

SQLite 3

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Who Am I?

- Employed by Jelsoft Enterprises Ltd
- PHP (SQLite3, imagick, svn)
- GD

Overview

- What is SQLite?
- Why use SQLite?
- Who uses SQLite?
- SQLite Explained
- Difference between SQLite 2 and 3
- PDO / SQLite3

What is SQLite?

- Embedded SQL Database Engine
- Serverless - accesses disk directly
- Single file
- Cross Platform / Architecture
- Small footprint
- Manifest typing

Why use SQLite?

- Zero Configuration
- Portable
- Public Domain

Public Domain?

May you do good and not evil.

May you find forgiveness for yourself and forgive others.

May you share freely, never taking more than you give.

SQLite Big Users

- Adobe - Lightroom and AIR
- Apple - Mail, Aperture, Safari and Core Data
- Google - Gears and Android
- McAfee - Antivirus
- Mozilla - Firefox 3.0
- Skype - Metadata
- Symbian - OS Storage

Where can SQLite be used?

- Replacement for a custom file format
- Temporary data storage *:memory:*
- Alternative to enterprise DB for demo
- Local node storage
- Communication between apps
- Embedded Devices

Versions

- SQLite - 2.8.17
- PDO - 3.3.7 + 2.8.17
- SQLite3 - 3.5.6, minimum is 3.3.9

SQLite 3

- 64-bit Rowids
- BLOB support
- Improved concurrency
- UTF-16 / UTF-8
- User defined collations
- Named bound parameters
- Connections shared between threads
- Runtime loadable extensions
- Fulltext searching
- ICU support
- OS Interface

