



PHP 8.5: New Features from the Source

Daniel Scherzer



Overview

- New features (not exhaustive)
 - Tooling that understands the usage
 - Tooling that validates the usage
 - Polyfills or workarounds
- Deprecations and warnings (not exhaustive)
 - Not removals
 - Tooling that identifies issues
 - Tooling that mitigates issues
- Removals
- Questions

Language: more constant expressions (1)

```
<?php
#[Attribute(Attribute::TARGET_FUNCTION|Attribute::TARGET_METHOD)]
class Tests {
    public function __construct( private Closure $cb ) {}
    public function run() {
        ($this->cb)();
    }
}

#[Tests(static function () {
    assert(isPrime(2));
    assert(isPrime(3));
    assert(!isPrime(100));
})]
function isPrime( int $val = (int)'123' ): bool { /* Exercise to do */ return false; }

new ReflectionFunction( 'isPrime' )->getAttributes()[0]->newInstance()->run();
```

- Attributes parameters
- Parameter and property defaults
- Global constants, class constants
- Access to private members
- Closures, casts, and first class callables

Language: more constant expressions (2)

```
<?php
class StringUtils {
    public const LENGTH = strlen(...);
    public function __construct( public readonly string $str ) {}
    public function transformed( Closure $transform = strrev(...) ) {
        return new StringUtils( $transform( $this->str ) );
    }
}

var_dump( (StringUtils::LENGTH)('example') );
$str = new StringUtils( 'MergePHP' );
var_dump( $str->transformed() );
var_dump( $str->transformed( strtoupper(...) ) );
```

PHPStan:

- Closures (2.1.32, [ab704f4](#))
- FCC (2.1.32, [f436abf](#))
- Casts (2.1.32, [df5ede5](#))

Language: clone() \$with

```
<?php
```

```
class Demo {  
    public function __construct(  
        public public(set) readonly int $val  
    ) {}  
}
```

```
$d1 = new Demo( 5 );  
$d2 = clone( $d1, [ 'val' => 42 ] );  
var_dump( $d2 );
```

- __clone() called *before* \$with applied
- Assignment in array order
- Visibility rules enforced
- Property hooks applied
- Dynamic properties validated, __set() called
- Lazy objects are made non-lazy
- Readonly unlocked:
 - Write in both __clone() and \$with
 - Limit to once in each

PHPStan understanding: 2.1.32, [5a9471a](#)

Language: pipe operator |>

```
<?php
```

```
$caps = new class {  
    public function __invoke( string $val ) {  
        return strtoupper( $val );  
    }  
};  
$result = [ 'w2bvNGI', 'IJXYgMXZ', 'wIGU' ]  
    |> (static fn (array $a): string => implode("", $a))  
    |> strrev(...)  
    |> 'base64_decode'  
    |> $caps;  
var_dump( $result );
```

- Compile-time optimized away
- Any callable
 - ...that can be called with 1 parameter
- Groundwork for partial function application

Tooling support

- NestedToPipeOperatorRector (2.2.6, [09ab43b](#))
 - Renamed in (2.2.7, [758adc7](#)) to SequentialAssignmentsToPipeOperatorRector
- NestedFuncCallsToPipeOperatorRector (2.2.7, [8376d26](#))
- PHPStan understanding (2.1.32, [e9df52e](#))

Language: attributes on constants

```
<?php
```

```
namespace Some\Library {  
    const VERSION = '1.2.3';  
}
```

```
namespace {  
    #[\Deprecated("Use Some\Library\VERSION")]  
    const SOME_LIBRARY_VERSION =  
    \Some\Library\VERSION;  
}
```

- New: Attribute::TARGET_CONSTANT
- Updated: Attribute::TARGET_ALL
- New: ReflectionConstant::getAttributes()
- Only for compile-time constants

Tooling support

- PHPStan attribute validation (2.1.32, [6958f86](#))
- Rector (2.1.5, [c5876ad](#))

DeprecatedAnnotationToDeprecatedAttributeRector

Language: other improvements

Asymmetric visibility for **static** properties

```
<?php
```

```
class Example
    public private(set) static string $prop = 'Foo';
    protected(set) static int $otherThing = 0;
}
```

PHPStan 2.1.32 ([8b2b97f](#)):

- assign.staticPropertyPrivateSet
- assign.staticPropertyProtectedSet
- property.staticAsymmetricVisibility

Constructor property promotion for **final** properties

```
<?php
```

```
class A {
    public function __construct(
        final $prop
    ) {}
}
```

