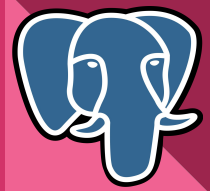
Otimização de consultas

Vitor Apolinário
Willian Genero

Consultas join

```sql
-- films that have more than two genres
select
    m.id,
    m.name,
    count(g.genre)
from
    movies m
join movies_genres g on
    g.movie_id = m.id
group by
    m.id
having
    count(g.genre) > 2;
```

```sql
from
    movies m
join movies_genres g on
    g.movie_id = m.id
join (
    select
        distinct genre
    from
        movies_genres r) gd on
    gd.genre = g.genre
```



Alterações nos índices

Tabela com índices

```
CREATE TABLE `movies_genres` (
  `movie_id` int(11) NOT NULL,
  `genre` varchar(100) NOT NULL,
  PRIMARY KEY (`movie_id`,`genre`),
  KEY `movies_genres_movie_id` (`movie_id`),
  CONSTRAINT `movies_genres_ibfk_1` FOREIGN KEY (`movie_id`) REFERENCES `movies` (`id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8
```

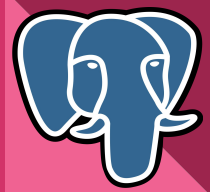
Tabela sem índices

```
CREATE TABLE `movies_genres` (
  `movie_id` int(11) NOT NULL,
  `genre` varchar(100) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8
```

Consultas subselect

```sql
--how many percents a genre represents
select
    gnr,
    cnt * 100 / (
    select
        count(*)
    from movies_genres g ) as perc
from
    (select
        g.genre as gnr,
        count(*) as cnt
     from
        movies_genres g
     group by
        g.genre) z;
```

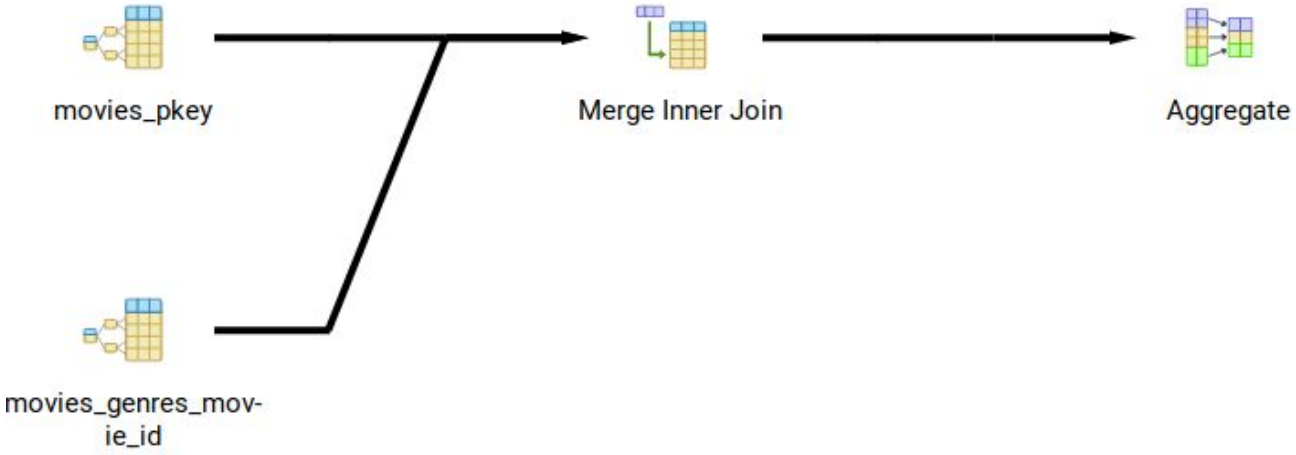
```sql
    cnt * 100 / (
    select
        count(*)
    from
        movies_genres g join movies m on m.id = g.movie_id
        ) as perc
from
```



Métodos encontrados Postgresql

- Merge inner join
- Aggregate
- Sort
- Materialize
- Gather
- Hash
- Hash inner join
- Subquery scan

