

# TPC-H performance measure

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## 1 実験環境

- CPU : Xeon X7560 @ 2.27GHz x4
- Memory : 64GB
- DBMS : PostgreSQL 9.2
- RAID0 : ioride x8 (chunk size = 64KB)
- 各テーブルの primary key 上に B-tree index を構築
- Scale Factor = 100
- shared buffer = 8GB

## 2 Query 8

簡単の為、Query8 のうちの I/O がメインとなる部分のみを実行する。work\_mem の値 (ひとつの sort や hash table に使用されるメモリサイズ) を変化させて、実行時間を計測する。

### 2.1 Query and Execution Plan

```
select
extract(year from o_orderdate) as o_year,
l_extendedprice * (1 - l_discount) as volume,
n2.n_name as nation
from
part, supplier, lineitem, orders,
customer, nation n1, nation n2, region
where
p_partkey = l_partkey
and s_suppkey = l_suppkey
and l_orderkey = o_orderkey
and o_custkey = c_custkey
and c_nationkey = n1.n_nationkey
and n1.n_regionkey = r_regionkey
and r_name = 'AMERICA'
and s_nationkey = n2.n_nationkey
and o_orderdate between date '1995-01-01' and date '1996-12-31'
and p_type = 'ECONOMY ANODIZED STEEL'
```

