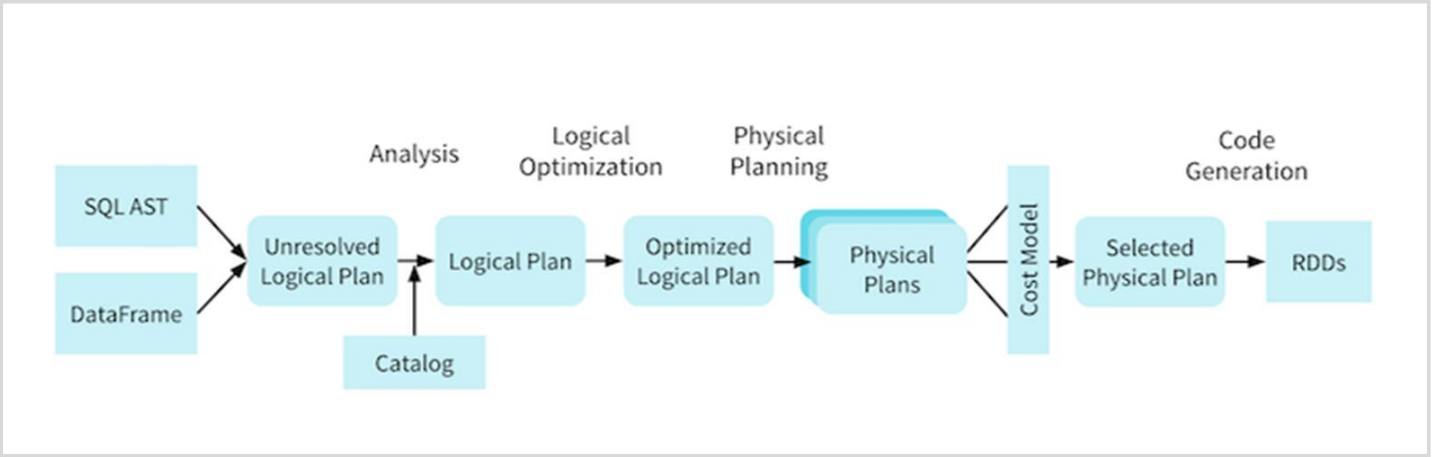
Specify **what** you want to do, not how you want to do it



