Pyspark Inner Workings : How

Yash Kothari · Follow

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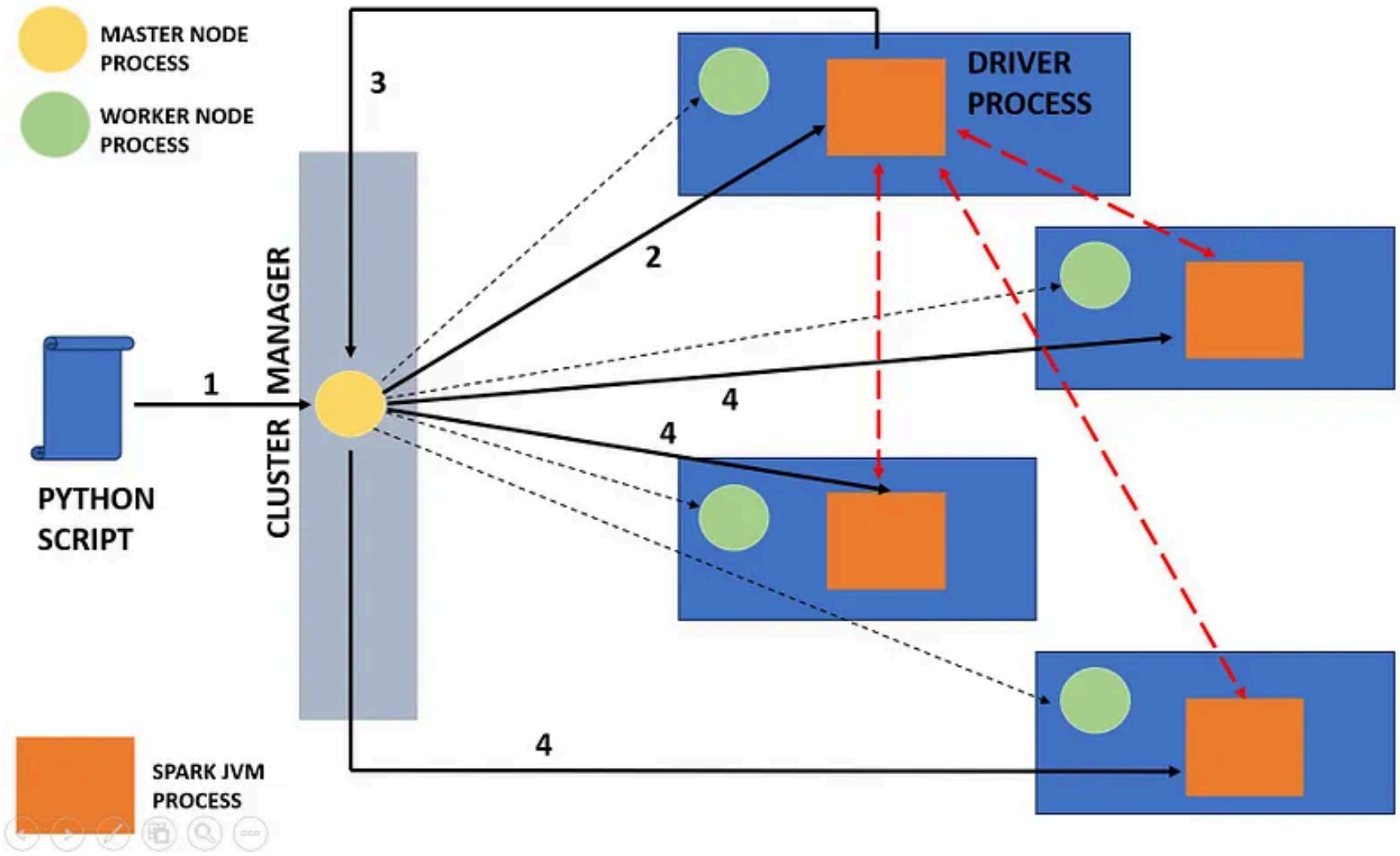
Ever wondered what happens behind the scenes when you submit a Python script for execution in a PySpark application?



