SYBASE TECHWAVE SYMPOSIUM 2009

Taking It All Offline with SQL Anywhere

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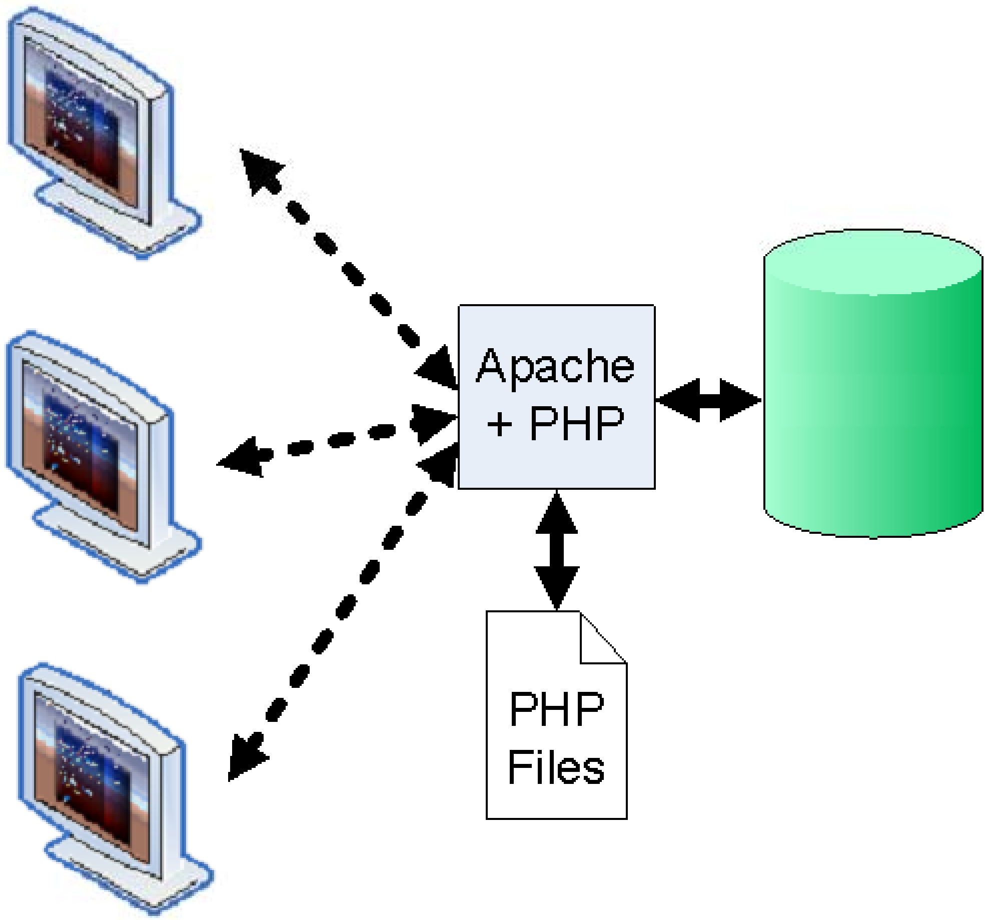
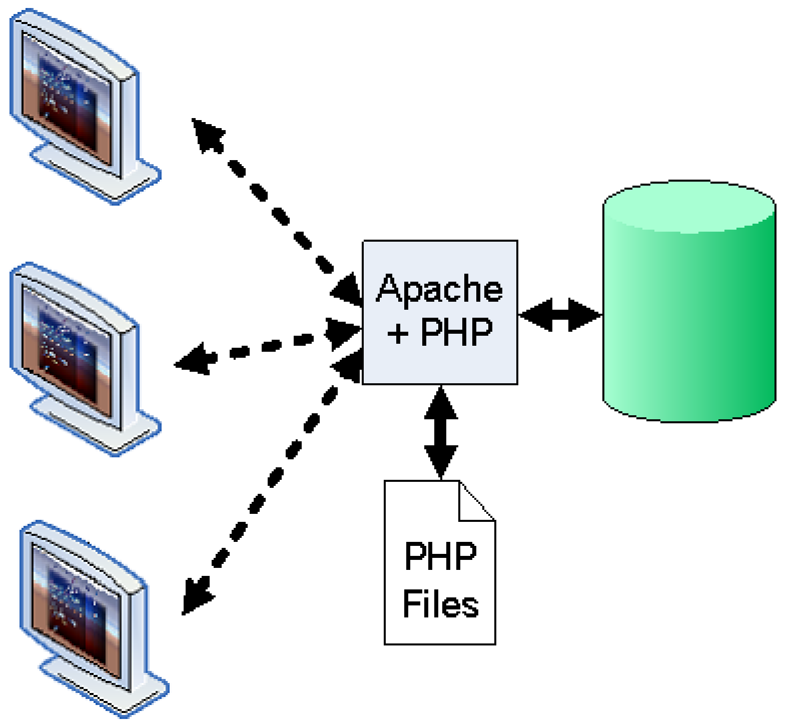
Why is Web Development Attractive?

