A generic PHP Application installer

International PHP Conference 2011

Kore Nordmann

10.10 2011

About me

- Degree in computer sience in 2010
- More than 10 years of professional PHP
- Open source enthusiast
- Contributing to various FLOSS projects
- Founder of **Qafoo GmbH**, which provides
  Services all around high quality PHP

Outline

The problem

History

Requirements

Design

Summary

The problem

- Users installing software
  - Shared hosts
  - Dedicated servers
  - (Administrators)

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  - ▶ Shared hosts
  - ▶ Dedicated servers
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- ▶ The use case
  - ▶ Download installer package
  - ▶ Copy it to server
  - ▶ Configure installation
  - ▶ Install software

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  - Copy it to server
  - Configure installation
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- Nothing like this exists
  - pear / composer: Allow (local) library installation / resolution

Outline

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History

- Christian Weiske blogged about the problem and his requirements
    - `http://cweiske.de/tagebuch/`
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    wiki/view/Installer
- ► Discussed the problems at various (un-)conferences
- ► Merged feedback from phpBB, Typo3 and other software communities

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General

- Handle "any" setup gracefully
  - PHP versions
  - Available extensions
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- Ability to upgrade existing installations
- Handling of task-graphs
  - ... more on that later.

Security

- Limit installation to one user
  - Require file with password created next to the installer
  - Limit installer to a single IP

Security

- ▶ Limit installation to one user
    - ▶ Require file with password created next to the installer
    - ▶ Limit installer to a single IP
- ▶ Drop permissions after installation

Steps

1. Check system requirements
   - Extensions
   - Libaries
   - PHP configuration settings
   - Web Server setup

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3. Install application
   - Copy data
   - Configure application
   - Set permissions

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Design

- Installer consists of any number of tasks, each has
  - Requirements
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  - ▶ (Verifications)
- ▶ Installer runs the start task
  - ▶ Each task may trigger any number of "dependant" tasks

Design

- Installer consists of any number of tasks, each has
  - Requirements
  - Configuration options
  - Actions
  - (Verifications)
- Installer runs the start task
  - Each task may trigger any number of "dependant" tasks
  - . . . optionally based on configuration settings

Demo

Arbit Installer

Disecting the installer

```
1  #!/usr/bin/php
2  <?php
3
4  require 'src/environment.php';
5
6  $installer = new aiInstaller(
7      'Arbit',
8      '0.3-alpha',
9      'Arbit aims to provide a decent modern extensible multi project tracking
           tool. Features start with issue tracking and wiki and do not stop
           before code analysis and translation management.'
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Adding a first task

```php
// Configure legal task
$installer['legal'] = $legal = new aiTask(
    'License',
    'Please read and accept the license.'
);

$legal->configurations['license'] = new aiConfigurationLicense(
    'Accept License',
    'Please read and accept the GPL 3 license, under which Arbit is licensed.',
    file_get_contents( __DIR__ . '/LICENSE' )
);
$legal->configurations['deps'] = new aiConfigurationDependency(
    'Dependencies',
    'Task dependencies.',
    array( 'main' )
);
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18    $legal->configurations['license'] = new aiConfigurationLicense(
19        'Accept License',
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Adding main task with requirements

```
29    // Configure main task
30    $installer['main'] = $main = new aiTask(
31        'Main_configuration',
32        'Main_configuration_for_arbit.'
33    );
34
35    $main->requirements = new aiRequirementsAnd(
36        new aiRequirementsAnd(
37            new aiRequirementPhpVersion( '5.3' ),
38            new aiRequirementPhpIniSetting( 'short_open_tags', false ),
39            new aiRequirementPhpIniSetting( 'memory_limit', '128M' ),
40            new aiRequirementPhpIniSetting( 'mbstring.func_overload', false ),
41            new aiRequirementPhpIniDateTimezone()
42        ),
43        new aiRequirementsAnd(
44    //        new aiRequirementPhpExtension( 'does_not_exist' ),
45            new aiRequirementPhpExtension( 'pcre' ),
46            new aiRequirementPhpExtension( 'spl' ),
47            new aiRequirementPhpExtension( 'date' ),
48            new aiRequirementPhpExtension( 'dom' ),
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Main task configurations