PHPStan 2.1.32 ([e5de6b8](#)):

- property.invalidPromoted (version detection)

New extension: ext/uri

- Scheme
 - Username
 - Password
 - Host
 - Port
 - Path
 - Query
 - Fragment
- `\Uri\Rfc3986\Uri`
 - Formal grammar, invalid inputs rejected
 - Uniform Resource Identifier
 - Fixed specification
 - `\Uri\WhatWg\Url`
 - Algorithmic, handling of malformed inputs
 - Uniform Resource Locators
 - Living document
 - ``league/uri-polyfill` package`

Extension change: OPcache enabled

- `--enable-opcache`
- `--disable-opcache`
- `zend_extension=opcache.so`
- `zend_extension=php_opcache.dll`
- `opcache_*()` functions
- `opcache.enable`
- `opcache.enable_cli`

New INI: fatal_error_backtraces

- Respects #[SensitiveParameter]
- Respects zend.exception_ignore_args
- Defaults to ON :)
- Class redeclaration
- Memory limit exhaustion
- Maximum execution time exhaustion

New Attribute: #[\NoDiscard]

<?php

```
#[\Attribute(\Attribute::TARGET_METHOD|\Attribute::TARGET_FUNCTION)]  
final class NoDiscard {  
    public function __construct(  
        public readonly ?string $message = null  
    ) {}  
}
```

Language change: `(void)` casts

- Symfony 8.5 polyfills: 1.32.0, [f3d7f32](#)

Tooling support

- PHPStan: (2.1.28, [f8ad453](#))
 - callable.resultDiscarded
 - method.resultDiscarded
 - staticMethod.resultDiscarded
- Phan: PhanPluginUseReturnValueKnown (5.5.2, [8c414bd](#))

New Attribute: #[\DelayedTargetValidation]

<?php

```
#[\Attribute(\Attribute::TARGET_ALL)]  
final class DelayedTargetValidation {  
    public function __construct() {}  
}
```

- Symfony 8.5 polyfills: PENDING, [17524a5](#)

Improved Attribute: #[\Override] properties

```
<?php
```

```
abstract class Base {  
    abstract public mixed $prop { get; }  
}
```

```
class Child extends Base {  
    #[\Override]  
    public mixed $prop;  
}
```

```
class Subchild extends Child {  
    #[\Override]  
    public mixed $property;  
}
```

- PHPStan 2.1.32 ([8b85e62](#))
 - Validation: property.override
 - Suggestion: property.missingOverride
 - Version: property.overrideAttribute
- Class exists, cannot polyfill expansion of targets
 - #[\DelayedTargetValidation] use case

Improved Attribute: #[\Deprecated] traits

```
<?php
```

```
#[\Deprecated]
```

```
trait DemoTrait {}
```

```
class DemoClass {  
    use DemoTrait;  
}
```

- Phan: PhanDeprecatedTrait (PENDING, [a4d67b6](#))
- PHPStan 2.1.32 ([f0675a7](#))
 - target validation for classes
 - trait.deprecatedAttribute for versions
- Class exists, cannot polyfill expansion of targets
 - #[\DelayedTargetValidation] use case

New feature: persistent cURL handles

- `curl_share_init_persistent()`
- `CurlSharePersistentHandle`
- Share options fixed
 - No `CURL_LOCK_DATA_COOKIE`
- Not polyfillable
- Persist between requests

New feature: CHIPS

“Cookies Having Independent Partitioned State”

- `setcookie()` [array overload]
 - `setrawcookie()` [array overload]
 - `session_set_cookie_params()`
 - `session_get_cookie_params()`
 - All with “partitioned”
 - `session_start()`
 - “cookie_partitioned”
- Manual header()
 - symfony/http-foundation (6.4.0, [f13a4b1](#))

Added: FILTER_THROW_ON_FAILURE

- Alternative to FILTER_NULL_ON_FAILURE
- Throws `\Filter\FilterFailedException`
 - Extends `\Filter\FilterException`
- Prompted by feature request on GitHub: [#16710](#)
- Out-of-band failures

Tooling support

- PHPStan inference (2.1.32, [193d801](#))

New functions: get*_handler()

<?php

```
function get_error_handler(): ?callable {  
    $handler = set_error_handler(null);  
    restore_error_handler();  
    return $handler;  
}
```

```
function get_exception_handler(): ?callable {  
    $handler = set_exception_handler(null);  
    restore_exception_handler();  
    return $handler;  
}
```

- Null when no handler set
- Symfony 8.5 polyfills: 1.32.0, [d791faa](#)

