SQLite and PHP

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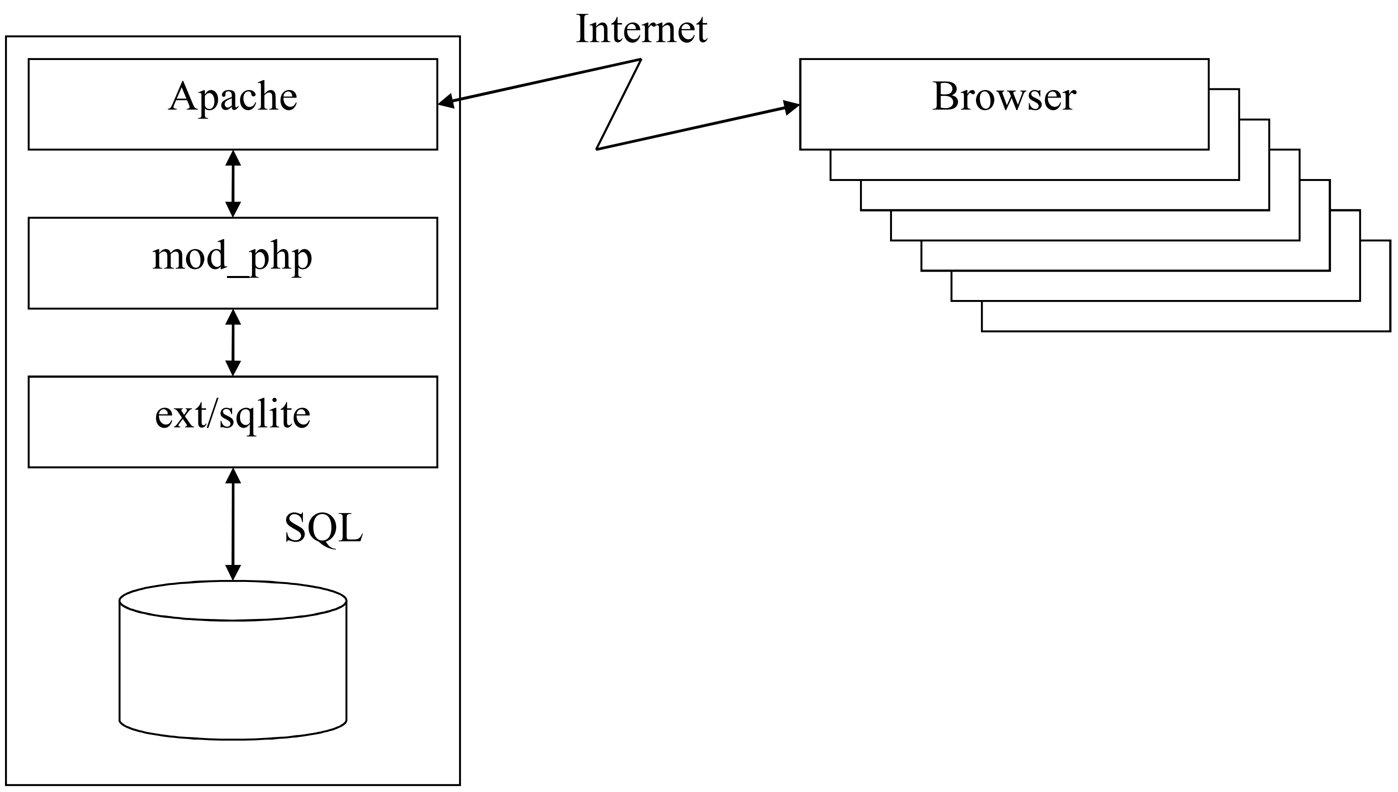
SQLite

- ☑ Started in 2000 by D. Richard Hipp
- ☑ Single file database
- ☑ Subselects, Triggers, Transactions, Views
- ☑ Very fast, 2-3 times faster than MySQL, PostgreSQL for many common operations
- ☑ 2TB data storage limit
- ☒ Views are read-only
- ☒ No foreign keys
- ☒ Locks whole file for writing

