Case Study - Linux Ext3

Physical journaling - write real block contents of the update to log

1. Commit dirty blocks to journal as one transaction (TxBegin, inodes, bitmaps and data blocks)
2. Write commit record (TxEnd)
3. Copy dirty blocks to real file system (checkpointing)
4. Reclaim the journal space for the transaction

Logical journaling - write logical record of the operation to log

- "Add entry F to directory data block D"
- Complex to implement
- May be faster and save disk space

Ext3 - What if there is a crash

➡ **Recovery** - Go through log and "redo" operations that have been successfully committed to log

What if …

- TxBegin but not TxEnd in log?
- TxBegin through TxEnd are in log, but inodes, bitmaps, and data have not yet been checkpointed?
- What if Tx is in log; inodes, bitmaps and data have been checkpointed; but Tx has not been freed from log?