Managing Query Plans

Controlling how queries execute

Overview
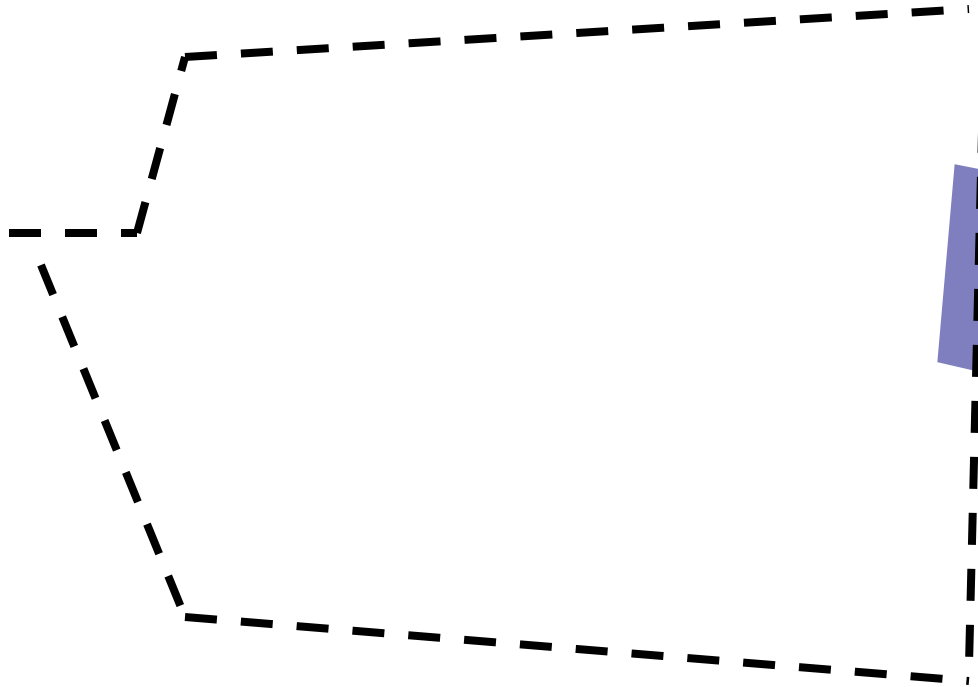
- **Optimization via query plans**
- **Parameterization**
- **Plan selection**
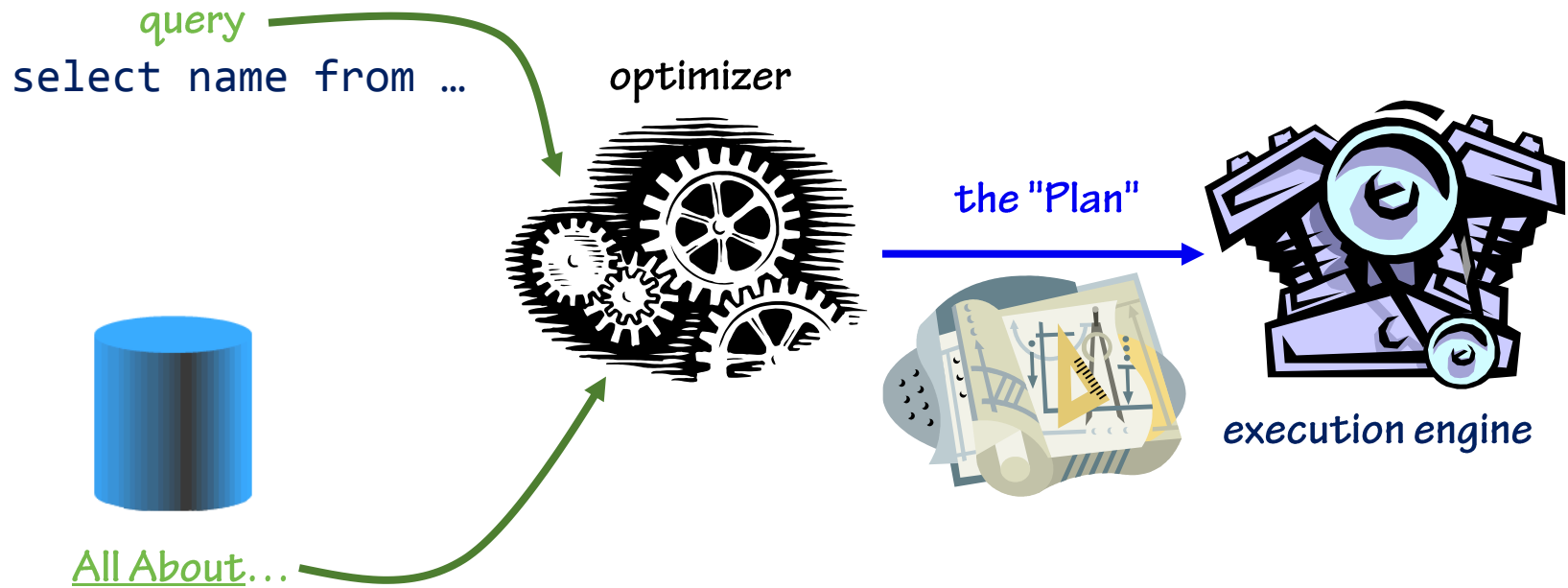- **Plan guides**

