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A NEW PLATFORM FOR A NEW ERA

Query Profiling

Pivotal® **Greenplum Database**
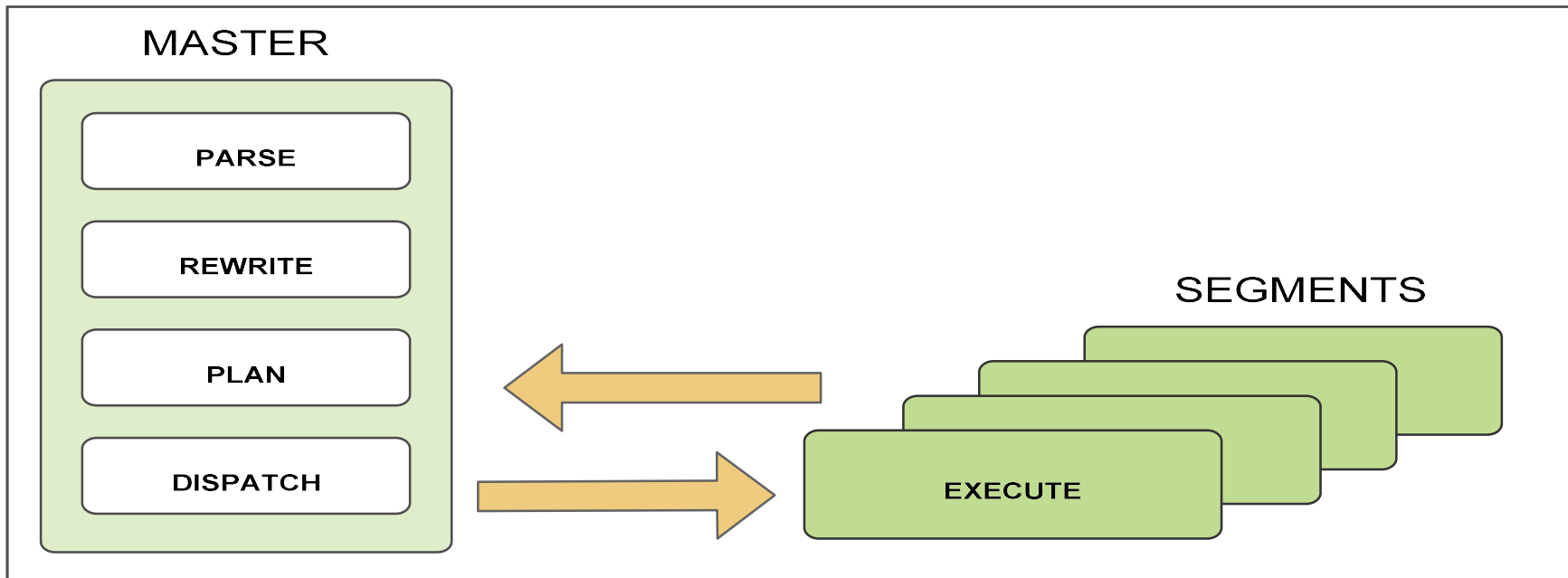
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Agenda