- Zero-deployment
- No need to maintain previous versions
- Everyone updated at the same time
- Some security problems become simpler
- Web development is (usually) simpler

Simple PHP-based Application



The Problem...



How can we solve the problem?

1. Take the stack offline

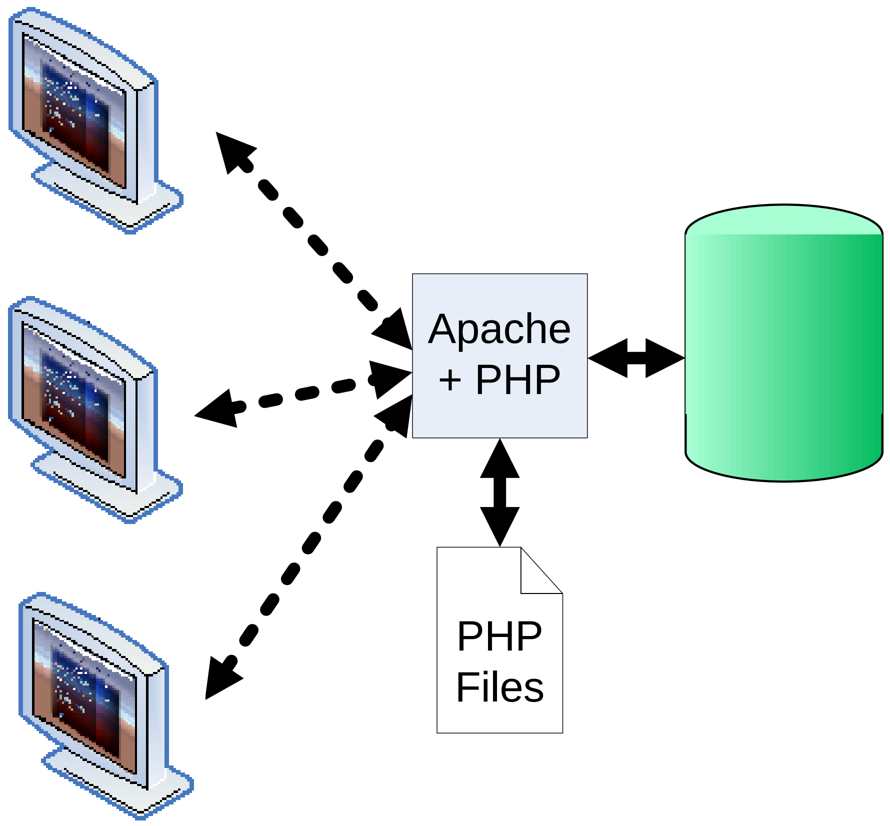
2. Rewrite the application as a client-side application

How can we solve the problem?

