

# Chapter 10

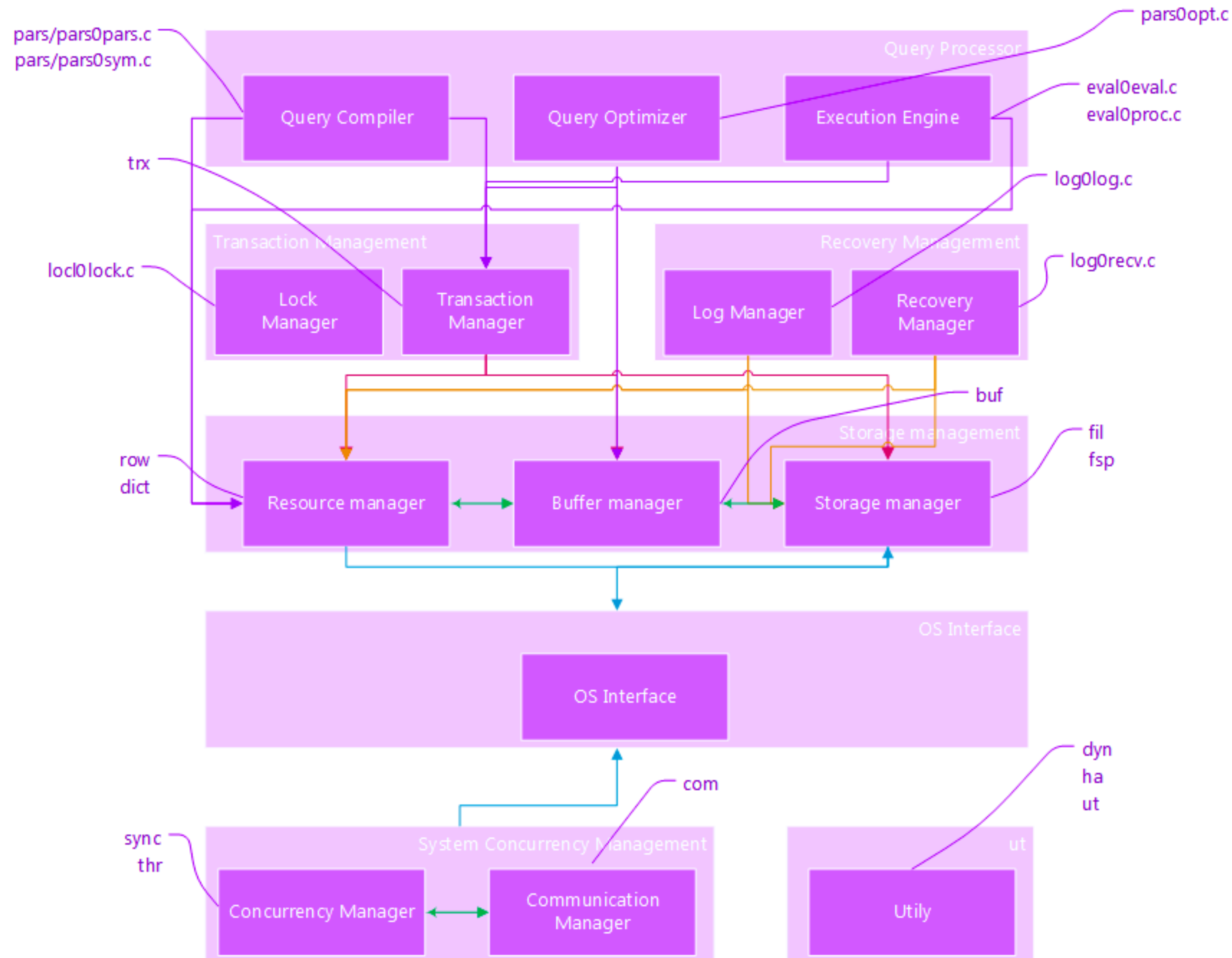
## Transaction Manager Concept

### : Mini-Transaction @ MySQL

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# MySQL InnoDB Architecture



# Mini Transaction (MTR)

- Unit guarantees atomic changes to multiple pages
- No rollback ; only `mtr_start()` and `mtr_commit()`
- MTR is **not** a transaction
- (For example) Insert operation, there are 4 (or more) mini-transactions

**IF index exists**

- ① Allocate UNDO spaces
- ② Write UNDO logs
- ③ Write data (inserted records)
- ④ Commit