- The Query Process

- Profiling

- Structure of a Query Plan

- Identify Tuning Opportunities

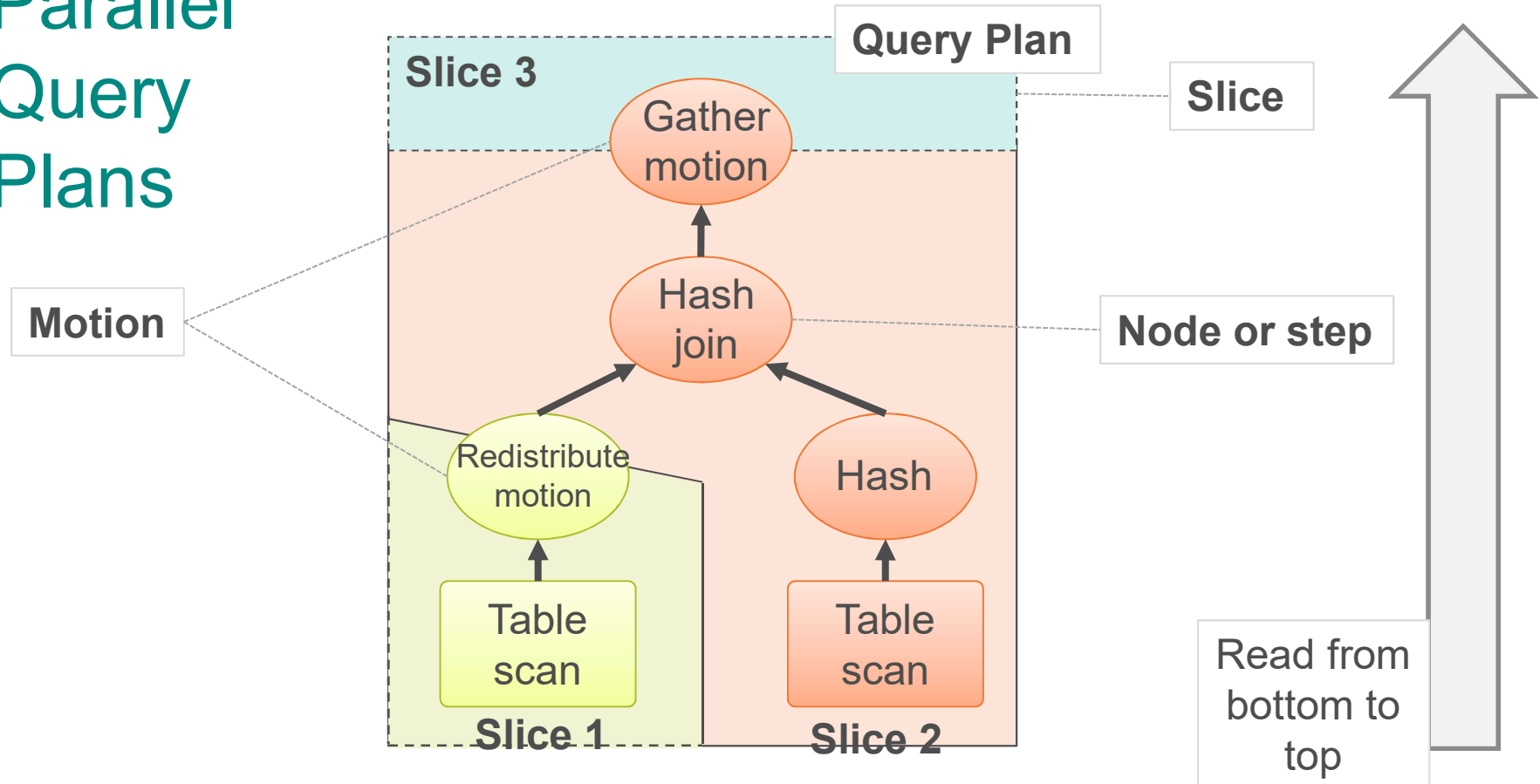- Work the lab

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Query Profiling

- Using query plans to identify tuning opportunities
- Assists you in addressing performance issues
- *Am I getting my results as quickly as possible?*