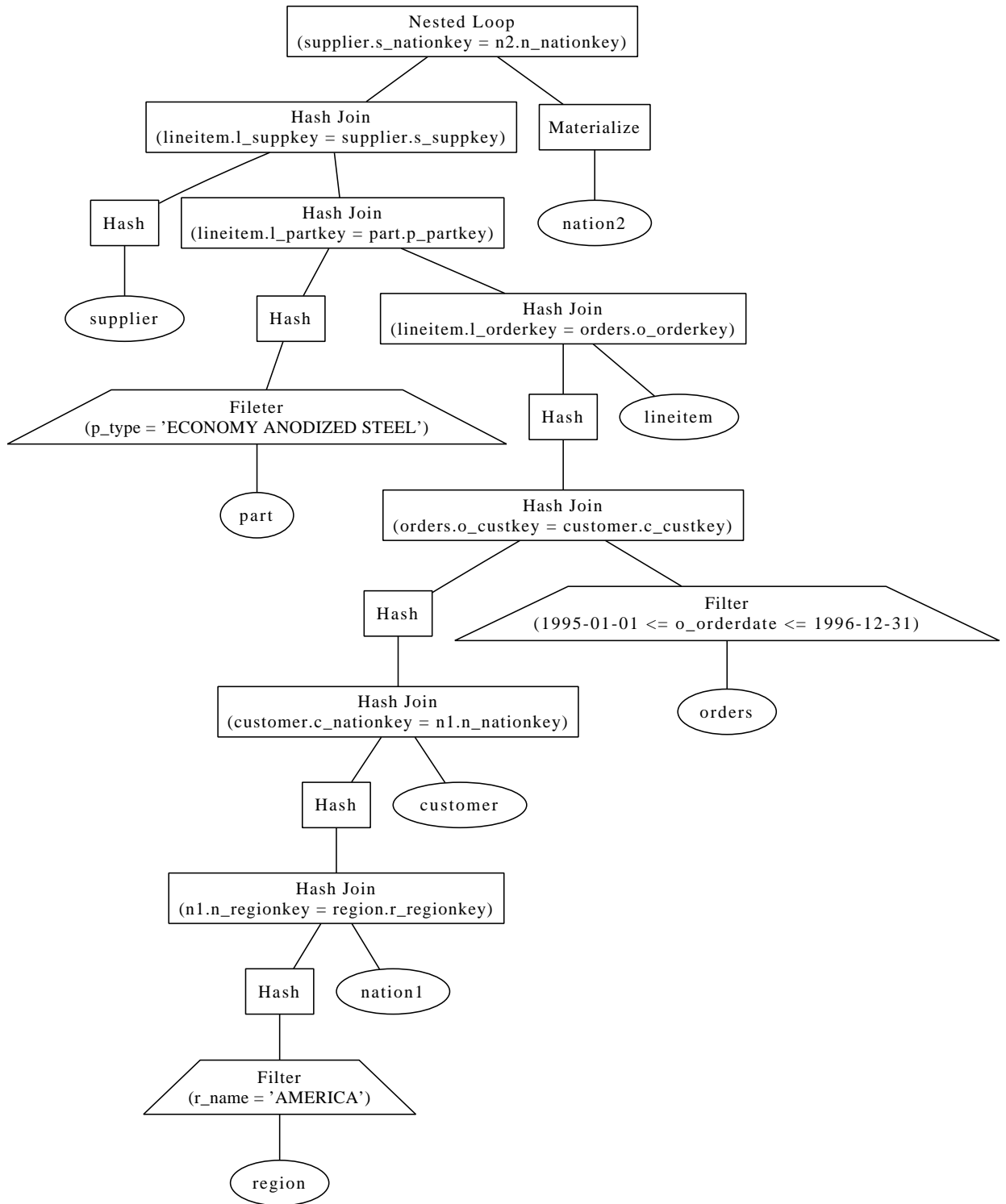


Figure 1 Query 8 execution plan

2.2 work\_mem = 64kB - 2GB

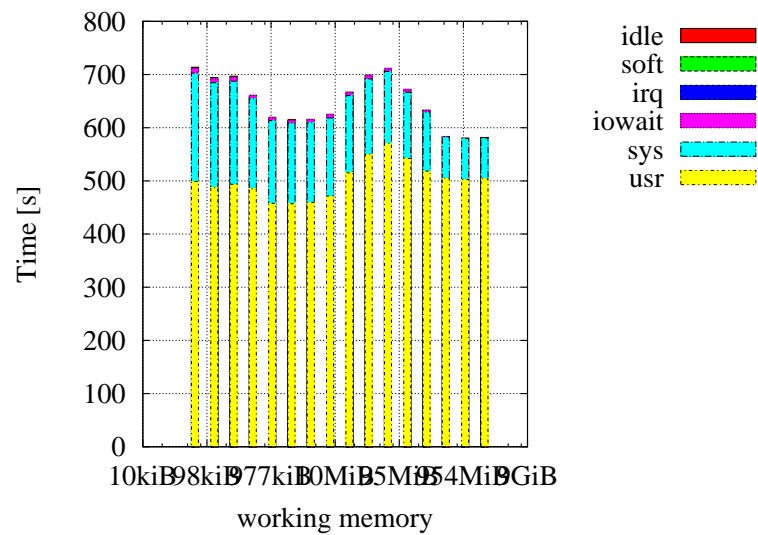


图 2 Executinon time and breakdown by mpstat

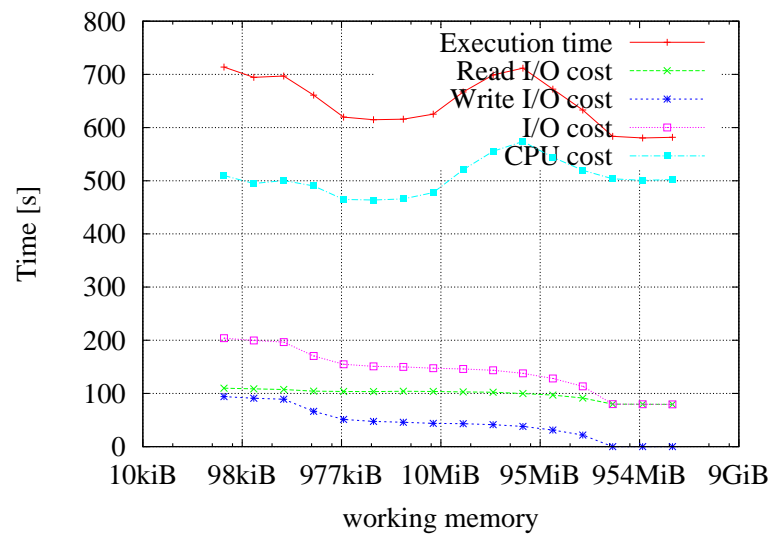


图 3 Executinon time and I/O cost and CPU cost

+	2.81%	postgres	postgres	[.] heap_fill_tuple
+	1.43%	postgres	postgres	[.] heap_form_minimal_tuple
+	1.05%	postgres	postgres	[.] BufFileWrite

```

+ 0.50%      postgres postgres      [...] ExecStoreMinimalTuple
...