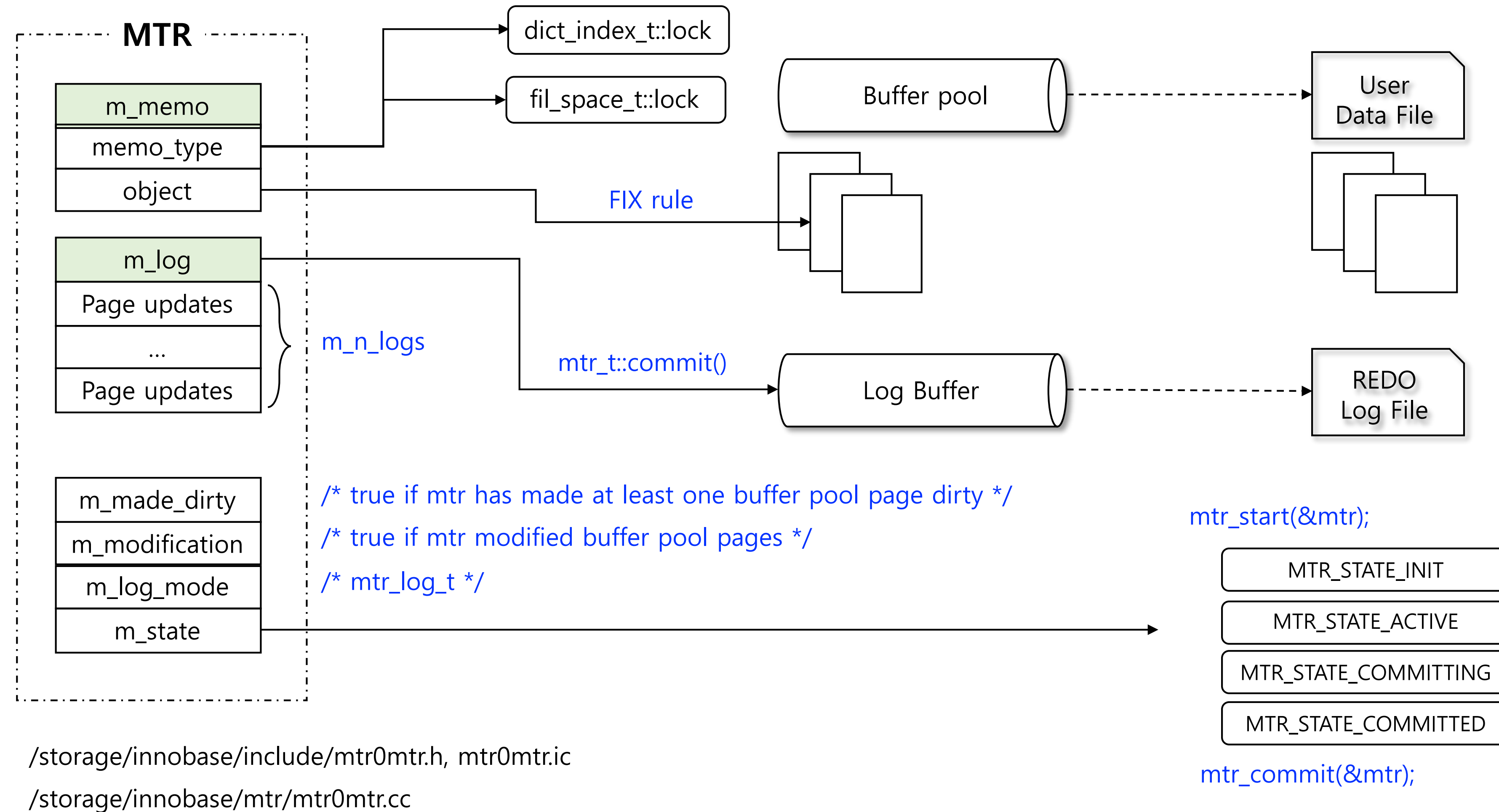
## INSERT:

```
row_ins_clust_index_entry_low
mtr1_start()
  trx_undo_report_row_operation
  mtr2_start()
    trx_undo_assign_undo
    mtr3_start()
      trx_redo_reuse_cached
      mtr3_commit()
    ...
  mtr2_commit()
  page_cur_insert_rec_write_log
mtr1_commit()
```

