

Today

✓ - LRVN Complete

⇒ - Rio Vista

- Hg

✓ LRVM

- persistent memory layer in support of
System Services

→ Riolista

- performance-conscious design of
persistent memory

System Crash

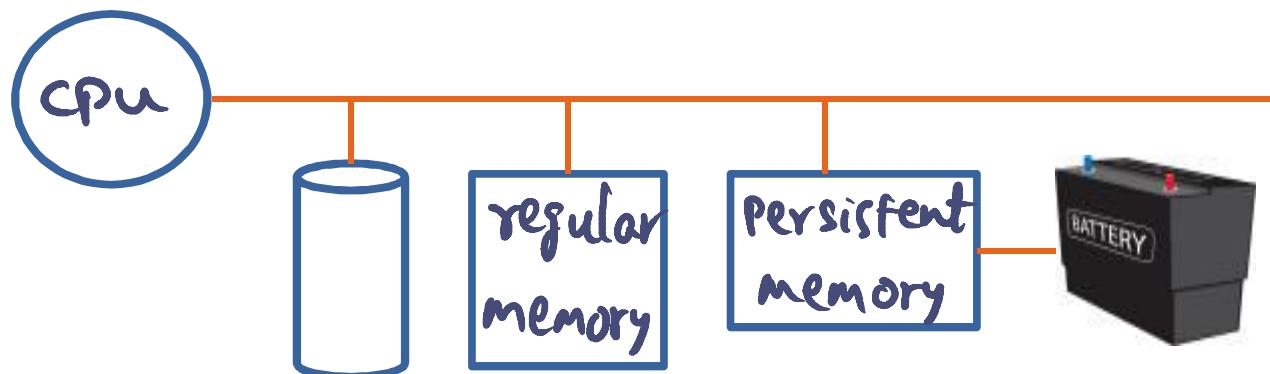
Two problems concerning failure

- Power failure

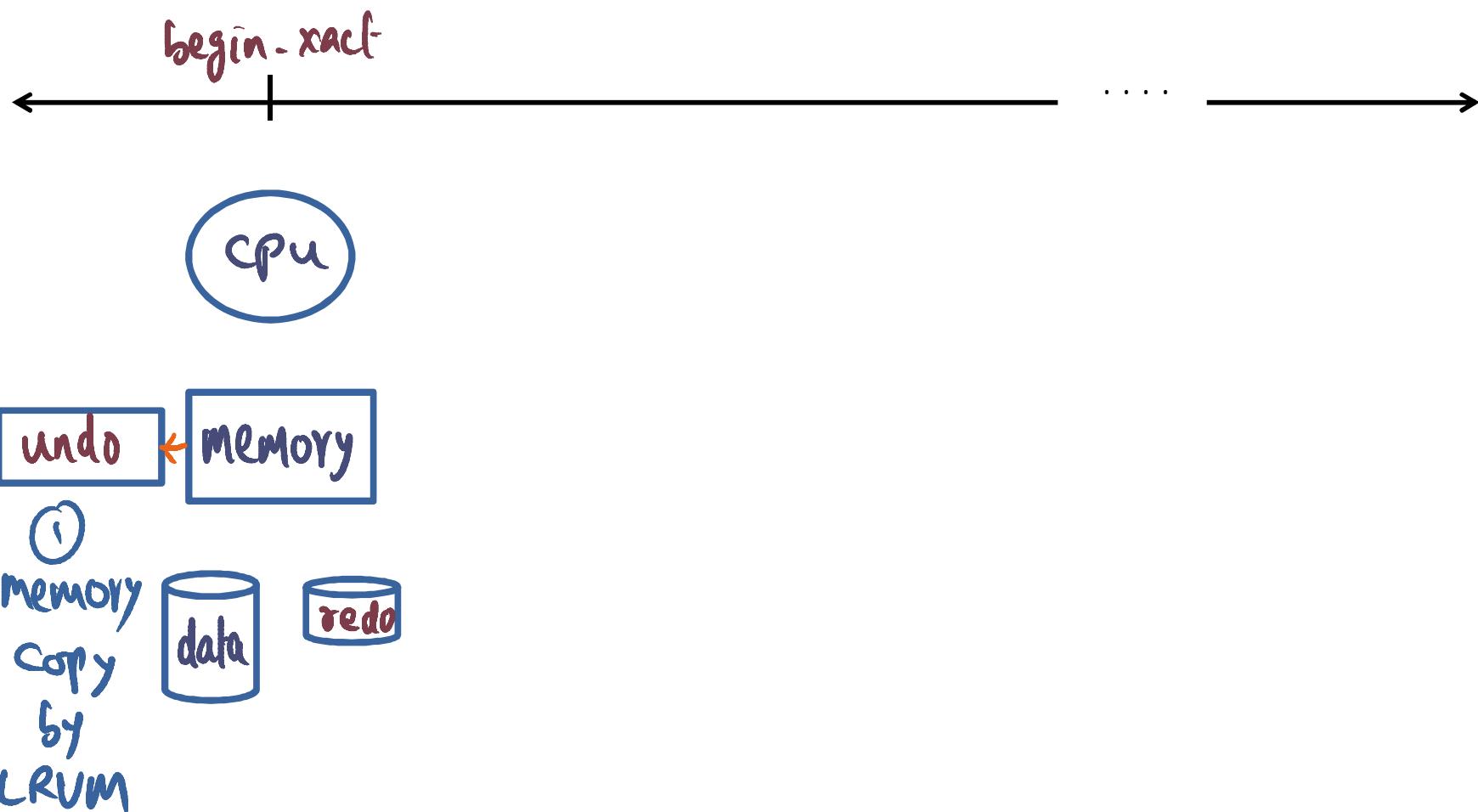
- * Can we throw some hardware at problem and make it disappear (e.g., UPS Power Supply)