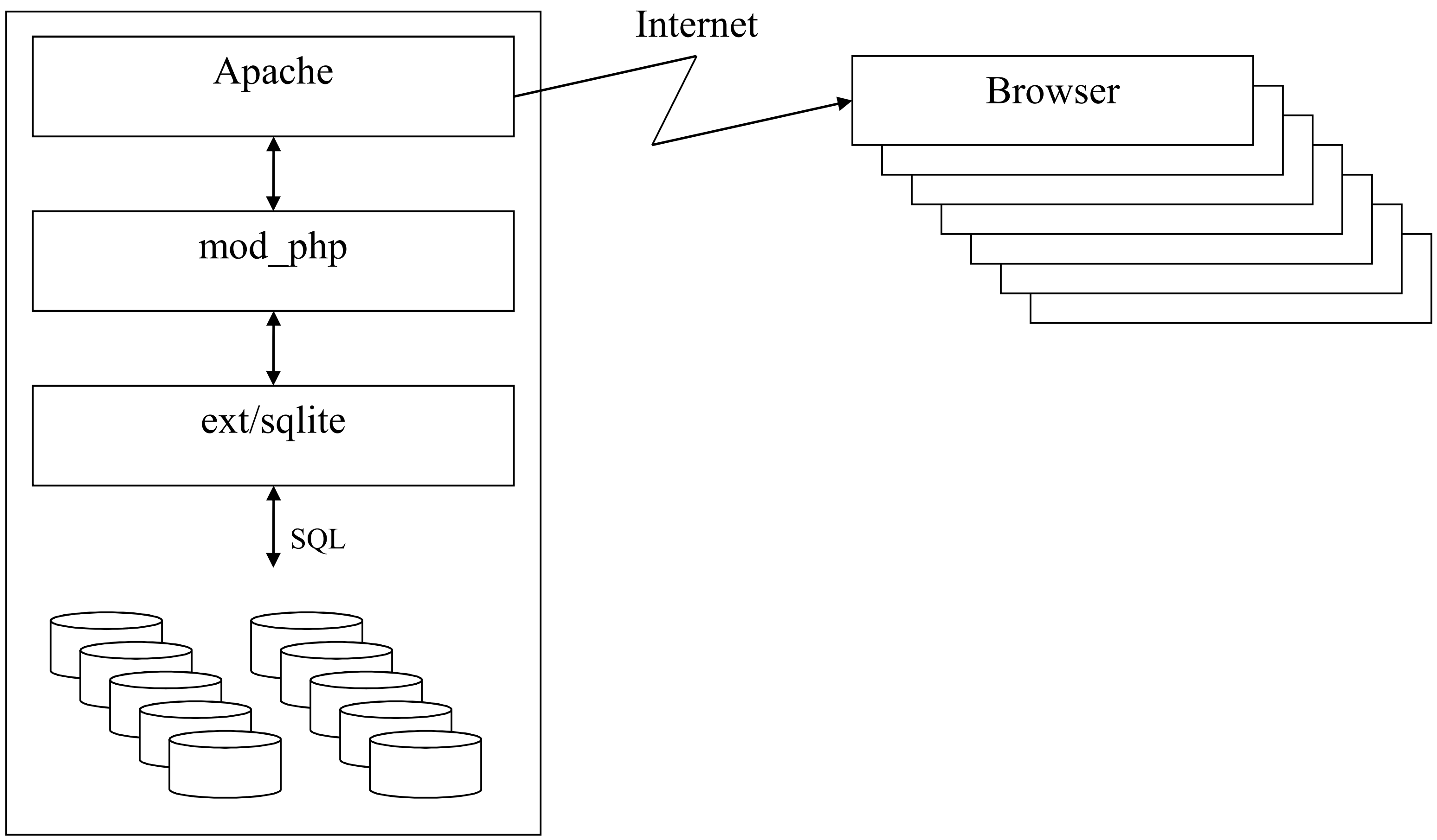
PHP with SQLite

- ☑ SQLite library integrated with PHP extension
- ☑ PHP extension available via PECL for PHP 4.3
- ☑ Bundled with PHP 5
- ☑ API designed to be logical, easy to use
- ☑ High performance
- ☑ Convenient migration from other PHP database extensions
- ☑ Call PHP code from within SQL