## COMMIT:

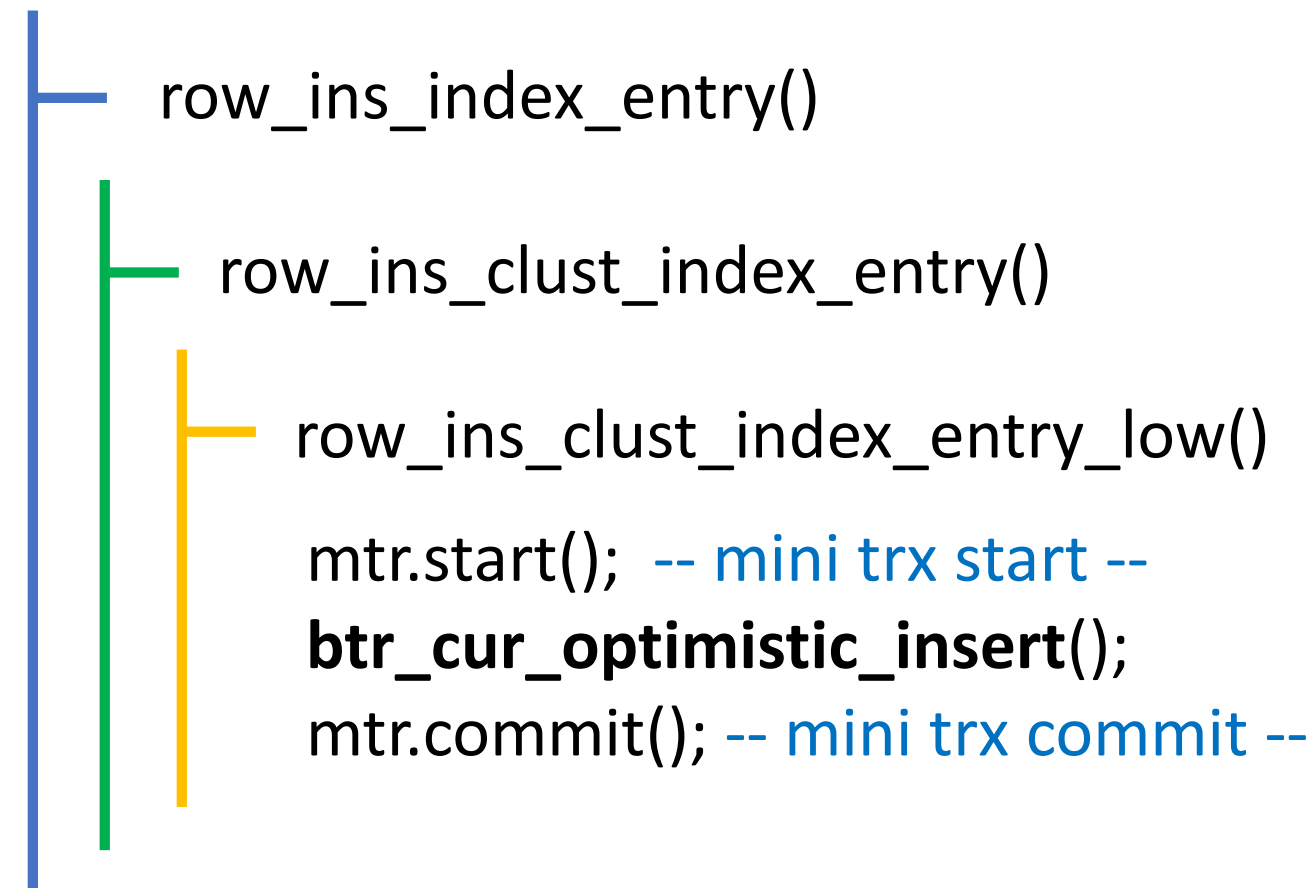
```
trx_commit
mtr4_start()
  trx_commit_low
  ...
mtr4_commit()
```