- Software Crash

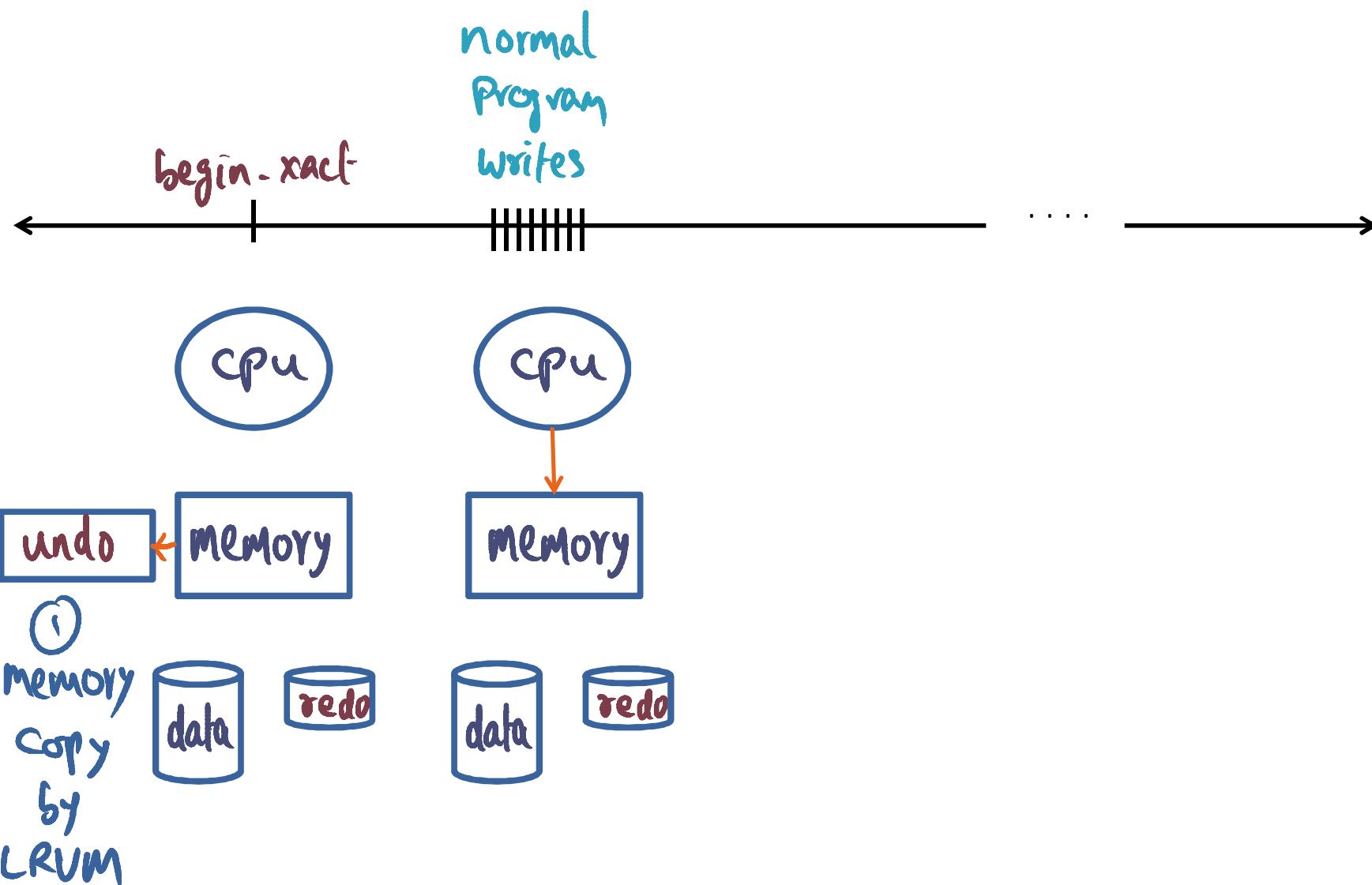
- * reserve a portion of main memory that survives crashes



