Physical Logging

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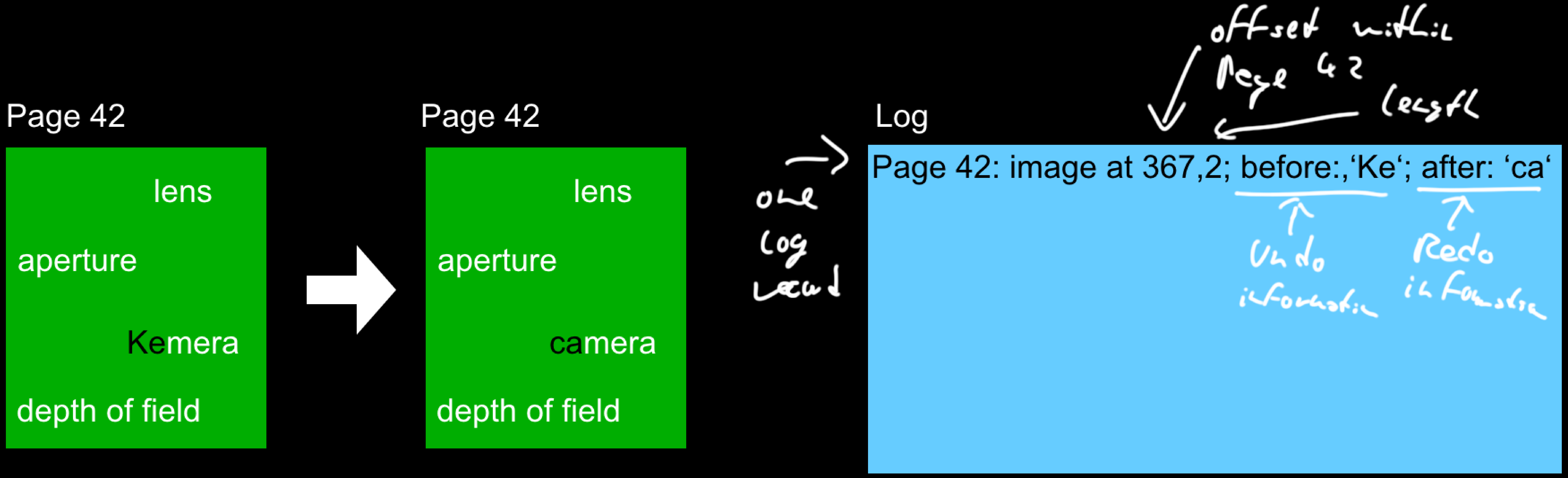
BY NC ND
Jens Dittrich