# Mini Transaction (MTR)

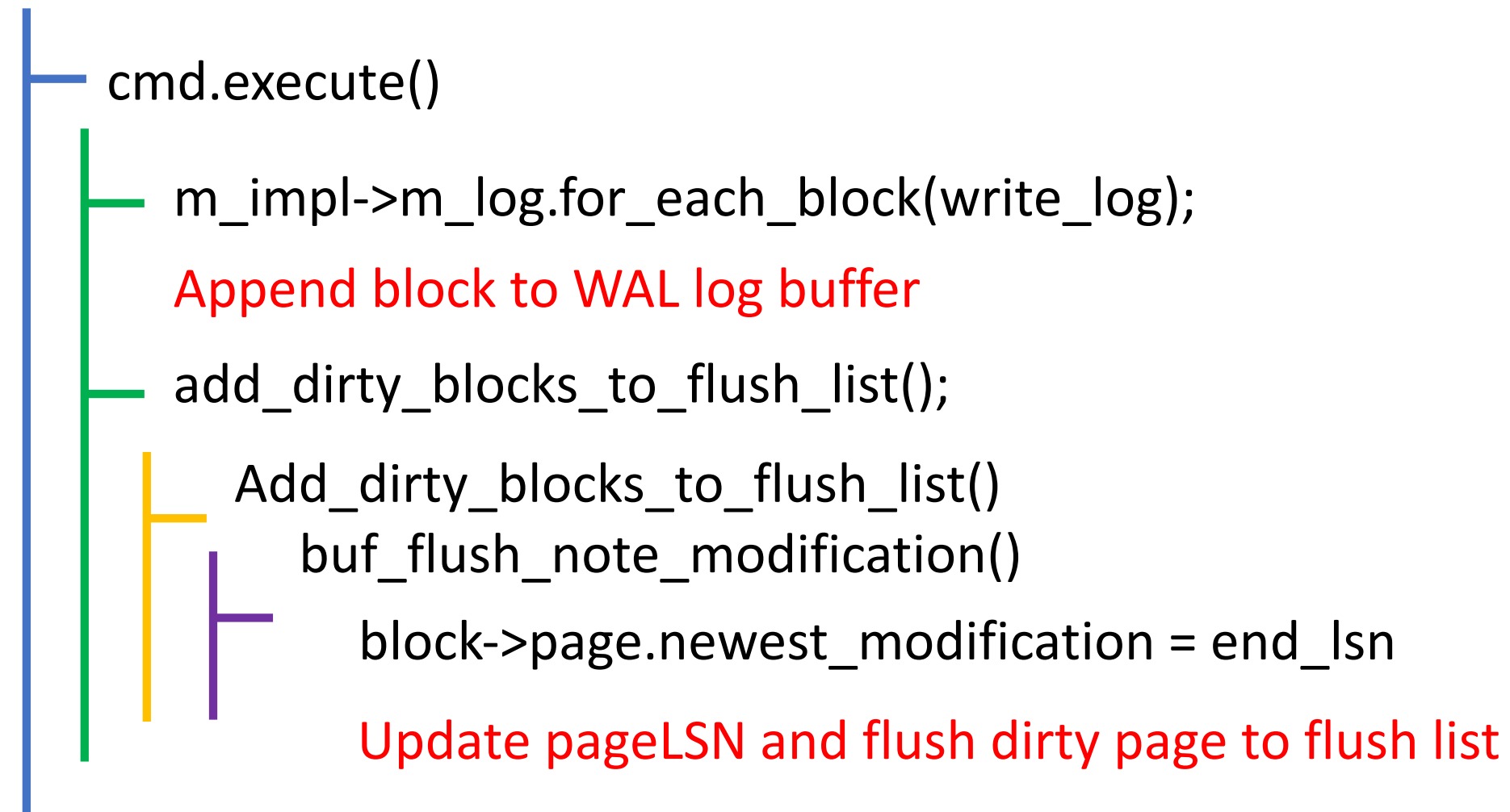


# Insert (Overview)

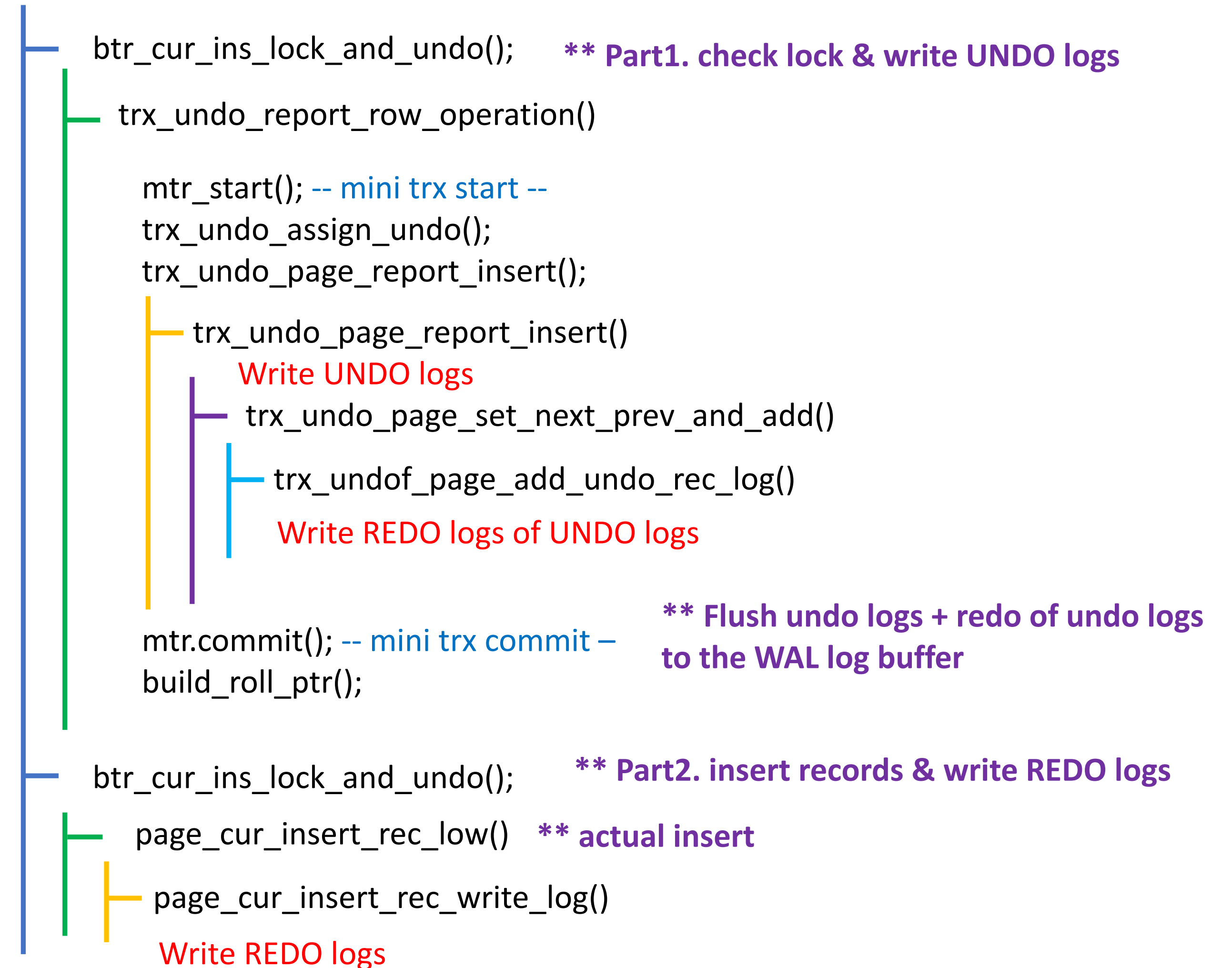