1. **Take the stack offline**

2. Rewrite the application as a client-side application

Sample Blog Application



Take the Stack Offline

- What do we need to host an offline version of the application?
  - Web Server
  - Database
  - PHP installation (or whatever server-side scripting language you use)
  - Synchronization

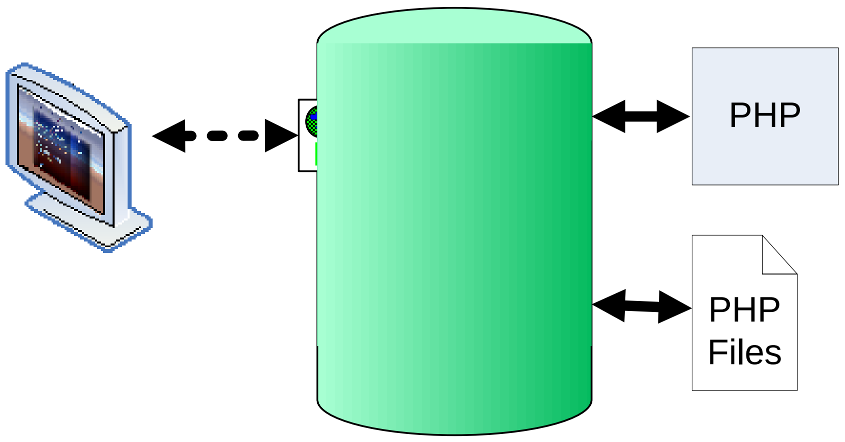
Make SQL Anywhere the Stack

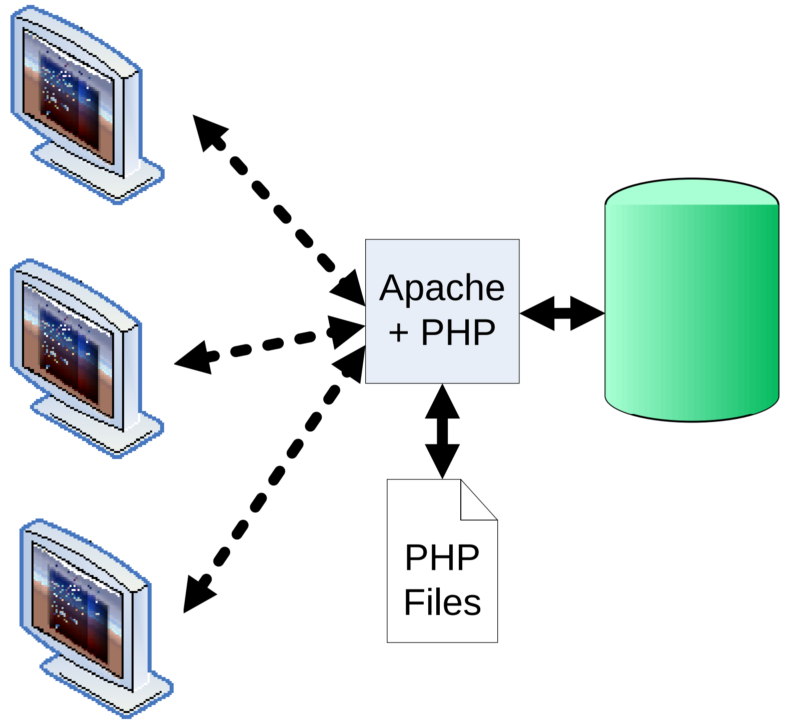
- Built-in HTTP server
  - HTTP
  - SOAP
- It *is* a database
- External Environments:
  - PHP
  - Perl
  - .NET
  - Java
  - C (external libraries)

What We Need Cont.

- Built-in synchronization
  - MySQL
  - Oracle
  - MS SQL Server
  - IBM DB2
  - SQL Anywhere
  - Sybase ASE