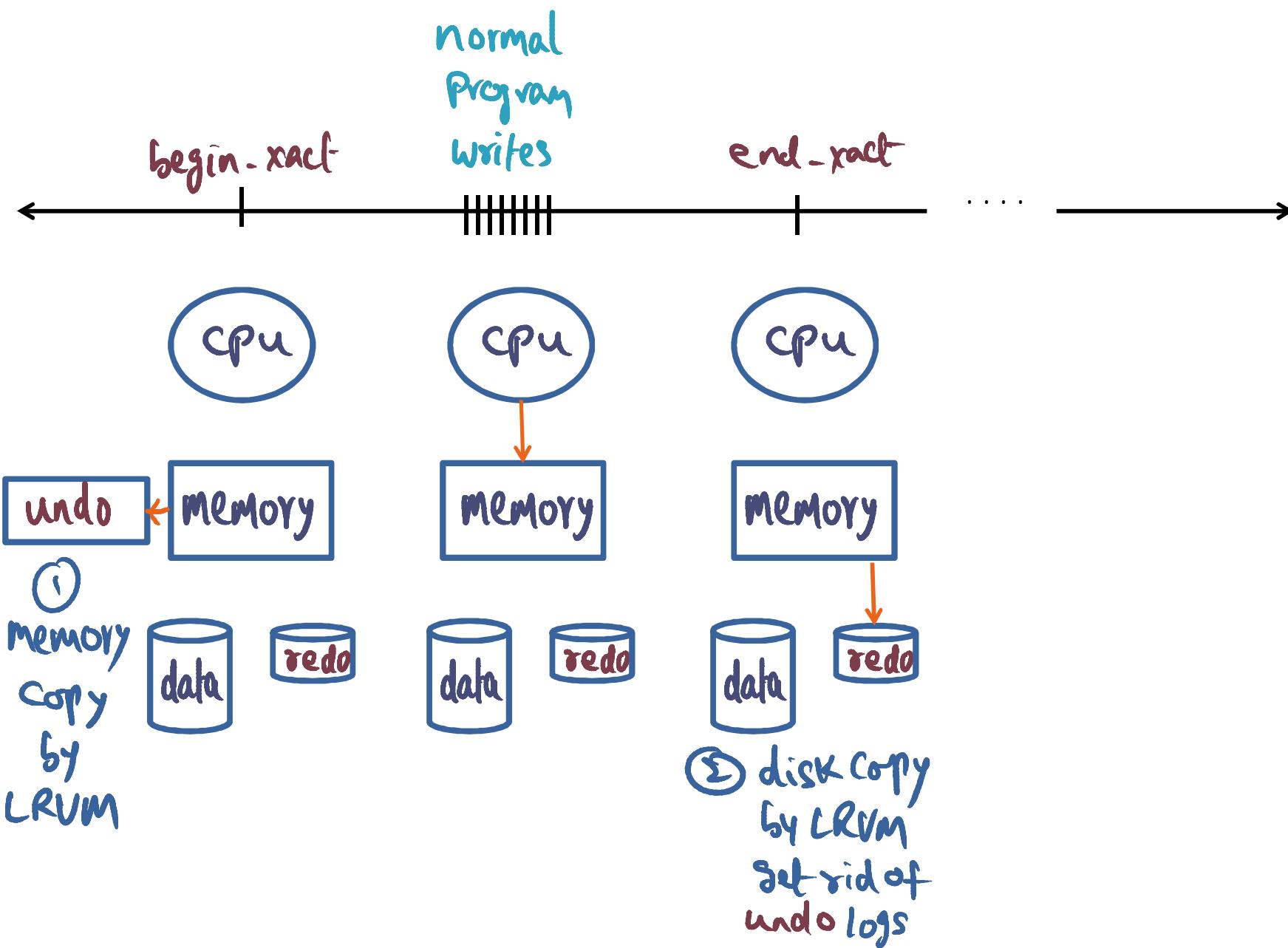
LRVM Revisited



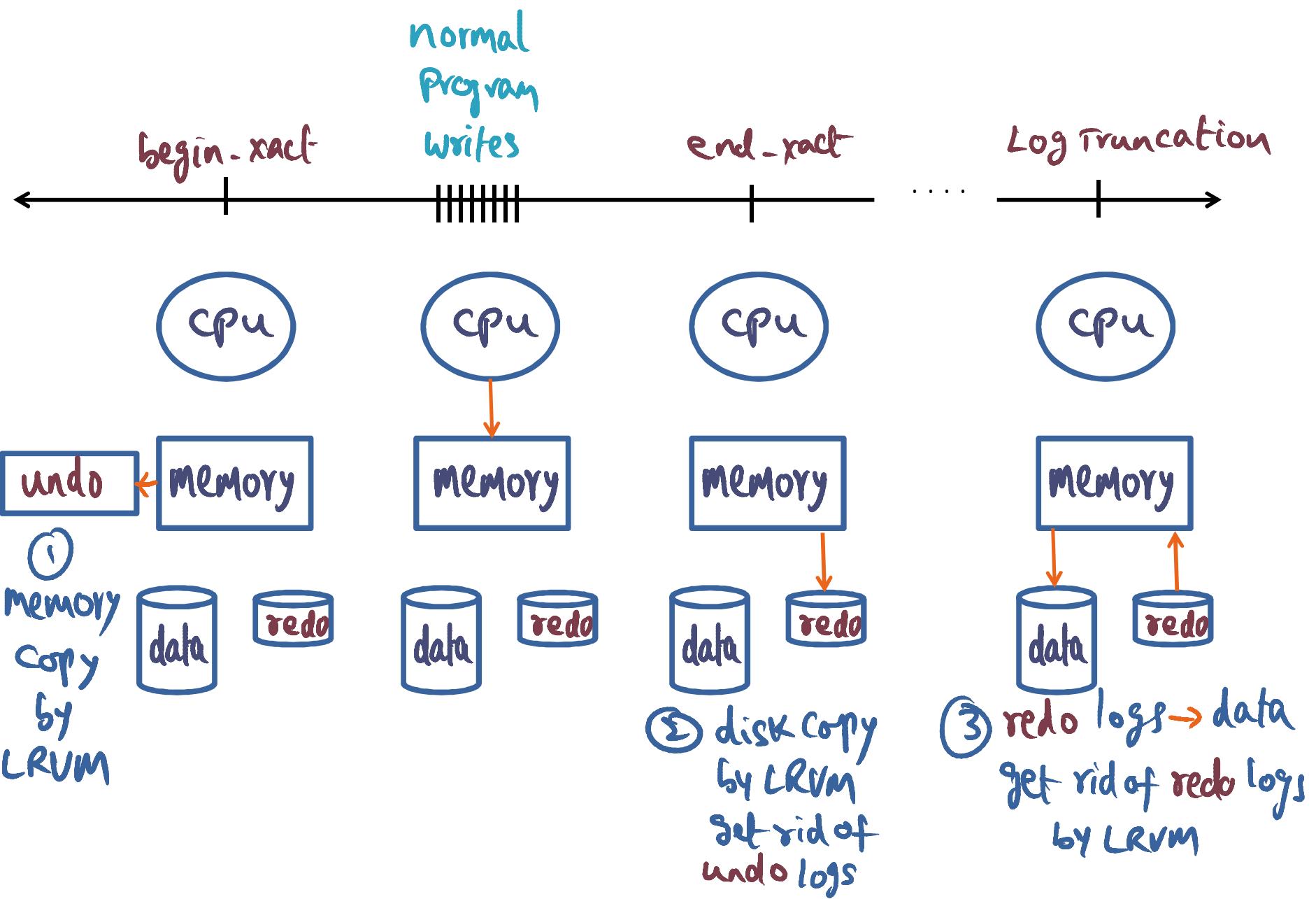
LRVM Revisited



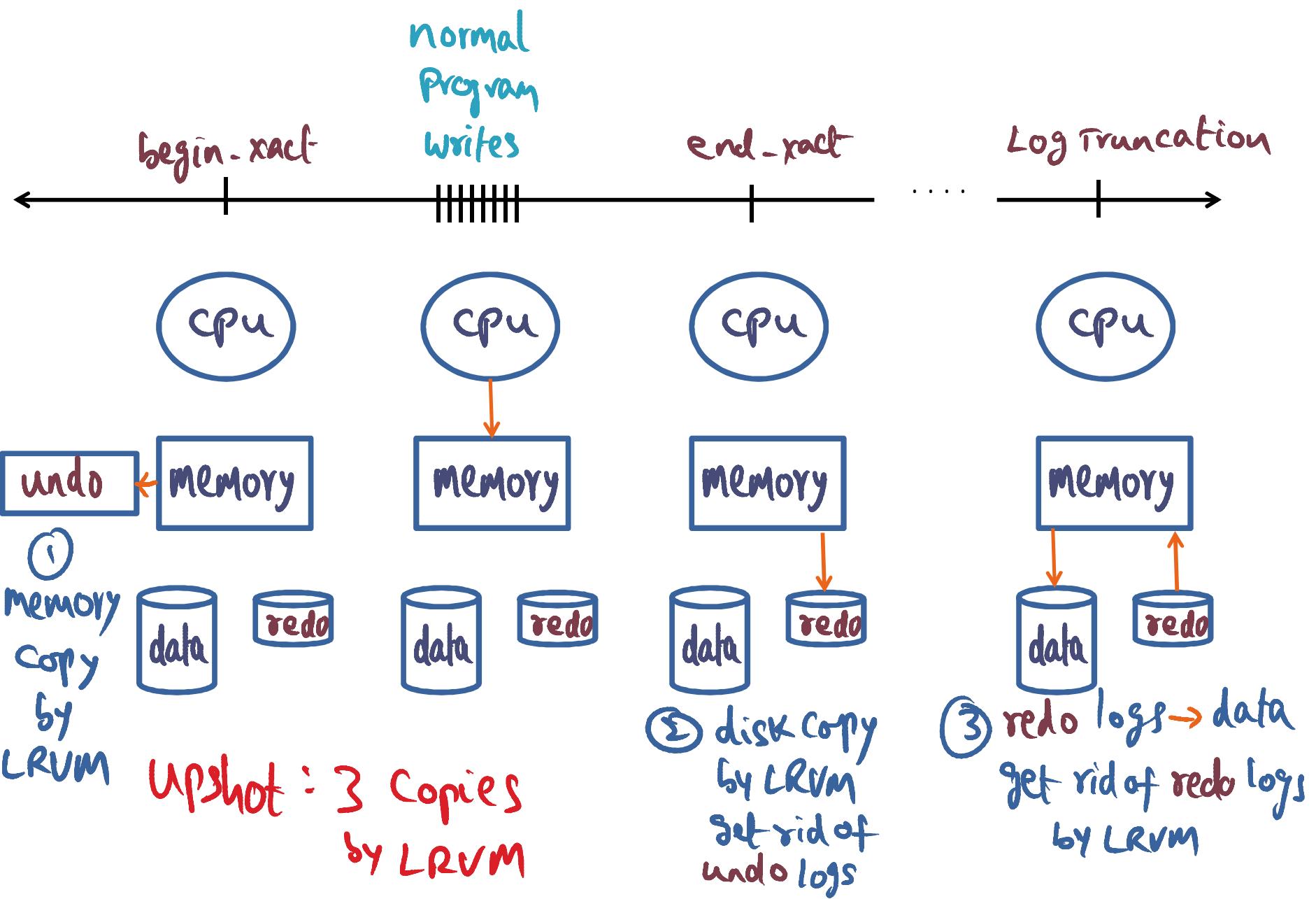
LRVM Revisited