## Transaction INSERT



## mtr.commit()

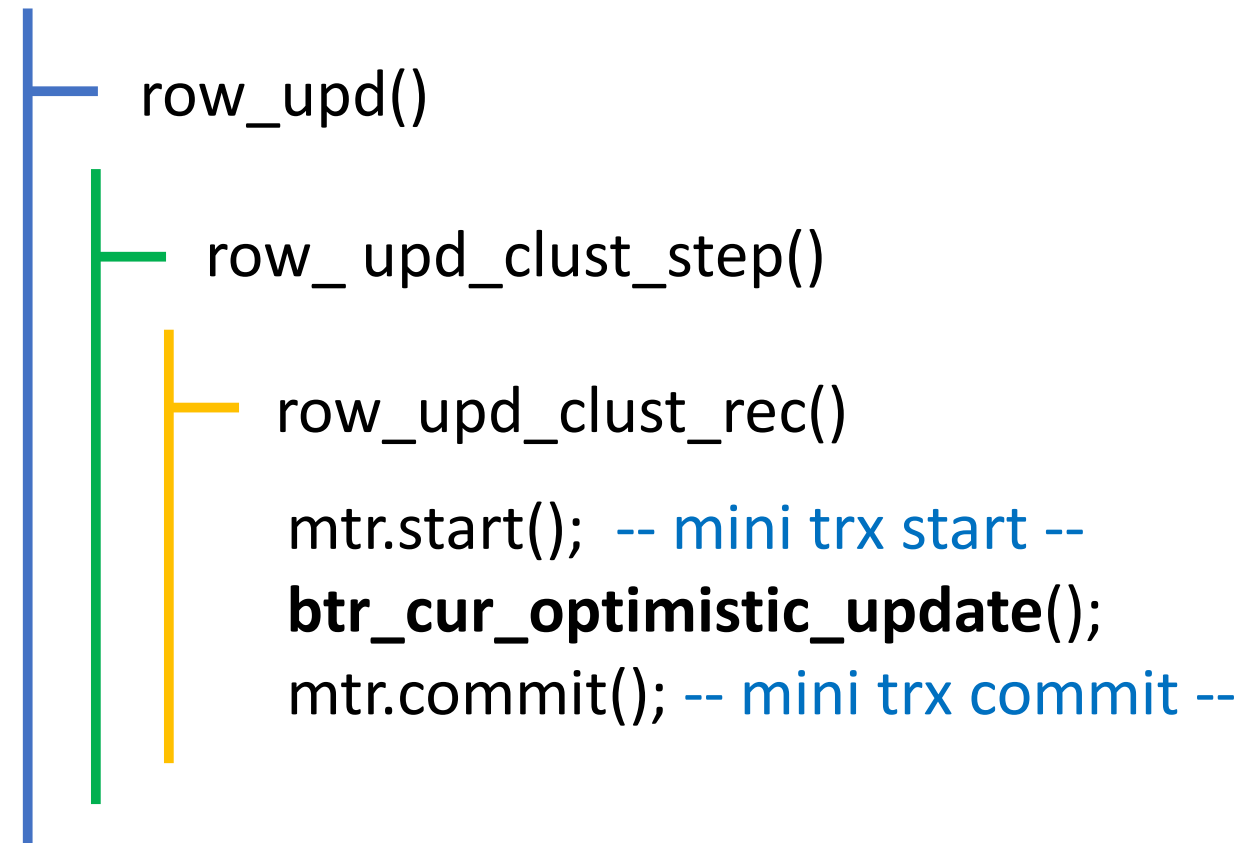


## btr\_cur\_optimistic\_insert();

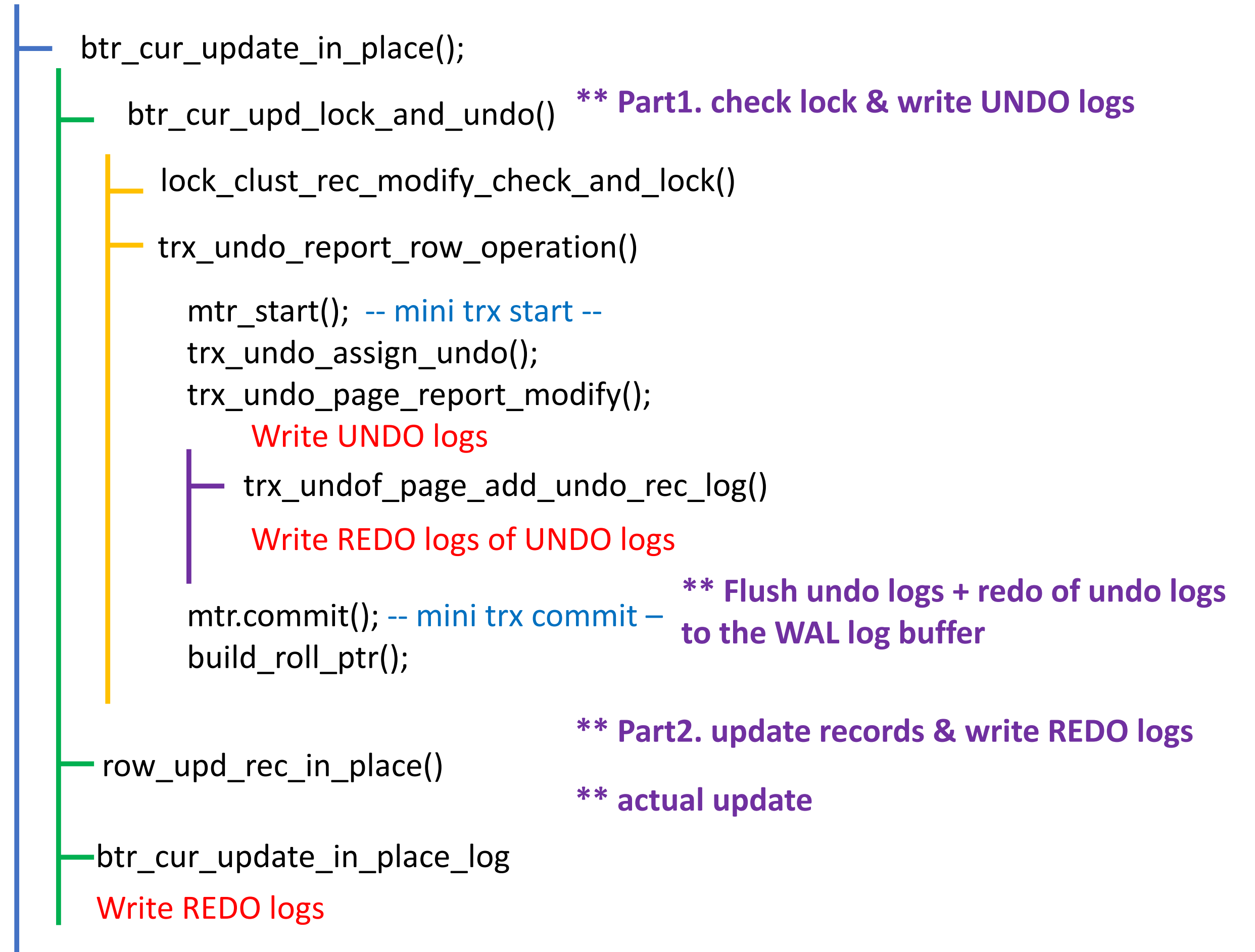