Stand-Alone Application

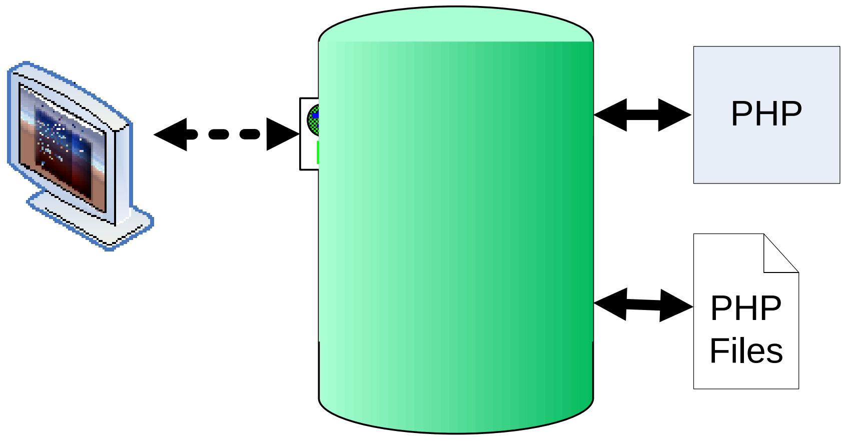


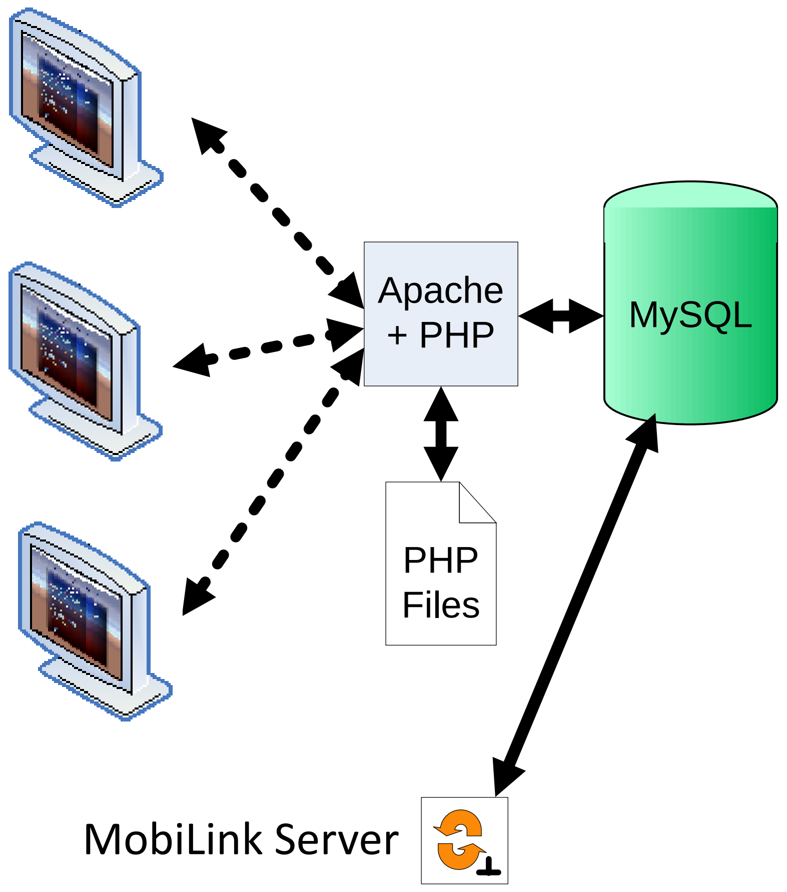


MobiLink and Synchronization

- MobiLink acts as a ‘sync server’
- Makes a regular database connection to consolidated database
- Handles all synchronization traffic
- Set up in farms to scale out (> 100,000 syncing remotes)
- Write sync scripts to handle business logic of sync
  - SQL (native dialect of consolidated database)
  - .NET
  - Java
- Conflicts detected at column or row level