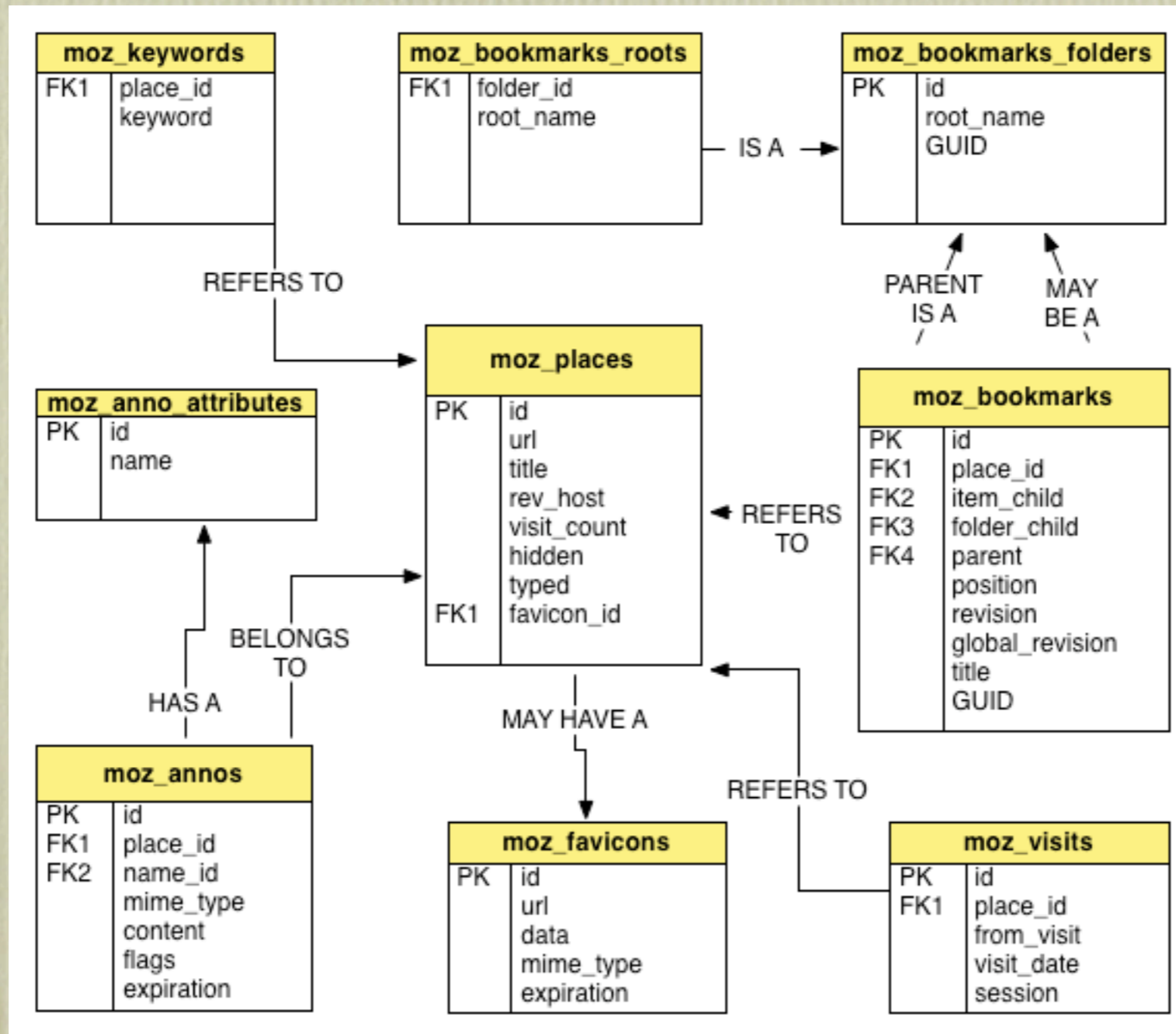
SQLite v2

- Smaller subset of SQL supported
- Larger file format
- Database format incompatible with v3
- No Unicode support
- No reading while writing

Examples

- Firefox 3.0
 - Profile directory contains places.sqlite
 - Schema on the next page

Firefox Places Schema



expiration
flags
content

expiration
mime_type
data

session
visit_date
from_visit

PDO

```
<?php
$dbh = new PDO('sqlite:places.sqlite');
foreach ($dbh->query(
'SELECT url, title from moz_places ORDER BY visit_count DESC'
) as $site) {
    echo $site['url'] . "\t\t" . $site['title'] . PHP_EOL;
}
$dbh = null;
?>
```


SQLite3

```
<?php  
  
$db = new SQLite3('places.sqlite');  
$update_favicon = $db->prepare("UPDATE moz_favicons SET data = :icon");  
$favicon_stream = fopen('/tmp/favicon.ico', 'rb');  
$update_favicon->bindParam(':data', $favicon_stream, SQLITE3_BLOB);  
$update_favicon->execute();  
fclose($favicon_stream);  
  
?>
```


Custom Functions

- Define SQL Functions in PHP
- Implement missing features
- Aggregation functions

Function Example

```
<?php

$db = new SQLite3(':memory:');
$db->createFunction('FROM_UNIXTIME', 'sqlite_from_unixtime');

$result = $db->query('SELECT FROM_UNIXTIME(1204214180) AS date');
var_dump($result->fetchArray());

function sqlite_from_unixtime($data) {
    return date('Y-m-d H:i:s', $data);
}

?>
```


SQLite3 Extension

SQLite3	SQLite3_stmt
open	paramCount
close	close
exec	execute
version	reset
lastInsertRowID	clear
loadExtension	bindValue
escapeString	bindParam
prepare	
query	
createFunction	
createAggregate	

Improving Performance

- Pragma
 - `cache_size`
 - `fullsync`
 - `synchronous`
- Shared Cache
- Use Transactions

Limitations

- Very large datasets
- High concurrency
- No Foreign Keys
- Nested Transactions
- Writing to Views

Questions?

Resources

- <http://www.sqlite.org>
- <http://pecl.php.net/sqlite3>
- <http://trac.macvicar.net/sqlite3>
- <http://talks.macvicar.net>