Dedicated Host



ISP/Shared Host



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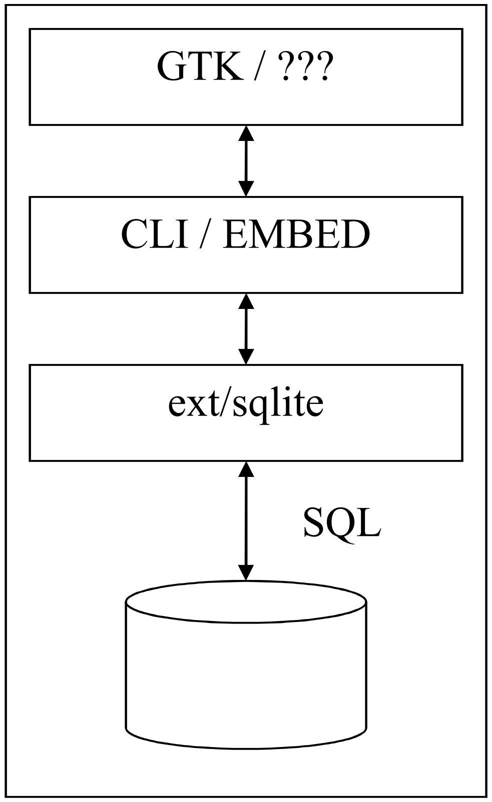

Opening and Closing

resource **sqlite_open**(string filename **[**, int mode **[**,
    string & error_message **]]**)

- ☑ Creates a non existing database file
- ☑ Checks all security relevant INI options
- ☑ Also has a persistent (popen) variant

void **sqlite_close**(resource db)

- ☑ Closes the database file and all file locks

```php
<?php
   // Opening and Closing
   // Open the database (will create if not exists)
   $db = sqlite_open("foo.db");

   // simple select
   $result = sqlite_query($db, "SELECT * from foo");

   // grab each row as an array
   while ($row = sqlite_fetch_array($result)) {
         print_r($row);
   }

   // close the database
   sqlite_close($db);
?>
```

Query Functions

resource **sqlite_query** ($db, $sql **[**, int result_type **]**)

- ☑ Buffered query = Flexible
- ☒ More memory usage
- ☑ Also have an unbuffered variant = Fast

array **sqlite_array_query** ($db, $sql **[**,int result_type**]]**)

- ☑ Flexible, Convenient
- ☒ Slow with long result sets

```php
<?php
   // Default result type SQLITE_BOTH

   $result = sqlite_query($db,
                     "SELECT first, last from names");
   $row = sqlite_fetch_array($result);

   print_r($row);
?>
```

```
Array
(
    [0] => Joe
    [1] => Internet
    [first] => Joe
    [last] => Internet
)
```

```php
<?php
    // column names only

    $result = sqlite_query($db,
          "SELECT first, last from names");
    $row = sqlite_fetch_array($result, SQLITE_ASSOC);

    print_r($row);

?>
```

```
Array
(
    [first] => Joe
    [last] => Internet
)
```

```php
<?php
  // column numbers only

  $result = sqlite_query($db,
        "SELECT first, last from names");
  $row = sqlite_fetch_array($result, SQLITE_NUM);

  print_r($row);
?>
```

```
Array
(
    [0] => Joe
    [1] => Internet
)
```

```php
<?php
   // Collecting all rows from a query

   // Get the rows as an array of arrays of data
   $rows = array();

   $result = sqlite_query($db,
         "SELECT first, last from names");

   // grab each row
   while ($row = sqlite_fetch_array($result)) {
        $rows[] = $row;
   }

   // Now use the array; maybe you want to
   // pass it to a Smarty template
   $template->assign("names", $rows);
?>
```

```
<?php
   // The same but with less typing and
   // more speed

   // Get the rows as an array of arrays of data
   $rows = sqlite_array_query($db,
          "SELECT first, last from names");

   // give it to Smarty
   $template->assign("names", $rows);
?>
```

Array Interface

array **sqlite_fetch_array** (resource result **[**, int result_type **[**, bool decode_binary **]]**)

- ☑ Flexible
- ☒ Slow for large result sets

array **sqlite_fetch_all** (resource result **[**, int result_type **[**, bool decode_binary **]]**)

