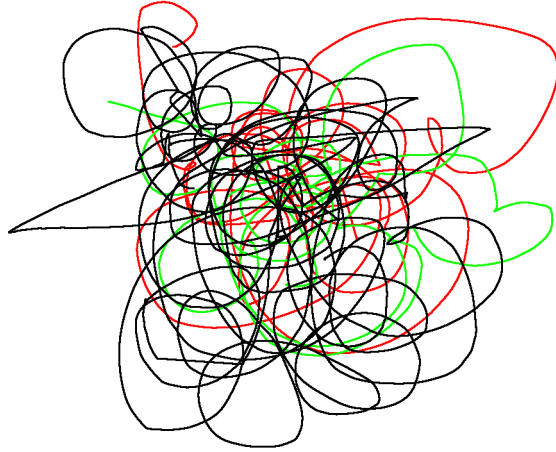


Main classes/structures of MariaDB and how they are connected



Oleksandr „Sanja“ Byelkin, MariaDB, 2019

MEM_ROOT - Memory Allocation

- Allocate in big chunks
- Deallocate all together after query execution

select_result class family

Interface to return results from select execution

- send_data
- send_result_set_metadata

Sending

- To a client (net)
- File
- Temporary table
- Result interseptio
- ...

Item - expression build block

- Organize a tree of expression (walk method to traverse)
- Prepared with fix_fields
- Value get by val_*() and val_*_result() methods

Query_arena – storage for Item-s

- Contains MEM_ROOT and list of Items allocated in it (free_list)
- Used to correctly cleanup after execution free_items()

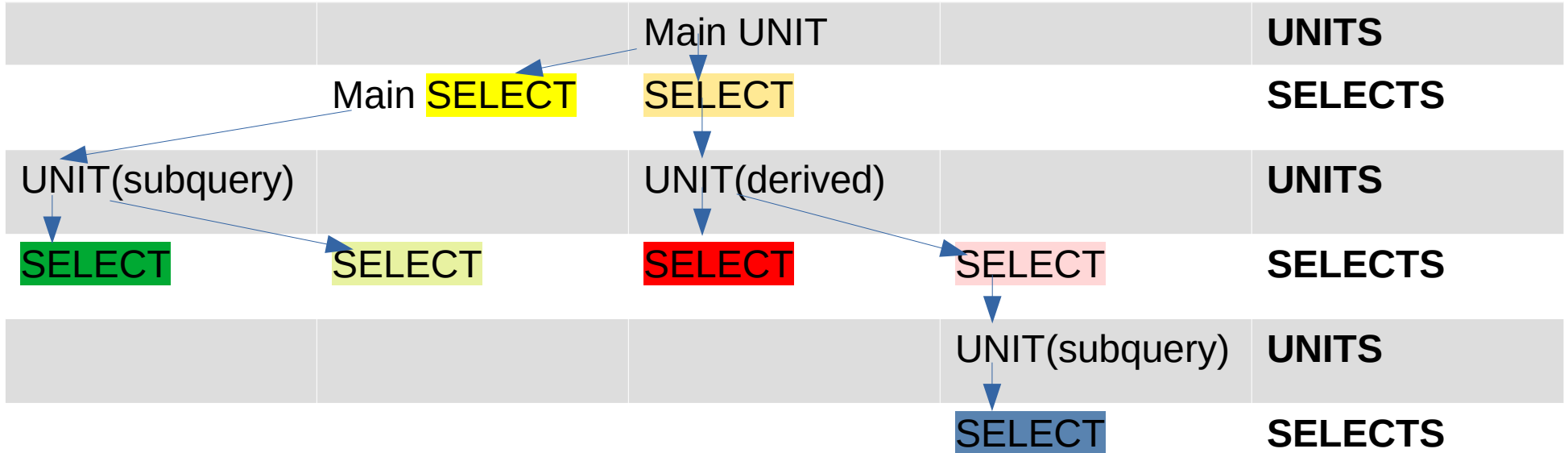
Statement

- Inherited from Query_arena
- Represent a statement (not all)
- Contain LEX (result of parsing)

THD – represent connection

- Based on Command
- Tons of settings and variables
- Contains run-time Query_arena
- Has links for myna other Query Arenas
- List of opened tables
- **Many more**

SELECT_LEX / SELECT_LEX_UNIT



```

SELECT * from t1
  where a in (SELECT a from t2 EXCEPT SELECT a from t3)union
SELECT * from
  (SELECT * from t0 UNION SELECT * from t3
   where exists (SELECT * from t4 where t4.a=t3.a))
  
```


SELECT_LEX

- SELECT clauses
 - Select list
 - Where condition
 - Table list
 - ...
- Statistics (with_wild, with_sum_suncs...)
- Processed select info (leaf_tables, ...)
- ...

SELECT_LEX_UNIT

- Reference to select_result object family
- Flags and data for UNION/EXCEPT/INTERSECT processing
- Reference on subquery Item (if represents subquery)
- Reference on post-processing SELECT (fake_select)
- ...

LEX – result of parsing

- Represent result of one parsing pass
 - Query
 - PS/SP statement
 - View
- Refers to main UNIT and SELECT
- Flags and data global for statement

Structs related to table

- TABLE_LIST – parsed table, stay with SP/PS
- TABLE – opened table entity (on prepare linked to TABLE_LIST)
- TABLE_SHARE – table definition (each TABLE of the same table refer to one TABLE_SHARE)

JOIN/JOIN_TAB

JOIN

- Represents everything connected to SELECT prepare/optimize and execute

JOIN_TAB

- Represents possible table access methods
- With position array used find best table join order
- Represents final execution plan

Almost standard containers

- HASH (C implementation of hash table)
- DYNAMIC_ARRAY (C implementation)
- List<> (C++ template of a list)
- String (C++ class, can use system alloc)

General picture

Common

mem_root

Item

HASH

DYNAMIC_ARRAY

List<>

String

Connection

THD

Statement

Query_arena

Parsing

LEX

SELECT_LEX_UNIT

SELECT_LEX

Table

TABLE_LIST

TABLE

TABLE_SHARE

Execution

JOIN

JOIN_TAB

Select_result*