```php
57    $main->configurations['database'] = new aiConfigurationDatabase(
58        'Database connection',
59        'Database which stores the arbit data.',
60        array(
61            'couchdb'  =>  'Apache CouchDB document database',
62            'mysql'    =>  'MySQL database using the mysql driver',
63        )
64    );
65
66    $main->configurations['email'] = new aiConfigurationString(
67        'Admin E-Mail',
68        'Mail address of administrator for error reporting.',
69        'errors@example.org'
70    );
71    $main->configurations['sender'] = new aiConfigurationString(
72        'Sender E-Mail',
73        'Mail address used as the sender address for all mails sent out.',
74        'Arbit <no-reply@example.org>'
75    );
76    $main->configurations['project'] = new aiConfigurationOptionalDependency(
77        'Configure Project',
78        'Configure a project directly inside the installer. Otherwse this can be
              done later by modifying the configuration files.',
79        'project'
80    );
```

Main task actions

```
82   $main->actions[] = new aiActionPhync( array(
83       array(
84           new phyncMatcherTargetExists(),
85           array(
86               new phyncChmodAction( 0770 ),
87           ),
88       ),
89       array(
90           new phyncMatcherOr( array(
91               new phyncMatcherNot(
92                   new phyncMatcherTargetExists()
93               ),
94               new phyncMatcherSourceNewer(),
95           ) ),
96           array(
97               new phyncCopyAction(),
98               new phyncChmodAction( 0770 ),
99           ),
100      ),
101  ) );
```

Interlude: Phync

- ▶ Implements user-land PHP stream wrappers for different protocols
    - ▶ FTP (using the PHP extension or sockets)
    - ▶ Virtual File System (Memory)
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    - ▶ Matcher: Decides if the rule should be applied
    - ▶ Action: Executed if the rules applies

Main task actions

```php
<?php

stream_wrapper_register( 'phyncftp', 'phyncFtpHandler' );
stream_wrapper_register( 'vfs', 'phyncVirtualFileSystemHandler' );

$syncer = new phyncSyncer();

$syncer->addRule(
    new phyncMatcherNot(
        new phyncMatcherTargetExists()
    ),
    array(
        new phyncCopyAction(),
        new phyncChmodAction( 0777 ),
    )
);
$syncer->addRule(
    new phyncMatcherFile(),
    array(
        new phyncChmodAction( 0666 ),
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$syncer->syncronize(
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```php
102  $main->actions[] = new aiActionIniConfig(
103      'config/main.ini',
104      array(
105          'email'           => 'main.email',
106          'type'            => 'main.database.extension',
107          'connection'      => 'main.database.url',
108          'options[from]'   => 'main.sender',
109      )
110  );
111  $main->actions[] = new aiActionMkdir( 'var/log', 0770 );
112  $main->actions[] = new aiActionMkdir( 'tmp', 0770 );
```

Main task actions

```
114    $main->postActions [] = new aiActionPhync ( array (
115        array (
116            new phyncMatcherAnd ( array (
117                new phyncMatcherDir ( ) ,
118                new phyncMatcherNot (
119                    new phyncMatcherPcre ( '(/(?:var|tmp|log)/)' )
120                ) ,
121            ) ) ,
122            array (
123                new phyncChmodAction ( 0550 ) ,
124            ) ,
125        ) ,
126        array (
127            new phyncMatcherFile ( ) ,
128            array (
129                new phyncChmodAction ( 0440 ) ,
130            ) ,
131        ) ,
132    ) ) ;
```

Packaging

```
212    $packager = new aiPackagerPhar();
213    $packager->package(
214        $installer,
215        new RecursiveRegexIterator(
216            new RecursiveRegexIterator(
217                new RecursiveRegexIterator(
218                    new RecursiveDirectoryIterator(
219                        '/home/kore/devel/arbit/trunk/src',
220                        FilesystemIterator::KEY_AS_PATHNAME | FilesystemIterator::
                                CURRENT_AS_FILEINFO
221                    ),
222                    aiPackager::createRejectRegExp( '/.svn/' ),
223                    RegexIterator::MATCH,
224                    RegexIterator::USE_KEY
225                ),
226                aiPackager::createRejectRegExp( '/var/' ),
227                RegexIterator::MATCH,
228                RegexIterator::USE_KEY
229            ),
230            aiPackager::createRejectRegExp( '/tmp/' ),
231            RegexIterator::MATCH,
232            RegexIterator::USE_KEY
233        ),
234        'arbit-0.3-alpha-installer.phar'
235    );
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  - Command line user interface
  - Make it easier to use it as an "updater"
  - Provide non-PHAR packager
  - Store and replay configuration

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- ► TODO
  - ► Security features
  - ► Command line user interface
  - ► Make it easier to use it as an "updater"
  - ► Provide non-PHAR packager
  - ► Store and replay configuration
  - ► Installer configuration through XML

Thanks for listening

Please rate this talk at
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and / or give me some feedback right now!

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