



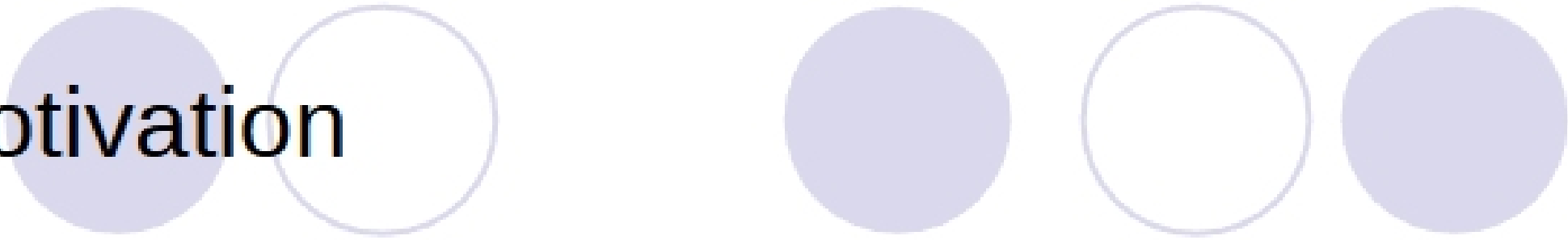
Transactions and Reliability



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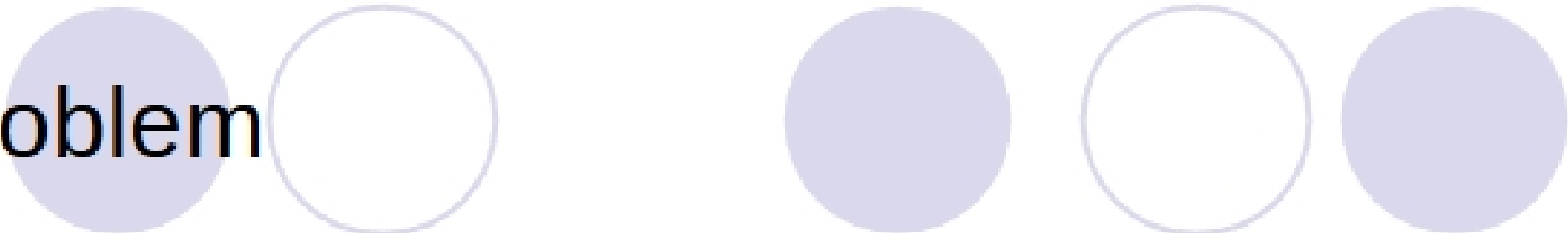
Operating Systems

COP 4610 / CGS 5765



Motivation

- File systems have lots of *metadata*:
 - Free blocks, directories, file headers, indirect blocks
- Metadata is heavily cached for performance



Problem

- System crashes
- OS needs to ensure that the file system does not reach an inconsistent state
- Example: move a file between directories
 - Remove a file from the old directory
 - Add a file to the new directory
- What happens when a crash occurs in the middle?