```

### 2.3 work\_mem = 16MB - 32MB

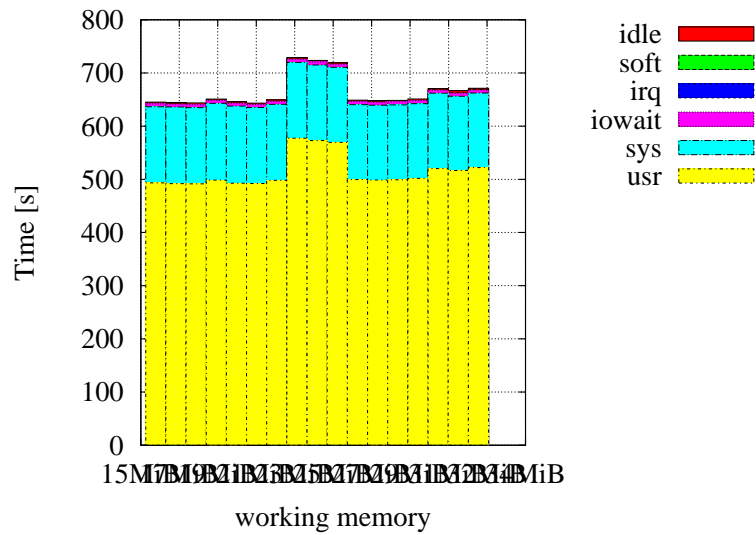


Figure 4: Execution time and breakdown by mpstat

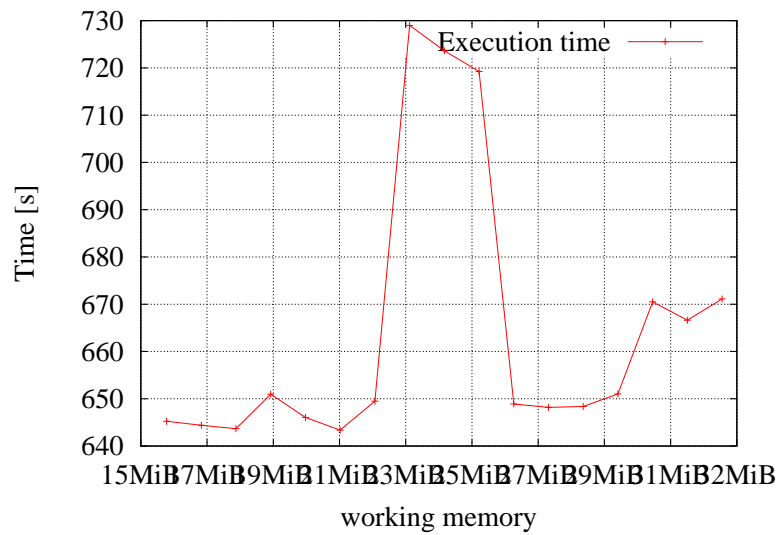


Figure 5: Execution time and I/O cost and CPU cost

### 3 join between orders and lineitem

#### 3.1 work\_mem = 64kB - 8GB

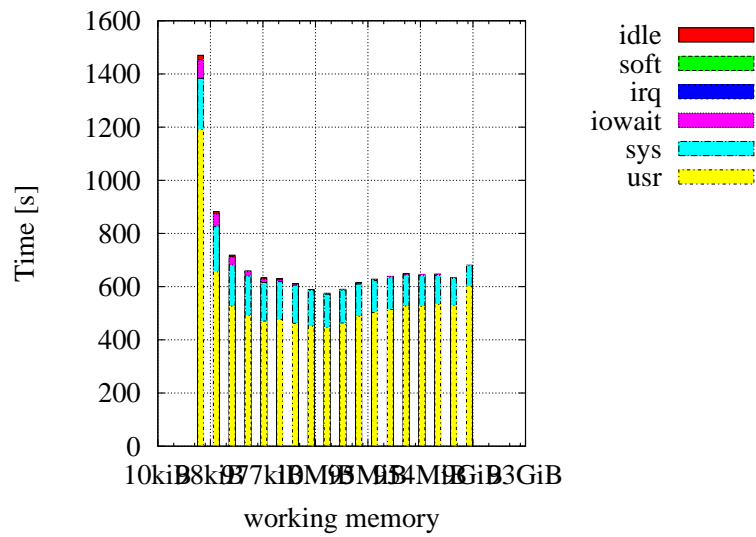


Figure 6 Execution time and breakdown by mpstat

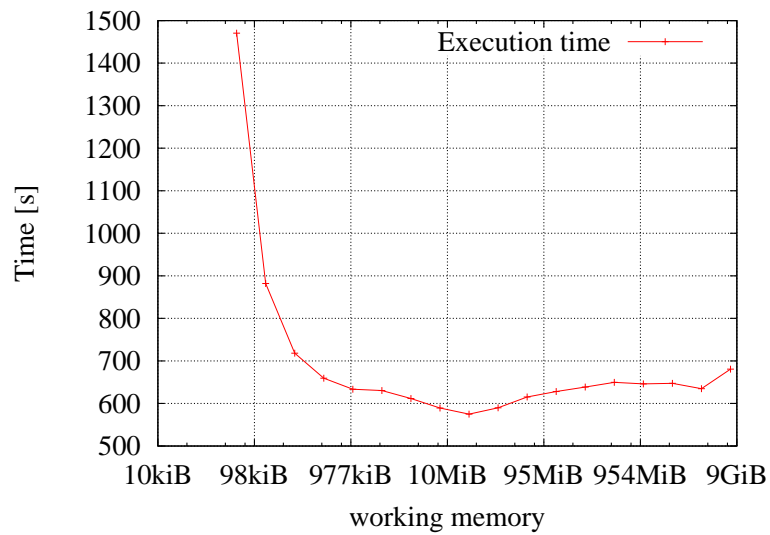


Figure 7 Execution time and I/O cost and CPU cost