New functions: array_first() / array_last()

<?php

```
function array_first(array $array): mixed {  
    return $array === [] ? null : $array[array_key_first($array)];  
}
```

```
function array_last(array $array): mixed {  
    return $array === [] ? null : $array[array_key_last($array)];  
}
```

- Null on empty arrays
- Symfony 8.5 polyfills: 1.33.0, [fc474ff](#)
- polyfills/array-first-array-last: 1.0.0, [c2a004e](#)

Migration: ArrayFirstLastRector (2.0.17, [4c3f175](#))

Deprecated: semicolon after `case`

```
<?php
```

```
switch (substr(PHP_VERSION, 0, 3)) {  
    case '8.5';  
        echo "The semicolon is deprecated\n";  
        break;  
    default;  
        echo "Semicolon works\n";  
        break;  
}
```

- PHP CS Fixer: `switch_case_semicolon_to_colon` (1.12.0, [0e56077](#))
- PHPCS: 1.4.0 ([baec904](#))
PSR2.ControlStructures.SwitchDeclaration.WrongOpenercase
 - Message: 2.3.2 ([931842a](#))
 - Autofix: 3.13.3 ([d9766f8](#))
- PHPStan: `backtick.deprecated` (2.1.32, [9405233](#))
 - Autofix: 2.1.32 ([89c7bf9](#))
- Rector: `ColonAfterSwitchCaseRector` (2.1.5, [eda7704](#))

Deprecated: non-standard cast names

| Replace: | With: |
|-----------|----------|
| (binary) | (string) |
| (boolean) | (bool) |
| (double) | (float) |
| (integer) | (int) |

- PHP CS Fixer: `short_scalar_cast` (1.12.0, [0e56077](#))
 - (binary) since 2.12.0 ([5ac307d](#))
- PHPCS: `SlevomatCodingStandard.PHP.TypeCast` (4.5.0, [563b080](#))
 - Forbids (binary)
- PHPStan: `cast.deprecated` (2.1.32, [d0a77d1](#))
- Rector: `RenameCastRector` (2.1.4, [33b12c2](#))

Deprecated: backticks for shell_exec()

```
<?php
```

```
$version = `php -v`;
```

```
echo $version;
```

- PHP CS Fixer: backtick_to_shell_exec (2.10.0, [45e7c85](#))
- PHPCS: Generic.PHP.BacktickOperator (2.7.0, [4543ab2](#))
- PHPStan strict rules: backtick.notAllowed (0.12.0, [b7ae6e0](#))
 - PHPStan: backtick.deprecated (2.1.32, [9405233](#))
- Rector: ShellExecFunctionCallOverBackticksRector (2.2.2, [ade4c81](#))

Deprecated: `null` as array offsets

- Also `array_key_exists()`
- Just use an empty string
- Phan: `PhanTypeMismatchArgumentInternalProbablyReal` (Reflection - PHP 8.0?)
 - `PhanTypeInvalidDimOffset` (5.3.0, [55745e6](#))
- Psalm: `InvalidArrayAccess` (0.1, [8c5adf4](#))
 - `InvalidArrayOffset` (0.2.66, [6c9cdd8](#))
 - `NullArrayOffset` / `PossiblyNullArrayOffset` (0.2.66, [1f57881](#))
- Rector: `ArrayKeyExistsNullToEmptyStringRector` (2.1.5, [aeb8a67](#))

Deprecated: __debugInfo() with `null`

<?php

class Example {

```
    public function __debugInfo() {  
        return null;  
    }
```

}

Equivalent to an empty array

- Phan: PhanTypeMismatchReturn (2.0.0, [b75c692](#))
 - PhanTypeMismatchReturnProbablyReal (3.1.0, [2279b77](#))
- Rector: NullDebugInfoReturnRector (2.1.3, [3dd70ad](#))

Deprecated: function aliases

| Replace: | With: |
|-----------------------------------|------------------------------------|
| <code>socket_set_timeout()</code> | <code>stream_set_timeout()</code> |
| <code>mysqli_execute()</code> | <code>mysqli_stmt_execute()</code> |

- PHP CS Fixer: `no_alias_functions` (3.1.0, [3d3e267](#))
- Phan: `PhanDeprecatedFunctionInternal`, (Reflection - PHP 8.5)
- Rector: `RenameFunctionRector`, 2.1.3
 - socket: [cc85909](#)
 - mysql: [29fbd7f](#)

Deprecated: confusing chr() and ord()

chr() outside of [0, 255]