Slide 13: Spark DataFrame Execution

Spark DataFrame Execution

1. Unresolved logical plan before look-up in data catalog
2. Then Catalyst resolves them and creates a logical plan



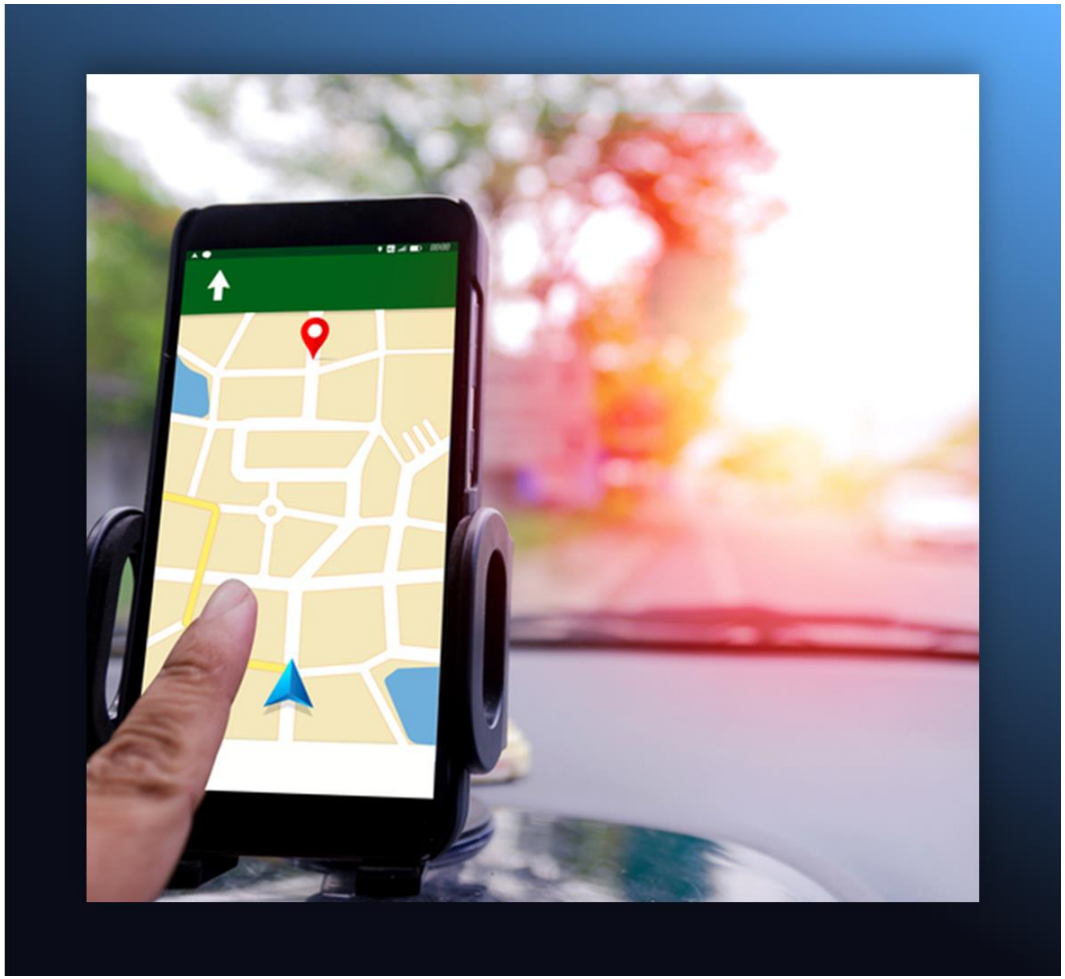
Slide 14: Spark DataFrame Execution

Spark DataFrame Execution

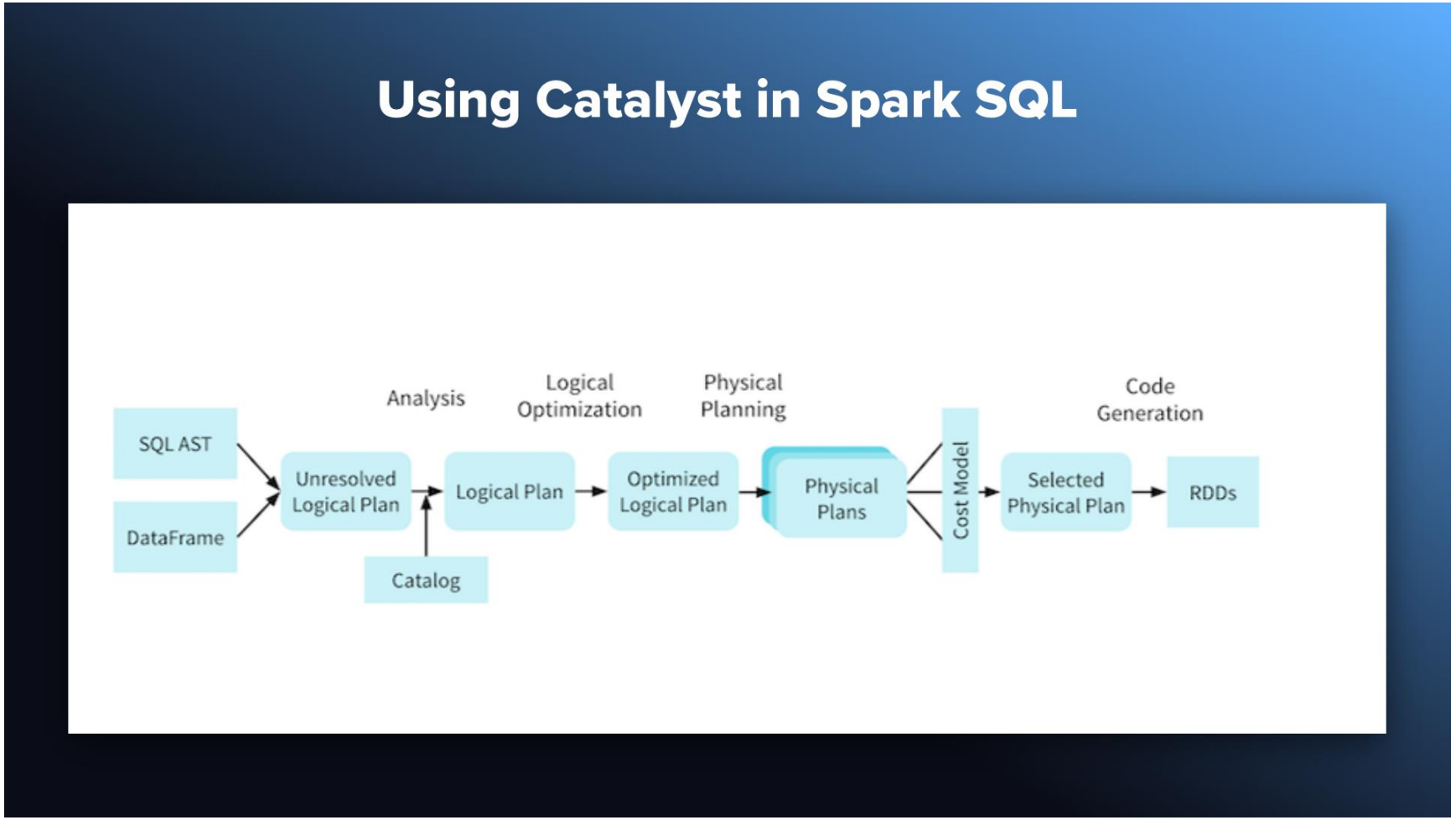
Maps Analogy:

There are many ways to get from point A to point B

What you want to do, not how you want to do it



Slide 15: Using Catalyst in Spark SQL



Slide 16: Coming Up

Coming Up

Look at Tungsten which illustrates why DataFrames are more performant than RDDs