Using SPL Tools in Your Code

OTHERWISE KNOWN AS SPL IN THE WILD

If you don’t know what SPL is or have never used SPL features, this talk might go fast for you.

Feedback is good!

Why SPL?
What SPL?
How SPL?

Standard PHP Library

A library of standard interfaces, classes, and functions designed to solve common programming problems and allow engine overloading

But isn't SPL an Extension?

- SPL is an extension
- SPL is a core extension
- SPL cannot be built shared
- SPL should not be turned off
- SPL is present in PHP since 5.0 (almost 6 years ago)
- As of 5.3, SPL cannot be turned off

If you don't have SPL, whoever built your PHP is an idiot.

Autoload

DON'T LET FRIENDS USE __AUTOLOAD

Autoload Stack err Queue

- spl_autoload_register()
- spl_autoload_unregister()
- spl_autoload_call()
- spl_autoload_functions()

- https://github.com/hyla/hyla/blob/a9f445115b942865241653dce02aa029c7453f41/kohana/application/bootstrap.php

Beware the Weirdness

- spl_autoload()
  - lowercase
  - relative paths
  - namespace aware
- spl_autoload_extensions()
  - include the .
  - no spaces in between
  - comma separated string

Exceptions

WHAT WENT WRONG WHERE

Exception Classes

LogicException

- BadFunctionCall Exception
- Domain Exception
- InvalidArgument Exception
- Length Exception
- OutofRange Exception
- BadMethodCall Exception

Exception Classes

RuntimeException

OutofBounds Exception

Overflow Exception

Range Exception

Underflow Exception

Unexpected Value Exception

Marker Interface

- Note that the ability to “nest” exceptions in 5.3 makes using this stuff far more practical
- Component level interface as the “marker” or “domain” for all exceptions belonging to a library or package
- Specific types of exceptions for code that tell what happened

Arrays as Objects

I'M AN ARRAY, WELL KIND OF BUT
I'M AN OBJECT, REALLY!
I AM INCREDIBLY USEFUL

The use cases are infinite

- https://github.com/ooyes/Microweber/blob/d4d64cb563b73fa47db5e1e61f913d426d29154c/system/application/stats/libs/Zend/Registry.php

- Gotchas:
  - &offsetGet
  - Quite buggy in 5.2, much more stable in 5.3
  - Can't use all array functions
  - Serialize, unserialize, sleep, wakeup issues

ArrayAccess, ArrayObject, Array

- Lots of people want arrayaccess or arrayobject to work like an array
- ArrayObject might be feasible and in fact some of these can already be used
- What about sorting? Merging? Other behavior

Files

YES PHP HAS A FILE OBJECT
WELL ACTUALLY IT HAS 3
SPLFILEINFO
SPLFILEOBJECT
SPLTEMPFILEOBJECT

Practical Uses

- https://github.com/fqqdk/phpcmc/blob/c3b2450ff6f0293f3de0525745f4f5d551181d0d/src/jabbar/PearXmlBuilder.php

- https://github.com/horde/horde/blob/a49d5c901d184dd8581ada0829ad33db053fd07b/framework/Support/lib/Horde/Support/StringStream.php

Interfaces

MAGIC AND ORGANIZATION

PHP Interfaces

- Traversable
- Iterator
- IteratorAggregate
- ArrayAccess
- Serializable

- And in 5.4 JsonSerializable

Countable

- Interface meaning “you can count me”
- Can be put on any class
- Makes count() magical
- Note this is NOT the same as iterator_count()

Iterator Interfaces

- Outer Iterator
- Inner Iterator
- Seekable Iterator

- For examples, pay attention to what all the iterator classes we'll talk about implement

SplSubject SplObserver

- Are you implementing the observer pattern in your code?
- Do you intend to have other people use your code/ library in some way?
- Are you implementing something LIKE the observer pattern?