states (byte images) are logged

before image contains state **before** change was performed

after image contains state **after** change was performed



Page 42: image at 367,2; before:,‘Ke‘; after: ‘ca‘

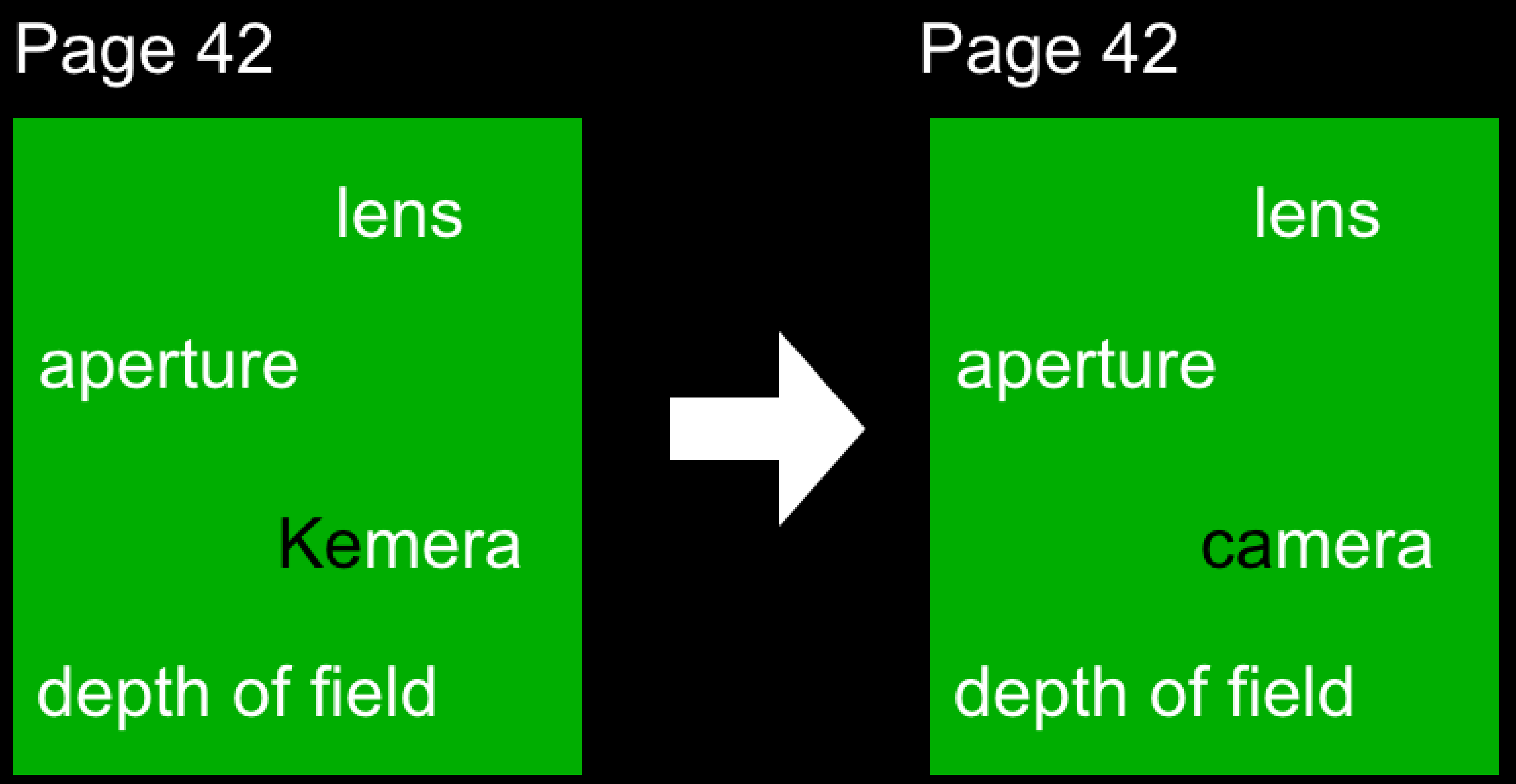
Logical Logging

CameraLingo	
termID	term
0	Kemera
1	lens
2	aperture
3	depth of field
4	aperture
5	body
~~5~~ 6	shutter

high-level operations are logged

not necessarily limited to a single page

non-transactional problem:
log-entry: "change to capital"
-> Page 42, 57, 85



Page 42

lens

aperture

Kemera

depth of field

Page 42

lens

aperture

camera

depth of field

Log

CameraLingo: update(0, ‘Kemera‘ => ‘camera‘)

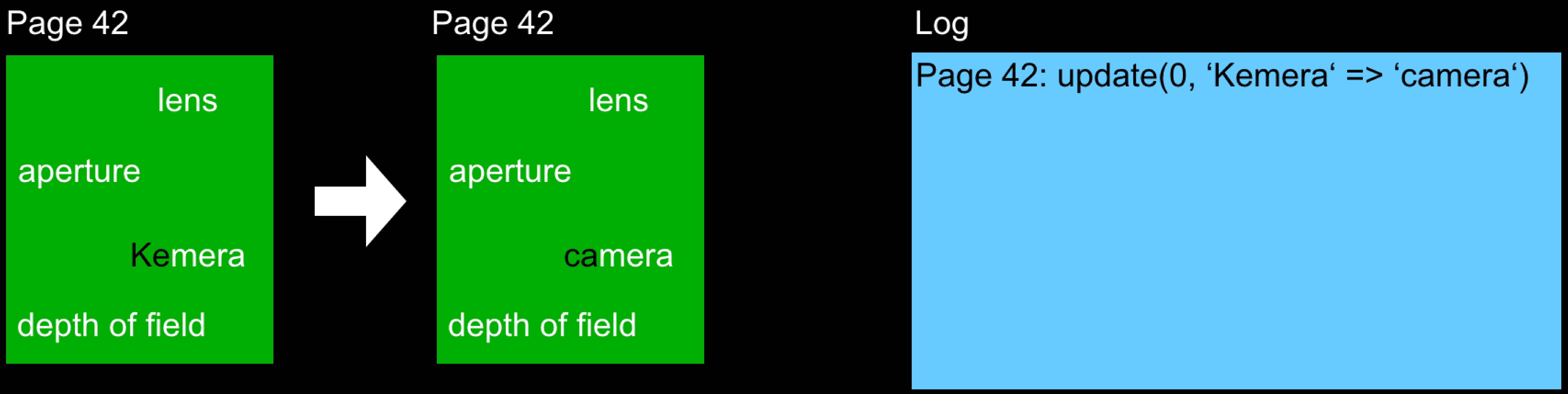
Physiological Logging

like logical logging, but:

log entry **may only affect a single page**

example for capital character

=> 3 log records



Page 42: update(0, ‘Kemera‘ => ‘camera‘)