# Update (Overview)

## Transaction UPDATE

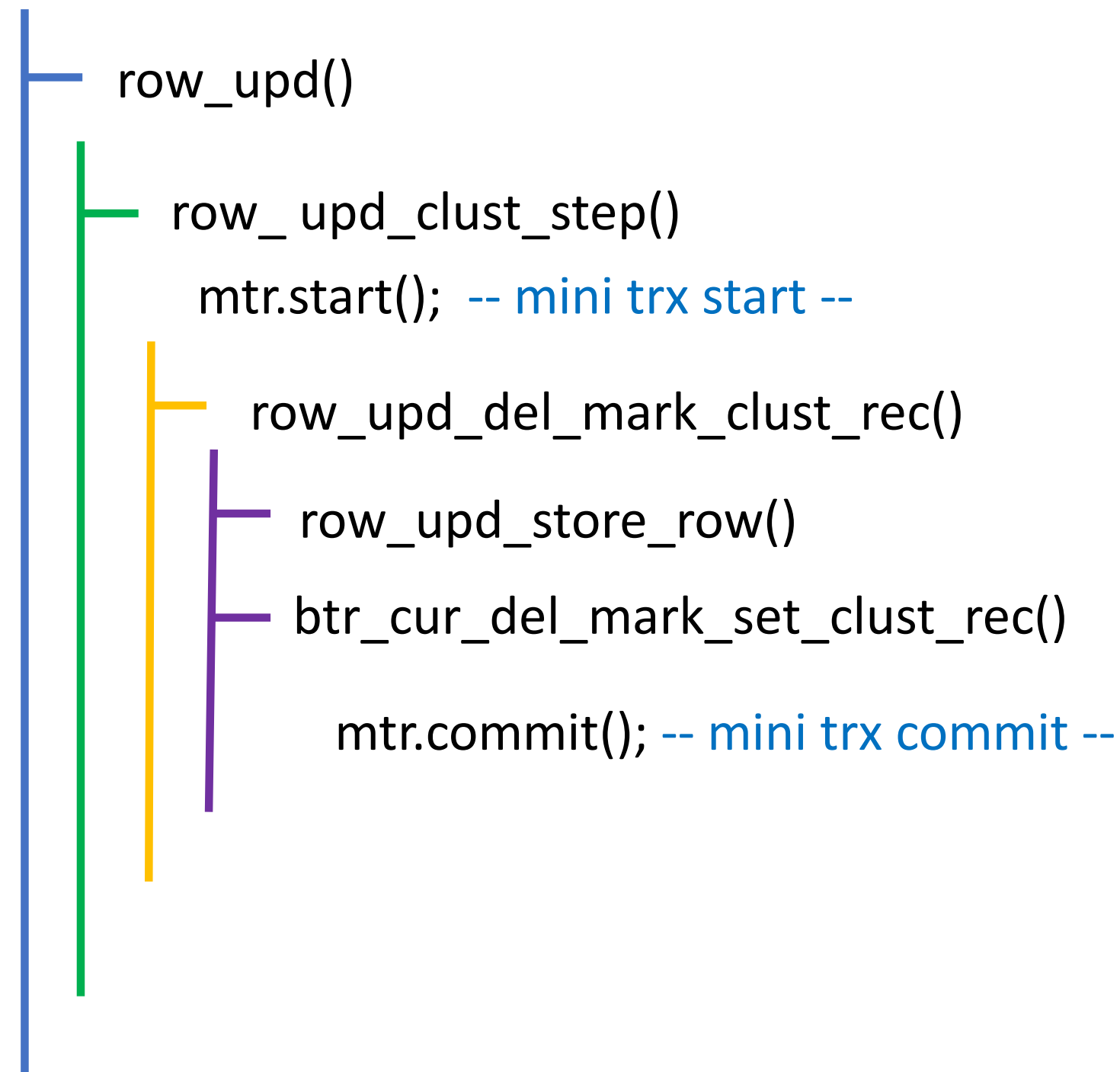


## btr\_cur\_optimistic\_update();

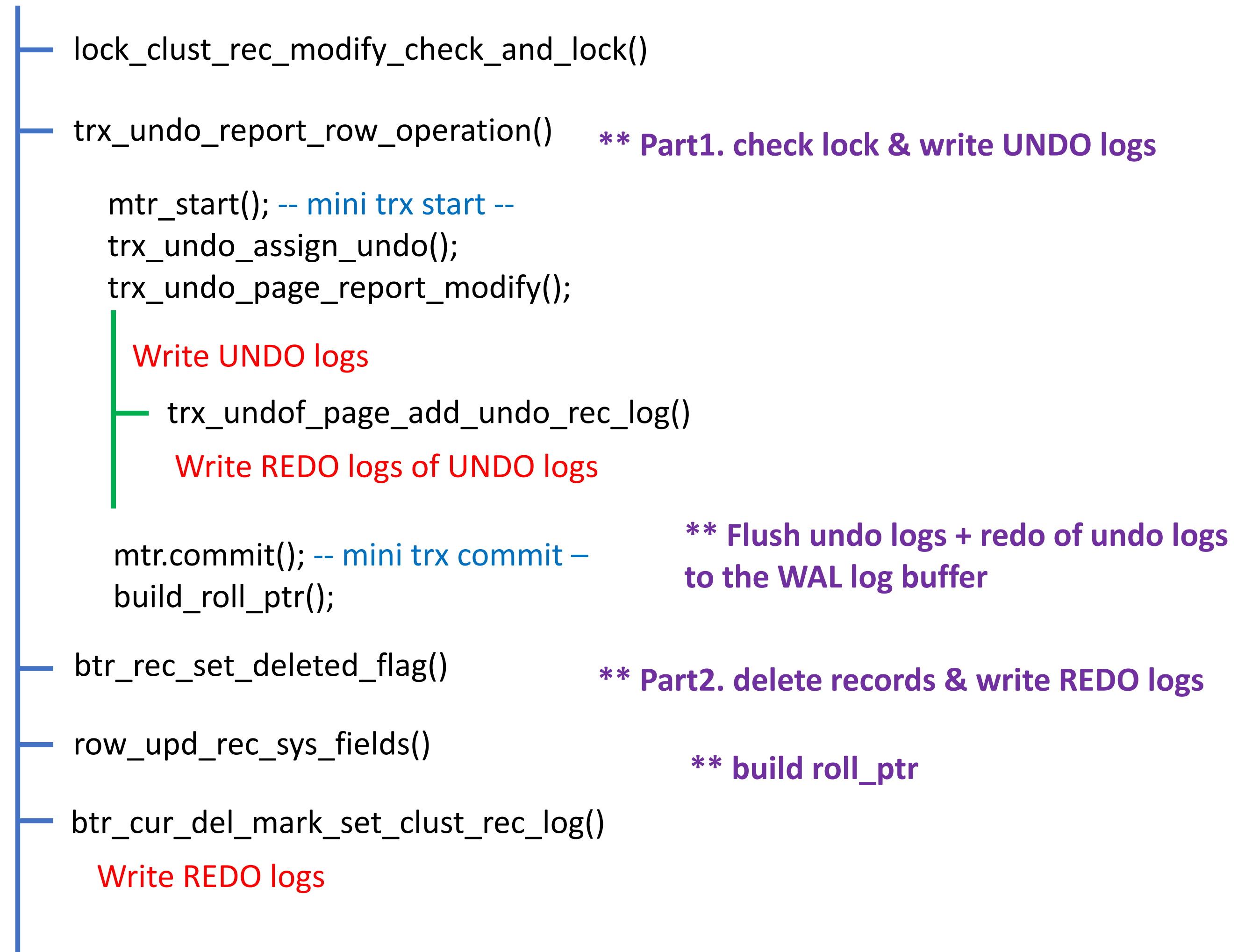


# DELETE (Overview)

## Transaction DELETE



## btr\_cur\_del\_mark\_set\_clust\_rec()



# Reference

- [1] Jim Gray and Andreas Reuter, “Transaction Processing: Concepts and Techniques”, Morgan Kaufmann, San Mateo, CA (1993)
- [2] <http://mingxinglai.com/cn/2015/09/Architecture-Of-MySQL/>