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The Query Process

MASTER
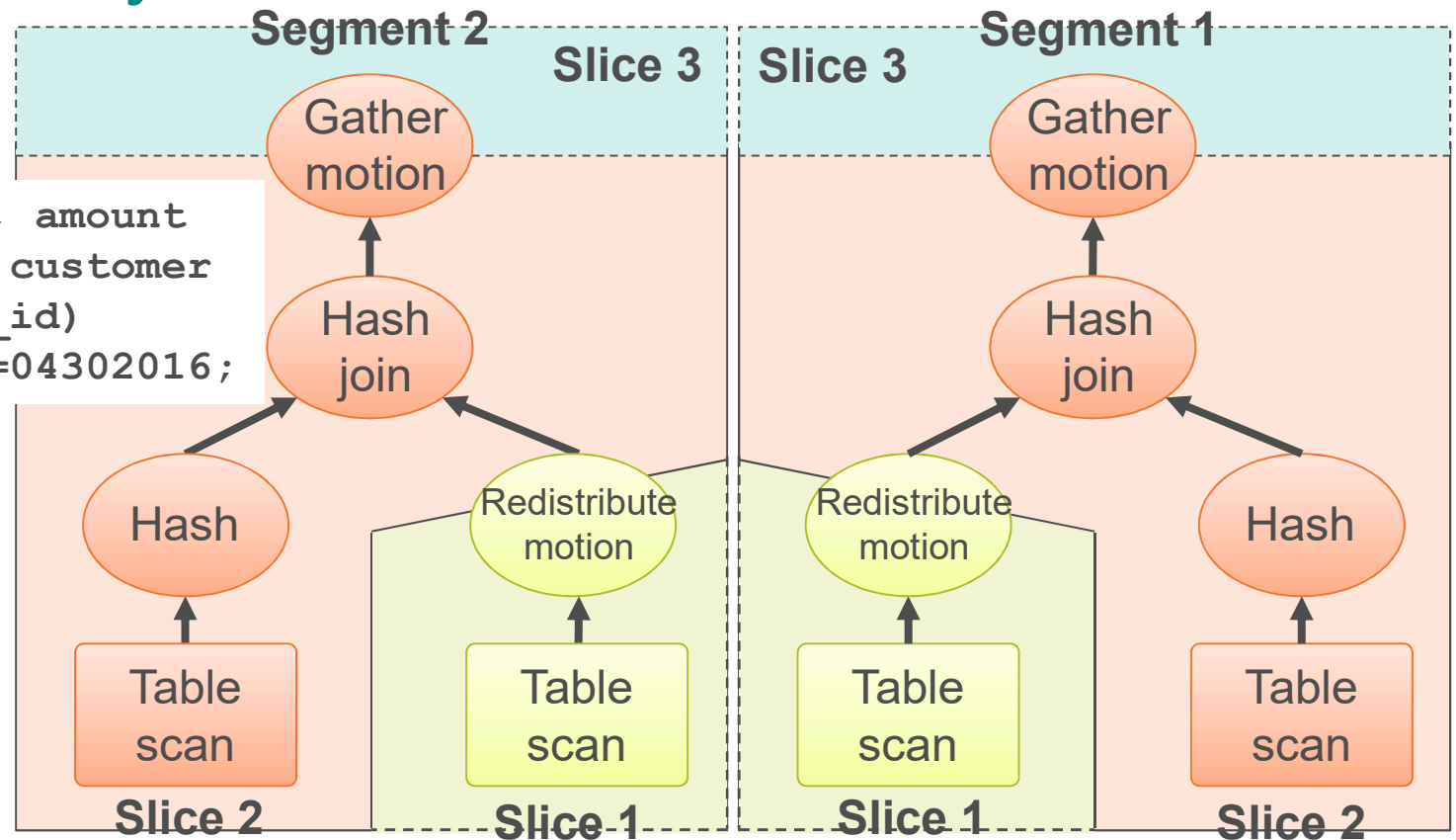
- PARSE
- REWRITE
- PLAN
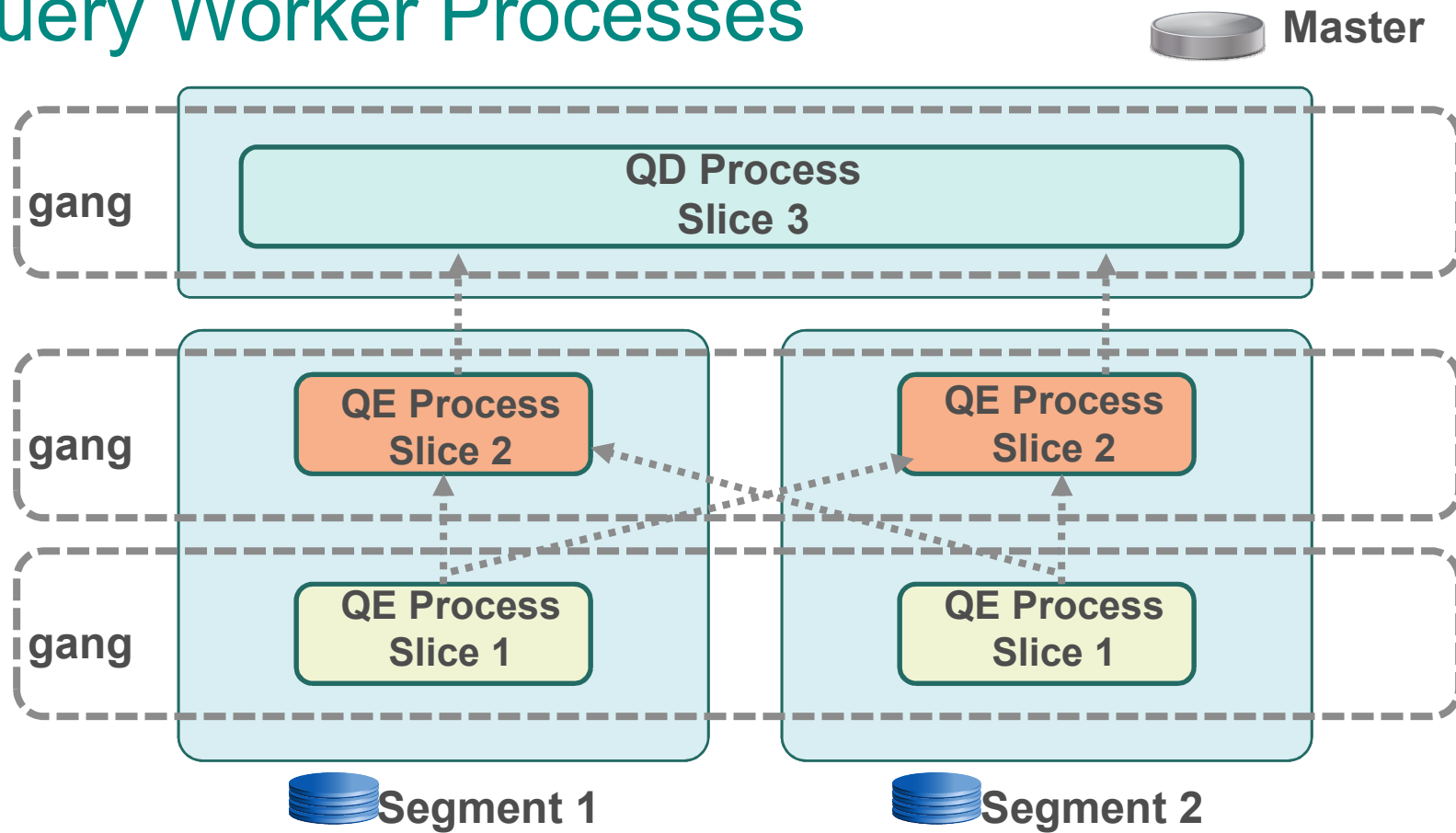- DISPATCH