Values are bitwise-AND with 255 (0xff) and that ASCII char is returned

Rector: ChrArgModuloRector (2.1.5, [ef73f11](#))

ord() with bad lengths

First character from a C-string is returned as an int

- Empty string -> NULL -> ""
- Multiple chars -> first

Rector: OrdSingleByteRector (2.1.7, [5ef04eb](#))

Deprecated: no-op closing functions

- `curl_close()`
- `curl_share_close()`
- `finfo_close()`
- `imagedestroy()`
- `xml_parser_free()`
- PHPStan 2.1.23:
 - `curl_close()` ([fbb9cb6](#))
 - `curl_share_close()` ([fbb9cb6](#))
 - `finfo_close()` ([f43f8ea](#))
 - `imagedestroy()` ([0c62fa9](#))
 - `xml_parser_free()` ([fbb9cb6](#))
- Phan: PhanDeprecatedFunctionInternal, (Reflection - PHP 8.5)
- Rector: RemoveFuncCallRector (2.2.4, [4b30bc5](#))
 - WrapFuncCallWithPhpVersionIdCheckerRector (2.1.5, [66ac8c6](#))

Deprecated: no-op \$exclude_disabled

- `get_defined_functions()` returns all functions
- Since PHP 8.0 disabled functions are always excluded
- Rector: RemoveFuncCallArgRector (2.1.3, [a357fdb](#))

Deprecated: Reflection*::setAccessible()

- ReflectionMethod::setAccessible()
- ReflectionProperty::setAccessible()

Since PHP 8.1, all methods/properties are accessible

- PHPStan stub data (2.1.23, [fbb9cb6](#))
- Phan: PhanDeprecatedFunctionInternal, (Reflection - PHP 8.5)
- Rector:
RemoveReflectionSetAccessibleCallsRector (2.1.3, [6d046c1](#))
 - Added to 8.1 config set

Deprecated: in-band Reflection failures

`ReflectionClass::getConstant()` when missing

- ``false`` indicates missing constant
- ``false`` is a valid constant value
- Guard with ``::hasConstant()``

`ReflectionProperty::getDefaultValue()` when missing

- ``null`` indicates missing default
- ``null`` is a valid default
- Guard with ``::hasDefaultValue()``

Deprecated: SplObjectStorage aliases

| Replace: | With: |
|---------------------------|-------------------------------|
| <code>::contains()</code> | <code>::offsetExists()</code> |
| <code>::attach()</code> | <code>::offsetSet()</code> |
| <code>::detach()</code> | <code>::offsetUnset()</code> |

- Phan: PhanDeprecatedFunctionInternal, (Reflection - PHP 8.5)
- Rector: RenameMethodRector (2.1.3, [ad470ba](#))

Deprecated: unregistering all autoloaders

```
<?php
```

```
spl_autoload_unregister('spl_autoload_call');
```

```
<?php
```

```
foreach (spl_autoload_functions() as $fn) {  
    spl_autoload_unregister($fn);  
}
```

Deprecated: `\$_http_response_header`

Compile-time error

```
<?php
```

```
$GLOBALS['http_response_header'] = 0;  
var_dump( $_http_response_header );
```

```
<?php
```

```
$url = 'https://www.php.net/release-candidates.php?format=json';  
$content = file_get_contents($url);  
if (function_exists('http_get_last_response_headers')) {  
    $_http_response_header = http_get_last_response_headers();  
}  
// Safe to use $_http_response_header
```

Deprecated: `null` directory arguments

- `readdir()`
- `rewinddir()`
- `closedir()`
- Phan:
PhanTypeMismatchArgumentInternalProbablyReal
(Reflection - PHP 8.0?)

`null` results in using the most recently opened directory stream, just pass that directly

Deprecated: driver-specific PDO parts

- PDO::DBLIB_ATTR_* (7)
- PDO::FB_ATTR_*_FORMAT (3)
- PDO::MYSQL_ATTR_* (19)
- PDO::OBDC_* (5)
- PDO::PGSQL_* (1)
- PDO::SQLITE_* (7)
- PDO::pgsql*() (9)
- PDO::sqliteCreate*() (3)
- Phan: PhanDeprecatedFunctionInternal, (Reflection - PHP 8.5)
- Rector: RenameMethodRector / RenameClassConstFetchRector (2.1.3, [3cd5e4a](#))

Deprecated: finfo_buffer() '\$context'

- Also finfo::buffer()
- Parameter is unused
- Rector: RemoveFinfoBufferContextArgRector (2.1.3, [1e7f7ea](#))

