Publishing a Book

1st edition

Databases

by Jens Dittrich
Publishing a Book

1st edition

changes:
Publishing a Book

1.1st edition

changes:

page 23:
"database" → "database"
Publishing a Book

1.2nd edition

changes:

page 23: "database" → "database"
page 345: "idex" → "index"
Publishing a Book

2nd edition

Databases
by Jean Detrich

changes:

page 23:
“database” → “database”

page 345:
“idx” → “index”

page 77:
“idx” → “index”
Publishing a Book

2.1st edition

Databases
by Jean Detrich

2.1st edition

changes:

page 23: “database” → “database”
page 345: “idx” → “index”
page 77: “idx” → “index”
page 75: “kamera” → “camera”
2.2nd edition

Databases
by Jien Datrich

changes:

page 23: "database" → "database"
page 345: "idex" → "index"
page 77: "idex" → "index"
page 75: "kamera" → "camera"
page 143: "big date" → "big data"
Publishing a Book

3rd edition

changes:

page 23: 
“database“ → “database“

page 345:
“idex“ → “index“

page 77:
“idex“ → “index“

page 75:
“kamera“ → “camera“

page 143:
“big date“ → “big data“
new chapter on “tools“
Publishing a Book

3.1st edition

Databases
by Jens Dittrich

NEW: 3.1st edition!

WAL write ahead
changes:
logging

page 23:
"database" → "database"

page 345:
"idx" → "index"

page 77:
"idx" → "index"

page 75:
"kamera" → "camera"

page 143:
"big date" → "big data"
new chapter on "tools"

page 55:
"profi" → "profile"
= yet another instance of: The Data Redundancy Pattern and The All Levels are Equal Pattern
may be applied at almost any level, e.g. entire databases, files, indexes (disk or main memory), tables, blocks, pages, rows, ...

fast sequential write to log

yet: cheap reads (no read of log required)

log corresponds to incremental backup (→ Log Archive, Log Shipping)

data redundancy (recovery)

“truth“ = Read-Write File OR the log: “The Log is the Database“
Drawbacks

additional storage space for log

still random write I/O (Read-Write File)

log may become large
Drawbacks

additional storage space for log

still random write I/O (Read-Write File)

log may become large

extra storage space
### Differential Files vs Logging

<table>
<thead>
<tr>
<th>main Idea</th>
<th>Differential Files</th>
<th>Logging</th>
</tr>
</thead>
<tbody>
<tr>
<td>given a file $X$: collect changes to $X$ in a separate structure $Y$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X$</td>
<td>RO</td>
<td>RW</td>
</tr>
<tr>
<td>$X'$</td>
<td>$X + \text{DiffFile}$</td>
<td>$X + \text{change}$</td>
</tr>
<tr>
<td>“truth”</td>
<td>$X + \text{DiffFile(s)}$</td>
<td>$X \text{ OR the log}$</td>
</tr>
</tbody>
</table>
Example: Combining Differential Files and Logging

current edition

Read-Write File

changes:

Log File
Example: Combining Differential Files and Logging

current edition

Read-only File

Read/Write DiffFile

changes:

Log File