Adding MobiLink

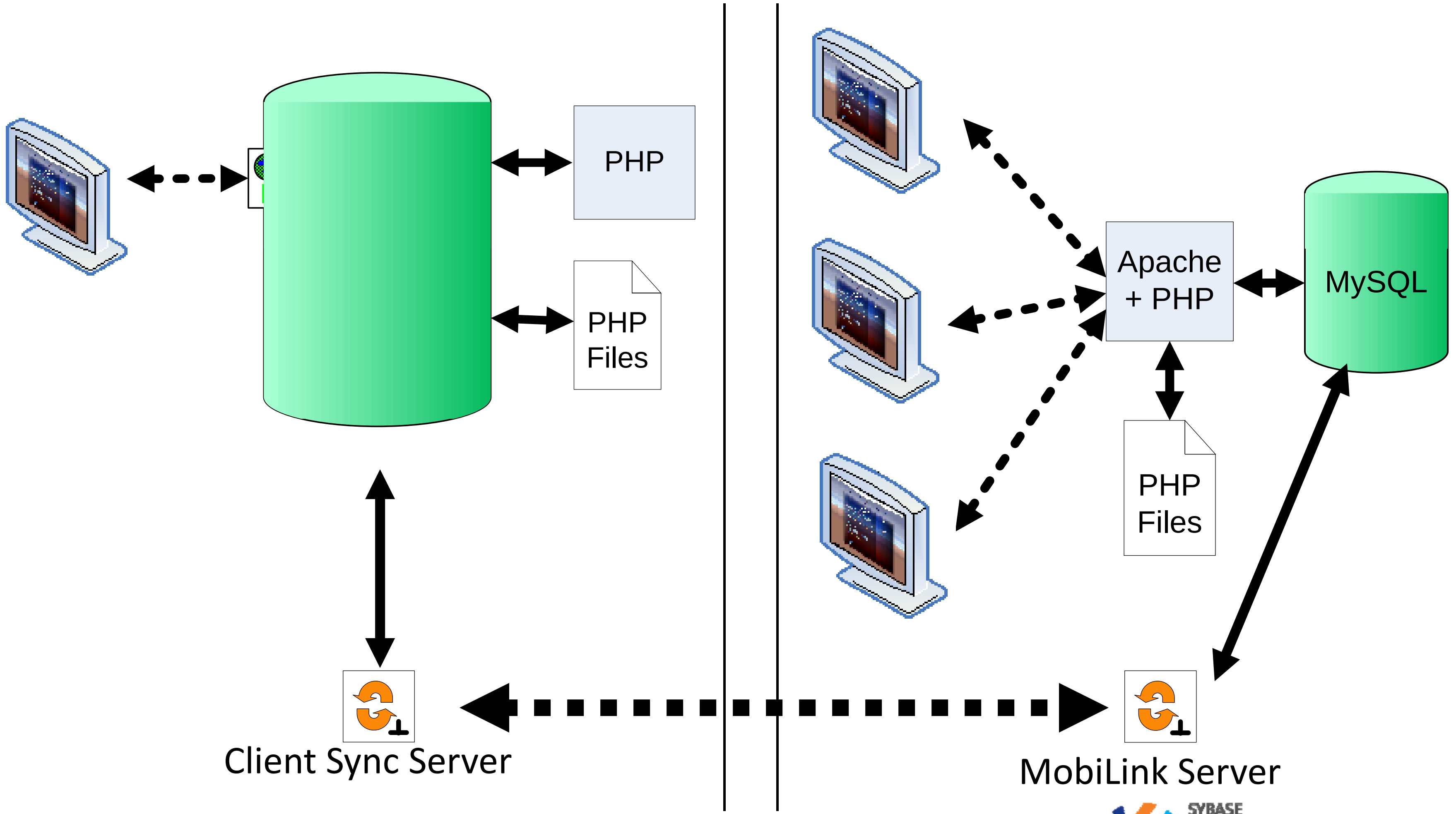




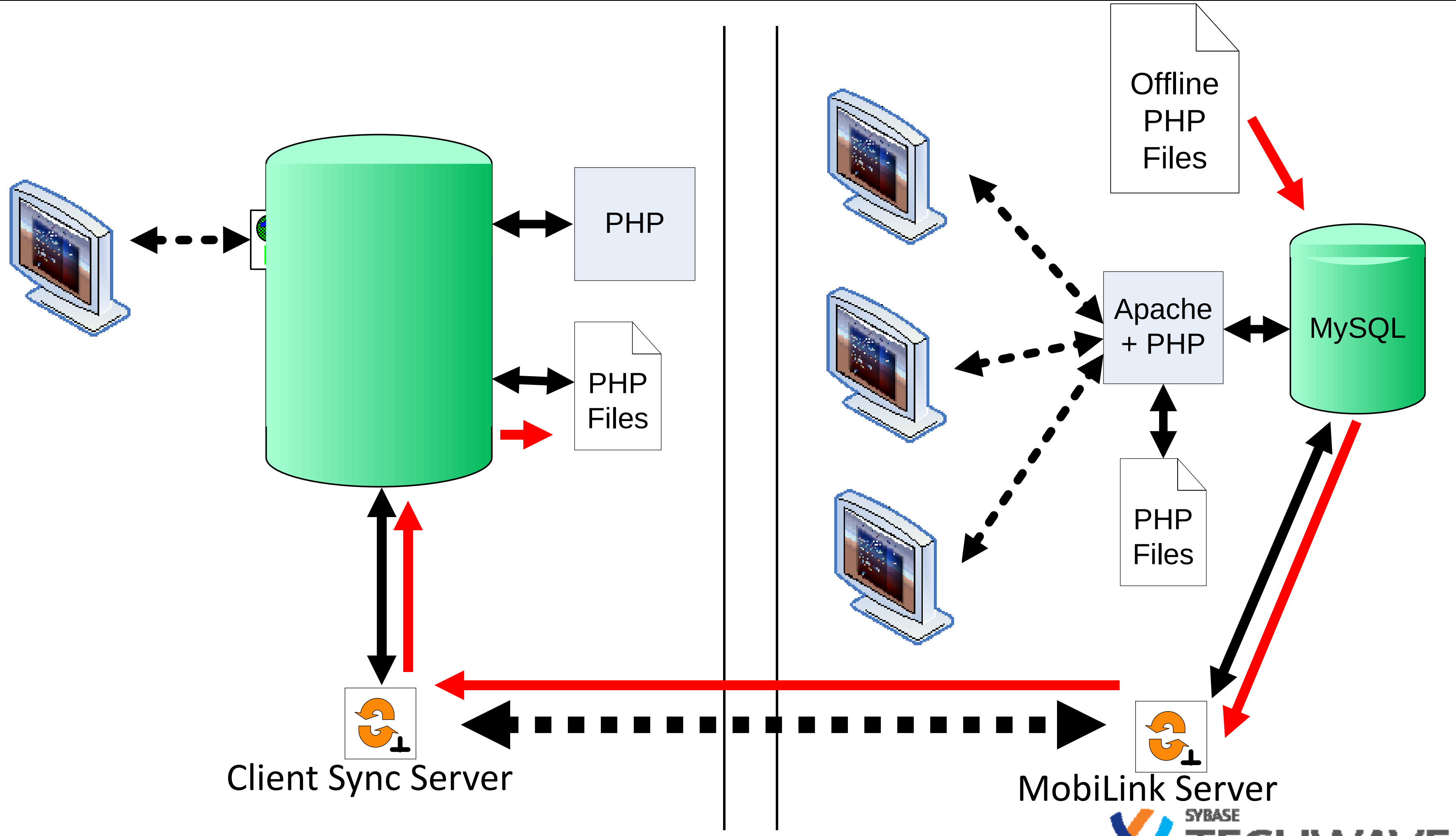
Client Sync (dbmlsync)

- Uploads all changes to database since last sync
- All synchronization happens in a SINGLE transaction
    - Any failures will cause a full rollback
- Sends both current value, and original synced value of rows
- Can be run on demanded, or scheduled