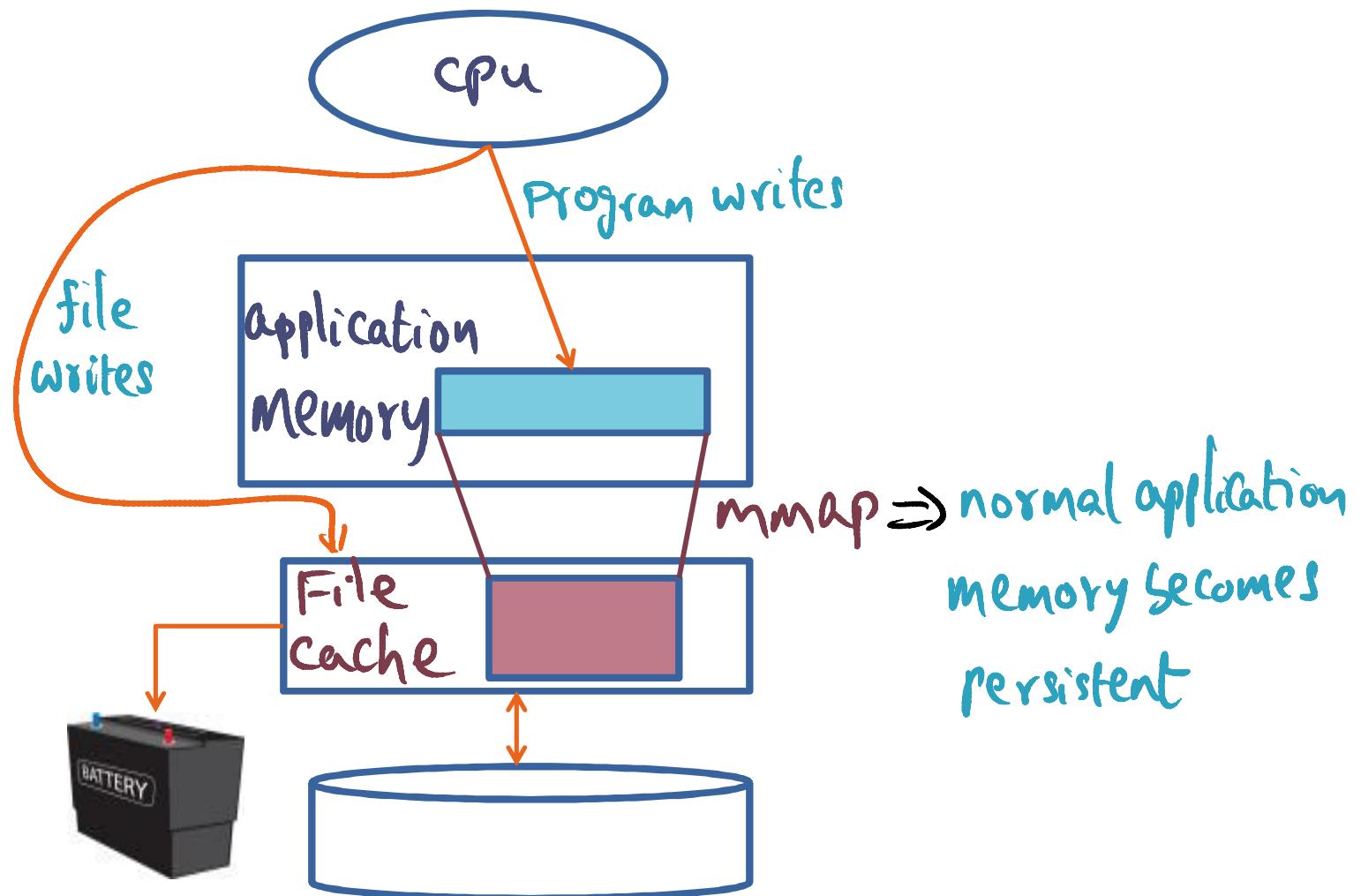
LRVM Revisited



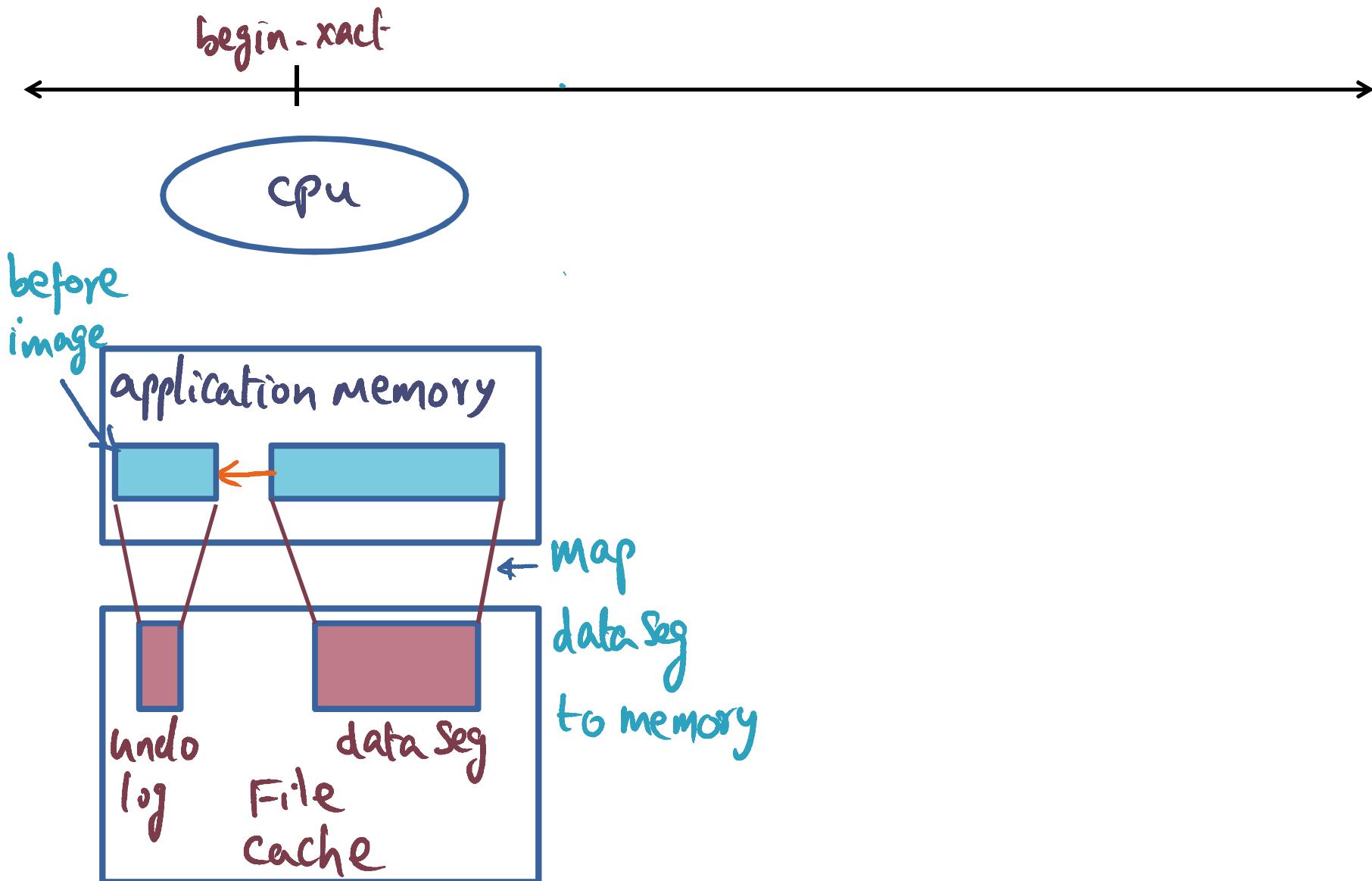
LRVM Revisited



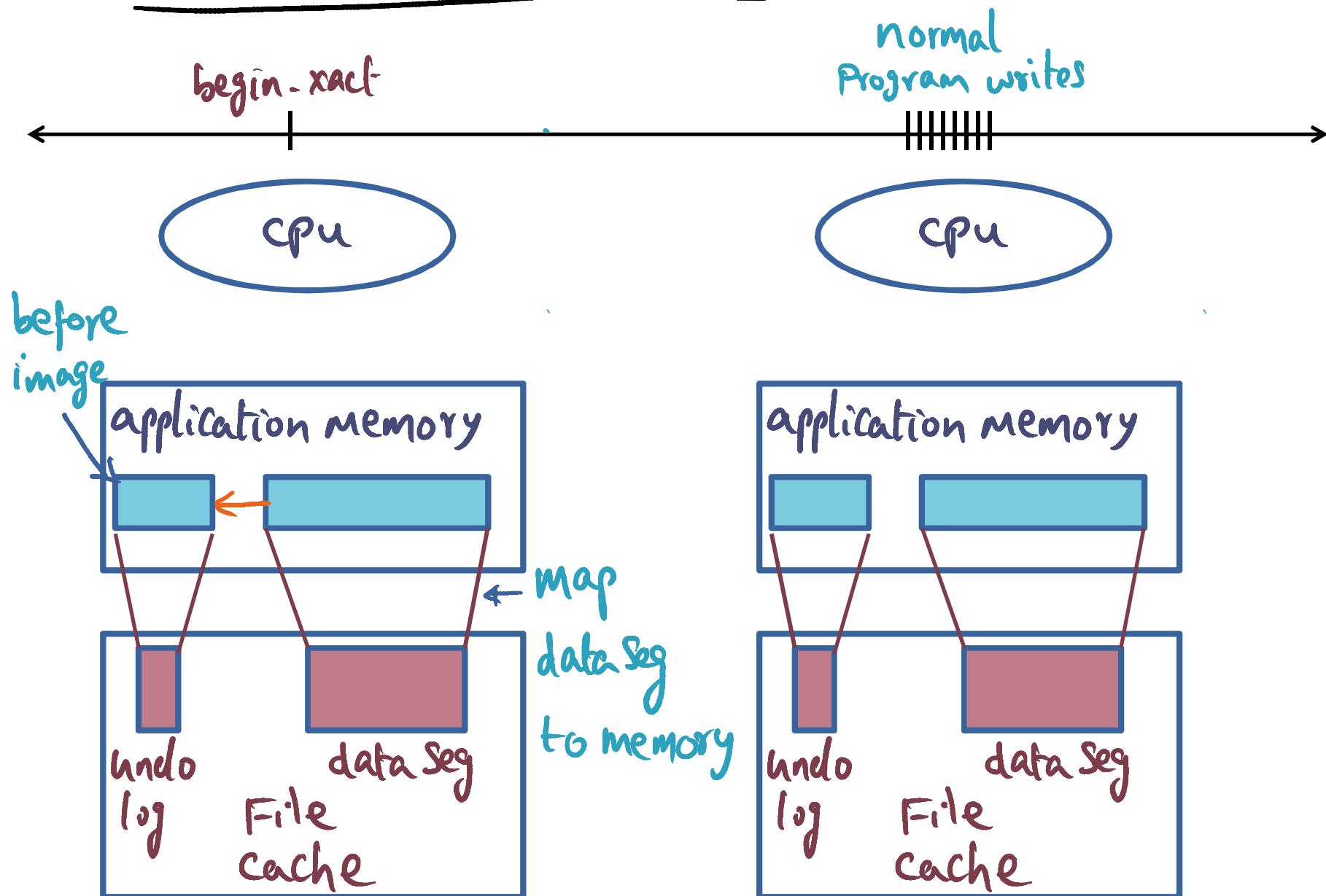
Rio File Cache



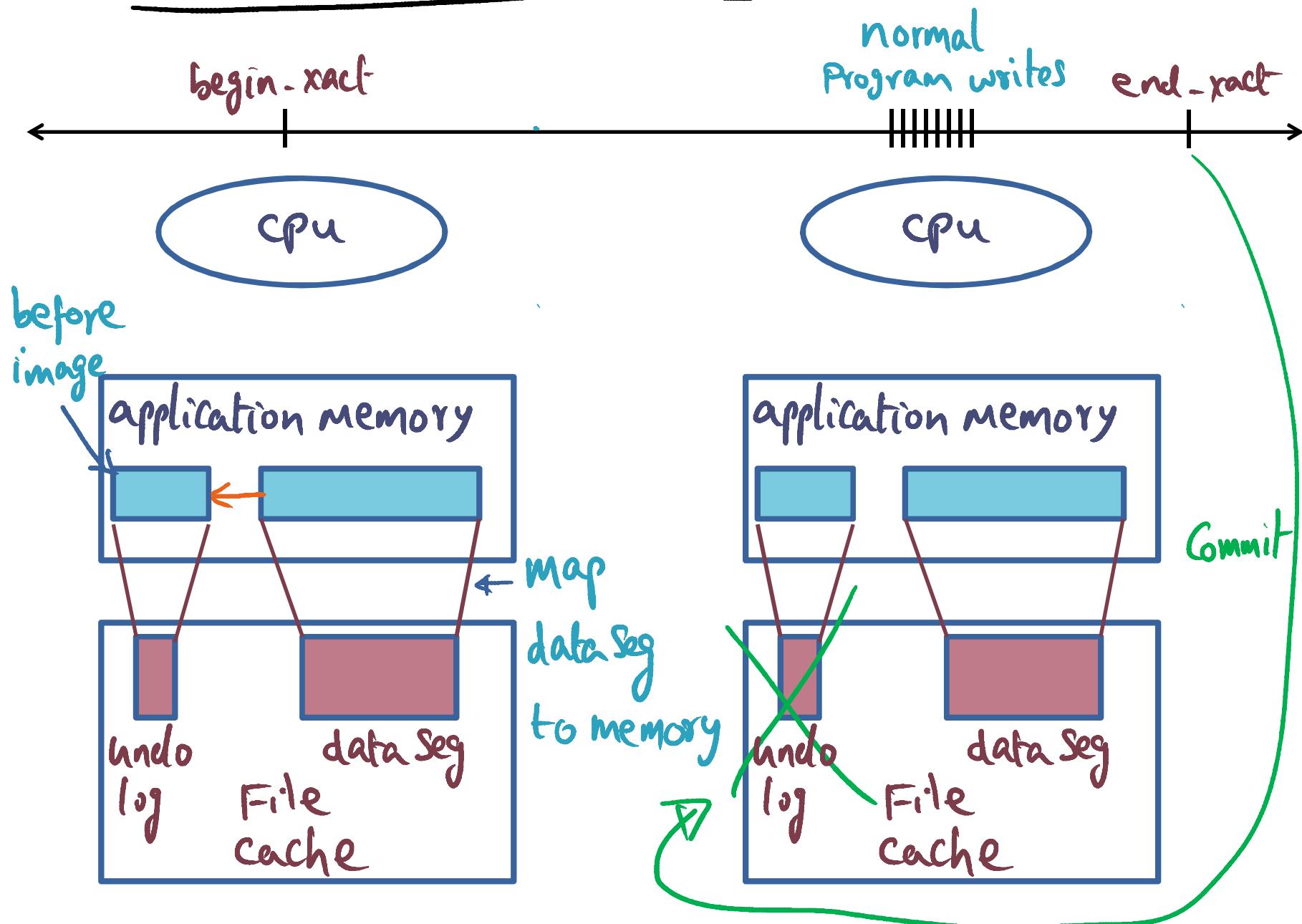