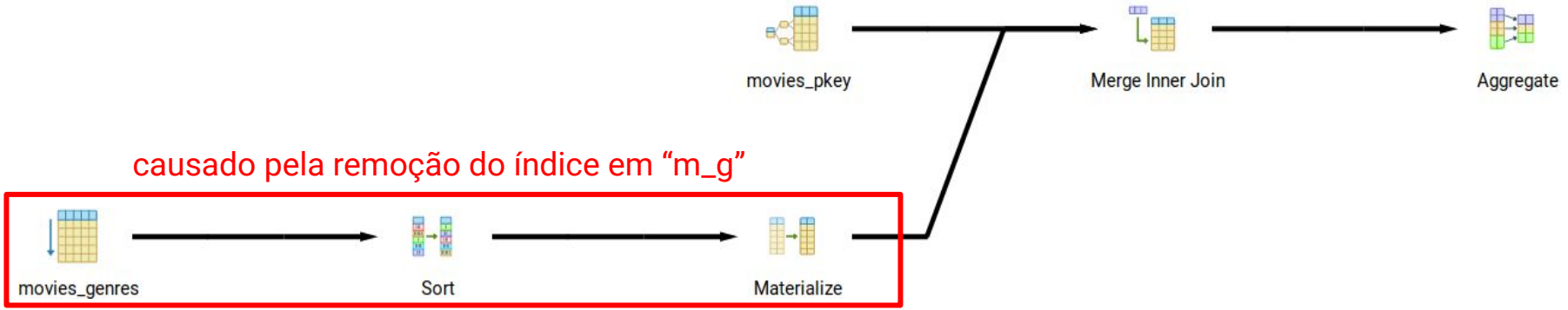
Join c/ índice, otimizado - Postgresql



Planning time: 0.341 ms

Execution time: 303.535 ms

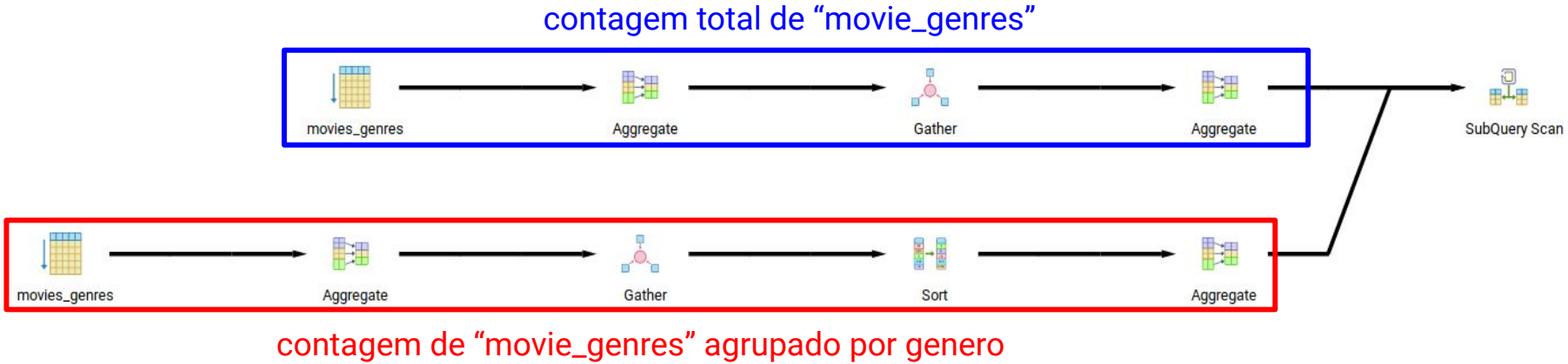
Join s/ índice, otimizado - Postgresql



Planning time: 0.217 ms

Execution time: 613.074 ms

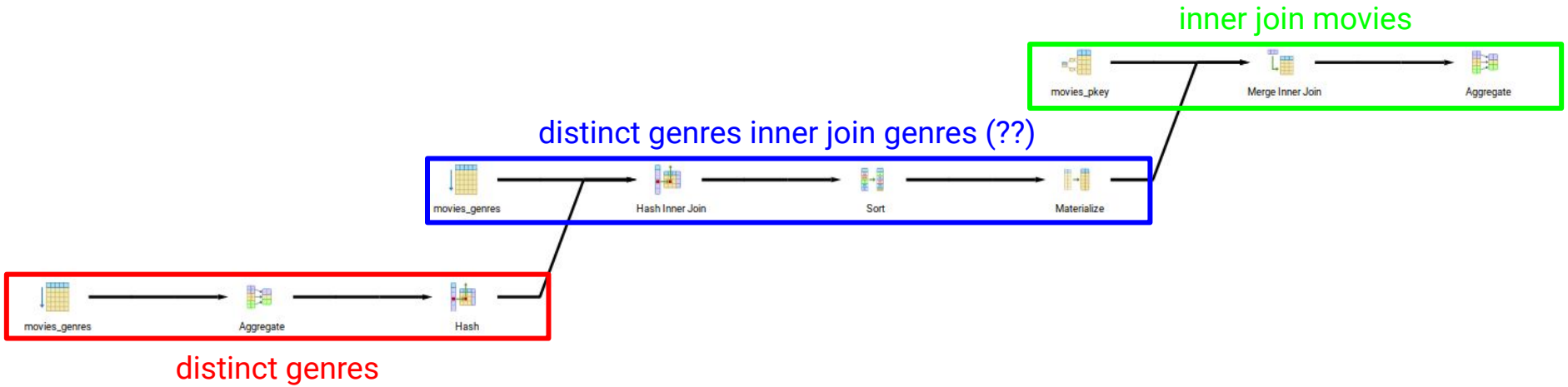
