

Log-block FTL

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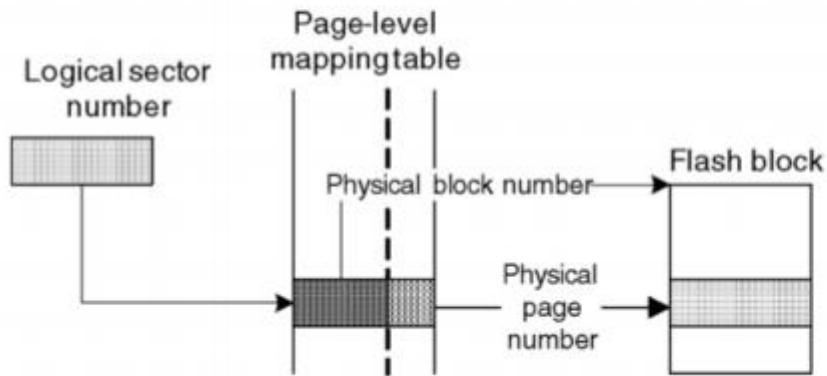
<http://csl.skku.edu>

Schedule

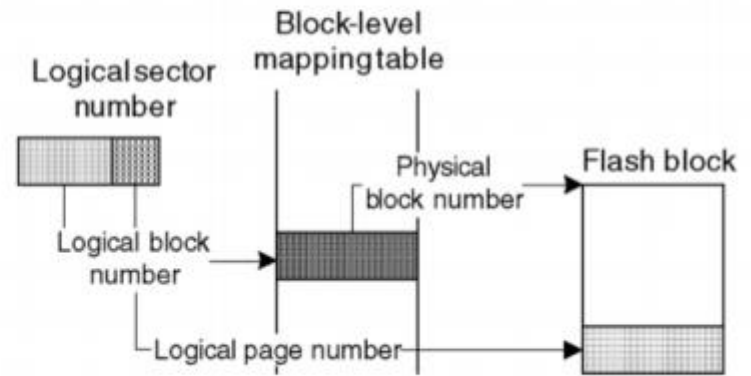
- **Project4: Log-block FTL**
 - 11/22 ~ 12/2(Sun., 23:59:59 PM)
 - -10% for delayed submission (per day)
- **Project5: Power-off Recovery**
 - Submission: 11/29 ~ 12/13(Thu., 11:59:59 AM)
 - Presentation: 12/13(TBD)
- **Implement multi-stream on jasmine board will be done as “lab” on 11/24 (Sat., make-up class)**

Block Mapping FTL

Page mapping



Block mapping



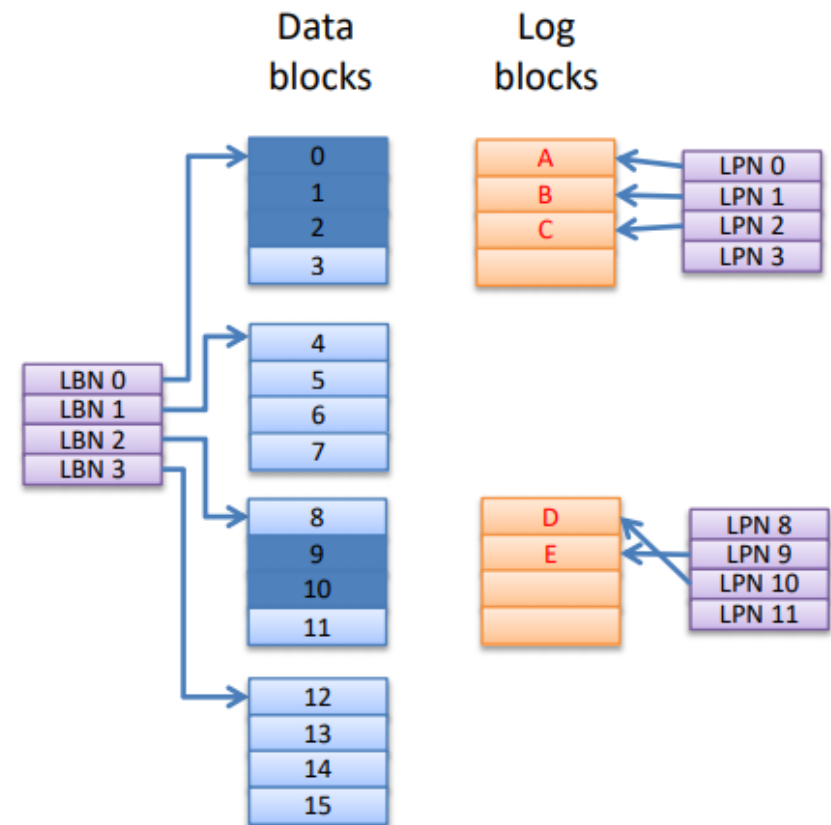
Page Mapping vs. Block Mapping

- Exploits both mapping schemes
 - Page mapping
 - Update block or log block
 - Block mapping
 - Data blocks

	Page Mapping	Block Mapping
Pros	<ul style="list-style-type: none">• Efficient handling of small writes	<ul style="list-style-type: none">• Small management overhead for translation information
Cons	<ul style="list-style-type: none">• Large management overhead for translation information	<ul style="list-style-type: none">• Inefficient handling of small writes

What should we implement? BAST

- Data block
 - Block level mapping
- Log block
 - Page level mapping
 - Temporary block associated with the data block
- Merge
 - Partial, Switch, Full



Log Block FTL on NAND simulator

Descriptoin

- Design log-block FTL on **NAND simulator**
- Make # of log block flexible
 - e.g) `#define NUM_LOGBLOCK (3) // in ftl.h`
- Make three merge functions explicitly
 - `switch_merge()`, `partial_merge()`, `full_merge()`
 - Those three functions should be exist and called in FTL
 - **No restriction at return type and arguments**
- With a well-designed code, draw a graph
 - Relation between WAF and `NUM_LOGBLOCK`

Log Block FTL on Jasmine board

Descriptoin

- Design log block FTL on **OpenSSD Jasmine board**
- Make # of log block: 3 ~ 8
 - e.g) `#define NUM_LOGBLOCK (3) // in ftl.h`
- Modify only `ftl.c` and `ftl.h`
 - Above two files are the only source files submitted
 - **Any source code in OpenSSD ftl is available**
 - Greedy, Dummy, Tutorial, etc.
- You may use spare area (`include/jasmine.h`)
 - `VBLKS_PER_BANK ~ SPARE_VBLKS_PER_BANK - 1`

Comments

- Read
 - Find out which block has the up-to-date data
 - Data block vs. Log block
- Write
 - Similar process as page-mapping FTL for page-level logging
 - Misc. metadata to help allocating new block
 - Free block list
 - Block bitmap
- GC
 - When GC happens?
 - No avail page in a log block
 - No avail log block
 - You have to keep track of valid pages of each log block

Submission

- As personal,
 - Compress your folder as YourStudentID-4.tar.gz
 - With code and graph(# of log block vs. WAF)
 - Please send mail with uniformized title
 - [ICE3028]YourStudentID-4
- As team,
 - Compress your folder as YourGroupID-4.tar.gz
 - With code(ftl.c, and ftl.h) and report
 - Please send mail with uniformized title
 - [ICE3028]YourGroupID-4
- Send email to minwoo.ahn@csl.skku.edu
- **PLEASE DO NOT COPY**
 - **YOU WILL GET F GRADE IF YOU COPIED**
- Due date: 12/2(Sun.), 23:59:59 PM
 - -10% per day for delayed submission



Any Questions?