Vista - RVM on top of Rio



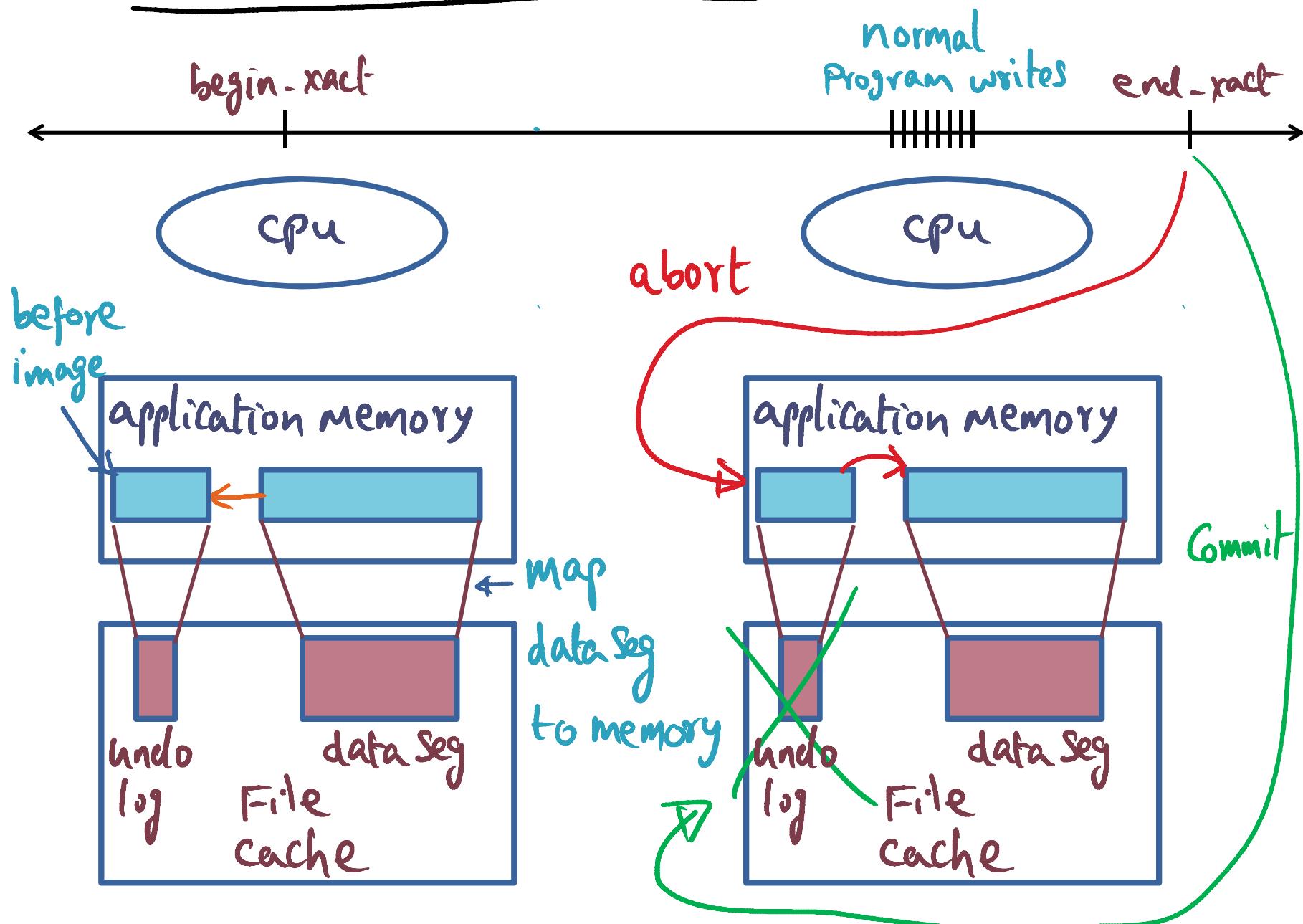
Vista - RVM on top of Rio



Vista - RVM on top of Rio



Vista - RVM on top of Rio



Crash Recovery

Treat like abort

- recover old image from undo log

↓
survives crashes since
it is in RIO file cache

crash during crash recovery ?

- idempotency of recovery \Rightarrow no problem

Vista Simplicity

700 lines of code in Vista

- 10K lines in LRVM

Why?

- no redo logs or truncation code
- checkpointing and recovery code simplified
- no group commit optimizations

upshot

- simple like LRVM but performance efficient

- Rio Vista is a very interesting thought experiment.
- Change the **starting assumptions** for a problem,
Come to a completely **different design point**.