Deprecated: PDO 'uri:' scheme

Triggers reading the actual DSN from the given URI

Replacement: manually fetch the URI first line

Deprecated: existing warnings elevated

Constant redeclaration: guard with ``defined()``

Closure binding issues:

- “Cannot bind an instance to a static closure”
- “Cannot bind method `%s::%s()` to object of class `%s`” - for trying to change the type of object bound to
- “Cannot unbind `$this` of method”
- “Cannot unbind `$this` of closure using `$this`”
- “Cannot bind closure to scope of internal class `%s`”
- “Cannot rebind scope of closure created from function”
- “Cannot rebind scope of closure created from method”

Deprecated: ArrayObject for objects

- Also ArrayIterator
- Break engine assumptions
- Phan: PhanDeprecatedConstructorObjectParamInternal (5.5.2, [76c8d10](#))

Deprecated: PDO Pgsq transaction constants

- PDO::PGSQL_TRANSACTION_IDLE
- PDO::PGSQL_TRANSACTION_ACTIVE
- PDO::PGSQL_TRANSACTION_INTRANS
- PDO::PGSQL_TRANSACTION_INERROR
- PDO::PGSQL_TRANSACTION_UNKNOWN
- Pdo\Pgsq::TRANSACTION_IDLE
- Pdo\Pgsq::TRANSACTION_ACTIVE
- Pdo\Pgsq::TRANSACTION_INTRANS
- Pdo\Pgsq::TRANSACTION_INERROR
- Pdo\Pgsq::TRANSACTION_UNKNOWN

Transactions are not exposed by the pdo/pgsql extension, only by pgsql

Deprecated: openssl_pkey_derive() \$key_length

- Higher than key prime size: ignored
- Lower:
 - ECDH: truncation
 - DH: derivation fails
- Rector: RemoveFuncCallArgRector (2.1.3, [d4a9592](#))

Deprecated: Date RFC7231

```
<?php
```

```
var_dump( DATE_RFC7231 );  
var_dump( DateTimeInterface::RFC7231 );  
var_dump( "D, d M Y H:i:s \GMT" );
```

- Ignores associated timezone, always GMT

Deprecated: INI options

- `report_memleaks` - should never be disabled
- `register_argc_argv` - hardcoded to ON for CLI, phpdbg, embed SAPIs
 - Default to ON but default ini disables for other SAPIs
- `intl.error_level` - use `intl.use_exceptions`

PHPCompatibility.IniDirectives.RemovedIniDirectives.*

- `report_memleaks` (PENDING, [b2d6b43](#))
- `register_argc_argv` (PENDING, [d90960a](#))
- `intl.error_level` (PENDING, [900c9ab](#))

Does not handle .ini files

Deprecated: `__sleep()` and `__wakeup()`

- 7.4 added `__serialize()` and `__unserialize()`
 - 8.5 proposed deprecating `__sleep()` and `__wakeup()`
 - Accepted and then converted to soft deprecation
- Rector:
 - `SleepToSerializeRector` (2.2.0, [4507adf](#))
 - `WakeupToUnserializeRector` (2.2.0, [92708a1](#))

Deprecated: output handler problems

```
<?php  
  
ob_start(  
    static function ($buffer) {  
        echo "Testing...";  
        return $buffer;  
    }  
);  
echo "Foo\n";  
ob_end_flush();
```

- Left over from 8.4
- Output within callback goes nowhere
- Deprecations bypass the problematic handler
- <RC5: non-string return deprecation errors

Warnings: Footguns for types

```
<?php
```

```
$nan = fdiv( 0, 0 );  
var_dump( (string)$nan );
```

```
$aboveMax = PHP_INT_MAX + 1;  
var_dump( (int)$aboveMax );
```

```
[$first, $second] = 123;  
var_dump( $first, $second );
```

- NAN coercions:
 - settype()
 - Parameters and return values
 - (string), (bool), (array)
- Out of range float cast to int
 - (int) for NaN
 - PHP_INT_MAX + 1
- Destructuring non-arrays
 - Objects already though `Error`s
 - Scalar/null/resource just assigned null

Removed: INI disable_classes

- Breaks engine expectations
- All core classes are safe
- SlevomatCodingStandard.PHP.ForbiddenClasses (6.3.0, [915a7cd](#))
- PHPCompatibility.IniDirectives.RemovedIniDirectives (PENDING, [e3a71a2](#))

Changed: Directory class

- Final
- No `new Directory()`
- No cloning
- No serialization
- No dynamic properties
- Create with `dir()`
- Match other “resource objects”



Thank You

Questions?