Let's break it down step by step.

Step 1: Client Request
The process kicks off with the client submitting the PySpark application. This submission, often a Python script containing the application logic, triggers a request to the cluster manager's driver node. Upon acceptance by the cluster manager, resources are allocated, and the driver process is placed onto a node within the cluster. With the client's task completed, the PySpark application seamlessly transitions to running on the cluster.

Step 2: Launch
With the driver process now deployed, it begins executing the user's Python code. This code initializes a SparkSession, setting up the Spark cluster comprising the driver and executor processes.

Step 3: Start-up Communication

The SparkSession communicates with the cluster manager to request the launch of executor processes across the cluster. User-specified configurations, such as the number of executors, are passed via command-line arguments during the spark-submit call.

Step 4 : Spark Cluster Established

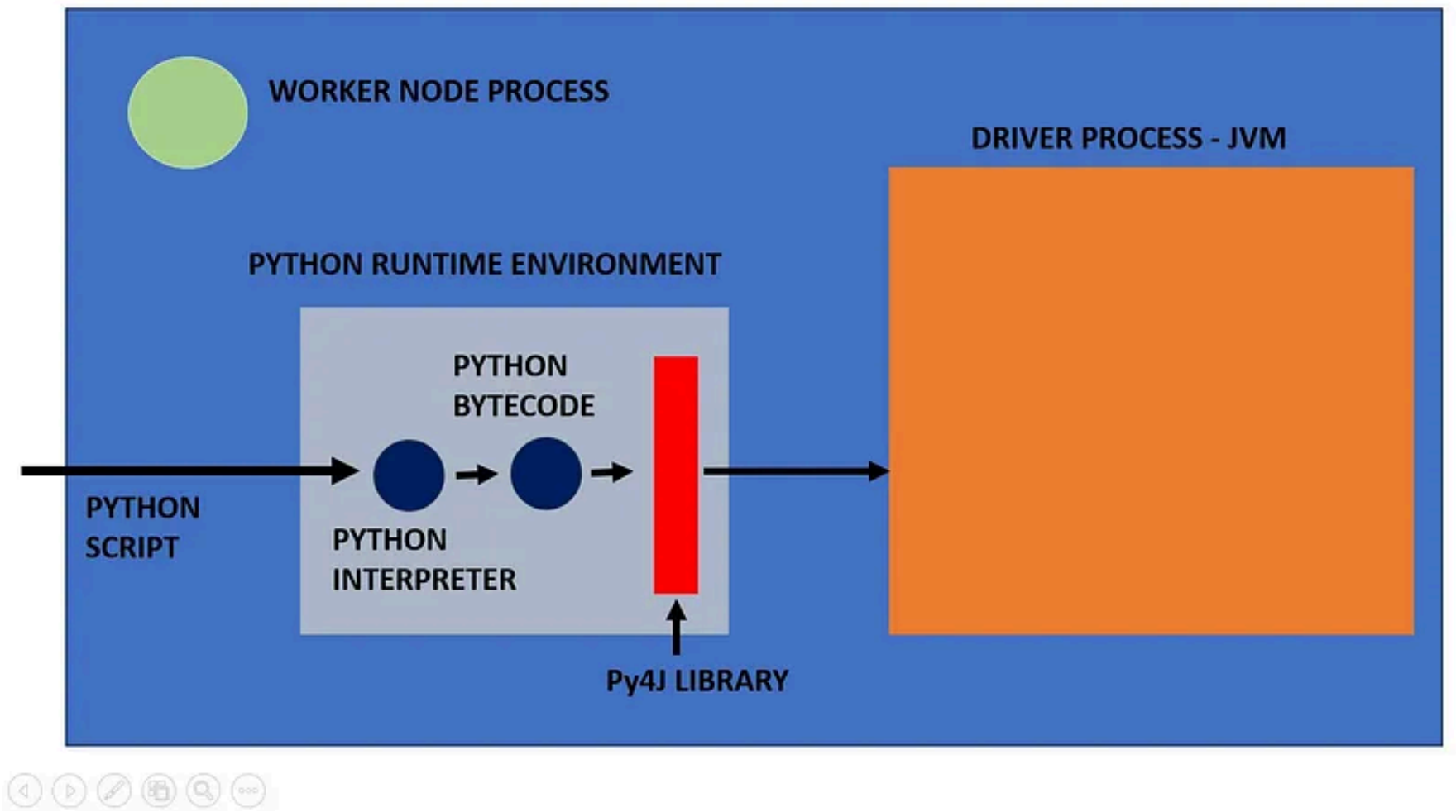
Upon receiving the request, the cluster manager responds by launching the executor processes, provided everything proceeds smoothly. It also communicates relevant information about the executor locations back to the driver process. This step establishes the complete "Spark Cluster" setup for the application.