Subselect, otimizado - Postgresql



Planning time: 0.168 ms

Execution time: 79.351 ms

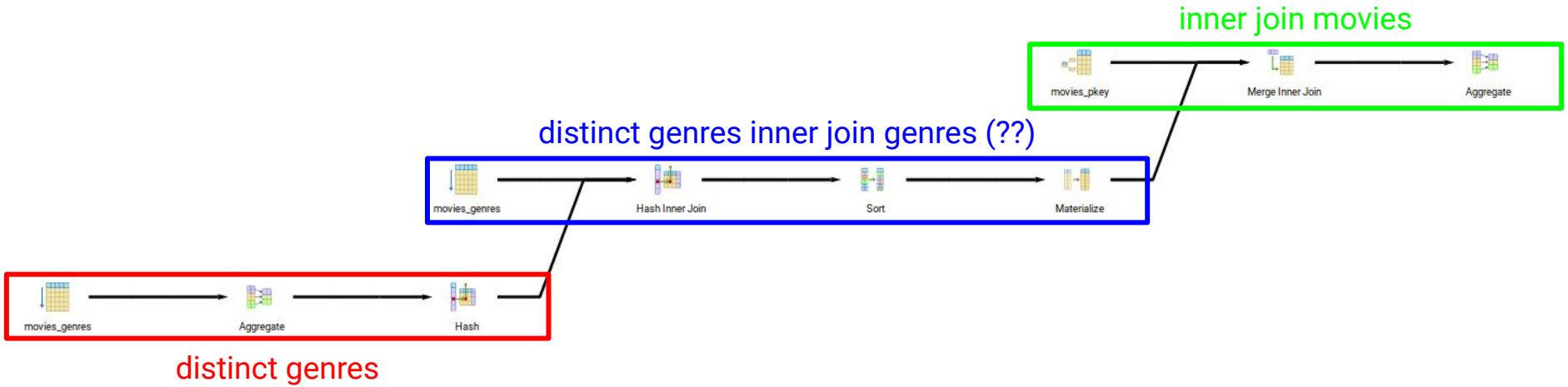
Join c/ índice, não otimizado - Postgresql



Planning time: 0.302 ms

Execution time: 751.364 ms

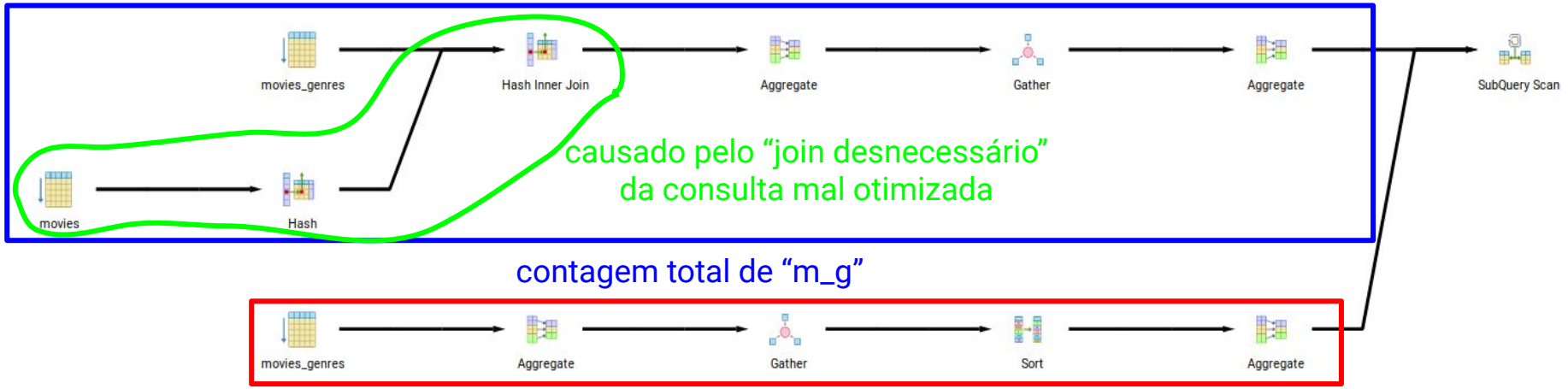
Join s/ índice, não otimizado - Postgresql