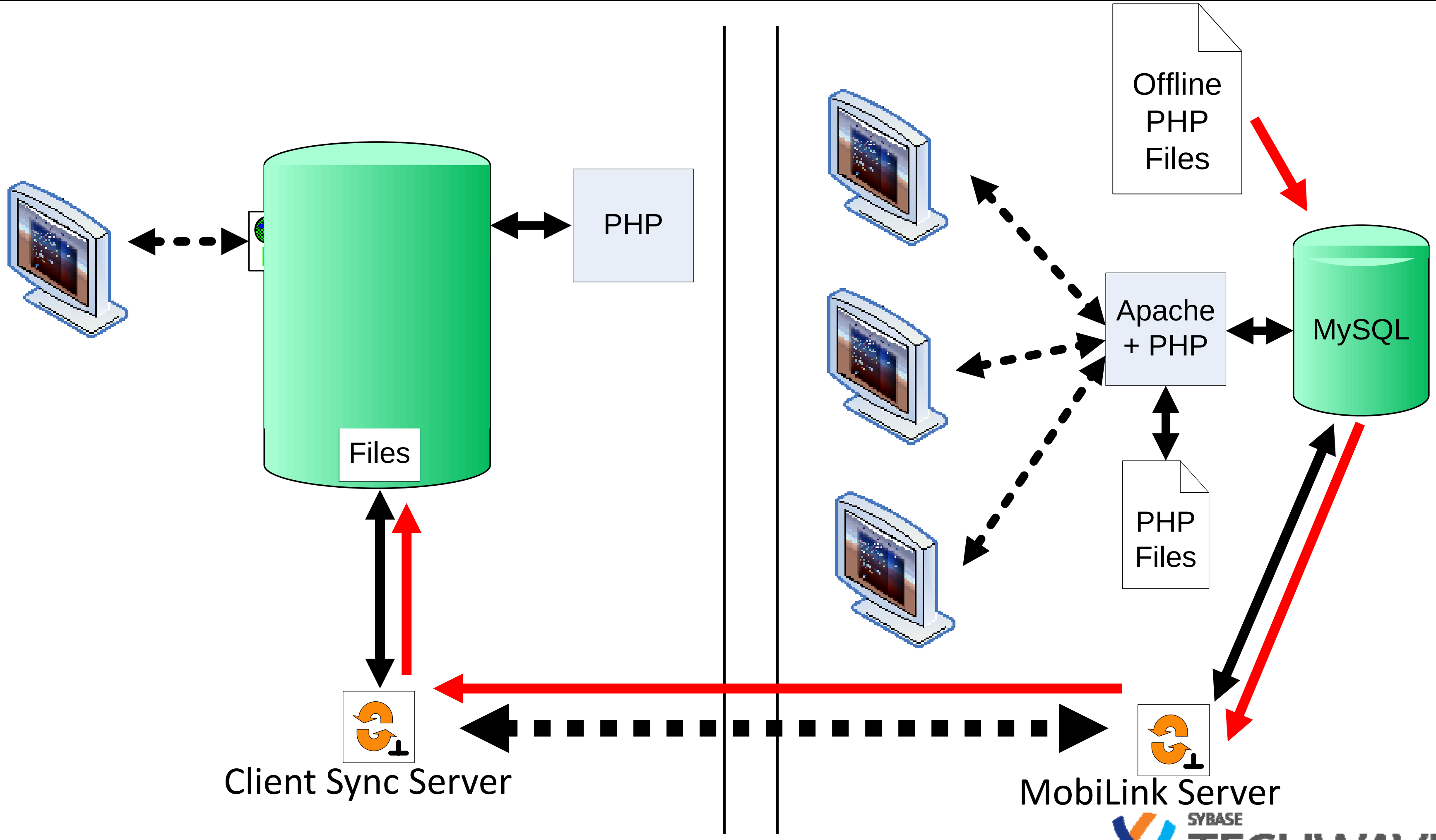
Sync!!


PHP
PHP Files
Client Sync Server
Apache + PHP
MySQL
PHP Files
MobiLink Server

Syncing Files



Storing Files in the Database



Conflicts

- What if two people change the same blog post?
  - Posts are stored a single row in the database
  - Need to ‘merge’ the rows
- Solution:
  - Use `diff3` utility as our custom business logic
  - `diff3` requires:
    - Original
    - My changed copy
    - Their changed copy

Other Languages

- Although this example uses PHP, can be used for other languages as well
  - Java
  - .NET
  - Perl
  - Python
  - Ruby
  - etc....

How can we solve the problem?