Step 5: Execution

The PySpark application swings into action, executing its code across the Spark Cluster. Driver and executor processes collaborate, executing code and managing data flow. The driver schedules tasks onto each executor, while the executors report back with task execution status updates, indicating success or failure.

Step 6: Completion
As the PySpark application concludes its tasks, the driver process exits, signaling either success or failure. Subsequently, the cluster manager shuts down the executor processes associated with the Spark cluster. Users can then query the cluster manager for status updates to determine the outcome of the Spark application.

How the Execution Happens at the Executor End?



At the executor end, the Python script is received by the Python Runtime Environment, where the Python Interpreter stands ready to process it. The Python Interpreter first converts the script into

Python bytecode. This bytecode is then executed on the Java Virtual Machine (JVM) with the help of the Py4J library, facilitating seamless communication between the Python runtime environment and the JVM.

Pyspark Spark

Written by Yash Kothari

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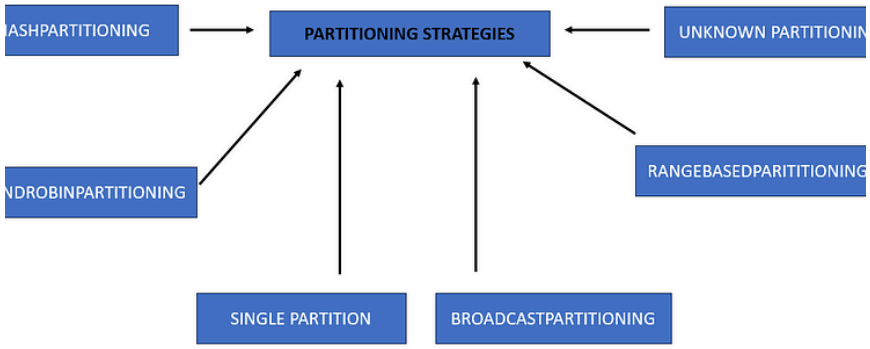