- http://www.a-scripts.com/object-oriented-php/2009/02/21/the-observer-pattern/

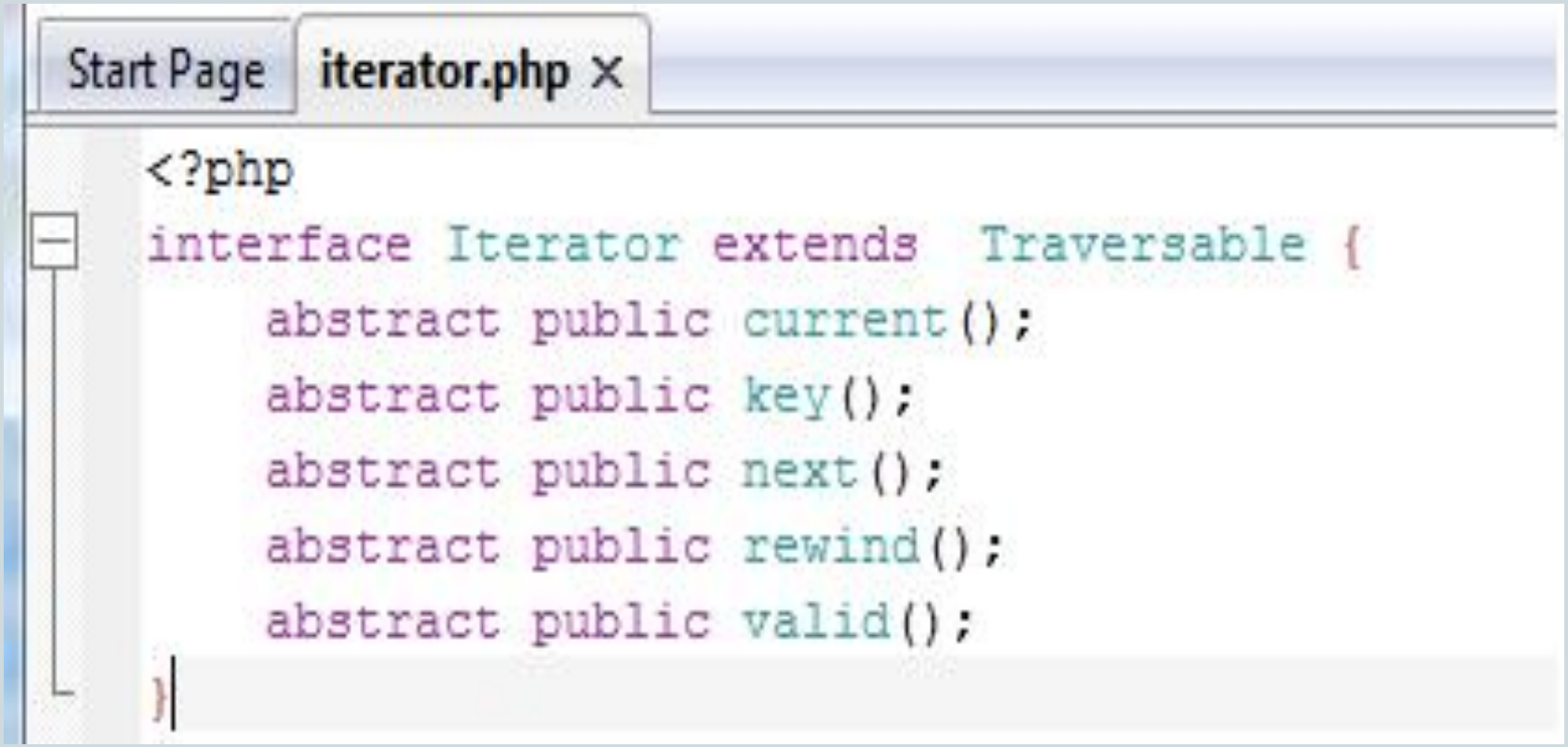
Iterators

TAKE A DRINK …

Why Iterators?

- Readable
- Easy to understand
- Testable
- Easy to refactor
- Consistent usage
- Easily add functionality
- Can be extended
- Can be chained

Meet the Iterator Interface



So how is it different?

$ar= array();	*$it = new Iterator;*
• *reset($ar)* • *!is_null(key($ar))* • *current($ar)* • *key($ar)* • *next($ar)*	• *$it->rewind()* • *$it->valid()* • *$it->key()* • *$it->current()* • *$it->next()*

FilterIterator

- Abstract Class
- Has one method that must be implemented – accept – which should return true or false
- Highly useful for many types of iteration
- https://github.com/sebastianbergmann/php-file-iterator/blob/master/File/Iterator.php

IteratorIterator

- Regular Class
- Stick in something that implements traversable
- Instant Iterator
- https://github.com/mediaslave/phrails/blob/6d40d1584c0202668b071c0fd4b53e060b6724c7/framework/db/ResultSet.php

ArrayIterator

- Regular Class
- Iterates an array – OR the public properties of an object! (neat trick – dirty trick)
- https://github.com/codealchemy/ACL/blob/d1729ec7c3aee427fb57da9c2f2817503aa507b5/lib/CODEAlchemy/Component/ACL/NodeList.php

RecursiveIteratorIterator

- Regular Class
- Like IteratorIterator only recursive to boot

- https://github.com/Xosofox/propelVendor/blob/85986d1ef52167f3044d69be142c72895174bac1/propel/config/PropelConfigurationIterator.php

ParentIterator

- Regular Class
- Filter out stuff without children

- https://github.com/ebihara/php-src/blob/b62203bf12ea1c2b63a0de996a236f43b2ac100c/ext/phar/phar/directorygraphiterator.inc

LimitIterator

- Regular Class
- Like mysql's limit – pick your range and offset and foreach away!