1. Take the stack offline

2. **Rewrite the application as a client-side application**

Some Definitions

- Server-side scripting languages run at the server
  - Ex. PHP, Perl, Ruby
- Client-side scripting languages run in the browser
  - JavaScript
  - ActionScript (via Flash Player)

Some More Definitions

- HTML5
  - Specification for the next version of the HTML standard
  - Currently in draft by the W3C
    - 2012 - Candidate Recommendation
    - 2020 - Final Working Draft
    - 2022 - Proposed Recommendation
  - Some browsers (Chrome, Firefox) already implement a few of the features
- Gears
  - Browser plugin/add-on
  - Open source project originally created by Google
  - Goal is to implement a subset of the HTML5

The Gears' Modules

- Implements three main features:
  - LocalServer
    - Caches resources (HTML, JavaScript, CSS, JPG, etc) and serves them when no connection is available
  - WorkerPools
    - Creates psudo-threads for JavaScript
  - Database
    - Stores local data
    - Gears currently uses SQLite
- Everything is there to make an application, but how do you synchronize your data?

Disclaimer

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All of the information in this presentation after this slide is forward-looking as defined above. As such, there is uncertainty associated with if or when any of these features will be added to the product.

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UltraLiteWeb

- A alternate build of Gears with the addition of an UltraLite module
- Allows Gears application to leverage the full power of MobiLink synchronization

```
// ----------------------------------------------------------------------------
// ** Creating and Opening an UltraLite Database **
// ----------------------------------------------------------------------------
// Create an instance of the 'beta.uldatabase' object
// using the Gears factory
var db = google.gears.factory.create('beta.uldatabase');

// UltraLite databases can be created/opened with a variety
// of configuration options. These options are passed in through
// a dictionary object
var options = {
  case: "Respect",     // Respect case sensitivity
  page_size: "8k",     // 8K memory pages
  date_order: "MDY"    // Interpret data in order of 'Month-Day-Year'
};

// Open (or create) a database called 'database-test' with
// the supplied options
db.open('database-test', options);
```

UltraLiteWeb

```
// ----------------------------------------------------------------------------
// ** Simple Queries **
// ----------------------------------------------------------------------------
// Create a table with an auto incrementing primary key called "id",
// and a 32-character column called "name"
var sql = "CREATE TABLE \"Foods\" (" +
          "  id int primary key default autoincrement," +
          "  name char(32)" +
          ")";

// Execute the query
db.execute(sql);
```

UltraLiteWeb

```
// ---------------------------------------------------------------------------
// ** Preparing for Synchronization
// ---------------------------------------------------------------------------
// Create a synchronization profile for synchronizing with a server-side
// database. The business logic of the synchronization is defined at the
// the server. Each profile synchronizes with series of publications. A
// publication is predefined set of tables and business logic.
sql = "CREATE SYNCHRONIZATION PROFILE MySimpleProfile '" +
      "Stream=https(host=my.mobilinkhost.com;tls_type=rsa);" +
      "ScriptVersion=Food_v1;" +
      "MobiLinkUid=ml_user;" +
      "MobiLinkPwd=ml_user;" +
      "Publications=FoodPub;'";
db.execute(sql);

// Synchronization happens asynchronously. The user-defined "onsync"
// function will be called with periodic updates as the synchronization
// proceeds.
db.onsync = function(status) {
  console.log("Current Sync State: " + status.state);
}

// ---------------------------------------------------------------------------
// ** Starting a Synchronization
// ---------------------------------------------------------------------------
// Start the synchronization using the "MySimpleProfile" profile
db.sync("MySimpleProfile");
```

UltraLiteWeb

- More to come. Stay tuned....
- Watch my blog for announcements

Taking It All Offline

1. Leverage your current codebase and take the stack offline
   - Allows code reuse on the client application
   - Requires SQL Anywhere installation on the client machine
   - May require a server-side scripting language installation
2. Rewrite the application as a client-side application
   - Requires a browser add-on
   - Application must be totally written in client-side languages (JavaScript, CSS, HTML)

Where to get more information

- SQL Anywhere PHP Developer Center
  - http://www.sybase.com/developer/library/sql-anywhere-techcorner/php
- SQL Anywhere Web Forum
  - http://groups.google.com/group/sql-anywhere-web-development/
- SQL Anywhere PHP Module page
  - http://www.sybase.com/detail?id=1019698
- My Blog – “Peering Behind the Browser”
  - http://iablog.sybase.com/efarrar