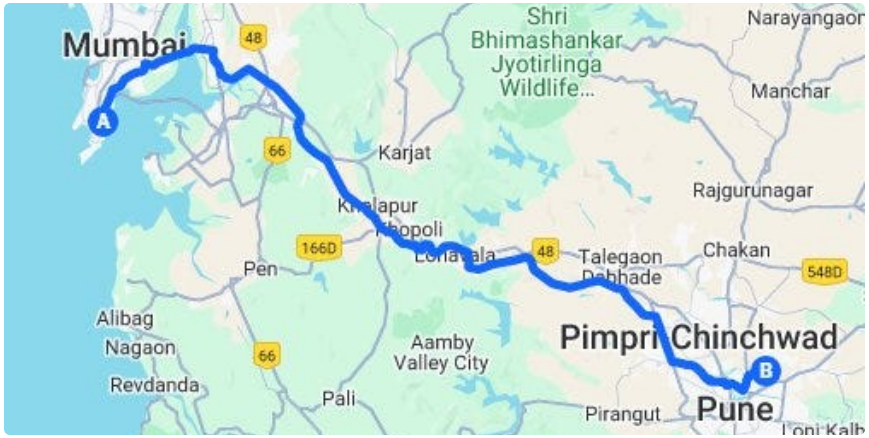

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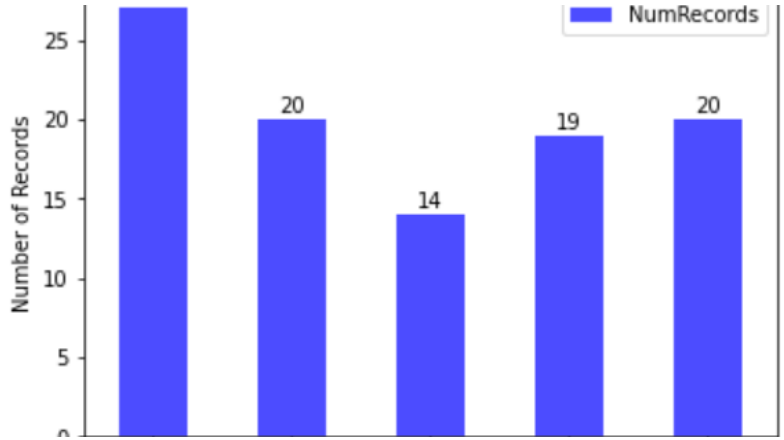

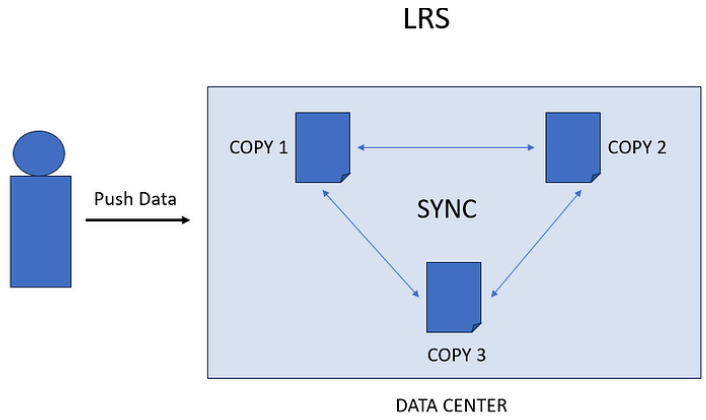

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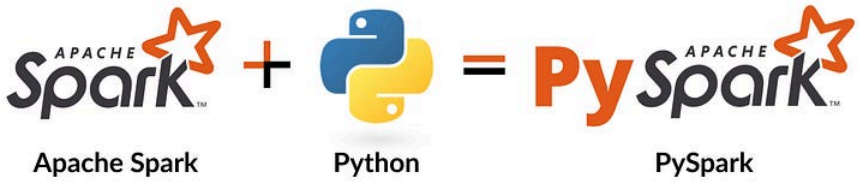

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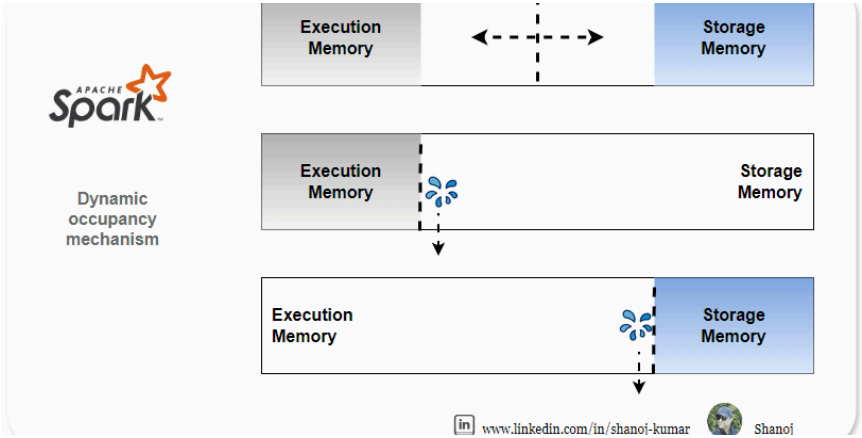

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