

PHPUnit Database
Testing

ESOF 411,
Software
Verification &
Validation

DB Testing

Database is essentially a global input variable to your code.

Keep the amount of data used for each test small and test as much code using non-database tests as possible.

PHPUnit Documentation, Chapter 8:

<https://phpunit.de/manual/5.7/en/database.html#database.will-phpunit-re-create-the-database-schema-for-each-test>

Stages of a DB Test

4 stages of a db test:

1. Setup fixture – describe initial state of application & db.
 - getConnection() - cache the PDO instance to avoid connecting over and over
 - getDataSet()
2. Exercise system under test (SUT)
3. Verify outcome
 - assertEquals()
 - assertEquals(),
4. Teardown – TRUNCATE resets the table to entry

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DB Structure

PHPUnit assumes the db schema is created before a test is run. Can use:

- sqlite
- MySQL
- Doctrine 2
- Propel
- PHPUnit's Bootstrap

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Run test, verify outcome and teardown

After the db is reset and loaded with its initial state the actual test is executed by PHPUnit.

`getDataSet()` method is called once during `setUp()` to retrieve the fixture data-set and insert it into the db.

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Workflow for db assertions

Workflow for db assertions in your tests:

1. Specify one or more tables in your dataset
2. Specify the expected dataset
3. Assert that both are equal

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DataSets and DataTables

DataSets and DataTables are represented via:

- Flat XML
- XML
- YAML
- Csv file
- PHP arrays

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Flat XML Dataset

```
<?xml verion="1.0" ?>
```

```
<dataset>
```

```
  <guestbook id="1" content="Hello buddy!"  
                                                    user="joe">
```

```
  <guestbook id="2" content="I like it" user="nancy">
```

```
</dataset>
```

PHPUnit Documentation, Chapter 8:

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XML Dataset

Flat XML can't handle nulls

```
<?xml verion="1.0" ?>
<dataset>
<table name = "guestbook">
  <column>id</column>
  <column>content=</column>
  <row>
    <value>1</value>
    <value>Hello buddy!</value> ...
  </row>
  <row>
    <value>12</value>
    <value>I like it</value> ...
  </row>
</table?
</dataset>
```

PHPUnit Documentation, Chapter 8:

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YAML Dataset

guestbook:

- - id: 1
 - content: "Hello buddy!"
 - ...
- - id: 2
 - content: "I like it!"
 - ...

PHPUnit Documentation, Chapter 8:

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csv Dataset

For the `guestbook-table.csv` file:

`id,content,...`

`1, "Hello buddy!",...`

`1, "I like it!",...`

PHPUnit Documentation, Chapter 8:

<https://phpunit.de/manual/5.7/en/database.html#database.will-phpunit-re-create-the-database-schema-for-each-test>

PHP array Dataset

```
return new MyApp_DbUnit_ArrayDataSet(  
    [  
        'guestbook'=>[  
            [  
                'id'=>1,  
                'content'=>"Hello buddy!", ...  
            ],  
            [  
                'id'=>2,  
                'content'=>"I like it!", ...  
            ],  
        ]  
    ]  
)
```

PHPUnit Documentation, Chapter 8:

<https://phpunit.de/manual/5.7/en/database.html#database.will-phpunit-re-create-the-database-schema-for-each-test>

PHP array Dataset

With PHP array databases assertions can be specified directly in the test case.

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