- https://github.com/mintao/zf-mini/blob/9efff5f8b25383ef2cdf91b0e4301d90965c4fb8/Paginator/SerializableLimitIterator.php

CachingIterator

- Regular Class
- Manages another iterator by checking whether it has more elements each time using a hasNext() method
- https://github.com/shimondoodkin/node_spreadsheet/blob/e16660cebd2b65abba1a8f5db4449285fa4c3cc6/orig/Classes/PHPExcel/Worksheet/RowIterator.php

RecursiveCachingIterator

- Regular Class
- Just like caching iterator only – believe it or not – recursive!
- https://github.com/codedor/cakephp_navigation/blob/121b3f0594ad0e42a873f65d45583c5ca85343c3/views/helpers/menu.php

DirectoryIterator

- Regular Class
- Makes going through directories a snap
- isDot, isFile – I love you

- https://github.com/quentinhill/curator/blob/44ec76ca9c3d749028b5d950ab78c7dc480dee83/Curator/Project.php

RecursiveDirectoryIterator

- Regular Class
- Like, do it again… and again… and again… and…

- https://github.com/gjarkko/Track-o-Matic/blob/ce506e71326805fe24e38b42623286 48cad9a50e/server/classes/Tools.php

RegexIterator

- Regular Class
- Filter an iterator by a regex
- Pick how you want it to match

- https://github.com/drm/Sprig/blob/b57bee029ce3d4317f90f38de2b643e3b6d94c96/lib/Sprig/Extension/Smarty/PluginLoader/Iterator.php

Datastructures

NEW WAYS OF MANAGING DATA

http://matthewturland.com/2010/05/20/new-spl-features-in-php-5-3/

DoublyLinkedLists – CS Lesson

- ordered collection of values
- linked to each element before it
- linked to each element after it
- “doubly linked”

- PHP datastructure – a php object with a doublylinkedlist stored inside it

SplDoublyLinkedList

- Don’t use this
- Yes, that’s a terrible thing to say – but this is really nothing more then a “base class” with little to recommend on its own
- Has a doublylinkedlist from C underneath instead of a hashtable – if you know what that means you may find a real use for this (I have not)

SplStack

- Data is in LIFO

- Anything you need to iterate a lot
- Even cooler? Turn on the mode that will autodelete each item as you process it

- Any Queue you need to push stuff onto and deal with in LIFO order

- https://github.com/CHH/Spark2/blob/a01607a2480bd6a9b8251e56579fe848696839 25/lib/Spark/App.php

SplQueue

- Data is in FIFO

- Anything you need to iterate a lot
- Even cooler? Turn on the mode that will autodelete each item as you process it

- Any Queue you need to push stuff onto and deal with in LIFO order

- https://github.com/composer/composer/blob/52565a93529048a6311110879c76b46bbf76ba82/src/Composer/DependencyResolver/Solver.php

Heap – CS Lesson

- comparison function used to compare the new element to other elements
- element is placed according to functions return value
- underlying algorithm does it with minimal comparisons

- PHP datastructure – a php object with a heap stored inside it

Using SplHeap

- This is an abstract class
- You need to compare elements

- https://github.com/ckwalsh/LibSprite

SplMinHeap, SplMaxHeap

- These are concrete heap implementations, designed to grab the lowest possible value out, or the highest possible

- https://github.com/Wordi/LooPHP/blob/fce3947bc27cdd4ae2109e62f7ad58ed68af7862/LooPHP/EventLoop.php

SplPriorityQueue

- Uses heap internally
- Is non-deterministic when identical priorities are used (bug bug bug….)

- https://github.com/ss23/DeBot/blob/dced95faaf5b52840570d0824151bae4a95866305/core/SplFIFOPriorityQueue.php

SplFixedArray

- You have a large amount of data, you know the final size, you need to stick it into an array
- You're not going to expand it past the final size
- This is not a small amount of data
- You might need it in non-sequential order but can handle having only integers for keys

- https://github.com/cboden/gClient/blob/429b27a54db5b4c1d30bbdc83566678c03b96bea/lib/gClient/Calendar/Calendar.php

SplObjectStorage

- This can be used two ways
  - Objects can be keys in an array (with two values)
  - As a Set (with one value)

- https://github.com/greggles/epm_project_management/blob/50b90433364721 6ec678fd922f4ac53dbf0e53ee/QueryPath/CssEventHandler.php

What do you want to see in SPL?

- More standard interface?
- More datastructures?
  - trees?
  - graphs?
- More iterators? really? more?

Get Involved

- http://edit.php.net
- Blog posts
- Articles
- Use SPL in the wild

Contact Me

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