Planning time: 0.309 ms

Execution time: 760.432 ms

Subselect, não otimizado - Postgresql



Planning time: 0.313 ms

Execution time: 258.437 ms

Found procedures - MariaDB

- simple select
- derived select
- subquery select
- using index
- using temporary
- using filesort

Join c/ índice, otimizado - MariaDB

	id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	1	SIMPLE	m	index	PRIMARY	PRIMARY	4	[NULL]	380771	
2	1	SIMPLE	g	ref	PRIMARY,movies_genres_movie_id	PRIMARY	4	imdb_ijs.m.id	1	Using index

Duration (ms)

1,076

Join s/ índice, otimizado - MariaDB

	123 id	ABC select_type	ABC table	ABC type	ABC possible_keys	ABC key	ABC key_len	ABC ref	ABC rows	ABC Extra
1	1	SIMPLE	g	ALL	[NULL]	[NULL]	[NULL]	[NULL]	394892	Using temporary; Using filesort
2	1	SIMPLE	m	eq_ref	PRIMARY	PRIMARY	4	imdb_ijs_bugado.g.movie_id	1	

Duration (ms)

1,428

Subselect, otimizado - MariaDB

	123 id	ABC select_type	ABC table	ABC type	ABC possible_keys	ABC key	ABC key_len	ABC ref	ABC rows	ABC Extra
1	1	PRIMARY	<derived3>	ALL	[NULL]	[NULL]	[NULL]	[NULL]	395065	
2	3	DERIVED	g	index	[NULL]	PRIMARY	306	[NULL]	395065	Using index; Using temporary; Using filesort
3	2	SUBQUERY	g	index	[NULL]	PRIMARY	306	[NULL]	395065	Using index

Duration (ms)

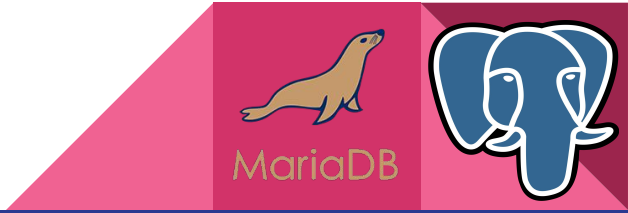
427

Join c/ índice, não otimizado - MariaDB

	id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	1	PRIMARY	m	index	PRIMARY	PRIMARY	4	[NULL]	380771	
2	1	PRIMARY	g	ref	PRIMARY,movies_genres_movie_id	PRIMARY	4	imdb_ijs.m.id	1	Using index
3	1	PRIMARY	<derived2>	ref	key0	key0	302	imdb_ijs.g.genre	1	
4	2	DERIVED	r	index	[NULL]	PRIMARY	306	[NULL]	395065	Using index; Using temporary

Duration (ms)

1,495



Join s/ índice, não otimizado - MariaDB

	id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	1	PRIMARY	g	ALL	[NULL]	[NULL]	[NULL]	[NULL]	394892	Using temporary; Using filesort
2	1	PRIMARY	m	eq_ref	PRIMARY	PRIMARY	4	imdb_ijs_bugado.g.movie_id	1	
3	1	PRIMARY	<derived2>	ref	key0	key0	302	imdb_ijs_bugado.g.genre	1	
4	2	DERIVED	r	ALL	[NULL]	[NULL]	[NULL]	[NULL]	394892	Using temporary

Duration (ms)

2,130

Subselect, não otimizado - MariaDB

	123 id	ABC select_type	ABC table	ABC type	ABC possible_keys	ABC key	ABC key_len	ABC ref	ABC rows	ABC Extra
1	1	PRIMARY	<derived3>	ALL	[NULL]	[NULL]	[NULL]	[NULL]	395065	
2	3	DERIVED	g	index	[NULL]	PRIMARY	306	[NULL]	395065	Using index; Using temporary; Using filesort
3	2	SUBQUERY	m	index	PRIMARY	movies_name	303	[NULL]	380771	Using index
4	2	SUBQUERY	g	ref	PRIMARY,movies_genres_movie_id	PRIMARY	4	imdb_ijs.m.id	1	Using index

Duration (ms)

1,211

Comparativo - tempo médio de execução (ms)

	Postgres		Mariadb	
	Otimizada	**N Otimizada**	**Otimizada**	**N Otimizada**
Indexed join	303	751	1076	1495
Simple join	613	760	1428	2130
Subselect	79	258	427	1211