- ☑ Flexible
- ☒ Slow for large result sets; better use sqlite_array_query ()

Single Column Interface

mixed **sqlite_single_query** ($db, $sql
[, bool first_row_only**]**)

- ☑ Fast
- ☒ Only returns the first column

string **sqlite_fetch_single** ($result)

- ☑ Fast
- ☒ Slower than sqlite_single_query

mixed **sqlite_fetch_single** ($result,
$index_or_name)

- ☑ Flexible, Faster than array functions
- ☒ Slower than other single functions

```
<?php

  $count = sqlite_single_query($db,
       "SELECT count(first) from names");

  echo “There are $count names";
?>
```

```
There are 3 names
```

```php
<?php

  $first_names = sqlite_single_query($db,
      "SELECT first from names");

  print_r($first_names);
?>
```

```
Array
(
    [0] => Joe
    [1] => Peter
    [2] => Fred
)
```

Meta information

int **sqlite_num_rows** (resource result)

- Number of rows in a SELECT

int **sqlite_num_fields** (resource result)

- Number of columns in a SELECT

int **sqlite_field_name** (resource result, int field_index)

- Name of a selected field

int **sqlite_changes** (resource db)

- Number of rows changed by a UPDATE/REPLACE

int **sqlite_last_insert_rowid** (resource db)

- ID of last inserted row

Iterator Interface

array **sqlite_current** (resource result [, int result_type [, bool decode_binary **]]**)

- Returns the current selected row

bool **sqlite_rewind** (resource result)

- Rewind to the first row of a <u>buffered</u> query

bool **sqlite_next** (resource result)

- Moves to next row

bool **sqlite_has_more** (resource result)

- Returns true if there are more rows

bool **sqlite_seek** (resource result, int row)

- Seeks to a specific row of a <u>buffered</u> query

Using Iterators

```
<?php

   $db = sqlite_open("…");

   for ($res = sqlite_query ("SELECT…", $db);
         sqlite_has_more ($res);
         sqlite_next ($res))
   {
         print_r (sqlite_current ($res));
   }

?>
```

Calling PHP from SQL

bool **sqlite_create_function** (resource db,
    string funcname, mixed callback **[**,
    long num_args **]**)

- Registers a "regular" function

bool **sqlite_create_aggregate** (resource db,
    string funcname, mixed step,
    mixed finalize **[**, long num_args **]**)

- Registers an aggregate function

```
<?php
  function md5_and_reverse($string) {
      return strrev(md5($string));
  }

  sqlite_create_function($db,
       'md5rev', 'md5_and_reverse');

  $rows = sqlite_array_query($db,
       'SELECT md5rev(filename) from files');
?>
```

```php
<?php

   function max_len_step(&$context, $string) {
        if (strlen($string) > $context) {
                $context = strlen($string);
        }
   }

   function max_len_finalize(&$context) {
        return $context;
   }

   sqlite_create_aggregate($db,
        'max_len', 'max_len_step',
        'max_len_finalize');

   $rows = sqlite_array_query($db,
        'SELECT max_len(a) from strings');

   print_r($rows);
?>
```

Handling binary data in UDF

string **sqlite_udf_encode_binary** (string data)

- Apply binary encoding (if required) to a string to be returned from an UDF

string **sqlite_udf_decode_binary** (string data)

- Decode binary encoding on a string parameter passed to an UDF

Handling Binary Data

string **sqlite_escape_string** (string data)

- Escapes quotes appropriately for SQLite
- Applies a safe binary encoding for use in SQLite queries
- Values must be read with the decode_binary flag turned on (default!)

Utility Functions

void **sqlite_busy_timeout** (resource db, int ms)

- Set busy retry duration.
- If ms <= 0, no waiting if performed

int **sqlite_last_error** (resource db)

- Returns last error code from database

string **sqlite_error_string** (int error_code)

- Converts error code to a readable string

string **sqlite_libversion** ()

- Returns version of the linked SQLite library

string **sqlite_libencoding** ()

- Returns charset encoding used by SQLite library

Resources

☑ Documentation at
http://docs.php.net/?q=ref.sqlite