Main Performance Trade-Off (disk-based Systems)

logical (transactions)

log entry processing time [minutes]

logical (logical operations)

e.g. inserts/deletes to table

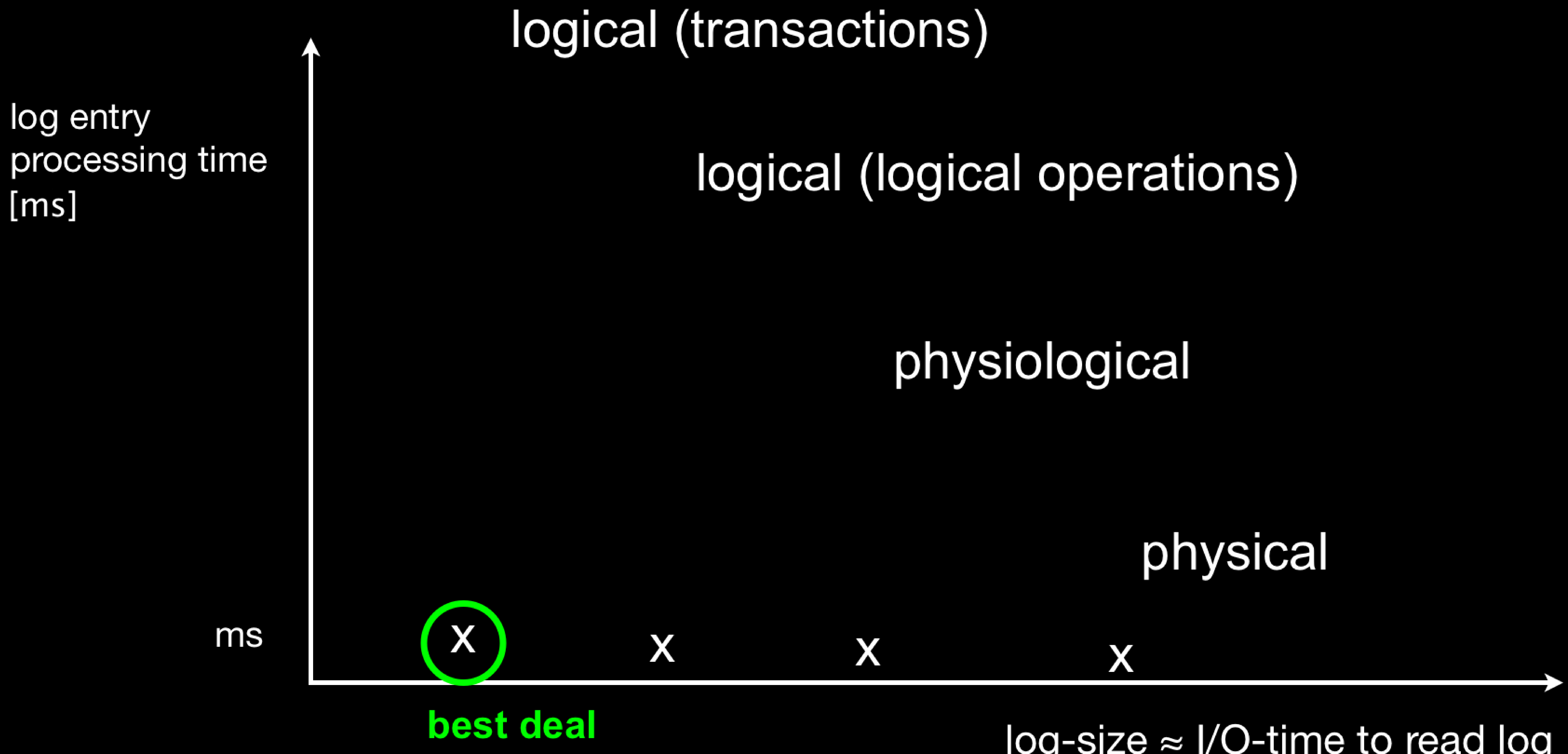
physiological

physical

log-size ≈ I/O-time to read log

x
x
x
x
p42
→
p42

Main Performance Trade-Off (Main Memory Systems)



Logical Logging Example in Main Memory

just store the invocation parameters of the stored procedure in the log

Query_Dictionary	
queryID	SQL
0	UPDATE CameraLingo SET term=$A WHERE term=$B
1	INSERT INTO CameraLingo VALUES ($A,$B)
2	DELETE FROM CameraLingo WHERE term=$A

Log

```
2:‘lens“
0:‘camera‘:‘Kemera‘
1:42:‘tripod‘
```

Logical logging

+ dictionary compression

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