SEGMENTS

EXECUTE

Parallel Query Plans

Parallel Query Plans

SELECT customer, amount
FROM sales JOIN customer
     USING (cust_id)
WHERE ship_date=04302016;

Query Worker Processes

Query Profiling – Addressing Key Issues

- Operations that are taking a long time

- Are the planner's estimates close to reality?

- Is the planner applying selective predicates early?

- Is the planner choosing the best join order?

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Query Profiling – Addressing Key Issues

- Is the planner selectively scanning partitioned tables?

- Is the planner choosing hash aggregate and hash join operations where applicable?

- Is there sufficient work memory?

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Viewing the Query Plan

To see the plan for a query, use:	Query plans:	The following metrics are given for each operation:

• `EXPLAIN <query>`
• `EXPLAIN ANALYZE <query>`
	• Are read from bottom to top
	• Include motions, such as Gather, Redistribute, Broadcast on
	  • Joins
	  • Sorts
	  • Aggregations
		• Cost (units of disk page fetches)
		• Rows (rows output by this node)
		• Width (average size, in bytes, of a node's output)

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Reading the `EXPLAIN` Output

SQL query

```
EXPLAIN SELECT * FROM names WHERE name = 'Joelle';


---------------------------- QUERY PLAN ----------------------------
```

Gather motion

Cost, rows, and width

```
Gather Motion 2:1 (slice1)  (cost=0.00..20.88 rows=1 width=13)
   -> Seq Scan on 'names'   (cost=0.00..20.88 rows=1 width=13)
         Filter: name::text ~~ 'Joelle'::text
```

Filter condition

Reading EXPLAIN ANALYZE Output

```
EXPLAIN ANALYZE SELECT * FROM names WHERE name = 'Joelle';

------------------------ QUERY PLAN ---------------------------

Gather Motion 2:1 (slice1) (cost=0.00..20.88 rows=1 width=13)
  recv: Total 1 rows with 0.305 ms to first row, 0.537 ms to
end.
   -> Seq Scan on 'names' (cost=0.00..20.88 rows=1
       Total 1 rows (seg0) with 0.255 ms to fi
to end.
         Filter: name::text ~~ 'Joelle'::text
22.548 ms elapsed
```

1 row returned to master

1 segment returned rows

Actual time to run the query

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Review

- The Query Process

- Profiling

- Structure of a Query Plan

- Identify Tuning Opportunities

- Work the lab

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