Query Plans

T-Sql » **Query Optimizer**» **Query Plan**

Query Optimizer

- **T-SQL ⇨ Query Plan**

query
`select name from ...`
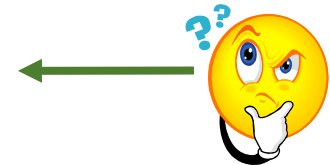
optimizer

the "Plan"

execution engine

All About…

Plan Reuse

- **Plans are reused**

Cache　transient

Batch
```
select a, b from …
insert accounts …
exec [trial balance]…
```

key ⟶

⟵

Ad hoc Expressions

- **Caches do not "just work"**
  - data access pattern dependent
- **ad hoc workloads**

```
                      used a lot

use once 1            use once 4

                      use once 6
```

Parameterization

- **Literal values make statements look different**
- **Automatic**
  - simple
  - forced
- **Manual**
- **Plan guides**

```
select * from sales where agent= @agent
```

Plan Guides

- **Control plan generation**
  - adds/removes hints
  - specific plan
  - changes parameterization
- **After the fact**
- **Manageable**

hint added

```
select * from order with (forceseek) join detail on id;
```

Kinds of Plan Guides

- **SQL**
- **Object**
- **Template**

@stmt

select * from rvbls..accounts where id = @0;

@module_or_batch

exec TrialBalance @acc=45

select * from Customers;

@module_or_batch

@stmt

select * from Orders with (FORCESEEK) join Details on ID;

create proc TrialBalance (@acc int)
as
…

@stmt

@stmt

select sum(balance) from banks join
customers on banks.id = customers.id;
…

Managing Guides

- **sys.plan_guides**
- **sp_control_plan_guide**
- **@operation**
  - drop all
  - disable all
  - enable all
- **@name**

Summary

- SQL Server executes plans, not queries
- Plan reuse can speed up subsequent queries
- Parameterization of plans may improve cache performance
- Server can be optimized for ad hoc queries that are not reused
- Plan guides control how SQL Server creates query plans

References

- sys.plan_guides
- sp_get_query_template
- sp_create_plan_guide
- sp_create_plan_guide_from_handle
- sp_control_plan_guide
- sys.dm_exec_cached_plan
- sys.dm_exec_query_stats
- sys.dm_exec_requests
- sys.dm_exec_plan_attributes
- sys.dm_exec_query_plan
- sys.dm_exec_cached_plans
- dm_exec_sql_text